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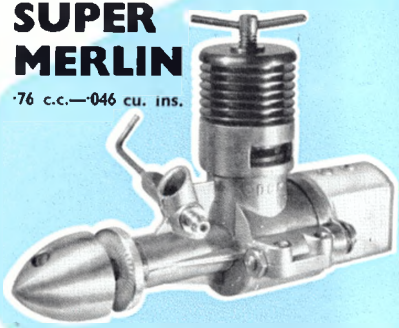

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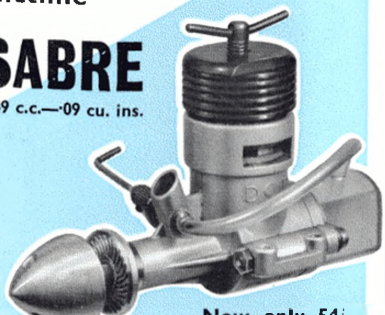

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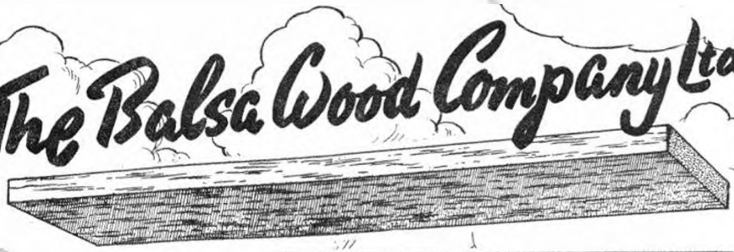

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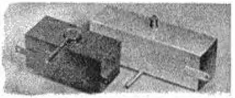

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AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XXI
NUMBER 246
JULY 1956

Managing Editor - C. S. RUSHBROOKE
Editor - H. G. HUNDLEBY
Assistant Editor R. G. MOULTON

★

Special features

★

Regular features

★

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:
MODEL AERONAUTICAL PRESS LIMITED
SUBSCRIPTION RATE: 22/6 per annum prepaid (including the special Christmas Number).
Editorial and Advertisement Offices:
38 CLARENDON ROAD, WATFORD, HERTS
TELEPHONE: GADEBROOK 2351 (Monday-Friday)

The other side of model flying

AS AL READ WOULD SAY, "You've seen 'em!"

Head in air, puffing through over-exertion, glassy eyed yet with a peculiar fixation on some indeterminate something in the distance. Hawthorn hedges, muddy streams, bulls, cows, and all the other natural and unnatural obstacles pass unnoticed as they pursue their relentless course.

You've guessed! The Retrievers. Not the long-eared variety with shaggy coats, but the long-haired variety with no coats at all—at the best an oil-stained shirt.

We have all done it sometime or other, for no true aeromodeller can justify the name unless he has been on a model chase. Our own experiences include the meadows and the Colne whilst at Eaton Bray, this particular river having a fiendish capability of winding itself at least twice across one's downwind beeline; adventures amongst the extensive sandpits that skirt the home of Handley Page's; of straying into fields containing tempestuous Arab stallions, and our rapid exit from same; of interesting diversions with the inmates of a mental home that borders one of our well-known flying fields, although as our feminine friends remarked at the time, just who should have been inside and who outside was open to debate; of our most difficult recovery job at a glider international when the model disappeared into a large field of 10-foot high maize, which necessitated walking up and down row after row of dense green jungle wet with early morning dew, which when mixed with dust from the field coated us liberally from head to foot; of finding our favourite radio model the morning after the search the night before, complete with mournful Jersey cow, which offered up with plaintive moo the remnants of a regurgitated tailplane; of the fellow travellers one meets in that downwind "other world" of modelling—people one has nodded at for years, who have a common task and in a moment become as brothers.

But then we have almost forgotten the reason for this dissertation, which was to appeal to the Retrievers now that the flying season is in full swing, to take care when recovering over other people's property, particularly the farmers! Seek permission whenever possible and if you do have to retrieve from a field of growing crops please do so in a commonsense manner so that no damage is done.

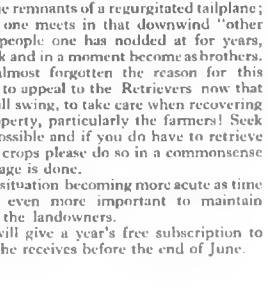
With the flying field situation becoming more acute as time progresses it becomes even more important to maintain friendly relations with the landowners.

Finally, the Editor will give a year's free subscription to the best recovery story he receives before the end of June.

Get running boys!

On the Cover . . .

A Fairey Gannet trainer poses for the renowned Charles E. Brown camera to display its lightweight aluminium finish with trainer yellow bands across wing and fuselage. The device between first and second cockpits is a periscope for the instructor to see forwards. Further Gannet details, and a fine scale model, are presented in this issue.



Air of realism is captured by J. Rayne in this low angle photograph of his Allban Sabre powered APS Vulcan. For the shutter-bugs, his advice is to position the Coronet Cub camera 4 ft. from the model, and 100 yds. from a suitable hangar.

Air Scouting Stimulus

May 26th-27th saw an important conference that may have widespread effects on aeromodelling, when leaders of the Boy Scouts movement met at R.A.F. Halton to discuss the future of the Air Scout branch. Inaugurated in 1941, the Air Scout branch had a natural appeal during the war years, and was very popular, since when it has settled down to a comparatively small but enthusiastic membership which has shown a gradual increase in the last few years.

The recent appointment of Air Vice-Marshal J. G. W. Weston, C.B., O.B.E., R.A.F., as Headquarters Commissioner for Air Scouts will do much to expand this useful branch of the Scout movement in the United Kingdom. He firmly believes that Air Scouting fulfils a great need for air-minded boys who wish to further their aeronautical interests, whilst at the same time following normal Scouting activities. The Air Ministry offers official recognition to Troops of Air Scouts who fulfil certain conditions. Recognition makes the Air Scout Troop eligible for assistance, where practicable, from R.A.F. Stations, and for Scouts who have reached a certain standard of proficiency to fly as passengers in Service aircraft.

Our Managing Editor had the privilege of addressing the meeting on the subject of aeromodelling, as a result of which the Proficiency Badge requirements have been made more realistic, particularly as regards the expected abilities of a junior Scout in relation to his more senior counterpart. It was indicated that whilst very few Scouts could expect to get into the air until such time as facilities are more plentiful, a model aircraft could be in the hands of every boy, and much could be learnt of air requirements from the construction and flying of individual models.

Other speakers were Mr. Paul Minton, instructor at the Lasham Gliding Centre, and Mr. Gerald Pollinger on the subject of Aircraft Recognition, under the chairmanship of Air Vice-Marshal C. N. Bilney, C.B., C.B.E.

Lebensraum

The above term, flogged to death and destruction by the late (but not lamented) Adolph Hitler, may well be applied to the present day flying field situation. In practically every part of the country aeromodelling is operating under great difficulties due to the lack of reasonable facilities for free flight activities, and there is every indication that the situation will worsen.

We well know that some grounds have been lost to the aeromodelling fraternity through the thoughtless actions of one or two clots, but that does not help to alleviate the knowledge that many hundreds of well-mannered fellows are prevented from getting the most out of their hobby through the occasional lack of co-operation where a suitable ground is available. There are still a number of more-or-less derelict aerodromes scattered over the countryside that would prove a haven for such enthusiasts, but it would appear that there is far more difficulty in securing access to such places than to a fully-manned Service station!

Why? We haven't a clue, other than that in general such unused 'dromes are manned (if at all) by a skeleton staff, reduced to a minimum at week ends, and probably scared stiff of the responsibilities that may come their way were a band of wild-looking aeromodellers to descend on their blissful Sunday afternoons. Whatever the reasons, it grieves us to pass by expansive aerodromes completely void of plane or person, knowing full well that not far away enthusiastic aeromodellers are eating their hearts out for want of flying room.

Seriously though, we would welcome any suggestions from readers that may help in preparing a correct approach for the use of reasonable flying room, for there can be no doubt that the lack of free-flight space is slowly strangling the movement.

Designer's Loss

As we close for press, we learn with sincere regret of the sudden death of Mrs. Anna Smith, wife of the well-known designer of the popular Veron kits. Phil and his family were regular visitors to the popular rallies all over the country, and our readers will join us in tendering our sincere sympathies to Phil and his two young children in their sad loss.

S.M.A.E. Change of Secretary

As a result of the resignation of Mr. D. A. Gordon from the office of General Secretary of the Society, an Emergency Meeting of the Council has asked Major S. D. Taylor to relinquish the office of Competition Secretary and take over the duties of General Secretary with immediate effect.

Mr. B. A. Messom has agreed to carry out the duties of Competition Secretary and has been appointed to this office.

Speed gen

Recent correspondence from abroad indicates that there is an even greater dearth of information on speed matters than exists at home, so the following lists of current F.A.I. International Records should be of interest. Both free-flight and control-line categories are recognised by the International group, though much greater attention is paid to the tethered classes than the free-flighters.

FREE FLIGHT

Record No. 4 Rubber-driven: V. Davidov (U.S.S.R.) 11/7/1940 107.08 k/hr.
Record No. 8 Power-driven: E. Stiles (U.S.A.) 20/7/1949 129.76 k/hr.
Record No. 23 Radio-control: K. Stegmaier (Germany) 21/3/1954 58 k/hr.

In the above classes the record is measured over a course of 50 metres (164 ft.) for models with rubber motors, and 100 metres (328 ft.) for models with mechanical motors. The course must be flown in *both* directions within 30 minutes, times taken as the model enters and leaves the course (airborne of course!) and the mean of the two runs made gives the record speed. The figure recognised is that of the next whole number below in km/hr., and each new record must beat the preceding record by at least 5 km/hr.

CONTROL LINE

Record No. 27 Class I (0–2.5 c.c.): R. Gibbs (Great Britain) 18/12/1955 208 k/hr.
Record No. 28 Class II (2.5–5 c.c.): R. Gibbs (Great Britain) 25/9/1955) 235 k/hr.
Record No. 29 Class III (5–10 c.c.): L. Berke (Hungary) 2/10/1954 255 k/hr.
Record No. 30 Class Jet: I. Ivannikov (U.S.S.R.) 8/8/1955 275 k/hr.

Timing of control-line records is over 1 kilometre, and here again any new claim must exceed the previous record by at least 5 km/hr.

Prime interest is shown in engines used by record holders, and the following details are relevant to the above:

Stiles ... ... Triumph 51 (8.226 c.c.)
Stegmaier ... Eisfeld DV3 (6 c.c.)
Gibbs (Class I) Carter Nipper (2.41 c.c.)
Gibbs (Class II)... Carter Special (4.83 c.c.)
Berke ... ... McCoy 60 (10 c.c.)
Vassiltchenko ... M.V.4

Advance gen for philatelists

Regular readers and many of our overseas readers are keenly aware of our editorial interest in foreign stamps, particularly those featuring the hobby of aeromodelling. We have published facsimiles of many such stamps in the past, and now it is our turn to publish a stamp illustration that has not yet been issued.

It will be put into circulation next year by the L.I.P.A., Oporto's main aeromodelling club, in Portugal, and is entitled "Aeromodelling is the beginning of a dream . . ." Whether it will be used for postal services or as an envelope emblem or sticker is not yet clarified, but as an illustration we consider it one of the best yet seen.

Errata

To set the record straight, our recent feature on Multis (May issue) credited the wrong person for building the scale Lockheed Constellation in photo 5. This model was built by J. M. Walling of the Glevum Club, and has been demonstrated by him at many rallies. He specialises in four-engined types and is at the moment engaged on a seven-foot Bristol Britannia, and from the photos sent to us, it looks like being a most outstanding model.

Hungry Heifers

The whole of Cambridge felt sorry for David "Dusty" Miller, Chairman of Cambridge M.A.C., when his brand new high-climbing power job landed among a crowd of hungry heifers.

Trouble started when "Dusty's" model went O.O.S. after three minutes on its third flight in the d/c Hamley Trophy, which also coincided with Club's annual power event. His A.M. 2.5 powered red and white pylon model disappeared into the blue above Oakington Airfield and "Dusty" heard no more until next morning, when he received a phone call from an amused farmer.

"Your model landed among my heifers who decided to eat it", said the farmer. "What happens if they are ill?"

"Dusty" collected what was left of his model—the engine, two bearers and part of the pylon with address label!

The *Cambridge Daily News* ran the story with headline, "Heifer so sad tale" together with picture of "Dusty's" model before its last flight.

The farmer later commented, "My stockman was more than a little surprised when he saw the herd crowding round what was left of the model. Anyway cows are daft enough to eat anything. Mine have not started flying yet and they have not asked to join the A.T.C."

Happy ending: "Dusty" won the Club's power trophy with a three flight total of just over 8 mins.

Portuguese Aeromodelling stamp to be issued in 1957 depicts the hobby "At the beginning of a dream".

All the winners

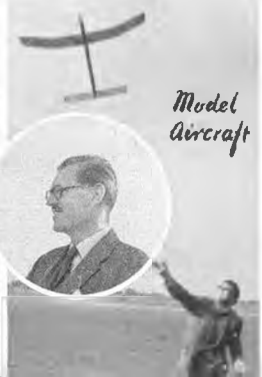
POWER winner of the fly-off, after making three maximum flights, Tom Smith, the English Electric design wizard, launches his Oliver Twister for an ultra-rapid climb and a 6 : 39 flight. Class B TEAM RACE winners were the Martin Brothers of Chingford, with W. Martin handling fast pit stops for the 103 m.p.h. green and natural finish Carter Special model. In the SHORT CUP, Ron Ward of Croydon (Elpin 2.49) heaved off the 16 ounces payload for best three-flight performance.

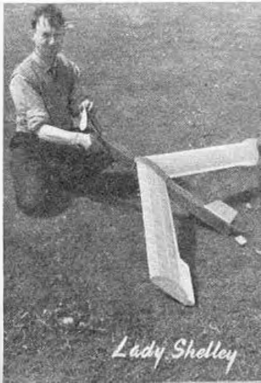
SCALE winner by a slender point was G. Wilson from Maybole in Scotland, with his enhanced APS Prestich Pioneer in authentic R.A.F. colour scheme. Model flew with identical short take-off characteristics of the full size. GOLD Trophy winner for second year running, Peter Russell of Worksop refuels the ED 2½ in his 33½ design to appear in Plans Service soon.

Smile on Reg Hazell's face is understandable as he returns after the long 6 : 31 fly-off decider which won him the THURSTON Trophy, which he well deserves after trying for so long. Model is his M2 design for '56. DAVIES 'A' Team Race winner was the Foresters combination of Sewell[Steward (Owner)[Crawforth, with an FAI specification model, using 10 c.c. tank.

RUBBER winner in the fly-off by 3 secs. of timers eyesight was Cartwright of Hull, doing well this season in Bakefield. He uses twin skein motors, like Josh Marshall of Hayes, winner of the Lady Shelley TAILLESS Trophy. Josh has 6 ounces of motor in this large model (3 sq. ft. area).

J. Nixon (inset) an S.M.A.E. Country Member from Grimsby, won both the National RADIO CONTROL events with his 'Ab Initio', nose of which is Glass Fibre to stand up to the hi-speed descent and landings.





The NATIONALS

IN SPITE OF a last minute set-back due to the loss of Waterbeach as a venue, the 1956 British Nationals was one of the most successful meetings yet held. First class co-operation from the personnel at R.A.F. Hemswell (in particular F/O Goodnough, who as liaison officer saw to it that no detail was left unattended) resulted in a smoothly-run meeting upon which King Sol shone unabated the entire Whit weekend.

Hemswell proved a first rate flying ground with excellent retrieving country on its outskirts and, although not so accessible as Waterbeach, being 12 miles from Lincoln and 9 miles from Gainsborough, certainly drew as many competitors as previous years, if not more.

The camping site, which ran along the western perimeter of the aerodrome, presented a hive of industry when we arrived on the Saturday evening; in fact we cannot remember seeing such a concentration of tents at any other Nationals of recent years.

Thanks to a stalwart band of volunteer clubs and officials, contests on the Sunday were away to an early start under ideal weather conditions. Bright sunshine was already warming up the thermals and the wind can best be described as a perfect modellers' breeze. Organisation creaked a little at the glider control point, as this big-entry free flight contest had unfortunately been allocated only the same number of helpers as smaller contests. However, the situation was corrected as the day progressed, but a number of competitors did have to wait a long long time in the flight queue.

Most noticeable trend of the meeting, confirmed by all the judges, was the appalling lack of knowledge of contest rules shown by the majority of competitors. Henry J. Nicholls, who ran both the radio control contests assisted by Bob Yates and Ron Darr did a roaring trade in S.M.A.E. Rule Books which he sold to all R/C contestants who came up with queries during the run of the contest! There were people who tried to fly their Bowden entries according to three-year-old rules; there was the Gold Trophy competitor who came up with a stunt model without undercarriage, in spite of the fact that this contest has been compulsory R.O.G. for many years now; there was the PAA-load competitor who turned up with a 1 c.c. PAA-load model for a 2.5 c.c. contest, and was more than dismayed when told he would have to carry 16 ounces! Will these and all the other competitors kindly sport a modest shilling, invest in a Rule Book and READ it before next year's Nationals!

Glider (*Thurston Cup*)

Though somewhat taxed by limited area on the field, and paltry assistance from competitors except when ruddy urged to help timekeep, the Thurston disposed of 178 entries in magnificent conditions, some 70 of whom did not return a score. Launching point was adjacent to the crest of a ridge at the airfield boundary, and the wise ones soon found that by towing up to the hedge, the model was positioned in a standing wave good for an extra 25 ft. altitude with the better models. Many who released in the turbulent wake of the wave were downdraughted. Thus we found maximums galore, and among the high number of "doubles" was Dave Painter with the *Pelican*, winner last year. His third flight was not so bright, however, and after a long session on the line, trying to find lift in an impossible flat period, he released low down for a mere 48 sec. Downwind were large areas of Lincolnshire potato fields with parched earth offering very convenient general lift throughout

SMAE Chairman Alec Haulberg chats with Wing Commander Russell-Bell, who presented prizes, and liaison officer F/O Goodnough, who did Trojan work for the competitors.

the day, and so slight was the drift that it was possible to run and keep up with most 4-minute flights.

The fly-off was between F. Cartwright of N. Lines, with his Hansen airfoiled *HG44* and Reg Boxall of Brighton with his A/2, to which a typical Boxall fin had been added during the course of the day. Apparently it had been tricky on the line, so Reg increased the area almost 100 per cent. with a second fin on top of the fuselage. The *HG44* made a very nice unassisted 2 : 11, and Reg Boxall caught the lift for 6 : 34 O.O.S.

Team Racing (*Davies "A" and "B" Trophies*)

Seventy-five entries in Class A were dealt with in prompt manner by the Foresters and associated helpers, beginning with an early start as soon as barriers had been erected across the fine smooth runway. It would be safe to say that 90 per cent. were Oliver Tiger powered, and the slowest model still capable of circulating at 75 m.p.h. Claims of over 90 m.p.h. were actually substantiated by our stopwatch when we checked a couple of models; but the average is still around 82, for 40 laps or so. Perhaps the second biggest surprise was the snappy little "*Tiger Terror*" in bright yellow by J. Muir and Co. which valiantly upheld Scottish prestige, and might well have taken the trophy across the border had it not been for a couple of slow pit stops. These Scots lads certainly rocked the established southern favourites from Wycombe, Nottingham, Southend and Sidcup, but were beaten by the more experienced Foresters team, who provided the biggest surprise of all.

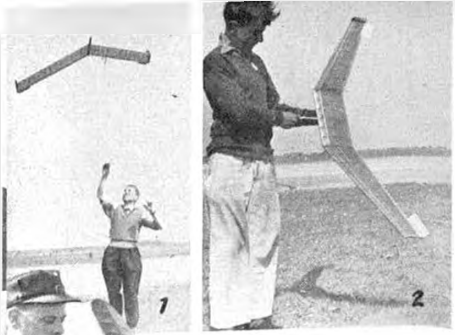
They were flying "*Finger Print*", recently returned from the Brussels International, still equipped with a 10 c.c. tank and carrying about 50 sq. in. of battered excess wing area! The under size tank only required one extra pit stop in the ten-mile final, and the size of the model seemed to have no retarding effect on the Oliver's output. Same model won at Radlett last year and was in the final at the Wycombe rally in May, proving once and for all that team racers need not degenerate into skinny, rule scraping midgets to win a place.

We cannot pass without comment on Dick Edmond's fine effort. Said to have lost his heat, although fastest both in the air and off the ground, his was also an F.A.I. size model, and well deserved a place in the final for a chance to collect the Davies for the fifth year running. Such was not to be, and we admire his reticence in not querying the lap-scoring though many were rooting on his behalf.

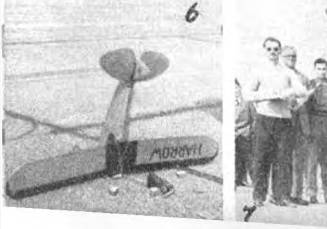
Class B racing appears to be losing its grip on appeal, and probably the influx of some very superior "over 100 m.p.h." specials has something to do with this. It was once more a Carter engine victory, this time by the Martin Brothers of Chingford, using a re-worked McCoy 29 in a green and natural finish model.

Speed

The speed pylon saw sporadic activity, except for a last hour rush on the second day. "Gadget" Gibbs



J. J. Marshall launches clubmate P. Hedgeman's Tailless glider which came 2nd in Lady Shelley. 2. Paul Lynn of St. Albans had an ultra-light tailless with 14 oz./sq. ft. wing loading, which was too light for the breeze. 3. L. Clark of Sunderland and neat low-wing he flew in Bowden. 4. G. Parkinson's profession (see van address) has no effect on his lively R6-B flying. 5. Fisher starting up for a dabble with proportional control. 6. How not to spot land by Maharin (UNSAFE). 7. Radio judges watch launching of J. Curry's Amco 'Bit' Junior 60 with transistorised receiver.



edged another mile per hour on each of his previous "bests" in 2.5 and 5 c.c. (127 and 147 m.p.h.) and 15-years-old R. King of West Essex made a creditable 145 in 10 c.c. with a stock McCoy. Mike Bassett of Sidcup pushed the 1.5 c.c. record to 84 m.p.h. (yet to be confirmed) with a Tiger Cub driving a 5¼ in. x 8 in. prop and we hope this indicates renewed interest in the smaller class, for there's a margin of another 20 m.p.h. before we catch up with the American figure for engines of similar size.

AN 'AERIAL' VIEW

Radio Control

(S.M.A.E. and Taplin Trophies)

After the promising start to this season's radio contests, as witness the "AEROMODELLER" Trophy at Cranfield, the standard of flying at the Nationals was a great disappointment. From 27 entries, ten failed to fly and only a handful of the remaining 17 put up a creditable performance. Surprise of week-end was J. Nixon, an S.M.A.E. Country Member from Grimsby, who won both the S.M.A.E. Trophy and the Tuplin Trophy with a model of his own design powered by an E.D. 3.46. Special features of this model are a knock-off fibreglass engine assembly (more of which anon) and a Bonnerised escapement system with rudder and elevator, plus two-speed motor control, the transmitter being operated by a joystick type control box. Model was trimmed for "no-glide", *i.e.*, cross between vertical descent and the normal glide, and the Nixon technique for spot landing was to cut to half speed on the engine control and drop like a brick on the spot, using the specially reinforced fibreglass "chin" to take the shock! As the judges said afterwards, "There's nothing in the rules to prevent this method of spot landing, but we must have them amended before next season."

Other creditable performances were put up by R. Donohue of Kersal flying a flat-bottomed Sparky powered with a 2.5 c.c. A.M. 25; T. Budding who flew a model of his own design; and W. Airey flying the familiar R6-B design, as did many others.

In the *Taplin Trophy* on the Monday, a stiffish breeze made conditions a little more difficult and inevitably lowered the standard of flying. To compensate for the wind, however, competitors were blessed with the attendance of the donor of the trophy who certainly made the shortest flight of the day - the model being back on *terra firma* in pieces even before he had reached the control button after launching!

"Funereal" Parkinson provided an entertaining session when the motor of his R6-B ran rich after a spiral dive. Model then proceeded to fly around at head height, being underpowered, and performed some lively crowd chasing, including a hectic run through the middle of the team race circle. All the time Parkinson was struggling to maintain sufficient height to reach the spot landing area, which he finally managed, the motor cutting at the ideal moment and the model touching down a few yards from the spot!

Gold Trophy (*C/L Stunt*)

A familiar face in the shape of Pete Russell of Worksop carried off top honours for the second year running. An E.D. 2.46 c.c. was the power unit in a beautifully-constructed silver and green semi-scale stunt model that went through the book smoothly and effortlessly, the truly circular shape of his loops and precision of his cross-overs in "eights" scoring top points. Late-flier Len (Stoo) Stewart of West Essex, flying an A.M. 25-powered stunter at very high speed, ran Russell a close second with only seven points between them. It is interesting to note that none of the top men used wing flaps, which seem to have gone out of fashion.

View of the 'Gold' —as one spectator would have the judge see it!

Variety in the way of models was provided by W. Hawkins who entered two scale jobs, a Martinside Buzzard that had a baulky motor, which resulted in him flying a Nakajima "Tenzan" powered with a D.C. 350. Platt of Wanstead produced a semi-scale Heinkel decorated with the customary large black crosses, and Blundell of Godalming turned up with the old "Flying Eye" model that readers will remember from our February, 1956, issue. Biggest hard luck story of the "Gold" was Bill Morley's crack-up when a line broke on the best-looking and best-finished model of the meeting. On its maiden flight at that!

Short Cup (*PAA Load*)

If the International Class PAA-Load contest machine is any indication of the ability of a heavily-loaded model to the "new" F.A.I. power specification, there seems little to worry about, for the average performance witnessed in the Short Cup event was really good.

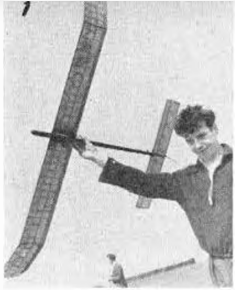
Ten competitors got cracking with their engines, these comprising Elfin (4), E.D. and Eiffaender (2 each), Oliver and Webra, and the healthy roar of these packets of concentrated dynamite indicated that a large model plus 16 ounces of dead weight could still be pulled upstairs in quick order. Both Brian Faulkner and Alan Mussell scored maximums, though both lost a complete round, Faulkner with model trouble, and Mussell not recovering the job after his 2nd round flyaway of 7 minutes plus from a 6-second motor run!

Ron Ward (Croydon) made flights of 2 : 40, 1 : 37 and 1 : 17 to win, his Elfin 2.49-powered model being the normal squarish functional job associated with him. Glynn of Brixton, a former winner, went right off form after his good first round flight of 2 : 39, further flights only collecting 0 : 32 and 0 : 27.

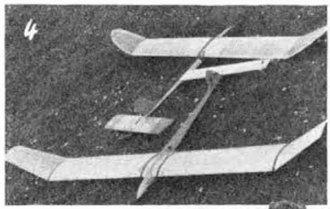
Ward will agree that he was lucky to win, for quite moderate flights by either second or third placemen would have put him out of the running, but that is the way of things on contest days.

Power (*Sir John Shelley Cup*)

If any event could be said to have left an impression at the Nats, it would certainly be the Sir John Shelley for free flight power; and this view was confirmed to us by the several world-travelling Internationalists who were present. The standard among the 166 entries was as high as we have ever seen, and height gained on the 15 sec. engine run was simply fantastic in some cases. There were 48 maxes, and one model went O.O.S. vertically on an overrun of 25 sec.! Mike Gaster had a Fox 35 in an elderly Gastove, but was quick to tell us that it used to be faster with the Oliver Tiger, and there

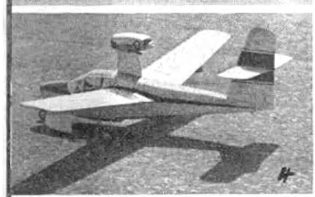


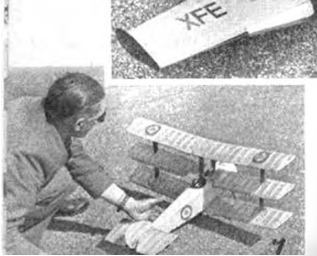
1. Hugh O'Donnell and brother John's 4/2. caught the down-draught badly. 2. Donaghue of Kressal takes no chances when range checking his equipment on VM 25/Sparky. 3. Elegant lines on John West's model in the glider park, part of which can be seen in background. Up to 100 models waited to fly at one stage. 4. Among the 100 were the BG 44, and a Hansen Aurikel by E. Cartwright of N. Lincs. who was in the fly-off.



5. Several lady fliers took part in the events including Miss Pepper seen adjusting her Tangle Foot A/2. 6. Is typical of many attempts to take-off in the Bowden contest and shows the American Canard design Fatso, built by J Dunkle of Epsom for a McCoy .8 r.c. diesel. In photo 7, Mike Bassett of Sidcup holds the Oliver Tiger Cub 1.5 c.c. speedster which made 84 m.p.h. with 5½ x 8 in. prop.

1. Waco Model "E" Biplane was operating at a disadvantage as the Elfin 1.8 broke a vital elevator lug on a test flight. Nevertheless it took off for Archbold of Leicester. 2. Maestro of the handle, and somewhat slimmer than before, Len Steward, 2nd in the Gold. 3. Get that car out of it! A near miss for Bridgewood's beautiful Phoenix as it heads for a straying vehicle. 4. Colonial Skimmer by Eric Fearnley off for a 400 ft. take-off run. 5. Smart Heinkel-semi-scale by Platt of Wanstead, suffered from engine trouble.





6. The Flying Eye prototype shook a few with its fine aerobatic performance. Here Blundell of Godalming seeks a glow in the Frog 500. 7. Regular scale entry is Ball's Sopwith Triplane, built from A.P.S. drawings.

Assorted headgear . . . the Davy Crocketts

were a large number of Torp 19 and Frog 500 entries. Predominant were the "*Creeps*" with Torp 15, E.D. or Oliver power, and the honour of highest climb would be divided between some of these and Dave Posner's AM 35 *Dream Weaver*. For sheer speed, the *Oliver Twister*, which eventually won the fly-off and collected the Trophy for Tom Smith, was most impressive.

One must hand it to Tom Smith with these ultra-light swept-forward designs. He is probably the only professional aerodynamicist following the hobby who adheres to his line of model theory and makes a success of it, and what a trail of successes it is! Fifth in 1953, 1st in 1954, and 1st again in 1956, not forgetting his confrère Ian Harrison's 3rd in 1955 with a similar design. Tom's model was perfectly trimmed and any who decry its gliding ability should note the fly-off duration of 6 : 39, which followed three 4-minute maxes. It seems a pity that Tom should miss the trials this year through not flying in one of the Eliminators.

Scale *(Super Scale Trophy)*

The number of models entered in the Super Scale Trophy probably represented less than half the eligible types to be seen around the field, including some fine multi-engined controliners, a Liberator, Fortress, Wellington and Whirlwind to name but four. In the judging enclosure were nine of the finest scale models one could wish to see, and the general standard was high. Most of them blended a modicum of practicality with accuracy, resulting in increased dihedral, enlarged tails, increased prop clearance, etc. Exception was the perennial Heston Phoenix by Bridgewood, which was entered for the last of many scale contests on this occasion. It was beaten by one slender point and a better flight by Wilson's *Prestwick Pioneer*, built from A.P.S. drawings and considerably embellished with details culled from examination of the full-size machine by its Scots constructor. All stencilling and interior fittings were authentic; but more points would have been gained with a scale pilot and dummy Leonides radial.

Eric Fearnley's "Colonial Skimmer" lived up to its name well and truly by penetrating the wind and almost disappearing O.O.S. up the runway on a perfectly stable everlasting take-off run. After trimming, it earned a cheer from admirers when it became airborne from a 400-ft. run, and made a nice but glideless flight. Among others, Archbold's Waco "E", Fergusson's Convair L.13A and Ball's Sopwith Tripe were fine entries, and though non-flying (due to need for a C.G. shift), Peter Whittaker's latest effort of a ducted fan Venom illustrated enterprise in the fascinating subject of flying scale.

Bowden Trophy *(Precision)*

Probably the less said about this event the better, for from an entry of only sixteen, nine modellers flew, and only *two* returned any kind of a score. Only two models had been prepared especially for this contest, the remainder being mainly kit or plan jobs—well built in the main, but totally outclassed when awarding points for design, etc. Last year's winner, R. Swinden of Darlington, had built a keen-looking swept wing "fighterish" job that flew very stably . . . when the contest flights were completed! Take-off troubles beset this model when the two official flights were being taken.

Most models either failed to reach the minimum flight

. . . and others

time, or went well above it, P. H. Ball of Leicester making the best showing with a 57-second flight with his "Mam'selle", having failed to reach the 40 sec. mark with his first attempt. Whilst commiserating with Mr. Ball, we are not at all surprised to learn that the event was declared a "no contest". We trust The Colonel will at long last appreciate that there is little or no support for the contest as currently conducted, and a new approach is required . . . or drop the contest altogether.

Lady Shelley Cup (*Tailless*)

Though the entry for this event is always restricted to those enthusiasts who like to get out of the rut of orthodox designs, the general standard of flying was high despite the gusty conditions which made long distance timing something of an eye-strainer. When edge-on at the far end of an airfield, these flying wings take some seeing . . . even so our aged optics coped better than some of the teenage clock wielders when it came to an O.O.S., or it could be that long experience has taught us better concentration and an ability to blandly ignore the comments of enthusiastic lookers-on!

Josh Marshall (Hayes) thoroughly deserved his win with the most interesting model in the contest, a twin-skein rubber driven job that flew very consistently indeed, steadily improving with each flight. The first two flights were troubled with a fairly tight low circling attitude, but the final flight—his best—was beautifully trimmed and was almost out of sight when grounded.

The only other powered job was by Headley of English Electric, a single skein rubber motor being employed. The general consensus of opinion is that the engine-powered tailless does not stand a chance with the permitted 15-second motor run.

P. Hedgeman, a clubmate of Marshalls, made the best individual flight of the contest with a near-maximum, but even so was well down on the winner's time.

For once F. C. Smith (Southern Cross) was out of luck, first with a sticking auto-rudder, and then launching difficulties with a reserve model. Thus came to an end an extraordinary run of success in this particular contest, for he won in 1953, 1954 and 1955.

Rubber ("*Model Aircraft*" Trophy)

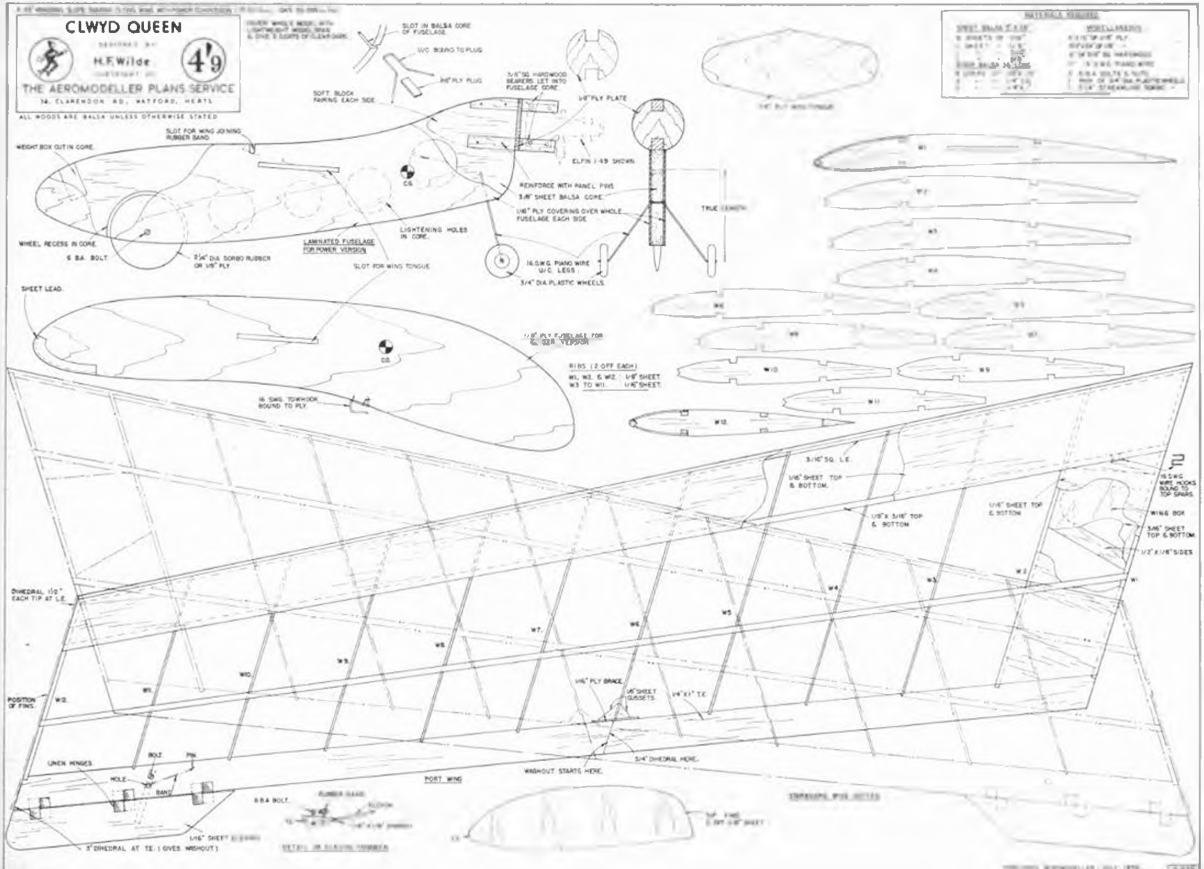
Our best impressions of the *Model Aircraft* event for rubber models were during the final stages of the contest late on the Monday afternoon. The wind had dropped to almost a standstill and as we approached the take-off area the pungent smell of D.T. fuse hung around as if to remind one that here is a type of model flying that really needs them. As we followed the direction of the timekeepers' shaded eyes we saw no less than four Wakefields all circulating lazily in the same thermal against a background of wispy stratus cloud. Investigation showed that at the end of the third round three people had achieved full maximums, making a fly-off necessary between Cartwright of Hull, Alexander of Cowley, and Marshall of Boston.

Alexander was first away, but found no lift and landed within the aerodrome. The other two were in the air together, Cartwright at fairly low altitude picking up spasmodic lift from the runways, and eventually the potato fields, to be timed O.O.S. at 6 : 54, only 3 seconds in front of Marshall's *Borderline* which was high up and presumably harder on the timekeepers' eyesight.

RESULTS ON PAGE 385

1. Scots representatives, Bill Meechan holding for Jock Finlayson at the end of the stretch. 2. Latest Creep held by Arthur Collinson (Torp 15) had very high climb. 3. Bond Baker from far-away Australia, flew in Rubber as well as Alan King, but both were off form. 4. One of the large entries, a Frog 500 model by D. Nixon of R.A.F., Wyton.

5. Though only 13 years old, John Pool of Halifax handled his Mk. 3 Creep with the air of an expert. 6. Pop Miller of Bradford, winner of this year's Gamage Trophy but not with this model. 7. Dave Posner temporarily lost his AM 35/Dreams Weaver, and the chance of a victory. 8. High Thrust model was flown by Hollis of York. Power unit was a Frog 2.49 B.B.



CLWYD QUEEN
H.F.Wilde
4'9
THE AEROMODELLER PLANS SERVICE
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
SLOT IN BALSA CORE OF FUSELAGE
U/C BOUND TO PLUG
1/8" PLY PLUG
SOFT BLOCK FAIRING EACH SIDE
3/16" SQ. HARDWOOD BEARERS LET INTO FUSELAGE CORE
1/8" PLY PLATE
SLOT FOR WING JOINING RUBBER BAND
WEIGHT BOX CUT IN CORE
ELFIN 1·49 SHOWN
C.G.
REINFORCE WITH PANEL PINS
3/8" SHEET BALSA CORE
1/16" PLY COVERING OVER WHOLE FUSELAGE EACH SIDE
TRUE LENGTH
LIGHTENING HOLES IN CORE
WHEEL RECESS IN CORE
6 BA. BOLT
2 1/4" DIA SORBO RUBBER OR 1/8" PLY
LAMINATED FUSELAGE FOR POWER VERSION
SLOT FOR WING TONGUE
16 S.W.G. PIANO WIRE U/C. LEGS
3/4" DIA PLASTIC WHEELS
SHEET LEAD
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
W11
W12
RIBS (2 OFF EACH)
W1, W2, & W12 : 1/8" SHEET
W3 TO W11 : 1/16" SHEET
16 SWG. TOWHOOK BOUND TO PLY
3/16" SQ. L.E.
1/16" SHEET TOP & BOTTOM
1/8" x 3/16" TOP & BOTTOM
1/16" SHEET TOP & BOTTOM
16 S.W.G. WIRE HOOKS BOUND TO TOP SPARS
WING BOX
3/16" SHEET TOP & BOTTOM
1/2" x 1/16" SIDES
DIHEDRAL 1/2" EACH TIP AT L.E.
POSITION OF FINS
1/16" PLY BRACE
1/8" SHEET GUSSETS
1/4" x 1" T.E.
3/4" DIHEDRAL HERE
WASHOUT STARTS HERE
PORT WING
LINEN HINGES
BOLT
PIN
HOLE
BAND
6 BA BOLT
1/16" SHEET
3" DIHEDRAL AT T.E. (GIVES WASHOUT)

The Clywd Queen

A UNIVERSAL 63in. SPAN TAILLESS MODEL THAT CAN BE EITHER POWER OR GLIDER. BRITISH RECORD HOLDER IN TWO CLASSES.

by H. F. WILDE

WITH LESS construction involved, and definitely less susceptibility to damage, the tailless model is a fascinating subject, particularly when one is presented with a design that holds two British National records. The "Queen" of which no less than three have been lost on the Clwyd slopes, established a lightweight record of 9 : 51 in 1954 and a record with F.A.I. wing loading of 3 : 17 as far back as 1949. In its latest version, as presented here, it can be flown in three forms, either for slope soaring, two-launching or as a power model for up to 1·5 c.c.

Construction is both simple and inexpensive and naturally enough begins with cutting out the wing ribs which change in section from root to tip.

Pin down the two lower spars over the plan, cementing the ribs in place, using packing strips where necessary to provide a wash-out and add the two top spars. Make sure that the root tip is at a slight angle, to allow for dihedral, and the tip rib W.12 should be inclined at the same angle to keep the tip fins vertical. Now add the leading edge to the ribs, remove the wing from the plan. Joint the trailing edge at W.6, then fit to follow the lower profile of the ribs at all points. Now pin down wing on the board except for the outer trailing edge portion and insert packing under the trailing edge to obtain the correct wash-out angle before cementing firm. Linen patches over the trailing edge joints are advised. Attach the leading edge sheeting on the upper surface, remove from the board and build on the underside.

Now make the two wing boxes from hard balsa, pre-cementing or using a slow-drying glue. Before fixing the wings, check for alignment with the tongue in place between the two wing panels. Fit the elevons while the box assembly is drying in position, and then finally complete the wing by sheeting the centre bay on both surfaces, then cover with heavyweight Modelspan. The original is covered with yellow tissue to show up amongst the countryside when landing on the slopes of Clwyd.

Trim for hand-launch on level ground, the correct position of elevons being with them following the contour of the underside of the wing. If the "Queen" turns right or left, screw down the elevon on the outside of the turn. When a satisfactory glide has been obtained, add an extra ounce of nose weight for flying from a slope. It should sweep away, climbing steadily in the wind. The power version has actually flown with an Elfin 2·49, but more modest power is recommended, at least to start with. For a safe flight pattern use a left hand circuit with the port elevon screwed down half a turn at a time on the trimming bolt to obtain the desired rate of turn.

FULL SIZE COPIES OF THE 1·4 SCALE PLAN OPPOSITE CAN BE OBTAINED PRICE 4/9d POST FREE FROM AEROMODELLER PLANS SERVICE. PLEASE QUOTE PLAN NUMBER U.630 WHEN ORDERING

Hungarian team at Soviet International is Peter Roser, A/2; Vadislav Ordogh, Power; and Georges Benedek. Wakefield. At right is an A.P.S. Bird Dog by Phil Guilmant of Mexico

World News

MODELLING IN THE Services can at times be rather difficult, and this is particularly so at Overseas stations where supplies are not immediately available, or provision made for recreation in the form of a workroom. R.A.F. Wahn, in **Germany,** is a note-worthy exception, where 30 members have increased activities to the extent that they have made a move to a larger clubroom. Some of the lads went to the first German Eliminators and were allowed to take part in an unofficial capacity, just to compare efforts and add to the fun of things. Naturally enough, they can learn a lot from the German A 2 fliers: but in power, the boys of the R.A.F. fancy their chances. Inter-station model meetings are non-existent in Germany, so the enthusiasts of Wahn issue a challenge to any other active clubs in 2nd T.A.F. through these columns.

As mentioned in brief last month, the **Danish** Nationals were held on May 16th at Odense Airport, and although less blustery than usual for their annual event, the weather was still far from ideal. For the first time, a radio control contest was included. Jan Hackbe won, using proportional rudder control, with elevator and engine stop on an Elfin 2.49. He comes from a place named Windy !! 2nd was J. Holm Jorgensen, chairman of the Danish model committee, also using three controls.

Borge Hansen won A 2 for the 3rd year running, using a 1956 design with thicker and less under-

Left, top: A.P.S. Turbulent by Heinz Graus for a Taifun Hobby. Centre: Sven Larsson and Jan Svensson with their SJI (and photographer Stig Skogstedt's) gliders at Jonkoping. Bottom: Mrs. Robin Wee and husband's old timer which flies well. Below and opposite: Japanese Hipe starters are typical of scale interest in Japan

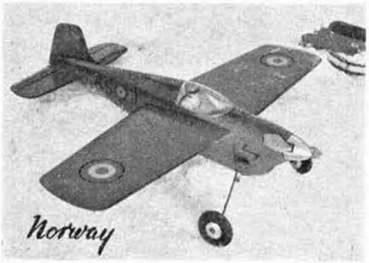
cambered airfoil than the so-called "flapped" section which he has used before. 2nd was a newcomer, Peder Ducholm, and third, T. Stripp, who comes from the champion club, Sportsflyveklubben of Copenhagen.

Following their first Wakefield representation at Finthen last year, the Danes are improving fast in the rubber class, and Niels Sorensen made four max's and 2 : 36 to win in conditions where the OOS range was close on three minutes.

Generally, the '57 F.A.I. rules have met with approval in Denmark, and a full team is expected to participate in Sweden for the Wakefield this year, though the prospects of sending a team to Italy are more uncertain. One power flier at least, Flemming Kristensen, will represent Denmark in power at Cranfield.

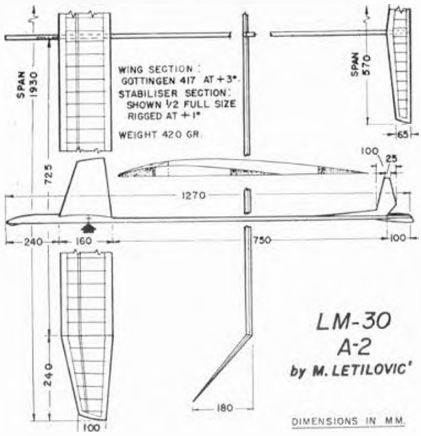
Still in the Nordic countries, news from **Sweden** concerns a two-day event at Malmo for the International classes as a preliminary elim. and also the small glider (S/1 Class), small rubber, beginners and radio control. Chas. Moberg won the Wakefield, only one mere second short of five perfect max's, and Gunnar Kalen was A/2 victor with 813 secs. In power, there seems little doubt that Rolf Hagel will make the team as he topped the list with 861 secs. He was in both the A/2 and power teams last season, and winner of the Europe Cup at the S.A.A.P. International in '54. Chas. Moberg will forever be remembered as the man who lost his Wakefield tailplane as it continued upwards in a thermal at Cranfield in '53, when the rest of the model d'd'd!

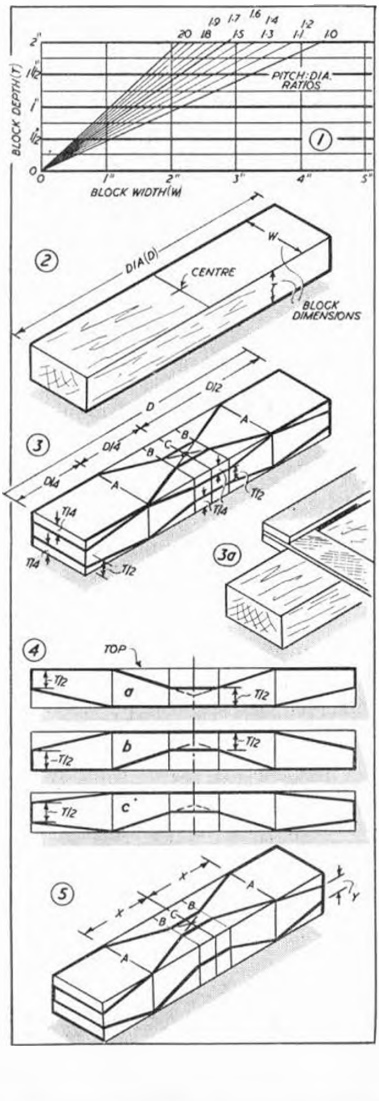
From the radio event, winner Erik Berglund and his father will go to the King of the Belgians International Trophy at Antwerp on June 17.



Top left: U.P.S. Swiss Miss with K & B 15 from Lisbon. Right: Champion CH. club in Sweden is Soderstije, in the middle is Petterson with 106 m.p.h. Webra speedster, flanked by 90 m.p.h. Tjeroen of Persson and Soderberg. Norwegian racer below is by Ragnar Jastnaes, does 62 m.p.h. with David-Anderson 2.5 c.c., to F.A.I. rules

Drawing below is for a novel Yugoslav CH of ultra-simple construction including hardwood stick for fuselage





Aeromodelling Step-by-Step

CARVING RUBBER MODEL PROPELLERS

FOR BEST PERFORMANCE, diameter of a rubber model propeller is generally about 40 per cent. of the wing span (allied to a rubber motor length equal to the span).

A common error is to use too low a pitch on a rubber model propeller. Unlike the engine-driven propeller, a rubber prop. is usually most efficient when the ratio of pitch divided by diameter is at least 1 5 : 1 and not more than 2 : 1. Only in the case of the very large propellers mentioned are finer pitch/diameters advisable.

Pitch is determined by the angle or "twist" of the blades and is related to the size of block from which the propeller is carved. The graph **1** shows the relationship between block width (W) and block thickness (T) for a range of pitch : diameter ratios. This relationship is independent of dimmeter. The relationship between block width and diameter is that W is usually made about 1/8th of the diameter, although most propellers are carved from "standard" block sizes. For example, 15, 16 and 18 in. diameter propellers are almost invariably carved from 2 in. wide block.

The block, as purchased, may then need trimming to the required thickness dimensions (selected according to the pitch diameter required)—**2**. It should be accurately squared up and the centre marked. Use medium hard straight grained wood for freewheeling propellers and quite light wood for folders.

A standard blank layout is then shown in **3**. The block length is divided into quarters and marked around lines for laying out the blank. The complete blank shape which gives the required change in twist or pitch angle along each blade is then easily laid out, using a straight-edge, a ruler and a pencil or ball point pen.

The layout shown gives a symmetrical propeller, when carved. Using the same proportions, the blank can be laid out to give swept-forward blades **4a** or swept-back blades **4b**. Of the two the latter is to be preferred, but a more popular arrangement is to keep the outer portions of the blank symmetrical and use sweepback on the inner portion only—**4c**.

There is also another method of marking out the blank, using unequal divisioning, *i.e.*, spacing the "A" lines some measured distance from the centre "C" line instead of at half radius **5**. This has the advantage that using a standard block size, *e.g.*, 2 x 1½ inch, the actual pitch of the propeller can be varied by varying the "X" dimension. The value of "X" is calculated from the pitch required—

$$X = \frac{\text{block width (W) x pitch required}}{2\pi \text{ x block thickness (T)}}$$

Actual pitch values for a 2 x 1½in. block (which are independent of final diameter) are:

X	4	4½	5	5½	6	6½ ins.
Pitch "	22	25	27½	30	33	36 ins.

Theoretically the end taper should be adjusted accordingly so that the pitch at the tip (π x diameter x T/W) is the same as the calculated or selected pitch, but more often than not this is simply made T/2 as with the standard layout.

Cutting the block to *blank* shape **6** often proves difficult for the inexperienced modeller. If you have a fret machine, or can use a fretsaw freehand accurately the job is simplicity itself. Actually only one-half of the blank edges are critical and so it will pay to give these particular attention and at least start cuts along their

length. Use a small stiff-backed saw for as much cutting as you possibly can as this will more or less guarantee "square" cuts if held upright. But before you do any cutting at all on the block, *drill the centre hole* whilst the block is still true and square.

The backs of the propeller blades are always carved first **7**. Carve from the centre to the tip and remove the *top right edge* for the first cut. Then continue carving carefully to reduce the blade to a substantially flat surface between the top left and bottom right edges of the blank. Do not try to remove too much wood with a single cut and watch for signs of the grain running off. If necessary carve in the reverse direction to prevent splitting off part of the blade. Finish carving with a slight undercamber in the surface and then sand perfectly smooth, right out to the edges. Check that the undercamber is the same on each blade.

The partly carved blank is then turned over and the top of each blade carved, in turn, in a similar manner. The secret of a good propeller is a good thin blade section with the maximum thickness well formed and the after portion thinning away smoothly to a very thin trailing edge **8**. The actual thickness of the blade should also taper from root to tip. A useful way of judging the section is by "feel" with the finger and thumb. Try to get the blade sections identical each side, sand the front surface to remove knife cuts but do not bother to finish smooth at this stage.

Each blade is then trimmed to a smooth outline shape **9**. You can either make a card template of the blade shape required and use this to mark out each blade; or trim one blade to a nice shape and make a template of this shape by marking around the blade on to card. The template is then used to mark out the second blade.

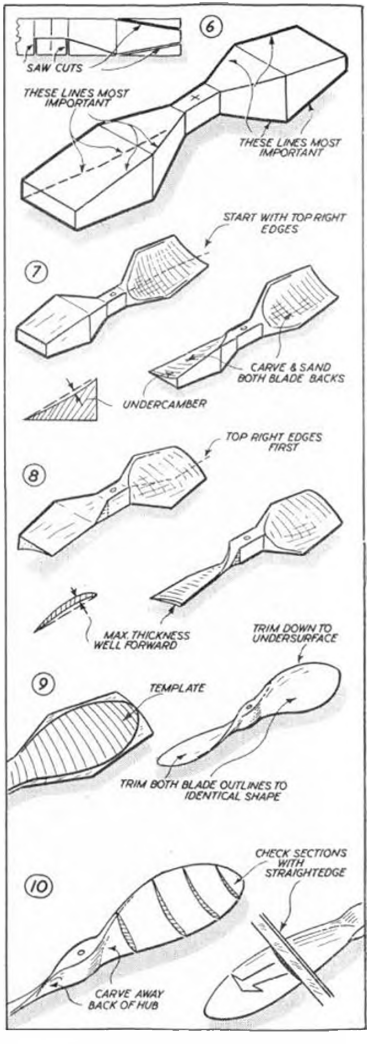
Where wood is trimmed away from the edges this will result in uneven sections. It is therefore necessary to work the upper surface to final shape, preferably with sandpaper. Do not work off any of the bottom surface (blade back) as this establishes the correct pitch. To preserve this pitch the top surface must be trimmed down to meet it.

Continue the smoothing down of the front surfaces right to the hub. Then turn the propeller over and work on the bottom surfaces near the hub **10**. Here, of course, we will be modifying the pitch angles slightly, but the shape will normally be most unsatisfactory if left untreated. Follow the changing pitch as much as possible so that the whole of the blade root blends smoothly into the hub, but avoid undercutting or "notching" which may drastically weaken the blade.

Before finishing the propeller completely with fine sandpaper it must be checked for balance by slipping on to a length of wire, sanding wood off the heaviest blade if unbalanced. Undercamber on each blade can be checked by sliding a straight edge along between the leading and trailing edges. Differences in thickness on the blades can readily be determined by "feel" and corrected by sanding.

In balancing, remember that wood removed from the tip region of the heavier blade will restore far more rapidly than sanding away nearer the hub. If unbalance is due to the wood density being greater on one side than the other, then push scrap lengths of wire into the *lightest* blade to to get balance, rather than work the heaviest blade down excessively thin.

As to finish, many expert aeromodellers give no treatment to a balsa propeller, other than fine sanding. It usually pays, however, to give at least three coats of dope, sanding between each; or use filler plus dope and finally wax polish for a really smooth finish.



Scale enthusiasts will like the Gannet for its clean lines and variety in possible decorative schemes. Designer, at left, chose No. 826 F.A.A. Squdn insignia for the prototype. Photo at foot of page shows the model seated on its take-off dolly.

Fairey Gannet

AN ACCURATE 38 INCH SPAN SCALE CONTROLINER BY J. M. BODEY

FLYING SCALE CONTROLINE is gaining increasing favour this season and we suspect that a great many enthusiasts will welcome this most practical model of the "Fairey Gannet" which can be used either for sport flying or developed into an entry for the "Carrier" event, which is so popular in the U.S.A.

The prototype weighed 28 oz. all up, flew at 60 m.p.h. and used an E.D. 2.46 Racer. With 3.5 c.c. we have no doubt that it would be faster and capable of loops and mild manoeuvres.

Make the wings first by building up the two spars from $\frac{1}{8}$th balsa & $\frac{1}{16}$th ply, then fit on all the ribs to the front spar only. While this assembly is drying, cut the fuselage formers, then add the rear spars to the wing, together with the leading edge and trailing edge. Line guides, and undercarriage tubes can now be bound and cemented to their respective positions.

Formers F.5 and F.6 can be cemented to the wing spars, checking that they are square in the front elevations, then add bellcrank support, remembering to drill it first. The bottom keel of $\frac{1}{8}$ in. balsa is now added, also ply formers F.3 and F.4. Engine bearers and tank are positioned in place and firmly glued (using one of the slow drying adhesives). Formers F.2, F.7 and F.9 come next, followed by rear keel and former F.11.

After all formers are firm, the $\frac{1}{8}$ in. sheet strip between formers F.5 and F.7 can be cemented in place together with the $\frac{1}{8}$ in. backbone and fin outline including the two ribs R.1 and R.2.

The bellcrank assembly should now be completed by adding leadouts and pushrod. Before adding tailplane, cement in tailplane supports and check for alignment with wing by means of a piece of scrap sheet. When certain they are correct, mount tailplane and connect up to pushrod. Check both elevator and bellcrank are "neutral" before finally cementing in place.

Now plank the fuselage where indicated with $\frac{1}{8}$ in. x $\frac{1}{4}$ in. strips and add soft block. The fin and between formers 5 and 7 can be covered in $\frac{1}{16}$ in. sheet. Before finally sanding, the cowling can be roughly carved and hollowed out of block then spot cemented in place.

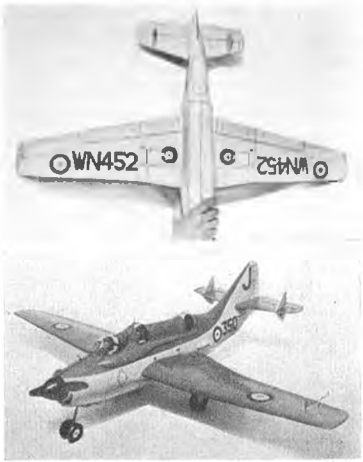
Fuselage can now be completely sanded to a smooth finish with several grades of glass paper. Cut cowling in half and mount engine temporarily. Check for a good fit.

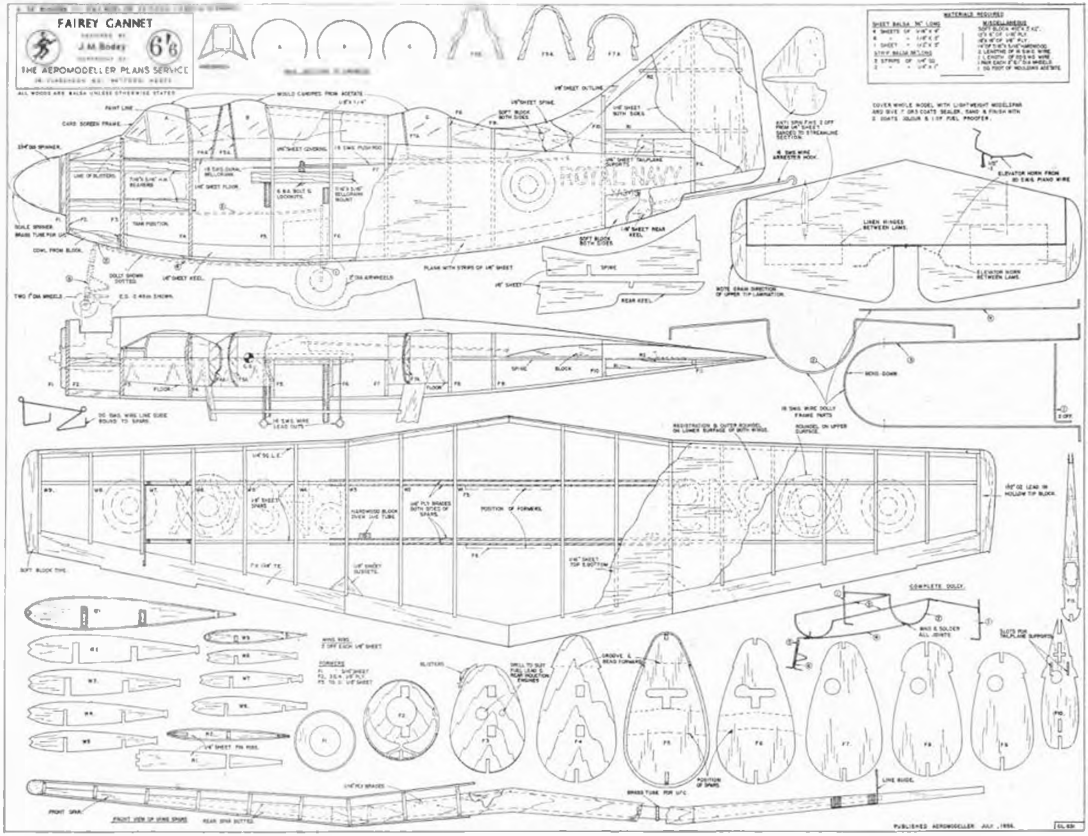
The wings can now be covered with $\frac{1}{16}$ in. sheet, and tip blocks added, not forgetting outer tip weight.

Cover entire model with lightweight tissue and give one coat of thin, clear dope. All extras such as radar, dustbin, tailskid, jet orifices and fuselage fairing under the cockpits, etc., can now be added.

The complete model is given several coats of sanding sealer until a smooth finish is achieved. Full details of the colour scheme will be found on the 1/48th scale drawing on page 364.

The original flew best using a 8 x 8 plastic propeller on 50-ft. laystrate lines. The glide after the engine stops is very flat indeed, up to two laps being possible, thus providing ample time for the pilot to select a soft landing spot to avoid damage to the belly.





FULL SIZE COPIES OF THIS 1/5th SCALE DRAWING CAN BE OBTAINED FROM THE AEROMODELLER PLANS SERVICE BY QUOTING NUMBER CL/631 ,PRICE 6/6 POST FREE

AEROPLANES
In
OUTLINE No. 46

Fairey Gannet

by J. R. ENOCH

SINCE THE FOUNDATION of the Fairey Aviation Company in 1915 by Mr. R. C. (now Sir Richard) Fairey, the types of aircraft designed and built by the company have included a large number of specialised nava faircraft, and it is with particular regard to this type of machine that the company has been more closely associated for the past few years.

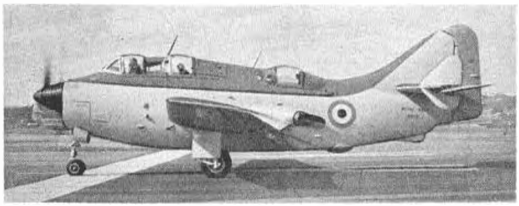
Latest of this long and highly successful line which includes many famous types such as the Swordfish is the Gannet A.S.1, which was designed to meet the requirements of M.O.S. Specification GR.17/45, the company having been awarded a prototype contract on August 12th, 1946.

On September 19th, 1949, the first prototype GR.17/45, known then as the Fairey 17 and bearing only vague resemblance to the present Gannet, was flown for the first time by the company's chief test pilot, Group Captain Slade, at Aldermaston. This machine, Serial VR.546, was the first post-war British aircraft designed to combine the Search and Strike roles for carrier-borne anti-submarine operations. A two-seater aircraft with pilot and navigator in tandem cockpits, the GR.17 was the first aircraft in the world to be fitted with twin engines having single engine configuration. This power unit, the Armstrong Siddeley Double Mamba ASM.D.1, was specially developed for the Fairey 17 as a result of very close collaboration between design teams of the two companies concerned. Of 2,950 e.h.p. the Double Mamba is in fact two AS.Ma.3 units placed side by side, driving two free contra-rotating co-axial Rotol four-blade propellers, this system of drive being of Fairey conception. Such an arrangement possesses several features of specific advantage for this type of aircraft. Each half of the Double Mamba is independently controlled and either can be shut down and its airscrew feathered, permitting single engine operation with its attendant economy and—of great importance—without the assymetric tendencies inherent in the conventional twin configuration. The power plant incorporates reverse torque mechnism which is in effect an automatic airscrew feathering device, reducing the drag of a windmilling airscrew rapidly. This minimises the loss in height or speed which occurs while the stationary half of the engine is started and accelerated in the event of the other half failing.

The second of the prototypes, VR.557, a two-seater, and similar in most respects to the first, was first flown on July 6th, 1950. Meanwhile, during the development of the design, numerous changes in requirements were made by the Admiralty in the light of improved armament, radar and operational techniques, which resulted in extensive modifications and provision for a third crew member. Construction of a third prototype was commenced and whilst this was being built the first prototype re-appeared with a wooden mock-up of the new rear canopy, with the retractable radome further aft, and the characteristic auxiliary fins on the variable incidence tailplane. The inboard section of the wing was of increased area being swept forward from the inner fold line to the fuselage. The third prototype, WE.488, was first flown on April 10th, 1951, and was similarly powered to the first two aircraft.

A considerable amount of development and test flying was undertaken by these three prototypes, and on June 19th, 1950, the first prototype landed on H.M.S. *Illustrious* at sea. On its first deck landing trials this aircraft made 27 take-offs and landings in one day under varying conditions of take-off distance, ship speed, etc. During this development period over 250 deck landings were made by the three prototypes, and hot and cold weather trials were satisfactorily completed in Malta and Canada respectively.

On March 14th, 1951, a substantial production order was placed by the M.O.S., and in May, 1953, the first production machine, WN.339, made its first flight, piloted by Peter Twiss. The production Gannet is powered by an improved Double Mamba (100) ASM.D.3 of 2,950 s.h.p. plus 535 lb. of residual thrust. One of the primary reasons for the original adoption of the Double Mamba is the fact that it complies with a Navy requirement that no petrol need be aboard the Carrier. Of



Opposite: Patrol at low altitude reveals the retractable "dustbin" for search radar in its fully-extended position, also the size of the long and capacious bomb and torpedo bay. Gannets often cruise on one half of the double Mamba unit, giving the appearance of flying without visible power. Right: Camouflage division line and sundry details of use to the solid modeller are seen in view from Farnborough runway

particular significance is the fact that the unit can operate on Kerosene, wide cut turbine fuel or Naval diesel fuel.

Seated above the power plant, the pilot has an unrivalled field of vision, a contributory factor to the most excellent handling performance and close combat effectiveness. The navigator seated behind the pilot has also excellent visibility, the radar operator facing backwards is accommodated in the single seat rear compartment, which has a transparency smaller than that of its predecessors. Access to the three crew positions is by means of a retractable ladder adjacent to the nosewheel door, and steps up the starboard side of the fuselage nose—thence along steps above the wing to the mid and rear positions.

A sting type arrestor hook is provided, forward of which can be seen the emergency tail bumper. Accelerator attachment hooks are situated forward of the wing leading edge adjacent to the bomb door hinge.

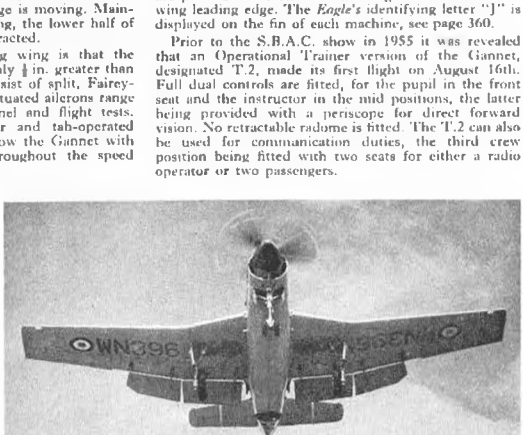
The tricycle undercarriage, engineered by Fairey, is of long stroke type permitting a high rate of descent without the tendency to bounce. The nosewheel unit retracts backwards under the front fuselage between inward folding double doors which are closed to reduce drag, except when the undercarriage is moving. Mainwheels retract inwards into the wing, the lower half of the wheel being unfaired when retracted.

A feature of the power folding wing is that the "folded" height of 13 ft. 9 in. is only ½ in. greater than normal. Wing control surfaces consist of split, Fairey-Youngman flaps and spring-tab actuated ailerons range especially developed in wind tunnel and flight tests. Combined with the large rudder and tab-operated elevators, the control surfaces endow the Gannet with exceptional handling qualities throughout the speed range.

The Fairey method of "Envelope Jigging" by which means the aircraft structure is built from the skin "inwards", considerably enhances speedy production and being used for the first time in production has largely contributed to the "smooth" manner in which design and development has progressed. Initially, production was undertaken at the main factory in Hayes, final assembly being completed at Northolt from where machines were flown to White Waltham to await collection by the F.A.A. A parallel production line was later laid down at the company's Stockport factory and the first machine to leave the line there was publicly demonstrated at Ringway on October 5th, 1954.

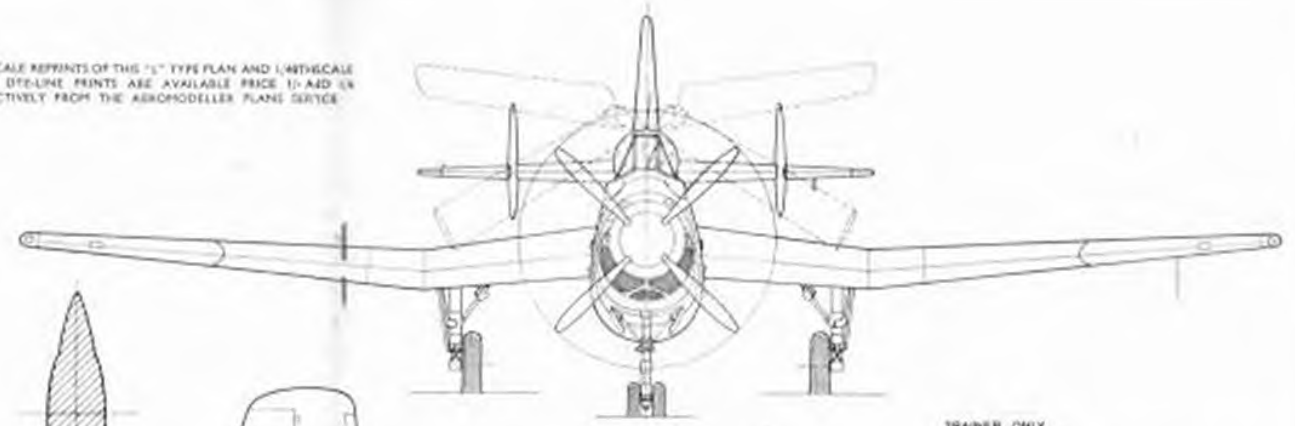
On April 5th, 1954, at Lee-on-Solent the first unit to be equipped with Gannet AS.1 aircraft was formed. This unit, No. 703X Flight, had the express purpose of carrying out intensive operational trials prior to the type being issued to A.S. Squadrons of the F.A.A. The four aircraft of the flight have the serials WN.347, 348, 349 and 350. Nine months later, on January 17th, 1955, No. 826 Squadron at Lee-on-Solent became the first to reform with Gannets, followed in February by No. 824 Squadron at Eglinton. No. 826 Squadron later embarked in H.M.S. *Eagle* prior to her first Service Commission. Of the squadron's aircraft, WN.410 bears the individual number 349 between roundel and serial and WN.452 has the number 350. The last two digits of the number are painted white on a black background on the inner wing leading edge. The *Eagle's* identifying letter "J" is displayed on the fin of each machine, see page 360.

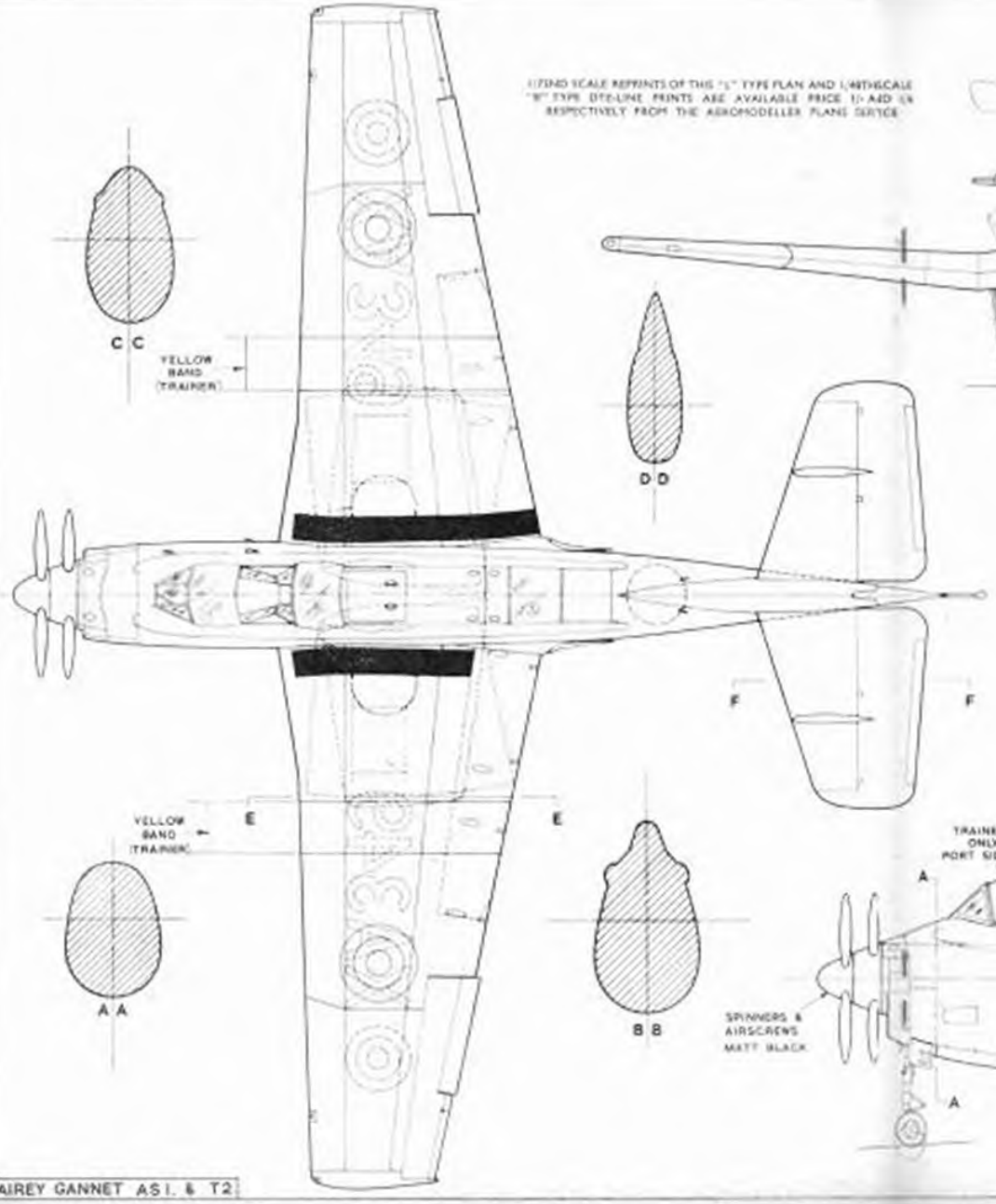
Prior to the S.B.A.C. show in 1955 it was revealed that an Operational Trainer version of the Gannet, designated T.2, made its first flight on August 16th. Full dual controls are fitted, for the pupil in the front seat and the instructor in the mid positions, the latter being provided with a periscope for direct forward vision. No retractable radome is fitted. The T.2 can also be used for communication duties, the third crew position being fitted with two seats for either a radio operator or two passengers.



Everything "down" including the hook and massive four-piece flaps. This photo, reproduced by courtesy of the "Aeroplane", shows all underside markings

1/72ND SCALE REPRINTS OF THIS "S" TYPE PLAN AND 1/48TH SCALE "R" TYPE DITE-LINE PRINTS ARE AVAILABLE PRICE 1/- AND 1/6 RESPECTIVELY FROM THE AEROMODELLER PLANS SERVICE



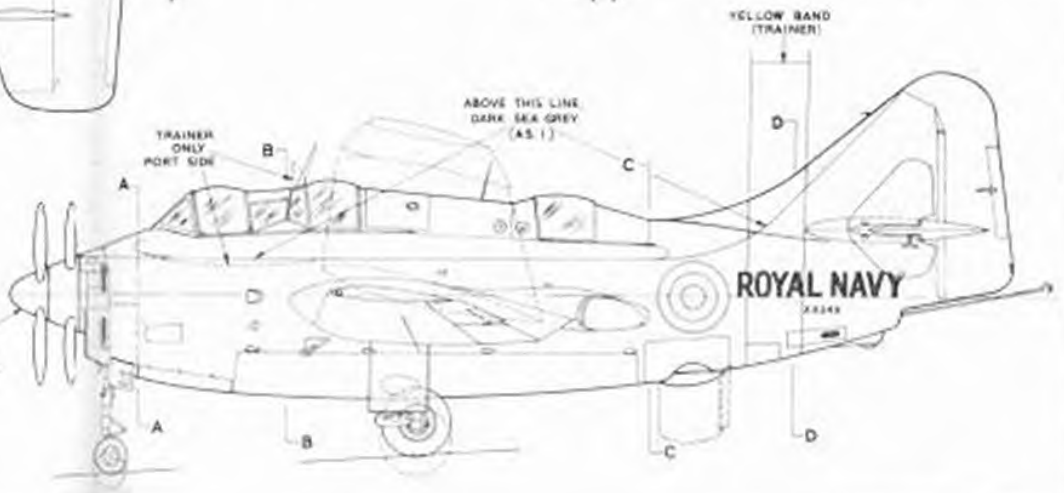


COLOURING

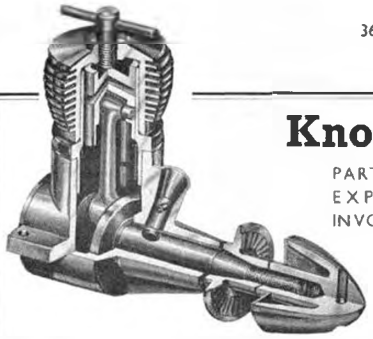
AS.1. DARK SEA GREY TOPSIDES
SKY UNDERSIDES

T.2 ALUMINIUM ALL SURFACES
EXCEPT AS NOTED

STARBOARD VIEW



FAIREY GANNET AS.1. & T.2



Know Your Engine

PART 4 OF THIS REGULAR FEATURE EXPLAINS THE TECHNICALITIES INVOLVED IN BORE AND STROKE

Could you identify this 2.42cc diesel? The answer is given in Club News on Page 384

THE TIMING DIAGRAM of an engine—expressed in terms of crankshaft rotation, as explained in an earlier article—gives us only part of the picture. The actual opening and closing *time* of the various ports—expressed in fractions of a second (or more truly milliseconds)—will be dependent on the bore/stroke (or stroke/bore) ratio for a given capacity, the length of the connecting rod relative to the stroke, whilst any asymmetry of the cylinder axis relative to the crankshaft centre line will alter the relative speeds of port opening and closing.

To illustrate the effect of varying the sizes of the bore and stroke for a given capacity we can take the three different arrangements for an imaginary 0.1 cu. in. (1.6 c.c.) engine—one with a stroke appreciably longer than the bore; one with equal bore and stroke (usually referred to as a "square" layout); and one with the stroke much shorter than the bore, or an "over square" layout. These are shown diagrammatically in *Fig.* 1.

Shortening the stroke (*i.e.*, increasing the bore/stroke ratio or decreasing the stroke/bore ratio for a given capacity) has two obvious effects. The distance travelled by the piston per revolution is *reduced*; and the load on the crankpin is *increased* for a given shaft torque (due to the reduced "throw"). Also the resulting engine is squatter, enabling its external dimensions to be reduced, with the possibility of an appreciable saving in weight. And for very high revving engines the reduction in friction and wear resulting from a lower piston speed makes the short stroke design more to be favoured than the long stroke counterpart. This advantage is gained at the expense of higher loads on the crankpin and main bearing for the same torque and a greater leakage path around the piston (due to the increased circumference). Although it was at one time held that the advantage of a short stroke for high speed engines was not so apparent in model sizes, with most standard engines having a normal operating speed of 10,000 to 12,000 r.p.m. and above, a near "square" arrangement is almost always adopted in modern designs. (Notable exceptions include the Oliver and Elfin 2.49 (radial).) This, too, is in direct contradiction to the early conception that a long stroke engine was best for high compression ratios and essential for model diesels. In general terms, the improved performance of model diesels has largely been due to "tailoring" them for high speed operation by increasing the bore-stroke ratio.

In a long stroke engine the piston has to be accelerated from zero at bottom dead centre (B.D.C.) up to a maximum one-quarter of a revolution later, then decelerated to zero again at T.D.C.—*Fig.* 2. The corresponding velocity gradient for a short stroke engine is appreciably flatter. This means that, apart from the mid position and B.D.C. and T.D.C., the piston is sweeping any other point on the cylinder faster

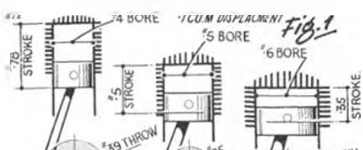


Fig. 1.

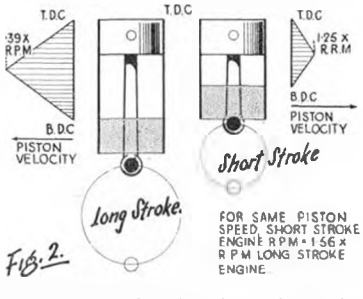


Fig. 2.

with a long stroke than with a short stroke at a given r.p.m. If, therefore, the port depth is limited the gas flow will have to be correspondingly faster, a feature which may not be clear from a study of a timing diagram alone. For the same opening period, compared with a short stroke engine, port depth would have to be increased to correspond to the same percentage length of stroke in each engine. Thus the only way to compare port timing without taking the bore/stroke ratio into account is to express it in terms of percentage stroke.

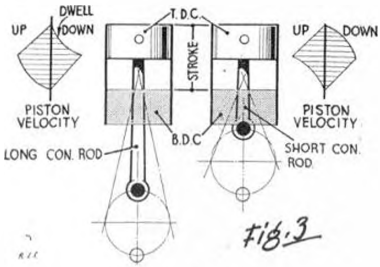


Fig. 3

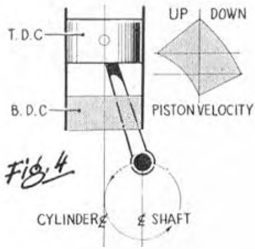


Fig. 4

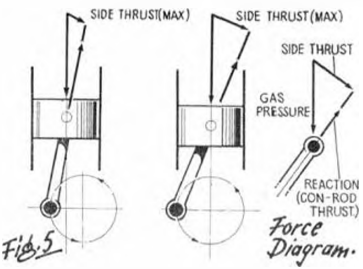


Fig. 5 Force Diagram.

The timing period is also modified by the length of the connecting rod, relative to the stroke. Lengthening the con. rod (for a given stroke) will modify the "velocity gradient" of the piston so that it tends to dwell about T.D.C. and accelerate more rapidly through B.D.C. Similarly, shortening the con. rod will have the opposite effect—the piston tending to dwell about the B.D.C. and accelerate more rapidly through T.D.C.—*Fig.* 3.

Thus, con. rod length can be an important factor in engine design, although usually once the prototype has been made it cannot be changed without a major re-design. It will be appreciated, however, that a relatively long con.rod length could be an advantage in a sideport engine with its inherent limitations as regards induction timing; and a short con.rod an advantage with rotary valve induction to increase exhaust and transfer port opening periods for a given physical depth of ports (strictly, retarding their closing).

An alternative method of promoting piston "dwell" is to offset the cylinder relative to the crankshaft, known as the Desaxe arrangement—*Fig.* 4. If the cylinder is offset in the direction of rotation the piston accelerates faster away from B.D.C., promoting quicker opening and slower closing, giving in effect a larger opening for a given size of port.

Such an arrangement is relatively uncommon on present-day model engines although it has been employed on a number of published British designs and in some versions of the K & B series of engines. As a general rule is is applied to cross-scavenged engines with the exhaust on the "displaced" side of the cylinder. Compared with the other methods of promoting piston "dwell", too, the system is essentially uni-directional. It cannot operate with equal efficiency if the direction of rotation is reversed. Hence a sideport engine with a Desaxé cylinder would have a preferred direction of rotation (the sideport engine having previously been described as the only layout which would run equally well in either direction).

Actually the timing feature of a Desaxé cylinder is not necessarily the reason for its adoption. It may be employed for mechanical reasons in that it greatly reduces the side thrust of the piston during the power stroke. As *Fig.* 5 shows, once the piston has moved away from T.D.C. on its power stroke, in a symmetrical cylinder design, the pressure is being transmitted at an angle via the con. rod, thus causing the piston to bear

TECHNICAL DATA ON BORE/STROKE OF BRITISH ENGINES

Engine	Type (Induction)	Bore in.	Stroke in.	Displacement c.c.	Displacement cu. in.	Bore / Stroke	Stroke / Bore	Piston* Speed Factor	Con rod length in.	Con. rod / Stroke
Allbon Dart	Crankshaft Rotary	.350	.350	.55	.0036	1.0	1.0	.0583	.58	1.66
Allbon Merlin	" "	.375	.420	.76	.0464	.89	1.12	.07	.58	1.38
Allbon Javelin / Sabre	" "	.520	.420	1.49	.0909	1.24	.81	.07	.718	1.71
Frog 1.49 / 150	Diaphragm Valve / Crankshaft Rotary	.500	.460	1.48	.0903	1.09	.92	.076	.844	1.83
Oliver Tiger Cub	" "	.432	.625	1.5	.092	.69	1.45	.104	1.062	1.7
E.D. 2.46	Disc Valve	.591	.562	2.46	.150	1.05	.95	.094	1.062	1.89
Frog 2.49 BB	Crankshaft Rotary	.581	.574	2.49	.152	1.01	.99	.0956	.969	1.69
Elfin 1.49 BB	Reed Valve	.503	.460	1.49	.0910	1.09	.92	.076	.92	2.0
A-M "25	Crankshaft Rotary	.570	.562	2.4	.15	1.02	.98	.0936	.88	1.57
A-M "35	" "	.590	.567	3.44	.210	1.59	.61	.0936	.88	1.57
Frog "500	" "	.750	.680	4.93	.30	1.1	.91	.113	1.375	2.02

* Piston Speed = $\frac{\text{stroke} \times \text{r.p.m.}}{6}$ ft./min. = column factor x r.p.m.

Know Your Engine (continued)

against one side of the cylinder. For a given stroke, the Desaxe cylinder of *Fig. 5* reduces this angular thrust effect to the minimum possible, at the expense of increased piston side thrust on the up or compression stroke, this being almost negligible by comparison since the load is very much lower.

Normally, however, side thrust loads on pistons do not appear to be a critical problem with model engines. The side thrust generated will be proportional to the stroke, but independent of bore/stroke ratio if the ratio of con. rod length to stroke is the same in each case. The longer the con. rod (for a given stroke) the lower the side thrust because of the reduced angular displacement—*Fig. 6*. Likewise, the greater the stroke the longer the con. rod required to maintain the same value of side thrust, which means that the overall height of the engine tends to become still further exaggerated, if this particular feature is pursued. Generally speaking, the only troubles which are likely to arise, within conventional design proportions, is if the piston depth is greatly reduced, relative to its diameter. It is normally considered inadvisable to make the depth of the piston less than $\frac{3}{4}$ x diameter.

As a matter of interest, the table summarises measured data extracted from a number of typical engines illustrating the range of proportions encountered in practice. The short stroke or near square engine is undoubtedly the present standard for design with a connecting rod length of 1.7-1.8 x stroke (average), resulting in a relatively squat, compact layout as compared with earlier engines.

Increasing the bore/stroke ratio, however, is no cure-all for high performance design problems. In fact a large bore can become something of a disadvantage with high-compression ultra-high performance engines where particular attention is paid to the design of the combustion chamber for optimum flame propagation. Clearances within the head are very small and the relatively large piston and head areas exposed may tend to reduce thermal efficiency. Invariably, however, all high speed engines are of short stroke design; and long stroke engines, where still made, designed for generating high torque at low or moderate speeds. The true "general purpose" engine, it has been suggested, should have a stroke slightly greater than the bore, this being what we would classify as a "sports" type engine with a maximum life. Obviously, however, many other factors come into account in commercial productions—following proven practice established by earlier designs; designing for "reworking" to a different capacity later for a new model in a different class; and so on.

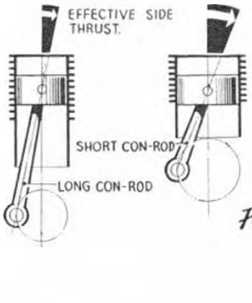


Fig. 6

RAF GEN

How much do you know about the Royal Air Force?

ORIGIN OF THE R.A.F. MOTTO

by Bruce Fergusson

WHEN COLONEL (later Lieutenant General Sir) Frederick Sykes was commanding the R.F.C. at Farnborough in 1912 he received a War Office letter suggesting a motto be found for the Corps. The idea was soon circulated through Daily Routine Orders and, shortly, all sorts of suggestions were coming forward.

It was a young subaltern of the Royal Engineers, Lieutenant (later Colonel) J. S. Yule who hit upon "Per Ardua ad Astra" (Through Struggles and Difficulties to the Stars) as an appropriate motto.

At that time Sir Ryder Haggard's book, "People of the Mist" was very popular in the Mess. This book, an obscure one, was a favourite with young Yule and in the first chapter he found the motto.

His suggestion was "put up" to the "Powers that be" through the usual channels by Colonel Sykes. A committee under Brigadier General (later Lieutenant General) Sir David Henderson debated the question of the motto for the Corps and eventually Yule's suggestion was accepted. The suggested motto was next placed before the King for his approval and in March, 1913, was adopted.

When the R.A.F. was created in 1918 it took the motto under which the Royal Flying Corps had trained and fought.

The motto has been described as most appropriate and one of which any Corps which has ever prepared for action and gone into battle can be proud of.

Last month we discovered that the basic badge of the Service was the EAGLE. In a Minute of the Air Council for a meeting in 1918 the crest is described as "In front of a circle, inscribed with the motto, 'Per Ardua ad Astra', and ensigned with the Imperial Crown, an eagle volant afrontee, the head lowered to the sinister".

After submission to the College of Arms on January 23rd, 1923, having previously been approved by H.M. King George V, it was registered three days later, on January 26th.

QUIZ PAGE ANSWERS

Top Left: Not a space ship, but a model gas turbine engine. Weight: 1 847 lb.

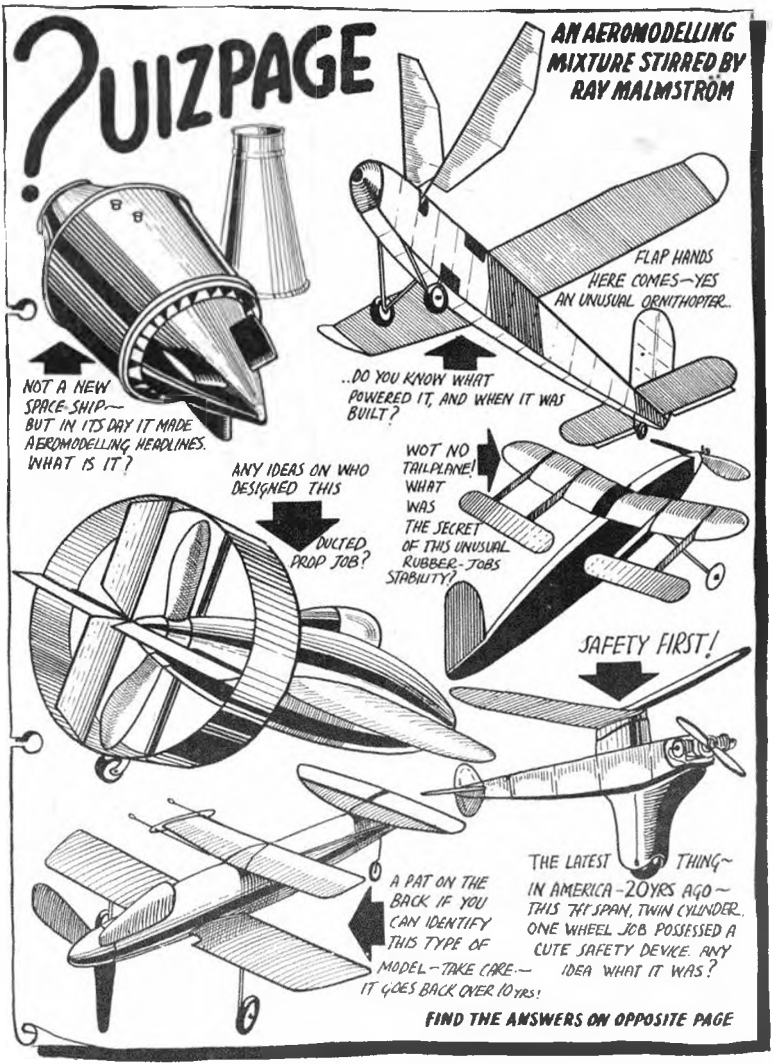
Top Right: A petrol-engined German ornithopter of 1943.

Centre Left: This early ducted-prop design came from Dr. F. Pistelli of Italy, 10 years ago.

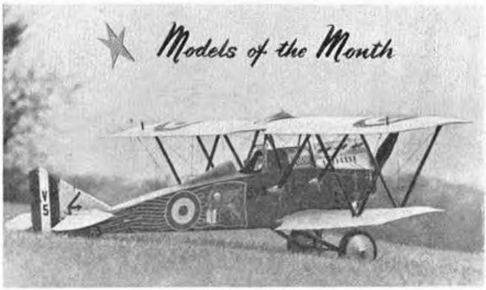
Centre Right: Tailplane-less job's stability came from a pivoted mainplane – a "Floating-wing" in fact. Flew well 16 years ago.

Bottom Left: This was a "rubber-powered-canard control-line model" built and flown before control-line hit either the U.S.A.—or us. By F. B. Thomas.

Bottom Right: Curious kite had a wing that automatically released itself from the fuselage upon impact with the ground.


?UIZPAGE
AN AEROMODELLING MIXTURE STIRRED BY RAY MALMSTROM
NOT A NEW SPACE-SHIP.— BUT IN ITS DAY IT MADE AEROMODELLING HEADLINES. WHAT IS IT?
FLAP HANDS HERE COMES—YES AN UNUSUAL ORNITHOPTER..
..DO YOU KNOW WHAT POWERED IT, AND WHEN IT WAS BUILT?
WOT NO TAILPLANE! WHAT WAS THE SECRET OF THIS UNUSUAL RUBBER-JOBS STABILITY?
ANY IDEAS ON WHO DESIGNED THIS DUCTED PROP JOB?
SAFETY FIRST!
A PAT ON THE BACK IF YOU CAN IDENTIFY THIS TYPE OF MODEL—TAKE CARE:— IT GOES BACK OVER 10 YRS!
THE LATEST THING~ IN AMERICA—20YRS AGO~ THIS 7FT SPAN, TWIN CYLINDER, ONE WHEEL JOB POSSESSED A CUTE SAFETY DEVICE. ANY IDEA WHAT IT WAS?
FIND THE ANSWERS ON OPPOSITE PAGE


1



Model News


2


3


4


5

6

TWO MODELS of equal merit share the title of "Model of the Month" and it is has been our pleasure to make a close examination of each of them. Upper photo shows the latest of Captain Milani's SVA Fighter models and he took this photo especially to show the effect of realism, rather than to reveal the immense amount of detail he has applied to the model.

Particular point of interest, is the finely inscribed gold heraldic Lion with Latin motto and trailing pennants in red which, as Captain Milani says, "can never be painted by hand on the finished model". Application was made using the home-made transfer system recently described in the "AEROMODELLER."

Second Model of the Month is a magnificent Wellington Mk. III, built by F./Lt. Slater of R.A.F. Station, Binbrook. The "Wimpy" is authentically coloured in matt black and light earth for desert night operations, and Fl./Lt. Slater served in this particular aircraft during the North African operations with Number 142 Squadron. Code letters on the fuselage are in red, "KG", and the engines are Frog 500's. A third line operates the undercarriage which is interconnected with flaps.

Photo No. **1** shows a model which recently competed in the Controline Scale event when U.S.A.F.E. bases in Great Britain sent representatives to Manston in Kent for a combined contest. The model is an American Kit design for the famous Rickenbacker Nieuport and we admire the constructor's patience in reproducing the camouflage.

Completing the foursome of controline scale models, photo **2** shows one of the Halton aircraft apprentices (who shall remain nameless!) who has not only placed the registration of his A.P.S. Hawker Hart on the upper, instead of the lower wing, but has also used the letters and numbers of the Duke of Edinburgh's Chipmunk Trainer! Nevertheless, the model seen at the High Wycombe Controline Rally was very well made and otherwise beautifully finished in chrome yellow.

Twin engine free-flight models are rare birds indeed, and one of the very few successful experiments in this line is seen in Photo **3**, where J. E. Carroll of the Harrogate M.F.C. is holding his 56 in. model. Two Mills .75 engines provide some spectacular flying and we are not surprised, since the all-up weight of the model is only 16 ozs.

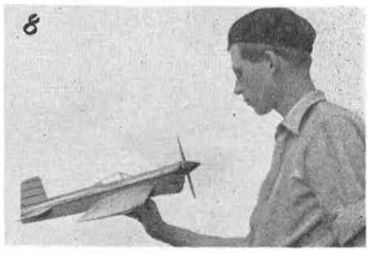
Peter Dodd, a junior of the Epsom M.A.C. is seen in Photo **4** with his own designed Dart power model, which is built specially for the 1956 Bowden contest, although we regret to say that we did not see it in action at the event at Henlswell.

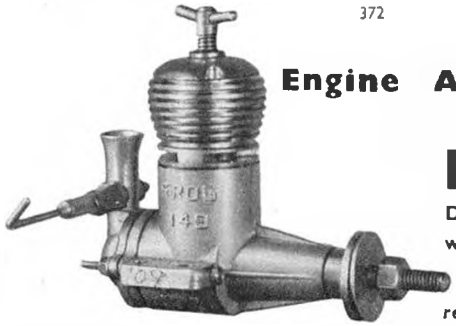
One can call the Team Racer in Photo **5** a truly International model for it was built by Rolf Studer, now living in Southgate, whilst temporarily working in England. Rolf is a Swiss modeller from Lucerne and has been quite active with his models in the London area, as visitors to the Enfield Team Rally last year will remember. This racer has an Oliver Tiger, and we hope that Rolf will take it back to his native country to stimulate interest in team racing over there.

G. H. Berry of Vancouver in Canada, is a regular "Model News" contributor, but we are sorry to learn that he has to give up his aeromodelling due to illness. He has a fine collection of small flying scale models for Dart power, among them the excellent Westland Widgeon with only slightly increased dihedral to display it as a model, in **6**.

At the last indoor meeting of the Gloucester Club, Ron Limbrick flew a very successful rubber power Helicopter, photo **7**, which is built from a plan in an American magazine with slight modifications. We are told it really gets upstairs and knocks the ceiling with great regularity. What a pity we do not see more of this type during the dormant months of the winter.

How fast can you get? Peter Wright's latest Combat design **8** has been genuinely clocked at 100 m.p.h. (Torpedo 19) and was almost too fast for its owner at the High Wycombe Rally. No undercarriage is employed, the chin of the engine cowling being tough enough to take landing loads, and the whole model is covered with nylon of the best underwear grade, which Peter tells us he located in the St. Albans market!





Engine Analysis No. 23

FROG 149's

DIESEL and GLOWPLUG with "Vibra-matic" induction

reviewed by **R. H. WARRING**

INTERNATIONAL MODEL AIRCRAFT are certainly right back in the engine market with a whole spate of revised and new engines. Latest of these is the "149" which, whilst retaining many of the features of the "150", has diaphragm-controlled induction direct into the crankcase, the diaphragm being a $\frac{1}{4}$ in. diameter disc of .005 in. pen steel, loaded by means of a coil spring. This type of valve is essentially similar in action to the now familiar reed valve, but a much simpler production job and also virtually immune from fatigue since the valve disc is a separate, integral unit and the spring itself is only lightly stressed.

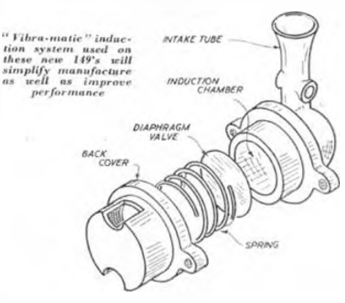
Details of the valve are shown in the exploded drawing. The back cover of the crankcase is in the form of a shallow cylinder extending into the crankcase proper with generous area ports cut in top and bottom. Onto this butts the choke tube assembly—a rather odd shaped unit which has been likened in appearance to the front end of an "Emmett" railway engine—and between the two is the diaphragm, spring loaded by a coil spring to rest normally against the face of the induction chamber.

Suction pressure within the crankcase at the appropriate part of the cycle draws the diaphragm inwards, away from the induction chamber facing and against the action of the spring, remaining open all the time there is sufficient suction and thus allowing the mixture to be drawn into the crankcase in the normal way. As soon as the suction pressure falls off the spring takes over to close the valve for the remainder of the cycle. Thus direct induction to the crankcase, controlled by suction pressure and thus self- or automatically timed, is achieved independent of the other working parts of the engine—reed valve induction with a much more robust unit.

In practice, and particularly at high speeds, almost certainly the diaphragm "floats" as the inertia of the system would preclude its completely opening and closing at such frequencies. The extent of "float" or true cycling would, of course, depend on the spring tension and this is quite surprisingly high. The extent to which the valve remains "open" whilst there is positive pressure (compression) within the crankcase cannot be high, however as the predominant pressure is positive over a whole cycle and were the induction system "open", fuel would be blown back out of the choke tube. This does, in fact, occur on the Frog "149" if a much weaker spring is used when a whole plume of fuel spray rises out of the top of the choke tube, but with the engine still continuing to run. Thus spring tension is far from critical. The blow-back which does occur could, indeed, have a beneficial effect in turbulating the mixture and promoting better atomisation. Suffice it to say that this simplification of reed valve induction works and works extremely well, although we understand that it is not directly applicable to any engine. With smaller capacities, for example, it has so far given very indifferent results.

Probably because of the method of induction, the "149" has some unusual characteristics. On the basis of straight power performance it is somewhat superior to its conventional counterpart, the Frog "150". Since these two motors use the same crankshaft, cylinder, piston, con. rod, etc., this difference must be attributed to the induction. Rather more striking, however, is the extreme speed range possible with the "149" and the peculiar "delayed response" one gets on leaning out the mixture too much. Nothing happens for several seconds on over-closing the needle valve and by the time one realises that the engine is starving it will have stopped by the time the re-adjustment had taken effect. Once having tumbled to the time lag between "cause and effect", the answer in such cases is to momentarily choke the intake with a finger to keep the engine running until it picks up on its own. Needle valve adjustment is, in any case, quite coarse and it is probably far easier to run on a slightly rich mixture. Mixture adjustment at the lower end of the speed range can almost be ignored, provided it is rich enough, but fine adjustment gives that little extra at the top end and does result in an appreciable saving in fuel, which could be important on a team racer if ever used for this purpose.

The speed range is of the order of 5 : 1—even higher if you take into account that the ultimate free-running



"Vibra-matic" induction system used on these new 149's will simplify manufacture as well as improve performance

speed is well in excess of 20,000 r.p.m. But by speed range we really mean the range of speeds given by extremes of propeller sizes on which the engine will run normally and consistently. Down at the lower end, for instance, the "149" swung a 11 x 6 high-thrust propeller smoothly and consistently at 3,600 r.p.m. without a miss or falter and the torque at this end was almost constant at 12.5 ounce-inches up to roughly double this speed. At the upper end of the scale it would start just as readily—although you had to mind your fingers here—and scream a 6 x 4 nylon prop around at a consistent 16,000.

A 10 x 4 or a 9 x 5 or 8 x 6 might, in fact, be an excellent prop size for sports or radio flying. The engine peaked at 12,750 and so any propeller size giving more than about 11,000 r.p.m. on the ground would be wasting power in the air, which looks like an 8 x 4 or a 9 x 3 as the best size for free flight and a 7 x 6 for control line. The "149" would appear readily capable of handling higher pitch propellers for control line work, provided the blades were trimmed to keep up the revs.

We also investigated the "two-speed" properties of the "149" on account of its obvious attractions for radio control work. Twin needle valves are one solution, one adjusted for normal and the other for very rich mixture but closing the intake tube with a clapper drilled with a $\frac{1}{8}$ in. hole produced the most satisfactory results. Removing the choke too rapidly, however, would sometimes cause the engine to stop entirely instead of picking up on the weaker mixture. This however, would appear to be largely a matter of further experiment to decide on the best form of choke and linkage. The needle valve, incidentally, is locked by a weak spring ratchet which is quite positive in action and, being behind the cylinder, this control is readily accessible.

The cylinder unit, as mentioned, is identical with that of the Mark II "150" and so needs no further description. The crankshaft is essentially the same, except that it is not drilled (and therefore slightly heavier) and also the web has been thickened up slightly and the crank pin made a little longer. Although the same overall length, the propeller backplate is narrower and so there is a longer length of shaft protruding, sufficient to accomodate the highest pitch propellers likely to be employed and also screw-on spinners. The propeller nut thread is 2 B.A. The propeller backplate is broached to fit over a splined section of the crankshaft, rather than a friction fit on a taper.

DIESEL

PROPELLER—R.P.M. FIGURES

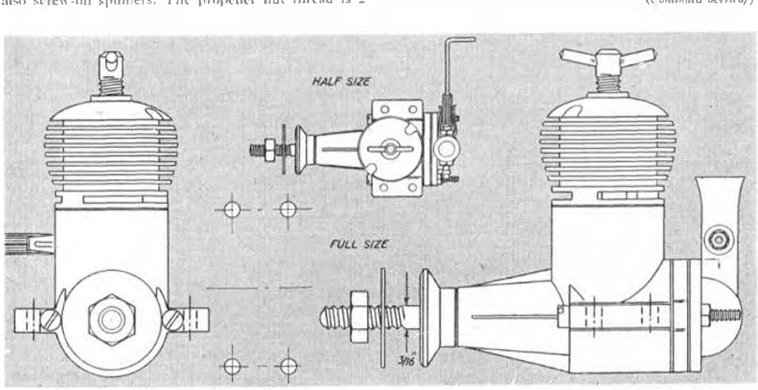
Propeller dia. x pitch	r.p.m.
11 x 6 (Super Scru)	3,600
10 x 6 (Frog nylon)	6,100
9 x 6 (Frog nylon)	8,100
8 x 6 (Frog nylon)	8,000
9 x 4 (Stant)	8,200
8 x 5 (Frog nylon)	9,000
7 x 4 (Stant)	11,500
8 x 4 (Stant)	10,750
6 x 5 (Stant)	13,500
6 x 4 (Stant)	13,900
6 x 3 (Stant)	14,500
6 x 4 (Frog nylon)	16,200
7 x 6 (Stant)	10,800

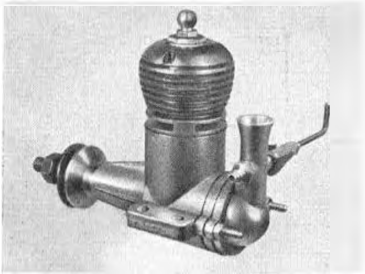
Fuel : Frog "Powamix".

The crankshaft bearing will, perhaps, be something of an eye-opener for those of the "gen boys" who like to judge an engine by the amount of, or rather lack of, side play on the shaft. The main bearing has a generous clearance of the order of 1 to 1½ thou., this being quite deliberate and, in fact, recommended by the makers of the Vandervell bearing used as the optimum fit for the speeds and loads concerned. The bearing itself is of sintered bronze, steel backed and is only reamed to finish, once fitted. It is obviously perfectly satisfactory in service as neither the shaft or bearing showed signs of localised overheating or wear after extended running a lot of which was at 12,000 r.p.m. plus, and remained cool throughout. Yet handling the new engine one can readily wobble the shaft in its bearing and when running it dribbles an appreciable amount of oil out of the front end. It would seem worthwhile to repeat that this is not a "fault", but a "characteristic" and the loose bearing fit has probably quite a lot to do with the excellent power performance achieved at the top end of the speed range.

Employing a similar crankcase casting to the "150", the "149" is primarily intended for beam mounting, although the fact that the backplate and induction assembly are held in place with two 8 B.A. screws

(*Continued overleaf*)





Continued from page 373)

would appear to suggest that it could be radially mounted via these screws. This, however, we would not recommend as the size of the screws is not really large enough for the size and power of the engine and also the bulkhead would have to be generously cut away to accommodate the rear casting and clear the needle valve.

A possible point with free flight models employing a fuel cut-out to limit motor run is that exact timing may be a little difficult. There is an appreciable delay in shutting off the fuel and the engine actually stopping, during which period the speed will fluctuate. But again this is probably a feature where a satisfactory solution could be arrived at with a little experimenting.

Summarising we would say that the "149" is a most delightful engine which we found particularly free from vices and a pleasure to test. Individual test runs went so smoothly that we had time to spare for a quite extensive series of independent propeller-r.p.m. tests, all the runs being conducted on Frog "Powamix" fuel. No additional nitrating was necessary to obtain consistent running at the very high speeds, but around 12,000 r.p.m. and up a slight increase in r.p.m. was noticeable with a more heavily nitrated fuel.

The "149" would appear capable of giving a good account of itself in every sphere—sports, duration or control line. It is easy to handle, flexible in the extreme and with an extremely good power output. And one further point in its favour—the price is most attractive.

149 Glowplug

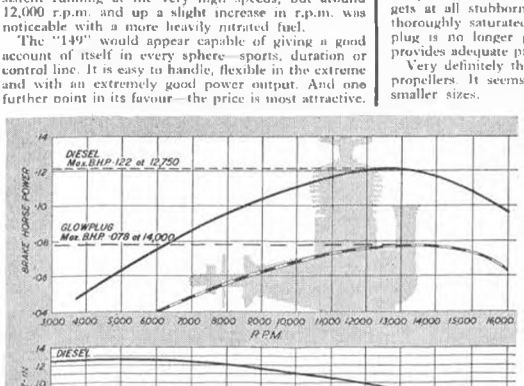
Photo, left, illustrates salient difference in cylinder head.

THIS ENGINE IS identical with the standard "149" diesel, except for the adaptation of the head for glow ignition. The change involves replacing the contra piston with a shaped aluminium insert which has a thin flange at the top, seating on the top of the cylinder proper. The glow plug screws directly into this insert, the whole being held in place by the cylinder jacket (exactly like the diesel jacket, but drilled out with a $\frac{1}{4}$ in. dia. hole to clear the plug). The head insert is sealed with a gasket and it is obligatory that the cylinder jacket be screwed up really tight to eliminate blowing. Also, unless this assembly is tight it will unscrew instead of the plug, when attempting to remove the latter.

The most outstanding feature of the "149" glow is undoubtedly its easy starting characteristics. Provided it is not flooded, it starts with a single flick on any size of propeller. It also starts and runs equally well in either direction, and, particularly with smaller propellers, it is common to find the engine running backwards (at a somewhat reduced speed, it might be mentioned).

The needle valve control is so non-sensitive that finding the optimum setting demands a little patience, particularly on account of the "time lag" between making any adjustment and it taking effect, common to this type of induction. The two extremes are; that if the mixture is excessively rich the engine will suddenly stop abruptly: if too lean it will start to lose speed and die out. Between the two settings there may be several turns of the needle valve on any particular propeller. In this respect, it is quite fun to play with, choking the intake with a finger for a second to make the engine pick up if there is no immediate response to opening the needle valve. The only time the engine gets at all stubborn for starting is if the cylinder is thoroughly saturated with fuel to the extent that the plug is no longer glowing. Finger choking normally provides adequate priming for startup.

Very definitely the "149" glow runs best on plastic propellers. It seems to run more consistently on the smaller sizes.



DIESEL SPECIFICATION

Displacement: 1.49 c.c. (.091 cu. in.).
Bore: .50 in.
Stroke: .460 in.
Bore/Stroke ratio: 1.09.
Bare weight: 3¼ ounces.
Max. torque: 12.5 ounce-inches at 3,000-6,000 r.p.m.
Max. B.H.P.: .122 at 12,750.
Power/Weight ratio: .0375 B.H.P. per ounce.
Power rating: .082 B.H.P. per c.c.

MATERIAL SPECIFICATION

Cylinder: Phoenix case-hardening mild steel.
Piston: Brico centrifugal cast iron.
Contra-piston: Brico centrifugal cast iron.
Crankshaft: Phoenix case-hardening mild steel (stress relieved).
Bearing: Vandervell steel backed sintered bronze sleeve.
Crankcase: L.M. 112A light alloy die casting.
Cylinder jacket: Dural, anodised red.
Con rod: Dural forging.

Manufacturers:
International Model Aircraft Ltd., Morden Road, Merton, Surrey.
Retail price **54s. 9d.**

We would say, that unlike the "149" diesel, which is quite happy at any speed, the glow version is definitely best at 12,000 r.p.m. and above and continues to turn over with regularity at speeds well past its peak power output. The latter occurs at 14,000 r.p.m. or some 1,250 r.p.m. up on the diesel version, although the actual power output is lower. Power is, in fact, appreciably lower all along the scale, so that for any particular propeller size r.p.m. is a matter of 1,200 r.p.m. or so down on the diesel version.

The "149" glow will have to be operated fast to get any reasonable performance out of it, with a 6 x 3 wooden propeller seemingly about the right size. Since general running is better on a plastic prop, however, our personal preference would be for a 6 x 4 Frog plastic prop, treated to increase the pitch to some five or six ins. This can be done in the case of the acetate prop by softening in boiling water; or by direct heating (e.g., in an oven) in the case of the nylon prop. Adjusting the pitch in this way to give a static r.p.m. figure of about 13,000 r.p.m. is about right. The "149" glow might also be well suited to ducted fan installations which require a high operating speed for reasonable fan efficiency, and so a high speed engine is to be preferred to one which peaks at a moderate r.p.m. figure.

Probably the most saleable feature of the "149" glow is that its easy starting characteristics label it as "ideal for the beginner". It should be an engine which the absolute beginner could learn to start and adjust with the minimum of time and trouble. It will, quite genuinely start merely by *turning* the propeller over after priming, instead of flicking it, and is in no way vicious. Also it runs fast and makes a "powerful-sounding" noise—even if, in fact, the power output is quite moderate. But there is still ample power there to fly any type of model.

Footnote

Subjected to an arduous works test, two production Frog 149s came through with flying colours. After a total of 21 hours running time the engines were broken down for inspection and showed only very small traces of wear. In fact, to judge by their performance at the end of the run they were just "nicely broken in" ! One of the specimens was sent to us for comment and is now towing a 4 lb. radio model around very nicely. The other is going into a "Frog" prototype to start another life of useful service.

The tests were made *without* cooling fins on the cylinders and were conducted in three stages—two continuous runs of 8 hours each on a 7 x 5 propeller and a final 5 hours continuous run on a 6 x 4 Frog nylon propeller. The equivalent of some sixteen cans of fuel was consumed.

GLOWPLUG

PROPELLER R.P.M. FIGURES	
Propeller	r.p.m.
Nylon propellers	
8 x 6	6,400
8 x 5	7,000
7 x 5	8,400
6 x 4	15,000
5½ x 4	16,200
6 x 6 (approx.)	12,800
Wooden propellers	
7 x 4 (Stant)	10,400
6 x 4 (Stant)	12,600
6 x 3 (Stant)	12,800
6 x 3 (Trucut)	13,000
9 x 6 (Stant)	5,300

Fuel: Frog "Redglow" plus 10 per cent. nitromethane.

"49" GLOW SPECIFICATION

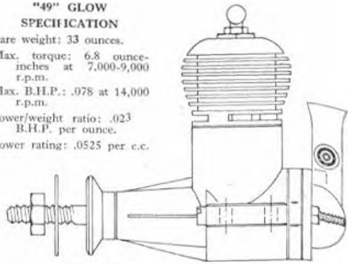
Bare weight: 33 ounces.

Max. torque: 6.8 ounce-inches at 7,000-9,000 r.p.m.

Max. B.H.P.: .078 at 14,000 r.p.m.

Power/weight ratio: .023 B.H.P. per ounce.

Power rating: .0525 per c.c.



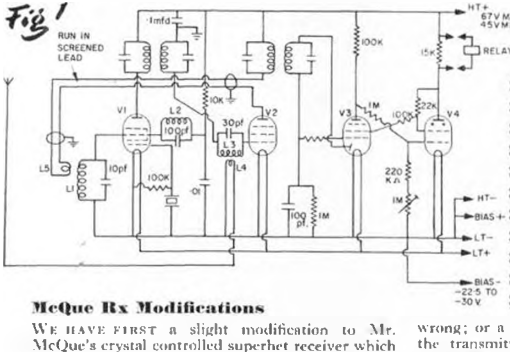
What's the answer?

Tony Adams was well out in front of the rest of us with rubber models, although some of us reckoned that he was a bit old-fashioned in sticking to free-wheeling propellers. We had an eye-opener one calm Sunday recently, however, when Tony's new model and a large power job were gliding round together, circle for circle, with Tony's job coming down slower, free-wheeling prop or not ! But there's something none of us have been able to fathom. Tony just cannot get a decent glide circle with this design. Off-setting the rudder tab makes it spin in under power and Tony insists on a wide climbing circle because he is not sure of the spiral stability. Try as he may, the glide circle always remains straight ! What's the answer?

What would YOU do in a case like this? Think a moment, then twist the page for the solution to the problem printed below.

The Answer:

With a freewheeling prop, *additional* is one of the chief factors affecting the glide circle. A fair amount of sidethrust (to the right) makes it easy to trim for a nice right glide circle. Little or no sidethrust and some designs are very difficult to make circle on the glide. A rudder tab is more effective for glide turn may well be under power than one the glide, so the tab offset needed more than it will stand under power. Trimming the tail is necessarily an effective method of glide trim for turn. Back up to raise the right for a right turn, and trim *worse*. The effect on power trim is not so marked as with rudder offset.



RADIO CONTROL NOTES

Conducted by HOWARD BOYS

McQue Rx Modifications

WE HAVE FIRST a slight modification to Mr. McQue's crystal controlled superhet receiver which enables two such receivers to be operated within a few inches of each other without interference. In the original version the local oscillator radiated sufficient energy to interfere with another receiver, causing both receivers to be operated by one transmitter, if the receivers were within ten feet of each other. That distance is now reduced to less than two inches. The modification makes use of V2 in a dual capacity, first as a radio frequency amplifier, and second as an intermediate frequency amplifier. Coils L3, L4 and L5 have been added. L3 is similar to the original L1, but with 14 turns instead of 16. L4 is four turns wound on L3, and L5 is four turns wound on L1. L1 is now bridged with a 10 pf condenser because the aerial has been removed. The pair of leads from the anode circuit of V2 to L5 must be carried in a screen which is anchored at each end. At the valve end it is fixed to the valve-holder screw nearest the chassis corner, and at the coil end to the coil fixing screw, the lead being taken along the corner of the chassis. The aerial should be taken away from the chassis at the same end as the battery leads to avoid regenerative coupling. The new circuit is shown in *Fig.* 1 and can be compared with that in the February, 1956, issue of these Notes from which all other details can be obtained. L3 is fitted on the side flange of the chassis between the first I.F.T. and V2. For V3 a 1U5 can be used which is less microphonic and is better in a receiver using a reed unit.

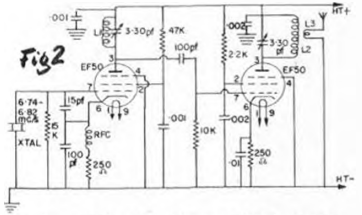
Readers get some difficult troubles at times. One that the writer has been asked about before has come again, this time from Mr. Budding of York. He is using an "AEROMODELLER" transmitter with Sid Miller's version of the "AEROMODELLER" receiver. One day the model failed to answer in the air at short range, and when it had drifted about three-quarters of a mile down wind it was noticed that the H.T. current as shown by the built-in meter was 40 m.a. instead of the usual 25. Thinking this was due to the damp ground the transmitter was moved to the tarmac, and the model responded and was brought back. If the circuit stops oscillating the current will rise and there will be no signal, so this is evidently what was happening—but why? There are many things that might be blamed, such as batteries running down; soldered joints going wrong; or a component failing. It was found that the transmitter behaved properly in an upstairs room with 18 inches removed from the aerial, and also when placed on dry instead of wet ground. All these reduce the loading on the transmitter and so allow it to oscillate again. Under such circumstances the first thing to do is to check the batteries, but in this case they were up to voltage reasonably well.

Voltmeter accuracy

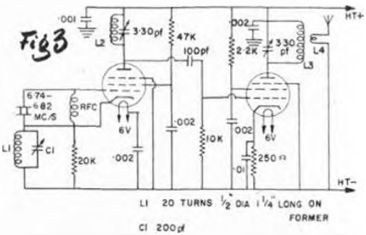
This, however, brings up a difficulty the writer experienced some time ago, and that is the accuracy of voltmeters. In checking the calibration it was found that the test instruments used by some people varied as much as 15 % so in times of trouble check the meters. It could be tried on a new battery, or in the case of the L.T. a new battery of smaller capacity that could still be used for transmitter or receiver could be purchased for test purposes. A U8 or U11 would serve for a test on the transmitter for the few minutes required. A shopkeeper would no doubt test the voltage of the H.T. battery in the hope that a new one would be needed. It should, of course, be tested under load, and if taken out of the transmitter a resistance could be put across the terminals while the test was carried out. The value of the resistance is found from our old friend, Ohm's law, which states that the current equals the volts divided by the resistance. The current is in amps' and we are dealing with milli-amps so we must divide by a thousand. The formula then is:

$$\frac{25}{1000} \quad \frac{90}{R} \quad \frac{1}{40} \quad \frac{90}{3600}$$

3,600 ohms is what is required in this case, but for the purpose of the test it would be near enough to use a resistance within two or three hundred of that figure. If the fault is not with the batteries it will be necessary to test various components and joints. Make sure the valve pins are making good contact in the socket. It may be necessary to bend them very slightly to make firmer contact. Then resolder all the joints. To check the other components substitute new ones, one at a time, commencing with the anode to grid condensers as these are more likely to break down. Also get a check on the valve if possible. A friend with similar equipment is of great assistance in a case like this. If the above procedure is followed it should find any trouble in a transmitter.



L1. 7 turns 22-24 s.w.g. Spaced ⅛" long on ¾" dia. Paxolin tube.
L2. 10 turns 14 s.w.g. ¾" inside dia. spaced to 1½" long, self supporting.
L3. 2 turns insulated round middle of L2.



L1 20 TURNS ½ DIA 1¼ LONG ON FORMER
C1 200pf

Crystals in AM No. 2 Tx

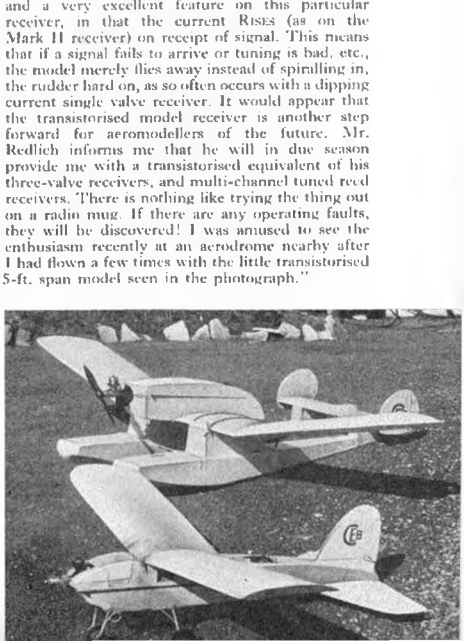
Another query of general interest came from Mr. Sargent of Smallfield. He wanted to know if the ex-government crystals available could be used in the "AEROMODELLER" No. 2 transmitter. These ex-gov. crystals are a quarter of the frequency we are allowed, and the No. 2 transmitter uses a third frequency crystal. The circuit will only work with a third frequency crystal or an overtone type which is specially made for this type of working. The next query is naturally to see if the ex-gov. crystal can be used in the McQue transmitter. This could be done all right if the coil L1 were made about 20 turns instead of 16, but the power output would be less. What the range would be the writer has not yet tried to find out. Mr. Sargent wanted to supply the H.T. from a motor generator run from a six volt motor cycle accumulator, and giving about 250 volts. This is too much for the McQue transmitter, but with six volts available the best thing to do would be to use six volt valve. The writer has recently built a transmitter using an ex-gov. crystal and two E.F. 50 valves which are available at 5s. each. It has not yet been tested in the field, but tried in the back garden with a field strength meter it gives more output than the "AEROMODELLER" No. 2 transmitter. The circuit may not be the best that can be done, but is simple for its type and easy to adjust. Another circuit which ought to give a little more power output though has not yet been tested is shown in *Fig.*3. The coils L2, L3 and L4 are the same as L1, L2 and L3 in *Fig.* 2. When making these transmitters the anode circuit coils should be kept well apart or screened. If an aluminium chassis is used, one coil can be below and the other above.

Transistors

And now a letter from old friend Colonel Bowden:

"I have recently been flying a single channel transistor receiver produced by our old friend and most versatile designer George Honnest Redlich. Mr. Redlich is putting this on to the market, at first in limited quantities I understand. I suppose this is the first commercially obtainable transistor model receiver in this country. It has much impressed me with its light weight, good range, ease of tuning, and reliability. In fact it has so far proved itself as foolproof as the well-tried E.D. Mark II three-valve Miniature Three, which I have always admired because of single-handed tuning, great range, and general ease of operation for the radio mug. The latter was, of course, also designed by Honnest Redlich. Although I still use large servo batteries for the transistor receiver, I find I have saved six ounces in overall weight. As I usually fly large models because they are majestic in the air and not touchy, I am not much bothered about carrying a few more ounces provided I can get single-handed tuning of great simplicity and great range.

"Anyway, the transistor receiver, single channel, is very light, has a satisfying 3½ m/a current change, and a very excellent feature on this particular receiver, in that the current RISES (as on the Mark II receiver) on receipt of signal. This means that if a signal fails to arrive or tuning is bad, etc., the model merely flies away instead of spiralling in, the rudder hard on, as so often occurs with a dipping current single valve receiver. It would appear that the transistorised model receiver is another step forward for aeromodellers of the future. Mr. Redlich informs me that he will in due season provide me with a transistorised equivalent of his three-valve receivers, and multi-channel tuned reed receivers. There is nothing like trying the thing out on a radio mug. If there are any operating faults, they will be discovered! I was amused to see the enthusiasm recently at an aerodrome nearby after I had flown a few times with the little transistorised 5-ft. span model seen in the photograph."



Col. Bowden's radio models carrying transistorised equipment for land or water operation, as detailed above

ARMCHAIR AERONAUTICS

GOOD READING FOR YOUR BOOKSHELF

WORLD AIRCRAFT RECOGNITION MANUAL *by* C. H. Gibbs-Smith and L. E. Bradford. *Silhouettes and Photo illustration* (Putman) 15s.

A bold and embracing title which few publishers would dare to tackle, for the risk of losing the race with the world's aircraft designers is great indeed. There is an extraordinary amount of white space that might have been filled with more fact: but for its purpose, this new Gibbs-Smith approach to aircraft recognition is worth having. Five view silhouettes are given for a number of types; but the work relies mainly on the excellent selection of photos, chosen more for their aesthetic value rather than for aircraft identification. How observers can possibly learn the outline of an HD 32 from ground views we do not know. More underside photos should be included in the next edition.

OUTPACING THE SUN *by* "Aeroplane" Staff, *fully illustrated* (Temple Press Ltd.), 2s. 6d.

Produced, we suspect, when this expert staff of aviation writers were somewhat stymied by the British printing dispute and unable to publish their regular weekly, this book is a must for all aviation enthusiasts. Many are the hitherto unrevealed background facts to the 1,132 m.p.h. World Airspeed Record by Peter Twiss in the Fairey Delta 2, that can be found in this fine story of the record. Did you realise, for example, that the timing cameras could not be focused on the needle nose, and were fixed upon more obvious parts—this at a height of 7½ miles up! The airframe, engine, design story and full account of the record are covered in full detail—all for a modest half-crown.

KNOW YOUR AIRLINERS *by* Roy Cross, 70 *colour illustrations*, 29 *silhouettes* (Perry Colour Books and Educational Productions Ltd.), 2s. 6d.

Another modestly-priced product, blessed with the sponsorship of the Shell-Mex and B.P. Ltd. who have probably reduced the cover price to one-tenth of what it might have been as a free-lance production. All modellers with an interest in airliners, either from a solid modelling or C/L flying scale point of view, will find the colour plates of inestimable value. Not only can one accept the printed colours and relative schemes as depicted on Roy Cross's excellent paintings of famous modern airliners, as being positively authentic, but the author proceeds one stage further and offers emblems in full colour of 29 of the World's leading airlines. A Foreword by J. W. R. Taylor introduces this excellent publication and we thoroughly agree with him in that it provides interest for everyone, from the super enthusiast who knows his airliners to the last nut, bolt and rivet, to the casual airport visitor, and, of course, we modellers.

ACROSS THE HIGH FRONTIER *by* W. R. Lundgren (Victor Gollancz Ltd.). 16s. 6d.

In the assessment of aircraft achievement, speed has long been regarded as the most interesting—and certainly the most spectacular—yardstick, and undoubtedly more people could quote the world record speed figure than any other from the official lists.

This book then deals with the ultimate in high speed flying, for the incredible story of Charles E. (Chuck) Yeager, American Air Force pilot who was the first man to break through the sound barrier in the rocket-propelled Bell X-1, is told with a wealth of detail that highlights the life of a test pilot, with all its ground and domestic worries, played against a background of high courage in the air. What could have been merely a dry-as-dust account of the development and testing of an outstanding aircraft is leavened by an account of Yeager's rise from a country lad, through his wartime experiences to the time he was selected for the most spectacular piloting job of his career, the choice falling on him for his extraordinary ability as a test pilot, and even more his uncanny stability under all conditions.

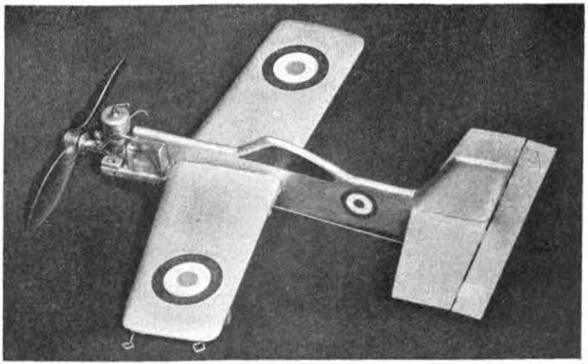
Our enjoyment of this book was made even more complete by hearing Lieut.-Col. Yeager lecture to the august Royal Aeronautical Society last April. Here the character of the man was evident in the completeness of his understatements, the most hazardous aspects being dismissed with a humorous wisecrack that had his audience convulsed with mirth. Nevertheless, we guarantee that not one listener was left in any doubts as to the great risks undertaken in this dangerous experiment into the unknown, and appreciative more of what had been left unsaid rather than the spoken word.

Definitely a book to be recommended to all those who have any thoughts of or in the air, recounting as it does in non-technical language the plane and personalities concerned in one of the most astounding achievements of our time.

C. S. R.

STILETTO

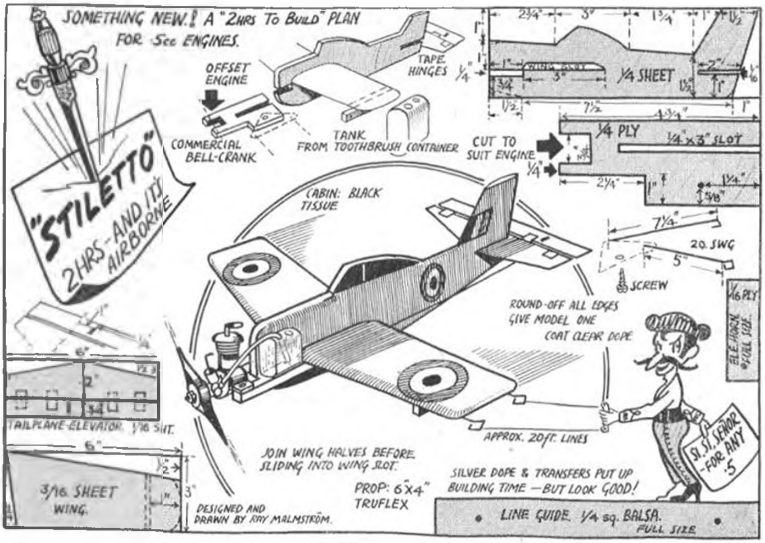
by Ray Malmstrom



Who's for a crashproof, cheap, easy-to-build control liner that you can assemble from ply and balsa in a couple of hours, ready for a spot of line circulation? Ray Malmstrom's latest masterpiece has a Spanish air about it, but you won't have to dress up like a Torendor to fly it!

For the youngster who wants to get used to control lining without risk of pranging an expensive kit, or for the experienced man who wants to run in his new .5 c.c. diesel, *Stiletto* is the answer. Simply transfer the dimensions given for the wing, tailplane and fuselage on to balsa sheet, making the wing joint a firm one in the centre with perhaps a ply brace from panel to panel, and cut the elementary plywood engine mounting plate from an old piece of packing case or anything that looks handy for the job. The tank is a transparent toothbrush container cut down to size with the ends blanked off, and a couple of holes pierced through for the fuel lead and filler. You'll have to buy a small size bellcrank for a few coppers and link up the controls so that the elevator is neutral when the two lead out wires, bent from 20 gauge piano wire, are equal in length at the wingtips.

Stiletto flies well on any line length, from 12 to 25 ft., but 25 ft. of fishing line is advised, and even if you do try to stab it into the deck, you will find that, providing a plastic prop is used, there will be no more damage except perhaps a bent wing, which can be put right with a dab of cement. Original *Stilettos* have been doped silver all over with commercial transfers to boost the appearance.



Trade Notes

P. Farrar a Torquay and part of his enormous solid model collection in which Britfix products are used exclusively

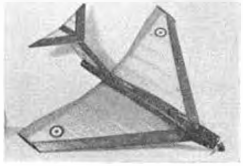
AT LAST we have had an opportunity to try out the **Goodyear Pliobond** thermoplastic adhesive. Though pre-advertised for some time, the actual product has not been available until recent weeks, and this has been the cause of considerable speculation. For modelling purposes it is best applied to specific jobs, at which it can be said to excell. For ply to balsa facing joints, such as engine mounting plates, dihedral gussetts, general ply reinforcement, etc., it offers a perfect joint that is extremely strong, yet resilient. Our wings have Pliobonded dihedral braces and we are sure the spruce spars will have to break before the joint parts. Most valuable of its purposes is that it is an "Impact" adhesive and after the two faces are smeared with the tan coloured synthetic, they are allowed to dry off. On making the joint, slight pressure immediately bonds the parts together and completely eliminates all need for pins or clamps where balsa is concerned. Thus it is ideal for sheet covering, when the time allowance is not critical, and a clean exterior free of pinholes is required. Tubes are 1s., 4 oz. bottles are 4s. 1d. and pints (would last years!) 8s.

Sport fliers will rejoice at the arrival on the counters of the latest **Mercury** product, the **Agressor** (with only one G). Laurie Ellis's Deltas need no advertising boost to enhance their saleability, and the Mercury kit more than justifies a fine model design at the very economic figure of 28s. 6d. Span is 39 in., and the stated power range is .5 to .87 c.c. (.049 cu. ins.); but we will not be surprised to see a great many Agressors flying fast and furiously on 1 c.c.

Flight tests this month have been with the **Veron Combateer**, and the **Jasco Tiger**. The control line Combateer was silk covered as illustrated last month on page 326, and finally camouflaged in sand and spinage with black and silver undersides like a 1939 fighter. Unfortunately, editorial verve resulted in early loss of a wing panel in its first tourney, and a tight engine did not do its best to allow as much in the way of aerobatics as we would have liked. In construction, the kit is easy as ABC, and we particularly like the inclusion on the plan for alternative side-winder or radial engine mounting.

In free-flight, the Jasco Tiger, with an Allbon Dart for power is a remarkably fine job and we are surprised that we have not seen more of them in action. Construction is such that junior can make it completely unaided, and as for flying, well it is simply a case of starting up and letting go! The Tiger has a profile type fuselage built up and sheet covered. Wingspan is 36 in. so it will conventiently travel in most model boxes, and at 12s. 6d., it is remarkably cheap.

Jasco Tiger, with Allbon Dart power



Mercury Agressor with Mills .75

Mercury Texan with Elfin 2.49

We recently asked a well-known control-line flier what kind of dope he had used to get such a fine finish, and the answer was found to be **Humbrol** Art Oil Enamel, which though slower drying, gives a super gloss on a well prepared surface. Half ounce tins are 8d. and 2½ oz. retail at 1s. 6d.

We soon found that modifications to the tail unit were necessary—a d/t tip up tailplane in fact—and we advise all Tiger flyers to arrange this simple mod. by fitting wire fuse band hooks to the fin base and rear fuselage, with a hole for pull-down bands to pass through the fin and over the tail leading edge.

Left: Japanese Jet is a true copy of British Jetex 50 unit, even to colour of fuel. Right: Veron Combateer camouflaged and fitted with Webra Mach 1

U.S. Navy Markings

Notes for model-makers on colour schemes used before 1940

BY G.A.G. COX

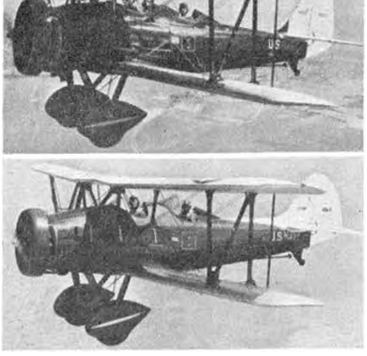
Flying scale model by I. D. McHard shows accurate application of colours to an SBU-1

TO THE BUILDER of scale model aeroplanes, with a weakness for elaborate colour schemes, the pre-war American naval aircraft make ideal subjects, for the U.S. Navy colour scheme in operation until Pearl Harbour offers the opportunity to use as many as five colours excluding the squadron badges.

To the uninitiated, it may appear that these aircraft were subject to a certain degree of artistic licence. Their colouring, however, followed a well-defined but complex pattern. The object of this was not only to render the machines clearly visible against a backcloth of sea and sky, but also to aid formation flying and to identify base carrier and squadron without recourse to impossibly large numerals. The system was as follows:—

General colour scheme

Metal surfaces—light grey anti-corrosion paint.
Fabric surfaces—silver dope.



Not the same aircraft! A Vought SU-2 and OS2U-1 for executive use. Note the Rear-Admiral's badge before the rear cockpit OFFICIAL U.S. NAVY PHOTOGRAPHS

With two exceptions—1. The top surface of the upper wing—chrome yellow. 2. The tail surfaces were painted according to the base carrier (*See* tables 1 and 2.)

In these tables the prefix "V" devotes a heavier-than-air unit (the U.S. Navy has for many years used dirigibles for coastal patrols), the following letter indicates the function of the squadron—Bomber, Fighter, Scout, Patrol, or Torpedo. After the squadron number, a suffix "B" means "Battle" force, as opposed to "Scouting" force; a final "M" indicates a Marine Corps squadron.

Squadron markings

Every squadron was equipped with eighteen machines divided into six flights of three, each flight having its own distinguishing colour. Table 5 and *Figs.* 1, 2, 3, 4 and 5, explain the system of markings. The wing chevrons facilitated formation flying—the pilot sighting along the chevron of the plane in front when in vee formation. The chevrons were usually as in *Fig.* 1, but in a few cases were reversed (*Fig.* 2). The cowling band extended the full width of the cowling on a single-row engine, such as the Pratt and Whitney "Wasp" or Wright "Cyclone".

TABLE 5

Number in squadron	Wing chevron	Fuselage band	Engine cowl (Top half)	Engine cowl (Bottom half)
1	Red	Red	Red	Red
2	Red	—	Red	—
3	Red	—	—	Red

Similarly:

4	7		10		13		16	
5 White	8 Blue		11 Black		14 Green		17 Yellow	
6	9		12		15		18	

Every aircraft carried on the fuselage (forward of the wings on patrol boats) the squadron and aeroplane number; and the aeroplane number inside the wing chevron. All lettering was black, except where it crossed a fuselage band of a dark colour, when white was used for both hyphens and letter. The aircraft type was painted on the rudder, the serial number on the fin, and U.S. NAVY on the rear fuselage and under the lower wing.

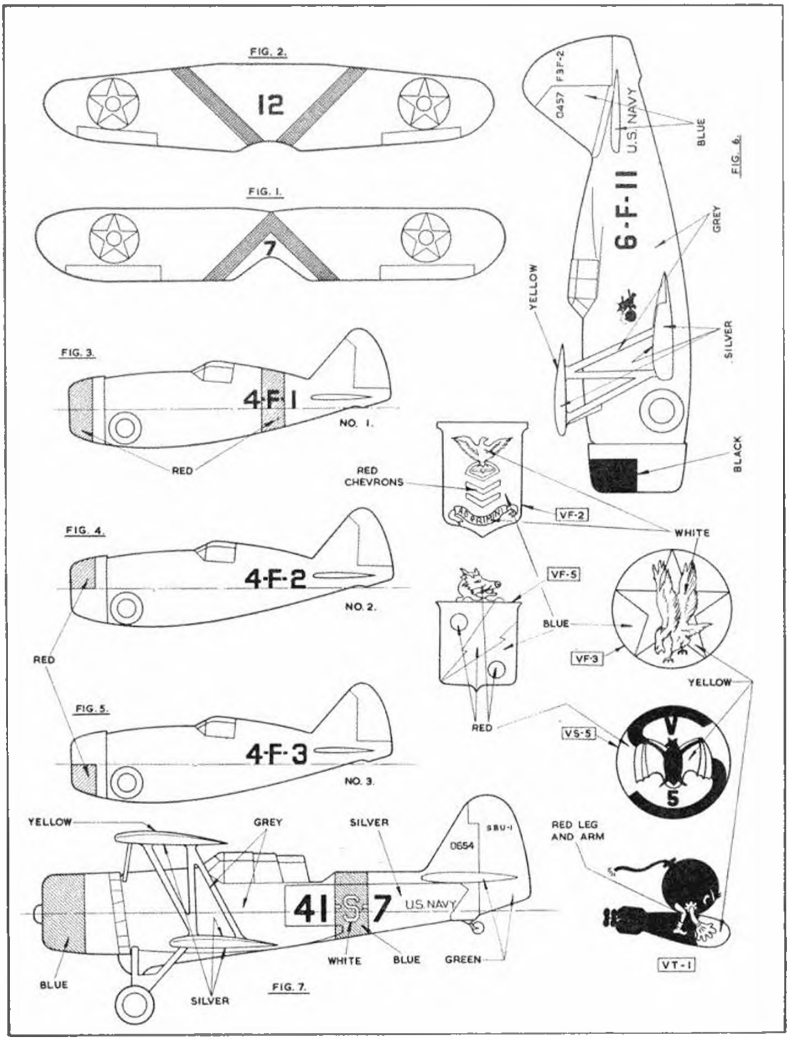


FIG. 2.
12
FIG. 1.
7
FIG. 3.
4-F-1
NO. 1.
RED
FIG. 4.
4-F-2
NO. 2.
RED
FIG. 5.
4-F-3
NO. 3.
YELLOW
GREY
SILVER
41
S
7
U.S. NAVY
WHITE
BLUE
GREEN
BLUE
SILVER
FIG. 7.
C457 F3F-2
U.S. NAVY
6-F-11
BLUE
GREY
YELLOW
SILVER
BLACK
FIG. 6.
RED
CHEVRONS
VF-2
WHITE
VF-5
BLUE
VF-3
YELLOW
RED
VS-5
RED LEG
AND ARM
VT-1

Coloured vertical tail surfaces and upper cowl half on an SU-1. The cowl colour is blue and no fuselage band is carried —see table 5

Grumman F2F-1 shows VF-3 Sqdn. insignia with VF-5 identification! Possibly there is a very good explanation for this novel deviation OFFICIAL U.S. NAVY PHOTOS

Now let us apply these rules to two imaginary models:—

Example 1. Grumman F3F-2.

Table 2. shows that one squadron using this machine was VF-6 aboard U.S.S. *Enterprise*. Colouring will be as follows:—

Fuselage (metal) - light grey.

Wings (fabric)—silver, except for top surface of upper wing, yellow. Tail—blue.

Aircraft number 11, therefore the wing chevron and upper half of cowling are black. Cipher 6-F-11 on fuselage, No. 11 inside the wing chevron. (*Fig.* 6.)

Example 2. Vought SBU-1.

Squadron VS-41, U.S.S. *Ranger*. Table 2.

Fuselage (metal and fabric)—light grey and silver.

Wings (fabric)—silver and yellow.

Tail—willow green.

Aircraft number 7, therefore, all round the cowling, the wing chevron and the fuselage band are blue. Cipher 41-S-7 on fuselage, No. 7 inside wing chevron. (*Fig.* 7.)

Squadron badges

Most aircraft carried the squadron badge on the fuselage, usually just forward of the cockpit. A few examples are illustrated opposite.

It should be remembered that there are exceptions to every rule, and that photographs are often misleading. The Vought SU-2 and O3U-1 on page 381 were used for V.I.P. transport, and had blue fuselage and struts. (The two stars below the rear cockpit denote that they were used by a Rear-Admiral.) The Boeing F4B-4 on page 306, June issue, should have the lower half of the cowling black, as well as the cowl front. This machine appears to be in new condition and may have been photographed before the colour had been applied.

The foregoing notes are necessarily abbreviated, but it is hoped that they serve as a guide to the scale model builder.

The writer wishes to acknowledge the generous help given by officials of the U.S. Navy in Washington and London in compiling the information for this article.

TABLE 1

Disposition of naval squadrons in 1934.

U.S.S. *SARATOGA*
VB-2B Tail insignia red.
VF-6B " white.
VS-2B " white.
VT-2B " insignia red.

U.S.S. *LEXINGTON*
VF-5B Tail lemon yellow.
VF-5B " true blue.
VS-3B " lemon yellow.
VB-1B " lemon yellow.

U.S.S. *RANGER*
VF-3B Tail willow green.
VS-1B " " "
VB-3B " " "
VB-5B " " "

U.S.S. *LANGLEY*
VS-14M Tail insignia red.
VS-15M " true blue.

U.S.S. *MACON* (*Airship*)
Hook-on fighters—Tail black.

Aircraft types assigned to carriers at this time.

VF Boeing F4B-4.
Curtiss F11C-2 "Goshawk".
Curtiss HF2C-1
Grumman FF-1.
VB Great Lakes BG-1.
Martin BM-1.
VS Grumman SF-1.
VT Great Lakes TG-1 and TG-2.

U.S.S. *MACON* heavier-than-air unit—
Curtiss F9C-2 "Sparrowhawk".

TABLE 2

Amendment of 1937 ordered tail colours as follows. (Aircraft are those in service in June, 1940.)

U.S.S. *SARATOGA* (Tails white)
VB-3 Vought SB2U-2.
VF-3 Grumman F3F-1, later Brewster F2A-1.
VS-3 Curtiss SBC-3.
VT-3 Douglas TBD-1.

U.S.S. *LEXINGTON* (Tails lemon yellow)
VB-2 SB2U-1, SB2U-2.
VF-2 F2F-1, SB2U-1.
VS-2 SBC-4
VT-2 TBD-1.

U.S.S. *YORKTOWN* (Tails insignia red)
VB-5 Northrop BT-1.
VF-5 F3F-3, SBC-3.
VS-5 SBC-3.
VT-5 TBD-1.

U.S.S. *ENTERPRISE* (Tails true blue)
VB-6 BT-1, Vought SU-3.
VF-6 F3F-2, SBC-4, SU-2.
VS-6 SBC-3, SU-2.
VT-6 TBD-1, SU-2, SU-3.

U.S.S. *RANGER* (Tails willow green)
VB-3 SB2U-1, SB2U-2.
VF-3 F3F-1, F3F-3, SU-2, SBC-3.
VS-41 SBU-1
VS-42 SBU-1.

U.S.S. *WASP* (Tails black)
VB-7 BG-1.
VF-7 F2F-1, F3F-1, SB2U-2, SU-2.
VS-71 SBU-1, Grumman JF-1.
VS-72 SB2U-1.

(U.S.S. *LANGLEY* converted as seaplane tender, the U.S.S. *MACON* H.T.A. unit ceased operations.)

TABLE 3

Tail colouring of shore-based aircraft, 1934.

Pearl Harbour
VP-1 Tail red.
VP-4 " yellow.
VP-6 " blue.
VP-8 " white.
VP-10 " black stripes on silver.

Fleet Air Base, Coco Solo
VP-2 Tail white stripes on silver.
VP-3 " red " " "
VP-5 " black " " "

San Diego
VP-7 Tail blue.
VP-9 " red
VP-1 " green { J means 'utility', e.g., Grumman JF-1
VJ-2 " yellow

The stripes were approximately two feet wide, and ran fore and aft on vertical and horizontal surfaces.

TABLE 4

Tail colouring of shore-based aircraft, 1940. (A few examples only.)

Patrol Wing Five
VP-51 Complete tail red.
VP-52 " " white.
VP-53 " " blue.
VP-54 " " black.
VP-55 " " green.
VP-56 " " yellow.

CLUB NEWS

WELL THE NATS ARE now history, and I believe that quite a number of clubs were surprised at the good attendance. Most of the far travellers I spoke with had kind words for the site, and the increase in entries for the free-flight events indicates that it is nearer to that quarter of the country where most aeromodelling takes place. Next time, though, I'm going to set up a fried fish and chip stall in the camping site—and expect to make a fortune. The number of underclothed underfeds to be seen shivering early on the Sunday morn showed how few of the campers were experienced at sleeping and eating under canvas!

What next now? A full programme of rallies lies ahead, and this list of events for your diary *not* diary as the printer spelled it last month !!—would be even more full if some organisers would indicate if their events are open to outsiders. Restricted rallies for certain areas or clubs are not included in my programme.

London

The "Thermal", newsletter of the **ST. ALBANS M.A.C.**, always provides some interesting reading, and latest issue includes an announcement that makes my hair curl. They are going to run a scramble on their flying field which is appropriately named Nomansland. Now if you could see Nomansland you know what I mean. They've got hawthorn, hornbeam, Sunday trippers, a cricket match, main roads, the LOT . . . and they are going to run a scramble there! Hope they have an ambulance handy. Same day will be the date for a club A/1 competition and the tussle with Epsom in the London District Inter-Challenge Cup.

PARK M.A.L. has now formed a Tadworth Branch of the club which meets at Tattenham Corner Railway Station Hall every Thursday evening from 7.30 till 10 p.m. Sounds like a handy clubroom for the Epsom Downs fliers.

After victory at the Wycombe rally in Class A team racing, **SIDCUP A.S.** are pleased with themselves, J. Harding being the actual winner. Mike Bassett set a new speed figure of 84 m.p.h. for 1.5 c.c. at the Nats, and will make a record claim for the class. One feature of the C/L circuits at the Nats was the four-wheeled toolbox by Templeman and Bassett which always had the right tool for the job – even includes a blowlamp!

South Eastern

Ron Moss's B17G *Flying Fortress* had a spot of engine bother when it took its first airing on unfortunate May 13th, and I hope he mastered a test flight while he had it at Hemswell. I saw it in the park, and it looked fine at a distance. Maybe it will appear at the Rallies for closer examination. There have been full attendances at recent flying meetings, and some were able to enjoy a mirth-provoking incident involving Dick Mercer's Mills-powered flying wing controliner.

Apparently the undercarriage became mixed up with the prop, and this tore the engine loose. The model then calmly rotated on its own axis, and while it remained airborne for some time, the prop slowly chopped the wing up piece by piece. The usual happened in free flight when Tony Fletcher launched his *Zoot Suit* sans kit with the comment "It won't go far." He returned 30 minutes later, sweating and without the model!

East Anglia

R. Greygoose of **ANGLIA** is doing well in glider this season, well up in the Thurston Trophy, and heading the area Eliminator in April. Dave Willis actually heads the combined Elim results, and is one of the men who gained a place in all three of the F.F. Finals as R.A.F. Spitalgate on the 10th. **THAMESIDE** are current champion club in the area, leading by 109 points to Anglia's 71.

South Western

From the Hon. Secretary of the **PLYMOUTH M.F.C.** at 8 Western College Road, Mannamead, Plymouth, Devon, I learn of a most interesting rally for all in the area, either as residents or perhaps on holiday in the glorious West Country. To be held on Woodbury Common, Exeter, the Plymouth lads are organising this rally to include all free-flight and control-line events plus radio control and a club award. Send for details to the quoted address.

South Midland

The **LUTON M.A.S.** turned out in full force for the area Elims, and Roy (Lucky) Clements gained a place in the Trials for A/2, the remarkable thing being that his times for both Elims were identical to the very second! Gerry Moss is an area power representative, along with Jim Waldron of **HENLEY**. Sid Miller, the Luton radio expert has a real bomb of a model to succeed his famous *Rahnu*, and I reckon that it hits 60 m.p.h. on the level at times, and is much faster in a spiral dive. At the last Area meeting at Henlow, the Luton and **LETCHWORTH** R/C fliers had a 2s. per head spot landing contest, won by Letchworth's John Ramsey.

Midland

Advance gen on the area open rally to be held at R.A.F. Wellesbourne-Mountford near to Stratford-upon-Avon, shows that it will be as full a day as one could hope. Write to L. Harding, 28 Hangleton Drive, Sparkbrook, Birmingham, if there's time (date is June 24th), for entry details.

One *Mamselle* flew away in a thermal at the **LEICESTER M.A.C.** competition, but was luckily recovered later. Precision flying is much in favour, and Mr. Meadows won the first "dot" this year. Spot landing is the subject of another June contest, and judging by the Leicester entries in the Bowden and Seale at the Nationals, I should say that Mr. Ball's *Mamselle* should do well.

Northern

Success in **HALIFAX** includes K. Attwell topping the area in the Western Cup, followed closely by friend J. Pool. The club also managed to knock out **BRADFORD** in the area challenge event, the actual result depending on one last flight by R. Summersgeale in quite an un-wind and rain. He, and the club, need 1 : 40; and he went O.O.S. at 1 : 47!

MIDDLESBROUGH M.A.C. and **STOCKTON D.M.F.C.** went to the power Elims together and explored the bounds of rolling Baildon Moor. In the final results A.E. Spurr of Stockton, who flies a *Rapture*, one of the long fuselage Russian designs, placed 9th with 11 minutes, and at the Nationals the same model did fairly well to record 9 : 56.

North Western

HYDE M.A.C. wishes it to be known that their title is now to embrace the model boating fraternity, and will in future be called the Hyde D.M.A. and R.C.B.C. Plans are being made for their rally, for which I wish to know the date, and most activity seems to be around the local duckpond with R/C boats.

Some who had no previous experience of camping were the **HUDDERSFIELD D.M.A.C.** First they left a tent pole on the platform at Huddersfield Station, then they suffered from amateur cooking and the drop in temperature overnight. In spite of this they say they enjoyed themselves, and they are particularly grateful to some of the Scots lads who came to their rescue when they could not get on the bus to Gainsborough. Shameful note of the month is that the club has lost its flying field which has recently become a factory site.

SHARSTON and **HEADLE** had a clash recently, and Sharston came off best in glider, but lost to the visitors in power. Of the Sharstoneers at Hemswell, A. Sedgebeer placed 2nd in the Sir John Shelley with his Weira Mach 1-powered *Creep* with 11 : 19.

Engine on p.366 is the Yugoslav AERO 250 MR.

For your Diary

Events inviting your entry

June 24th
Midland Area Rally—R.A.F. Wellesbourne—f/f, T/R, Combat.
West Hants Rally—R.A.F. Andover—f/f, R/C, Glider, T/R.

July 8th
Stockport Express Rally—Woodford—f/f, T/R, Combat, Scale.
Northern Heights Gala—R.A.F. Halton—f/f, Combat.

July 15th
Enfield C/L Rally—Enfield playing fields—all classes.
Croydon Gala—Chobham Common—f/f.

July 29th
Epsom Slope Soaring Rally—Box Hill, Surrey.

August 5th
I.R.C.M.S. R/C—R.A.F. Wellesbourne—Nr. Stratford-on-Avon.

August 12th
Cambridge C/L Rally—Pye Sports Field—T/R, Combat.

August 26th
S. Midland Area Rally—Cranfield—f/f, T/R, R/C, Combat.

August 25th 26th
P.A.A. Scottish Festival—R.N.A.S. Abbotsinch—f/f, P.A.A., T/R.

August 26th
Devon Rally—Woodbury Common, Exeter—f/f, C/L.

September 2nd
Northern Area Rally—venue to be announced.

September 16th
All-Britain Rally—Radlett.

S.M.A.E. Contests

June 24th
Keil Trophy—Open Power.
Frog Junior Trophy—Open Rubber/Glider.

THE NORTHERN GALA

Date and Venue *still* not announced.
C.M.A. Cup—C/R Glider.
Frog Senior Cup—I.R Power.
Flight Cup—C/R Rubber.
Rijmax Trophy—Radio Control.
Pan American Trophy—American Class P.A.A-Load (1949-1 c.c.)
Team Racing—"A" and "B".
Team Racing—"A" and "B".
Speed—All Contest Classes.
Combat—Possible new event.

International Events

August 4th 6th
World Power Championship—Cranfield Beds.

August 5th
I.R.C.M.S.
Radio Contest, Wellesbourne Mountford.

August 17th 19th
Wakefield Cup—Hoganas, Sweden.

North Eastern

Team racing is falling out of favour in the WEST HARTLEPOOL and D.M.A.C. and the main interest is in power duration, with the *Creep* as most popular design, also A 2's in which class the *Seraph* is favourite. Of the members who went to the Nats, none managed to make their models last until the contest started! Organised destruction should be the club motto. Regular meetings are held on alternate Saturdays at St. James Hall, Whitby Street, and new members are specially welcome. Latest club record is no less than 25 minutes O.O.S. by H. Hanland's glider, returned two weeks later after a seven miles hop.

Scotland

MONTROSE is now using the new 37 ft. x 20 ft. wooden hut as a clubroom and H.Q. They say they'll have a picture of Robbie Burns on the wall and a bottle of his favourite liquid handy should I ever turn up. After getting a bottle of golden fluid presented to me at the Nats (it was diesel fuel, complete with tartan label) I'll believe them though thousands wouldn't. At ARBROATH the club held an exhibition in April, with 50 models on show and ICI demonstrations. There was an "Aeronautical" mural background which should have been worth seeing the members painted it themselves.

In BUCKSBURN there is an air of victory since an A.P.S. *Corsair* survived the elements to win the League A/2 event held in atrocious wind and rain—it was the only model to make three flights, such were the conditions!

Ireland

The LARNE M.F.C. held their first competition on May 26th and it was a *Creep* in the hands of L. Blair that took first place. S. Burke showed some members the effect of a thermal by temporarily losing his *Stomper* O.O.S. with no d.t., and was lucky to get it back two days later from a friendly Co. Antrim farmer.

Wales

No less than 45 entries, mostly Class A team racers, came to the CARDIFF M.A.C. C.L. contest at Pengam Airport from Merthyr, Swansea, Port Talbot, and Newport. Amid much cursing (I can just imagine it !) the Welsh crowd were told to shift to the other end of the runway, half a mile away just as the contest was about to start. However, by nightfall all was settled and Cardiff won first three places in Class A, with a Newport man top in Stunt and Merthyr in Class B. A new vice-chairman has been elected to the Cardiff club, and no wonder, he has a 350 acre farm with large flat fields—lucky Cardiff.

Pen Pals

A British Pen Pal is wanted by Zdenik Durler, of Wolserova 9, Prague 6, Czechoslovakia, with a special interest in magazine exchange and scale models. Sixteen-year-old H. de Boer, of Blijhamsterstraat 2, Winschoten, Holland, also wants a Pen Pal to correspond in English, and most unusual, I have a request for an Australian Pen Pal for Emmanuel Radolf, 276 Sibley Street, Newark 12, New Jersey, U.S.A., which is forwarded to me by British flier Reg Parham. But there is a point in this last request, as Mr. Radolf wants particularly to contact a pal of 20 years back, Christian name Allan, and then a resident of North Sydney. Are you still modelling, Mr. Allan? ?

Out on the 15th next month — we hope.

THE CLERMAN.

Secretarial Changes

WEST HARTLEPOOL AND D.M.A.C.
D. Applegarth, 35 Challoner Road, West Hartlepool, Co. Durham.

BRISTOL AND WEST M.A.C.
J. Haydn Berryman, 19 Royal York Crescent, Clifton, Bristol 8.

LARNE M.F.C.
L. Blair, 18 Drumalone Crescent, Millbrook, Larne, Co. Antrim.

TIMPERLEY AND D.M.F.C.
G. J. Hankinson, 6 Hillcroft Road, Altrincham, Cheshire.

RECORDS de MODELES REDUITS D'AERODYNES

at at 30th APRIL, 1956 (By courtesy of the F.A.I.)

WORLD RECORDS

Duration IGOR KOULAKOVSKY
(U.S.S.R.) 6 8/1952 6 hr. 1 min.
Distance EVGENY BORISENKO
(U.S.S.R.) 14 8/1952 378.756 km
Height GEORGES LIOUBOUCHKINE
(U.S.S.R.) 13 8/1947 4,152 m.
Speed IVAN IVANNIKOV
(U.S.S.R.) 8 8/1955 275 km/hr

INTERNATIONAL RECORDS
AIRCRAFT—RUBBER DRIVEN

Duration MIHOL KIRALY
(Hungary) 20 8/1951 1 hr. 27: 17
Distance GEORGES BESENEI
(Hungary) 30 8/1947 50,260 km.
Height ROLAND POTCH
(Hungary) 31 8/1948 1,442 m
Speed VLADIMIR DAVIDOV
(U.S.S.R.) 11 7/1940 107.080 km/hr.

AIRCRAFT—POWER DRIVEN

Duration IGOR KOULAKOVSKY
(U.S.S.R.) 6 8/1952 6 hr. 1 min.
Distance EVGENY BORISENKO
(U.S.S.R.) 14 8/1952 378.756 km.
Height GEORGES LIOUBOUCHKINE
(U.S.S.R.) 13 8/1947 4,152 m.
Speed EUGENE STILES
(U.S.A.) 20 7/1949 129km. /hr.

HELICOPTERS—RUBBER DRIVEN

Duration GEZA IVERGARY
(Hungary) 13 6/1950 7 min. 43 sec.
Distance NORBERT ROSH
(Hungary) 9 4/1930 238 m.
Height *No record established.*
Speed *No record established.*

HELICOPTERS—POWER DRIVEN

Duraton MARAT TCHITCHENKO
(U.S.S.R.) 12 4/1954 2 min. 49 sec.
Distance *No record established.*
Height *No record established.*
Speed *No record established.*

GLIDERS

Duration ISTVAN TOTH
(Hungary) 24 5/1954 4 hr. 34: 11
Distance FRANCOIS SZOMOLANYI
(Hungary) 23 7/1951 139 8 km.
Height GEORGES BESENEI
(Hungary) 23 5/1948 2,364 m.

RADIO CONTROLLED (POWER)

Duration PETR VELITCHOVSKI
(U.S.S.R.) 6 7/1955 3 hr. 6: 38
Distance *No record established.*
Height JEAN-PIERRE GOBEAUX
(Belgium) 15 8/1955 1,142 m.
Speed KARL HEINZ STEGMEIER
(Germany) 21 3/1954 58 km.hr.

GLIDER—RADIO CONTROLLED

Duration FRANK BETHWAITE
(New Zealand) 17 4/1955 3 hr. 28 min.
Distance *No record established.*
Height *No record established.*

CONTROL LINE SLEED

Class I RAYMOND GIBBS
(Gt. Britain) 18/12/1955 208 km/hr.
Class II RAYMOND GIBBS
(Gt. Britain) 25/ 9/1955 235 km/hr.
Class III LASZLO BIRRI
(Hungary) 2/10/1954 255 km/hr.
Jet IVAN IVANNIKOV
(U.S.S.R.) 8/ 8/1955 275 km hr.

S.M.A.E. NATIONALS RESULTS

THURSTON CUP

1.	R. Boxall	Brighton	12:00 + 6:34
2.	E. Cartwright	North Lincs	12:00 + 2:11
3.	L. Greygoose	Anglia	11:45
4.	G. Cameron	Leeds	11:04
5.	K. Leeson	Derby	10:49

SHORT CUP

1.	R. A. Ward	Croydon	5:34
2.	B. Faulkner	Cheadle	5:32
3.	A. Mussell	Brighton	4:35

GOLD TROPHY

1.	P. Russell	Worksop	310 points
2.	L. Steward	West Essex	303 ,,
3.	E. G. Lloyd	R.A.F.M.A.A.	283 ,,

S.M.A.E. TROPHY

1.	J. Nixon	C.M.	306 points
2.	R. Donohue	Kersal	296 ,,

SIR JOHN SHELLEY CUP

1.	T. W. Smith	English Electric	12:00 + 6:39
2.	G. Ford	Novocastria	12:00
3.	A. Sedgebeer	Sharston	11:19 + 1:35
4.	J. Harley	Wolverhampton	11:19
5.	J. West	Southern Cross	11:02

MODEL AIRCRAFT CUP

1.	J. Cartwright	Hull Pegasus	12:00 + 6:54
2.	S. Marshall	Boston	12:00 + 6:51
3.	A. Alexander	Cowley	12:00 + 1:45
4.	R. Pollard	Tynemouth	11:50
5.	R. J. North	Croydon	11:37

SUPER SCALE TROPHY

1.	Q. Wilson	Maybole	80	Prestwick Pioneer
2.	J. Bridgwood	Doncaster	79	Heston Phoenix

TAPLIN TROPHY

1.	J. Nixon	C.M.	368 points
2.	G. W. Parkinson	C.M.	288 ,,

LADY SHELLEY CUP

1.	I. Marshall	Hayes	6:09
2.	P. Hedgeman	Hayes	4:33

SPEED

1.	R. Gibbs	East London	2.5cc	127.5 m.p.h.
2.	R. Gibbs	East London	5cc	147 1 ,,
3.	R. King	West Essex	10cc	145 2 ,,

DAVIES TROPHY

Ten Miles

"A"	J. Howard	Foresters	
"B"	W. Martin	Chingford	9:25

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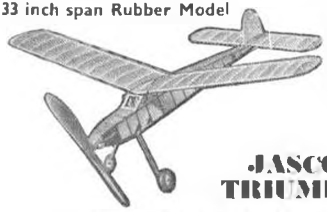

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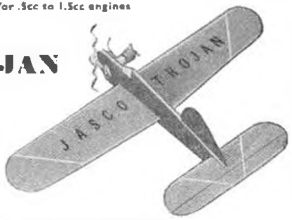

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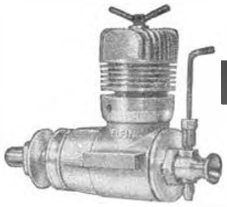

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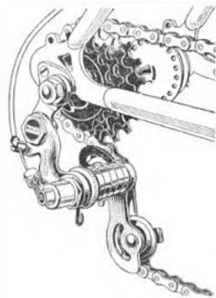

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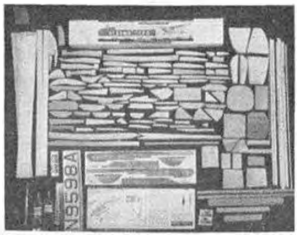

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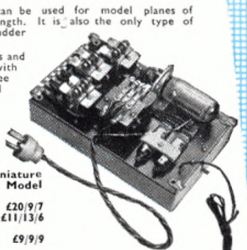

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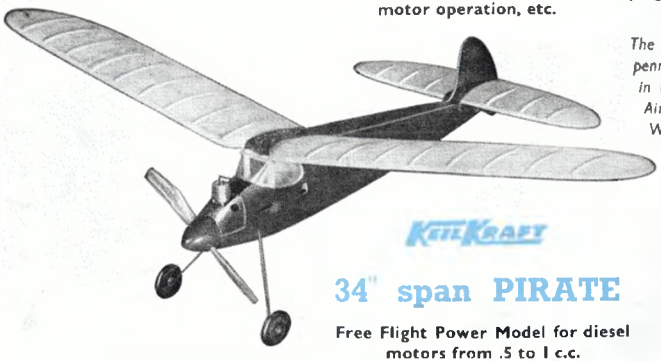

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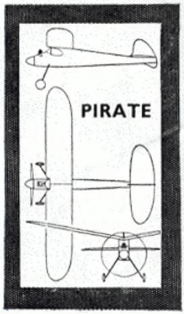

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