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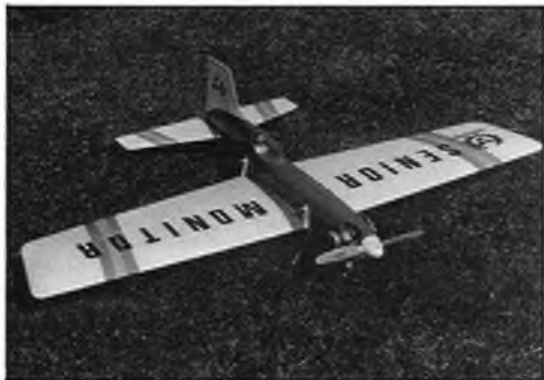
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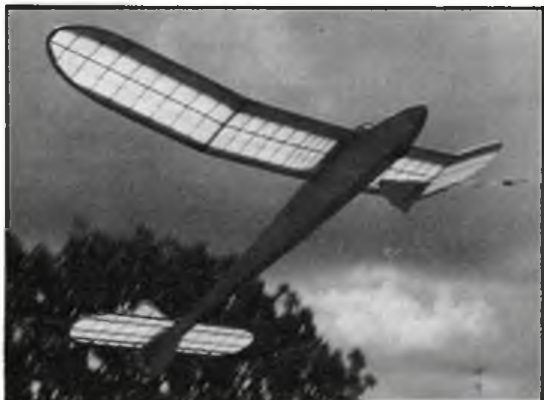
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AERO

MODELLER



p.6



p.42

Editor	<i>Geoff Clarke</i>
Group Editor	<i>Alec Gee</i>
Editorial Director	<i>Ron Moulton</i>
Advertisement	
Sales Executive	<i>Siobhan Doody</i>

Cover:
Two delightful scale creations for CO₂, John Blagg's Jeannin Taube and Robin James' Sopwith Schneider, photographed at a past Model Engineer Exhibition, are presented here to whet your appetite for the 58th extravaganza scheduled for Wembley in January. Go and enjoy!

HANGAR DOORS	News and views aeromodellingwise	4
SENIOR MONITOR	A Henry J. Nicholls rarity brought back to delight all stunt enthusiasts by John Perry	6
BALSA CUTTINGS	Cyano de Bergerac's incisive look at matters aeronautical	9
ELECTRIFYING EXPERIENCES	The second part of Roy Ashby's account of electric flight experiments	10
GOOK'S GLOSSARY	A host of sharper definitions from the pen of Peter Holland	14
CO₂ - CONTINENTAL STYLE	An invitation to travel and fly CO ₂ abroad	15
WORLD NEWS	Martin Dilly's pot-pourri of overseas activities	16
MIND THE LINES	A look at Vintage circulation, with Any Brough this month	20
A DATE WITH A LADY	Learning to fly R/C power posed no problems for Trevor Faulkner - find out how...	22
MACCHI C202 FOLGORE	Build Lubomir Koutny's super rubber scale WWII fighter from our full-size plan...	25
BI-1	...or try this obscure Russian fighter for control-line, by Dave and Jym Leddy	35
VINTAGE CORNER	Alex Irvine looks at today's old-time aeromodelling scene	36
PRETTIFIED PITTS	Renovate that model! Robin James tells you how to strip off with ease...	40
VINTAGE SOARERS	Dave Jones thinks that these giants of the silent sky are worth a closer look	42
NEGLECTED ASPECTS OF AERODYNAMICS	Aeronautical matters that you didn't know about are brought to your attention by Alec Green	45
FREE FLIGHT SCENE	Dave Hipperson's monthly round up of thermal-seeking news	46
SCALE MATTERS	Bill Dennis focusses on ways to help you win contests	50
FROM THE HANDLE	All the latest of interest from the centre of the circle brought to you by our regular contributors	53

Other ASP Model Titles:

Clocks - Military Modelling - Model Boats - Model Cars - Model Engineer - Radio Control Models & Electronics - Radio Control Boat Modeller - Radio Modeller - Scale Models International - Your Model Railway - R/C Scale Aircraft Quarterly - Sea Classic International



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HANGAR DOORS

Wembley ... Wembley ... Wembley...

Where else to go but the Conference Centre at Wembley in order to view all the best that the world of modelling can offer. Aeromodelling-wise, there will be more than ever to delight at the 56th M.E. Exhibition next month. For those lucky to attend on the opening day – that's 1st January – there will be the opportunity to watch all that's going on in the auditorium during the DPR Model Flying Championships. Full gen was given in last November's Hangar Doors, but we must repeat that stupendous prizes are on offer for the main competition – the National Cosmo Challenge, which is divided into Junior and Senior categories. Radio gear, a model and an engine will be awarded to the lucky winners. Full details from Dave Rawlins at DPR Models, Unit 9, The Van-guards, Vanguard Way, Shoe-buryness, Essex. There's still time to build a model and take part! We hear from Dave Rawlins that entries are cramming in... On the day youngsters can build and fly in the Junior Cosmo Challenge; the DPR Workshop will be in residence for the duration of Day One at Wembley.

What else is on offer? Reg Pearham, gentleman flier and Indoor wizard as ever was, will again be demonstrating all the delights of his craft on Friday, 2nd January, from 14.30 to 15.30 and Saturday, 3rd January, from 14.15 to 15.15. Those lucky to

Are you amongst this 'fifties throng? If so, you were a member of the Maybole MAC and we'd like to hear from you! (See 'Where are they now?').



have seen Reg's past expositions will need no encouragement to go again – Indoor miniatures, ormithopters and helicopters all have a part to play in this fascinating display. Don't miss it... you'll regret it if you do!

It is expected that other model flying demonstrations will also take place (keep an eye peeled for details on the day of your visit) and once again, the informal but amazingly popular paper dart competitions will encourage the 'fives to fifteens' to battle against each other with that most basic of flying devices. Traditional or adventurous – all types of design will result from the energy expended in making a few folds in a sheet of A4 – but there's no guarantee who will win. Go along and cheer the youngsters on. Who knows – we might let you have a go yourself...

Also at Wembley...

...is the 1987 F/F Experts' Forum, previously announced as taking place at a Kensington university lecture theatre. Saturday, 3rd January is the date – the same as originally planned – and the exact location is Severn Suite 1, from 15.00 to 18.30 to be precise. This information may not appear in the Exhibition catalogue, so this is your chance to take note. Those wishing to attend are advised to pre-book, if only to avoid the possibility of having to queue in the snow...

There will be more for the aeromodeller to see on the SAM 35 and SMAE stands; bigger and better this year, we hear. The former group are now famous for their merry kaleidoscope of vintage craft at that prime M.E. site 'tween stairs above the foyer. Visit and be entranced.

And to learn more about the organisation that aims to support you, the aeromodeller, spend time with the SMAE representatives, where you'll find out about Britain's latest record-breaking exploits and achievements in competition abroad. No doubt a winning model or two will be on display for all to admire.

Of course, an essential part of a visit to the M.E. is the opportunity it affords to take a look at the models entered in the competition classes. See if your opinion coincides with that of the judges – and ask yourself if your workmanship could stand such close scrutiny. Do something about it next year if the answer is yes!

Where are they now?

The heading photograph should evoke memories in the

Left: The line-up of competitors in the first Hungarian CO₂ event, held last year. George Benedek, third from left, has returned to model flying after a break of twenty-five years. Fancy some Continental CO₂? Read our feature on p.15. Right: Roger Winsor about to raise the R/C Electric Speed Record to 62.71mph. Note the raised flag in the background. 1986 was a good year for British record-breakers. Roll on '87!



small Ayrshire town of Maybole. Back in the 1950s a thriving aeromodelling club had their own premises in Inches Close in that town; here they are on the occasion of a model display, with a wide variety of subjects to their name. John Munro wonders what has happened to them all – so if you're out there, Jack Eaglesham, Joe Robertson, Quintin Wilson, Colin Macpherson, Alex Baillie, Jimmy Ross, Sandy Shannon and the rest, let us know. Not content with pondering the past, John would also like to hear from anyone in South Ayrshire who might be interested in getting together as a club in '87. If so, write to him at 26b Kennedy Road, Troon.

And is there anyone you'd like to locate after the passage of years – a fellow clubmate or flying-field acquaintance, perhaps? Why not tell us at Aeromodeller?

BARCS honour Dr Richard Eppler

At a ceremony held at the Royal Aeronautical Society on Saturday 18th October, Professor Dr Richard Eppler was made an honorary member of the British Association of Radio Controlled Soarers (BARCS) when he was presented with his membership card and rule book by BARCS President Nick Neve.

In conferring the honour, Nick Neve said that it was in recognition of the significant contribution made to radio controlled soaring by Professor Eppler as a result of his work on aerofoil section design and the consequent success and enjoyment many BARCS members had experienced whilst employing the results of his research. Professor Eppler also autographed a spruce replica of the famous Eppler 193 aerofoil section, which will now be embodied in a permanent BARCS trophy to be competed

for on an annual basis and known as the Eppler Trophy.

Professor Eppler was in London to attend a conference on Aerodynamics at Low Reynolds Numbers' which was followed by a Practical Aerodynamics workshop organised by the Royal Aeronautical Society and attended by many BARCS members from all over the country.

Get insured

Good news for the many thousands of modellers in the UK and Channel Islands who operate their models under the protection of the Argus Specialist Publications 'Modellers Accident Protection' Insurance scheme... Negotiations with our insurers have resulted in much improved terms at no extra cost. Cover is extended to £1,000,000, now necessary for operation of models on MOD Land for which this insurance covers modellers; and the engine size limit has been extended to a 40cc maximum enabling many more modellers to take advantage of the scheme.

As well as aircraft boat and car insurance the ASP scheme covers operation of live steam passenger carrying model locomotives and traction engines of up to 7 1/4 gauge and 1/4 scale respectively.

At the same time the operation of the scheme has been fully computerised; and members will now receive a smart protective wallet to hold their certificate plus decals to fix to their models to indicate their membership of the scheme.

How much does all this cost? Just £4.00 for aircraft, boat and car modellers and £5.00 for the additional cover required for passenger carrying models.

How do you get it? Fill in the form found elsewhere in this issue and post with your cheque to ASP Readers Services, 9 Hall Road, Maylands Wood Estate,

What's on...

14th December
SLAITHWAITE LOW CEILING INDOOR MEETING
E2B, HLG, PND, Scale. Venue: Colne Valley Leisure Centre, Slaithwaite, Nr Huddersfield. Contact: Bernard Hunt. Tel: 0484 862353.

1st-8th January 1987
1987 MODEL ENGINEER EXHIBITION
Venue: Wembley Conference Centre. How can you have missed all the news on this one! Lots to see and do; models of all sorts to see and admire. Aeromodelling and model flying too – it's not all locos and steam. Come and enjoy.

11th January
SLAITHWAITE INDOOR MEETING
E2B, HLG, PND, Scale. Rules as previous meetings. All welcome. Contact: Dennis Davitt. Tel: 0532 875433.

1st February
SMAE S.E. AREA ANNUAL INDOOR FLYING MEETING
Venue: Leisure Centre, Haslett Avenue, Crawley, West Sussex. 11am-6pm. Contact: 0293 510272.

1st March
SAMS INDOOR FUN-FLY MEETING
Fly what you like from 11am-6pm! Venue: Watford Leisure Centre. Contact: SAMS. Tel: 0438 832011.

29th March
SOUTHERN AREA INDOOR ALL-SCALE DAY
Peanut, Open Rubber, Open CO₂. Venue: HMS Daedalus, Lee-on-Solent. Contact (essential): Derek Knight. Tel: Rowlands Castle 412058.

COME ON, CLUB SECS – LET'S HAVE DETAILS OF YOUR EVENT. DON'T LEAVE IT UNTIL THE LAST MINUTE! WHAT ABOUT SOME OUTDOOR NEWS, TOO...

Hemel Hempstead Herts HP2 7BH. As soon as your cheque is received you are covered.

Coming up for '87

What's new for Aeromodeller readers this year? Considerable notice has been taken of what you all have to say; so – beginning in this issue – we can offer the renaissance of World News, always an inspirational feature. Of course, it will depend on input from overseas, so here's your chance, readers abroad, to make your voice heard. What are you up to out there? Another favourite, Model News, is set to make a return; and as a result of much interest in the notion of an 'information exchange' feature we may well devote space to this; particularly useful, we hope, to the Scale and Vintage fraternity. Are you involved in an apparently useless aeromodelling quest? Tell us...

Look out, too, for news of more competitions with an Aeromodeller flavour. Events for Jet-X, glider and CO₂ are being worked upon during these dark winter months, all set to challenge you in the coming season.

Club News, did someone say? Well, maybe. It does seem a pity that the newcomer to this

magazine is unaware of how to reach other enthusiasts. Or is the scene really too specialised these days? Let's see... if club secs or PROs care to submit a report of their activities (this does not mean just sending the newsletter, but collating a couple of hundred words especially for Club News) we'll take a hard look at the idea. Readers' Letters will be stabilised as a monthly feature, subject to healthy input. Really, it's the same old story; if you don't speak, no-one will hear you. Don't say you weren't asked.

Oh dear

Hope you enjoyed our competition reports last month – but we must apologise to Bill Dennis and Vic Willson, the uncredited authors of our Nationals coverage of F/F and C/L Scale. Mysteriously, too, the heading 'Class B Team Race' went AWOL from its scheduled location, as did the notice of continuation of John Ashmole's Christmas offering 'Return of the Maestro'. And by the way, the plan number to quote in order to speed delivery of the DH Hawk Moth is AM 1531; send £4.00 plus 55p UK postage to our Plans Department if you wish to add this beauty to your collection.

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HENRY J NICHOLLS' Mercury Monitor was one of the most popular stunt C/L models available in the late '40s. Powered with the Amco 3.5cc diesel, this model was to be seen going through its paces in parks and open spaces right across the country. Although the Monitor was long ago superseded for contest flying by slower flying, flapped craft it still makes a good sport model, and is perfectly suitable for Old Time Stunt events. A reproduction kit of the standard Monitor is available from Ron Prentice.

The existence of a larger size Monitor in the late '40s, designed for 10cc motors but never put into production, was completely unknown to me until a picture of this prototype was published in the Society of Antique Modellers newsletter 'SAM 35 Speaks' a year or so ago. Built by Henry J. Nicholls himself, it had his usual 'HN7' logo on the fin and was powered by a Super Cyclone 10cc engine running on the then new glowplug ignition. I decided there and then to build a replica of this model; thus, during the autumn of 1985 a copy of the plan of the original Monitor was obtained and drawing began. As I had a Fox 45BB

Wing construction

Cut out the four spars from sheet balsa; 1/4in. for the front, 3/16in. for the rear. Note the small gap in between the rear spars; these spars must not touch. Cut the dihedral braces from 1/16in. ply and join the front spars over the plan. Make a good joint here as a lot of load is carried during manoeuvres. Cut out the ribs and build the wing in the usual manner, one panel at a time, flat on the plan leaving the LE, TE and rear spars unjoined. The tips are not fitted yet.

Check the wing panels for warps and if any exist steam them out AT THIS STAGE. Leave panels to settle for at least a day in a dry atmosphere and check again. If the warps have returned repeat the process and again leave in a dry atmosphere for another twenty-four hours. Only proceed when the structure is stable and true. Join the rear spar by sliding in a pre-glued brace, making sure that the panels stay true. The LE and TE can then be joined, making sure that no stresses are introduced. The wing is then finished in the conventional manner. Note the very long pivot bolt (2BA steel) required to

Right: Sharp lines of the Senior Monitor hint at fast aerobatics - not for stunt beginners... Below: Builder John Perry with his handwork - and toolbox - at Old Warden. Plans of the Senior Monitor are available from Aeromodeller Plans Service, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Price is £4.00 plus 55p postage. Please quote AM 1533 when ordering.



Forty years on - exclusive plans for a Vintage stunter that didn't quite make it to the model shop shelves

motor doing nothing, it was decided that this would provide the motive power.

Henry's original large size Monitor was said to be of 'nearly twice' the wing area of the standard model, so I scaled the dimensions by a factor of 1.4:1, giving a wing area of 607 sq.ins. The nose profile of the enlarged fuselage is slightly shorter than I would have preferred: some of the difficulty in placing the CG (Not GC this time!!) in the optimum position is alleviated by the use of a sturdy fixed undercarriage and substantial beams to mount the engine rather than the bulkhead mounting arrangements of the original. The nose easily accommodated my Fox 45, and would, with care, absorb the less-bulky among the 10cc motors. I have aligned a ST60 over the nose outline and after careful paring of the inside of the 1/2in square bearers, it would be quite feasible to be able to fit this motor.

I have maintained the Monitor outline as far as possible. However, as the model needs to be capable of withstanding the rigours of general flying, I have increased the strength of some parts that are not very robust on the original. A second wing spar has been added; the tailplane and elevator are constructed of larger section material than scaled from the original and the fuselage keel extends from the U/C bulkhead to the tailplane, with additional stiffening carried forward to the nose. This, coupled with fabric covering, will result in a model that can be stuck vertically into the turf up to the wing with only minimal damage. I know this is so because I did it with mine on the first flight. Luckily it had been raining and the ground was soft!

Since the fuselage has to be trimmed during construction to accommodate the wing, it is best to start with the latter component.

engage in the ply plate in the fuselage.

Tailplane and elevators

The tailplane and elevators on my Senior Monitor are 5/16in. thick. Since balsa of this thickness is not normally available (although the Balsa Cabin can supply it) I have specified 3/8in. sheet on the plan. Take extra care in wood selection or the model will become tail heavy. Construction is straightforward; build components over the plan and sand elevator. LE and tips to section.

Fuselage

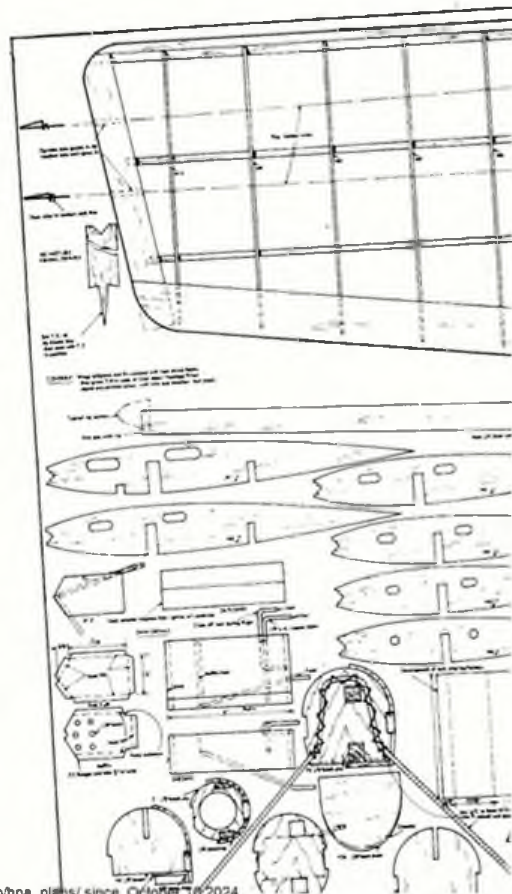
'Crutch' construction was very popular in the early days for F/F pylon models. It also found its way into some early C/L designs such as the Monitor and the original Junior Monitor, as well as John Coasby's Icarus designs. With the 'box' type of construction having been in use for many years now, relatively few modellers will have had experience of the crutch method, in which a frame of balsa is built over the plan view of the fuselage. When removed from the board, this structure has the appearance of an underarm support crutch, hence its name. Big advantage of the method is that accuracy in plan view is easily achieved.

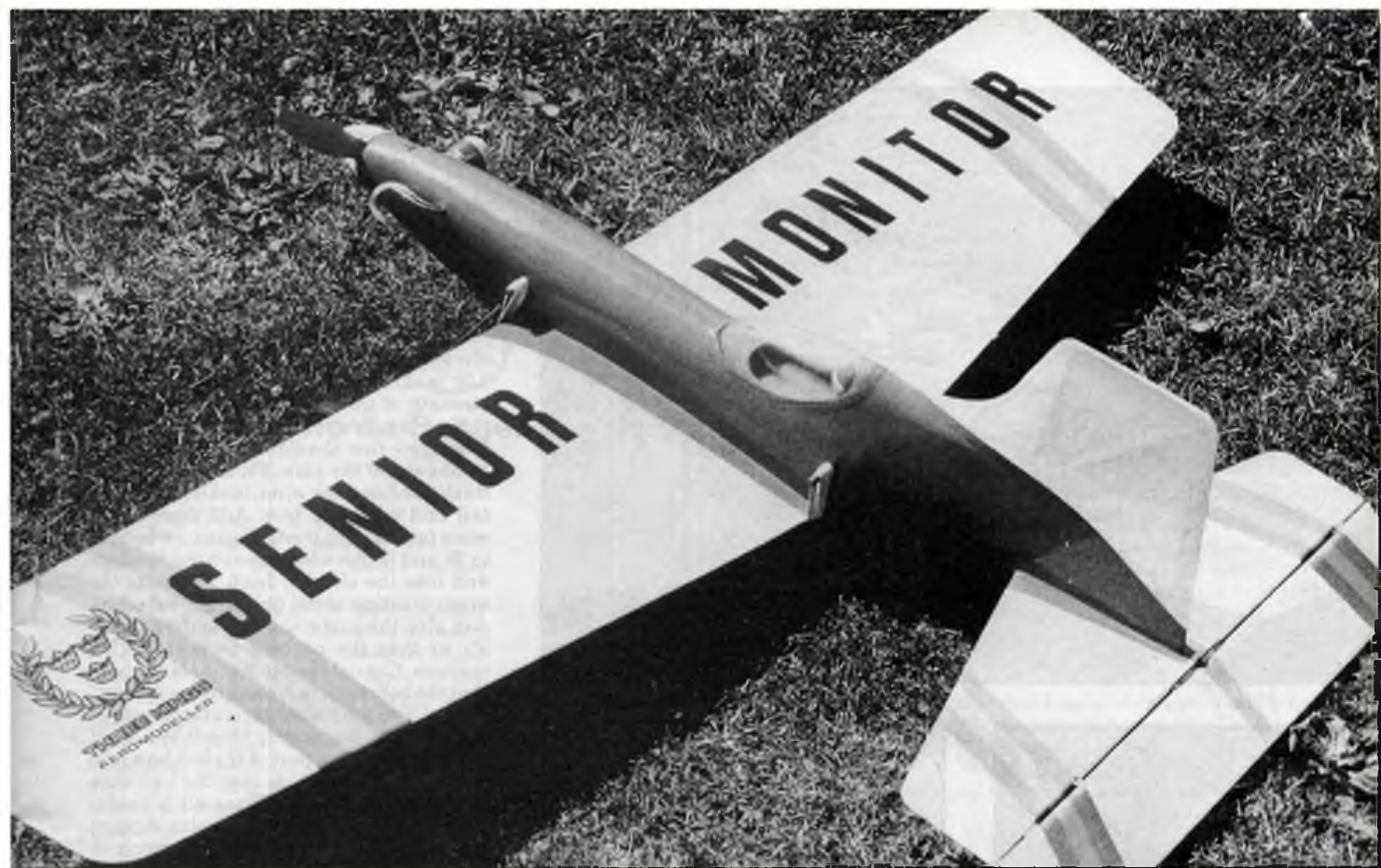
The crutch on this model is made from 1/4 x 5/8in. strip cut from sheet. Note the offset to the right, which, which gives a little bit of rudder offset and this coupled with the aerofoil-section fin, gives just the right amount of right hand yaw to maintain line tension. This is far better than using engine offset which wastes power and causes other undesirable effects.

Next cut out the formers. The U/C needs 'sewing' to F3, the tailskid is similarly fixed to F7A, and the F7 laminations should be glued together. Next, cut the 1/8in. sheet centre keel.

JOHN PERRY

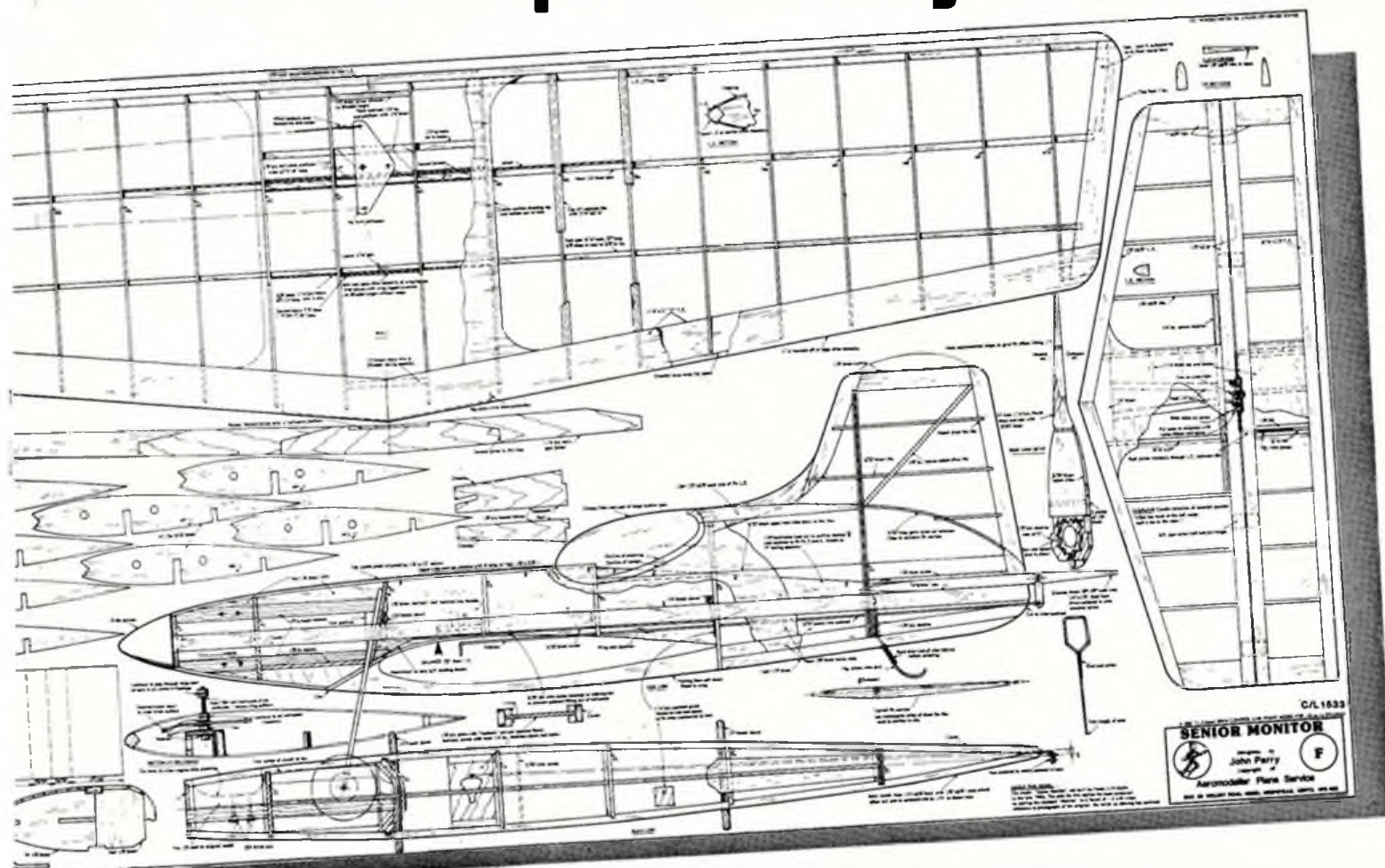
...a n





PERRY'S SENIOR MONITOR

most accurate replica....⁹ Henry J. Nicholls





Top: With Fox 45 roaring, John's Three Kings clubmate Mike Rolls prepares to free the Super Monitor for another session of aerobatics. **Above left:** Engine bay close-up shows how the simple cowling gives ease of access. **Above right:** Renewed acquaintance - Henry J. Nicholls met up with John Perry's replica of his design at Vintage Weekend. **Below:** Long nose and short tail moment mean responsiveness plus. Original flew with a Super Cyclone running as a glow. Can you resist?



Assemble the formers on the crutch (making sure that the tail offset is still on the right) and locate and glue the keel. The tank must be installed at this stage, before the pre-drilled engine bearers are slid into place and epoxied. Make sure that the tank is centrally located between the bearers and pack with scrap balsa. Fit the 1/8in. ply horizontal braces to the lower bearer and to formers F2 and F3, ensuring a strong joint at the junction with F3. The fuselage can now be planked in the area shown; note that the top front plank is of 1/8 x 1/2in. spruce to maintain the strength of the keel through to the nose.

Now construct the fin and lower rear fuselage - this should be straightforward as shown on the plan. Fit the tailplane in its slot and seat the wing, making sure that tail and wing are true. Add dowels and wing fairing. The pushrod can now be bent to fit and is threaded through the fuselage and into the elevator horn. Estimate the mean position of the hole in the bellcrank and glue the pushrod guide to the front of F6 so that the pushrod is held in this position. Cut out the ply 'key-hole' plate so that the bellcrank bolt seats in the 'bottom' radius. You may need several attempts at making this but ensure that it is a good snug fit. The large part of the key-hole is to allow the plate to pass over the lock-nuts on the bellcrank bolt. When all is ready, epoxy the 1/4in. square hard balsa support blocks between the sides of the crutch. A piece of piano wire is then fitted, as shown, under the fuselage and above the pushrod to prevent the pushrod lifting out of the bellcrank.

Other details of fuselage construction are clear from the plan.

Covering

I used Solartex as it looks like nylon and has similar strength to it. A couple of coats of dope stabilises the covering after heat shrinking and acts as a key for paint and transfers. Nylon would be OK as a covering material but don't overdo the shrinking dope - use non-shrinking dope finally to fill the nylon. The fuselage can be dope/tissue/dope/sanding sealer/colour dope finished, or Solartex may again be used. A second mortgage would pay for some Micafilm if you can find any - it may just be possible to cover the open areas with a single sheet (consult an architect for this).

Fuel-proof the entire model with Tufkote or Aerocoat.

Flying

Use seven-strand lines of 0.017in. diameter, seventy to seventy-five feet long depending upon the engine installed. The Schneurle Fox 45 used in mine is of adequate power. This is a naturally fast model, and is not recommended for beginners or the faint-hearted. Limit the elevator movement to 30-35 degrees up and down; any more will only cause mushing and stalling.

Remember, do not fly near or under overhead power lines. Also, if your first flight is anything like mine, keep clear of underground power cables as well!

BALSA CUTTINGS

Cyano de Bergerac takes a look at a potentially shocking aeromodelling issue

*The moral is that little boys
Should not be given dangerous toys.*

Hilaire Belloc

IF TWO GIANTS of the aeromodelling press have already unleashed thunders upon the head of that unknown flier whose adventure with an electricity cable left him with his trousers afire, why bring it up again? Four reasons.

The first is that it poses quite heart-searching questions for the virtuous amongst us who would never dream of getting involved in anything like that. It's your club gala day. Friends are coming from far and wide. The eats are laid on. Neighbouring clubs, and the sun, turn out to support you. At the gate to your field you are met by the owner.

'Zorry, laads,' he says, 'Moi missus clean forgot to let ee know we be a-sprayin' yere today, but ee kin use the ol' twenny-acre medder to yer hearts' content.' Exit bloke who played the part of the farmer to quite unmerited applause.

Now the old twenty-acre meadow is fine, except that it has overhead power lines right across it. And it's make your mind up time. Simple question - do you fly or don't you? Um, er, ah. Well, in the circumstances, of course you must. And you do. And something goes wrong. Whilst bearing in mind that this is not the place for Counsel's opinion on exactly what you might or might not get away with on a point of law, let us take a quick look at what could be in store for you. For the club. For the committee - oh, especially the committee. Forget the loss of the offending model, its radio gear if any and its expensive motor with the piston arc-welded to the liner. That's peanuts. First on the scene is the area electricity board emergency team. Their control room showed that the breakers jumped, they've had phone calls, and they're looking for damage. There is some. The bill for the initial turn-out at weekend rates plus the cost of replacing a run of cable between insulators will fair take your breath away. It was only a little cable, after all. But it served the locality, and five thousand chickens tore themselves to pieces when the fans in their hut stopped. Or somebody else's intensive something was affected - it always is. There was a little factory on the farm estate working overtime on a special order. You'll hear about their lost production and their penalty clause. Someone was away for the weekend and came back to find the contents of the deep-freeze had wholly lost their attraction. No-one actually sues you for the Sunday dinners you spoiled, although they all talk about it,

and you won't be flying that neighbourhood again. Ever. Didn't you know that a non-control-line, non-conducting model can short out power lines? Well, you do now. What is your insurance company going to say to all this? Not a lot. Probably: Dear Sir, Nothing doing, yours faithfully.

The second reason brings another question. Suppose you are behaving yourself but you get a flyaway and find the model five miles across country hooked up on a power line. What do you do? When the dew settles on the aircraft and it swings in the night breeze, it may cause a flash-over between cables. If you could be sure your name and address would be destroyed in the resulting pyrotechnics you might be tempted to tootle off, pretending you never found the model. Goodbye beautiful Wakefield and all that, but that's life. However, in such a case, where you really haven't been playing the fool and try to do the responsible thing by getting in touch with the electricity people, they may well thank you and be as philosophical about clearing the line of a model as they would be about removing a dead branch. Attitudes may of course vary, but the current (!) thinking is that an electricity authority probably would not seek to charge you, that they'd have a job if they tried, and that an insurance company might reasonably be expected to look kindly on your plight anyway.

Reason the third really takes the Huntley & Palmer. Because, stap me, it's

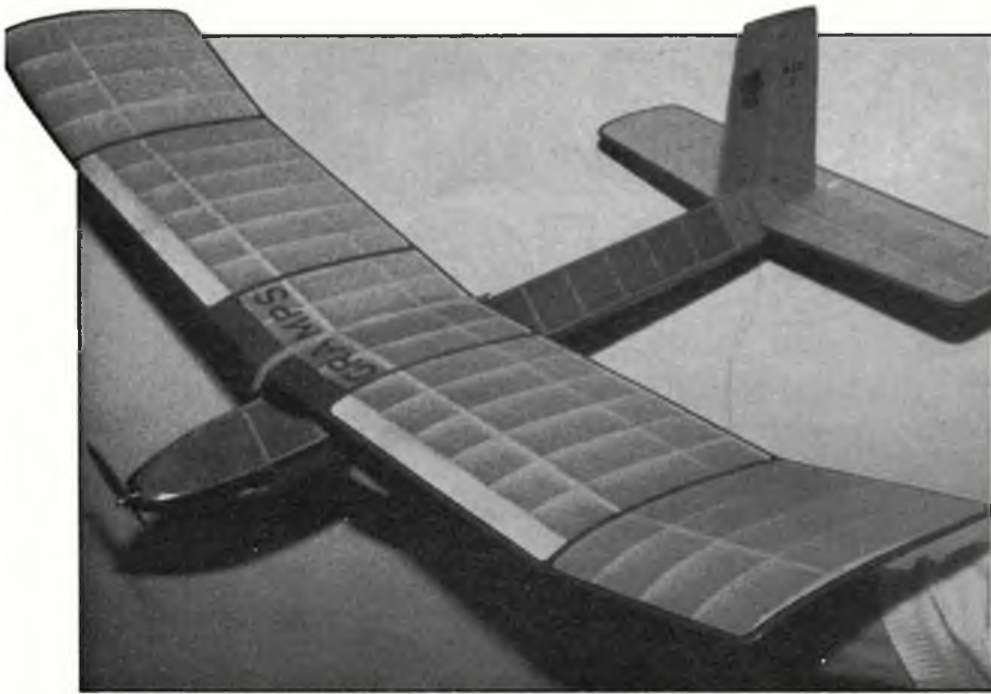
happened again! And we're not talking about some furtive, nameless little trouser-burner, but a club, who held a well-attended open day in a field with power cables along two sides. Visiting clubs observed and accepted the risk. One supposedly responsible authority considered it added to the excitement. Well, to cut a long story short, if you'll pardon the expression, a model hit the lines and blew the works, to the disgruntlement of the engineers whose care this installation is. All right, flying fields are few and far between, even in the heart of the countryside, and beggars can't be choosers, etc., etc., but exactly where are we heading? When warnings are being offered about the dangers of electricity, it always seems it would be faintly indecent to accompany them with any, er, down-to-earth illustrations of just how terrible a power it is. For instance, the case of the mobile crane driver with his tyres burning and big blue flashes jumping out of his head would not go down well. So how is the point to be made? Has something really ghastly got to happen?

Reason number four? Just that as the sun sinks slowly over the Law Courts, let us enjoy a farewell chuckle at the mental picture of the party referred to in the opening paragraph, legging it away in the direction of the Burns Unit at whatever speed the complications induced by a blaze in the britches permit. It might be the last time we get a laugh out of this sort of thing.

'HE'LL BE ALL RIGHT - HE'S GOT HIS RUBBER GLOVES AND HIS LUCKY RABBIT'S FOOT...'

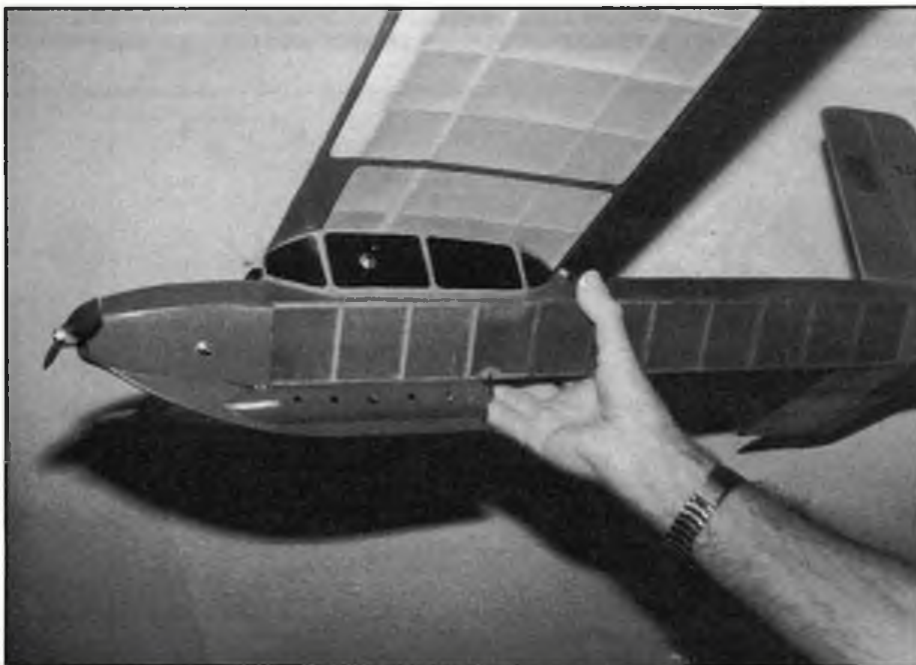


January 1987



Electrifying Experiences

In the second part of Roy Ashby's account of his electric flight exploits we look at an R/C craft and examine some earlier designs



LATE IN 1984, having had some success with my free flight electric-powered models, I began thinking about a radio controlled version. A lightweight motor glider seemed the next step; nothing elaborate, a keep-it-simple design based loosely on the largest outdoor free flight craft I had built. A simple on-off switch started at launch would allow the motor to run until the power was exhausted. The rest of the specification was: a Mabuchi 380 motor (ungeared); five 600mAh nicads contained in a streamlined torpedo - cum - skid under the fuselage, to give a usable power run of about 5 minutes with a Cox 6x4 prop; weight limit of about 20 ozs (anything less would be a bonus). A nice low wing loading was needed so the wing area needed to be about three square feet.

I am a low-aspect-ratio enthusiast so I chose a chord of 9in, which meant a wingspan of 49in with polyhedral. The inner panels were 16in; the outer 8½in. A little area was lost at the tips but this gave me my 3sq ft. An undercambered wing section was adopted and stretching the thickness/chord ratio almost to the conversant with strength at 6½% aimed to compensate for the drag of the low aspect ratio planform. A lifting tail, to help eliminate stall, allowed a rearward CG of about 45% chord. The diamond-section fuselage was 32in long and 2½in wide. Tailplane area was 120sq ins, and a single fin and large rudder were employed. Fleet radio control was used; that is, a mini receiver, micro servos for rudder and elevator, the whole system running on four 150mAh nicads.

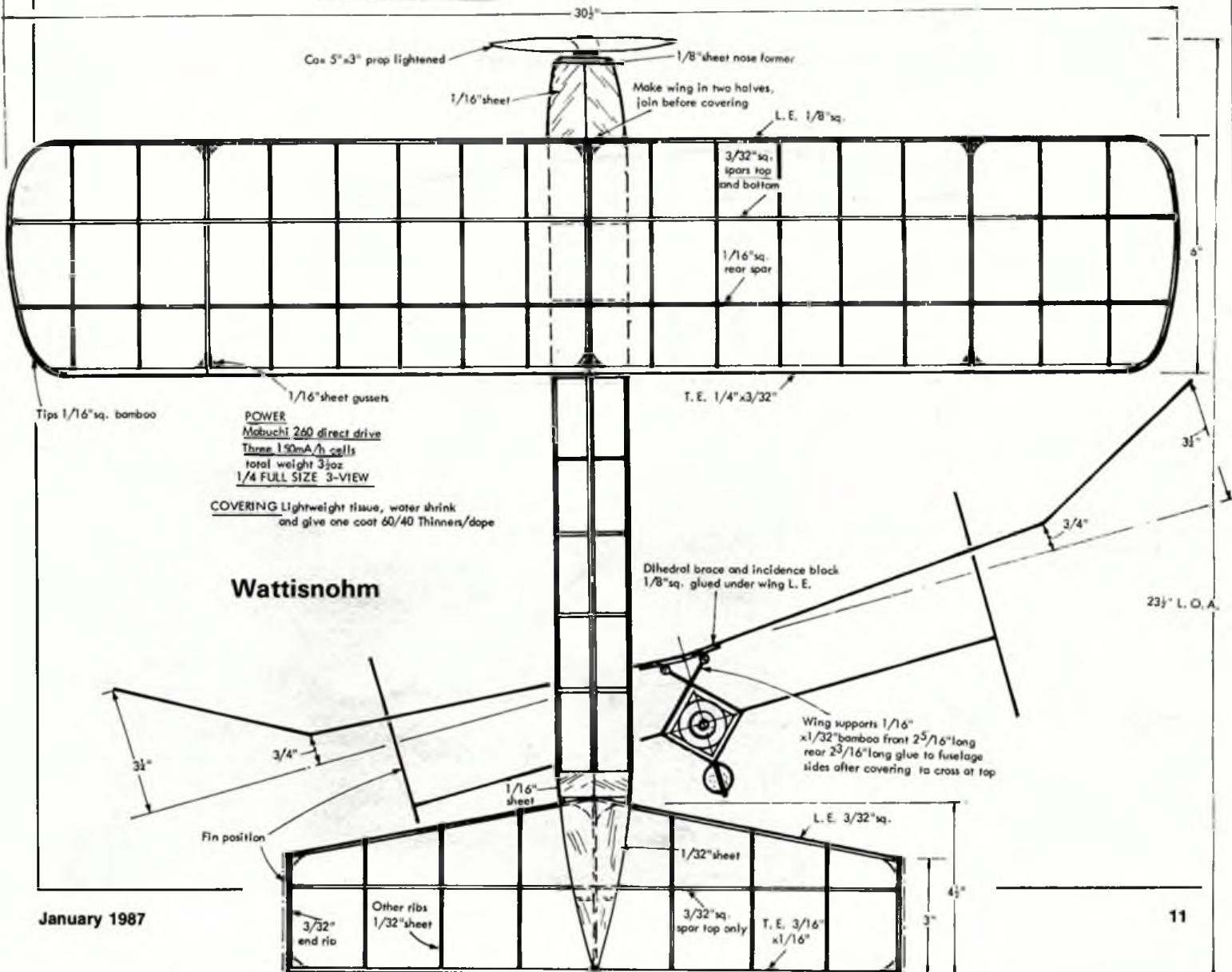
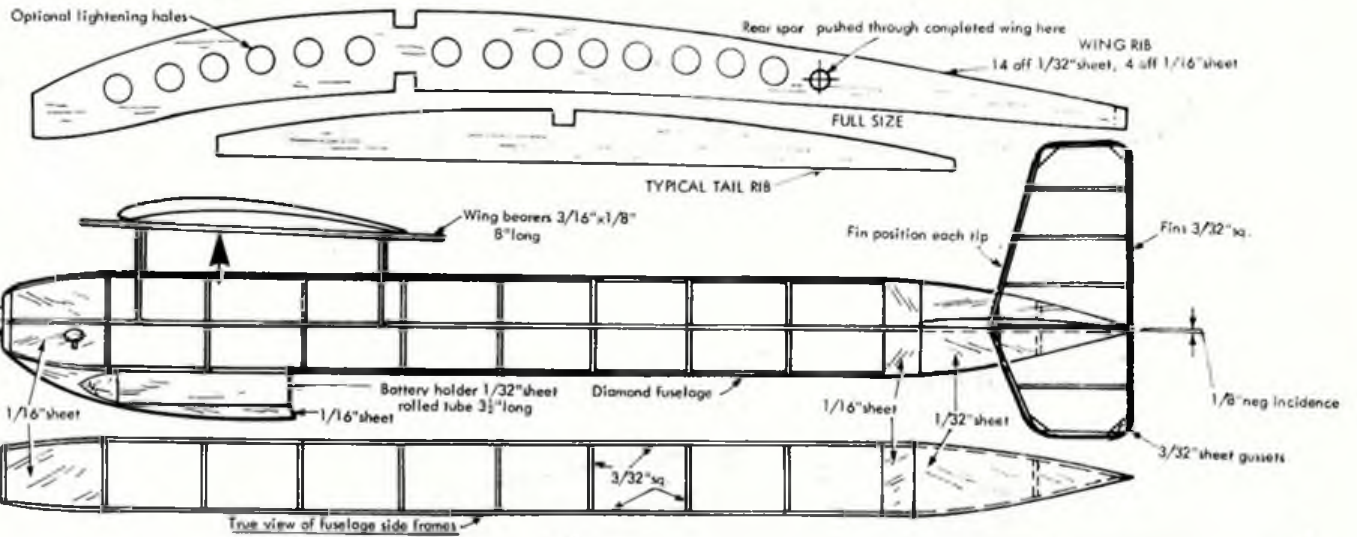
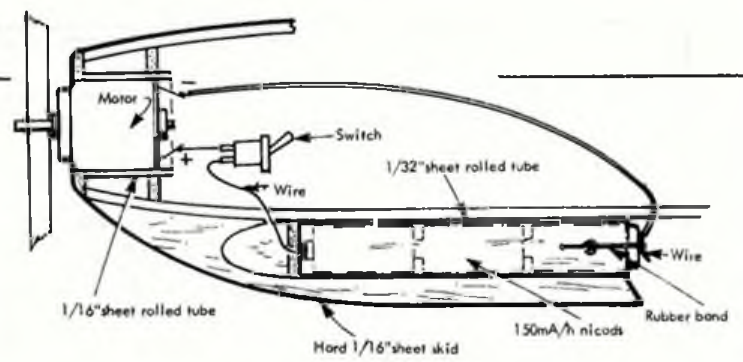
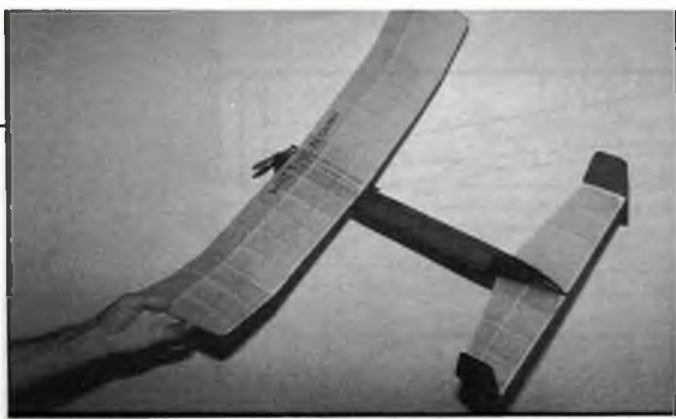
The model was covered in Jap tissue and given two coats of dope overall. It came out at 18ozs ready to fly, that is, a loading of 6ozs/sq ft (the model now weighs 18½ ozs after one or two minor modifications). It was crying out to be named, so seeing that it was light, electric and I was no spring chicken, 'Gramps' seemed appropriate.

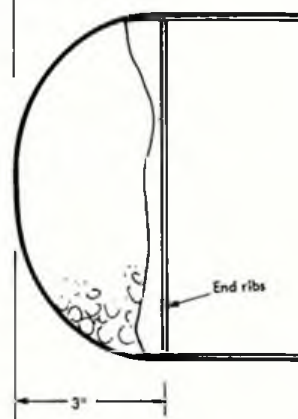
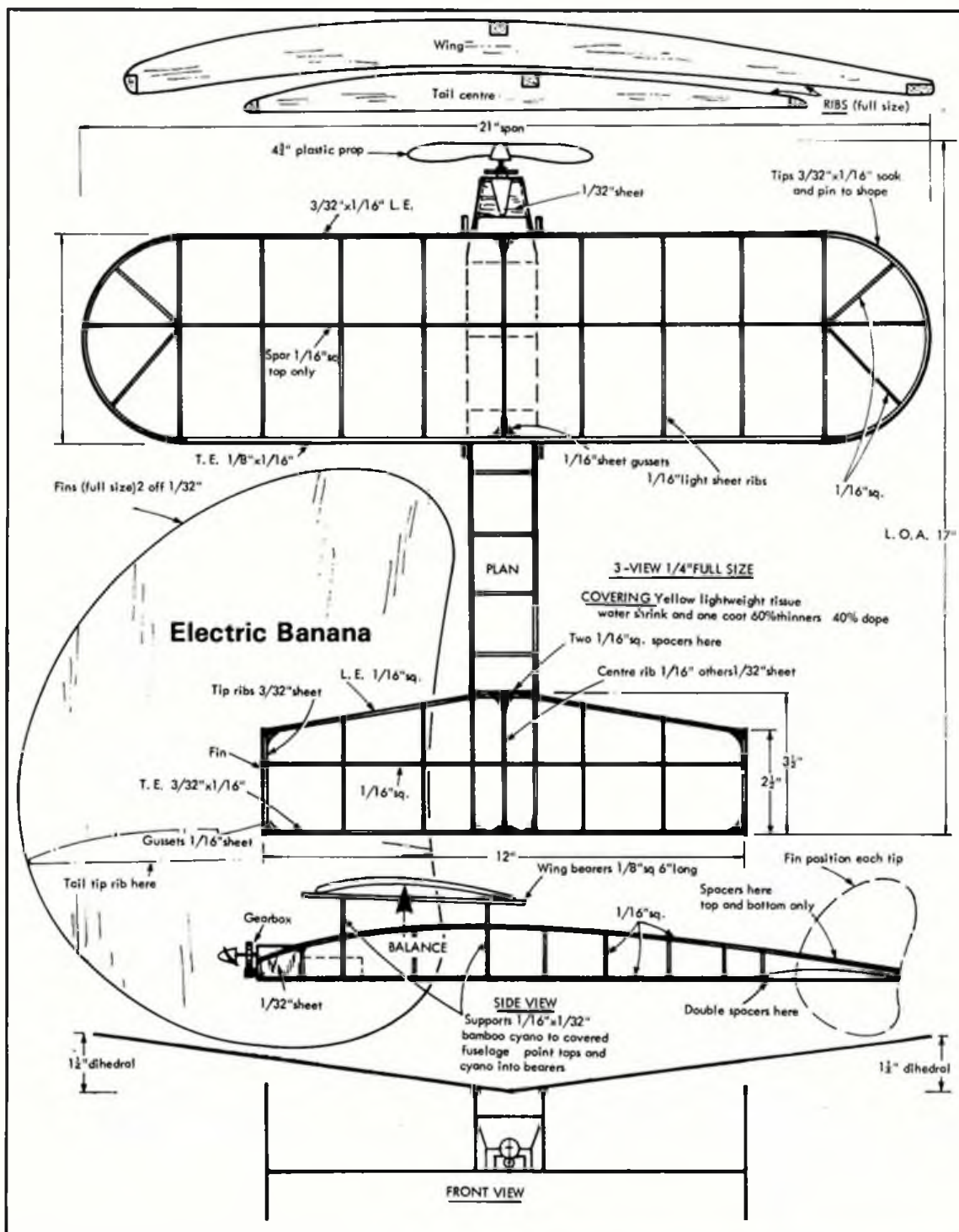
The model flew off the board, turning in flight times of about seven minutes. It was only flown a handful of times during 1985 as my time was taken up with indoor electrics and a conventional radio model. The best flight to achieve this time was 9mins. 30sec.

As the summer of 1986 came round, it was time to give Gramps another airing. The prop was changed to a Cox 6x3 and the difference in performance was notable. Not only did the model not want to come down but it would even fly in quite a high wind. Flight times too were creeping up; 10 mins 20 sec now being the best.

But it was at Pontins model week that we saw the best of Gramps. Despite overcast, strong lift was about and - thanks to the superb efforts of my brother Maurice at the controls - flights of twelve and thirteen minutes became the norm. Naturally enough, we were delighted, and now look forward to much more fun to come...

Heading photo: Radio-equipped Gramps is described in text. Close-up view at left shows under-fuselage tube-cum-skid which houses four 150 mAh nicads. Layout is derived from essentially-similar Wattlanohm free-fighter, drawn and illustrated at right.

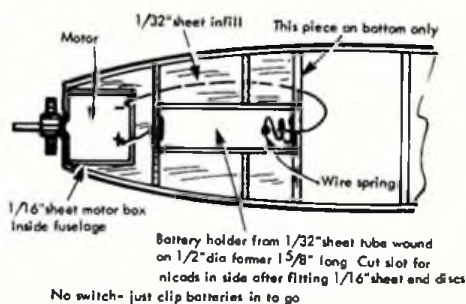


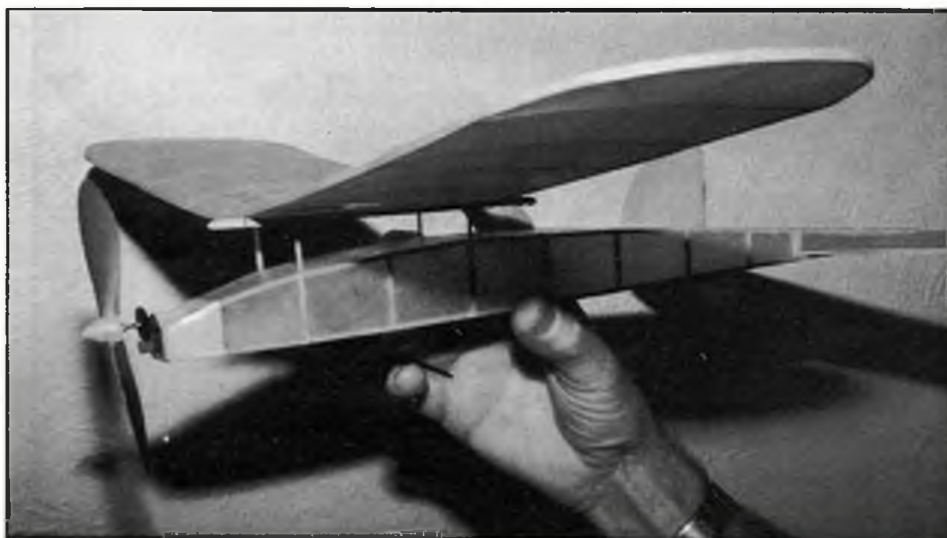
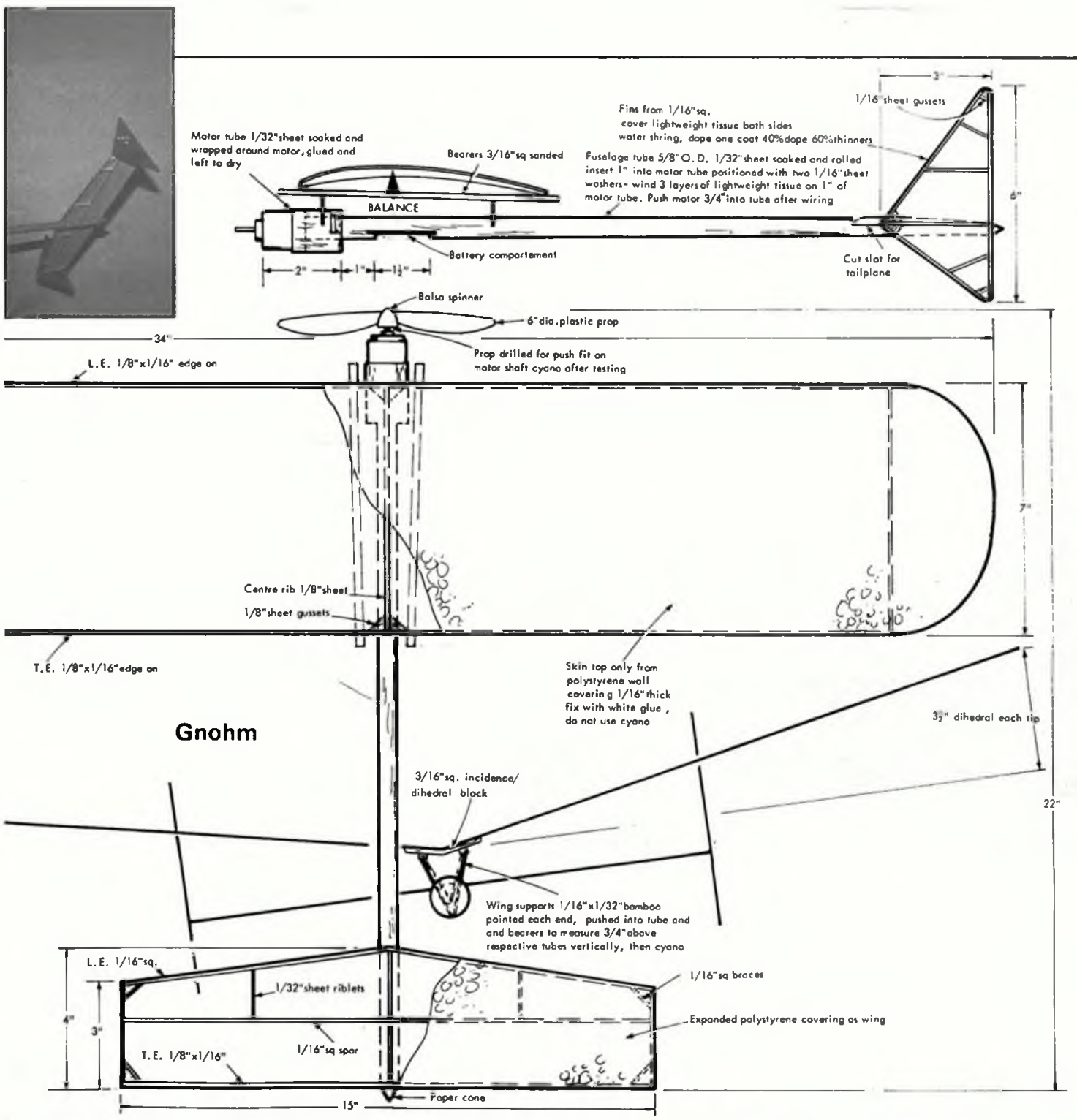


TOTAL WEIGHT 2 oz.
POWER Mabuchi 140 motor
Two 75mAh nicads

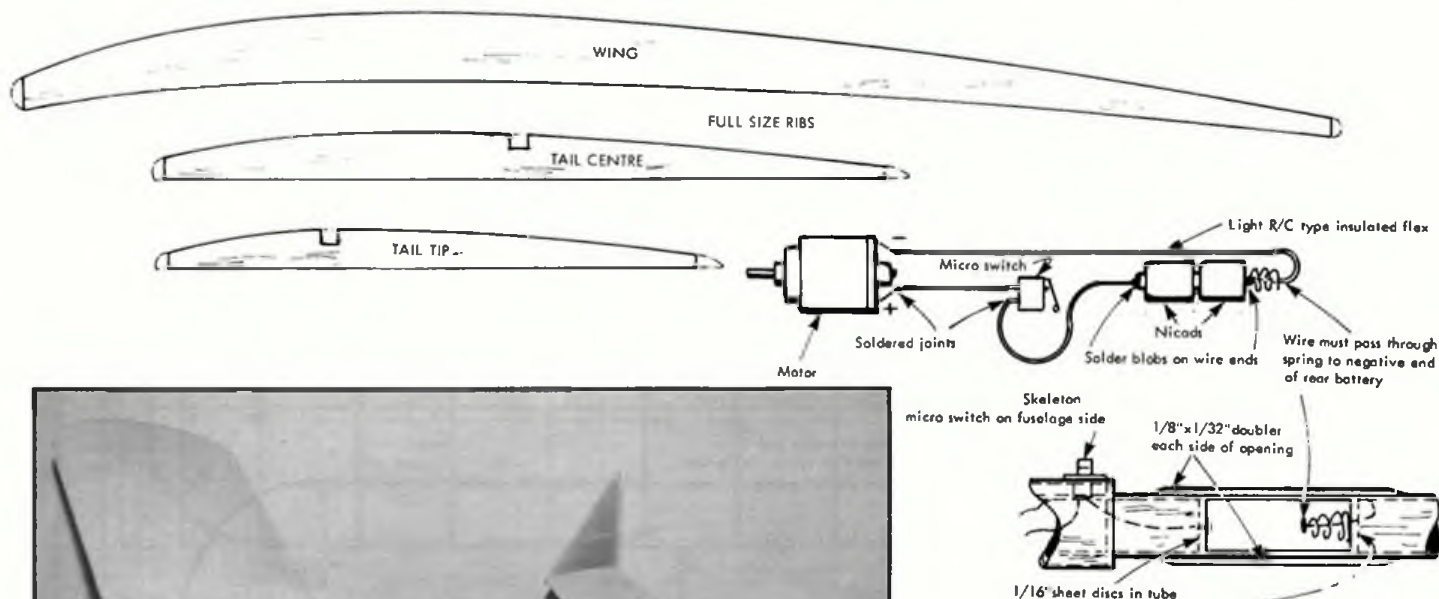
Model flies in right hand circles
Adjust by tightening or slackening
retaining rubber band on port wing
to increase or reduce wash-in

Electric Banana nose assembly below shows just how simple are the works of this indoor lightweight. Nicad installation is seen in photo, right. No switch is used.





Two models for indoor flying (see also November Aeromodeller). Left: Functional but attractive lines of Electric Banana are apparent here, as is the reduction gearing which allows a relatively large propeller to be used efficiently. More details of gearing next month... And why the choice of model name? Because the original was covered in yellow tissue, of course! Above: the larger Ghohm is of even simpler construction, with a rudimentary framework to the flying surfaces which are given substance with a single surface of 1/16in polystyrene wall covering - further room for experimentation here, you CO2 and rubber flyers? More gen overleaf...



Above: More secrets of lightweight Gnom. Stunningly basic approach should eliminate much of the mystique attached to this form of motive power. Who else is experimenting?

Left: The model itself, which features a possibly unique method of adjustment for turn in flight - altering the tension of the rubber band that passes over the port wing root allows the camber to change, thus inducing washout or washin which will cause a variation in radius of the flight circle. Relatively 'floppy' wings and tail mean that damage after collisions is almost unworthy of mention; great for indoor flying provided there's not an excess of power to produce unwanted deformation. Note that the tail is apparently the more robust surface, no doubt to prevent flexing from the action of the tip fins - the consequences of which could be fatal!

Next month: More drawings, plus motor and gearbox how-to-do-it advice.

GOOK'S GLOSSARY OF ERROR NAUTICAL TERMS

a concoction by Peter Holland

"A" frame: Goes around a picture.
Airframe: Made in Ireland.
Aileron: Offering R.G. Moulton a drink.
Aerofoil: Used for lubricating aerofs or for wrapping Irish turkeys.
Anhedral: Sister of Di (see later).
All-moving-tail: Should use stronger elastic.
Angle of attack: Depends on how you hold the hammer.
Anti-warp: Dotty relative.
Anti-stall: She's 6ft. 3in.
Balsa wood: Then again, it might not.
Bi-plane: Starting aeromodelling.
Ballast: Small stones dug out of noseblock.
Bracing: Windy.
Bellerank: Enthusiast found in churches on end of rope.
Cabin model: Useful place for stowing headgear.
Centre of lift: Equal distance from each wall of the cage.
C.G.: constantly gyrating - due to wrong balance point.
Centre of pressure: Point on back of head in contact with unseen model.
Camber: Emerges from tent with stinking cold.
Clevis: Situated mid-way between two prominent points.
Crosspiece: Angry girlfriend.

Control-line: Telling the kids off.
Canopies: Choice of garden or mushy.
Canard: Noticeable when thrown.
Dihedral: Welsh wing manufacturer.
Drag: Wear what you like, Duckie.
Dive brake: Termination of dive.
Elevator: American lift.
Exocet: Hard boiled.
Free-wheel: You pay for the other one.
Free-flight: Gliders... Rubber and fuel costs you.
Fuselage: But some are small.
Gear: Smart field wear.
Gravity: Expression on surveying wreckage.
Helicopter: Female under discussion.
Horizontal stability: Flat on your back.
Incidence: Actually, she's quite bright.
Jury strut: Courtroom walk.
King post: Royal Mail.
Kwik-links: Short golf course.
Longerons: Useless on short fuselages.
Lean run: Overdone the jogging.
Lateral stability: Edge of bar.
Low centre of lateral area: Beer gut.
Low wing: Sound made by cattle.
Mixture control: Stick to beer.
Microfilm: 1/4 reel, half an actor.
N-strut: Chicken walking.
Nose moment: Pause to blow.
"O" ring: In debt.

Open model: Before covering.
Oleo: Yodelling practice.
Propeller: Give her a shove.
Parasol: French paraffin.
Plane: Un-decorated.
Ply: Cockney kid at leisure.
Quarter-sawn: Only part way through.
Rib: Take the Mickey.
Reflex: Change the plug wiring.
Return gear: The sleeves were too short.
Revs: Two clergymen.
Rubber motor: To polish it.
Silencer: Very difficult.
Stabiliser: Give her a gin.
Stall: Needed on finger after starting engine.
Sweepback: Tidying up the workshop.
Sub-spar: Asking bad for money.
Swing-wing: Show-off assembling model.
Slab-side: Undersurface of haddock.
Tailskid: Untruthful child.
Torque: Major clubroom activity.
Tommy bar: They won't let him in.
Towline: Bragging about the launch.
Tail moment: When you find you left it at home.
Tail wind: Too much curry.
Undercarriage: Landed on railway.
Wakefield: Disturb sleeping cattle.
Whipping: Theft.
Wingtip: Won't fly level.



WE KNOW THAT British CO2 fliers have great experience in building and flying their craft...and we are trying to do our best, too. But unfortunately we don't meet any of your pilots here on the Continent; so we would like to invite you to come to the middle of Europe to take part in some of our competitions in 1987.

In order that you know what to expect, I would like to tell you a little about our activities. There are duration competitions with a two-minute-maximum in Czechoslovakia, Switzerland, Poland, West Germany, Hungary and (from 1987) in Austria. There are no weight limits or any other restriction but in Czechoslovakia you have to fly models equipped with the Modela motor and prop. By the way - the Modela prop is very good, and a lot of fliers use it for the Telco! You can find the greatest number of CO2 enthusiasts in Czechoslovakia - several hundred - and very often there are seventy or more competitors to be seen during well-known events like the Mala Gena Modely or the Memorial J Smoly. The number of CO2 modellers in the other countries is much smaller, but perhaps we will get a CO2 boom in the USSR because in 1985 a Soviet

CO₂ - CONTINENTAL STYLE?

Fancy some overseas free-flight in '87? Klaus Jörg Hammerschmidt extends an invitation or two...

Top: Concentration plus as Rupert Roger launches in the Swiss CO2 competition at Schneisingen - placed 5th. Is that a spot of self-timing we can see? Below: One of the younger fliers from W. Germany, Klaus Eschwieler, 3rd at Aachen in '86. Below right: Czech enthusiast Švatopluk Lesar shows his filling pistol.



factory started the production of these motors...and there is one Scale competition in Czechoslovakia with a lot of nice models to see. Interested? The following sources can help you...

Austria: Mr Edwin Krill, c/o PROP, Prinz-Eugen-Str 12, A-1040 Wien.

Czechoslovakia: Redakce Modelar, Jungmannova, 24 CS-11356 Praha 1.

Hungary: Modellező Klub, H-1165 Budapest XVI, Veress Peter-ut 157 (Mr Pinkert).

West Germany: Klaus Jörg Hammerschmidt, Veltmanplatz 4, D-5100 Aachen.

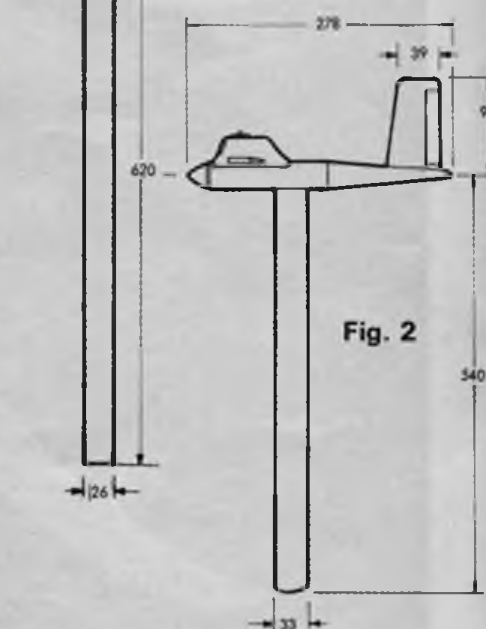
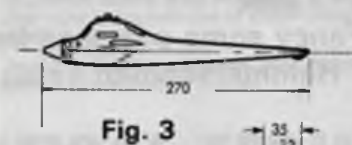
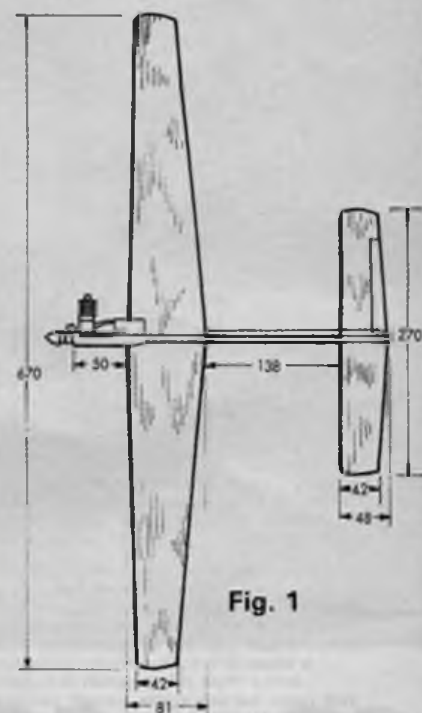
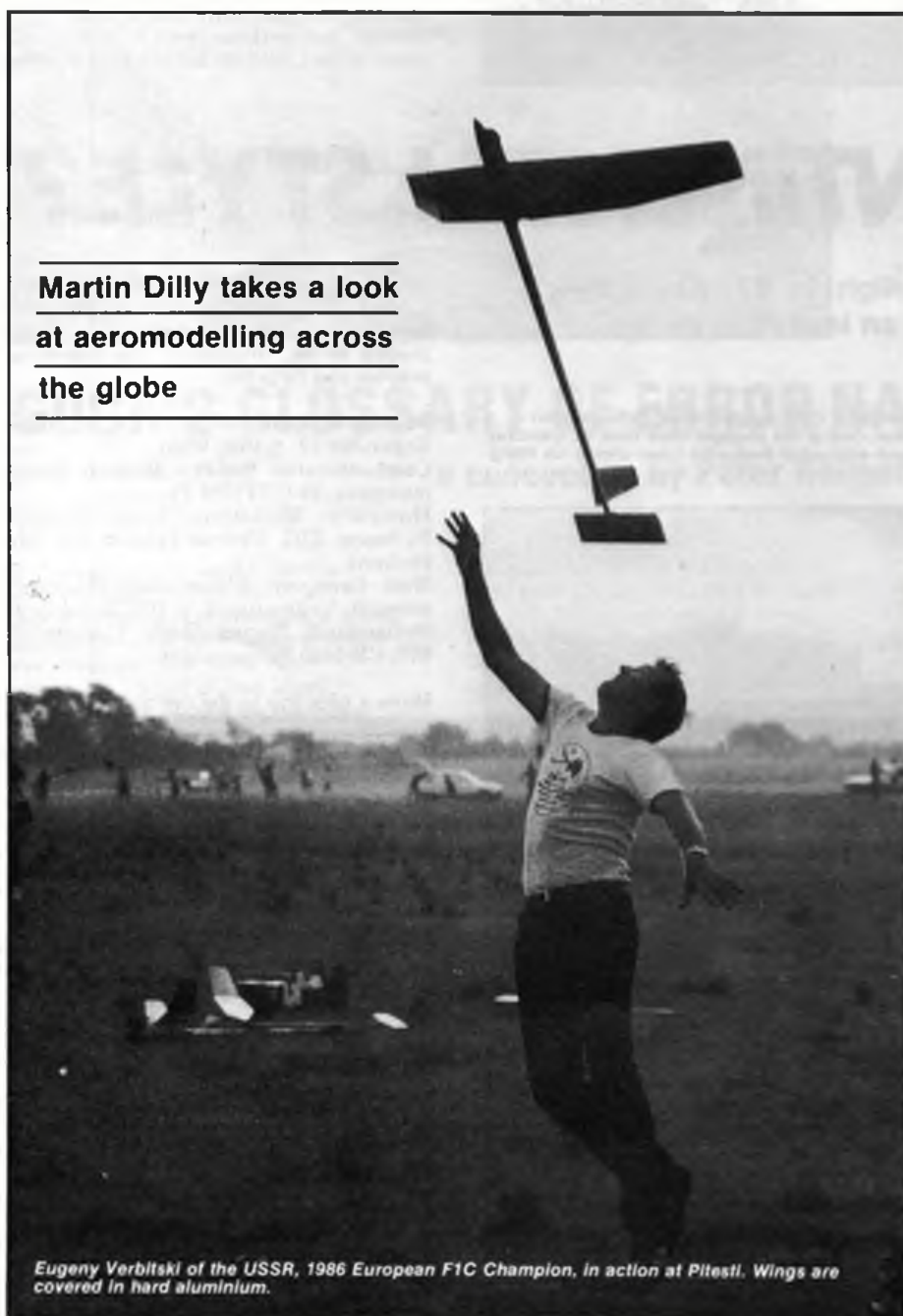
Switzerland: Werner Heise, Guggimoo 437, CH-5425 Schneisingen.

Have a nice trip to the continent in 1987!



WORLD NEWS

**Martin Dilly takes a look
at aeromodelling across
the globe**



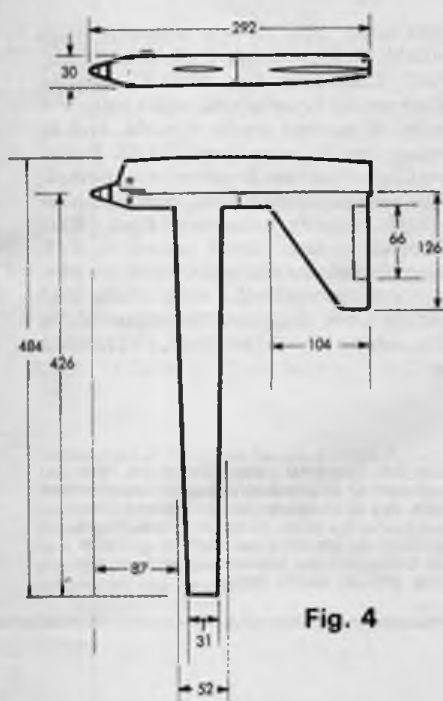


Fig. 4

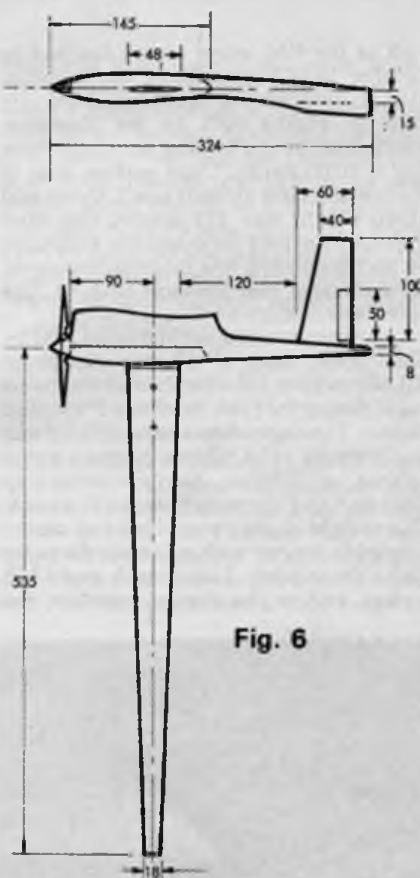


Fig. 6

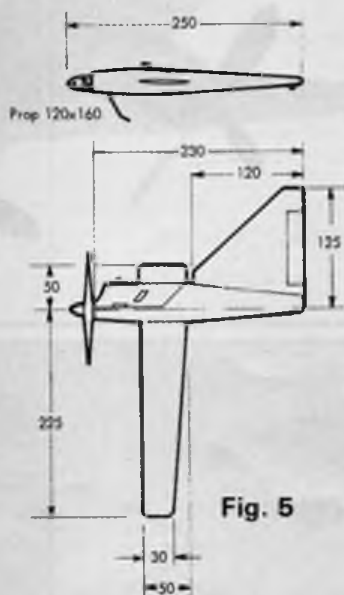


Fig. 5

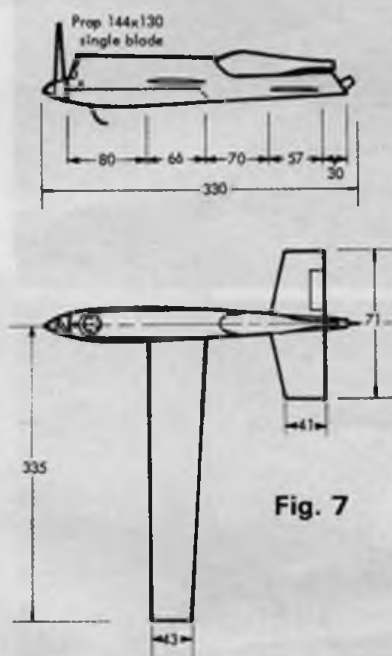


Fig. 7

1cc control line speed FAI World Record Holders 1980-1986

Key to figures:

Fig. 1: The 1980 record-holder by Sidorov (USSR) reached 79.34km/hr; dimensions here are scaled from a photograph of the model. Record stood until the following year, when it was raised four times in quick succession, first by the model in Fig. 2, that of Alexander Nizovtsev (USSR, 94.61km/hr); then by Nikolai Nizovtsev (USSR, 101.98, Fig. 3), Ravil Ibragimov (USSR, 110km/hr, Fig. 4) and Victor Fomin (USSR, 114.28, Fig. 5). The Chinese took over in 1983, with Huang Yong's model, shown in Fig. 6, reaching 223km/hr, a speed which was increased to 251.66km/hr by Zhao Jihe in 1984 with the model in Fig. 7. This record is still current.

THIS IS THE FIRST of what will probably be an irregularly-appearing column on model flying all over the world. Since the magazine budget does not extend to sending its columnists on overseas research visits, most of the material will depend on the input of news from our foreign readers; or it will be culled from newsletters and magazines published abroad. Should any foreign aero clubs care to send expense-paid invitations to visit their facilities or contests, then I am sure coverage in this column will result... Having flown control-line, radio-controlled and free-flight aircraft over the past 40 years, I have a wide range of model flying interests, though my actual *flying* is now entirely free-flight-contest oriented. I am currently New Zealand delegate to CIAM (the Commission International d'Aeromodelisme, which is the FAI's specialist group co-ordinating every aspect of model flying worldwide, from world championship organisation to safety recommendations) and also happen to be chairman of the CIAM's Information & Education Committee. We in Britain have a great deal to learn from the way other nations encourage model flying, so you will probably be reading about this special interest of mine from time to time.

See how they fall; or four years in the life of a world record

While looking through the current FAI World record dossiers at the FAI's Paris office, I noticed that the 1cc. control-line speed figure stood at a mere 79.34km/hr. That was in 1980 and Malcolm Wood and I, free-fighters both, but with a C/L background from way back, decided to have a go at getting one record at least for Britain.

The Cox TD .049-powered model that resulted is still hanging on my wall, unflown, for things happened pretty fast internationally after that first record, set by Nikolai Sidorov of the USSR. Let's have a look at the models and see how FAI record number 27 looks today.

Although we have no drawing of the Sidorov aircraft, a photograph shows a pretty basic profile fuselage, with a single leg fixed undercarriage and an external fuel tank with open vents; the overall appearance is rather like a Mouse Racer. Total surface area was 5.4dm² and the model weighed a heavy 250 grams; power came from a home-made 0.98 cc. glow-plug motor with a bore of 11mm. and a 10.3mm stroke. Fig 1 shows this aircraft, which set the first record in August, 1980.

Six months later another Soviet flyer, Alexander Nizovtsev, put the speed up to 94.61 km/hr, using another home-made engine with the same bore and stroke, but in an asymmetric aircraft with only 2dm² surface area and weighing 120 grams. The engine was side-mounted. (See Fig. 2.)

Less than a month later Nikolai Nizovtsev (a brother, perhaps?) raised the figure to 101.98 km/hr with a 0.86cc. Colibri engine (bore 10.6mm, stroke 14mm). This time the engine was mounted upright, but the model was again asymmetrical, weighing 126 grams for a 1.95dm² surface area (Fig. 3).

The next record claim to arrive in Paris was another one from the USSR, this time for 110km/hr set by Ravil Ibragimov. His

home-built motor had an 11mm bore and a 9.8mm stroke, giving a swept volume of 0.93cc., and it was side-mounted with a cowl that stretched the full length of the fuselage and must have contributed a bit to the overall lift. The half tailplane was on the inside of the flight circle and the surface area was 2.5dm²; empty weight was 190 grams (Fig. 4).

The final figure to emerge from this flurry of Soviet speed activity came in September 1981, when Viktor Fomin used a Cox TD .051 to produce a flight of 114.28km/hr. Using a side-mounted engine, the aircraft had a lowish aspect ratio wing, again asymmetric, but with a small stub on the outside of the flight circle, and a low aspect ratio triangular tailplane. The fuselage has a short landing skid under it; the aircraft weighed 110 grammes and had 2.25dm² of surface area. This speed of 70.96mph stood for two years; where were you, British speed flyers? However, the Chinese were having a good

look at the FAI world record list and in October 1983 Huang Yong of Shanghai almost doubled the previous speed. He used an engine built by the Shanghai Aeromodel Team, having an 11mm bore and a 10.05 stroke. Total surface area of the asymmetric aircraft was 2.32dm² and all-up weight was 212 grams. The wing had a 16:1 aspect ratio and the tailplane, set on the outside, was mounted low down on a drooped rear fuselage (Fig. 6). The speed was 223km/hr.

The current record, set in August 1984 by Zhao Jihe, also of China, stands at 251.66km/hr or 156.28mph, and was home made during the Fifth Szechuan Provincial Games. The engine has a bore of 11.007mm and a stroke of 10.325mm, giving a swept volume of 0.983cc. Surface area was 2.661dm² and the weight was 227 grams. The upright engine was piped and used a single-blade prop with a 144mm diameter and 130mm pitch. Line length was 13.28 metres, and as the dossier report on the

flight says 'line' in the singular, it is probable that monoline control was used.

Neil Lunham, the SMAE records Officer would be delighted to let you have details of current world records, and to arrange for the necessary SMAE/Royal Aero Club observers for your own attempt. There are 82 different categories for model aircraft records, ranging from R/C helicopter closed circuit speed to F/F rubber driven seaplane duration, so how about getting yourself a copy of the FAI Sporting Code, Section 4, from the SMAE office, seeing what is required, and having a go?

Below left: Youngest competitor at the 1986 World Indoor Championships at Cardington was Laszlo Ree of Hungary, whose father Andras was also on the team. Laszlo's longest flight was 35:27; he placed 22nd. Not the use of a stick to transfer the pre-wound motor to the model. (Photo: Martin Dilly).



We get (news) letters...

Much of the enjoyment of model flying can come via international contacts, and even if we cannot all manage to get abroad to fly in contests there are dozens of newsletter producers all round the world keeping enthusiasts in touch with each other.

The Hanger Pilot is now in its fourteenth year and comes from the Miami Indoor Aircraft Model Association (MIAMA) which is the only all-indoor club in the USA. Editor is Doc Martin, and the

Below centre: From the States, a scale fighter twin with a difference. Rare rubber-powered craft is Dick Howard's MIG DIS of 28 1/2 in. span and 70 grams all-up-weight. Model is still being trimmed out... Full-size machine was designed to a 1939 requirement of relatively low priority; development ceased in 1942 after several prototypes had been built.

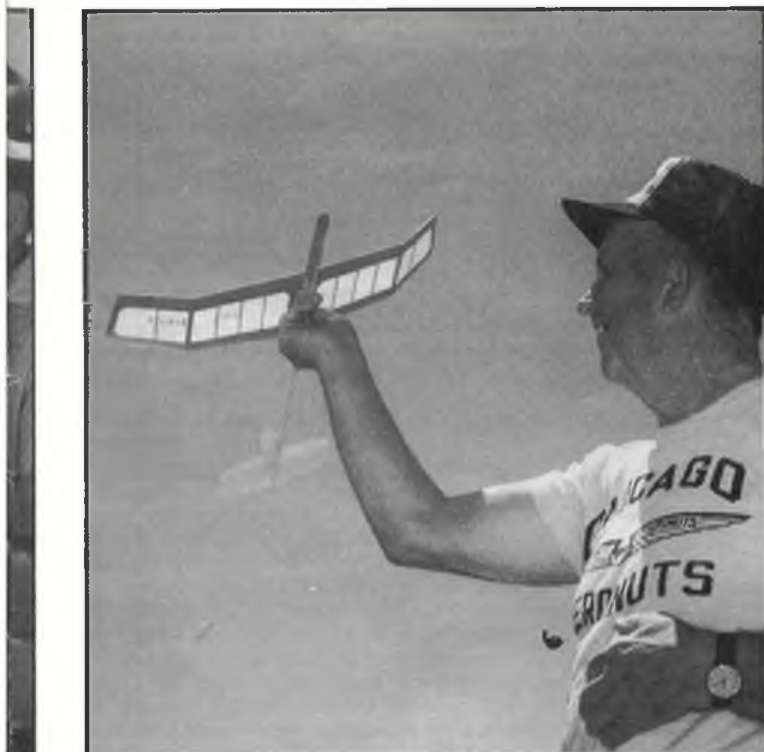
emphasis is on Peanut and other indoor scale classes; drawings of some fairly obscure prototypes are a regular feature. MIAMA will be running the first Pistachio Scale Inter-Gnats in April 1987, and this is an event you can take part in, for they accept postal entries in this sub-Peanut size class. A year's subscription to Hanger Pilot costs \$10.00 and it is published eight or nine times a year. Write to Dr. John Martin Jr., 2180 Tigertail Avenue, Miami, FLA 33133, USA.

Weighty matters

One of the publications I have collected as part of the mass information and education material coming to me through CIAM is from the German Aero Club; called Groundwork for Model Building and Flying, it runs to several hundred pages of A4 and covers a vast range of

topics from simple experiments in aerodynamics, through building techniques, plans for a variety of basic aircraft from chuck gliders to Wakefields and from magnet steerers to indoor, and includes sections on contest organisation and tactics, as well as various syllabus outlines for club and school courses.

All in all this is one publication I would love to see translated into English and published here, but one of the ideas in it is easy enough for you to use right away. If you use a beam balance or other weighing device you will probably need several different sub-gram weights to check component weights as you build. Most people use wire of various thicknesses, or aluminium strip, cut to length against known weights. After you cut these to the right length, bend them to the shape of their own weight, as shown in the diagram. This way they can be quickly identified and also can be hooked directly onto the loop or hook of the balance.



Above: Winner of the Peanut event at the Flightmasters annual contest on 13/14th September was another of Dick Howard's creations, this Curtiss Cox Cactus Kitten (don't say that with your mouth full!) which clocked a best time of 43 seconds. Bottom row, across the page: Scenes from the IMAC meeting at Bong, USA. Far left: Chuck Marcos of Deerfield, Illinois, with a model familiar to British eyes - a Lively Lady (designed by Elton Drew and featured in this magazine over fifteen years ago). Chuck built four in 1977; only this one remains. Centre left: Bob Black and son-in-law Mark Schuts, who hail from Wisconsin, prepare Bob's ten-year-old Peanut Mr Mulligan which has clocked 40 seconds - indoors. Left: Joe Baton from Illinois with a Bruce Kimball - designed HLG, modified with built-up wing. Pics: Dick Stouffer.

MIND THE LINES

with
Andy Brough

Rubery Hill Vintage C/L Rally

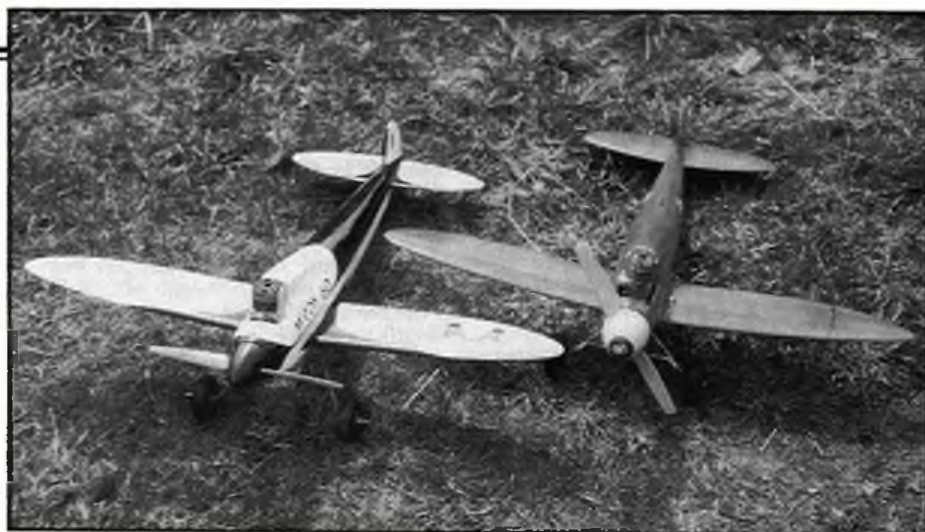
Organised, as ever, by Peter Martin and the rest of the South Birmingham MAC, the October gathering at Rubery Hill must rank as a major C/L rally, and one not to be missed for a relaxing day's flying. Sunday, 5th October was all you could wish it to be; sunny (mostly), warm and almost windless.

By midday between 25 and 30 cars had arrived, most having brought at least two modellers and several times more that number of model aeroplanes! Amongst the planes were the usual favourites, and thinking about it I don't recall seeing any American design; very British these 'Brummy' lads. I took my three kit review subjects, the Marlin, Smalley Fry and Midge, just to prove that they all fly, or perhaps to show that I can still hold a handle after all this talk of black boxes with little levers!

After the hectic time at Old Warden I was looking forward to a very low-key day with plenty of flying and chatting, but I'd only been there a few minutes when someone said 'I'm glad you've arrived, we can have a Midge comp now; where would you like to run it?' 'Two o'clock, over there,' said I, and so it was...

First to fly was Don Burgess, whose Frog 150 sounded better than the resultant speed of 68.7mph indicated; his second flight was only 70.87 which was good enough for 11th place (it would have been in the top three a couple of years ago).

At this juncture, I had to leave the proceedings to fly in the stunt event, and so left instructions to 'write your name down on the entry list and find a fellow flyer to time you'. By the time I returned there were thirteen names on the list, the



same number as an Old Warden; and most first-round flights had been recorded. Barrie Wade with his Super Midge, complete with detachable wing yet (it's a slip-in-your-pocket job) had exchanged his Elfin for a slightly better one. A first 75.6 was followed by a 80.36, which with fifteen per cent bonus added gave 92.3mph which was unbeatable, although the PAW-Midge of Messrs Skitt/Clews got close at 89.1mph genuine airspeed. It was gratifying to see four entries with vintage motors, the +15% giving some incentive; and it was very proper for an Elfin to win what after all is a Vintage event. The results below show just how close it all was:

Rubery Hill: Midge Speed

1	Barrie Wade	Elfin 1.49	92.3mph (inc +15%)
2	Skitt/Clews	PAW 1.5	89.1
3	John Gibbs	Frog 150	82.6
4	Keith Garbett	PAW 1.5	82.6
5	Rob Gough	PAW 1.5	78.95
6	Mike Downing	Frog 150	78.28
7	Eddie Snow	Elfin 1.9	74.5 (inc +15%)
8	Eric Hawthorn	AM 15	73.2
9	Mike Downing	AM 15	72.0
10	Bob Walker	Elfin 150	71.9
11	Don Burgess	Frog 150	70.87
12	Ray Gordon	PAW 1.5	62.9
13	Peter Martin	Allbon Javelin	59.5

I never had time to sort my Frog 150 Midge, but at least it flew OK; it just needs some work on the motor.

Dick Downes ran the vintage stunt comp

very ably. This attracted six entries (one more than the Nats), so it doesn't seem a very popular event, although there must have been at least five times that number of suitable models present. Perhaps the schedule needs to be simpler? The vertical eight is a little awe-inspiring for most pilots (not to mention some models) but it can be achieved with practice. Do we want a stunt comp or a simple competition for vintage models? Please tell.

After my inspiring flight with the Small Fry at Old Warden I entered it in Stunt, Mills 1.3 and all. The first flight was OK, up to the vertical eights where one of us couldn't quite get it together (I think it was the model) but at least the schedule was completed, earning me 231 points. I'd rather not mention the second flight, but re-engined with a more powerful motor I reckon the Small Fry will be a very acceptable stunter. Roll on next year!

Laurie Glover's Devil Bug was an impressive performer, topping the bill with a 289 and 307 to win. Not far behind was Roy Gordon with his Elfin 2.49 powered Ambassador. Third place man Mike Downing terminated his first flight vertically but no damage resulted. His second flight yielded 255 points.

Rubery Hill: Vintage Stunt

(Best of 2 flights)			
1	Laurie Glover	Devil Bug, Fox 35	307
2	Ray Gordon	Ambassador, Elfin 2.49	277
3	Mike Downing	Devil Bat, OS 20	255
4	Andy Brough	Small Fry, Mills 1.3	231
5	Eric Hawthorn	Stunt Queen ED Tempest	188
6	M J Bodkin	Ringmaster Merco 35	214

It's funny how I always stress the fun aspect of these vintage rallies and yet all I ever seem to report is the competition side, however low-key it may be. Just a fraction of the flying is in the events but as I am expected to produce reports, or run events I tend to watch only the comps; perhaps I am the poorer for so doing. There is much said and done which is worth passing on to give a broader view. Most people only go to chat and fly, not to enter a comp, so I will try to avoid too much reference to competition in future.

Back to Rubery for a moment; I must stress once more the fabulous day out afforded by going. There is space for about ten circles, it's a central location only a few minutes from the M5, and the company is great. Be there next year - you have been warned!



Heading: Two McCoy 60 powered Arkansas Travellers seen at Old Warden. Hot stuff! Left: Here's a miscellany - Ray Gordon's Firebrand, Darvish and Vandiver ready to go at Rubery Hill a couple of years ago. Above: 'Do we have to use these smelly Limey diesels?' asks Ed Gifford. Actually, he's testing his PAW-Midge for balance at the recent Stateside event for these models (details next month).

Model of the Month: The Bullet

We have mentioned this model before. The *Aeromodeller* of the time accredited fellow columnist Ron Prentice with its design, although Ron could not remember it! Further to confuse the issue, Ron Parker rang to say he saw Ron P. fly the Bullet at the '48 All Herts Rally, and Derek Bird wrote to say he saw Donald Powell fly it at Fairlop. However, Sam Skitt thrust the plan itself into my hand at the Nats.

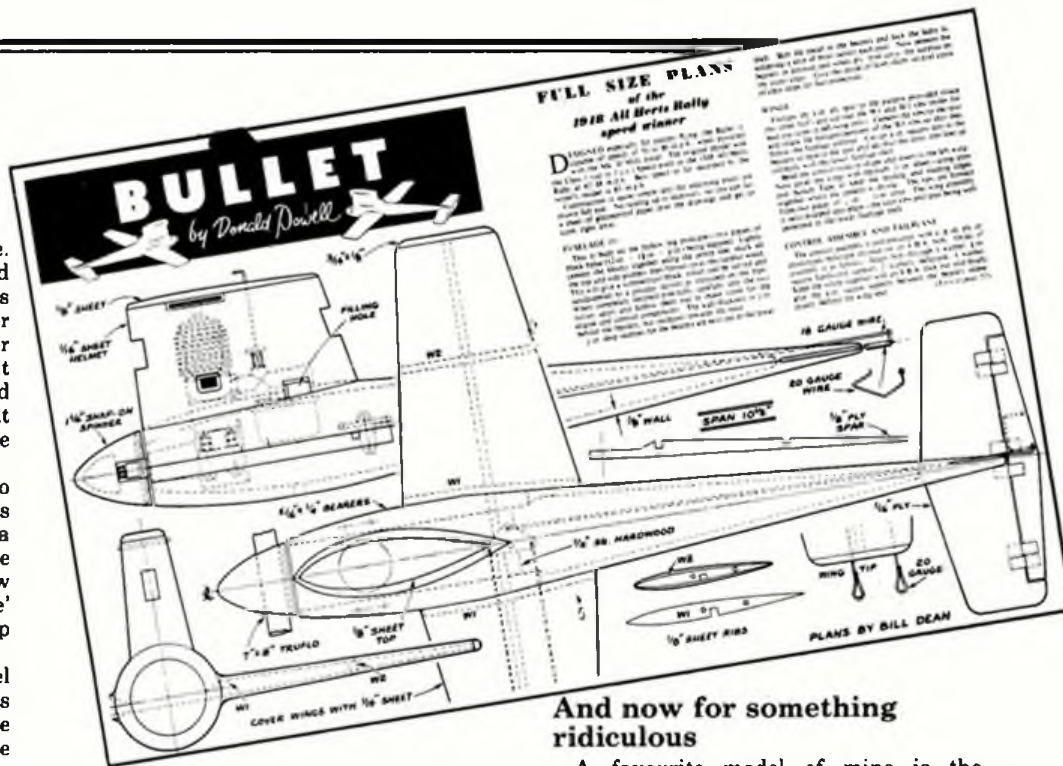
It was indeed Donald Powell who designed the Bullet; the plan was published in *Model Aeronautics* circa 1948/49. Donald, who is a member of the Witham Club, still flies a little Carrier now and then. I suppose 'Powell' and 'Prentice' are names that could have been mixed up by a reporter.

The reason for my interest in the model is its reported speed of 80-85mph on a Mills 1.3 Mk II. Now we F/F enthusiasts love the Mills because of its ability to swing large props at low revs, not ideal characteristics of a speed motor. Nevertheless, it would be fascinating to build a speed model with a Mills, would it not? But what class to enter the model in, you ask? Class I of course, and to give you an incentive the bonus speed will be +25%.

(Just to keep the heat going on this idea, bear in mind that Peter Chinn's Engine Test re-evaluation of the 1.3 Mk II in the December 1960 issue of Model Aircraft contained the comment that the engine '...is by no means a sluggish performer... maximum torque (is) comparable with that of some current 1.5cc diesels...' GC).

To help you on your way we show the plan of the Bullet originally drawn by Bill Dean and published by Ian Allen. As reported earlier the model won the All Herts Rally at 62.48 but later recorded a best of 85mph (or so they say).

I find the model very attractive. It's more of a scaled down 'proper' speed design than the Midge. One very useful feature of the Mills of course if that one need not



And now for something ridiculous

A favourite model of mine is the Arkansas Traveller by HA Thomas. By my reckoning there must be about five that I've seen at Old Warden. Wouldn't it be nice to see all of them together - and, if the following proposal inspires you, several more on Vintage Weekend Sunday next year. We could have a 'Traveller In'; not so much a competition but a fly-in, although it would be nice to see whose was the fastest, wouldn't it...

For those of you who do not know this aeroplane the photo shows a couple of them basking in the Old Warden sunshine. I can supply the article and reduced drawings for this 10cc speedstar on receipt of an SAE. The model was designed as a speed trainer, and as such it flies very adeptly with a top speed of around the hundred mark with a hot motor (McCoy of course). 70ft heavyweight Laystrate lines would be required, and the timing would be taken over the usual six laps, equalling half-a-mile distance flown. To reach 100mph requires a time of 17.9 seconds for the six laps. This would be one where vintage motors only (or replicas) should be used, preferably on sparks.

You may think me mad but the idea of half a dozen Arkansas Travellers all together for one meeting would make your columnist very happy. It would provide a spectacle that would remain in our minds for many years. Please tell me what you think, safety angles and all.

Above: The Bullet for Mills 1.3 speed. Half-span is 5.1/4ins. **Below left:** Don Myers' Midge, also at the American meet, is Super Tigre G33 powered. Don, who is a member of the South Jersey Aeromodellers, reports that it's a couple of mph faster than an AM15 on the same prop. **Below right:** Paul Kennard launches Johnny Hall's Midge with much gusto.



IN THE DARK DAYS of 1939, fundraising was a national occupation. In addition to the removal of garden railings (in order to recycle the steel involved) and the surrender of aluminium saucepans allegedly to facilitate the production of more Spitfires, our district with its many competing chapels and churches of sundry denominations was a rich field of opportunity for the impecunious fan of the Jumble Sale.

It was at such a function that I, as a small boy with a few coppers to spend, first became aware of the existence of a beautiful creation whose image has remained with me through the years.

The 'Lady' in question appeared in an ad. issued by the Scientific Model Airplane Company which was featured in a treasured copy of Model Airplane News acquired for, I recall, two old pence, from the stall allocated to books and magazines by the organisers of Jumble at the Wesleyan Methodist Chapel.

There was this beautiful big model, powered of course with one of the famous marques of American model engines, available in kit form and promising untold delights for a mere \$7.50, including air-wheels! Miss America ... could any model ever have been more appropriately named? For some reason, that advertise-

ment remained clearly in my mind (such is the power of advertising...) so that a subsequent happy accident some forty years later made closer acquaintanceship a definite possibility.

An American friend sent a whole batch of plans from his vast file of model designs. Amongst them lay an updated version of Miss A., still recognisable, but now geared for R/C use. I don't often build designs other than my own, but for obvious reasons, most of us have to build Vintage from plans. I couldn't wait to start. The giant drawing was laid out on the biggest building board I've ever needed, and the heftiest longerons I've ever handled were sawn to length and pinned down.

As a member of SAM I was offered the loan of a copy of the original plan from the Scientific kit, sadly rather faded, but still fairly decipherable. To be truthful, two versions of the fuselage were available, and these contained details of the spark-ignition circuitry for one of the Browns or Ohlssons of the time.

Motor matters

Never having ever *owned*; let alone operated, an engine before, it seemed prudent that I had better decide what power plant was to be used. The choice was facilitated after attending one of those

marvellous meetings organised by Dave Hanson in the Sheffield area. The qualities of the four-stroke OS 60 had impressed me, and this coincided with my spotting an advert for just such a motor in RCM&E. This particular engine turned out to be new, boxed and with full instructions... in Japanese. The vendor kindly offered to send a copy of the British version of the text, so thus equipped it was now possible to make a start on a bit of plans redrafting in order to fit the OS. Fortunately, I hadn't proceeded too far with the fuselage, having merely produced longerons and spacers which were applicable to the design irrespective of whatever powerplant was to be used. This was a genuine case of beginner's luck, as most of the work involved in designing to accommodate the power plant, fuel tank, throttle controls and so on was entirely new to me. The decision was made to do three things. First, to maintain the original nose length, thrust-line and cowl shape so that my version would look as much like the original as possible. Second, to redesign the landing gear to keep as much of the character of the first Miss America as I could, even though this would have been a lighter (free-flight) job than the R/C version; and finally to contact Frank Zaic, the designer, to get some of the back-

A Date with a Lad

Noted glider enthusiast Trevor Faulkner recently took the plunge into the world of radio control power flying. Here he describes how painless it all was

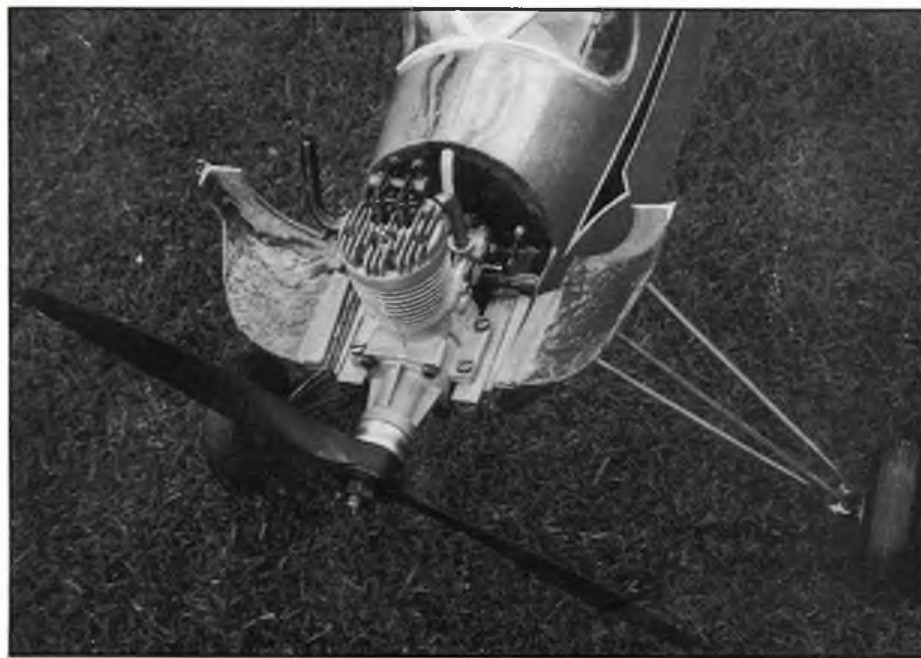


ground to the model.

Decisions

Frank's reply explained that the landing gear had employed some standard pressings produced by an engineering firm for some other purpose and that the flexing of the wire undercart had been the primary as a shock-absorbing medium. In addition, the kit had featured a complex little casting into which the ends of the undercart wires fitted, to be held in place with grub screws (the prototype had used wire-bound and soldered wire only). By now, I was firmly of the opinion that my version would look as much like the kit model as possible, and that it would have that beautiful insignia with name, 'Old Glory' and 'speed-stripe' which I feel sure Frank would not have bothered with on his pre-kitting version. To this end I fabricated an approximation of the axle and strut and pivoted the cross member to give adequate springing without relying on the wire to absorb landing shocks.

To familiarise myself with the motor, I built a test rig complete with an enormous wooden silencer box, and by the time an hour's running-in had been chalked up, I was in a fairly good position to check on my redrafted plans to ensure adequate space had been left for essential things like



fingers (to connect and disconnect fuel lines) and a sump drainage tube to avoid flooding the fuselage with unburnt lubricant. The resulting plans had to include some shifting of the formers, but as the fuselage is mainly a box with a semi-circular cowl forward of the cabin, this presented no major problem.

As the end of the fuselage construction drew near, a stupid error occurred. I copied the ply shapes for the area next to the cabin carefully, transferred this to ply, fretting them out with equal care, offered them up ... and found that what should have been a neat flange to help the glazing to be located and fixed just was not there. 'Window frames' (of $1/64 \times 3/32$ in. ply laminates) resulted, a rather elegant solution to a stupid error in not checking before cutting to size.

Mistakes...

I was to do the same daft trick again when it came to some of the wing ribs as drafted on the updated version of the drawing. Templates were produced as per plan, ribs cut ... and then it was discovered that several of the ribs as shown on the drawings were undersize (fortunately in width, not length). Once again, back to the drawing board; new templates, new ribs, and success. Most of the ribs fitted. Then it was found that those drawn for the tips were also inaccurate, so that all in all, a lot of time had been spent clearing up what was very careless drafting in the original drawing. By now, I had learned to check all rudder and stabiliser ribs against the plan well before cutting; not surprisingly, errors occurred in the plans of both but rectification was easily done.

Without going into greater detail, the important point to note is that any plan may carry human errors, and it is far better to spend a little time with dividers and ruler to guarantee that an appropriate accuracy is present.

Wishing to hand-on wings and tail as much like a '30s model as possible, I

abandoned the screw arrangement of the updated drawing, and at the same time made provision for as unobtrusive a fitting of control arms as possible. The result is a little fiddlesome, but is almost invisible, and works well in practice. Having so much fuselage space for the R/C bits was a delight, my Sprengbrook servos looking quite miniature in the cabin area.

Nearly there

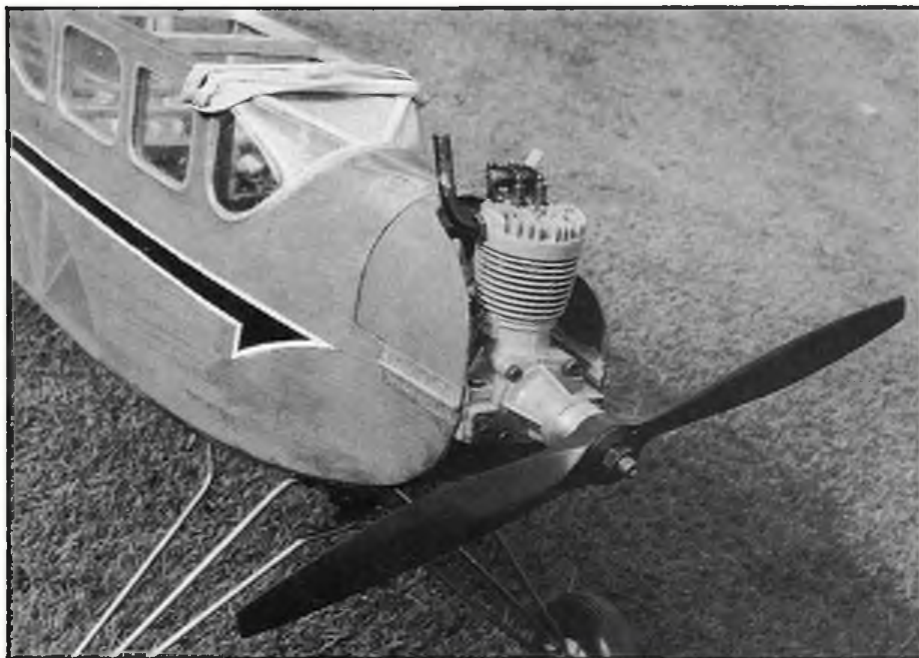
Covering with nylon was another adventure for me, and once again beginners luck held. I was able to get some surplus rip-stop nylon for the red and blue scheme mentioned in the kit blurb. The glazing of the fabric seemed very water resistant, but eventually all the surfaces were wet-covered using dope as the adhesive. Now my normal doping technique is to use 30/70 dope thinners but upon reading the books, the received wisdom was that 50/50 (or even full strength) was better to avoid complete penetration of the fabric with the resulting under-surface runs. Knowing what I know now, the first coat of dope should have been more like 10/90 (dope to thinners) to get through this type of material. Failure to do this allowed some slackening to occur in damp conditions, cured on the wings and stab by extra fuel-proofer, which are 'sealed units', but necessitating the removal of top and bottom fuselage covering as the inside of the fuselage is open to moist air getting to the nylon which hadn't had its weave completely penetrated by dope.

Photocopies of the insignia were cut out, doped in place and painted in poster paint, doped again and fuel-proofed (the originals were also paper cut-outs, not decals).

Resin was liberally applied to the engine bay and fuel tank areas and all the usual details fitted. All seemed well; and there the work stopped. Having committed myself to a number of European Championships for free-flight contests, I simply didn't get around to even flying any sort of R/C model, even though I had previously played around with thermal and slope soarers a bit. In 1986, some three years later, the R/C gear was fired up again, and it was decided that test-flying



Left: Vital statistics of this beauty queen are: wingspan, seven feet and weight, five-and-a-half pounds. Above: The cowl hinges to allow easy access to motor controls. Note the glass-fibre engine bay reinforcement which also acts as fuel-proofer.



Top: The alloy hinges, made especially for this model, were fixed with No. 0 x 3/8in. brass screws. Very 'period'. Above: The famous insignia, in red, white, blue and yellow. Has anyone ever finished a Miss America without it?

of Miss America could commence.

It seemed quite natural to me to proceed to teach myself just as I had done with my first 'bang-bang' single channel set way back in the past. After all, the model had been designed originally for free-flight, and would therefore have spent most of its time gliding. So what could be more appropriate than to set the glide trim by flying the model (prop-less) from the slope? Power-fliers of my acquaintance thought this rather an odd approach, but with a good westerly onto the hill, my first R/C flight for a long time took place. Problems? Only one. How does one hold a 5in. wide fuselage on a large area model in a 15mph airstream with one hand? Answer: with great difficulty; but the onset of finger cramp precipitated a launch and Miss A took to the air as though on rails. A spot of up-elevator was the only required modification to existing trim, and the landing (dead straight into wind at the top of the slope) was far easier than with a smoother,

less draggy glider. The stab was packed to remove the need for up-trim, and the model tested again. This time she flew hands-off, showing good rudder response despite the lack of slipstream, settling down once more to a docile, floating landing on the long moorland grass. A gentle nose-over as the wheels touched, and it was obvious that no more work was needed to be done prior to power flight tests.

Power on!

At this point I chickened out, and invited an experienced fellow club-member to look over the model prior to the first trip to the flat field. This invitation was rewarded by invaluable advice on two points. First, I was told to get the switch in a position for operation from outside the model (on my gliders I'd always removed a canopy to switch off and was prepared to do the same with the wings). The second point was that the throttle cable was far too flexible, didn't need a 'hairpin' loop in it, and

should be capable of positive closure to stop the motor. With these mods completed, the model would be ready for what I anticipated might be a nerve-wracking experience for both of us.

A further delay resulted from a visit to the Eurochamps at the Wasserkuppe, but on returning, a date was fixed to go with my adviser to his Club field as a guest.

4.30pm saw the two of us plus model out on the landing strip; there was hardly a breath of wind and my excitement was building up to a level I'd almost forgotten could be associated with model flying. This was to be a double 'first' ... the first time I'd ever started the motor with anyone around (and I dreaded making a hash of that) and the first time a powered model of mine would (hopefully) be airborne.

Well, after getting a succession of one-second runs, the tank was topped up sufficiently to get the fuel level right (tail dagger, motor higher than tank; why hadn't I remembered?) and away went the OS. The mixture, low speed and tick over were checked and then the Tx was passed over to my mentor. In about thirty seconds it was back in my hands, with the brief comment 'it's all yours', the model being safely off and up almost high enough to prevent the motor being heard. Circuits left, right, climb, descend on tick-over, away and up again until the tank ran dry. Then in for a long, long glide, overshooting the strip and nosing over in the grass. Not elegant, but I was delighted.

Now it was up to me. First take off ... not enough right rudder, ground loop so sedately, chop the throttle, try again. Right this time, off and climbing with full up and full throttle ... so docile it didn't seem possible. After ten minutes a dead-stick approach, this time short. Subsequently a few low passes after take-off, advice not to be too low nor too distant as the tank was running out, and a landing on the strip. Criticism? Yes, tail not low enough to make a three-pointer, but not bad all the same. My colleague was as thrilled as I, and pointed out that Miss A was an ideal trainer, infinitely easier to handle than many of the 'beginners' models he'd helped people to fly. As to the slope testing, it had at least allowed the trim to be set up properly, and had prevented embarrassing situations developing once that oily fan was moving. Speaking of oil, I'd anticipated a foul, greasy model necessitating a thorough scrub prior to a drive home, with the car windows fully wound down to avoid smell. Not a bit. Most of the exhaust seemed to have been thrown well clear, and just a dribble of lube had travelled to the underside of the fuselage. So into a dustbin liner when the business ended, and another imagined spectre of power flying had been laid; it didn't have to be dirty.

Thank you Frank Zaic, Scientific Model Aircraft, the OS Company, Don A., the SARCS and of course Miss America ... it was certainly a date worth the wait!

What are your experiences of starting in radio control? We'd like to know about the successes – and the failures. There must be a rich fund of tales, the hair-raising and the hysterical as well as the instructive. Let's hear them!

All the way from Czechoslovakia comes this superb 1/20 scale Italian warbird by Lubomir Koutny



MAGNIFICENT MACCHI C202 FOLGORE

THIS IS ONE OF MY favourite fighters of WW II. It has outlines that could only have been designed by an Italian, and its proportions are ideal for a rubber powered model. Many copies of this model have been built by Czechoslovakian modellers, and its flying performance is well proven. Construction is quite straightforward, although it would not be a suitable project for a complete beginner to scale modelling. Choose your materials carefully, bearing in mind the stresses placed on each part. The target weight you should be aiming for is around 30 grams.

Ali (wings, in Italian!)

Because of the taper and changes in wing section the ribs must be produced by the sandwich method from quarter grain 1/32 in sheet blanks. Note also that the tip sections are slightly different for each wing. The differential washout is essential and is best built into the structure rather than by attempting to twist after covering.

The dihedral angle necessary depends on how to intend to use the model. At one extreme, a model flown wheels-down indoors will need little over-scale dihedral, but an outdoor model without the pendulum effect of the undercarriage should have dihedral of between 35 and 40 mm under each tip.

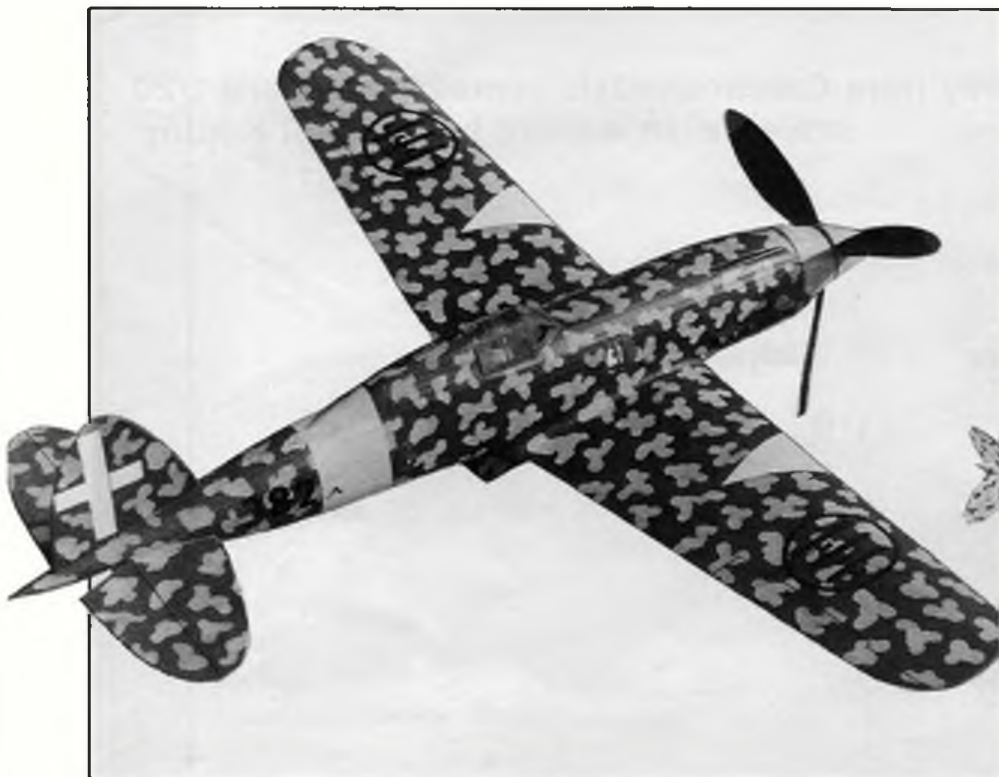
Fusoliera (fuselage)

This is built on the familiar 'keel and former' system, with a large number of small section stringers to preserve the scale contours. It is essential that the fuselage formers are accurately cut in order to avoid undulations in the stringers.

Pin down the top and bottom keels over the plan and add the half formers to the post side, followed by the side keel which must be cut to shape from the plan view. If you try to use a straight strip bent around, the fuselage will distort. Wood for the stringers must be stiff to avoid pulling in. They can be stripped from 1/20 in. or 1/24 in. sheet (available from The Balsa Cabin); or an alternative would be to use 1/32 x 1/16 in. set on edge. Note that only on F1 do the stringers fit into slots. Before adding the lower-most stringers, cut away parts of the keel and fit the wing at the correct angle, gluing and spars to formers F4 and F5.



Heading and right: Two views of Lubomir's original Folgore, which had fewer stringers than our plans subject, should guide modellers who may prefer to try lighter construction. Upper surfaces and fuselage sides are dark yellow with green patches; model undersides are silver-grey. Superb photos, too...



Anteriore e eliche (tail and prop)

Tail outlines are laminated from balsa, or better still, laminations of 1/16 x 32in. bass wood. The undercarriage is best made detachable, since these types always look better when flown without the legs dangling.

Individual blades for the propeller are prepared from three laminations of 1/32in. balsa glued together and bound to a tin can of about 9in. diameter at an angle of 15 degrees to the vertical. This gives them the right amount of twist. The blades are then glued to the spinner at the correct pitch angles.

Finish

This model is best covered with lightweight Jap tissue (available from Mike Woodhouse or SAMS), steam shrunk and

given several coats of very thin dope (15/85% dope/thinners). There are several colour schemes to choose from. Try to get hold of Profile No.28. A lightweight finish may be obtained by dyeing the tissue with water-soluble fabric dyes. Alternatively, a much more realistic effect results from spraying with Humbrol enamel in cellulose thinners.

Trimming

Check the wing washout, adjusting if necessary. The original model was trimmed to fly left/left. Test glides should be straight or with a slight 'left' tendency. Using a 400mm long loop of 1/4in. flat rubber, begin power flights with 200 turns and work up to a maximum of 1,000, adjusting with sidethrust for a wide left turn. Flight durations of well over a minute are not unusual with this model - good luck with it!

Top left: Vladimir Kunert built this Folgore exactly to plan. Final markings yet to be applied. Documentation can be found in Profile No. 28 and Famous Fighters by William Green. Above: Lubomir admires his handiwork. Looks like a good flying site, too! Below: Vladimir's model ready to go. Finish is Humbrol enamel, sprayed on.





BERZENIAK-ISAEV BI-1

THE BERZENIAK-ISAEV BI-1 was a single seat target defence interceptor designed around 1940 in the Soviet Union. It made its first powered flight on May 15th 1942. Its power plant was one 1,100lb Dushkin Bi-fuel rocket motor which gave a powered flight time of 8-15 minutes. Armament was two 2mm ShVAK Cannon. A multi-chamber rocket motor was evolved to provide cruising and combat speeds but the new motor was erratic under test and its weight had increased. By this time the authorities were needing fighter with a good endurance and the short-range interceptor was cancelled.

The model is 24 $\frac{3}{4}$ in. span and is powered by a PAW 1-5cc diesel. The prototype flew straight from the building board and is a very stable machine.

The wings

The 1/8in. hard balsa main spar is pinned directly to the plan on one side. The trailing edge, previously notched, is then pinned to the plan on the appropriate packing pieces. The ribs are now added and when they are completely dry the leading edge and scrap sheet tips are added. Tilt the completed half of wing and pack it up so that the opposite half of the spar can be pinned to the plan. The second half of the wing can now be built in exactly the same way as the first. When set remove the wing from the plan and cover the top with 1/16in. soft balsa sheet. If an undercart is to be fitted, epoxy and thread the main undercarriage to the 1/8in. ply wheel brace and then glue the whole assembly into the bottom of the wing, making sure that it slopes forward. The assembly is reinforced with 1/8in. sheet gussets and then the bottom 1/16in.

Go Russian around with this latest control-line rarity from Dave and Jym Leddy

sheeting can be added. The wing can now be sanded and put to one side.

Fin and tailplane

These are cut from 3/16in. balsa and sanded to shape. The 14 swg wire joiner can be put in a piece of plastic tubing (we used a scrap from an R/C snake) before being glued in place.

Fuselage

Pin the hard 1/8in. balsa upper and lower clutch pieces to the plan. Cut the 3/8 x 3/8in. hardwood bearers to length and

drill the lower one for the bellcrank mounting block. Blue the bearers into position, making sure they are packed up with scrap 1/16in. to ensure they are on the true vertical centre line. Now add half formers F2 to F10 ensuring they are correctly positioned (and vertical). Add the 1/8 x 1/4in. balsa stringer and leave to dry thoroughly. Remove from the plan and carefully add the other halves of formers F2 to F10, making sure the tank of your choice is correctly positioned in the fuel tank bay. The 1/8 x 1/4in. balsa stringer is then glued in place and the fuselage skeleton is glued in position on the wing. The bellcrank is now fixed in place and after the cockpit floor has been carefully located the upper half of the fuselage is planked with 3/8 x 1/16in. balsa strips, making sure the fuselage does not twist or bend. Glue on the 3/16in. balsa platform at the rear and then fix on the fin, rudder and tailplane. Connect up the 16 swg push rod and make and fix the 18 swg lead outs in place. When you are satisfied that the movement is correct and free complete the

continued on p.55



Heading and photo, right: We bet few of you could identify this one! Great satisfaction comes from modelling a scarce subject - try it and see... Simple camouflage of dark green upper surfaces and light blue underside is highlighted by the red-with-yellow-outline Soviet insignia.

VINTAGE CORNER

The delights of electric-powered flight form the main part of Alex Imrie's old-time commentary this month

THE REQUEST in the July issue for more contributions from readers has resulted in two responses on electric power. The first is a long treatise by Jack Hardwicke of Enfield, the second is an up-date from Jim Alaback of San Diego on the subject of his Cleveland Viking which was pictured in skeleton form in the issue mentioned above. These submissions are complementary to each other, so we'll let Jack blast-off!

'...I saw that plan in Model Builder too and the construction is very light indeed. Jim Alaback has made a very handsome looking model by the look of the photo and I would love to hear more about how it flies and what goes into it by the way of power pack batteries and electric motor etc. (*Jim tells us later about this. GC*). I have built and flown the *Aeromodeller* scaled-down CO₂ Cleveland Viking published in July '84 issue; it flies very pleasingly, even although it is 33% up on John Watters' original in weight, and the wing loading of 3½ ounces per square foot gives it quite adequate 'fly-away' characteristics, so goodness knows how John's model stays with him. Perhaps it hasn't! My model flies sedately to the left under power with a nice, though not frightening, climb; then on the glide it will go anywhere. Although I first flew my Viking in July I am still working on its trim. At meetings there always seem to be some free flight sport models that fly consistently to the left both on power and on glide, just like control-liners. This is a very desirable flight pattern nowadays with generally only small flying fields to fly from. Somehow getting this result evades me. I have tried applying side thrust to balance the amount of left trim needed for the gliding turn, yet I don't get those control-line type circles. Yet with my Sal Taibi Cadet I get left/left flight patterns, although the glide turn is pretty wide.

'On first looking at the Model Builder plan I was rather shocked to see how it differed from John's Viking. My model has polyhedral and less pronounced elliptical-shaped wing tips; also, I think that the tail on my model is smaller, in keeping with what is a quite elegant moment arm. I wonder about the cabin window fillets too; did the original have them? Dave Baker assures me that the original could have either polyhedral or dihedral...I find the 'miss-outs' of authentic model variations quite interesting!

'You described my electric Brigadier in the January 1984 issue, and some readers might be interested to know that this model now has completed 114 flights of an average duration of eight minutes each, thus making around 15 hours in the air. I have graduated to the point of now flying it regularly myself (*initially Jack's son did the flying; AI*) and I now have had at least ten hours at the controls. A crash in 1984, caused by turning too soon after take-off in too high a wind, opened the way for a

rebuild of the nose and the opportunity to put in an Olympus belt reduction drive unit. At the same time I changed to a Ripmax Cyclone 15 electric motor, made up a new power pack of only six 1200 mah yellow Sanyo nicad cells and put an 11 x 7 Taipan propeller on the front. Because I changed down to only six cells, charging from a 10 ampere/hour motor cycle battery allowed me to charge the cells more fully and the improvement in flight times was gratifying; the model would now fly 8 to 10 minutes per flight instead of six to eight. Climb was slower, but usually as high in the end as with eight cells on direct drive, but the glide was infinitely better because of the lighter weight. Model now weighs 46 ounces ready to fly; that's a wing loading of just under one pound per square foot, but it includes quite a number of doped on patches to the tissue!

'I charge the six-cell power pack using the voltage peak system, in about twenty minutes. Mitch Poling, designer of the original electric model, featured in later Model Builder articles details of an expanded scale voltmeter for this purpose, and I simply bought the parts from Maplin and talked my son into building the ESV

for me. The way that I have been using this for two years now, is that the 12 volt battery feeds current into the MFA standard charging monitor, but then on through the ESV and then into the model. When the first rush of current has flowed normally for around five minutes, I switch to the seven-cell rate (even though I am only charging a six cell pack). It is now necessary to keep an eye on the ESV dial! Eventually the needle starts to show a reading as the combined charging voltage rises to nearly ten volts with the meter showing the last volt expanded right across the scale. When the needle jumps about half-an-inch across the scale, the pack has peaked and I disconnect. I then have a fully charged pack in the model. If charging were allowed to continue longer the ESV needle would start to fall back, and then shortly afterwards there would be a big bang! In practice I have an additional standard voltmeter in circuit, and I keep an eye on this and the ammeter on the MFA charger. By reading the ammeter and the voltmeter I can tell when I am within about five minutes of the actual peak, so is not quite as 'hairy' as it may sound. Anyway, I have charged up this way now for around a hundred times and it's still cheaper than the most sophisticated packs on the market which do it all for you. The electric Brigadier is beautiful in the air on a calm warm summer evening, almost noiselessly whirring around just like a huge rubber job with the light shining through the heavy-weight-tissue-covered structure. For most of the time it flies itself, and I stand hands on hips entranced! Flying thus, I alter its



huge circles to figure of eights from time to time, using the trims only. Eventually, when it is getting lower, just like a glider ready for landing, I get hold of the stick properly and steer firmly downwind, crosswind (base-leg) and just after the last turn onto final approach, switch off. The huge propeller, now wind-milling, seems to act as an airbrake and make the approach and landing more positive. If I just get the flare right, I don't even need to bend the undercarriage straight anymore!

'Some authorities feel that it is not wise to allow the batteries to drain so fully, but I have had no problems in this respect; but between flying sessions I regularly leave the power pack trickle charging from the transmitter charger, and I believe that this keeps all the cells evenly charged in the long run. Incidentally, it seems not generally known that a fully charged nicad cell has a significantly higher internal resistance than one that has become partially discharged. My electric model, in common with many others, goes away like a heavily laden Lancaster bomber, and great care is necessary on the first circuit of the field. Thereafter you can see a marked increase in power, as she starts to climb away properly, and by the time she comes overhead a second time, plenty of height has been obtained and the aforementioned "hands-on-hips" stage is reached! For anyone wanting to read all

Main picture: Jim Alaback's electric powered Cleveland Viking was built from Model Builder plans (see text). Jim is Newsletter Editor of SAM 41 which is the old San Diego Aeronauts in disguise! This page, top: Close-up of Jack Hardwicke's electric Brigadier on the bench with charging plug inserted. Middle: The same model being re-charged in the field. Cables pass from model over the fender into the car via the black box - about which Jack will have to tell us more... Bottom: This CO₂-powered Cleveland Viking was built by Jack Hardwicke from plans in the July 1984 issue of this magazine.



the elementary practical stuff about electric flight, Mitch Poling has written a book entitled "Building and Flying Electric-Powered Model Aircraft", which is published by Kalmbach Books in USA, and is obtainable from Jack Beaumont's Aviation Bookshop. At \$10.00 (approx. £7.50) it is not cheap for a saddlestitched quarto-sized book, but it's quite the best there is and is well worth looking into.'

Now let's hear what Jim has to say about his model. He includes the answers to Jack's queries:

'...The electro-powered Cleveland Viking is now complete. I ended up with yellow Micafilm covering on the wings, light blue Solartex fuselage covering and yellow Japanese tissue (clear doped) for the empennage cover. The fuselage stripe is red with a white pin stripe to match the wheels. The fuselage trim is ironed-on Solartex. With an Astro Cobalt .05 motor and seven 800 mAh cells the model weighs 38.1 ounces ready to fly. The radio is a

Futaba RH4 with a 175 mah battery. The plane performs very well, much better than the pilot (myself) after 20 flights to date. I have tried so much that is new to me on this model that I am pleased to report what a pleasure it has been, both to build and fly. Last time out at our San Diego Aeronauts monthly contest, the Viking even managed to take a ribbon. Our contests are for best duration total of two flights with a motor run of 1½ minutes and a flight maximum of seven minutes. The models are to ROG unless otherwise decided by the contest director because of some adverse condition of the field or weather. There are fly-offs in the case of ties. A year ago the Aeronauts had only two electric model flyers. Now we have a dozen or so, with an entry list of eight or ten each month. The silence and freedom from mess are a treat, and also I find that I am not coming home with lost or crashed models in this event. Just recharge and you're ready to go again!'

Hear this!

It is always illuminating to hear what others think about the vintage scene, and when comment comes from one so knowledgeable as Mike Beach, the originator of the Fireball Trophy, a one-time vintage engine collector, and an avid vintage enthusiast for many years, one must really put down the tube of cement and listen! Mike recently sent an interesting letter which mirrors some of our own thoughts, and he explains that although he realises that control-line is covered as a separate entity in this magazine, his remarks on how he sees the direction of the Fireball Trophy may be pertinent to trends in other areas of vintage. Over to Mike:

'You will remember well the type of

model we used to fly in the late 1960s and early 1970s in the re-birth period of vintage - they were very close to what we actually flew in our youth (*Mike means in the late 1940s here. GC*). Things have changed dramatically with modern engines, radio and covering materials, and while it could be considered more practical and sensible, vintage - it ain't! Now control-line is beginning to slide the same way and I think it's important we try and retain some actual vintage models; this is not to decry the modernistic approach to vintage, since that might after all be the more sensible - however, and it is a very big however, there must be some recognition for enthusiasts who try and re-create in the most accurate way.

'What we are doing with the Fireball is to

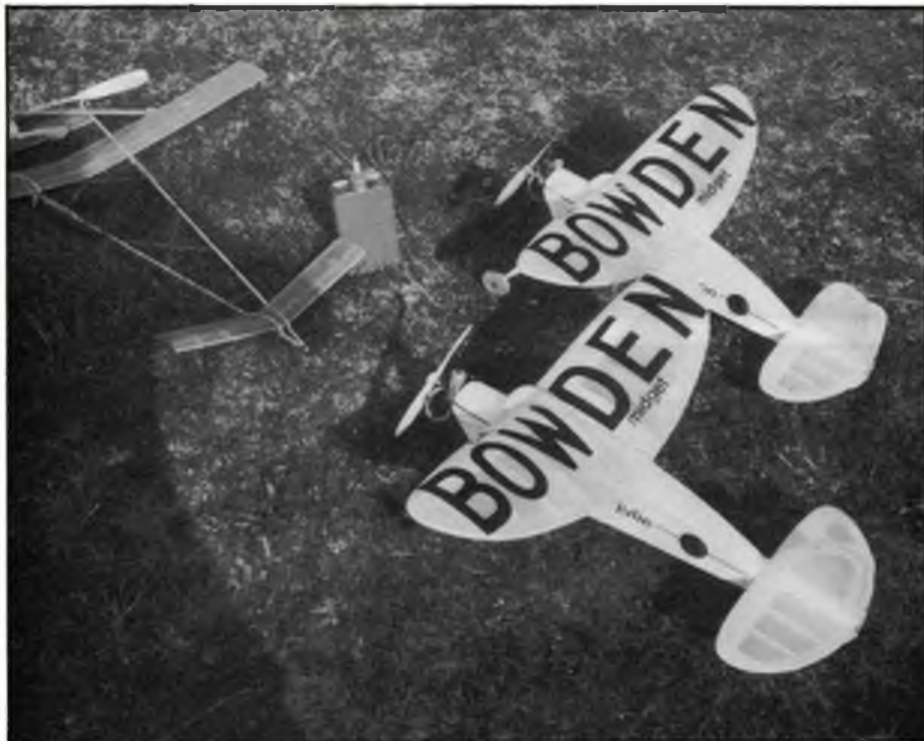
look at the models entered and invite the most accurate to fly. Out of perhaps 50 models only 10 may be asked to perform, and we stress it's not a competition or even a trophy - it's more an award to people who have made the best attempt to encapsulate a certain year and model. It's all very low-key but very easy to run, as many possible entrants scrub themselves by using modern engines. Everything is very friendly and if they just want to fly and their model is not selected they carry on. The chosen few must fly their model in a suitable manner. If it is a stunter, they stunt, a speed model must speed, a trainer must fly quietly around. Obviously this offers, in the most pleasurable way, a chance for anybody to get involved with a very low "hassle" factor.

'As you must realise I am not against the modern approach to vintage models, but feel that we must not let it overwhelm us as to what it was *really* like. It was teenagers flying rather tatty own designs, it was petrol engines, it was tissue covering, it was home-made props, it was models made out of a tailplane from one design and a wing from another, it was fly-aways, it was build during the week and crash on Sunday. Although we can't re-create that scene, the gap is widening between what it was like and what now is promoted as vintage. Perhaps it's time to clarify just what we are trying to do; if it's just to have fun, then who cares? But if we are attempting to have fun *and* be historically accurate it may be time to gently redirect some of the enormous talent in the whole vintage scene.'

There is food for thought in the above, and it might be opportune to air my own viewpoint on the subject of 'historically accurate' vintage models. Although I am interested in all vintage models, free flight power is my particular bent and in following that pursuit I honestly find it very difficult not to be authentic in my approach. Arming myself with an original plan or magazine article (they are still around) I build my model as closely as possible to that and fit either the engine shown on the plan or a recommended equivalent. I even try to decorate my model like the original since this means a lot to my simple nostalgic mind. Modifications are kept to a minimum but I have transgressed; for example, I do admit to dividing the wing of my eight-foot span Miss Philadelphia in order to get it into my car; I have used nylon instead of silk and I use nicads for ignition; but despite these lapses I do like to think that my models are (as far as practical) 'as per'.

Top: The names Allison and Julie on the fuselages of these two Bowden Midgets proclaim them to belong to Dave Baker - the 'spark plug' of SAM 35 according to John Pond - they're the names of his daughters! **Below:** Ernst Schlachter of Switzerland, another keen C E Bowden enthusiast, built this Baby Blue Dragon from details in the book 'Petrol Engine Model Aircraft'. The original was probably one of the first to employ wing tip slots.

Aeromodeller



Flying Scale Rubber

In recent years there has been a steady increase of interest in this type of model, and with improved knowledge of the behaviour of rubber and propeller efficiency surprising performances are being obtained. The standard of the flying scale model was never higher than it is at present, but when looking at vintage flying scale designs it can be seen that many, especially those from around 1930 are sufficiently deficient in accuracy of outline and other features to warrant calling them semi-scale models. But who will be so bold as to decide what should be considered as flying scale or semi-scale? As far as vintage is concerned, it is felt that models adhering to original plans labelled as flying scale should still be considered as such.

This means generally that modellers who elect to build the very early designs might find features that will provide a performance 'edge' on later designs, like lengthened fuselages and increased dihedral; now, will this result in a plague of such models? Or will competitions for flying scale, where points are awarded for fidelity, mean that modellers will leave the elderly designs strictly alone? Another thought for flying scale competition might mean that designs only from a particular designer should be flown, like our present Earl Stahl competition. This could lead, for example, to competitions for Joe Ott designs only or Paul Lindberg designs only, although, of course, it might be necessary for more strict definition, since between the period 1930 to, say, 1945, changes understandably occurred even within these disciplines. SAM 35 has a keen flying scale rubber 'Staffel' headed by Vic Dubery, 172 Wandle Road, Morden, Surrey SM4 6AB, who is responsible for running the Masefield Trophy within that organisation to an intriguing set of rules that awards bonus points depending on the configuration of the model flown. This system has previously been outlined in these pages.

SAM 35

This society's AGM was recently held in the Sports Association Hall in Henlow village which is a mere stone's throw from Old Warden. It was well supported; and this venue has been earmarked as a possible site for further winter get-togethers of the society. The swap-meet that followed the AGM was very popular and members brought items superfluous to their requirements; thus many kits, plans, magazines books and engines from the vintage period changed hands to the obvious delight of all concerned.

Followers of this column, especially those of you who are regular readers obviously have vintage models as one of your interests and should be aware of the Society of Antique Modellers. Briefly, this is a world-wide organisation which is "...dedicated to the preservation of vintage model aircraft". Areas are divided



into Chapters, UK being number 35. This Chapter produces an excellent monthly magazine for its members which is a completely voluntary undertaking. Annual membership is £9.00 (or £12.00 if you reside abroad) so if you wish to avail yourself of the infections perpetrated by this breed of modeller, send your cheque for the appropriate amount, along with an SAE, to Les Duffy, Membership Secretary, 9 Queens Road, Wellington, Somerset.

MECA meeting

This brand of enthusiasts' interest concentrates mostly on the power units from all periods used by model aircraft, cars, boats and so on. On Sunday, 28th September, Region 13 of this world-wide association held a 'Collecto' in the Sports Centre at Market Warsop, Notts. Some thirty members attended, and covered the tables provided with many hundreds of engines both 'ancient and modern'. As an example of what can happen at such a function, one member produced a Kratmo 10 (a German petrol engine from 1938) which, although complete with aluminium propeller was missing piston rings, needle valve etc. and was coated with the thickest layer of rust on its steel parts that I have ever seen. Also, the spinner covering the crankshaft propeller retaining bolt defied every attempt to remove it. The reason for this shocking condition was the revelation that the engine, which had probably been brought back from Germany after the war by a returning serviceman, had spent the last 40 years in a flower pot! There must have been a goodly amount of earth in the pot too, since a fair proportion of this commodity was inside the engine! Only one blade of the propeller protruded from the flower pot, and this conjures up the picture of some elderly lady including what looked like an 'aluminium plant' in her forays with the watering can, doubtless wondering, over the years, why it did not sprout something! No suitable engine was available to secure the 'flower pot Kratmo', but a trade was eventually carried out via a third party when a Sky Chief was swapped for an ED Racer (first model) and the Kratmo obtained for the Racer.

It was necessary to cut through the propeller retaining bolt with a hacksaw in



Left: Flower Pot Kratmo (see text). This Kratmo 10B, serial No. 3998, after some 40 years of idleness was coaxed to run again by the writer. It swings that 14 inch diameter aluminium propeller at 5000 rpm (but watch your fingers). Right: One for the rubber enthusiasts. A look back to summer flying-field days: running repairs are being carried out by a contestant at the 1984 Warwick Wakefield Anniversary Competition.

order to dismantle the engine, which was surprisingly OK internally after the soil had been removed. Two new piston rings were fitted, brass tank de-coked and re-soldered, and after the removal of rust with a commercial cleaner, the engine was assembled again with new gaskets. It runs well despite the horticultural treatment it has received...thus another engine has been reprieved from an inglorious end, and who can tell what joy it might yet bring to those of our kind when fitted to a suitable spruce and plywood Benzinmotor-Flugmodell?

UK enthusiasts who wish to join this oily, fingered brigade should write to the Region 13 Director, Keith J Harris, 21 Burns Lane, Market Warsop, Mansfield, Notts. NG20 0PA with an SAE for full details of membership which costs \$16:00 (approx. £12.00) per year. Members receive six Swap-sheets during the year wherein members offer engines, hard to get parts, magazines, kits and other associated impedimenta for trade or sale at prices well below dealers asking prices for such items. Additionally MECA has a strict code of conduct that protects these dealings. See Vintage Corner September 1984 for a more detailed account of this enthusiastic band of helpful model 'grease monkeys'.

Model Engineer Exhibition

This keenly-looked-forward-to annual event will be held at the Wembley Conference Centre between 1st and 8th January 1987. A large stand has been allocated to SAM 35 so visitors will be able to examine members handiwork, as well as attending, *inter alia*, Reg Parham's lectures on the history of indoor models, examples of which will be demonstration flown in the auditorium. There are many other attractions, including trade stands. This is a treat that you cannot afford to miss.

MY ONE-EIGHTH-SCALE control line Pitts S25 was built for the Aero-modeller 'Dunlop Day' at Shuttleworth in 1982. It came top in static judging but bottom on flying, not only because it was under-powered but because the only test flight (the night before the event) had failed to reveal severe fuel feed problems. Subsequently, re-engining it with an Oliver Tiger plus a new fuel system turned it into a reliable, if unspectacular, performer which has flown at every Scale Day since, as well as at various other fly-for-fun events.

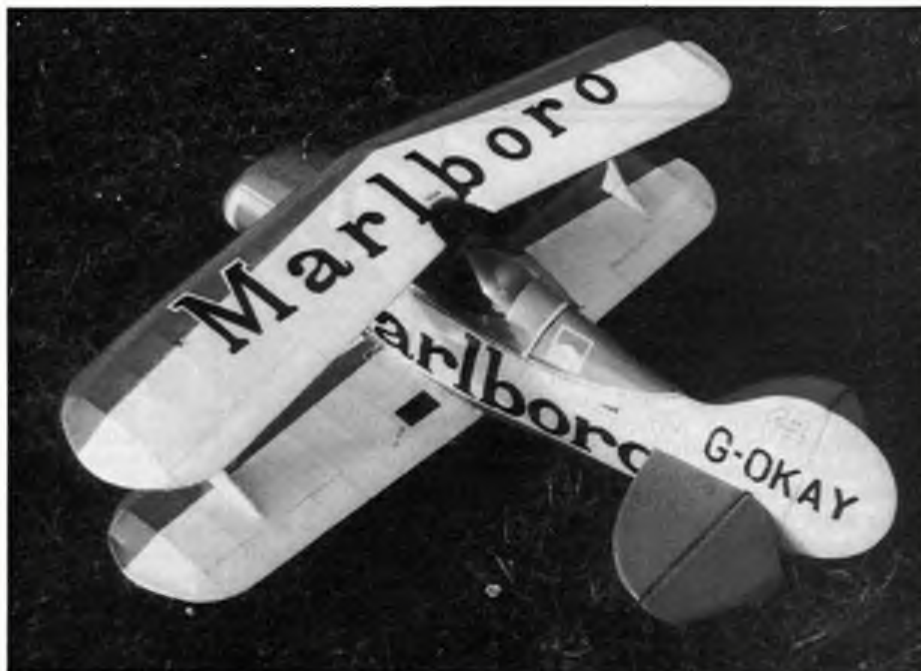
By the end of the 1985 flying season the Pitts was getting decidedly tatty. The engine cowlings, fabricated from beer can aluminium, were full of dents and wrinkles; regular noseover landings has produced stress cracks around the fin, and the undercarriage had never recovered from a loop which pulled out two inches too low.

With new models coming off the building board I could have retired G-BOOK, but it was an ideal plane for low-key participation in events like Scale Day - you just connect up the lines, fuel it, flick it and fly. It bombs round like a demented wasp in true Pitts fashion with tons of line tension, which is reassuring on windy flying days...so I decided to see if I could refurbish my Pitts.

Strip off!

First task was to remove the paint from the nylon covered wings and the balsa fuselage and tail (doped-on tissue being the finish used on these components). Working outwards there was: car spray primer; an overall coat of white car spray cellulose; and lettering and colour trim in Humbrol enamels, all protected with brushed-on Tufkote. As I had some Nitromors paint stripper in the house I decided to give this a try, starting with a wing on the basis that if something nasty happened I could always strip off the

Heading: Smart and fresh in its new colours, Roger's Pitts S2S is eager to circulate again. **Below left:** All you need to strip off - a can of Nitromors, white spirit to eliminate all traces of paint remover before repainting, and rubber gloves for protection. **Wing** is from a retired stunter; technique described in text is applicable to any model with a painted finish. **Right:** Applying the stripper.



PRETTIFIED Pitts

Off with the old and on with the new - Roger Ford tells us how he refurbished a favourite model

nylon and recover.

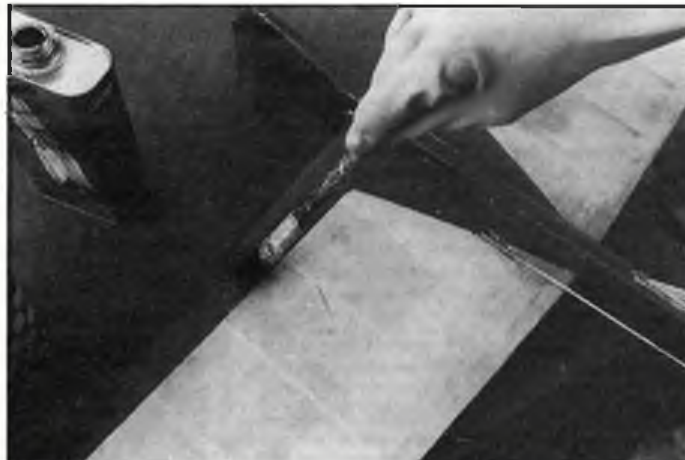
To my surprise, the Nitromors softened the paint while leaving the nylon taut and untouched. It worked equally well on the tissue finish. I removed the softened paint with wire wool - after putting on rubber gloves. Persistent patches of paint were encouraged by dipping the wire wool in Nitromors and rubbing the offending area. This rubbing produced a burnishing

effect so that all that was needed before priming was a light rub-down with fine wet-and-dry paper.

Chop up!

The hard part having turned out easier than expected, I turned to the undercart, which had been stitched to the 1/4in. ply

continued on opposite page



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Prettified Pitts: from opposite page

bulkhead with copper wire and Araldited into place. Removal involved untwisting each wire loop and chipping off the epoxy. This was a long fiddly job.

A new undercarriage was bent up from heavier gauge wire, but before bolting it to the bulkhead with commercial saddles I turned to the fuel system. The Mk 2 arrangement had incorporated a long thin tank which had to fit between the cylinder head and the bulkhead. The resulting small capacity restricted flight time, so the obvious solution was to fit the larger internal tank I should have installed in the first place. But how do you get into a planked fuselage without wrecking the finish? Study of the original plan showed the way in. The bottom of the fuselage between the lower wings could be cut away between two longerons to give access to an empty space beneath the bellcrank mounting. The only problem was designing a big tank that was the right shape to go through the small access hole. A series of dummies carved from block balsa resulted in the optimum shape, plus the acquired knack of wriggling it in, and the metal tank was soldered up from tinplate. To get the tank in, the filler vent had to be left off

*Left: The Pitts' rudder being rubbed with wire wool to remove the softened finish. The stripper has cut back to the tissue-on-balsa finish but has not affected it despite vigorous rubbing.
Right: Close up of repainting Pitts showing hand-lettered script decals, production of which is described in the article.*

and soldered in after installation. The job was completed by fitting the new undercarriage and letting in a new section of planking between the wings.

The final improvement was a new cowling. I planked this up from balsa, sanded it to shape and covered it with lightweight glass cloth and resin. For extra strength and fuel resistance I lined the inside with glass tissue and resin. Because the tissue seemed so flimsy I used three layers. This was a serious error. The cowling is now so strong that it was hard to fit and it is over-weight.

Paint on!

A new paint scheme completed the refit, transforming Dunlop Pitts G-BOOK into Marlboro Pitts G-OKAY. After an overall finish of white car spray cellulose, the red trim was masked-up and sprayed. For the black 'Marlboro' lettering and the registration number I used an acrylic produced for figure painters. Water is used for thinning and cleaning.

The lettering was scaled up on drawing paper and transferred to thin plastic card to produce templates. I find that this gives a sharper outline and a firmer edge for the pencil used to mark the outline of the lettering. To paint the lettering I used a fine brush (000) to draw in the outline. For the straight lines I use a guide made from a length of 3/32in. hard sheet glued to a smaller 1/2in. square block. The block rests on the wing or fuselage being lettered, keeping the straight edge clear. The outline may then be drawn with the handle

of the brush held firmly against the straight edge. The outlines are then filled in with a flat brush.

That completed the lettering except for the 'Pitts' logo on the fin. This is in script and I didn't fancy hand lettering straight onto the tail. The conventional way of producing home made transfers, or decals, is to coat the gummed side of a label with varnish and paint the lettering onto that. When applied to a pale surface, however, the varnish produces a discoloured film. Instead, I sprayed the gummed side of the label with the same primer and gloss coat used on the plane. Then I covered the surface with Pitts logos and cut out the best two. A dunk in warm water soaked off the paper label leaving the two white patches complete with logo. A light coat of sanding sealer on each side of the fin softened the finish so that when the patches were smoothed on they bonded to the surface, making a perfect match.

Reflection

Was it all worth the work? Definitely. Not only does G-OKAY look better than new, but the revised undercarriage has transformed the ground handling and the new tank, despite being half an inch below the venturi, gives longer flights and a more predictable end to the engine run. The groundsman at our flying field summed up the new-look Pitts when he saw it in the static park alongside some very smart control line stunt machines. He laughed and said 'It's that funny little red and white one I like best'. So do I!



Delightful informality...

BACK IN FEBRUARY last year I proposed in RCM&E the formation of a 'new' competition class for gliders; Pre-51 Vintage designs flown with radio control assistance. Of course, this sort of proposal is not a new phenomenon. Vintage power precedes it by several years. In fact, it was the success of the latter class that made me think that vintage gliders might be viable. However, beyond all this was a noticeable dissatisfaction with the way that present day soaring is going. On a personal level I still get a great thrill out of competition flying, but it does seem to be getting far too serious. Last summer saw several noted flyers turn their backs on competitive work and go into scale flying. When questioned they expressed the opinion that the atmosphere at a scale 'do' was much more pleasant because the day was not dominated by pot hunting. Personal experience would confirm this; probably the nicest day's flying I have had this year was at the Old Warden Vintage event, which was such a relaxed and pleasant day with so much to see.

The outcome of all this was the feeling that a low-pressure class for gliders was needed to cater for those who did not see winning as being all-important; a class where there was a certain element of competition to add sparkle to the day but which would not dominate it. A class where model performance was of interest but not paramount; in fact something that would give people a good excuse for getting out of the house and just plain enjoying themselves.

I feel that Vintage Gliders provide the ideal vehicle for such a class. Let's look at their characteristics. They can be built by traditional methods and can thus be kept inexpensive, they usually thermal well so their performance should be respectable, they are most suited to pleasant weather, make ideal trainers and have considerable charm. In addition there are an awful lot of models to choose from and this number is greatly extended by allowing the scaling up and down of designs. The older members of the modelling fraternity (I am

not one of them, I must say) should be well catered for by this class since they already have traditional building skills and the proposed style of flying should not be physically taxing.

The reason for my talking to you via *Aeromodeller* rather than from my usual soapbox in RCM&E may have crossed your mind so a few words of explanation may be helpful. I recently went into the offices of this renowned and august publisher to pick up some photos and get some information on Vintage Gliders. Whilst there I had a long chat with Geoff Clarke about this subject and was much encouraged by his enthusiasm for the idea. We both felt that the class might find greater favour with the sort of modeller who reads *Aeromodeller*, and that this might be a form of radio control activity that would be acceptable to the readership of this magazine - perhaps more so than my usual readers. Think so too? Let's move on to the rules. The aim here is to ensure that the model keeps within the spirit of the class, reflects the building skills of the modeller and is given plenty of opportunity to be flown.

Static scoring

Each model to be judged according to the following criteria:

Quality of Construction: up to 600 points maximum.

Quality of Finish: up to 600 points maximum.

Overall Effect, or 'feel': up to 600 points maximum.

Total Possible: 1800 points

Let's break that down. Construction should be basically the same as that used on the original design, with the following provisos. The use of spruce to beef up structures will be allowed as will small internal alterations to ensure airframe integrity. The discreet provision of hatches will be allowed so that the radio gear can be installed conveniently. Any alterations to provide control surfaces must not change the profile of the model. In other words, the model must look as like

the original as possible but it can be modified to make it a viable and safe radio control model.

'Finish' is probably more difficult to quantify. Obviously a true vintage finish is to be preferred but if the covering looks authentic then it should not necessarily be penalised for being, say, Solartex rather than traditional nylon and dope. The use of Solarfilm for this application requires no comment.

'Overall Effect' should perhaps be explained; some models are just 'right' irrespective of their construction and finish. The whole thing is entirely subjective of course but somehow they have character, a certain spirit. Perhaps it's because of the choice of colour scheme or respect for the flair of the builder. It could well be the result of a childhood association with a F/F version; just a plain liking for a design - or even pure nostalgia. Whatever it is, it is worth a third of the static points.

How these points are given is another matter. You could use three knowledgeable judges or you could let the competitors judge all the models other than their own.

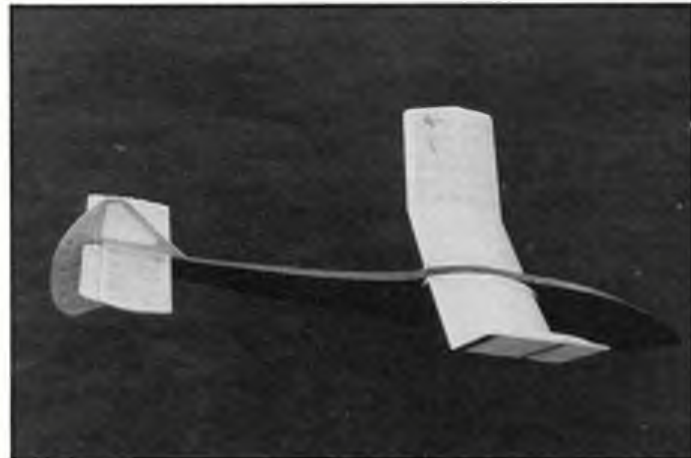
Building rules

The model may be increased or decreased in size, but this must be done in proportion to the original.

The original aerofoil must be used.

Allowing size changes permits a far greater pool of potential designs to be

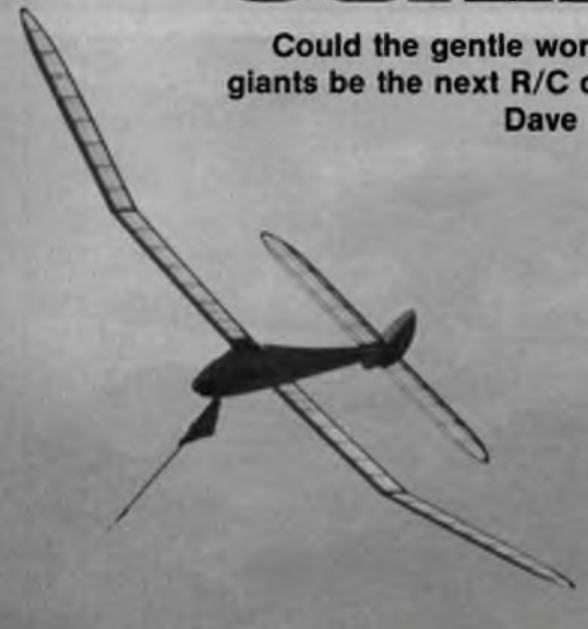
Heading: An enlarged Lulu leads a Thermalist into the blue. Below: Candidates for low-key competition? From left to right: Stan Bucknole's enlarged and slightly modified Snark is post-Vintage but very much in the spirit of things; the 72in. Lulu at point of touchdown (watch that vulnerable lower fin!); and the author's Sunspot, crisply finished in black and yellow Solartex. These large soarers are magnificent in flight. Don't be intimidated by their size and bulk; they're straightforward to build and docile to handle (most of them are straightforward to build, anyway!). Who else is flying this type of glider? We know one or two such craft have been seen at Chobham, though one or two may not have been equipped with R/C...





VINTAGE SOARERS

Could the gentle world of these pre '51 giants be the next R/C competition class?
Dave Jones thinks so...



available, and keeping the same aerofoil ensures that the performance should remain in character.

Flight scoring

The aim here is to allow a free-and-easy atmosphere devoid of high pressure.

Competition Flights: The best three flights of the day to be notified to the score keeper; any number of flights to be allowed.

Flight Duration: Maximum time per flight to be 10 minutes, i.e. 600 seconds. Each second to count as one point: 1800 max.

Overflying: To be allowed, but the competitor must land as soon as possible once the time task is completed if the frequency is needed for another flyer.

Landings: To be within the boundary of the field; no landing spot to be used.

Launching: To be by any convenient method but launches greatly in excess of 150 metres to be discouraged by the organisers if the launch apparatus is not freely available to all competitors.

The hoped-for effect of these very loose rules is to promote a 'fly-in' atmosphere with a little light competition. There should be a balance between flying and building.

In addition to the above rules BARCS have agreed to run a Vintage League along the lines of the Tailless League. Here the models are flown as a separate entry in Open class competitions, the score being irrelevant to the actual competition on the day but to go forward for a National league, results of which will be collated at the end of the year. The advantage here is the chance to get more flying into the day, to be able to pick your weather and to have fun upsetting the other flyers with their modern machines.

Experiences

The Sunspot at 10 foot span is a large, conventional lightweight; the one in the photograph is my personal property, and it has proved to be the most docile model that I have ever flown. At the moment it is in the workshop being repaired after an incident with a faulty line tensioner on a power winch, so it is hard to say how good it will finally be. The CG seems to be too far forward despite being in a 'standard position'; the huge tailplane seems to demand a more rearward location. The performance, reasonable to start with, was getting better with each flying session before the prang. It penetrates quite well and is flyable in a 10 mph blow; beyond that it is struggling a bit.

The 11 foot Thermalist is another large conventional lightweight. I have come across a couple of these, and towed them both (a simple task). Eric Humphreys' model is eleven years old and has been used for aerial photography from the slopes in Yorkshire. Mike O'Neill's model was built recently. In its first fly-in it

...a new class for '87

achieved a comfortable eleven minutes during the afternoon. Thermalists are very stately in the air and have a definite 'presence'. Penetration is on a par with the Sunspot, performance being roughly equivalent. Mike gave me the opportunity of flying his model and I discovered that it is very gentle on the rudder but quite sensitive to the elevator, due to a rearward C.G. However, given a responsive hand on the sticks it was simple to fly. Mike did say that he got a lot of pleasure out of flying the model and that it was very relaxing, a couple of hours on the slope easily being achieved without much fatigue.

Lulu, 72 inch span. An interesting one this since it is an enlargement from the original model of 50 inches span. It is very reminiscent of the type of model currently being used for training but it flies somewhat better than such models; indeed it could be compared very favourably with a Gentle Lady. On its first flight it exceeded ten minutes and showed no noticeable vices. With any luck it should be featured as a plan in this magazine very shortly.

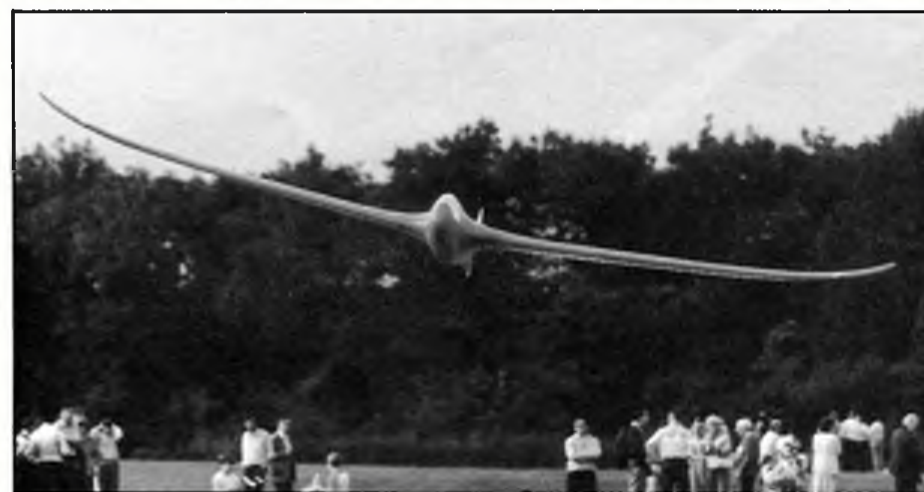
Fillon's Champ; 111 inch span French lightweight. This one really is a superb machine and for me, and quite a few other enthusiasts, it stole the show at the Old Warden Vintage meeting. In terms of performance it could give a good open model a shock on a calmish sort of day, its ability to ride out a weak thermal being matched in my experience only by a 139in. span Sunshine. It has a similar penetration speed to the Sunspot and the design created to challenge it, the Thermalist. Building is rather more difficult with this design than the others, but the result is very pleasant indeed.

The Snark (non Vintage). This one is stretched by 50% and has had the wingspan increased by a couple of bays. It flies very nicely but does not qualify as a vintage model, but perhaps there is a case here for a Vintage Style class if the popularity of these old models demands it.

Any class needs events and to this end the Clent Soaring Association will run a fly-in around about the late August/early September period. If your club decides to run such an event let me know so that I can publicise it.

(Enjoyment of these elegant designs via low-key competition sounds just great to us - so much so that we intend to get in on the act by promoting an event or two during 1987. Dates and venues yet to be finalised but we'll allow plenty of time for you to build that pukka ten-footer! Talking of which... we hope to publish drawings of eligible craft, including some overseas candidates, in the near future. News from enthusiasts with such models would be most welcome, so out with those cameras please! GC).

Top: Eric Humphreys with his eleven-year-old Thermalist at Old Warden. Centre and right: A most evocative sight for many at Vintage Weekend was the Gallic elegance of this Fillon Champ, built by Ron Hill and flown by Rod Holmes. Each design shown here is in the Aeromodeller Plans Service; spend £1.25 on Handbook No. 1 and hunt around for the treasures! Cheap and cheerful two-function radio gear is all you need to get amongst the thermals...



Alec Green reveals some intricacies of flight that may have escaped your attention

C.U. Tremble (loftily): Of course, Aeromodelling is only an approximate Science.

H.B. McGillicuddy: Weel, weel! And there was I thinking it was an exact Art. (Recently-discovered fragment)

IT IS A MATTER of concern amongst the learned that present-day aeromodellers find themselves under a disadvantage when some delightful old design turns up and they are hampered by the fact that the position of the Centre of Gravity is indicated somewhat nonchalantly, or not at all. Recently the text accompanying the re-introduction of the Buzz-Bat referred to this defect as a complication, and similar dismay was expressed when that lovely tandem-wing tailless biplane, the Alkie II, made its welcome re-appearance. Now this betrays an entirely wrong attitude, for whilst the average chap may not be equal to calculating the dreaded Posthumous Undercarriage Backward Shift without help, everyone should be able to ascertain the position of the C of G from old plans by himself.

This basic essential may be defined as that point in a body from which all parts weigh pretty much the same. Naturally it varies - Jane Russell's C of G would differ quite a lot from Alfred Hitchcock's, although both could easily be made to fly by anyone who can trim an Alkie II. It is arrived at for vintage bodies by the simple formula given at the foot of the page.

For vintage models it is even easier - the C of G lies on a vertical line passing through a point one-third of the way back from the leading edge of the wing, plus or minus 'b', which is the factor you bung on or take off just to be on the safe side. For pylon jobs with lifting-section tailplanes you usually want a bit more 'b'.

There are four, and only four, elements acting on model aircraft. These are Drag, Thrust, Weight and Lift, and we aerodynamicists usually express them graphically by what we call a Force Diagram. Torque, incidentally, does not affect models, either because they are gliders, or because you very sensibly apply some downthrust and counteract it.

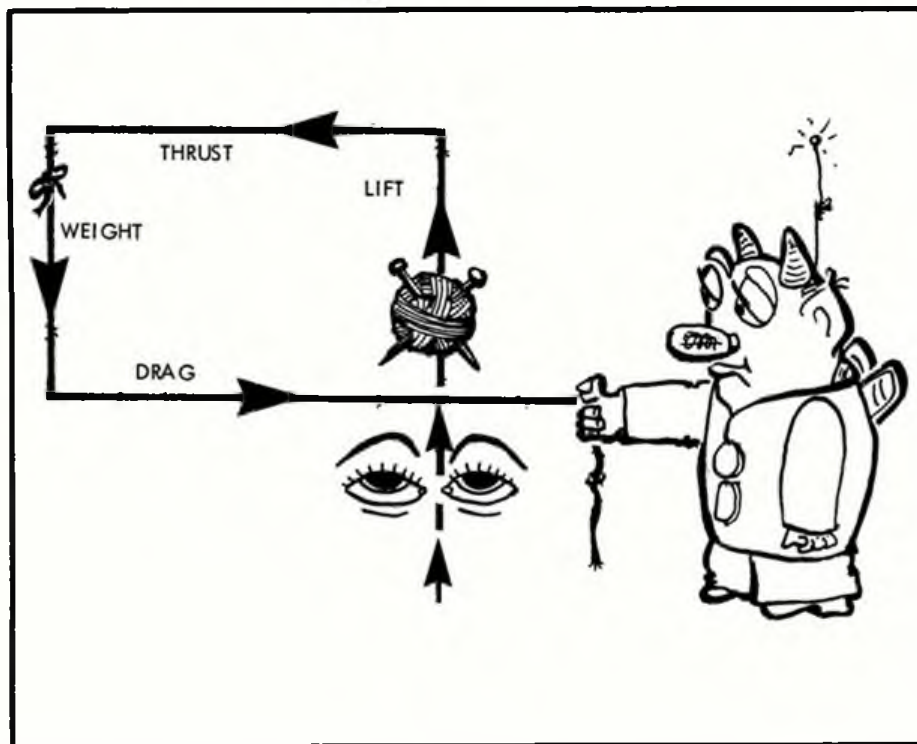
Drag Many older jobs have a fairly high Drag factor as an inescapable product of the design. As you can't change this, and it makes the model fly agreeably slowly, you shouldn't worry about it.

Thrust Gliders always make up their own minds about Thrust, or forward speed in their case, and with other efforts you know what to do already - just pile on more or fewer turns, or open or close the tap a bit as appropriate. You shouldn't worry about Thrust either.

Weight The Weight of any model is readily found by adding 25% to the figure you are sure it will not exceed.

Lift Take away the foregoing and you are left with Lift, that most delicious ingredient in the whole magic of Flight which transforms your model into the

Neglected Aspects of Aerodynamics



successful anti-gravity device. If you've got enough Lift, you can fly, and all these old jobs have got enough Lift. There is certainly no need for any calculations.

Mind you, calculations are not to be sneezed at. Calculations indicated that the Lancaster should have twin fins and rudders, plus a central fin with an area roughly equal to that of Hyde Park, and it was in this configuration that the prototype, BT 308, flew. Unfortunately, some idiot omitted the central fin from all production aircraft, and everybody knows the Lancaster was no good after that.

As for the rest: well, you don't want to get too involved at this stage, but you'd better have a bit of background. They will tell you that aerodynamics was invented as an excuse for the Barracuda, but its origins go back to long before the war. Aerodynamics would never have seen the light of day had not the famous French bomber builder Gabriel Voisin (1880-1973) occasionally taken time off from pursuing his designs on ladies to pursue designs for aeroplanes. As a guest speaker he once arrived at the British Aircraft Research Monitoring Institute looking as though he had slept on the boat-train in his day clothes, and when he had been shown to his room the Director

told two chambermaids to go and smarten him up before his official appearance. One armed with the big steaming-iron, one carrying the charcoal, they knocked at this door, stated their errand and were admitted.

«Ah!» said Voisin, «Ow I weesh I 'ad, like your Directeur, ze trouser well-presented.»

«Don't worry, Sir», said one of the girls, «He's sent us to press yours.»

A silent explosion took place inside Voisin's head. Slowly he lifted his eyes to her face.

«Centeurs de Pressures?» he repeated wonderingly, «Why! Zat ees ze vairy theeng I need to complete mon theory zat I, moi, and not ze Frères Wright, invented ze aeroplane.» History does not record how Voisin rewarded the maids, but it is known he returned to France that night, trousers still in a state, and plunged into writing his impudently Gallic autobiography in which, having the foresight to outlive all his contemporaries, he said precisely what he liked about them. And everything he didn't like as well. By the time this masterpiece appeared, the Wright Brothers were

Continued on p.55

$$\text{CG position} = \frac{\text{Age of body}}{\text{Weight last birthday}} \times \frac{\text{Height of top strand of barbed wire}}{\text{Inside leg measurement} \times \text{Value of trousers}} \times V$$

where V = speed of model disappearing downward

FREE FLIGHT SCENE

Dave Hipperson looks at home meetings, collates results and thinks back to the European Champs

SMAE Southern Area Gala: Odiham, 21st September

Very much a mixture of good and bad news this year. The warm, sunny and relatively calm weather stayed true to forecast which meant that plenty of people attended and were prepared to fly. What they were not prepared for was the news that no one was allowed to drive on the aerodrome! Cars were ushered into a roped-off area in the downwind corner. The majority were very disgruntled with this arrangement and with the thought of the long upwind hike with all the modern-day paraphernalia. Indeed, most saw it more as a convenient restriction imposed by the organisers than a directive from the RAF on high. The slackening and eventual total withdrawal of the restriction towards the end of the day certainly suggested that this was the case. Most unsatisfactory for the second-largest SMAE event of the year; and hardly a way of encouraging participation next year, particularly if the weather is doubtful...

Fortunately the actual sharp end of the contest under the control of Mike Howick almost made up for this silliness. He was particularly communicative around flyoff time, the organisation of these vital periods being very precise. This was particularly important at this meeting because with the entire entry grouped tight on an upwind grassy corner of the drome, and with never more than a 10mph drift, thermal picking in the form of mass piggy-backing was the procedure to adopt. With a little patience and an on-trim model no one need have dropped a flight all day!

Non-SMAE events run by SAM 35 for

pre-51 Wakefields and pre-51 lightweight rubber models of 34in maximum span attracted strong interest; numbers and quality were high. Chris Strachan topped Wakefield with his very high-climbing Yankee IV and then added to this a full house in Lightweight and Open Rubber. A flyoff was needed to decide whether he or Ian Davitt would hold the Lightweight trophy; and Chris' Scream was up against it, for on the day Davitt had the definitive Senator. Claimed to have flown straight off the board it is an extraordinary model; perfectly authentic, and not exceptionally light - it weighs 60 grams empty - the pattern was perfect all day and he walked away with the flyoff. I have never seen a small freewheeler model glide like it, nor climb so smoothly. This was certainly a case of the best model winning but it must be said that Davitt was on form all day. He too qualified for the Open Rubber flyoff and also made the Coupe d'Hiver final - that's a lot of maxes and three flyoff flights! No wonder he could hardly stand at the end of it.

Vintage (of all events) had been flown in rounds, which is a little odd when you consider that SAM 35 like to accentuate the casual and relaxed side of their flying rather than to over formalise it. What was more, full-size helicopter interruptions played havoc with their schedule which constantly had to be re-jigged. Thankfully these activities had quietened down by flyoff time when finals for the main SMAE events got under way.

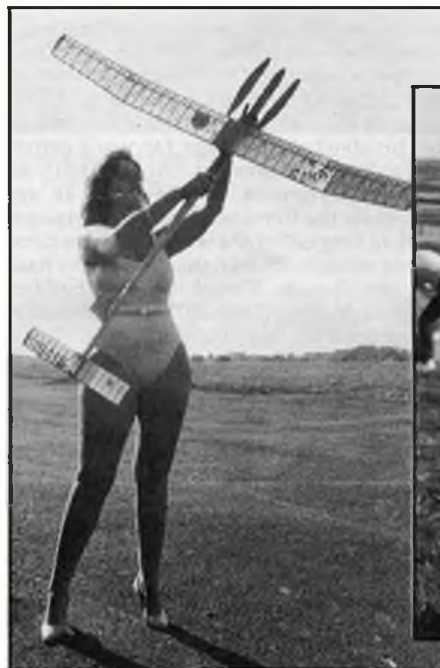
Coupe d'Hiver and Open Glider were off first. There was plenty of lift about as it



was just after 5pm. Cuthbert zoomed away early in obvious lift and it was this patch that Sharp and Davitt chose with their Coupes. Both made good climbs and excellent glides. Cuthbert's flight went on to win the Pilcher Cup but it was 1986's undisputed Coupe master Mike Chilton who topped CDH with a very early launch in a thermal picked by his instruments on the ground. Performances in 1/2A had suffered a bit - the class not lending itself so well to tactical thermal picking. Realising scores were on the low side last year's winner Andy Crisp made a challenge in the last half an hour; three maxes, then two more both with over-runs! At least he had the consolation of having already won HLG.

The Open Power and A/1 flyoffs were next. Lift was fading so Colin Sharman did well to clear 3½ minutes, sufficient to take the Ripmax Trophy for A/1. In Power, the other four qualifiers had to watch Screen launch very early and reach great

Southern Gala pics. Heading: Jeff Smith Prepares in Open Power. Below, from left: Ian Davitt collected this handsome trophy after winning Lightweight Vintage; Sue Hipperson with Dave's current F1B; Laura Strachan holds Dad's Scream; Trevor Payne waits in Open Power; Pete Jellis and Ray Elliot with their Coupes.



Aeromodeller



altitude. Hopper and Smith, the latter with a very short run, followed in the same air but were substantially lower. Julian's flight was good enough for 2nd place, but this was a bit of a blow as he had an unblemished record so far this year having flown only in the White Cup, the Sir John Shelley, two classes in the Scottish Nationals and the Hamley Trophy - and had won them all. His power design will be appearing in this column shortly.

Quite rightly the final event of the day was Open Rubber which was run off a little after 6pm and involved more than three-quarters of the complete entry. Not much daylight was left for retrieving as many found to their cost, but at least drift and thermal activity were at a minimum. Early launches contacted good air and both Norman Marcus and Anthony Ball made flights of well over eight minutes. Those that followed too soon were not so lucky but right at the end of the period the drift dropped away again and the air warmed a little in time for Hipperson's flight. The model got high and glided well, but not quite well enough this year, leaving Anthony Ball with his first-ever Senior SMAE win, pushing his famous Dad out of the top three. Anthony really did seem to have his model sorted out; all day it had been most impressive. This win just couldn't have been more popular with everyone - even me!

SMAE Southern Area Gala: RAF Odiham, 21st September.

A/1 Ripmax Trophy (19 flew, 8 in flyoff)

1 C. Sharman	10.00 + 3.31
2 K. Smith	10.00 + 3.06
3 C. Parry	10.00 + 1.12

Coupe d'Hiver No Trophy (17 flew, 7 in flyoff)

1 M. Chilton	10.00 + 3.46
2 I. Davitt	10.00 + 3.25
3 G. Sharp	10.00 + 3.24

1/2A Power Quickstart Trophy (8 flew)

1 P. Watson	9.54
2 P. Harris	9.39
3 D. Pepperell	9.27 + 2.37
4 T. Payne	9.27 + 2.10

HLG No trophy

1 A. Crisp	7.15
2 P. Ball	7.08
3 J. Hopper	6.29

Open Glider Pitcher Cup (42 flew, 17 in flyoff)

1 J. Cuthbert	9.00 + 6.13
2 W. College	9.00 + 5.14
3 J. Foster	9.00 + 4.69

Open Rubber Flight Cup (27 flew, 19 in flyoff)

1 A. Ball	9.00 + 8.42
2 D. Hipperson	9.00 + 8.38
3 N. Marcus	9.00 + 8.29

Open Power Short Cup (11 flew, 5 in flyoff)

1 S. Screen	9.00 + 8.28
2 J. Hopper	9.00 + 5.47
3 R. Peers	9.00 + 5.23

Unofficial Vintage Events (SAM 35)

Lightweight: (34in max span, freewheelers or folders)

1 I. Davitt	9.00 + 3.46 Senator
2 C. Strachan	9.00 + 2.43 Scram
3 M. Kemp	8.17 Senator

Vintage Wakefield

1 C. Strachan	9.00 Yankee IV
2 A. Wells	8.27 Voodoo
3 P. Michel	8.17 Lanzo

Tynemouth Rally: Albermarle Barracks, 27th July

Typical Northern England weather deterred all but the brave. It was cloudy and cool; and a blustery 30mph wind took long flights an enormous distance. Russell Peers had one such for his last max, a six-minute-plus effort. This wrapped up power for him, and as luck would have it he not

only found his model but during the search picked up Peter Gaunt's F1B which had been lost early in the day on its first Open Rubber max. This find allowed Peter to continue in Rubber and push our reporter Ian Davitt to a flyoff. Actually Ian had already acquitted himself very well in Mini with a very high score (considering the wind), but he was toppled by John O'Donnell flying an A/1. What would have been a tie, if actual durations had counted, was broken by the K factor.

John Carter's perfect score in Glider, made with his usual straight towing A/2, left what opposition there was very much behind. He was less successful in Rubber; turbulence caused a pile-in at the beginning of the day.

The one flyoff - for Open Rubber and involving just the two main contenders - was held during a very cold, blustery spell. Gaunt, who had been picking the air beautifully with his exceptional windy-weather Wakefield, suffered the ignominy of a wrongly-set VIT timer to come in under power, but with minimum damage. He declined the re-fly when Davitt, who was being particularly careful (remembering when he won Open Rubber at the Nats with a flyoff time equivalent to Gaunt's) launched in good air.

Thanks are due to Tony Brown and the other Tynemouth members for organising the day, and Ian Davitt for his report.

Tynemouth Rally: Albermarle Barracks, 27th July.

F1A Glider	
1 J. Carter	12.30
2 D. Hambley	4.10

Open Rubber	
1 I. Davitt	7.30 + 4.11
2 P. Gaunt	7.30 + 0.08

Open Power	
1 R. Peers	7.30
2 C. Plant	7.27

Vintage	
1 J. O'Donnell	2.30

Mini (Combined with 1.1 K factor)	
1 J. O'Donnell	9.50 (A/1)
2 I. Davitt	9.39 (CDH)

HLG	
1 A. Jack	261 Secs
2 R. Pollard	195 Secs
3 A. Brown	170 Secs



This page: Two enthusiasts who have featured in the results at the end of the season, seen earlier in the year at the Nationals...Right, John Cuthbert with patchwork-finished A/2 (John O'Donnell photo). Below: Calum Sabey prepares with some help from Dad. Opposite page: Happy after European Champs F1A flyoff is Gary Madelin, highest British contestant in seventh place.



Scottish Nationals Newbiggin, 16th and 17th August.

Open Glider

1 D. Hern	7:02 + 1:54
2 J. Cuthbert	7:02 + 1:47

Open Rubber

1 J. Arnott	7:30 + 6:28
3 H. Wilkinson	7:30 + 6:19

Open Power

1 J. Hopper	7:30 + 6:54
2 C. Plant	7:30 + 4:51

Combined Mini

1 J. Cuthbert	10:00
2 G. Ferer	9:40

Vintage

1 R. Peers	7:30 + 4:25
2 G. Blair	7:30 + 1:32

F1A (Five flights, 2:20 max)

1 J. Hopper	8:41
2 D. Hambley	8:01

F1B (Five flights, 2:20 max)

1 B. Martin	9:20
2 R. Peers	9:19

F1C (Five flights, 2:20 max)

1 G. Blair	7:32
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Junior

1 C. Sabey	6:51
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5th Area Centralised Results: 7th September

A/1 No trophy (26 flew)

1 A. Cordes	Birmingham	10:00 + 1:09
2 J. Cooper	Biggles	10:00
3 E. Drew	Bristol & West	9:57

F1B Gutteridge Trophy (25 flew)

1 T. Dilks	Falcons	12:30 + 4:01
2 N. Lee	East Grinstead	12:30 + 3:16
3 M. Howick	East Grinstead	12:30 + 1:37

Open Power Individual No trophy (38 flew)

1 P. Watson	Birmingham	7:30 + 5:26
2 D. Wain	Bristol & West	7:30 + 3:50
3 G. Fuller	Bristol & West	7:30 + 3:32

Team Power for Model Engineer Trophy

Anglia	(Wells, Collins, Bond)	22:12
Birmingham	(Watson, Monks, Harris)	21:30
Bristol & West	(Wain, Fuller, Buskell)	21:30

Plugge Cup positions after 5 events

Bristol & West	1112 points
Anglia	1062
Birmingham	1050
Biggles	905
Vikings	608

Northern Gala: Drifffield, 14th September

Open Glider CMA Cup (19 flew: 6 in flyoff)

1 J. Cuthbert	Grantham	7:30 + 3:39
2 A. Cordes	Birmingham	7:30 + 3:15
3 B. Nicholson	Liverpool	7:30 + 2:27

Open Rubber Caton Trophy (22 flew: 16 in flyoff)

1 L. Auckland	North Yorks	7:30 + 11:39
2 T. Chambers	Darlington	7:30 + 10:04
3 J. Anderson	North Yorks	7:30 + 9:07

Open Power Hamley Trophy (12 flew: 7 in flyoff)

1 J. Hopper	Stanstead	7:30 + 13:14
2 R. Peers	Falcons	7:30 + 10:12
3 P. Watson	Birmingham	7:30 + 9:39

Combined Mini non SMAE event (13 flew: 3 in flyoff)

1 G. Beal	North Yorks	10:00 + 2:34
2 I. Davitt	Morley	10:00 + 2:24
3 J. Cuthbert	Grantham	10:00 + 2:03

Falcons League:

(points up to Scottish Nats)	
1 Russell Peers	62 Points
2 Phil Ball	48 Points
3 John O'Donnell	42 Points
4 John Carter	38 Points
5 Chris Strachan	26 Points

SMAE Senior Champs:

(Points after 4th Area)	
1 Phil Ball	51 Points
2 Russell Peers	44 Points
3 Stafford Screen	33 points
4 John Carter	31 Points
= John Cooper	31 Points
= Pete Harris	31 Points

London Three Day Gala: Salisbury Plain DZ9, 23rd to 25th August Results

A/1 (11 flew)

1 T. Dilks	10:00 + 1:49
2 J. Cuthbert	10:00 + 1:37
3 C. Sharman	9:53

1/2A Power (10 flew)

1 P. Watson	10:00 + 3:00
2 R. Peers	10:00 + 2:44
3 J. Foster	10:00 + 2:09

F1A (14 flew)

1 D. Truluck	19:28
2 J. Cuthbert	18:52
3 P. Stewart	18:34

F1C (10 flew)

1 S. Screen	21:00 + 4:00 + 6:16
2 R. Monks	21:00 + 4:00 + 4:32
3 J. Bailey	20:32

Club Champs

Open Glider (5 flew)

1 W. Colledge	Birmingham	5:46
2 J. Carter	Falcons	4:36
3 R. Staines	Grantham	3:36

Open Rubber (7 flew)

1 P. Ball	Grantham	7:30 + 1:52
2 J. Carter	Falcons	7:30 + 0:45
3 A. Cliff	Biggles	7:22

Open Power (3 flew)

1 R. Peers	Falcons	7:03
2 P. Watson	Birmingham	5:00
3 R. Moore	Biggles	0:22

Club Champions

Falcons	175 points.
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C. d'H (15 flew)

1 G. Ferer	10:00 + 2:30
2 R. Monks	10:00 + 2:20
3 A. Moorehouse	10:00 + 1:59

HLG (9 flew)

1 P. Ball	8:34
2 P. Bayram	6:30
3 I. Rawlings	6:11

F1B (12 flew)

1 R. Peers	21:00
2 M. Howick	19:38
3 M. Richardson	18:08

Slow Open Power (6 flew)

1 P. Ball	9:00 + 3:38
2 K. Woods	9:00 + 2:52
3 A. Moorehouse	8:50

MORE RESULTS!

Reflection on the European Championships

My report on this appeared in the last issue of *Aeromodeller*. British Team members are obliged by the SMAE to make their own reports to Council. I did this enthusiastically after the World Champs last year at Livno and found it an excellent way of localising problems and polarising my ideas for improvements. In short, it probably benefitted me more than the recipients, particularly as there don't seem to have been many (not fliers, anyway). Rather sadly, such data disappears into the bowels of the SMAE rather than being published in a form that could be digested by future team members; so I thought it might be interesting and useful if I laid out a few of my thoughts here.

In its present form Free Flight is not, and never will be a Team game. Individual attainment and effort will always cut across team aims. After all, each member has got to beat the other two in his class before he can win anything! It thus stands to reason that anyone elected to manage such a potentially volatile group has got his hands full. Martin Dilly handled his difficult duties with the utmost diplomacy, even on the field where the task is most difficult. As the group travel courier he was exemplary in steering the fragile boxes safely into and out of the country. Future team members can have faith in him.

The greatest differences between conditions at these Southern European venues and here in the UK are the temperature - there's a lot more of it, and the humidity - there's a lot less of that. It's generally calmer and the weather patterns, when they do change, alter much more gradually but the low humidity and high temperatures make for very different lift generation. At Livno for the past two years, although it was approaching 100°F at its hottest the air at ground level was a little moist in the mornings. This gave a dew thermal period - we have that in the UK - followed by a dead patch before the ground dried out enough and the full-blown lift started. In Pitesti it was drier but at least ten degrees cooler, and the dew thermal period didn't occur. The first rounds were tough but the lift began more gently without a sudden dead period. In both locations the thermals never took the form of rising columns of accelerating air but instead were rising bubbles or 'doughnuts'. In Pitesti the lift would take a long time to break away after the temperature had started to rise - fifteen or twenty minutes sometimes! When it did break away the fill-in would be most marked and then it was nearly too late to catch as it would be rising above us very rapidly. Power models could climb and catch it. With constant circle towing gliders could feel it on the line and rubber models needed a very fast initial climb and as long a motor run as possible. I think all three of the UK F1B fliers had models that could do this. Our lift picking was far better than it



had been at Livno the previous year.

At meetings such as these, where teams are able to organise retrievers, it is most desirable to have models that are distinctively marked and highly visible. A model that appears really smart on the ground and is brightly coloured when flown under our overcast skies or in front of trees and fields takes on a very different appearance when attempts are made to spot it from a mile downwind or pick it out of a bunch of circling models hundreds of feet overhead with nothing but bright blue sky as the background. As for natural-coloured power models, they simply vanish from the sight of retrievers at that critical moment when they go edge-on and are farthest away - at the top of the climb. Mike Fantham's and Stafford Screen's use of very bold stripes under the wing tips were a great help. Some distinctive, bold dark undersurface pattern is essential for these contests. Remember that before you cover your next FAI model.

It was rather encouraging to see that thermal detecting devices in the form of thermistor set-ups were almost superfluous. Perhaps few would admit this yet but I believe most people had them to watch - or in Arno Hacken's case to listen to - whilst they waited for some thermalling models to fly under. Mylar streamers were a good guide to where the lift was breaking away and as drift was usually slight in the warm build-up periods there was plenty of time in which to occupy yourself. Patience is the best piece of equipment you can take with you or take a good book to read while you wait for the lift. Most people blew it by being too hasty; few by being too cautious.

I cannot stress too hard that for those who genuinely want to become competitive at European and World level

there is no substitute for practice in European conditions. I don't just mean weather conditions, either - that's really only part of it. Championship and major International meetings are run to a hard, tight schedule; seven flights between morning and early afternoon and then flyoffs commencing immediately. You know how often you are hanging about in a domestic FAI event - it gets to midday and you have perhaps made only one flight. None of this at a Champs. It's breakneck pace. Towards the end of the F1B day at Pitesti I heard someone ask our Team Manager what round it was. He frowned and said 'Don't know - we just keep at it until they tell us to stop.' It really is like that.

This might seem rather like hard work but as long as it's not too windy, or if you have good retrievers out in the field, it's actually beneficial. A rhythm develops which helps concentration to be ever active with no pauses either to come off the boil if things are going well or get depressed if they are not. There is none of this pussy-footing around with the timetable, either. If you can't get your model back in time then you fly a reserve - after all you are allowed four and there are only seven flights. We are too easy on ourselves over here. It's no earthly use making all UK FAI events 'seven flight' or even all UK events 'FAI' - it isn't going to help one bit. Get the models sorted out over here, certainly; but for practice get onto the European circuit and work at it in the heat and dust. That's the way to win the World Champs - but whatever you do, never listen to anyone who tells you that the tap water is safe to drink!

SCALE MATTERS

Bill Dennis looks at a variety of topics aimed at helping you to produce a winning masterpiece

Documentation

Now that the building season is upon us, many will be embarking on their latest project intended for competition next year, with the SMAE Indoor and Outdoor Nationals being the main events; and I feel I ought to stress yet again the importance of good documentation. Over the years that I have been involved with scale judging, from indoor down to R/C, it has always amazed me that so many excellent models are accompanied by the most appalling documentation - so much so that one often wonders how the model was built in the first place.

Of course, the non-contest modeller can please himself about how much authenticity he wants, but if you are going to spend many weeks or months on a model designed expressly for competition, then why be a loser before you even start? Harsh words perhaps, but true.

The first thing to realise is that scale contests are unlike most other aeromodelling activities in that your score depends entirely on the opinion of judges, and as such, it is to your advantage to give them all the information they need (and no more) in a form that will enable them to get through their task as easily and quickly as possible. In short, to get them on your side.

Each member of the SMAE is entitled to a free copy of the scale rulebook, wherein you will find the minimum documentation

requirements to be eligible for scale judging. In essence, you need (a) three photographs, including one of the actual aircraft you are modelling; (b) a three view drawing and (c) evidence of the colouring of the actual aircraft, either by colour photograph, printed representation (e.g. Profile) or a written description. Note that these are minimum requirements; by all means give more if the additional material helps, but not if it is just duplication - you are not entering the World Championships, and the judges will want to spend no more than 20 minutes on each model. Let's deal with each section in turn.

(a) *Three photographs.* This does not mean one photograph of a squadron lineup all from the same angle, or one of the whole aircraft plus one of the cockpit and one of a wheel. All three should be of the entire aircraft, taken from a variety of angles. Ideally there will be side, front and plan views, plus a couple of three-quarter views, front and rear, accompanied by two or three detail shots of the engine, cockpit and so on. Remember that the judges place more reliance on the photos than the 3-view since the camera rarely lies.

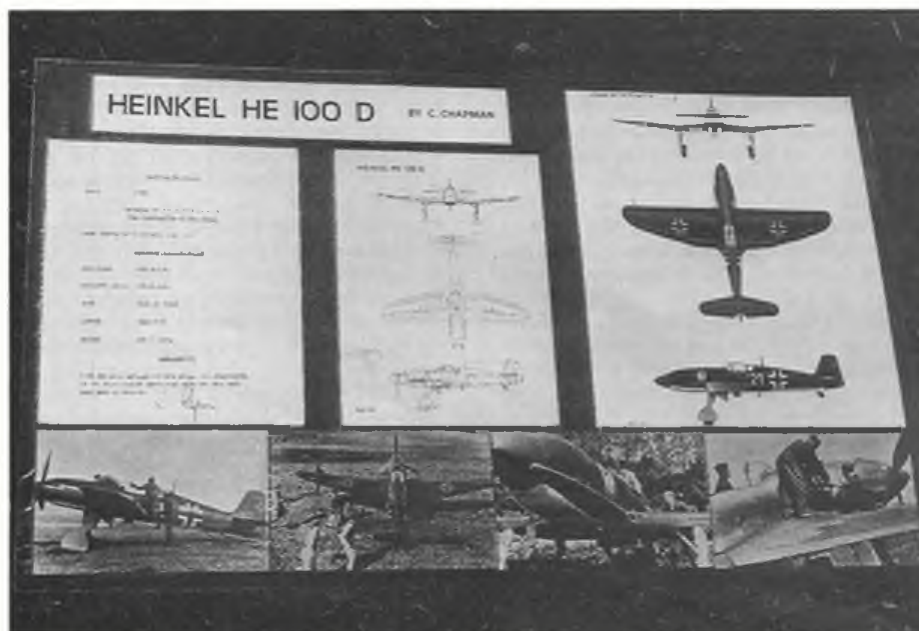
The photograph of your actual subject must show clearly the markings peculiar to that aircraft; registration number, for example. If other markings such as roundels are not visible, then the missing information



should be given in the next section.

(b) *Three view drawings.* There is no such thing as a totally accurate drawing; some are very nearly perfect while others clearly contravene the Trades Description Act. The most common error seen at the judging table is where a model has been designed with a slavish adherence to a drawing, when even a cursory glance at photographs would have revealed glaring errors in it.

While you have been drawing your plan or checking a published design (see *Aeromodeller*, August '83) you will have noted points of error on the 3-view. If these are relatively minor, or few in number, then you should draw attention clearly to these areas where you have intentionally deviated from the drawing and followed photographic evidence. However, when it gets to the stage where the drawing would be covered in red ink it is better to modify the actual 3-view and send it to the Chairman of the Scale Technical Committee for approval.



Heading: Chris Chapman's magnificent 'twice-Flyline-kilt-size' Heinkel He100 was seen at the Nats. The excellent documentation board for this subject, commented upon favourably in the text, is seen at left. Large rubber scale craft are coming - looking out for 'em in 1987... Above right: Not many of these about! Alan Jupp's F/F twin Airspeed Fleet Shadower has performed well, but was upset by engine problems at Scale Weekend. PAW 80s provide the urge. Right: Derry Eggs flew this APS Focke Wulf Stosser most impressively at Old Warden.



(c) *Colour and markings.* This is always the most difficult part for the judges. Colour representations, even photographs, can never be relied upon to be accurate, but you must do as best you can.

Of course, the most vexatious colour of all is the infamous PC10 shade of WW1 British aircraft, which I have seen represented by everything from grass green to dung brown. The problem is that no one really knows what the real colour was, if in fact there was *one* colour; and it certainly changed with ageing. All photos of the period are of course black and white, and while the shades in the Blandford books are brown, those in Profiles vary considerably and hence cannot be relied upon. So what do we do? To be practical, most people (and the majority of judges) have a similar idea of what colour 'looks' right, and that is the greenish-brown shade as used on the machines in the RAF Museum at Hendon, or the IWM at Duxford. The best thing to do is to get a good colour print or postcard of one of these aircraft, and mix your paint accordingly – a simple combination of green and red does the trick, but check it when dry and in natural light before slapping it on your model. Include this colour photo in your documentation and state that this is the example of PC10 you have followed.

While on the subject of WW1 planes, note that while the undersides were unpainted, clear doped tissue and silk does not give the same effect! A light spraying of a creamy shade is essential.

Presentation

Having assembled the aforementioned it now remains to get the judges on your side by presenting it properly. Piles of books covering every mark of Spitfire, or four loose drawings do not go down well on a cold, windy day. The best way is to have everything stuck down permanently onto one large board, so that each part can be seen at the same time (an example of this is Chris Chapman's presentation for his Heinkel He 100). Remember to weed out all that is irrelevant, including those parts of three views which show different versions of the aircraft you have built.

Hopefully, the above will enable some of you to do better next season. However, for those who always seem to aim wilfully for defeat, here are some extra hints and tips picked up after ten years of scale judging. Choose an unstable subject, preferably with a short nose for rubber power; don't trim it before the contest; don't make a scale propeller and present lots of useless documentation. Try it, it always fails!

Covering

The method of double-covering power models with silk on tissue has been described at length (*Aeromodeller*, April '84) and it is without doubt the best way of





Top: Dave Smith's scratchbuilt Hawker Harrier, another Old Warden masterpiece. Super Tig 20cc powered craft is R/C, of course. Below The most popular F/F Scale model ever has been the Tiger Moth. This version, Mills 1.3 re-powered, was built by Ted Home of Oxshott from the Aeromodeller plan FSP555. Below it, The Kelikraft flying scale series is popular again thanks to 'mass launch' competitions for the type. Here's Dick Skerrett with his Ercoupe. Bottom left: Bernard Sexton's Hall Racer is a colourful C/L subject. Bottom right: Another Bernard Sexton model is this absolutely charming Parnall Pixie. How about more scale models of ultra-light aircraft? Something in this selection of photos to inspire you this winter, maybe?



covering such types. However, it must be said that on occasions, and for no apparent reason, a covering job can go wrong, with air bubbles appearing all over the place, necessitating a re-start in an extreme case.

On my latest model I was trying to keep the weight down as much as possible, and I decided to use lightweight Jap tissue instead of modelspan. After steam shrinking, I gave it just two coats of 20% dope/thinner, and then applied the silk using the same dope, plus enough coats to seal it. The whole job went extremely smoothly with no sign of air bubbles developing, so if you've had trouble in the past, try using Jap.

Tyres

Material for tyres has always been a problem. I have used black butyl rubber tubing, mainly because I have 'access' to a supply at work which has become time expired for its real (much less useful!) purpose. The drawback with it is that it is a little heavy, and that it goes 'flat' when wrapped round a small diameter wheel.

However, Paul Briggs put me on to an alternative material which could only be better if it had 'Palmer Cord Aero Tyre' stamped along its length. Turn up 'Car Trimmers and Upholsters' in your Yellow Pages and visit your local stockist. You should find that he has a supply of sponge rubber mouldings normally used for car door and window seals, etc. Among the exotic cross-sections will be solid round rod. It is spongy on the inside but with a smooth black exterior; it is light, and it will cyano together with ease. Thanks for the tip, Paul.

FROM THE HANDLE

Under control

I remember my second model in my control line career with amusement. Using the wing of the crashed Number One I built a profile model with some of my own 'ideas'. Without any knowledge of how to do it I had to construct the control system. This caused quite a few problems. Either the leadouts jammed, or the horn was bent, or the pushrod fell out of the bellcrank. Every possible defect happened - except one: the model never crashed. It just didn't get into the air!

This must have been a healing shock for me. With one exception, I've never had a control system fail again. Maybe I went to the other extreme with some design overkill on dimensions and thicknesses. In recent years I have been steadily but carefully reducing dimensions in order to save weight. So far I haven't experienced any weak spots. Actually, when some of the airplanes which I had sold were crashed a few years later by their new owners, the control system, when examined, showed no notable signs of wear. I don't claim that I've found the optimum solution. During the year I've seen quite a number of clever ideas, but everyone seems to stay with a certain way of doing things, a method that is familiar or one which suits his abilities. Here I'm going to describe the kind of control system I use in my bigger (46 to 60 powered) stunt airplanes. The control system consists of the bellcrank, the horn(s), pushrod, leadouts and leadout



guide. Shape and dimensions are sometimes dictated not by function alone, but by construction techniques, the way the model will be used, and of course, by preference too - so, please stay cool when you read the following! Let's start with the bellcrank.

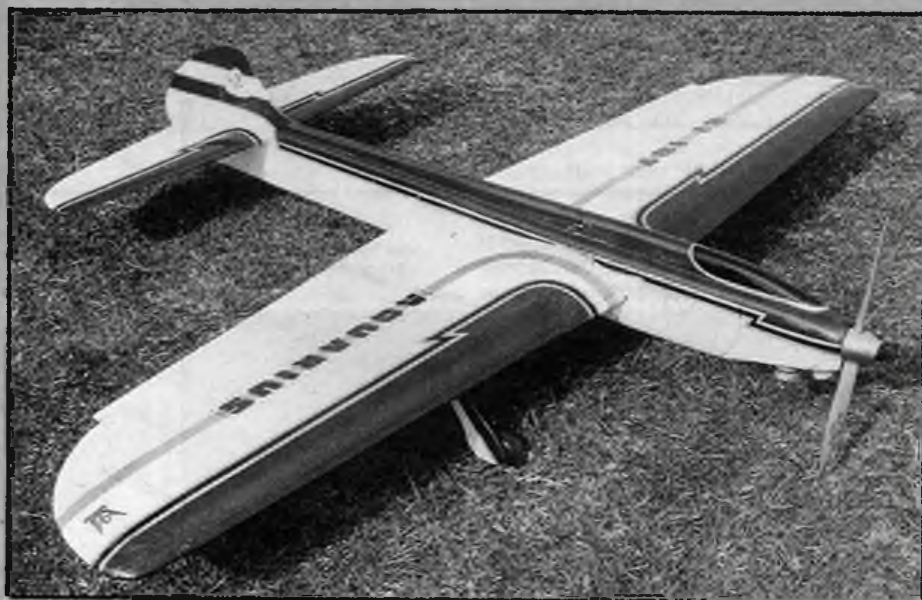
In my features on construction I've always shown the bellcrank nut soldered into the bellcrank itself. Since the bellcrank must be prevented from tilting and sliding, there must be some means to keep it in place. It's possible to use brass tubes and steel bolts but these have to be fixed, too. With my method it takes a little

longer to cut the hexagon-shaped hole, but once the brass nut has been soldered into the bellcrank the rest is easy. The bearing bolt (it's a high quality steel bolt which has a cleaner thread and never wears out) fits into the bellcrank platform. By turning it you can precisely set the vertical position of the bellcrank. I cut the bellcrank from 2mm. brass sheet; a 1.5mm. sheet would be just enough, but I like the additional thickness at the holes where the leadouts and pushrod are connected. To compensate, I prefer to make the shape a little more slim. The bearing of the brass nut on the steel bolt is very clean, tight, runs freely and lasts forever.

I'm always on the look-out for a suitable control horn. So far I haven't found one on the market which I dare to trust. Flimsy sheet pieces soft soldered to thin wire, or nylon pieces shrunk on might be sufficient for $\frac{1}{2}$ A toys... but if anybody has found a serious contender, I'd like to hear about it. Until then I'll make my own - brass horns silver soldered to piano wire. A Camping Gaz or Ronson burner has many uses so I own one anyway. I'm very careful not to heat the wire more than necessary, or rigidity will suffer; also, be sure to make the horn wide enough so you can bend the wire on a spot where it hasn't been heated so much. If the wire is bent too near to the horn it is prone to crack. As for bearings, I prefer to use brass tube. Don't forget to slide the bearings on the wire before bending (I do this now and again!) If you forget, don't try to straighten the wire to use again. Throw it away! You'll save your airplane.

There are two kinds of lead outs: flexible or stiff. Many enthusiasts like flexible cable; I don't. I am suspicious of the bent ends at the bellcrank hole - remember, the bellcrank is constantly moving. Without additional protection of any kind in this spot we have an accident waiting to happen. I've had problems with the much thicker cable used in my control handle, so I don't leave it to chance! I use still piano wire of 0.6mm diameter; that's more than necessary, but the advantage is that the protruding ends won't bend easily at the wing tip. At the bellcrank end, fastening is by a simple loop with the wire end bent back and around itself in a very tight wrapping. I've seen this used on those thin team race lines, so it's more than able to cope with our low centrifugal force. The handle end is made the same way. I fit the attaching hook (or swivel) to the lines. I've seen people walking by the models in crowded pit areas, the hooks of the leadouts catching the trousers, and the model being pulled away. Argghh! A closed loop won't catch anywhere. When wrapping the wire end, I clamp the leadout in a vice. With a piece of wire of appropriate diameter I pull the loop really hard to be able to wrap the end as tight as possible. Of course, the inner ends can only be made after the controls are installed in the wing with the lead out guide installed and the wing tip finished. Even then I try to position the wing so the leadouts can be clamped in the vice. Grandma's sofa

Remembered from the Nationals - Irish visitor Maurice Doyle's sleek Aquarius is a fine example of a state-of-the-art stunter. Relatively complicated colour scheme with full lining-out is almost exclusively a Stunt fashion these days. Very impressive.





Another approach to Stunt is the scale or semi-scale design, exemplified here by Glen Allison's Pace Spirit (soon to be an Aeromodeller plan). Who knows - with inspiration from the full-size World Aerobatic Championships hosted by Great Britain last August, maybe we'll see more such craft in 1987...

cushions do a good job here! (Aeromodeller will not be responsible for cleaning bills incurred as a result of following this advice. GC).

There's not much to be said about the leadout guide. I like to stiffen the innermost rib with a plywood half rib which has a slot cut in it for the guide, with be made of metal, plastic or wood. I make mine of brass sheet since metal slides best on the wooden rib. Two small pieces of brass tube and a nut are soldered to an oval brass sheet, which should be kept as small as possible to avoid unnecessary weight. With rounded wing tips (as on wings of elliptical planforms) the distance from the innermost rib to the actual wing tip can be quite large, and it can be a problem to reach the set screw. In this case the guide can be made with the adjusting nut fixed at a right angle to the guide tubes. The guide is then mounted to the wing tip sheet (this means the set screw sits vertically) and the adjusting slot is cut into a plywood stiffener which is glued to the wing tip sheet instead of the rib.

The pushrod is an item about which it is well worth while to think over twice - or even more seriously. In the most plans a thickness of 3/32in, about 2mm, is

Details of Claus Malkis' control system as described in the text. Make with care, discard anything that's less than 100% satisfactory and never, never re-bend wire!

specified. To put an end to any discussion: this is simply not enough! These designers probably use some kind of pushrod guide, like small holes in fuselage formers, or maybe short pieces of tubing pieces as a guide. I've seen a good solution in Egervary's model; that is, a plastic tube running the full length of the rear fuselage to guide the pushrod. But none of these features can completely prevent the pushrod from bending and - after all - there must be some friction with these methods. My own method has developed via 2.5mm diameter wire and fibreglass rods to the final solution: aluminium tubes. I'm glad our R/C companions have such needs, otherwise we wouldn't find this material in a model shop. Aluminium pushrods are more rigid and weigh less, and they are becoming popular - the more detailed plans of many leading aerobatic flyers now begin to show this feature. A tube pushrod demands more work to make in comparison to a simple wire type, of course. However, for stunt airplanes intended for serious competition I can see no other way of making a stiff, yet light pushrod. Because my control horns allow me to change deflection ratio (by means of three holes in the horn) I use a spring loaded keeper on the ends of my pushrods. Without this item construction is even easier.

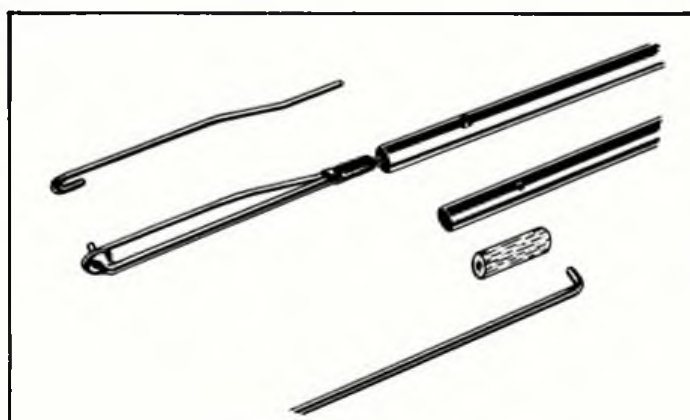
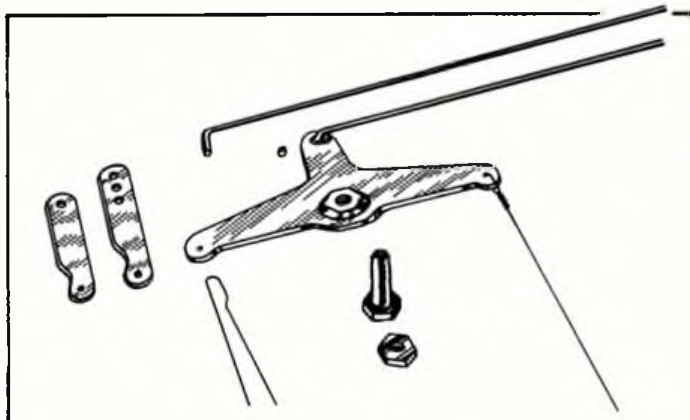
Start by carefully measuring the length of the pushrod. If you use detachable pushrods, I'd suggest about 6cm wire length at each end. With fixed ends, 2cm is enough for the hook-up. Now you can figure out the tube length. I use a 7mm diameter tube with a 6mm inner diameter. Two short pieces of 6mm hardwood dowel about 2cm long are drilled with a 2mm hole lengthwise. The diameter of the pushrod wire is 2mm. All measuring should be done extremely carefully, particularly if the pushrod is to be detachable. With fixed ends, construction is much easier. Make a right angle bend and cut off the wire so that you can insert the angled cut into the aluminium tube. Drill a hole a little more than 2cm from both ends of the tube. Slide the dowel on the wire and put some slow-drying epoxy into the tube, on the wire and on the dowel. Now thread the wire into the tube (the angled end must protrude through the hole). Slide the dowel on the wire into the tube until it stops at the wire bend. This bend locks the pushrod wire end to the tube. It *cannot* come off!

If an adjustable end is to be used this should be built before inserting into the tube, otherwise as the wire spring is soldered on, the heat produced could soften the epoxy. If a simple wire end is used, pushrod length can be adjusted later by simply bending the ends to the required length.

You can build the pushrod before making the cut-out for the tailplane. Simply attach pushrod and tailplane, make sure the bellcrank is in the neutral position, and mark the cut-out for the tailplane. If fuselage construction permits, I do prefer this method.

I forgot to mention that all holes in the bellcrank and in the horns are bushed (but not those at the wing tip). Short pieces of brass tube are enough. The complete control system is then checked for free movement. The weight of the pushrod alone should be enough to deflect the control surfaces when the model is held vertically with the nose or the tail up. If the control system doesn't work that freely, don't go on with construction until it does!

Of course, you might say that in this time you could easily build another stunter? You're right. Quality has its price - but it isn't too high if you consider that you've avoided one possible way of losing your airplane.



Combat with John James

SMAE 5th Centralised 3 Sisters event, 28th September 1986: FAI Combat

After the washout of FAI combat at the Nationals we were greeted with near perfect weather conditions for the last centralised meeting of the season. There was a light breeze and the weather was actually quite warm, which is virtually unheard of at 3 Sisters, particularly at the end of September.

The competition fielded the largest entry for a centralised event for many years, perhaps because this was the last qualifying event for next year's British team. Let's hope this is the start of an upsurge in interest in FAI combat after its being in the doldrums for a few years. Newcomer Ian Jacob looked very proficient in only his second ever competition (his first being the Nationals). He was flying copies of Neil Gill's Panic, which proved not to be quite strong enough to stand up to the 3 Sisters turf. He lost to Mike Whillance in the first round and then to John James in the second, but showed that he will be a flier to watch out for next year. Another to go straight out was team member Mervyn

Jones who lost to Mick Hember in round 1 and Mike Whillance in round 2. Mervyn has not had a very good domestic season although he managed to perform in the World Championships when it counted. Better luck next year. The highest-scoring bout came in the second round when Mick Tiernan beat Mick Hember by five cuts to four. Round 3 saw Mike Whillance and Paul Vallins having problems. The scores at the end of their first bout were equal so a re-fly was necessary. In the second bout Paul had his model cut off its lines, and as he was down on points at the time, he elected to have another re-fly. Third time round, and after a messy bout, Mike Whillance emerged the winner.

The semi-finals saw victories for Mike Whillance who beat Neil Gill and John James who beat Martin Leeper. Martin, incidentally, was the only flier in the competition using a Super Tigre engine.

An all-Nelson final flown in very poor light saw Mike Whillance take two cuts to John James's one, but Mike spent too much time on the ground so John emerged the victor.

really catch on until the appearance of the Fortress I & II. It was then rightly supposed that any discipline capable of producing two such unbelievably different tails for two otherwise almost identical flying machines must be a universal passport to confusion, and the Air Ministry adopted it at once, insisting that all aeroplanes it was going to pay for would have to have aerodynamics in them ever after. The elderly among you may recall that during WW II this country boasted a mysteriously large complement of expensive aircraft with functions politely referred to as second-line, spotting, general purpose and, Lord help us, night-fighting. Even Willi Messerschmitt tried his hand and produced the Bf. 109, which anybody who has tried to fly one will tell you could have done with a lot

Results

3 Sisters FAI Combat

1 John James	Sheffield CLAMS
2 Mike Whillance	Urmston MACC
3 Neil Gill	Peterborough MAC
4 Martin Leeper	Preston

The Simple Dummy!

Contrary to popular rumour, the title is not a reference to the writer. One of the problems encountered when using babies' dummy starts to empty, it frequently falls inside the pacifier pod, cutting off the fuel supply. Most fliers solve the problem by putting a safety pin around the dummy, but how about this for an idea (which I copied from Stuart Vickers many years ago). Instead of the normal practice of winding a rubber band around the dummy, use two lengths of fairly thick single core wire, approximately two inches long. Wind these around leaving the ends fairly long, and there is your solution.

Neglected Aspects of Aerodynamics: from p.45

far too dead to answer the onslaught he directed against them, based on his claim that he understood the Centre of Pressure, and its interaction with another of his inventions, the Centre of Gravity, long before anyone else did.

Meanwhile, here at home the Director had taken to making up hard sums as required exercises to slow down his graduate staff, who were tending towards hooliganism after the pubs had shut, and the very next time the two old friends met, the Science of Predicting the Size of the Hole in the Ground was born. With the passage of time, belief in this fairy-tale-in-algebra gained a foothold amongst the credulous, although aerodynamics did not

less theory and a bit more practice. The Germans had other problems, too. For a while they thought the Junkers 87 had been caused by aerodynamics and worried greatly about its tendency to go into a dive until someone twigged they had been getting the wings on upside-down. Not surprisingly, everyone was fed up with it by then and they never did bother to put it right.

And what of the old BARMI where it all began? From those small beginnings grew an establishment which today deals with problems aeronautical from all over the world. It is currently helping my wife to establish a formula illustrating the relationship between some splendid new silencers I have made and the fact that her tubular aluminium clothes prop is a lot shorter than it used to be.

BI-1 from p.35

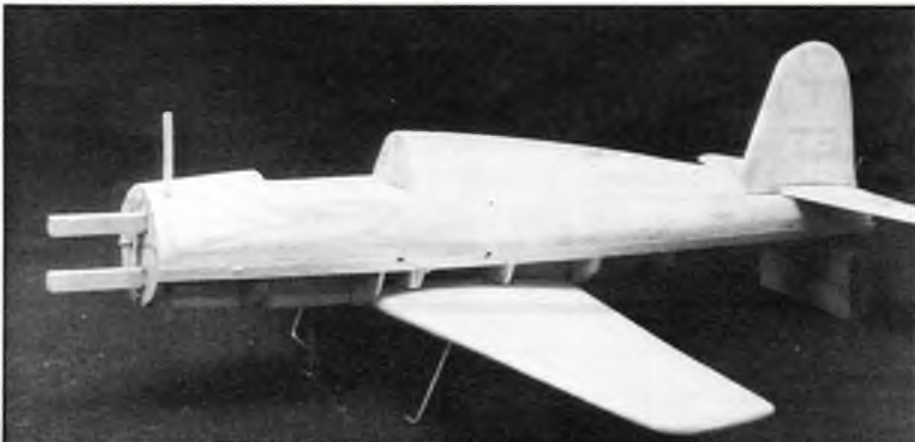
Structure of the BI-1 is relatively simple but take care to keep true alignment when planking the fuselage.

balsa planking. Fit your chosen engine into position and then fill in between formers F1 and F2 with soft block. Soft block is also glued either side of the fin. When a hard 3/16in. tail skid with a piano wire protector has been added the model is ready to be sanded.

Finishing

The prototype was covered in light-weight tissue paper applied with three coats of sanding sealer. At this stage the detail parts, tail, finlets, braces and wheel covers, having previously sand-sealed, can be added to the model, and a further coat of sanding sealer applied. After a final light sanding the model can be painted with matt enamel paints and fuel proofed with a matt polyurethane varnish. A commercial canopy was cut up to fit and the pilot was bought from the local toy shop (having started life as a frogman).

The model was balanced on the front lead-out and has been flown on 30 - 40ft. line with no problems, although for smooth ground take-offs the under-carriage may need to be bent forward slightly.



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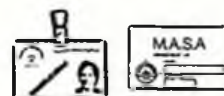
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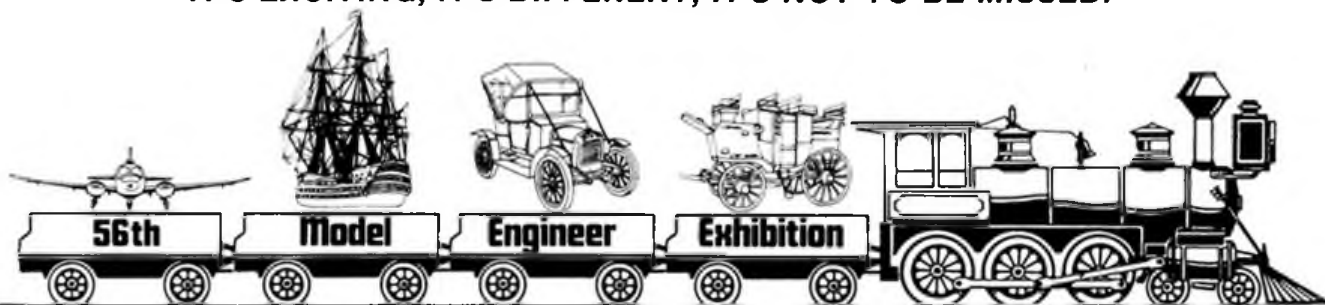
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Appendix - Links to the plans

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Senior Monitor by John Perry

John Perry's Senior Monitor vintage stunter

[https://outerzone.co.uk/plan_details.asp?ID=13859 ...](https://outerzone.co.uk/plan_details.asp?ID=13859)

[Document Page: 6](#)

Wattisnohm by Roy Ashby

FF Electric presented in 'Electrifying Experiences'

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Bullet by Donald Powell

CL Speed from year 1948/1949

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Macchi C.202 Folgore by Lubomir Koutny

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[Document Page: 25](#)

Berzeniak Isaev BI-1 by Jym & Dave Leddy

CL Semiscale

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