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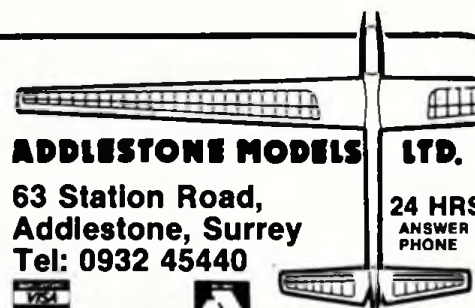


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September 1985

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AERO MODELLER



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Cover: Squadron Leader Paul Day on a sortie from RAF Bruggen with 17 Squadron Jaguars. M T 719 is in the S.E.A.C. markings of 17 Squadron and operational unit it served with in Burma in WWII. Owner is Franco Actis of Turin who restored the aircraft. Civil registration is I-SPIT... (photo: Peter R Arnold Collection via R.A.F. Germany).

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HANGAR DOORS

Old Soldier...

Some old soldiers don't even fade away! APS Plan No. D1237 'Licorice Stick' by Laurie Barr proves the point. Laurie (and the 'Stick') made it to the American Free Flight Championships at Taft, California at the end of May. Between them they won the one flight *Mulvihill Trophy* (flown at dawn) with a time of 11:04. The previous day they came second in Open Rubber with three 5 minute maxes followed by a 6 and a 7 dropping on the 8 minute round when the model decided to fly

time - no EZB at the same time as CO₂ scale! Comps for Rubber, Peanut and CO₂ Scale; EZB; HLG and Peanut Duration and plenty of time for fun flying. Whatever your indoor model is, bring it along. Don't do Indoor? The come along and see the fun others get out of it - like it... then buy a kit there and then from SAMS!

Watford Leisure Centre is in Horseshoe Lane, just a few minutes from junction 6 on the M1. Entry for flyers is £2.00 plus 75p per competition event, spectators are only 60p.



Above, a triumphant Laurie and Betty Barr, following Laurie's win in the *Mulvihill Trophy* at Taft, California (see old soldier...).



the date; Redhill Aerodrome, Surrey is the place. The list of attractions (apart from the girl on the wing' above) includes an impressive list of aerobatic displays and aircraft that have always been favourites amongst aeromodellers, such as: Stampe Spitfire, Hurricane, Turbulent, Cosmic Wind, Pitt's Special, and biplanes galore.

Few of you will be considering a B17 for your next model but for those fans of this famous aeroplane (1985 marks the B 17's 50th anniversary!) 'Sally B', of TV fame will be flying past during the day. Our own side of the aviation world will be

cars and military vehicles even a children's fun fair all go towards making this a good day's outing. Admission costs: Car plus *all* passengers £7, pedestrians and motorcyclists £2, children and senior citizens £1, - enjoy yourself... go visit a Tiger!

Schneider Trophy

The 1985 Digital Schneider Trophy Race - the revival in modern form of the famous pre-war contests, sponsored by *Digital Equipment* (computers and such...) was held on 23rd June and provided a thrilling spectacle for spectators around the course. Fifty four aircraft took

Left, 'all the fun of the show' just a taster of the things to be seen at the *Tiger Club Air Show* at Redhill Aerodrome on September 1st (see *Tiger Club Show*).

straight down wind for 5:50! This design (actually this model...) won the British Nationals in 1972...some old soldier!

F/F Nats raffle

Once again some lucky people missed those vital few seconds when the winning numbers were drawn for this year's raffle at the Free Flight Nationals. Those prizes not yet claimed belong to the following raffle tickets: GREEN 191, 425 and 487; WHITE 11 and 33. Anybody having these about their person or in their model box is advised to contact: Ian Bracken at 1, Didbin House, Mingard Walk, Andover Estate, Hornsey Road, London N7 7RT.

Watford again...

Following the success of the first two indoor meetings at Watford Leisure Centre, SAMS (the F/F and I/D mail order people!) have a third Indoor Flying Day planned for 6th October starting at 9:00am. Flying is in 'rounds' so that like models are flying at the same



Above, the winner of the 1985 Digital Schneider Trophy Race, Nick Snook, with his brother Simon, who acted as navigator in the *Robin Algon* aircraft flown by Nick. The race was run on 23rd June from the Isle of Wight and had some 54 starters.

Tiger Club Show

Last month we suggested that the Goodyear racers amongst you should go to the *Tiger Club Air Show* to see some Formula One Air Racing. September 1st is

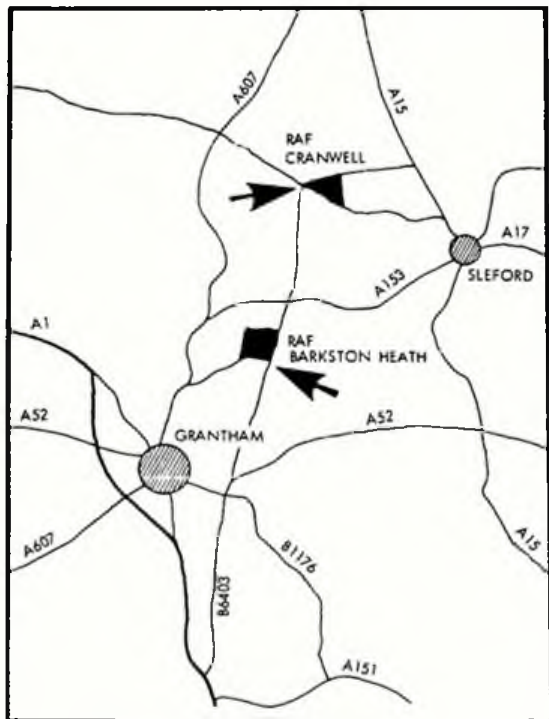
represented by Croydon Model Flying Club who will attempt to outfly their larger brothers and gain more converts to our side of the fence!

Various trade stands, vintage

off from the airfield at the *Pilatus Britten-Norman* factory at Bembridge on the Isle of Wight and battled it out over a 142 mile course.

The race was won by Nick

All Roads lead to:- The 1985 British National Championships 24, 25 26th August Control-Line... Radio Control... Scale RAF BARKSTON HEATH — RAF CRANWELL



Snook in a Robin R1180T 'Aiglon', winning him a cash prize, a replica of the Schneider Trophy and one of *Digital's* business computer systems. Nick is the son of Beverley Snook, Chairman of the Royal Aero Club and was accompanied by brother Simon as navigator. Observant readers may notice the appropriate registration number of the 'Aiglon', G-VITE...

Swopsies...

Many readers (bless 'em...) have copies of *Aeromodeller* or *Model Aircraft* going back to the year dot, but often with a few earlier issues (volumes?) missing. Buying from the various dealers in old mags is one way of obtaining these missing golden oldies - but can sometimes prove an expensive exercise. *Model Aircraft Exchange* offer another

approach... this is not a commercial organisation but is the brainchild of Dr. R.C. Armstrong - himself a frustrated collector! He produces a list of people's sales and wants together with their addresses - if you want to swap, sell or buy, contact the person direct and make your own arrangements. *Model Aircraft Exchange* includes anything aeromodelling - the latest issue for instance has a number of items from Mike Woodhouse, DT fuse, rubber, tissue etc.

If you have too many mags or items to mention in one of *Aeromodeller's* own Classifieds Ads. why not contact Dr. R.C. Armstrong at 1, Chestnut Drive, Holme-on-Spalding-Moor, York YO4 4HW.

New Zealand in February?

February 6th-9th, 1986 - travelling round the World, emigrating, visiting relatives, if these or any other reason takes you to New Zealand in early February then visit the *Pacific Free Flight Championships* on the Wairarapa Plains, 100km north of Wellington. Comps for F1A, F1B, F1C, P30 and A1. This is New Zealand's mid-summer and great flying weather. Anyone interested write to *Aeromodeller* for details - the Editor will even act as team manager - there is no cost for this service... just pay his travelling expenses...

Where did we come from?

The Sheffield Society of Aeromodellers is trying to trace its roots, can anyone help? They believe the Society was formed in

about 1938 from the amalgamation of two clubs, the Sheffield and District Model Flying Club and the Middlewood and District Model Flying Club. If anyone can provide any information about the model flying history of either of these two clubs in the pre-war era, or the Society in the post-war period please contact Jim Chalmers, 76 Barrie Road, Southey Green, Sheffield S. Yorks S5 8RT, or Tel: Sheffield 380465.

The main interest of the present Society is R/C Soaring and Magnet Soaring (F1E) - anyone interested in joining, contact Jim...

Indoor at Cardington

Earlier this year we stated that anyone intending to go to any of the indoor events planned for the airship sheds at RAE Cardington must inform Laurie Barr prior to the event of both names of persons going and relevant car registration numbers. This requirement *still stands* BUT once having informed Laurie... there is no need to repeat this action for every visit! Laurie Barr may be contacted at: Hasting Close, Bray, Berks. Tel: 0628 25595.

Stop Press European C/L Champs

U.K. win individual first and first team places in F2C Team Race, Third Team place in F2B Aerobatics and Third Team Place in F2D Combat... more next month.

What's On

**August 17-18
AEROMODELLER VINTAGE WEEKEND**
Venue: Old Warden, Nr. Biggleswade.
Contact: Aeromodeller. Tel: 0442 41221.

**August 17-18
PLUMPTON MODEL SHOW**
Venue: Plumpton Race Course. Contact: Dave Bishop, DB Sound, 17 The Square, Tatsfield, Kent. 300 mph Dutch Jets, Helicopter rides, Aeroplanes, Cars, Boats, Rocket Microlights, Live steam trains - Fun for the whole family. Camp or Caravan - £15.00 (If pre booked).

**August 24-25
CARDINGTON INDOOR MEETING**
Comps: F1D World Champs Team Trials. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. SMAE Comp Licence required. Names and addresses together with car reg. number - MUST be registered before the event.

**August 25th
PAISLEY TROPHY — OPEN FREE FLIGHT EVENT.**
Venue: Newbigging, near Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

**August 24-26
SMAE CONTROL LINE, SCALE AND RADIO CONTROL BRITISH NATIONAL CHAMPIONSHIPS**
Venue: RAF Barkston Heath. Contact: SMAE Comp Sec. Tel: 0533 58500 or 0533 412368. SMAE Members only: Contest Licence required.

**September 1
MIDLAND AREA FLY FOR FUN RALLY.**
Comps: A1, Cd/H, SOP, Vintage. Venue: RAF Barkston Heath, Nr. Grantham. Contact: Brian Perks. Tel: 0858 63829. R/C, F/F, C/L - tons of fly for fun - informal judging for best model, best flight, best junior - no comp. licence required.

**September 1
SMAE 5th AREA FREE FLIGHT EVENT**
Comps: A1, F1B, Team Power (Pluggie). Venue: Area Venues. Contact: Local Area. Comp Sec. OR SMAE On 0533 58500. SMAE Members only: Competition Licence required.

**September 8
OLD WARDEN SVAS SILENT DAY**
Venue: Old Warden, Nr. Biggleswade. Contact: M Staples Tel: 0223 241978. All welcome but NO IC engines in any form.

**September 8
STEEL TROPHY — FAI F/F EVENT**
Venue: Newbigging, Near Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

**September 14, 15
2nd ANNUAL HIGHLAND SPLASH-IN.**
Venue: Loch Inch. Contact: Duncan Cameron. Tel: 0497 810844. For all types of waterlanes: fun fly, record attempts, F/F, C/L and R/C Budget accommodation or camping - possibility of coach from London.

**September 15
CARDINGTON INDOOR MEETING**
Comps: E2B, F1D, 35cm, Open Microfilm (all index). Scale. Venue: Cardington, Beds

Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg. number - MUST be registered before the event.

**September 15
DISPLAY TEAM CONTEST**
Venue: Old Warden, Nr. Biggleswade. Contact: Radio Modeller. Tel: 0442 41221. For teams of three or more models — flying a 20 minute display.

**September 15
DUXFORD FLYING DISPLAY**
Venue: Imperial War Museum Duxford. Tel: 0223 833963. From vintage biplanes to modern jets. Adults £3.00. Children, OAPs £1.50.

**September 15
SMAE NORTHERN GALA**
Free Flight: OR, OG, OP, combined. Venue: RAF Driffield. Contact 0904 705647.

Control Line: 1/4A, FAI, B T/R. Venue: RAF Dishforth. Contact 0536 661066.

Radio Control FFF, Stand-off scale, Thermal. Venue: RAF Elvington. Contact Malton 2580.

**September 15
C/L AEROBATICS — DOUG BLAKE MEMORIAL TROPHY**
Comps: Open, Novice. Venue: Slip End, Luton. Contact: Glen Allison. Tel: 0923 772675.

**September 22
SMAE 6th AREA FREE FLIGHT EVENT**

**September 22
RAF SWANTON MORLEY MAC INDOOR FLY-FOR-FUN**

**September 22
SHEFFIELD VINTAGE COMP**

**September 22
THREE KINGS CONTROL LINE SCALE DAY**

**September 29
HOWARD BOYS MEMORIAL TROPHY**

**September 29
WHARFEDALE 1000 CLASS 'B' TEAM RACE**

**September 29
WARWICK '85 VINTAGE FLY-IN**

**September 29
SMAE SOUTH MIDLAND OPEN THERMAL COMPETITION**

**September 29
CARDINGTON INDOOR MEETING**

**September 29
ROLLS ROYCE VINTAGE FLY-IN**

**October 6
SAMS 3rd INDOOR FLYING DAY**

**October 6
VINTAGE CONTROL LINE RALLY**

**October 13
HESWALL MAC OPEN C/L STUNT COMP.**

**October 13
NORTHERN AREA FAI F/F.**

**October 20
DUXFORD FLYING DISPLAY**



Photo Prize

MODEL NEWS With Fliar Phil

Wood for Winners

100 Sheets of balsa, nearly 200 lengths of strip wood — some prize!

All you have to do is send Fliar Phil your photograph — good quality black and white or colour prints will do, with your name and address plus details of the model, its construction etc on the back. Post your entries to Aeromodeller Photo-Prize Feature, P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead Herts HP2 4SS. Photos will be returned after publication.

Sorting through the photo's submitted for this feature, Fliar Phil is frequently impressed by the artistic merit of many model aircraft. Few aeromodellers would consider themselves to be artists! — but the artistry their models display reminds F.P. of the remark by the famous sculptor Eric Gill — 'An artist is not a particular kind of man — BUT everyman is a particular kind of artist'. — and that includes aeromodellers! Herewith this month's selection of "Aeromodelling Art".

Photo 1

Described by him as a 'Kitchen Table project'! Mr. Dutton of Crewe, Cheshire, sent F.P. fine photos of his *Piper 'Cub'*. From a free plan in *Aeromodeller* January 1979 designed by the late Jack Headly, details are Span 52in. Power OS 15 glow. Three function *Skyleader 'Courier'* R/C. Mr. Dutton 'discovered' *Aeromodeller* in 1945 — and has been 'addicted' ever since! Good for you Mr. D.!

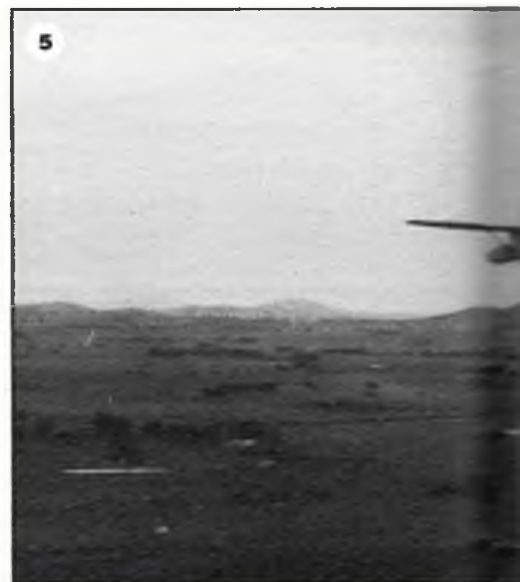


Photo 2

A carefully chosen background always enhances a fine model. This is well shown in this photo of an *Avro 'Tutor'* from David Gladwin of Plumtree, Nottingham. From a *Bryant* plan, power is an OS80FS, weight 10 lbs, *Skyleader* R/C. In the Central Flying School colours, David says the site is Waltham airfield once the home of the real 'Tutors'. Thanks for the interesting details David.



Photo 3

Rubber-powered fans — here's one for you! The 'Cruiser Pup' has proven a most efficient low wing job. This one belongs to Ron Brownson, and was photographed by Mr. B. Faulkner of Lymm Cheshire. An interesting note from Mr. Faulkner. This 'Cruiser Pup' was smashed by a power model at Old Warden, BUT was rebuilt and continued flying! A 'model tale' — with a HAPPY ending!

Photo 4

Scale buffs cannot resist the *Focke Wulf 190*! This one is a *FW 190 D9* and comes from Riccardo de Felice of Edinburgh. Riccardo's artistic ability shows in those hand painted markings. It is a *Mick Reeves* model, powered by an *Irvine 61*, with *JR* radio control. Riccardo comments: 'Very good, slow flying, aerobatic model'. Good looks and good flying capability. That's the name of the aeromodelling game Riccardo!



Photo 5 Winner

Unfortunately Fliar Phil does not receive many 'in flight' photos - but when he does they are impressive. This one from Frank Smith of Victoria, Australia certainly is! As Frank says, 'Is it a model, or a full size glider?'. It is actually a 1/5th scale R/C model of a *Grunau 'Baby' 2B* soaring above an Australian landscape - epitomising the beauty of model flight. This month's winner...congratulations Frank and to cameraman Mark Barber.



Photo 6

Like old soldiers - old models never die! They just get converted to R/C! Mr. Stew Redfern of Chester, built this *Frog 'Centurion'* 33 years ago! Originally powered with an *ED 2.49*, it now has an *Enya 35* up front and R/C...and still flies beautifully. F.P. has enjoyed sharing a moment of nostalgia with you Stew! Many thanks for the pic.

Photo 7

From Mr. A.L. Smith of West Hagley, West Midlands, comes this finely built and detailed '*Lublin*' by Mike Hall (Walsall MAC). The photograph was taken at the Indoor Nationals 1984. An impressive rubber powered model, Fliar Phil hazards a guess that it can be converted to CO₂. No doubt with either power, it is a fine flyer. That radial engine looks good!

Well thats it for now. More masterpieces 'suitable for framing' next month. Be seeing you.





AIRCRAFT DESCRIBED

Supermarine Spitfire MK VIII

No. 264 — The Supermarine type 539 Spitfire Mk. VIII drawn and described by Harry Robinson

THE PROGRESSIVE DEVELOPMENT of R.J. Mitchell's Supermarine Spitfire was a continuing process, the product of many minds in a variety of locations. While 'mainstream' modifications often originated in the Supermarine design office, other variants such as the highly successful Mk. IX were produced in such significant numbers as to belie the stop-gap nature of their origin. Field modifications sometimes proved superior to purpose-built innovations, some developments were overtaken by events but then could successfully be incorporated in other variants.

During 1941 the Merlin RM6SM engine with two-stage supercharger was developed as the Merlin 60 for the Wellington Mk. VI. In September the fighter version of this engine, designated Merlin 61, was fitted to the Mk. III prototype N3297 at Hucknall for development trials.

The Merlin 61 was at least 10% more powerful than earlier versions and performance was markedly improved. Fears of high-altitude attacks on Britain led Supermarine to design a successor to the pressurised Mk. VI, using the new engine.

This was the Mk. VII: modified C-wings were strengthened and retained the extended tips introduced on the Mk. VI, with a 14 gal leading-edge fuel tank in each wing. In addition, the ailerons were reduced in span at the outboard end: this shortened overhang beyond the outer hinge and reduced the likelihood of aileron flutter, which was a suspected cause of the loss of several earlier Spitfires in high-speed dives.

The 60-series Merlin was some 9in longer than the 45 and 47, so engine bearers were redesigned and the fuselage reinforced. A four-bladed Rotol propeller was fitted, with

individual fishtail exhausts and a second rectangular-intake radiator housing was installed below the starboard wing.

The port unit now housed a coolant radiator and the oil cooler: the starboard housing also contained a coolant radiator with the intercooler needed to cool the engine charge before entering the supercharger's second stage. A retractable tailwheel, which had first appeared on the prototype Mk. III, was also installed.

Prolonged difficulties associated with these modifications delayed Mk. VII production until August 1942 and not until the following April did the production rate rise above four aircraft per month. On the other hand the Mk. IX, in reality a Mk. V

with strengthened fuselage and Merlin 61 engine, was already entering Squadron service by June 1942 and its production rate was increasing rapidly.

Performance of the Mk. VII proved disappointing, being surpassed at altitudes above 40,000 ft by the specially lightened Mk. IX. But it was becoming recognised that the need for a specialist high-altitude fighter had been considerably over-stated and it was decided that the principal production version with the Merlin 61 engine should be a medium/low altitude machine.

This, then, was the Spitfire Mk. VIII: essentially an unpressurised Mk. VII, retaining all the structural and aerodynamic refinements of its predecessor

Heading picture, JG 204 L.F. Mk. VIII development aircraft being flown by Jeffrey Quill. Below, MV 436 - South East Asia camouflage and markings. Note minuscule roundels, wing band and weird fin flash. (photos from Jack Beaumont)



but with further strengthening of wing and fuselage, allowing full advantage to be taken of the increased power of the Merlin 61.

In the Mk. VIII this fuselage strengthening took the form of two folded channel sections rivetted inside the deep top-hat section of the two main longerons. All Mk. VIII were tropicalised and fitted with the Vokes Aero-Vee filter housed in a long graceful fairing beneath the engine.

There was no prototype Mk. VIII. Production began in November 1942 and reached more than 50 per month by the following June. Many variations and improvements were introduced during production: most notable was the adoption late in 1943 of the pointed, extended chord rudder originally designed for Mk. XII.

The first 251 of these to arrive were mostly LF Mk. VIII while later machines were all HF Mk. VIII which retained their RAF day fighter camouflage of dark green and ocean grey with medium grey undersides.

Mostly early arrivals were camouflaged in dark earth and dark green with light grey or sky blue beneath and most of these were overpainted in a variety of generally darker RAAF colours. In addition, the yellow wing leading edge was changed to white and the entire tail section was painted white. This was to aid identification in the South West Pacific area and Northern Territory since RAAF aircraft had been fired on by American gunners mistaking them for Japanese. For this same reason, the standard roundel's red centre was overpainted white.

RAAF pilots considered the Mk. VIII a joy

to fly: others were impressed by the relative lightness of its aileron control. Jeffrey Quill considered it the best of the Spitfires from the pure flying point of view, provided of course that standard wing tips were fitted. His opinion of the same aircraft with pointed wings was vastly different...

The Mk. VIII was the peak of Merlin-engined Spitfire development. Over 2 400 were ordered although many were in fact produced as other marks. For a time further Spitfire development was thought of in terms of the Mk. VIII: the laminar flow wing to Specification F1/43 (Supermarine Type 371) that eventually became the Spitfire was related, as early as December 1942, "in the first place to its use on the Spitfire VIII" although understood to be suitable for the still future Mk. 21.

The following September the laminar flow wing was still specified for the Mk. VIII and the Griffon-engined Mk. 21. Flight tests of the new wing were made using a Mk. VIII fuselage and tail assembly: this aircraft was the first Spitfire prototype NN660. Six Mk. VIII were delivered from production to Rolls-Royce at Hucknall for use in Mk. XIV development.

1 658 Spitfire Mk. VIII were produced, all by Supermarine at South Marston. JF299 was retained by Supermarine for development and was the first Spitfire to fly with cut-down rear fuselage and bubble canopy. JG204 underwent simulated tropical testing at RAE Farnborough and was later used for tests in connection with Mk. 21 development.

JG480 was used for winterisation testing in Canada during the winter of 1944-45: at least seven Mk. VIII were used by the USAAF. All Mk. VIII versions were withdrawn from RAF and RAAF service early in 1946: sadly, all were eventually scrapped except H.F. Mk. VIII MV 154 (A58-671) which has been preserved at Bankstown near Sydney.



Above, echelon of four RAAF aircraft somewhere in Australia. Note overpainting of red roundel centre in white on first three aircraft (photo Jack Beaumont). Below, MD 319 - L.F. Mk VIII, early example with splined oleo legs.

Supermarine's Chief Test Pilot Jeffrey Quill has explained that "anything with the standard Spitfire fin could accept that rudder, usually with benefit" (to stability and control) and this elegant pointed surface was in fact fitted to a number of late production Mk. VII, the vast majority of Mk. VIII, some Mk. IX and a large proportion of Mk. XVI.

In March 1944 the LF Mk. VIII with Merlin 66 engine first appeared and fittings were added for carrying a 500 lb bomb beneath the fuselage. In April the splined oleo-legs of the undercarriage were replaced by torsion links which required far less precision machining and the Merlin 70 engine was fitted to produce the HF Mk. VIII.

Also in April the pointed wingtips were replaced in production by standard tips. Jeffrey Quill was particularly outspoken against the extended tips on the Mk. VIII where they served no useful purpose but rather reduced aileron response and rate of roll. Most Mk. VIII were produced with standard wingtips and the enlarged, pointed rudder.

Although originally intended for U.K. service the Mk. VIII, being fully tropicalised, was transferred in large numbers to the Mediterranean and Far East theatres. During 1944 some 410 went to Australia where they replaced the RAAF's Mk. V, eventually equipping five Squadrons in mainland Australia and New Guinea, two RAF Squadrons in the Darwin area and three other non-operational units.



Characteristics

Wingspan:	36ft 10in (Standard)	40ft 2in (Extended)
Wing Area:	242 sq. ft (Standard)	248 sq. ft (Extended)
Overall Length:	31ft 6in (Enlarged Rudder)	31ft 1in (Standard)
Normal Loaded Weight:	7 767 lb (uncertain)	
Max. permitted Weight:	8 000 lb	
Engine: Rolls-Royce	L.F. Mk. VIII	F.Mk. VIII
Merlin	66	61
Service Ceiling:	1 580 hp	1 565 hp
Maximum Speed:	41 500 ft	43 000 ft
Stalling Speed:	408 mph	404 mph
Fuel Capacity:	82 mph (clean)	74 mph (flaps, L.G. down)
Armament:	124 gal normal + drop tank (30,50, 90 or 170 gal)	2 x 20 mm Hispano Cannon (belt feed)
(C-wing)	4 x Browning machine guns.	Modified to carry 500 lb bomb load under fuselage in March 1944.

BLADES & SPINNER
ARE BLACK
FOR END VIEW OF BLADE
SEE INVERTED PLAN

STANDARD IFF AERIAL BENEATH STARBOARD
WING NOT FITTED ON A58-303

REAR-VIEW MIRROR
TWICE GIVEN SCALE

NATURAL FINISH OF LEAD EDGE
D-BOX PHOTOGRAPHS CONSIDER-
ABLY DARKER THAN OTHER AREAS

PINLE

JACK

A/C

PIVOT

TAIL WHEEL FULLY EXTENDED, NO LOAD
TWICE GIVEN SCALE
COVER DOORS OMITTED IN SIDE VIEW
OTHER VIEW IS FROM REAR

PORT OLEO LEG FULLY EXTENDED, NO LOAD
TORSION LINKS SHOWN REMOVED
(SPRINED OLEO LEGS OF EARLY F.M.H. VIII)
REPLACED BY TORSION LINKS IN APRIL 1944)

SECTION ON FAIRING OVER
CANNON BELT-FEED MECHANISM
NORMAL WING SECTION SHOWN
THUS - - - - -

HORN, CONTROL ROD &
FAIRINGS TO ELEVATOR
TRIM TAB
THREE TIMES GIVEN SCALE

DIMENSIONS

WINGSPAN	36'-10"
MAXIMUM CHORD	8'-4"
WING AREA	242 ft ²
OVERALL LENGTH	31'-6"*
TAILPLANE SPAN	10'-6"
WHEEL TRACK	5'-8 1/2"
PROPELLER DIAMETER	10'-9"

* WITH STANDARD TIPS SPANS & (AREAS)
WITH CLIPPED & EXTENDED TIPS WERE
32'-7" (231 ft²) & 40'-2" (248.5 ft²) RE-
SPECTIVELY.

** VARIOUS SMALLER LENGTH DIMENSIONS HAVE BEEN
PUBLISHED THE FIGURE GIVEN WAS OBTAINED BY
MEASUREMENT & PUBLISHED IN AF 480 (JUNE 1944)

COLOURS

SEVERAL RAAF SPITFIRES WERE GIVEN THE BASIC NATURAL
METAL FINISH SHOWN. ON A58-303 ENTIRE TAIL, WING LEADING
EDGE & CANNON FAIRINGS WERE WHITE: SPINNER, ANTI-GLARE
PANEL, WINDSCREEN & FORWARD CANOPY FRAMES, BASE OF
RADIO MAST & SERIAL WERE BLACK.

ALL ORIGINAL CAMOUFLAGE WAS STRIPPED FROM THESE AIR-
CRAFT SO THAT NO STANDARD STENCILLING WAS RETAINED.
ROUNDELS (36" & 32") WERE BLUE & WHITE ONLY.
FOR DETAILS OF RAAF CAMOUFLAGE SEE "SPITFIRE MARKINGS
OF THE RAAF" (SMITH & MALONE: KOOKABURRA PUBLICATIONS)

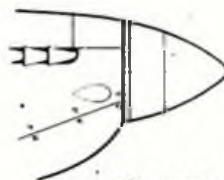
A58-303, formerly JFB21
ARRIVED AUSTRALIA, ALLOTTED
No 1 AIRCRAFT PARK, GEELONG,
VIC., 28-10-43.
ALLOTTED No 1 AIRCRAFT DEPOT
LAVERTON, VIC., 19-11-43 FOR
ACCEPTANCE TESTS.
ALLOTTED No 1 AIRCRAFT PER-
FORMANCE UNIT, LAVERTON,
17-1-44 FOR OIL COOLING TESTS
HIGH-G MANOEUVRES WITH CAAG
(ANTI-G) SUIT, TESTS ON CORROSION
OF COOLANT SYSTEM & TROPICAL
TESTS IN DARWIN AREA.

NACA 2200 SERIES AEROFOIL 13% THICK

STATION	0	1.25	2.5	3.0	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0.0	2.64	3.63	5.00	6.01	6.79	7.85	8.38	8.63	8.32	7.61	6.38	5.31	3.81	2.09	1.14	0.18
LOWER	0.0	1.58	2.12	2.76	3.13	3.37	3.73	4.05	4.37	4.25	3.86	3.30	2.63	1.88	1.03	0.61	0.14

INCIDENCE: $+2^{\circ}$ FROM ROOT TO DIHEDRAL BREAK 31° FROM ξ
 -1° AT TIP ($18^{\circ}-5^{\circ}$ FROM ξ)

DIHEDRAL: 7° ON UNDERSIDE AT 25% CHORD
 EFFECTIVE MEAN DIHEDRAL IS 6°



STARBOARD NOSE & FAIRING TO COFFMAN STARTER

AILERON HINGE

NATURAL METAL (ALSO MUZZLES)

WING SECTION ON ξ PORT RADIATOR WITH ADDITIONAL RADIATOR SECTIONS

AILERON & SHROUD: TWICE GIVEN SCALE

ξ PINTLE (APPROX)

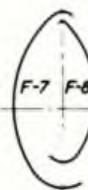
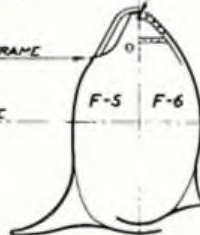
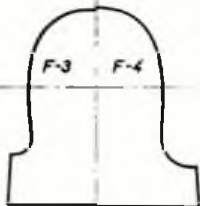
PORT WHEEL & OLCO LEG OMITTED TO SHOW INSIDE WELL

PITOT PRESSURE HEAD
 THREE TIMES GIVEN SCALE

TIE-ROD BETWEEN FRAMES
 11 (SECT. F-5) & 12

CANOPY FRAME
 FUSELAGE DATUM

HORN, CONTROL ROD & FAIRINGS
 TO RUDDER TRIM TAB
 THREE TIMES GIVEN SCALE



RUDDER HINGE

F-1

F-2

F-3

F-4

F-5

F-6

F-7

F-8

F-9

A58-303

A 1/24th scale dye-line print of this 1/48th scale drawing available from Aeromodeller Plans Service, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts., HPS 4SS. Price £1.80 plus 50p post and packing (Price Code C). Please quote plan No. 3069.

GRATEFUL THANKS TO JACK BEAUMONT, HELMUT TERBECK, ALFRED PRICE, 'JOCK' ROSS OF RAAF HISTORICAL SECTION & THE STAFFS OF RAF NORTHOLT & RAF UXBRIDGE.

Robinson
 APR 1983

VICKERS-ARMSTRONGS
 SUPERMARINE

SPITFIRE L.F. Mk. VIII



VINTAGE CORNER

WITH ALEX IMBIE

RGM at Toledo

Ron Moulton attended the R/C Expo at Toledo earlier this year and has kindly submitted the following glimpse of vintage 'goings-on' at this annual treat.

Toledo is always a haven for engine collectors and gives opportunity for display of absolute top quality R/C assist old time enthusiasts to exhibit their prowess. The Swap Shop is vast and fascinating. Such is its fame that it attracts traders from Scandinavia, the European continent and the UK.

Any diligent vintage fan can unearth spares and even kits from the 40's. There is as much bustle among the table top bargain stands of the Swap Shop as one finds in the rest of the huge Exhibition area. It is not all true vintage, reproduction engines have an increasing popularity albeit at a price.

Ron Moulton reports that he was almost attracted to supplement his collection of *Super Cyclone* engines as now made in Phoenix, Arizona but settled for a bevy of 'new' spares.

Outstanding prize winner among the models was Steve Ditta's half size 'Goldberg Valkyrie' for a *Bantam* 19 with even those built-up wing ribs made true to 50% scale.

Tom McCoy of Sterling Heights, Michigan, always produces a stunner (remember his 'Gladiator' in our Radio Control Extra of 1983?). For 1985 he produced an 'Albatross' with *Super Cyclone* engine and covered in translucent yellow silk with an external power pack, belly mounted.

Brian Beck entered a 'Spook 72' with *O&R* 60, covered in translucent *MonoKote* which lived up to this gull wing classic's name. Although it was nice to see all the structure, a couple of hefty push rods seemed out of place down the centre of the fuselage...

Other stunners were Owen Wyson's 'Pacemaker', fitted with a truly vintage *Barker* 60 and for sheer ugliness Jim Grant produced his 'GHQ Snortster', a design which only one modeller (Ian Potts) has dared to show in UK skies.

Vintage Scale

The weather on Saturday 22nd June for Aeromodeller Scale Weekend, was hardly conducive to any sort of model flying, and what did take place I am unable to comment on due to non-attendance! (None flew in F/F or C/L...Ed!).



Above, Trevor Simpson holds aloft his 1943 own design, built when he was serving in the Fleet Air Arm, the model had to break down into small components to fit in his small attache case. Trevor was friendly with M R Knight, and the model shows that well-known low-wing modeller's influence.

Early on the next day, the clear sunny skies reminded one of the 'Sun before seven - Rain before eleven' weather lore, so it was with foreboding that many enthusiasts must have left home to journey to Old Warden...

However, the prospect of unsuitable weather did not appear to have affected attendance and the meeting was well patronised with the car parks soon full to overflowing.

There were even more trade stands than usual and the double line of tent alley was a main thoroughfare for the whole of the day with many vintage purchasers emerging with old engines, books and magazines, mingling with the buyers of 'normal' items for up-to-date aeromodelling.

Although cumulus clouds formed fairly soon they did not produce any rain until evening, so the major part of the day was free of precipitation. There was a strong blustery wind, and this produced some nasty turbulence on the aerodrome, making the weather quite unsuitable for small free flight models.

Right, vintage models at Toledo. Tom McCoy's yellow silk covered 'Albatross' powered by *Super Cyclone*, note external belly pack for batteries. Owen Wyson's *Barker* 60 powered Ohlson 'Pacemaker' behind with highly polished aluminium cowl.

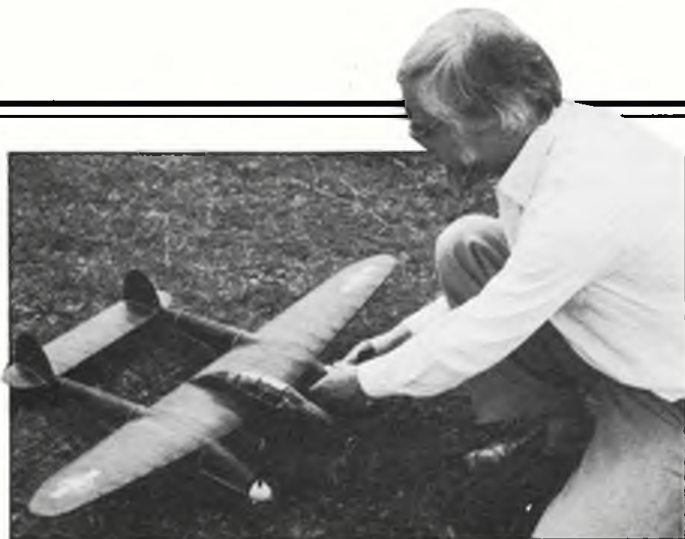


Left, Jim Shelley's 'Cavaller' fitted with *OS* 60 with Gerald Smith's magneto at rear of engine with shaft drive. On this early installation the 'normal' position is used for ignition points and condenser.

Composite... but, this is a vintage column and before the editor wields his blue (red...Ed!) pencil I had better concentrate on my subject!

As far as I could judge there were just as many modellers flying rubber and CO₂ models out on the aerodrome in the lee of the trees as there were flying the larger R/C Models that were statically on show in the compound.





Left, Steven Betney repairs his APS Lightning between Rounds in the Masfield Trophy at Old Warden on Aeromodeller Scale Day.

While the majority of free flight of course, were flying scale models, there were a number of vintage machines, and models with a dual classification were the CO₂ powered miniatures (really flying scale models of their big sisters) like 'Jersey Javelin', 'Scram', 'Rambler', 'Comet II', and 'Outlaw', amongst others.

Right, Jim Kay's models at Old Warden. Attractive semi-scale 'vintage style' open cockpit parasol in foreground with the hint of a 'Twin Cyclone' at rear.



Above, a different viewpoint of Jim Kay with his parasol, a 'vintage style', own design, powered by the ME 'Snipe' diesel at Old Warden on Aeromodeller Scale Day.

The true vintage enthusiasts were to be seen flying various Earl Stahl designs, and power models built from pre-1951 plans, like the 'Airflow Mite' powered by an ED 'Baby' by J Ketterer from Boston, and Jim Kay's 'Twin Cyclone' powered by a PAW 80. Jim also had with him a most attractive open cockpit parasol, not unlike the 'Luton Minor', this model, an own design, was definitely of vintage style and was powered by the ME 'Snipe' diesel.

'Slickers' in various sizes were to be seen as well as a number of Veron 'Cardinals' and Dick Skerten from Walton-on-Thames was flying his Keil Kraft 'Senator' rubber model, his first attempt at aeromodelling.

So this was a good day, with a strong vintage showing, and despite the wind a good time was had by all. As the car parks emptied as the evening drew on, one was the better able to wander around and see some models that had evaded detection for the

major part of the day...

I was personally pleased to see original examples of both P E Norman's and Fred Longbon's models resurrected and lovingly cared for by Alan Jupp of Wallington. These included P E's 'Siskin', and Fred's 'Monocoupe' and Fokker DVII, the last named being painstakingly hand painted (in the true Longbon tradition) in lozenge

pattern camouflage, sporting the markings used by Willi Gabriel, an NCO pilot in Jagdstaffel 11 during 1918.

Masfield Trophy

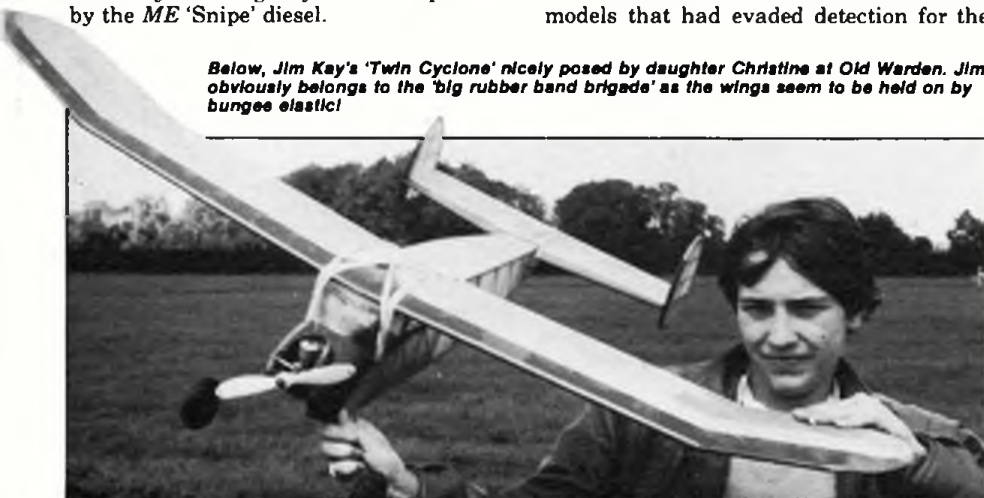
It was fitting that this SAM 35 award, a beautiful Bristol 'Britannia' finished in polished chrome plate attractively mounted on a wooden base, for the winner of a special competition devised by Vic Dubery, was flown for, during the day.

Briefly, this contest was for any rubber-driven flying scale model published or kitted before 1 January 1951, so came truly under the vintage meaning. Some slight modifications were allowed to make models more practical, but the uniqueness of this competition lay in the manner of awarding points...

Run on the flight card system, each competitor could enter two models if he wished, the best flight of three gave the time for Round I, best of two flights was used in Round II and one flight only in Round III was allowed.

To the aggregate of the three times a time was added based on a bonus percentage made up from wingspan (small models scored higher), number of wings (biplane scored higher than a monoplane), watercraft (flying boat scored higher than a floatplane), and number of engines (special score if airscrews were off the model centre-line).

As already mentioned the weather was completely unsuitable for this sort of model, but 13 modellers entered 18 machines. At the end of Round I, Steve Betney was leading with his APS Lockheed 'Lightning', his shortish flight time being boosted by the twin-engine bonus. In second place was Lindsay Smith who was reaping the maximum bonus possible for any single-engined model, he was flying a 12 inch span Curtiss 'Navy Racer' with float undercarriage made from a pre-war Comet kit plan. Don Knight lay in third place with his Earl Stahl 'Magister' operating on almost pure flight performance with little



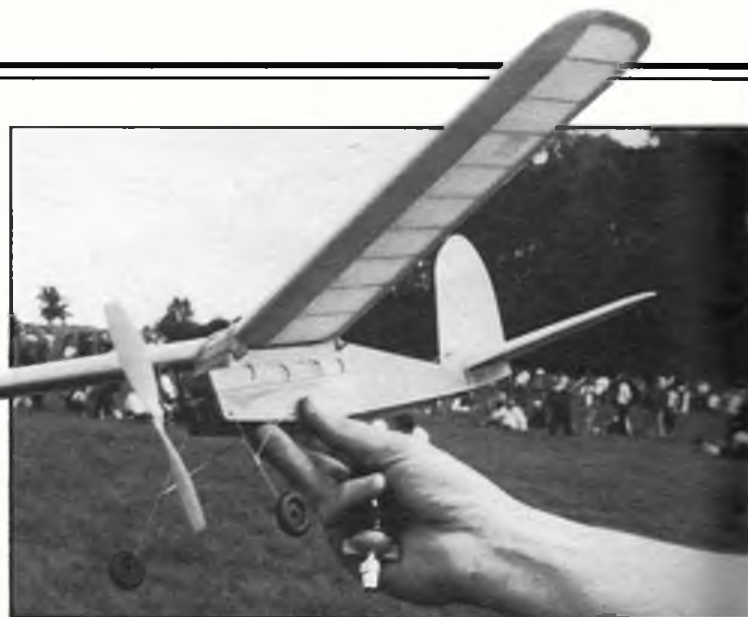
Below, Jim Kay's 'Twin Cyclone' nicely posed by daughter Christine at Old Warden. Jim obviously belongs to the 'big rubber band brigade' as the wings seem to be held on by bungee elastic!

help from the bonus system.

In Round II Bob Walden was leading with his Earl Stahl 'Albatros' DV, decorated with the markings used by Vizefeldwebel Clausnitzer a pilot in Jagdstaffel 4 during 1917. Don Knight now held second place followed by Steven Betney's 'Lightning'.

Bob Walden held his lead in Round III and won the trophy, his times were 25, 33 and 28 seconds multiplied by his biplane factor of 1.6 giving him 137.6 points. Second was Don Knight with 33, 28 and 35 seconds

Right, Bob Walden's fine 'Comet II' (made from Aeromodeller plans) powered by Telco CO₂ motor. Part of the large number of flying scale free-fighters can be seen in the background.



Left, Simon Morris from Tasborough near Norwich with a 'Viking' CO₂ powered model which was flown without landing gear. Another Aeromodeller free plan!



multiplied by his monoplane factor of 1.3 providing 124.8 points, and Bob Walden's other entry (the Earl Stahl 'Magister') did 20, 23 and 28 seconds resulting in 92.3 points for third place.

A novel and thrilling competition, the only criticism of which I have is, that due to the flight card system I could not personally witness all flights!

SAM 35 Competitions

The 50th Wakefield Anniversary as well as other competitions will have taken place at RAF Barkston Heath on August 4th, but all that, will be history by the time this appears in print, and will be reported upon in a later issue.

A number of events are planned for the Sunday (August 18th) of *Aeromodeller Vintage Weekend* at Old Warden foremost

amongst these being the Earl Stahl and the 'Achilles' Competitions.

John Lawson, the SAM 35 Chairman is organising the Earl Stahl event and possibly the experience and example of Warwick last year has been responsible for causing a re-organisation of this flying scale rubber competition for low-wing models.

This year the aim is to introduce some spectator appeal by flying in concentration, instead of using a flight card system, which has little meaning to the layman and does not generate the excitement of competition.

Model rules are unchanged from last year, but the format of the contest is altered to a series of timed heats, with the simultaneous launching of approximately four models per heat from a specified launch area.

There will be three rounds and competitors with the best times will then

participate in a final simultaneous launch fly-off. The competition will start at 1400 hours (2p.m.) and all competitors have to be present at this time.

This is certainly a step in the right direction, and I presume that models in the heats have to be simultaneously launched to reduce competition time, although for pure enjoyment models launched in 'rapid succession' would have been better, after all who has four pairs of eyes!

Old habits die hard and the high-wing Earl Stahl models will still be flown on a three flight card system with a new three minute winding time limit to reduce the overall time of the competition. It is a good idea to have the two styles of operating and this will enable a comparison to be made that will serve as a pointer on how this popular event should finally be run...

Alan Wiggs has told us that once again he is running an 'Achilles' Competition for Juniors under 16 years of age (he has even recruited his local paper-boy who is building one!), Alan writes: "This will be the fourth year that the 'Achilles' Competition has been run and to make it more attractive to the novice Junior, I am excluding any of the previous winners irrespective of age! This will give all newcomers a chance of winning a prize. They can build the kit how they like, but must use the 7 1/4 inch Keil Kraft black plastic propeller.

To cater for previous winners and anyone who wants to fly an 'Achilles', I am running a separate competition for all over 16 years of age, with no restrictions on the size of propeller used, but with just one prize for the top placed entrant.

The turn-out last year was up in numbers (6) but model preparation was so poor that two entrants failed to make minimum qualifying times of 20 seconds. In the light of the response I get this August I shall be deciding whether to continue this competition in the future."

So those of you who like the idea of a small simple duration type of competition, support Alan since this is the only Junior competitive type of flying that we have, and while sad to see so few Junior entrants it will be even sadder if the idea is dropped altogether.

Minimag

Jim Shelley is now beginning to produce his magnetos which suit most rear pushrod four strokes of 60 size upwards. Specialising in miniature ignition systems, he is also

Below, Dick Skerten from Walton-on-Thames with his Keil Kraft 'Senator' rubber model at Old Warden. This is his first model and there was not a wrinkle or warp in sight! Welcome on board Dick.



able to supply other items in this field...

Most of us know the advantages of magnetos over ordinary coil ignition, the main one being a nice hot spark all the time with no battery problems. The following is taken from Jim's current brochure which can be had for 50p from *Minimag Co.*, 358 Birmingham Road, Walsall West Midlands WS5 3NX. Telephone Walsall 28553.

Below right, the Curtiss 'Navy Racer' with float undercarriage made from a pre-war Comet kit plan and flown with high bonus points in the Masefield Trophy by Lindsay Smith (see text).



Left, Albatros DV complete with the famous 'wound ribbon' marking of Jagdstaffel 4 on its fuselage held by the builder, Bob Walden who flew it to victory in the Masefield Trophy (see text). This attractive Earl Stahl rubber model was described in Model Airplane News in February 1945.



When I followed this with a valve lifter enabling me to restart the engine in the air after gliding for 10 minutes, I was certified completely 'Mag Mad'.

I decided to manufacture magnetos and the *Minimag Co.* was registered on 9 December 1981."

Apologies

It was only possible to insert a brief *Stop Press* announcement in last month's issue correcting the venue of the 50th Wakefield Anniversary to Barkston Heath. To say that we were overtaken by events in announcing that this competition would be held at RAE

"In 1980 Mr Gerald Smith agreed to fit one of his magnetos, which he had designed and constructed for his 10cc 'Skylark' engines, on to an OS 60 four-stroke I had recently purchased. This was then fitted into my nine foot span 'Cavalier' and I carved a 14 x 8 inch laminated wooden propeller to suit.

It flew so quietly that even electric powered aircraft sounded noisy. I thus embarked on a new carefree era of flying. I could wander onto the field, syphon half a pint of petrol from my car, add a little racing oil and fly all day without a worry - it seemed to run on fresh air - no heavy field box, in fact one could smile and predict a hernia-free future.



Below, Les Smith with his CO₂ powered 'Rambler', another of the many miniatures seen at Old Warden that were true flying scale models of their vintage free-flight prototypes.



Above, 'Airflow Mite' built from plans in the first issue of the keenly sought after Ian Allan Model Aviation magazines that appeared from 1948 onwards. This model, a Ron Warring design, is powered by an ED 'Baby' and is held by its builder J Ketterer from Boston, Linco.

Cardington on 4th August 1985 is putting it mildly.

Due to a number of unforeseen circumstances RAF Halton (the original venue) proved unobtainable, and the substitute venue at RAE Cardington was eventually deemed unsuitable.

When all seemed lost, sterling work by Keith Harris and Phil Ball through the very kind and accommodating Grantham Club secured the use of Barkston Heath. The statement made in the July Vintage Corner was made in good faith, based on an 'official' release when it was 'all go' for Cardington. Essential to get the news into print to please the readership, it appears that we *jumped the gun*. Please accept our apologies for any inconvenience caused.



IN THE FIRST PART of this article (published in the July issue, of *Aeromodeller*) twelve F1A designs spanning a period of thirty years were presented. They were chosen firstly to illustrate the variation in design that has existed over the period and secondly because they were successful at the highest levels of competition flying.

The term *design* used in the context of this article refers to the outline and overall proportions of the model concerned and ignores the structural and technical detail that forms an integrated part of the total design process.

It is a natural progression in a modelling sense, to move from building and flying commercially available kits to building and flying model designs available through a purchased plan, to building and flying one's own designed aircraft...

An important aspect of competition flying is pitting one's own ideas and creation against those of other competitors. Hence most keen competition flyers end up designing their own models, or at the very least adapting or modifying the designs of others.

The intention of this second part of the article therefore is to help the less experienced modeller to design a competitive and successful F1A glider. This will be achieved by establishing through a simple analysis of successful F1A designs a basic *proportion* relationship that is within reason independent of the outline shape and so permits the budding designer complete freedom to follow present fashions, or indeed create a new fashion. The F1A designs analysed here include all those surveyed in the first part of this article.

It would be misleading to think that the design of a model is complete when the outline and proportion has been determined. Other aspects which are equally important and inter-related include the structural design, aerofoil choice, trim of the model (wing, warps, incidences etc) and technical detail such as the tow-hook (almost universally a 'circler' these days), variable incidence and variable CG etc, all of which in themselves could form the basis of other articles or reports...

The important model properties used in

International (F1A) GLIDERS

Expert glider flyer Tony Cordes, reviews thirty years of A2 gliders to find what features make a winning design.

features make a winning design.

Designer	Date Published	Projected Wing Area (AW) dm ²	Wingspan (S) dm	Average Wing Chord (C)dm	Wing Aspect Ratio (ARW)	Projected Tailplane Area (AT)dm ²	Tailplane Aspect Ratio (ART)	Moment Length (M ₀)dm	Tail Volume Coefficient (TVO)	C.G. Location	
1*	Lidner	1955	28.71	19.3	1.488	12.97	4.65	8.0	8.375	0.91	56
2*	Sokolov	1957	29.30	20.4	1.436	14.2	5.13	6.33	8.088	0.99	50
3*	Tahkapaa	1959	28.73	19.6	1.466	13.37	4.61	5.2	8.495	0.93	60
4*	Averjanov	1961	29.62	21.4	1.384	15.46	4.25	6.61	8.750	0.91	57
5	Erichsen	1963	28.56	21.4	1.33	16.04	4.4	5.56	7.740	0.90	56
6*	Bucher	1965	29.34	21.56	1.36	15.84	4.5	7.4	9.505	1.07	61
7*	Langevin	1965	28.65	20.51	1.397	14.68	5.03	5.33	8.255	1.04	50
8	Woodhouse	1965	28.39	19.81	1.433	13.82	4.84	5.78	8.382	1.00	55
9*	Hirschel	1967	28.71	20.20	1.42	14.21	4.68	5.33	8.175	0.94	50
10	Schmidt (SPL)	1969	29.20	23.80	1.227	19.4	4.32	7.06	8.525	1.03	47
11*	Dvorak	1967	28.90	22.50	1.284	17.52	5.10	5.81	7.127	0.98	55
12*	Ekhtenkov	1969	28.65	21.0	1.284	15.39	4.3	5.81	8.325	0.92	56
13	Tchop	1971	28.90	22.50	1.365	15.29	4.5	5.56	8.825	0.97	50
14	Allnut	1973	29.40	21.2	1.387	15.39	4.5	5.56	8.522	0.94	50
15*	Abadjiev	1975	28.84	20.32	1.387	14.32	4.52	5.71	8.485	1.05	63
16	Lepp	1975	28.84	21.0	1.419	15.3	4.88	5.65	8.725	0.97	55
17	Horejsi	1977	29.36	21.2	1.373	15.31	4.53	5.52	8.525	0.95	55
18	Zach	1977	29.30	20.8	1.385	14.77	4.60	5.65	8.525	0.93	47
19*	Hines	1977	29.08	21.6	1.409	16.04	4.72	5.30	7.728	1.05	54
20	Grunnet	1977	29.16	21.98	1.346	16.57	4.63	7.07	8.785	1.04	53
21*	Lepp	1978	28.86	21.24	1.327	15.63	4.69	5.55	8.680	1.04	53
22	Fantham	1979	30.19	23.8	1.359	18.76	3.60	5.63	9.000	0.85	53
23	Lagan	1979	28.90	20.02	1.268	13.87	4.48	5.58	8.775	0.94	52
24	Kraus	1981	29.90	22.92	1.444	17.57	4.00	6.76	8.975	0.92	47
25*	Breemen	1982	29.10	21.2	1.305	15.44	4.80	5.85	8.675	1.04	52
26	Average	1983	28.80	21.0	1.373	15.31	4.50	5.56	8.825	1.01	52
		1984	29.06		1.371	15.48	4.57	5.96		0.97	53.4

Fig. 1

* Model reviewed in July issue

Fig. 1

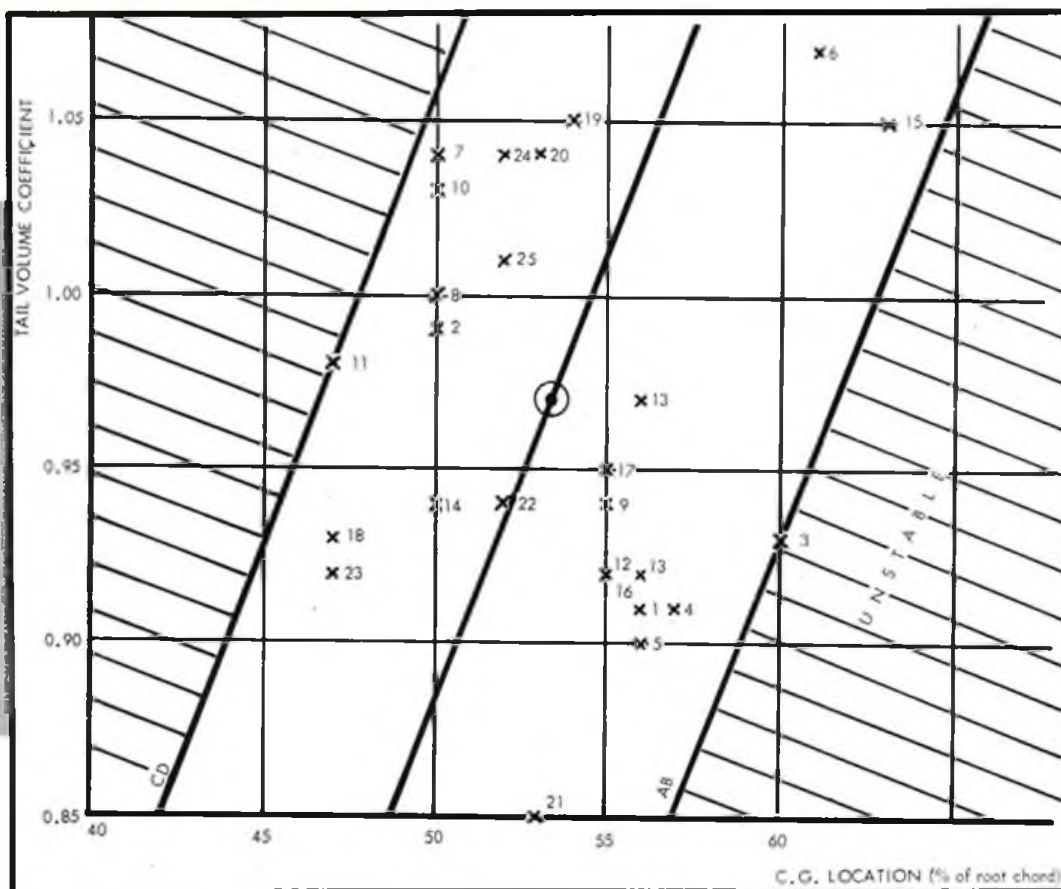


Fig. 2

the analysis and taken from the designs surveyed are:

projected wing area(AW)
 projected tailplane area (AT)
 wing aspect ratio (ARW)
 tailplane aspect ratio(ART)
 wing root chord(CW)
 tailplane root chord (CT)
 mean wing chord.....(C)
 wingspan(S)
 moment length (M₀)
 centre of gravity (CG)
 Some simple definitions involving the above properties are now given for information:-

aspect ratio = $\frac{\text{span squared (S}^2\text{)}}{\text{projected area (A)}}$

mean wing chord (C) = $\frac{\text{projected wing area (AW)}}{\text{wingspan (S)}}$

moment length (M₀) = distance from wing leading edge to quarter tailplane root chord = CW + M + 1/4 CT

where M is the moment arm

An expression relating the projected wing area (AW), the projected tailplane area (AT), the average wing chord (C) and the moment length (M₀) is known as the *tail volume coefficient (TVO)*,

tail volume coefficient (TVO) = $\frac{AT \times M_0}{AW \times C}$

The tail volume coefficient is a very useful parameter, as it can be used either as a means of comparing one design with another or as a design parameter in its own right.

Figure 1 sets out in a tabular form the properties and appropriate calculations given above, for the models surveyed. The numbers at the bottom of the columns represent the *average* of the numbers in the column.

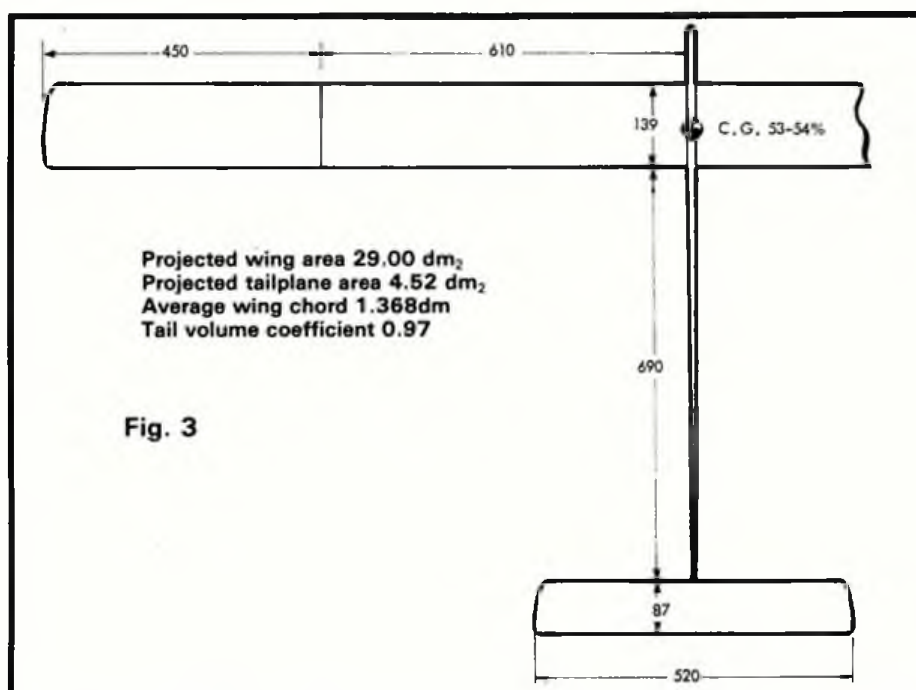


Fig. 3

Figure 2 shows a plot of the tail volume coefficient against centre of gravity location for each model surveyed, the number against each point corresponding to the model design listed in figure 1.

For interest, a sample set of calculations is given below for the model designed by Hines (number 18 in figure 1 and figure 11 in the first part of the article in the July issue). The units used are decimetres, which although non-standard, correspond to the specifications listed by the *Federation Aeronautique Internationale (FAI)* for an F1A glider:-

projected wing area	= 29.16 dm ²	wing
span	= 21.98 dm	
projected tailplane area	= 4.63 dm ²	moment
moment length	= 0.147 + 7.09 + 0.9	
	= 8.785 dm	
average wing chord	= 29.16 / 21.98	
	= 1.327 dm	
tail volume coefficient	= $\frac{4.63 \times 8.785}{29.16 \times 1.327}$	
	= 1.05	
centre of gravity	= 54% of wing root chord	

The design analysis is effectively summarised in figure 2. Having plotted all the models surveyed the line AB was drawn beyond which no models appeared. This line may be considered a limit of stability, ie, models falling into the shaded area to the right of and below the line are likely to be *unstable* and fly inconsistently. Thus the zone to the left of and above the line can be considered *stable*.

A second line CD was drawn for convenience parallel to AB, which can be considered a *sensible* upper limit for design purposes. It would appear from the analysis that models need not be designed so stable, as to fall in the shaded area to the left of and above CD.

Further it may be argued that models designed near the limit AB would be appropriate for *calm* conditions whereas those along CD and beyond would be better equipped for turbulent conditions, but there is no real proof of this.

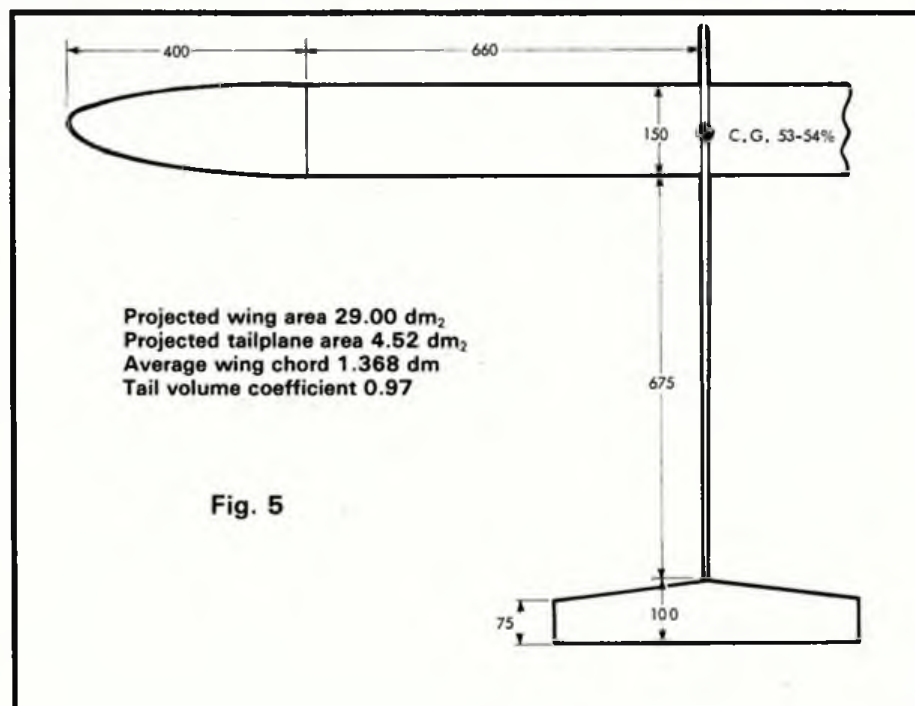
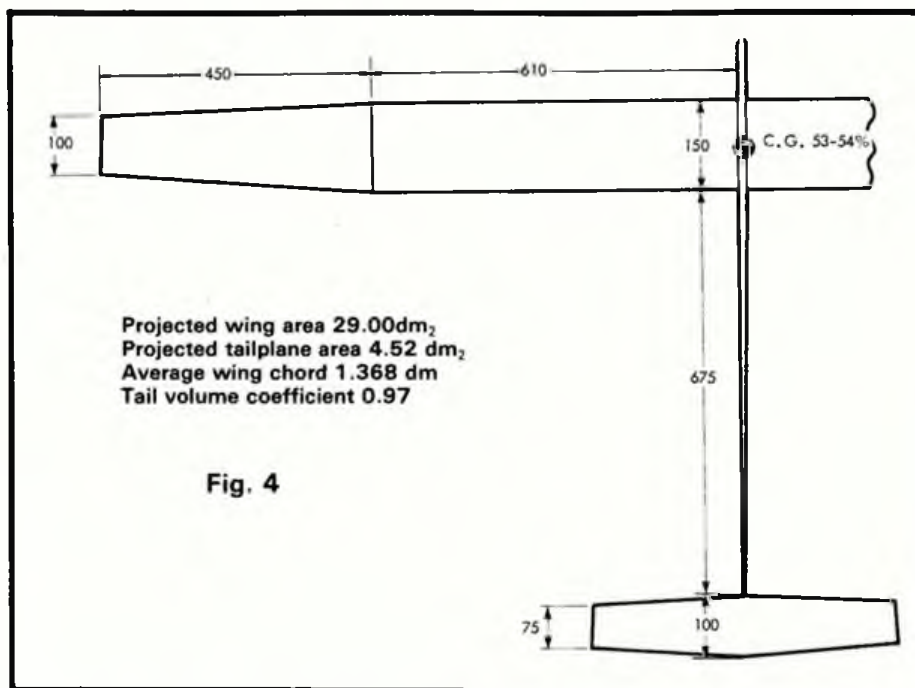
The emphasised dot in the centre of figure 2 represents the plot of the average numbers shown at the bottom of figure 1. A third line was drawn parallel to AB and CD through this point. This line represents the *design parameter* referred to in previous articles, updated appropriately.

How then may this design parameter, ie, the graph, be used? For a proposed design the projected wing area, the average wing chord and projected tailplane area should be determined. Then *either* for a given moment arm, the tail volume coefficient should be calculated and using the design parameter the appropriate CG location determined; *or* for a given CG location the design parameter can be used to determine the appropriate tail volume coefficient from which the moment arm can be calculated. Very often the design process requires several attempts to be made going back and forth before a satisfactory optimum is achieved.

Finally it must be of interest to see what design emerges from the *averages* given in figure 1. A very basic design is shown in figure 3 and derivations of this design are shown in figures 4 and 5, ie the outline shape has been varied.

Infinite variation of outline is possible so long as the tail volume coefficient - centre of gravity relationship fits the design parameter shown in figure 2.

Why not now get out pencil and paper and have a go at designing your new F1A glider? Better still, build it and be seen at the next free flight competition...



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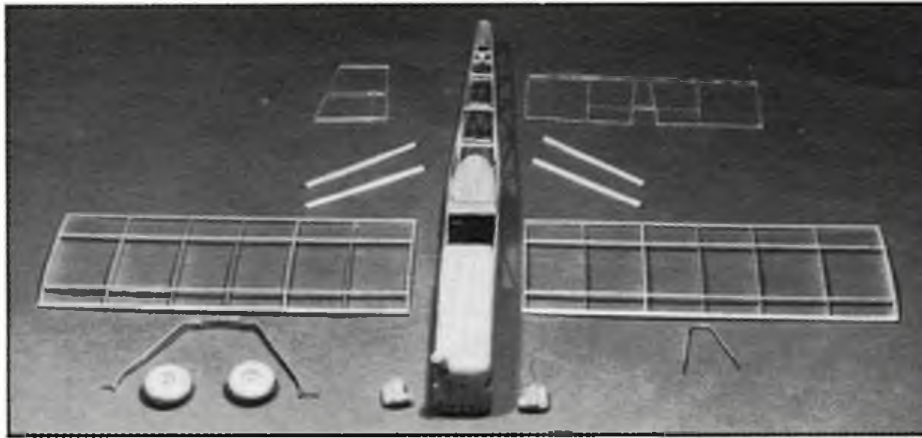
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Fuselage

The fuselage is built in the conventional manner as for most rubber scale models. Cover the plan which is attached to the building board with plastic sheet to prevent the fuselage components from sticking to the plan when the glue has dried. Build up the fuselage sides one on top of the other to get two identical sides. Thinned PVA glue or high viscosity cyanoacrylate glue should be used.

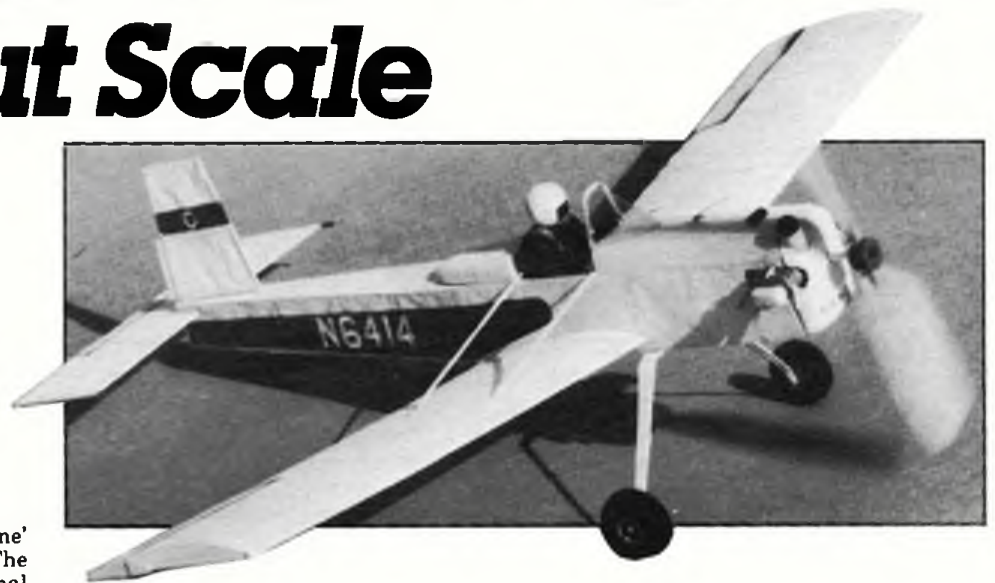
Since the top longerons are straight, the fuselage frame is assembled inverted. The

Left, the final 'kit of parts' prior to final assembly and covering. Below, 'Volksplane' warming up for an afternoons flying session.

VOLKSPLANE

-Peanut Scale

**Build this simple
format Peanut
Scale Rubber
powered model.
by Siegfried
Glöckner**



THE FIRST FLIGHT of the 'Volksplane' happened in summer of 1968. The aircraft was designed by the professional aircraft engineer W.S. Evans. At first glance it is not evident, that Evans' 27 years of experience in aircraft design assisted to create the 'Volksplane'. Evans' aim was not to have a high technology aircraft, but to get a homebuilder's first aircraft that was easy to build from cheap materials and also showed high stability and not too bad a performance.

To get an optimum compromise between construction effort and results, Evans made thorough stress and performance calculations and researched for cheap

materials. This time of paperwork consumed two years. The result is an aircraft any average do-it-yourselfer or homebuilder could build, since the Volksplane is nothing else but a huge model aircraft.

It has a box type fuselage, built from ply sheets, stiffened with spruce spars. The ribs of the wings and empennage are cut from ply and have lightening holes for weight reduction. Leading edges and spars are made from stock spruce spars and the trailing edges are built from ply strips. The VW-engine is bolted directly to the 3/4in. ply bulkhead and enclosed with a glass reinforced plastic (GRP) cowl.

That Evans succeeded in designing an ideal aircraft for the beginner in the homebuilder scene is proved by the facts, the 'Volksplane' has been built by homebuilders all over the world.

Because of the simple shape of the 'Volksplane' the aircraft is also suited for the beginner in the Peanut scene, even though low wings are not usually to be advised to the lesser experienced modellers. The long tail arm, and the slightly increased dihedral give the Peanut 'Volksplane' good stability and make the model easy to trim and suitable for the beginner.

fuselage sides are joined first by nose plate (F3) and stern post (F8). Crack the longerons slightly behind part F1 and add the 1 x 1mm balsa spacers that join the fuselage halves.

When the glue has dried, add S1 for fixing the fin, and reinforce the cracks in the longerons (behind F1), with small drops of glue. Make the turtledecks in front and behind the cockpit from light balsa, but do not yet glue in place. This is done when the fuselage is covered.

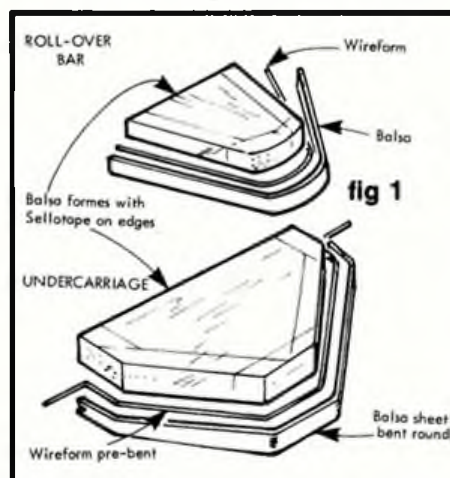
Fin and Stabilizer

These parts are built-up on the plan in the same manner as the fuselage sides. The static balance weights H1, H2 are glued in place *after* covering.

Wings

Prepare all parts ready for assembly. It is advisable to sand the leading edges to shape prior to cutting the component from 1.5mm balsa sheet. After sanding, cut off the leading edge using a sharp balsa knife and a steel ruler.

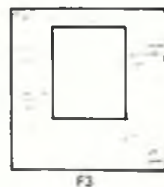
If you cannot get the thin balsa sheet that is required for the ribs, sand down a strip of thicker balsa to the correct size. Now build



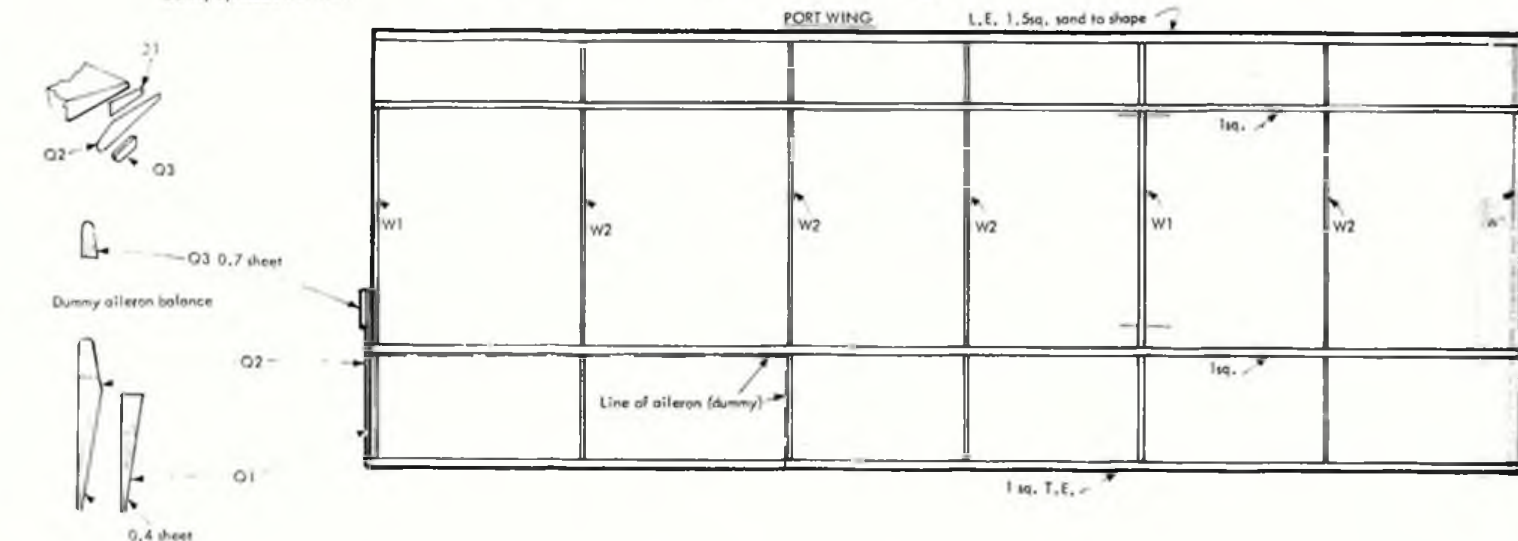
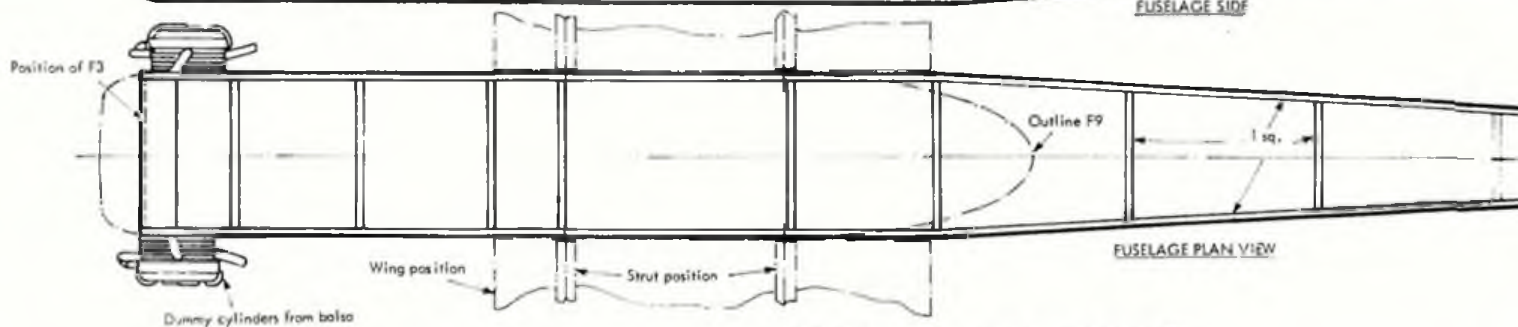
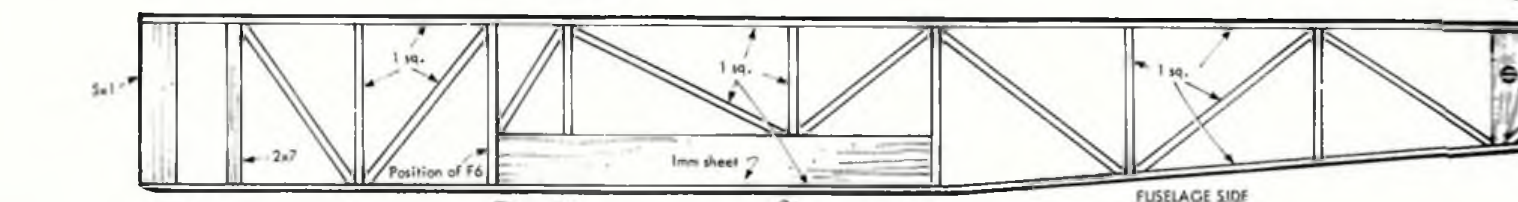
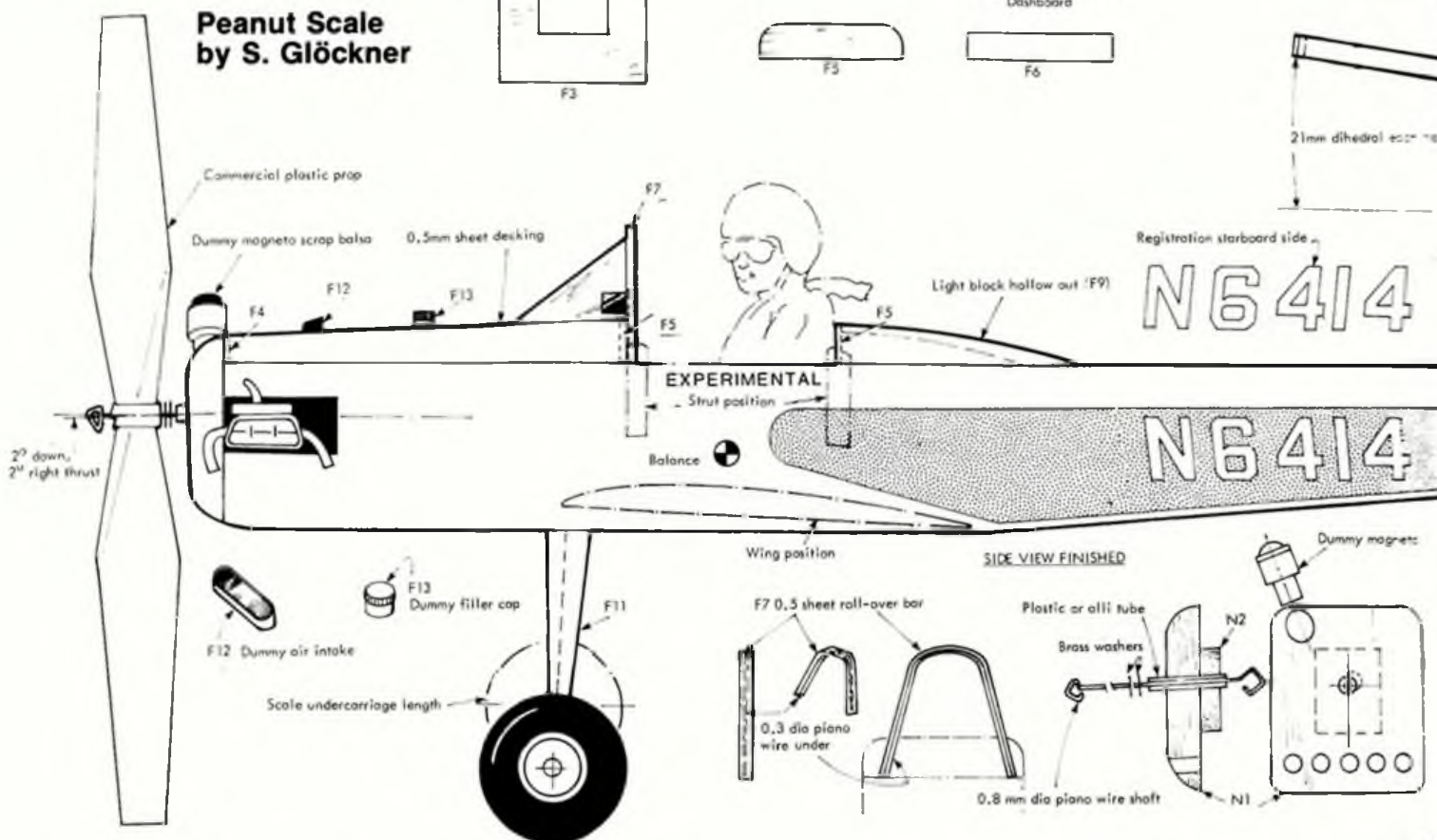
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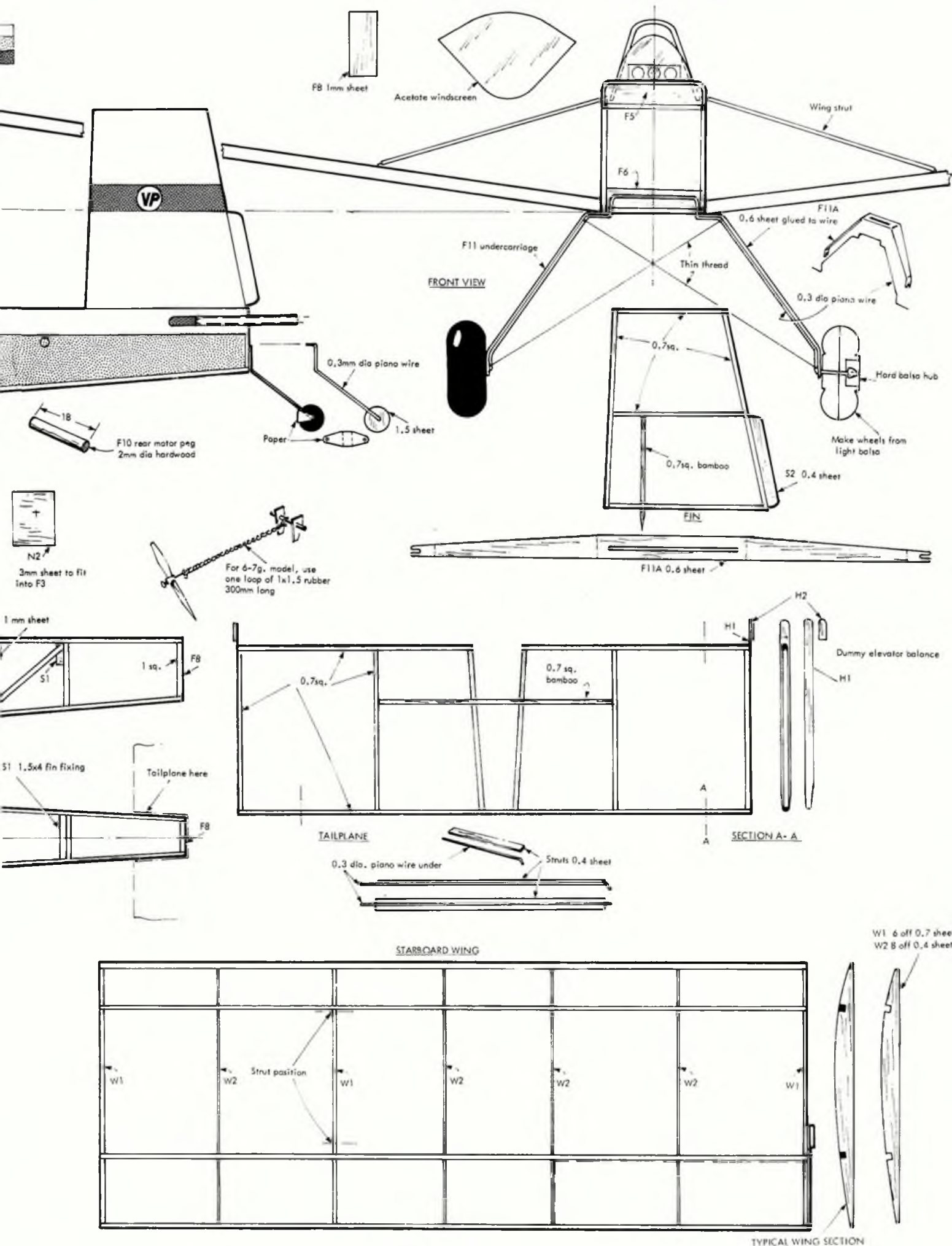
VOLKSPLANE

**Peanut Scale
by S. Glöckner**



COLOURS
White
Dope
Red





ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

ALL DIMENSIONS IN MILLIMETRES

MIND THE LINES

with
Andy Brough

Model of the month 'Hot Rock' by Bob Tucker

This design rose to prominence in 1947, winning two first places, two second places and finally the Open Stunt Event at the U.S. Nationals. Bob virtually learned to fly with this design in early 1947 and then won the main event of the year! Those were the days...

He even flew two at once which says something for the Drone 5c.c. diesels fitted. Might have ended up flying his very own team race! Construction is simple enough but a few comments are worth making.

Wing: The leading edge is described as 1/4in. sq. but drawn as 3/16in. so I've drawn it as 3/16in. and with a fully sheeted leading edge this will be more than adequate. The bellcrank pivot is fastened to the centre rib, shown as balsa but quite honestly I would substitute with 1/8in. ply, that apart, build as shown.



The simple lines and structure of the 'Easy' made it a popular model in the forties. This version powered by 5.3cc Valkyrie in R/C configuration but without throttle.

Fuselage: The crutch is laid out as shown after the motor mounts have been glued to the two long crutch members. Remove the crutch from the board, drill the engine mounting holes, glue on F2 (complete with undercart), tail plane, fin and the tailskid.

The wing should be bolted in place by running the bellcrank bolt through the hole in the 3/8in. by 1/2in. hardwood crossbrace. When all is true, glue the wing in place and add the top and bottom 1/8in. sheeting.

Using a 3in. bellcrank and an elevator horn of 1/2in. should result in a 45° movement either way. The original models were powered by Drone 5c.c. diesels and the ideal modern power plant would be a PAW 19 on a 9 x 6in. prop, the Drone used an 11 x 10in. prop!

Flying: That the model is a good flyer is beyond question as Mick Taylor's example won at Old Warden on Vintage Day and at the Rubery Vintage 'do' last October.

One last point is the direction of rotation, the *Aeromodeller* drawing has not been redrawn to suit UK standards, the original flew anti-clockwise as the designer considered it more natural for a right-handed pilot, but this was unusual for American designs of the period.



New Kits for old...

C.A.P. (Complete-a-Pac) are in the process of launching some kits for vintage control line. Four models are at various stages of completion and should provide a good cross section for us to build. Two are from the *Mercury* range - 'Monitor' and 'Viper', one is from America - Bob Palmer's 'Skyscraper' and the fourth is Ron Prentice's 'Small Fry'.

Keep your eyes skinned for 'ads' for these later in the year. *Aeromodeller* may even be able to offer some vintage control kit reviews! *Aeromodeller* Editor Pete Freebrey is looking for a good condition Amco 3.5 BB

This 'Arkansas Traveller' complete with replica Orwick 73 built by Alan Holmes of Dunham fame...not for the faint hearted!

engines. The engine shown is one of his replica Orwick 73's - should be fast enough!

The other model is a Frank Ehling 'Easy' originally published in *Air Trails* sometime in the 1940's. The model can be built in all sizes from CO₂ to 10cc and is as the name implies - easy to build. The design is a profile model of very simple construction employing a straight wing and sheet tail. This original article showed a drawing not with dimensions but with letters and an accompanying table with 7 basic engine sizes and a complete set of dimensions for each. The CO₂ model wingspan is 12 1/2 in. and the 0.49 to 0.65 is only 50in. which with an engine like the Orwick would prove to be a brisk flier. Alan's example is described as 48in. and is powered by a Valkyrie 5.3 diesel. He does not say how it flies but further information on this design can be found in the February 1984 issue of *SAM 35 Speaks* (Advt!)

Will Do!

I am pleased to report that my 'Kandoo', complete with PAW 2.5 (not them again!) will now - You Guessed it 'bunt'. Regular readers will know of my attempts with the 'Kandoo' to perform this advanced manoeuvre. Well, with the PAW and an 8 x 6in. prop, bunts are a piece of cake and what's more, we even have some line tension... As a matter of interest with a 9 x 6in. prop the performance is much the same as the 1.5cc version with a 7 x 6in. but the 8 x 6in. makes all the difference.

John Noble has suggested that the two of us give a display of 'Kandoo' combat at Old Warden this year but I'm not sure if I could stand the pace! A streamer may prove too much anyway!

Keep those lines taught!

The 5.3cc Valkyrie diesel engine as fitted to the Frank Ehling designed 'Easy' (above left).

- if anyone has one for sale - let him know - perhaps he could be persuaded to build a 'Monitor'...

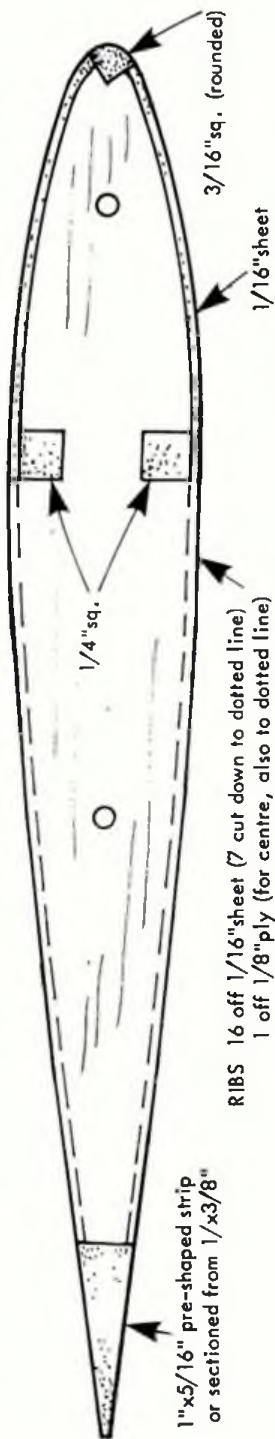
The prototype for the 'Monitor' kit has been redrawn by Ron Prentice and was flown at the Sandown Park Symposium powered by an AM 35. This of course was one of the truly great control line kits of yesteryear and winner in any company even though its looks are perhaps not to everyone's taste.

Pete Russell was a great advocate of the 'Monitor', powered by Amco 35's on 40ft to 50 ft lines, he would blast through the schedule at 50 to 60 mph stopping only to replace the crankshaft every dozen flights or so! A modern version, though with a PAW 19 (useful motors you know...) or Merco 29, would give a great account of itself.

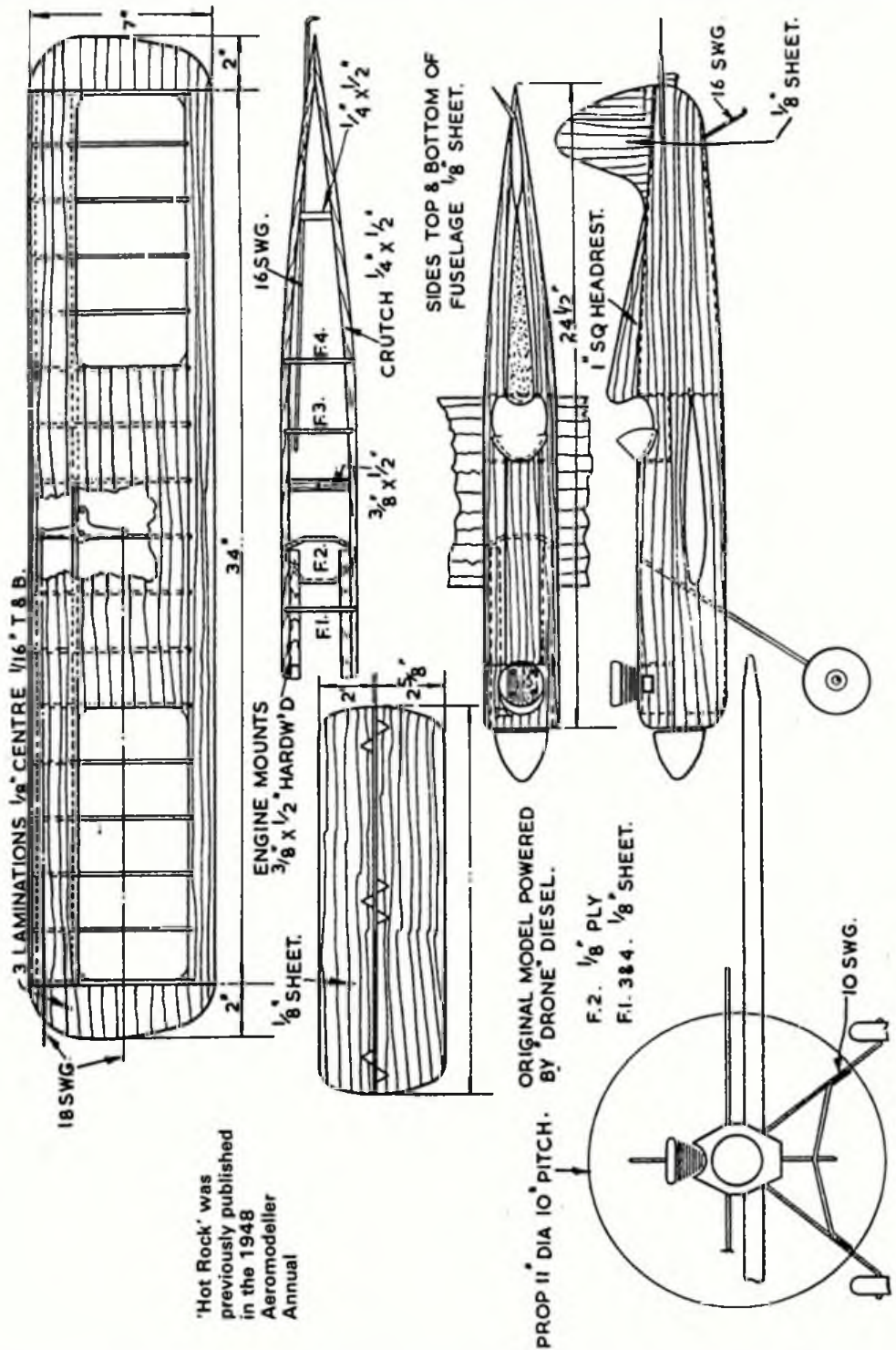
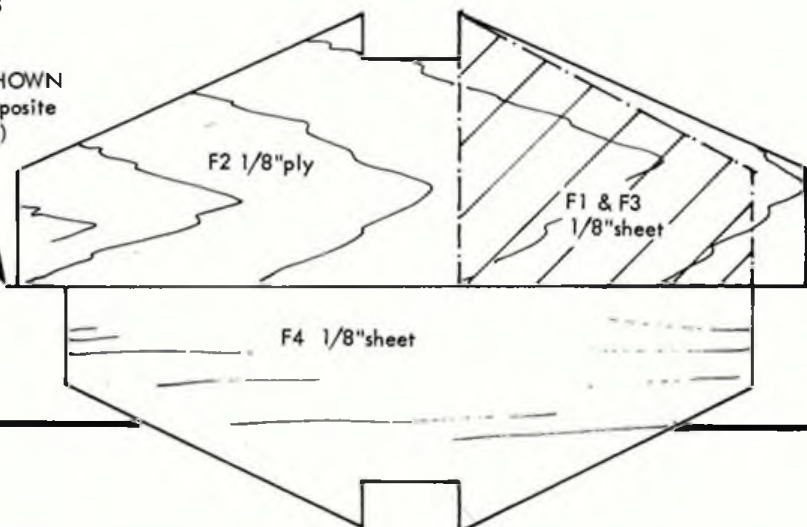
Dunham

Alan Holmes of Dunham Replica Engines fame, sent details of two of his current control line models. One is the speed model - 'Arkansas Traveller' - designed by H.A. Thomas (who also designed a superb free flight low wing model - the 'Southerner' I think) with a wingspan of 30in. Alan says the model is an ideal test bed for new





HALF FORMERS SHOWN
(repeat each on opposite
side of centre line)



'Hot Rock'
by Bob Tucker



SCALE MATTERS

Aeromodeller Scale Day 1985 Old Warden Aerodrome 23rd June

Free Flight with Bill Dennis

I hadn't been to the *Aeromodeller Scale Days* for many years and as I set out on the Saturday in horizontal rain I wasn't too optimistic. However, the miracle happened in this awful summer, and Sunday was sunny and quite pleasant. There was a breeze but the wise ones were flying in the lee of the trees where conditions were good. I'll keep these notes short since this report is traditionally one for the photographs.

The first thing I ought to say is that following my disparaging remarks about John Blagg's 'Lea Richards Annular Monoplane' at the Indoor Nationals, John was here flying it to good effect, so I eat my words!

The Masfield Trophy event was being run by Vic Dubery and attracted a creditable 18 or so entries. There had been rumours of all sorts of adventurous models being built, up to and including the legendary (and preposterous?) Halifax, but they did not materialise!

About 50% of the entry appeared to be Earl Stahl low wingers left over from the other SAM 35 scale event. Although this is simply a duration contest, some of the most realistic flying was done by these Stahl designs -

most notably Rex Oldridge's 'Magister'.

On the other hand, if accuracy of scale and finish had been the criterion, the event would have been won by the Trophy! One twin was entered - the APS 'Lightning' built by Steve Betney and completed in best aeromodelling tradition the evening before. It showed great promise, although I last saw it flying into the trees.

The most complex model present was Rupert Moore's Short 'Scion', beautifully built by Peter Druce. The 'Moore Drive' was



Above, Steve Betney's APS 'Lightning' was finished in black tissue and was entered in the Masfield Trophy event. Finished the night before, it flew well considering the conditions.



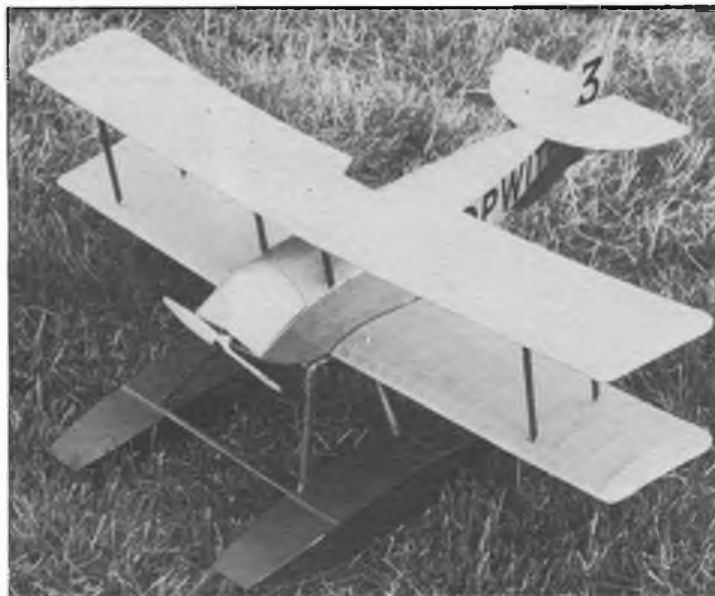
Right, another model in the early stages of flight testing was this Short 'Scion' by Peter Druce. Many models flying in the lee of the woods managed very respectable flights...



Left and Above, P.38 'Lightning' by Richard Falconer flew very well indeed. Its extrovert builder and designer demonstrating novel ways, 1) to wind rubber powered twins and 2) 'the necklace method' of carrying such a model when one's hands are full.



Above, one of the many Earl Stahl designs was this MIG 3, built by Rex Oldridge. Below, this magnificent Grumman 'Gulft Hawk' for CO₂ power, was the work of Doug McHard. From even such a small picture it is obvious that this model almost classes as a work of art!



Left, This Sopwith 'Schneider' floatplane was built by Gordon Hannah and we believe is based on Aeromodeller plan FSP/1019 by John Simmance - 38 inch wingspan and intended for 1.0 to 1.5cc engines.



Above right, CO₂ powered, Roland CII by Mike Hall - a delightful little model with fine detailing...no easy matter when weight is an important consideration. Right, Trevor Simpson launches his fine model of the Howards DGA 8.

found to be less than satisfactory and was replaced by a system using *LEGO* bevel gears which worked very smoothly and quietly. The couple of powered glides I saw indicated a lack of directional stability. Twins have been shown to be perfectly feasible with all forms of power, but a model with no dihedral and a single fin will 'do you in' every time.

I had been given the task of choosing four models for the awards - much more difficult than going through the *SMAE* judging schedule! In the end, I picked Richard Falconer's rubber powered twin P38 'Lightning'. When Richard was finally 'strong-armed' into putting on a meaningful amount of turns it went really well, flying as if on the proverbial rails. In fact it looked as if it would take more rubber and turns without affecting the trim at all and so I would suggest that the similar sized *APS* version would make a serious challenger for next year's Masfield Trophy.



I gave second place to Mike Hall's CO₂ powered *Roland CII* 'Walfisch'. This was the late version with larger fin and attractive green and purple camouflage. With a bit of luck this will be a future *Aeromodeller* free plan (glad I know about that now...Ed).

I have to admit that I was a little disappointed with the turnout of free flight scale models. A few years ago one used to see many more, especially diesel powered, and there was always something spectacular to see, even if it was only brought along for the purpose of posing - an activity well known among free flight scale modellers!

Control Line with Vic Willson

Control line participation at this year's Scale Day at Old Warden (is it really 19 years since the first one?) was confined to about twenty models, but these represented an interesting selection of prototypes and several models not previously seen in public.

Probably the most eye-catching model was the *Short* 'Mayo Composite', comprising of the 'Maia' and 'Mercury' seaplanes, both



powered by twin diesel engines. The larger 'Maia' having two PAW 19's and 'Mercury' being powered by two PAW 09's.

These aircraft were the unusual choice of the Leddy brothers from the Guildford area (who incidentally are now members of the Three Kings Aeromodellers - are there any control line scale flyers left, who aren't!) but unfortunately the sight that everyone was waiting for, i.e. a tandem take-off followed by separation in flight, did not take place due to the strong gusty wind, which prevailed all day.

However, 'Maia' did make a solo flight and after a lengthy run on its take-off dolly it flew very impressively, the free wheeling outer props giving a fine impression of having all four engines running. The landing on grass being an equally graceful slide to a halt.

The Leddy brothers had also brought some other unusual models including a 'Dakota' and a Waco 'Hadrian' glider, but on each attempt to tow the glider into the air, the 'Dakota' failed to reach take-off speed. Perhaps it would be okay on tarmac?

In addition they had two examples (large and small) of the Japanese Yokosuka MXY7 'Ohka' rocket propelled suicide bomb. Despite the heroic origins they had a rather staid performance as a model (Dynajet needed here?), albeit the larger of the two did attempt the scale suicide attack phase! Another impressive new model (so new in

Left, Jym and Dave Leddy, always prolific builders attempted to demonstrate the towing of the 'Hadrian' glider by 'Dakota' power... unfortunately the ground was just not 'bowling green' flat enough to enable the duo to get airborne. Below, another of Jym and Dave's models the Japanese 'Ohka' powered by an ancient AM 15.



Right, Chris Bradford's 'Dakota' (from last month's Scale Matters) seen here on final approach with both engines throttled back - beautiful flyer.

fact that it had not been test flown) was Geoff (the Red Barrel) Burkett's Hawker 'Fury'. This 60in. span 1/6th scale model is based on Dennis Bryant's R/C plan and is powered by a Merco 61 (ex Fokker DR1 'Triplane'), covered in nylon and painted using aerosol car paints.

The 'Fury' is always an attractive subject and this model is no exception, finished in overall silver with the markings of the Advanced Training Flight, RAF College Cranwell it is an impressive sight both on the ground and in the air.

After some engine testing and

adjustments Geoff took the plunge and test flew it, despite the wind. Watching from some distance it appeared to be rather 'hairy', the flight pattern being akin to a roller coaster, Geoff however managed to get it down in one piece. Undaunted, more lead was strapped to the nose, to bring the Centre of Gravity forward and several more flights followed, each of which unfortunately ending with a somersault, eventually breaking the fin, and causing other light damage.

55ft. lines were used for these flights, but in calmer conditions, 65ft. would be more



Left, the Short 'Mayo Composite' another design by Jym and Dave Leddy. The long awaited event with both brothers holding handles and the models roaring across the grass...didn't happen! The weather was just not calm enough to take the risk. Below and above, but at least the 'Maia' did take to the air - solo - with all engines running smoothly (the two outer props are dummies.)





Above and right, Geoff Burkett's Hawker 'Fury', Merco 61 powered, covered in nylon and with a very realistic silver finish from car aerosol spray cans - he did not let on how many cans though!



Right, the crew have disembarked and Chris Bradford's 'Dakota' waits to be fuelled up for another mission. The model flies very well indeed, although Chris is having some trouble with vibration at low speeds on the inboard engine. Below, Bernard Sexton's Laird LC DE now a tried and tested filler at scale outings...



appropriate and allow the model to fly more realistically.

The third new model was Chris Bradford's large 'Dakota' (described recently in this column), now finished, apart from a few small details, it had been test flown earlier in the week and performed at Old Warden in the proficient manner that one has come to expect of Chris and his models.

The all-up weight (including two Nicads and 4ozs. of ballast) is a very creditable 8lbs. 6½ozs. The promised parachutists will be installed later, but unfortunately there is insufficient room in the nacelles to incorporate a retractable undercarriage, which would have been the finishing touch for this fine model.

As I had been invited to 'judge' the control line section this year, I did not take a model (well it's a better excuse than I've had for some time!) and therefore I was able to take

a good look at *all* the models. Apart from the few described previously there were some other well-known examples, such as Wal Cordwell's 'SPAD', now repaired and flying, after its earlier disaster, Bernard Sexton's 'Laird LC DE', Patrick Roberts' 'DH 'Chipmunk' and Mick Staples' 'Miles 'Hawk'. In addition, there were examples of Pitts 'Special', 'Hurricane', 'Spitfire', 'Fokker DR1 'Triplane' (two), 'Fokker D8 and several profiles, including a couple of twins.

After much deliberation, I gave the Jack Carter Memorial Trophy (for the best biplane) to Geoff Burkett's 'Fury' and the other control line awards as can be seen in the results table.

As usual everyone seemed to thoroughly enjoy themselves, despite the stiff breeze which persisted all day. As flying stopped in the evening the talk was of plans for next year - such is the unique atmosphere of 'Scale Day' at Old Warden.

However, as far as control line is concerned, I must say that it is noticeable how the scene has changed in the last 10 years; during the 70's, in addition to the regular competition flyers, there was an overwhelming majority of 'sport' flyers who would make the pilgrimage to Old Warden, but now this activity has died down to a handful (are they all flying R/C or is it a 'dying hobby as some would have us believe?).

Results

Free Flight

1 Richard Falconer	P38 Lightning	Rubber
2 Mike Hall	Roland C2	Co2
3 John Blagg	Lee Richards	Rubber
4 Rex Oldridge	Miles Magister	Rubber

Control Line

1 Chris Bradford	Douglas Dakota
2 Bernard Sexton	Laird LC DE
3 Jym and Dave Leddy	Short Maia
4 Wal Cordwell	SPAD

Radio Control

1 Tim Angel	Cierva C30
2 Jeremy Shaw	Beech D-17
3 David Chinery	AW Atlanta
4 Richard Crapp	DH 89 Rapide

Best Shuttleworth Subject

Gordon Whitehead	Avro 504 K
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J. Carter Memorial

Geoff Burkett	best C/L Biplane Hawker Fury
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Masefield Trophy

SAM 35 F/F rubber scale		
1 Bob Walden	Albatros DV	137.8
2 Don Knight	Miles Magister	124.8
3 Bob Walden	Miles Magister	92.3

Why Control Line?

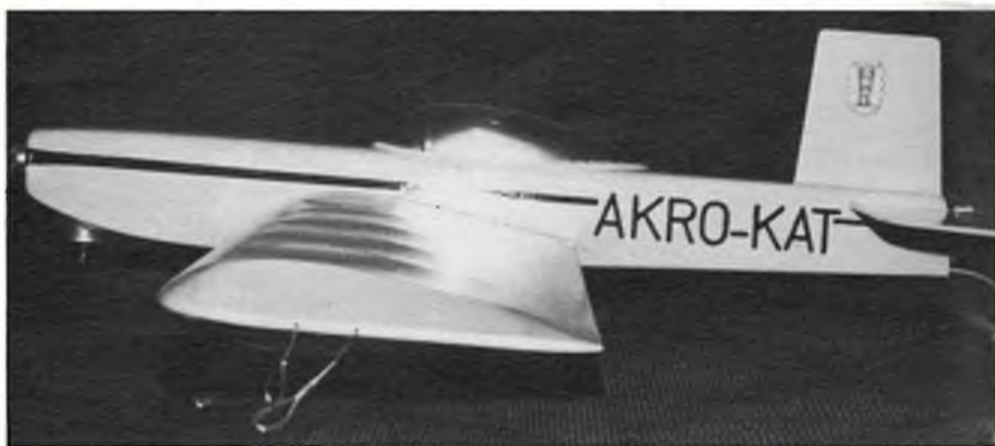
On a fun/£ basis Control Line must be hard to beat; a model like 'Akro-kat' can be built for about £25 *including engine and control system*. You would pay more than that for a R/C model kit and still have to pay at least £80 more for engine and radio!

C/L models are easy to build: the components are durable enough for the most fumble-fingered to handle without 'dissolving into dust' and the skills learned can be passed on to other branches of the hobby if/when interests change or finances permit.

Almost any patch of grass (playing field) is a potential flying site and a pint of diesel fuel lasts all week-end.

For the budding designer, almost anything will fly (even if not very well) and, once again, skills learned stand you in good stead for later projects in other areas.

The scope for C/L models on the contest scene is wide, in short C/L is good in its own right as well as being an excellent



Above, the 'squared off' lines of 'Akro-kat' make for a straightforward no nonsense model that makes an ideal trainer for the novice stunt man. Below right, an earlier 'Kat' with club stunt trophy...

AKRO-KAT

Do you want to move into control line aerobatics? Then build this no frills stunter by Dave Cowburn.



The wingspan is not enough to cause transportation problems but the area is large enough to provide good flying characteristics...

introduction to other areas of model flight. Many of you wire-less types don't know what you are missing, why not build an 'Akro-kat' to play with when your frequency is full or your batteries are flat?

'Akro-kat' is *tame* enough for a novice to fly safely yet aerobatic enough not to be boring for the more competent pilot - all a 'sport' (ie fun) model should be!

The model

A trainer with aerobatic capability may at first sight seem to be a contradiction in terms. However, experience has shown that a model of this type is in fact much easier to fly than many traditional trainers which are often over-weight and under-powered and require constant 'nursing' from the pilot to remain air-borne. High wing loading often causing an abrupt return to earth at the slightest mistake on the part of the (inexperienced) pilot.

A well developed racing model is better but in this case dizziness becomes a major problem for the trainee pilot and once again

the earth has an unfortunate habit of getting in the way.

The easiest models to fly are undoubtedly the *full-stunt* models, being smooth, responsive and slow. Their only drawback being their inherent fragility and long building time. Improve the strength and reduce the building time and, to my mind, you have the ideal trainer.

Properly designed (and built) it will fly level easily without having to be coaxed into the air, and its inherent manoeuvrability will allow the pilot the chance to recover from the kind of desperate situation in which a *solid* trainer would be removing

divots from the flying field. Also, the model will still be interesting to fly once the first hurdles of C/L flight have been crossed.

With these thoughts in mind 'Akro-kat' was designed. A constant chord wing was chosen for simple building, flaps being deleted from the *full-stunt* specification as the model would not be required to perform square manoeuvres. A simple box fuselage was chosen for several reasons, firstly they look better than a profile (and most people like their models to look like a real plane); secondly they need not be more difficult to build than a well developed profile fuselage (e.g. Goodyear racer with ply doublers, spruce spine etc.); thirdly the model was thought to be a *building* trainer as well as a *flying* trainer.

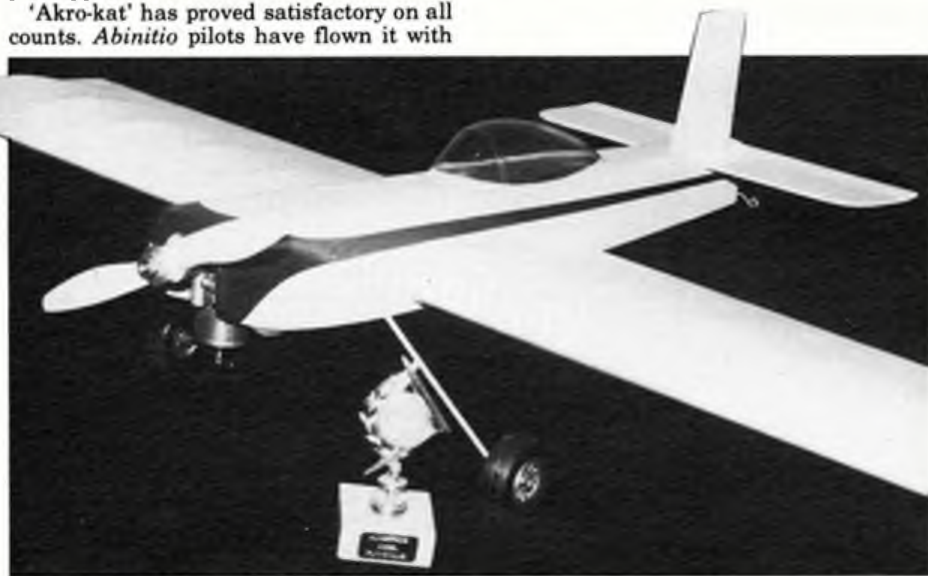
Engine size was set at around 2.5cc as a model of this size will fly on standard F.A.I. lines (52ft 3in./15.92m) with lower rotational speed for the pilot than a smaller size model and engine which has to fly on shorter lines and causes dizziness for the pilot. The 2.5cc engine is also likely to be of more use for later models and will not necessarily be more expensive to buy than its lower capacity counterpart. A 2.5cc P.A.W. was therefore chosen for the prototypes.

'Akro-kat' has proved satisfactory on all counts. Abinitio pilots have flown it with

Adhesives

For most gluing jobs I like to use Aliphatic resin, a pale yellow carpenter's adhesive. It has a faster *grab* (i.e. is stickier) than PVA, while having a sufficiently long working time to permit the working of large areas (good when laminating). When dry it is somewhat *crisper* than PVA, and sands down more easily.

For highly stressed areas I tend to favour epoxy adhesive. Other glues may have

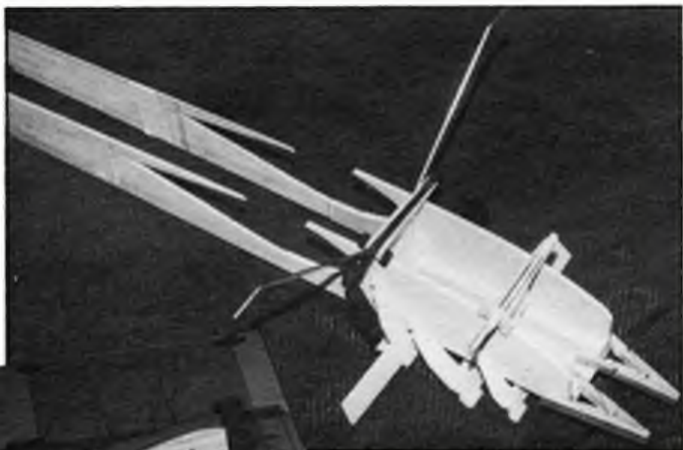


success (with a bit of dual-control for the first few flights) while more experienced pilots can perform all the normal *round* manoeuvres. In essence, a good 'sports' model well able to cope with the rough and tumble of club field flying. It should appeal to many C/L pilots, and perhaps to some of our 'wire-less' brethren too.

limited and specialised application but are not strictly necessary except when speed of building is of utmost importance.

Building

- 1 Laminate leading edge (L/E) and trailing edge (T/E) strips. Laminate 0.8mm ply doublers to fuselage sides as



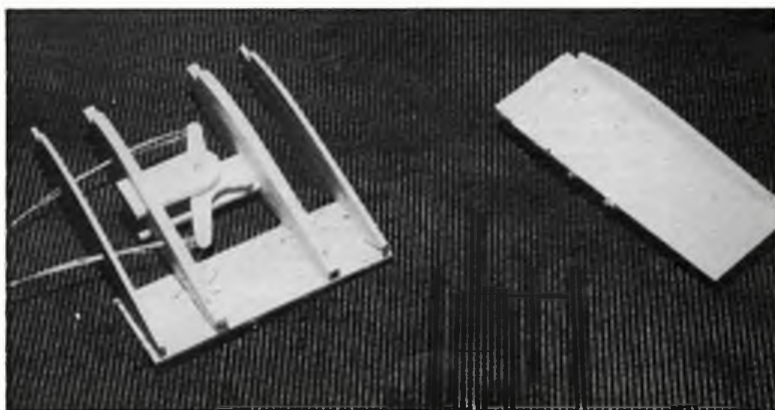
Right, two 'sections' showing bellcrank mounting and inboard wing tip with lead-out 'snakes' sandwiched between two 1/8in sheet lips. Left, wing nearing completion note leadouts already in place.

Left, fuselage sides are clamped and epoxied to the 'power pod' (stage 10). Make sure you do this on a flat surface to ensure wing cut outs are square.

- 4 Assemble *power pod* of bearers, bearer top plate (0.8mm ply) and formers. Check all is square and clamp carefully while adhesive (20min. epoxy) sets. Drill for engine mounting.
- 5 Plane and sand T/E to section (razor plane) and assemble 6mm centre section ribs and bellcrank mounts with bellcrank and leadouts (double heavyweight *Laystrait*) fitted.
- 6 Either build up starboard tip and three rib bays over the plan then move partial assembly along to complete rest of wing over plan, or, trace off tip and three rib bays to extend the plan to the required span before starting to build. Assemble the wing over the plan, packing up centre ribs by 2mm to allow for centre section (C/S) sheeting. Mark off position of leadouts onto port wing ribs and drill 6mm holes for lead-outs, elongating as necessary with a round file.
- 7 Fit *overlength* push-rod (retained by 'Z' bend) and C/S sheeting.
- 8 Carve, plane and sand the L/E to the section shown on plan, blend in tips and give an over-all sanding. Cover the completed wing with *Solartex* (recommended) or nylon. (*Solartex* covering instructions are supplied with the material and are quite explicit; nylon should be stretched tight over the wing and held with *many* pins, stick with dope brushed *through* the fabric.)
- 9 Carefully mark out one fuselage side using the top edge as a datum and your rib template to help mark out the wing cut-out. Hold sides back to back when cutting out and use a fine saw to cut the wing seat where there are ply doublers. The wing seat is, perhaps, the most important part of the whole model as any mis-alignment or incidence incorporated at this stage will effect the flying qualities.

Cut free and save the small triangles of wood at the rear of the wing seat to assist fitting the wing.

- 10 Epoxy fuselage sides to power-pod clamping together over a flat surface to ensure a *square* structure. Pin this unit down over the inverted plan and carefully fit the wing. Replace the triangles cut free and add F3 and the 3 x 6mm 'longerons'.



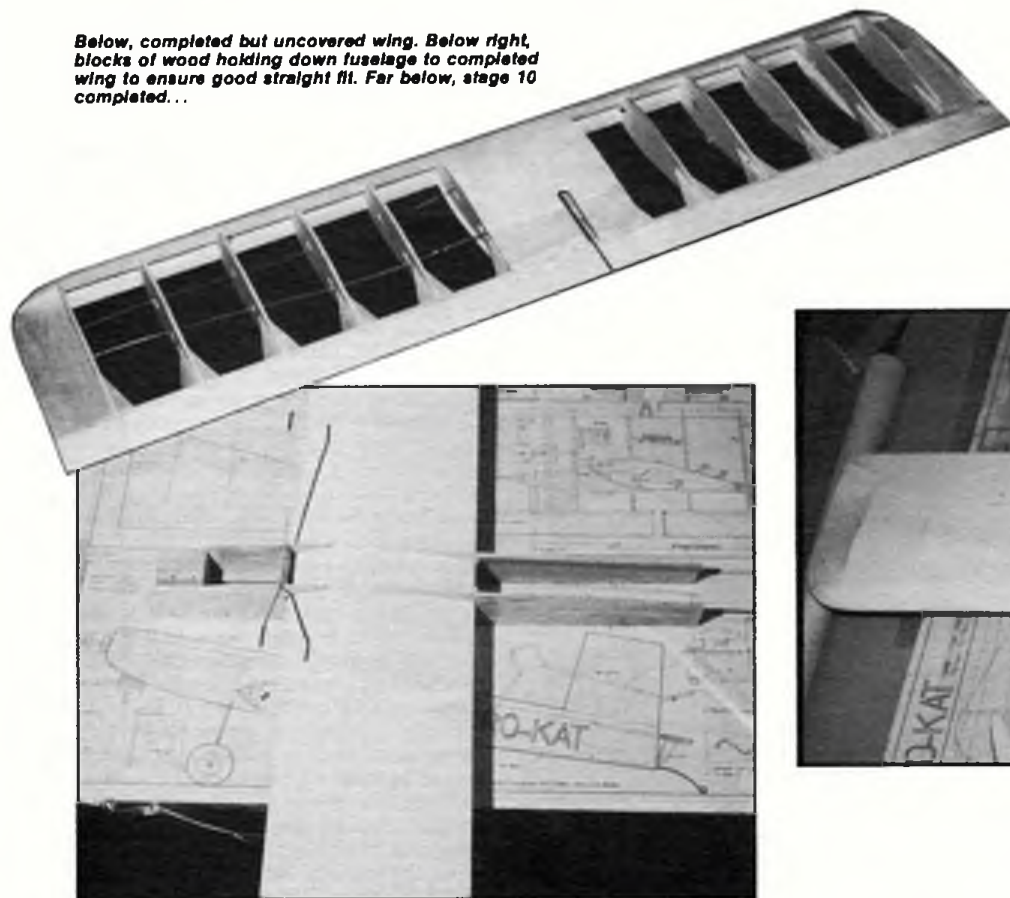
plain rectangular blanks and weight down between boards to keep flat.

- 2 Cut out formers F1 and F2, bend the undercarriage (U/C) and epoxy between two F2s (cut grooves into the formers for a neat fit) sewing together with strong thread.
- 3 Cut out the wing ribs, bellcrank mounts etc.

- 11 Make up the tailplane and hinge the elevator by your chosen method. Fix the elevator horn and then slide this unit into place at the rear of the fuselage. Bend push-rod to length and, if necessary, adjust for true neutral by sliding tail unit backwards or forwards slightly.

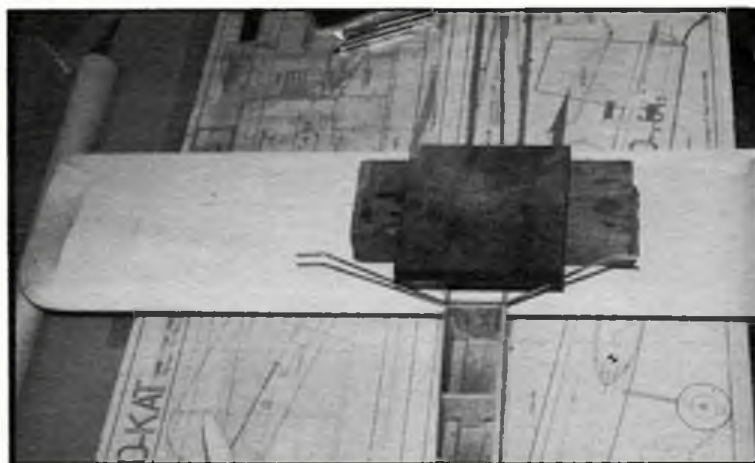
Pin tailplane in position on board then

Below, completed but uncovered wing. Below right, blocks of wood holding down fuselage to completed wing to ensure good straight fit. Far below, stage 10 completed...



Flying

If this is your first attempt at control line flying you would be well advised to seek the help of an experienced C/L pilot for a little *dual-control*. We in Humberside M.F.C. would be pleased to see anybody in the Hull area wishing to take up this fascinating hobby and your local library should be able to give you a contact address for a club near you (or contact the SMAE). If you have to 'go it alone' the following notes may help.



Become thoroughly familiar with your engine, run it 'on the bench' (screw it to temporary bearers, **DO NOT** clamp it in a vice by the crankcase) with a few tanks of fuel off the model before you even go to a flying field.

The tank pipes are arranged for the conditions which exist in circular flight when the fuel is subjected to centrifugal force and you will have to hold the model at an angle when 'ground running' to get all the fuel out of the tank.

On a suitable smooth grass area, such as your school playing field (ask your head teacher first!), lay out your lines and hook up the connections. Check lines are straight and free from 'kinks' and that the elevator moves easily and correctly in response to handle movements (i.e. *up* with *up*, *down* with *down* and exactly level when you point at the model).

Until confidence, and skill, is built

pull in fuselage sides to line indicated on plan and glue to tailplane. Now sheet over fuselage bottom with 2mm balsa cross grained and fit tail skid and mount.

- 12 Remove model from board and fit engine. My preferred method is as follows:- Place mounting bolts through pre-drilled holes from top of bearers with a smear of epoxy on their shanks, add alloy plates to underside again glued with epoxy.

Put the motor in place and add washers and nuts, screwing up firmly to hold all in place while the epoxy cures. The engine may then be removed by slackening the nuts, the bolts being firmly embedded in the bearers and remaining as mounting 'studs'.

This is one of the most reliable methods of mounting that I have found so far. The only drawback being the need to use a 'nut driver' or a box spanner to get to the nuts.

- 13 Temporarily fit the top block, squashing down onto the bolt heads and marking in the taper of the rear fuselage. Remove from model, counterbore for bolt heads and carve in the taper at rear of block.

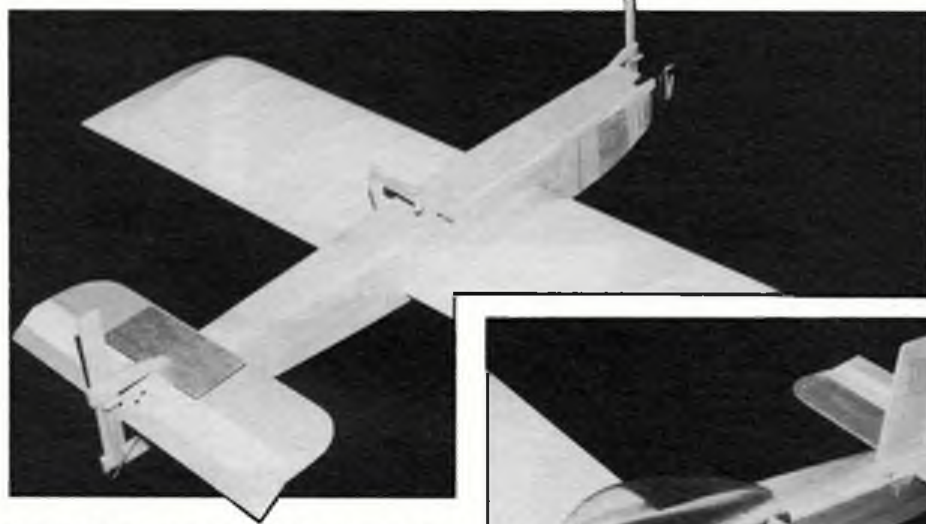
Round off top edges at rear as the tailplane makes this difficult with the block fitted. re-fit top block, after cutting slot for fin, and carve/sand to shape. Finish sand whole fuselage (protect wing roots with a wrapping of tape) and fit fin.

- 14 Dope all bare wood and cover with lightweight tissue brushing more dope through the tissue to hold it in place. Build up a satisfactory finish with further coats of dope, sanding down as necessary to remove 'fuzz' and loose tissue. The tailplane is easier to cover if the elevator horn is removed.

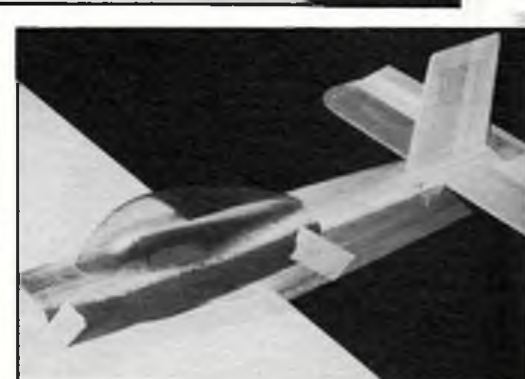
- 15 Fit the cockpit canopy by carefully trimming with sharp scissors and bedding down onto a piece of abrasive paper held over the model's top deck.

When a satisfactory fit has been achieved a groove is cut into the top deck around the perimeter of the canopy. The area within this groove is painted black and the canopy glued in place. Mask off the canopy about 2mm above the joint line and cover the joint line with strips of tissue and dope to form a neat fillet.

- 16 Finish the model by spraying lightly with primer (wing should not need priming if covered in Solartex) and colour scheme of your choice. Leave for a few days for the paint and transfers to dry before fuel-proofing then fit wheels, tank, engine etc. and form and solder loops on the lead-outs.



Above, stage 13, top block fitted and tape at wing root to protect wings during subsequent sanding of fuselage. Right, abrasive paper taped to fuselage to enable canopy to be sanded to correct fit.



up...only fly in calm weather, but try to organise things so that the model will run round the down-wind side of the circle as it takes off so that speed is built up to *penetrate* the wind on the up-wind of the circle. Wind should be on your *right* cheek as you wait for the model to be released.

When completely satisfied that all is in order, fill up the tank, start and tune the engine. Peak out the settings with the nose of the model raised, this will simulate flying high, when you *need* peak power, and should give a slightly rich setting in normal level flight.

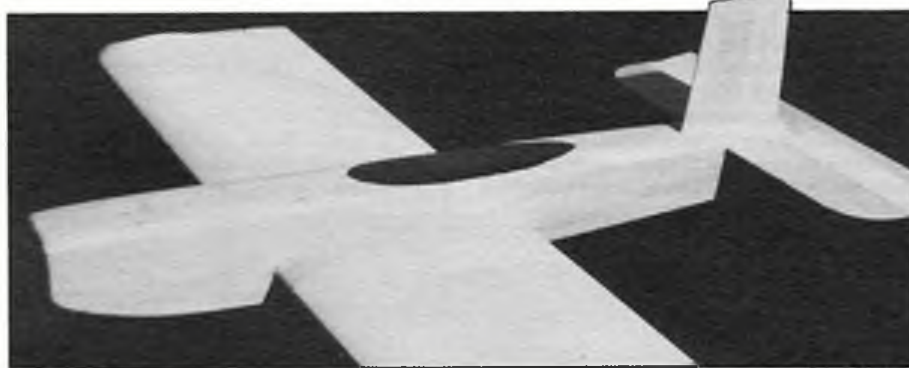
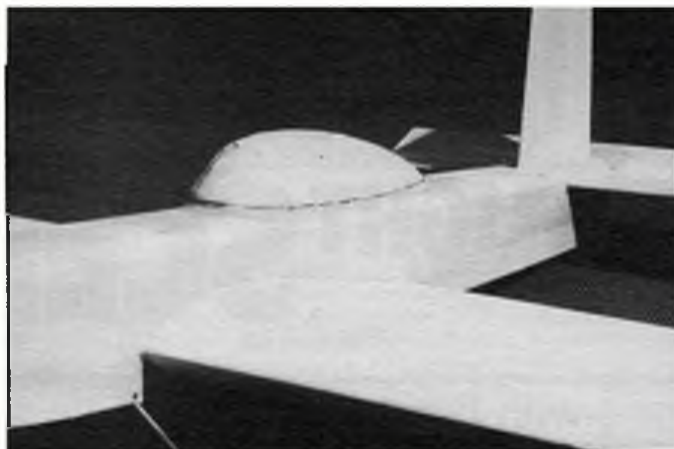
Place the model on the ground tangential to the flight circle and have your (one) helper hold the model back by hooking his/her fingers round the L/E of the tailplane while squatting on the ground behind the model.

Now *walk* to the handle, pick it up and step back gently to take up any slack in the lines. Wiggle the elevator as a final check that the controls are correct with the 'up' line to the top of the handle, raise your left hand above your head to signal readiness to your helper, hold in a *little* up elevator and point to the left with your left hand to signal release (during this period a diesel engine may have 'hardened off' but unless badly set to start off with should recover as the model accelerates in the air).

The model should run forward a few metres and bounce into the air. Don't let it climb too high or too steeply but try to avoid 'over controlling' which would probably push your pride and joy into the ground! Aim at maintaining level flight at about 3 to 5 metres (point your arm at the desired altitude while keeping your wrist stiff (rather like aiming a pistol) and the model will automatically level out where you want it).

When the engine finally stops - the tank shown is quite large for an economic diesel, about right for a glow - simply let the model

Below, paint inside area where canopy will be fitted. Right, canopy is masked off after fitting, and a fillet of tissue built up around the base, stage 15. Far below, two suggested variations to 'Akro-Kat' - only the top decking and canopy are affected...



glide down by itself and 'run aground' while you keep pointing at your pre-set altitude (continue to rotate with the model).

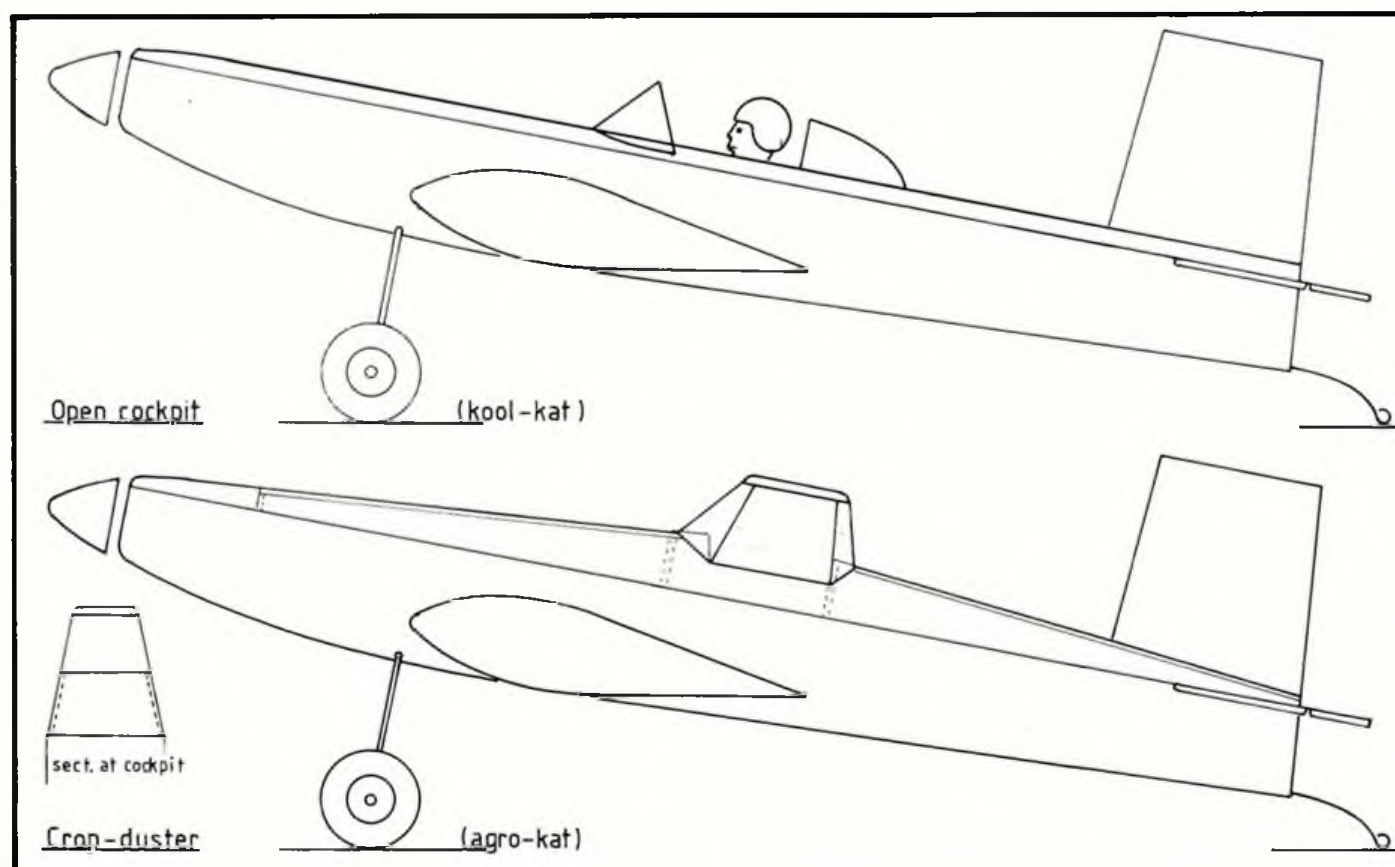
As experience is gained landings may be improved by 'flaring out' as the model nears the ground but don't try to hold it off too long, as once speed is lost so is control and the model will probably stall (SPLAT).

Dizziness can be a problem for early flights, as can wandering about. The former is helped by keeping first flights *short* (you don't have to fill the tank to the brim) and by focusing your eyes on the model, try to ignore the background. The latter by having a clear marker for the circle centre - place it a couple of metres back from the handle

when laying out the lines so that you move away from your flight box and helper when the model becomes airborne, it is most embarrassing to have an otherwise perfect flight terminated by hitting the flight box when gliding in to land!

Brief your helper as to the potential dangers involved, a kilo of model flying at about 100 kph will raise quite a large bruise! Ask him to keep all spectators out of the flight circle (you will not be able to see anybody who might be in the way until it is too late to take avoiding action).

Above all - enjoy yourself. C/L rules OK...OK



FREE FLIGHT SCENE

with Dave Hipperson

Super Nogs

The top three placings in the Open Power fly-off at this year's Nationals are now a part of aeromodelling history, of which many will talk for years to come. Tom Smith has been at the forefront of innovation in Open Power since the late 50's when his 'Nig Nogs' made such an impression, culminating in his winning the Sir John Shelle, Hamley and Frog Senior Trophies in 1960.

The plan of the original 'Nig Nog' then appearing in *Aeromodeller* March 1961. When he returned to aeromodelling in 1974 it was with the 'Super Nog Mk 1': 80 in. span, 550 sq. inch wing, 200 sq. inch tail weighing 38oz. with a K & B 40 Schnuerle.

This prototype had a glass-fibre tube fuselage but the Mk 2 models that soon followed used rolled balsa tubes, as they do now, with provision for the new, rear exhausted, rear valved, K&Bs. This is where his sons Tony and Jeff joined him. They built one each of the Mk 2's having only experience with 1/2A up until then!

In 1978-79 these models were replaced by the Mk 3 stretched to 90in. span with wing area now 616 sq. ins, tail still 200 and weight only slightly up at 43oz. The Smiths went into production; they built nine - three each! Most are still flying and it was these that were flown at the 1985 Nats. In the fly-off Tom and Tony still used Mk 3's but Jeff chanced his arm with a new Mk 4 - it paid off.

The Mk 4 is even larger: 95in. span, 686 sq. inch wing, 250 sq. inch tail but *lighter* at 42oz! this is achieved by much modification to the structure and the use of carbon fibre and even mylar covering on tail and fin. The aim being to lighten extremities and increase pitch damping to benefit both transition and glide. The Nationals is only the second time a Mk 4 had been used, the first being at the London Gala last August where Tom's model won with a 9 minute plus fly-off...

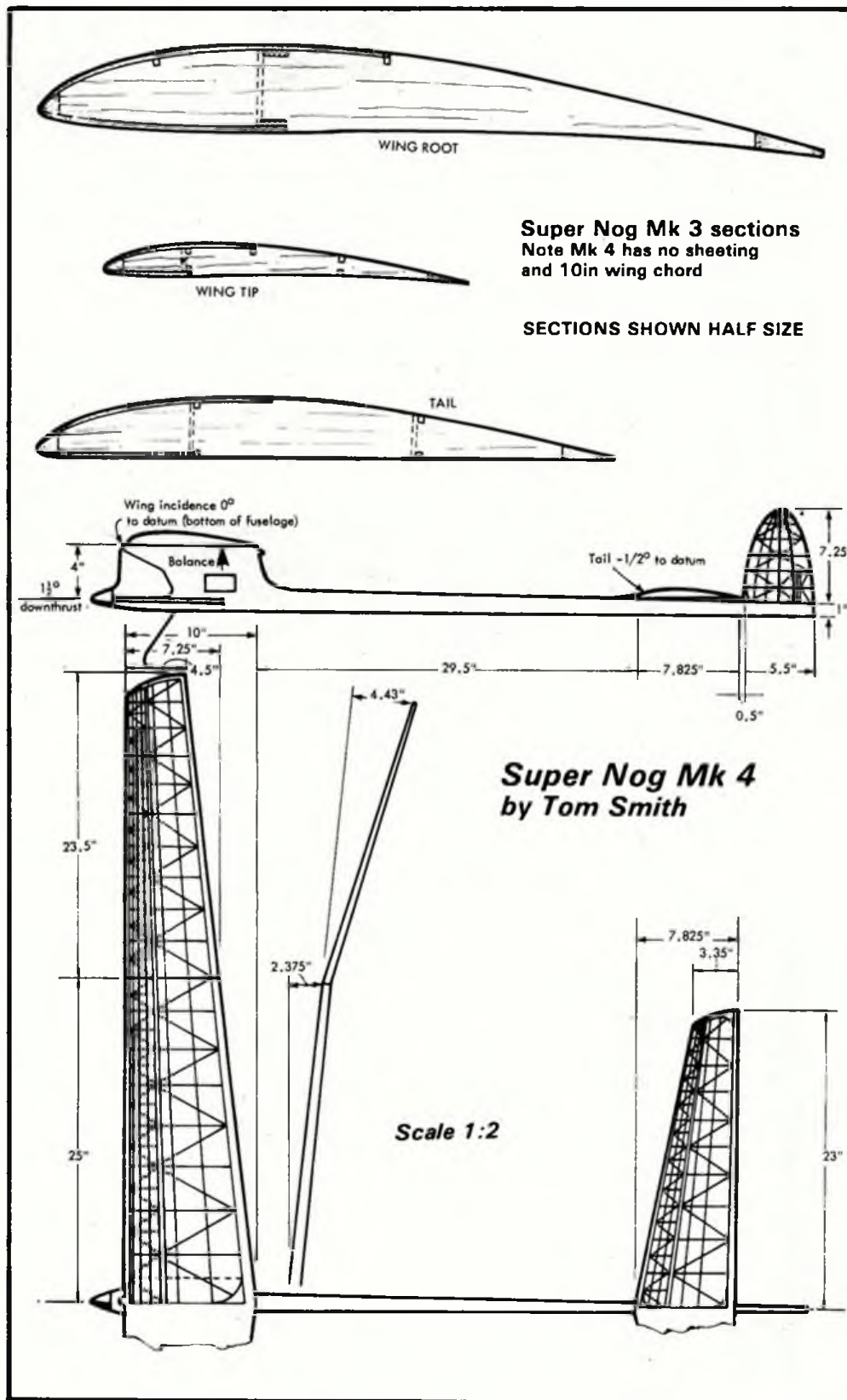
Tom and his sons do very little flying either together or separately away from contests. Tony is married and lives near Ipswich, and Jeff is finishing his final year at Sheffield University in - Mechanical Engineering. Tom points out that once set-up, very little trimming is actually necessary and they now, even have the initial 'sort-outs' down to a half dozen flights.

Much of this is because of painstaking documentation of trim settings for *all* models throughout the development stage. They also set great store by their method of jiggging the models when not in use. Jigs comprise 1in. strips of 1/4in. Ramin onto which further 1/4in. square strips are stuck, to precisely fit the trailing edges. The wing jig of course being constructed to also allow for the dihedral.

They are one piece wings so they have to

be one piece jigs - we are talking big model boxes here! All flying surfaces are then stored trailing edge down - (which is incidentally how you all ought to store your wings - even if not jiggged). The Ramin jigs making a useful seat as well as maintaining a perfectly straight trailing edge.

Using this system the Smiths have found it possible to dispense with check flights when time or conditions don't permit,





Above, Open Power fly-off winner at Bristol and West's Woodbury Weekend a mighty Super Tigre 51 in this design by Tony Hall.

although they still prefer to check if they have a chance. Certainly Jeff's fly-off model had not been flown since Easter and was not checked before the Nationals fly-off so the system worked...

The K & Bs turn homemade 9 x 4ins. Tornado type glass fibre props, and are run on a frightening concoction of no less than 65% Nitro, 20% methanol and 15% ML 70 Synthetic oil.

The auto functions go one step further than anyone else I know: The modified camera timers operate three discs activating first the rudder about 1½ seconds before the motor cuts and releasing it, not into the glide mode, but a 'transition' setting. Engine flood off and brake then follow simultaneously and the tail goes from power to glide setting and the rudder from transition to glide setting 2.5 secs after the motor cut. This allows separate control to adjust the transition period specifically rather than just letting it occur somehow between power and glide.

My drawing here is little more than an outline for the very good reason that no matter how detailed; no one in their right mind would attempt to build from it. The overall dimensions and proportions of course are interesting for comparison purposes.

It would be a considerable understatement to describe this model as *anything* but highly advanced and the Smiths have logged so much data over the years that they have reached a stage where flying, for them at least, is a relatively straightforward business. I say this because when I asked Tom for the details of the model he was kind enough to furnish me with, as well as a complete full size Mk 3 plan, an eight page booklet detailing the trimming technique and jiggling...

All this is now available to anyone direct from Tom. I would recommend those venturing into Open Power even for the first time to invest in a plan and book if only to marvel at the thought that has gone into this ultimate state of the art machine and discover tricks about trimming which will be invaluable even if you eventually build a different model entirely.

All available from Tom Smith - 22 Richmond Avenue, Wrea Green, Preston Lancs. PR4 2MH £5.50 plus postage.

The Sun shines but...

Last month's issue carried the Nationals report but even to a hardened contest flyer like myself there is much more to this meeting than just the results. I felt a little of the old time feel from past, and

from its prop-hanging, near vertical attitude at motor cut and into the glide...

General use of VIT (Variable Incidence Tailplane) came still later, although I have seen mention of it on European models as far back as the early 50's. It was the front runners in FAI around the mid. 60s that ironed out the bugs properly. It was discovered that an FAI power model rigged with more than the usual decalage (that's the difference in incidence between wing and tail) and a much further forward CG would transition from power and then glide, far better than the same model set-up as popular at the time with trailing edge CG and almost zero incidence.

The problem was that this more stable configuration looped all over the sky when any reasonable power was applied to the



Left, Chris Strachan prepares his winning 'Lanzo' at Woodbury, he took a risk by winding without using a 'winding tube' but got the model launched very quickly - and into the best air...

affectionately remembered Nats, return however briefly, at this years meeting.

Naturally this came in the middle of the second day when the sun shone and temperatures soared. Even when the rains came, Open day felt an occasion. So I was disappointed to hear the SMAE PRO advising the few members of the National Press that attended that the 'real' contest was the final day for 'World Championship Class Models'...

Certainly the numbers of entries did not bear this out - but if the organisation that day could at least have been of World Championship Class it might have helped. Perhaps it is time we stopped pretending that every FAI event was a World Champs and re-constructed the rules so that CD's have a better chance of staying within them. They are obviously too complicated at present...

Wouldn't it be better if we scrapped rounds, lines, poles, hooters and all the other paraphernalia. When it goes wrong, inevitably the shouting starts. It leaves a bad taste. From the Open Day this year we have the tremendous achievements of the Smith family in Open Power and Bob Wells' long overdue victory in Open rubber to remember - they are good tastes!

What is V.I.T?

It was not many years ago that so much as an auto-rudder was considered rather 'pansy'. John West's magnificent version of George Fuller's 'Dixielander' around the early 60's never used one. On FAI models they were found helpful if only to kick the heavy, usually slow moving model, over

climb. VIT is a way of reducing the decalage for the climb and re-establishing it again at the end of the run in time for the pull out and glide.

This is now universal equipment on all high performance power duration models, and with them comes a popular misconception that the tremendous climbs seen from the experts would be impossible without such a system. This is not true...

What would be impossible - or at least very much more difficult - would be the pull-out. Without a VIT most current power models would simply execute a vertical dive from the top of the climb after a very sharp stall.

How much and when? So VIT allows you to increase incidence at the end of the power run but how much and when? Well anything between 2 and 5 degrees, depending on where the CG is or to put it another way - how much incidence the model is going to need to glide properly (fig 1).

As far as *when*. Something about 2 seconds after the power stops seems like an average setting. A small light, Open model would probably be able to withstand less than that as it will decelerate more rapidly after the motor stops than a heavy FAI model.

Right, how do we do all this? Presuming that when assembled the tail is tensioned by bands into the DTing position, then when the trailing edge is released it will rise. So a line must be arranged over the TE to the engine timer to release it *after* the power cuts.

To stop it jumping from there straight into

Fig. 1

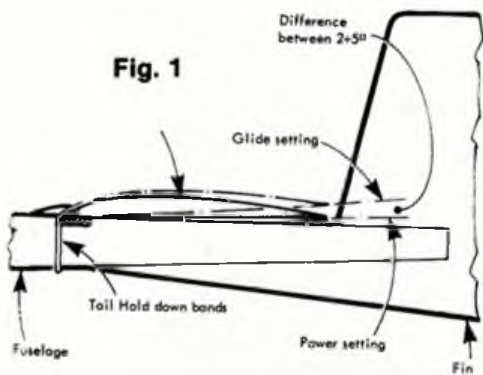
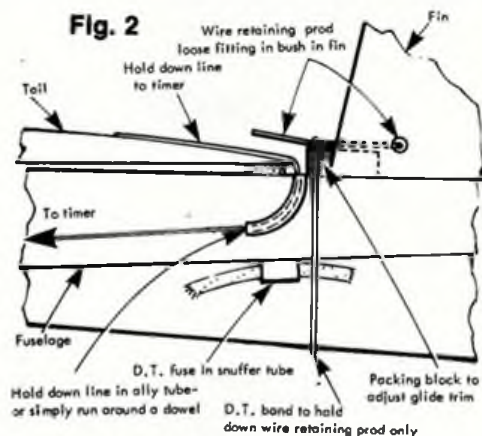


Fig. 2

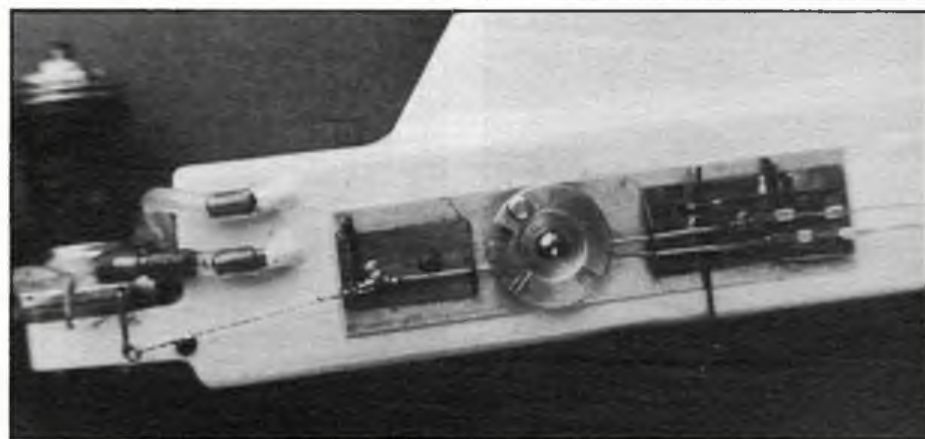


the DT position, a system can be used as in Fig 2. This is the simplest arrangement I have ever seen and have used it myself on various models. A wire prod pivots in the fin running in a size of tubing large enough to allow the pivot to be fairly sloppy.

This prod is then held down by a band through which the DT fuse can be slipped. Thus on release of the tail by the timer the TE jumps up under the prod to the glide position. This can be adjusted by shimming the block into which the prod is strapped by the DT band.

On DT the prod is released and because it is a very free fit in its pivot, is easily pushed away by the tail to allow DT. There are many variations on this theme but this is the simplest I know and will get you started...

Fig 3 shows a typical installation on a



Above, two variations on a similar theme, VIT arrangements at the timer end of Russell Peers' "Woodpecker" (above) and Stafford Screen's 1/2A (below).

forward fin set-up. Much more complicated... although I have seen some very simple versions of it on Wakefields that replace the aluminium arms and coil springs with fine wire hooks sufficiently flexible to be pulled in by the lines from the timer. This would probably not be substantial enough for anything but the smallest power model.

Release: Positive, reliable release of the lines at the timer end is now crucial to the workings of the system. Fig 4 shows a typical arrangement and the two photos are

of Screen's 1/2A and Peer's 'Woodpecker'. My diagram includes lines for flood off and prop brakes as well as VIT and auto rudder as of course often all these functions are used together.

The disc on the timer needs sufficient clearance behind it for the wire triggers and they should be 20 swg for models up to 1.5cc then probably 16 swg for larger motors. Remember also to keep the leverage under the disc to a minimum by making sure the arms holding the lines are very short, and that the arms that actually fit under the disc are as long as possible.

Notice also, both in my diagram and on Peer's system, that by varying the depth of the notch in the rotating disc certain functions will ignore the notches if their arms are long enough - allowing the timer to be wound one complete turn. This also imposes less of a restriction on exactly where you site the triggers.

You will undoubtedly need to replace the original face plate of the timer with a tin or brass plate so that the tubes for the triggers can be soldered to it, or alternatively you can leave the timer unmodified and site the triggers on plates screwed to the model fore and aft of the timer - a very good system incidentally if you want to retain timer interchangeability.

Timing of the operation of the VIT is important; the position of the triggers and the notches in the plate determine this. A favourite arrangement seems to be auto-rudder first - just before or at motor cut then the VIT, 1-2 secs later.

Trimming: Now we discover another useful advantage of so equipping your

Fig. 3

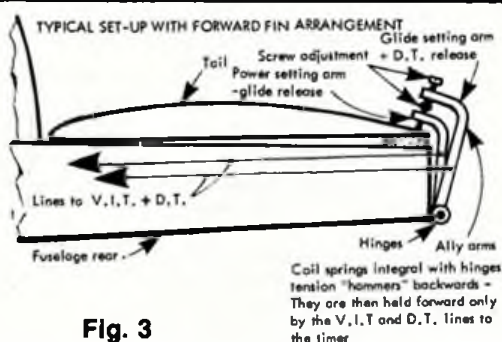
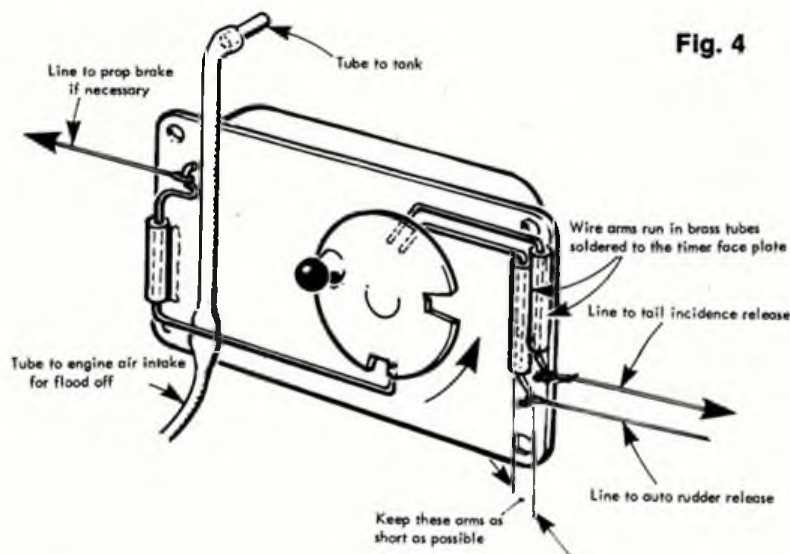


Fig. 4



power model. It is now impossible to DT under power, as no matter how short you set the fuse it will not DT until the VIT releases. That may still be too soon but at least it will stand a chance...the other way, the wings fold for sure.

Hence, it now becomes possible to use this facility for very safe and short trimming flights. As long as the VIT operates a reasonable time after motor cut - and there is no reason to suppose you can't bend the triggers a bit for the trimming stage - then DT fuse can be dispensed with entirely.

In fact there is a further safety aspect, as a new power model is at its most vulnerable on those first test flights on full power. If you can DT immediately the motor cuts, it is less likely that you will suffer a stall into the ground from an awkward altitude.

Next month I will explain a little more about prop-brakes, flood-offs and a way of equipping your Slow Open model with instant DT facility...without a full VIT set-up.

Cardington...2nd June

The warmest Sunday of the year so far and temperatures in the shed by mid-afternoon had risen to 74°F. A good day for rubber but slightly below par scores, were put down to most contestants using the day for trimming and experimentation in contest conditions.

John O'Donnell on the other hand always treats a contest as such and won the index event comfortably with an EZB. He continued later to unofficially equal his shed record in Peanut duration with a couple of flights of around 5½ minutes.

Results (Index event for EZB and Microfil models only)

1. John O'Donnell	EZB	19:10	85.7% of shed best
2. B Hunt	35cm	22:47	84.3% of shed best
3. A Robertson	EZB	18:48	84.0% of shed best
4. R Bailey	EZB	18:44	83.7% of shed best
5. L Barr	EZB	18:17	81.7% of shed best

Slope Soaring (F1E) Trials for European Champs

Trevor Faulkner kindly sent me these results and details from the first F1E meeting of the year that should have occurred on 19th May but was postponed and re-flown on 1st June because of thick cloud in May.

A full seven round schedule was possible but the 15mph North Easterly kept everyone guessing by swinging around. These variations coupled with a site comprising north and east facing hills produced a 'funnel' that had even the experienced competitors at a loss.

It seems most people are now equipped with Frieser pods and steering units in A2 size models although some flyers are recognising the glide and penetration potential of F1C models and are experimenting with thinner flat bottomed sections often sheet covered. Dihedral configurations seem to be almost universally flat with tip dihedral only - a set up renowned for its reluctance to turn - ideal of course for a slope soarer!

Unlike conventional free flight - F1E models have often to extend their flying speed to gain wind penetration. To this end up to 100% model weight is sometimes

carried as ballast, which in Trevor's own words makes DT'ing a rather 'positive' occurrence. The blessing is that there is usually less concrete on hillsides than on aerodromes!

The postponement of the first date sets a worrying precedent of course. These F1E events are now officially SMAE - only the second year they have been - and there is no clause in the rule book that allows for a postponement...

Other free flight classes at Trials level yes, but not F1E! I am sure that those that qualified for this Team will hope the SMAE Council and the FFTC turn a blind eye to this indiscretion as one well worded protest could have invalidated the whole thing. I am equally sure that they will also agree it is hardly the way to encourage new participation...

Slope soaring suffers differently from the weather to 'flat' free flight. It is understandable that if you site the event on a high hill, that low cloud will be a regular problem. A suitable amendment must be drawn up to allow such events legal postponement before someone quotes line and verse the next time the visibility closes in.

Results (Aggregate of 7 rounds scored to a 3 min max)

1. P. Dolby	Sheffield S.A.	610.4 secs
2. J. Palmer	Sheffield S.A.	608.3 secs
3. T. Faulkner	Sheffield S.A.	556.0 secs
4. S. Philpott	Biggles	504.2 secs
5. D. Bariel	BYFFG	471.0 secs

LATEST RESULTS SMAE 4th Area

Team Glider - Individual placings (61 flew)

1. A. Jack	Tynemouth	7:30 + 8:43
2. D. Bartle	North Yorks	7:30 + 2:30
3. J. Cooper	Biggles	7:30 + 2:18
4. R. Peers	Falcons	7:30 + 0:39
5. P. Cameron	Crawley	7:30

Coupe d'Hiver - no trophy (13 flew)

1. M. Dilly	Croydon	9:13
2. I. Davitt	Morley	9:09
3. N. Auckland	North Yorks	8:58

FIC - Astral Trophy (9 flew)

1. A. Jack	Tynemouth	12:30 + 12:16
2. S. Screen	Birmingham	12:25
3. P. Harris	Birmingham	11:56

Team Glider - Team Positions for Model Engineer Trophy

1. Biggles		
Cooper, Bailey, Lavis		20:37
2. Tynemouth		
Jack, Pollard, Wilkinson		19:05
3. Bristol and West		
Coomes, Greaves, Pink		18:39
Anglia		805
Biggles		794
B&W 788		788
Vikings		726
Tynemouth		693

Senior Champs positions after 8 events:-

D. Hipperson	26pts
A. Jack	12pts
S. Screen	11pts
R. Peers	10pts
P. Harris	10pts

...STOP PRESS... STOP PRESS... STOP PRESS... HOWARD BOYS MEMORIAL TROPHY

This long awaited event will be held at Eaton Bray on 29th September for unorthodox models with particular emphasis on tail-less models.

For more information telephone Ron Moulton at the Aeromodeller offices 0442 41221.



Above, a good launch from Eric Ridley to put vintage 'Challenger' on its way - unfortunately missed all the good lift. Note the single bladed propeller.



Below, Bill Dennis prepares his 'Heatwave' variant, for the Champagne flyoff on the first evening at Woodbury. He also flew on the following day but tree'd the model on the first flight.

FROM THE HANDLE

CONTROL LINE NEWS

Stunt with Claus Maikis

Let's twist again...

At the time I started flying control line aerobatics - and that's now more than a quarter of a century ago - the word *trim* was only known to the free flight people. A control line model had to fly just as it fell from the building board (or should I say kitchen table?).

To most flyers, stunt flying was mainly a matter of going full blast through several (more or less) round manoeuvres. If you had enough line tension to stress your arm muscles, that was it. Well, times have changed and with the introduction of the term *precision aerobatics*, requirements have risen considerably...

The demand to fly square manoeuvres and the desire to fly slowly have caused the need for better aircraft and the necessity to be able to trim them. Like any good free flight or R/C model, the stunter has to be trimmed to perform the way we want it to. I should better say two ways...

Firstly, we want our aeroplane to be aerodynamically 'clean'. If you have seen some models going through the schedule as on rails and others tumbling like a drunken

like to add: it needs an *enormous* number of flights. Of course, good basic trim is usually reached after 20 or 30 flights...

After that, I still continue to make subtle modifications or improvements (hopefully) and sometimes never seem to come to an end. The American Al Rabe - when asked when he stops trimming his model - replied "When I hang it up and retire".

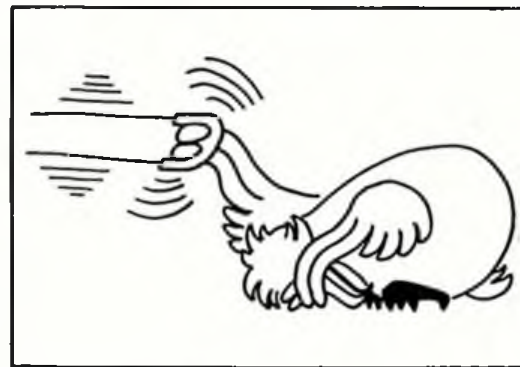
Imagine we have a perfectly built airplane (no warps). Also suppose we have trimming devices built in, such as: tip weight box, variable elevator movement, (possibly) variable flap movement, variable rudder movement, variable line guide, (possibly) a weight box in rear fuselage.

If these features do not exist then in some cases you may have to give up! But to cover the 'trim theme' I have to mention them...

Before starting to trim a new stunter I prefer flying one of my better aircraft. I want to get the right *feel* of how a good model performs, and what to look for. I try to do it alone, so that I'm not in a hurry and can fully concentrate on flying. Of course a fellow club member (and a knowledgeable one, at that), is very helpful if on hand.

We're on the flying field now and prepare our equipment. Before attaching the lines, I give the model a hard push to see how it rolls on the ground. It should roll straight ahead, neither to the left, nor to the right. To the left would mean an early death. To the right means oblique, jerky rolling with high drag resulting in a bad, jumpy take off

several times and adjust the lines if necessary. I try until I 'blindly' find neutral elevator position. From this point line travel (equals wrist movement) should be the same for up and down. This depends much on



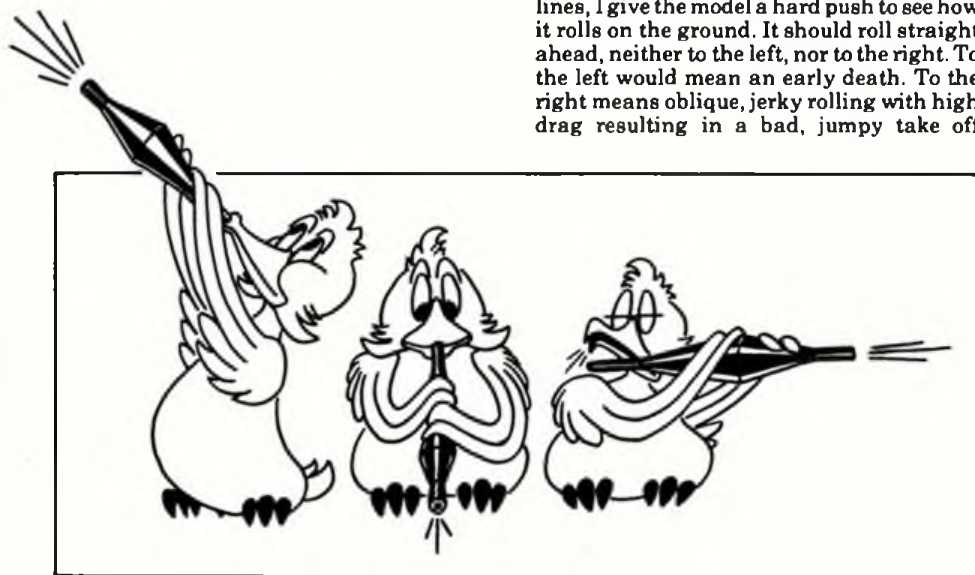
your wrist, especially your ability to move it up and down.

It's very important to find this *neutral* wrist position, since your ability to fly *equal* inside and outside loops depends on it. You cannot trim, or find out trim failures, unless you feel comfortable with the handle, and you've got a point to start from. This point is the comfortable, neutral wrist position which assures equal travel, particularly force to both sides of neutral. The handle is now adjusted - further adjustments may be necessary though...

Now I start flying. First some relaxed laps to see how the model handles. I always fly with a stop watch. On the first flight I stop manoeuvring very early to see how the tank works and when the engine stops. If I have found out flight time, I can fly manoeuvres out of order without the danger of running out of fuel in a situation where this is least desirable.

Actually, I use a stop watch on *every single flight*, be it practice of competition. This way, over the years you learn quite a lot about the relationship between weather, flight time and needle settings. If I want to know lap time, I use a second watch - my wrist watch. You may get one of the cheapest on the market, because you use it to check the *flight time*. The stop watch is then used for checking *lap time*.

After a few ups and downs to feel the sensitivity of the model, I do some inverted laps. I fly about 60° high, just in case something goes wrong. If the engine stops now, there's enough room below to recover an upright attitude and land on the wheels! If everything is right, I fly some upright and some inverted laps, this time at the correct five foot height. Now I carefully watch the wing. If you prefer, have a helper to watch the aircraft from outside the circle. Find out whether the wing is horizontal or banked.



elephant, you know what I mean.

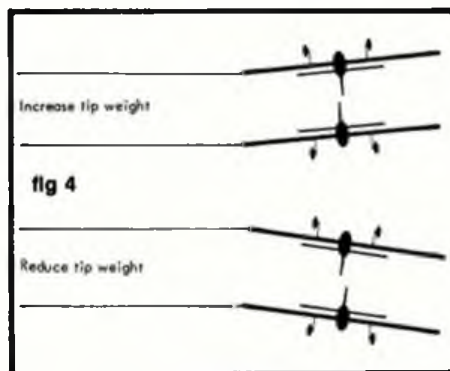
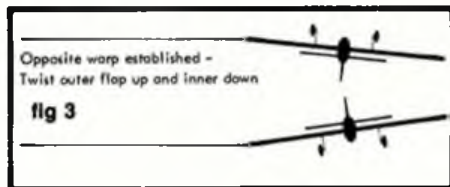
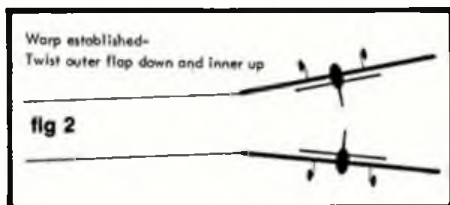
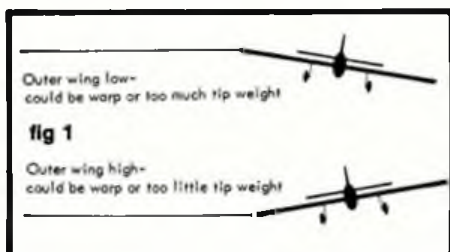
Secondly, we want to *tune* our model to suit our flying abilities and reflexes. This can often mean that two pilots with the same design, set up and trim their models quite differently.

A number of articles have been written about trimming. I remember a very competent and detailed article by John Newnham many years ago. All authors agree that trimming needs many flights. I'd

coupled with a rocking tail-end. Bend the tail skid until you are satisfied with the roll direction.

Now I attach the lines and adjust the handle. I grab the handle and - without looking at the model - move my wrist up and down several times. I stop in a position when my hand feels comfortable and *neutral* (this is how I hold my hand during level flight). Now I look at the elevator. It should point horizontally. I repeat this

Besides flying level (hopefully it does) it could be banked inwards (outboard panel high) or banked outwards (inboard panel high), refer to figs 1-4. It could have one attitude in the upright model position, and the reversed attitude in inverted flight. This is



caused by a warp. Also, the wing could have the same attitude in both upright and inverted flight. This is a case of incorrect tip weight.

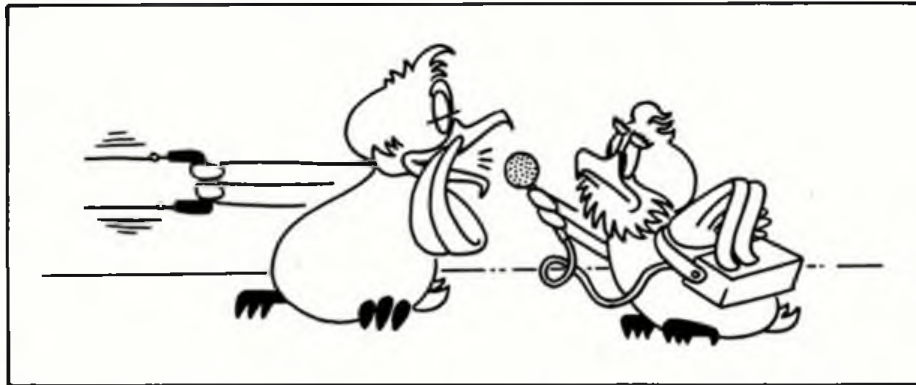
to climb or dive. I fly some inside and outside inboard wheel (fig 6) or is it hidden by the inboard wheel? Can I see it first a little bit, partly or fully? If so, that's an indication that the model yaws. During the wingover this can be seen even more clearly, because line tension is reduced.

When the engine stops I watch what happens... Does it raise or lower its nose? After landing, I first relax my knees! This first flight tells a lot about the flight characteristics of the model. I try to remember

1 Is the CG location correct and comfortable for my kind of flying? The model should fly so straight and level that - while flying - I can give an interview to the model press without changing greatly from the ideal flying height of five feet (only embarrassing questions by Pete Freebrey allow a deviation of up to 1 foot).

2 Though being able to 'groove' comfortably, the airplane should be capable of corners as sharp as you want them. You've to find a compromise here. If necessary the CG location has to be changed.

3 The wing must always be horizontal. If it's banked outwards in upright and inwards in inverted flight, the outboard panel needs more lift (or the inboard panel less). The outboard flap is bent down or the inboard flap is twisted up. If the reversed situation exists, reversed corrections are made. If the wing is banked the same way in upright and inverted flight the tip weight is changed.

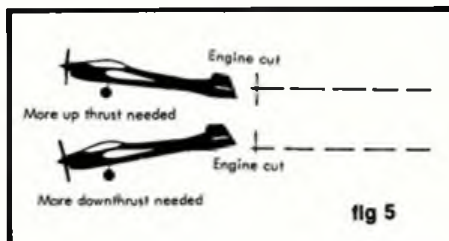


With a high outer wing tip, weight is added. Weight is reduced when the wing tip is low. Fine trimming of tip weight is continued later...

4 If the flight attitude of the model changes immediately after the engine stops, the thrust line is incorrect. If the nose is neatly faired into the spinner contour... that's it!

In other models, we can alter the thrust line. If the model nose rose after the engine quit, it means that the engine thrust line is pointed down so that constant up elevator is needed for level flight. When the engine stops, the nose goes up. Thrust line is corrected by using thin washers under the mounting lugs of the engine (depending on installation). In the opposite situation (nose going down) thrust line has to be pointed more downwards (fig. 5).

Now test flights can continue. On the next flights I watch any tendency for the model



to climb or dive. I fly some inside and outside loops and horizontal eights which may prove any existing tendency. The cause may be badly bent flaps or elevator.

This can be checked if carefully viewed from the side, and corrected accordingly, a zero/zero setting must be reached. But we've presupposed a correctly built model! So it must be the design. Extreme low wingers with a large vertical distance between engine thrust line and wing may have problems in this respect. Cure? Avoid low wingers! If everything is okay modelwise,

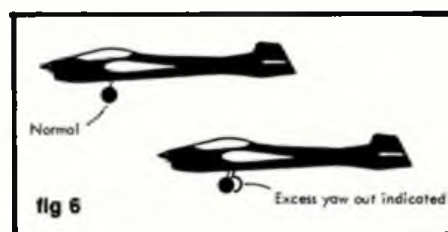
the lines must be readjusted. Maybe we couldn't get it right with the model on the ground (its five feet lower than level flight and sometimes difficult to judge handle adjustment that way).

Now I concentrate on movements around the vertical axis, in particular - line tension. First, I watch the wheel beside (behind) the inboard wheel, or is it hidden by the inboard wheel? Can I see it first a little bit, partly or fully? If so, that's an indication that the model yaws. During the wingover this can be seen even more clearly, because line tension is reduced.

Yawing is absolutely unwanted, because it creates a great drag and slows the model

down. Corners especially suffer badly, with the model rocking in all directions like Elvis Presley. This behaviour may be caused by 1) too much right rudder, 2) CG too far forward 3) line guide located too far back.

1 I try to use as little right rudder deflection as possible. You can improve line tension this way, but rocking at the exit of corners, especially if you prefer to fly



sharp corners, is unbearable. Only when flying in strong gusty wind do I increase right rudder slightly. This improves line tension, thus safety - which is good for my nerves! In gusty wind the model is jumping around anyway, so I don't lose many points.

2 The more forward the CG is located (with a given line guide location) the more line tension we have. Alas, the airplane is less sensitive now and flying sharp corners can become difficult. The large elevator deflection required produces drag, reduces speed, the airplane feels 'mushy' and the wing can even stall. I prefer to move the CG back and control the sensitivity, respectively line tension by other measures (more on that later).

3 The line guide should be positioned as little to the rear as possible. A rearward location enhances line tension too, but again the model is rocking badly in corners. Especially with the low lap times required these days, a far rearward

location is the biggest evil. I try to move the line guide forward, a little bit every time (maybe 5mm), as far as I can. The climbing part of the wingover is the indication for a correct location. If the model performs this part without going slack on the lines, line guide location is okay.

Of course, all checks mentioned so far are repeated *again* and *again* on every flight. Especially trimming around the horizontal axis which I feel is extremely difficult. It appears that this trim may easily be accomplished by adjusting the lines at the handle. But this cure can mislead you, and hide the actual problem...which still lies in the model's tendency to prefer one turning



direction. Sometimes I only discover this after many flights and when I've become quite familiar with the model's performance.

Now...the tip weight. I prefer to start with 'too much' and reduce gradually. Tip weight is the easiest way to increase line tension. But here is a drawback, too. On sharp corners - especially on pull outs - the outboard wing half dips. That means: on pull outs at the bottom, the outboard wing panel *drops* and at corners at the 45° level the outboard panel *raises*. Tip weight is reduced until the model behaves almost perfectly. I don't try to eliminate this effect completely, as line tension will have disappeared too!

By this time, we should have learnt a very important point: each trimming device must be used *as little as possible*. If we go beyond a certain limit, we may gain a small advantage in one direction, but we pay for that with serious disadvantages in many, if not all other directions! This is the basic principle of trimming. If you see a model with excessive engine side thrust, rudder throw, tip weight or line guide rear position, you can be sure that something's wrong with this model (hopefully it's not yours!)

By this time we've made quite a number of flights. The aircraft flies without any bad habits and we have become familiar with the model's flight characteristics. We have tuned it to our requirements (or ourselves to the aeroplane!) and we can now concentrate on fine tuning...

I like to make a series of flights while constantly setting the needle valve richer. Finally, I arrive at a stage when the model is *just* able to do a wingover. This is an excellent criterion for the location of the line guide! It is moved forward so that the wingover is *just* possible. Here, too, watch

the wheels. You'll see that the transition to, and the climbing part, of the wingover are improved considerably. At the same time you'll be able to detect a possibly minor wing or flap warp.

I start the manoeuvre with a bent arm. During the climb I stretch the arm quickly, but without a jerk. In the ideal case, at the zenith of the wingover the airplane flies 'free', the lines are slack. Don't be afraid, it's not all that dangerous, because now the dive starts, the wind pushes the model out of the circle, and all controls are at neutral.

If the wing is warped or the flaps are misaligned, this is clearly visible now. Because the lines are slack, the model can rotate around its longitudinal axis. At normal flying speed and in horizontal flight such tiny warps or misalignments cannot be detected and you are wondering about that tedious wobble in some corners...

Now you may clearly see the top or bottom side of your wing. The wing half which 'drops' needs more lift or vice versa. Cure this by twisting the flaps. Don't do this with your fingers only, use four scrap pieces of plywood to spread the pressure. Place two each at the top and bottom side of the flaps, just where the flap horn sits in the flap sheet. Be careful! A 1mm alteration of the trailing edge of the flap can do a lot...

Now we come to the tip weight again. I like to fly with a heavier tip weight - it helps line tension. On the other hand - as mentioned - it causes the outboard wing to dip after

sensitivity of the model, but tends to speed up manoeuvres and to cause problems with line angle.

I remember the '81 season, I flew the same airplane all year but at some contests I did quite well, at others... Oh well, forget it. At the end of the season I flew in the British Nationals at Barkston Heath. My first flight was not inspiring, so I changed my lines. Since there are no flying field problems as on Continental sites, I switched to longer lines... Instantly I noticed a considerable difference. On thinking about previous contests that year I realised: all contests where I had done well, were flown on longer lines!

I only realised this in England, because I changed line length *during* the contest. When increasing line length you may speed up your engine just a little bit. This increases flying speed (which helps flight characteristics), keeps the same lap time, thus increases line tension. You might even reduce rudder deflection slightly.

Now we come to the prop. Nowadays it's a well known fact that the prop can be seen as a trimming device in its own right. If you haven't tried it, you won't believe it. Changing the prop can not only change the model's flight characteristics just a little bit - it can produce a completely different aircraft! It may change things so much that you may have to start trimming right over again.

I usually start trying props when I've



corners. Bill Draper writes that a tip weight of one ounce at 60 mph flying speed, in a 8 feet radius turn will produce a force of two pounds pulling the wing tip out of the corner (off the centre).

Now there is a way to compensate for a larger tip weight: we simply increase the lift of the outer wing panel. We can achieve this with flaps that have a greater span or chord, or with equal span flaps on an asymmetric wing. On a given aircraft, we can reduce the area of the inboard flap by cutting off 2 or 3mm off the trailing edge. I've done this successfully on two occasions. It works! You can also cut off the inner flap at the wing tip (two inches or so) and fix it to the wing. It's easier to do, but it doesn't look very nice (beauty forever!).

If we change the line length for any reason, we might have to change the trim too... Increasing line length isn't critical. Reducing line length usually increases

reached the basic trim stage. It's nonsense to start fine trimming as long as you haven't decided which prop you'll be using in future. Talking about props, though, is another story and its too much to be included here. Just bear in mind that prop selection can be dictated by other criteria than performance. Among these are tank capacity (concerning flight time), noise level and last but not least - what your engine is able to swing!

Now we understand that remark by Al Rabe, we never stand still...We always want to improve our performance, especially if we are competition orientated. Imagine, a small detail modification - like the prop - can be the cause for yet another trimming session. Progress is fast. Every day brings new knowledge with new reasons to alter something! I see a point coming when my available spare time is just sufficient to allow trimming of models - Then I'll have to quit contest flying...



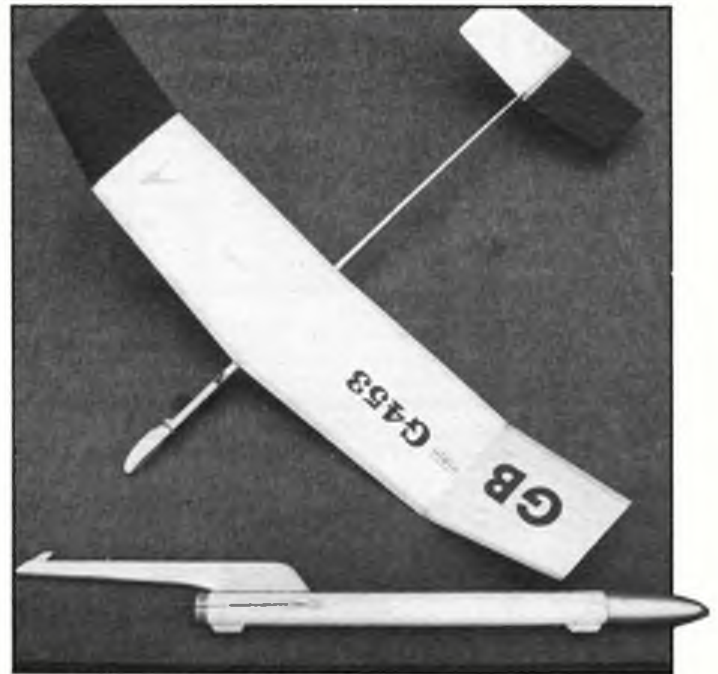
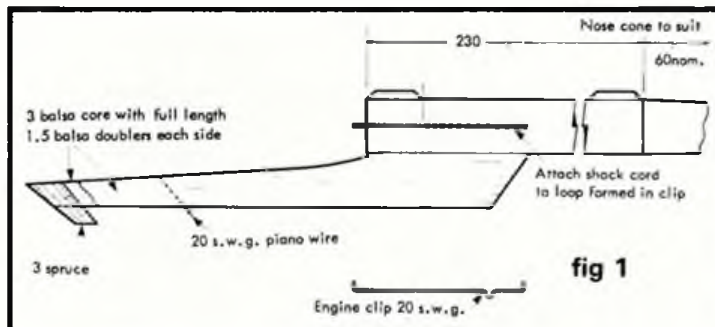
AT THE LAUNCH PAD

John Wheddon

SINCE this series of articles was started last year, many readers have written to offer comments and enquire about suppliers of kits and other rocketry items. The following should help answer many of those queries and save a lot of postage stamps!

Pegasus Models, Caston, Attleborough Norfolk NR17 1DG. *Pegasus* stock a range of kits produced by *Estes* in the United States and can also provide the excellent full colour *Estes* catalogue showing the entire range of items available from this major manufacturer. We have mentioned some invaluable books on rocketry in this column

Right, Ian Dowsett's winning class B boost glider, the 'Flanagan Pod' is a particularly simple and reliable way of ensuring separation from the glider at ejection.



before and the 'Handbook of Model Rocketry' by Harry Stine and 'Basics of Model Rocketry' by Douglas Pratt are also available from *Pegasus Models*.

Competition Model Rockets, P.O. Box 7022, Alexandria VA 22307 USA is a mail order company specialising in the supply of a complete range of rocket components and accessories. Don't be put off by the 'Competition' tag because *C.M.R.*'s range of body tubes, nose-cones and kits is well worth investigating. There's even a kit for a scale altitude model of the 'D-Region Tomahawk' plus a data pack which makes this an ideal introduction to that exciting branch of the hobby.

National Association of Rocketry, 182 Madison Drive Dept. M. Elizabeth, Pennsylvania 15037 U.S.A. The *NAR* is the official governing body of model rocketry in the United States. However, membership is open to overseas modellers and can form a useful link for isolated enthusiasts like some U.K. based modellers. The *NAR* issues a monthly journal entitled *American Spacemodelling* which often includes rocket designs, product reviews and a useful range of advertisements.

Modelar, Jungmannova 24, 11366 Praha 1, Czechoslovakia. This is a Czechoslovakian language magazine which includes model rockets among a wide range of modelling subjects. The editorial staff includes Otakar Saffek who is probably one of the best known scale space modellers in the world, having won two World Championships in this most challenging class. Naturally then, the plans available from *Modelar*, especially of scale subjects are very good indeed and surprisingly include highly detailed information on U.S., Soviet and West European subjects.

British Space Modelling Association: Set up to promote the hobby in the U.K., the *B.S.M.A.* has become the official contact

point with the Home Office and the *SMAE*. Not yet in the 'glossy brochure' and annual ball class of association (thankfully!) the *Association* has been successful in establishing good links with officialdom and has been responsible for bringing together modellers from all over this country. For more details apply, enclosing S.A.E. to *B.S.M.A.* c/o Aeromodeller at P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead. Herts HP2 4SS.

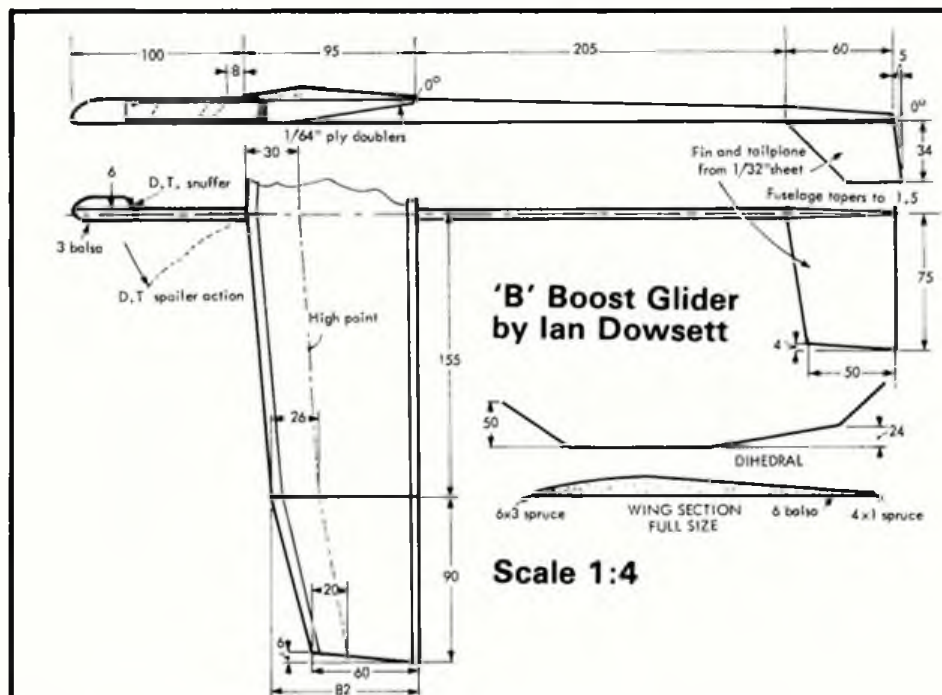
Ian Dowsett's Boost Glider

Designed for 'B', 5 Nsec engines this model created quite a stir at the 1983 Canadian Championships because of its apparently 'huge' dimensions. However the ample wing area proved to be just right, because Ian won the competition after an outstanding flight

with the model as shown in these drawings.

Construction of the boost glider is quite straight forward and follows conventional aeromodelling techniques, apart from the wing and tail incidences which should be strictly zero-zero as drawn. A dethermaliser is a very necessary feature and should not be omitted. However a dropping-weight type where the nose ballast is released and suspended from the tail, after D.T. fuse action, could be more effective than the spoiler type shown.

The engine pod, which is the kind known as the 'Flanagan Standard Pod' after its originator Chris Flanagan of the Massachusetts Institute of Technology Rocket Society, can be adapted to suit a variety of boost gliders. A most practical solution to an often tricky design problem...



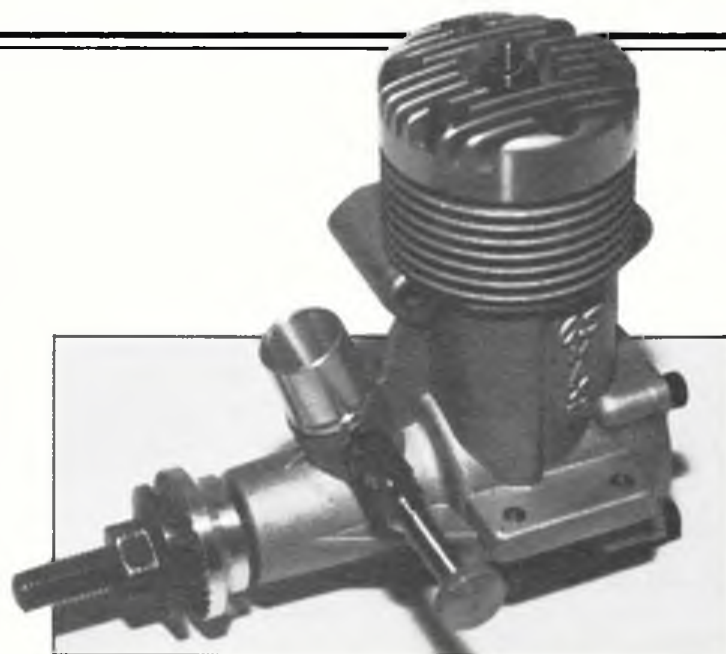
ENGINE TEST

O.S. 40 FPS: Mike Billinton checks out this control line stunt engine

THE RECENTLY INTRODUCED plain bearing front induction schnuerle ported engines - (the FP series) - interestingly combine a return to simpler construction and less extreme performance together with a continuance of the excellent OS manufacturing quality.

Available from UK distributor *Irvine Engines*, in four capacity sizes - .20, .25, .35, and .40 cu. in. - and intended mainly for the beginner and sports radio control flier, the .40 is also produced to control line aerobatic specification as the FP-S. The only

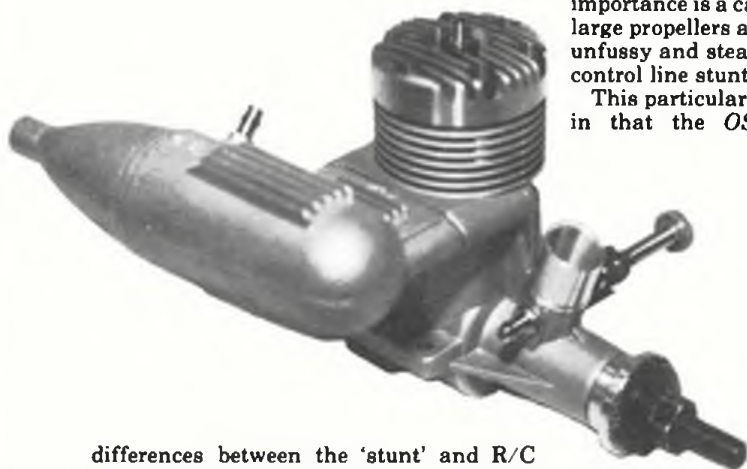
Right, the O.S. 40 FPS is a plain bearing engine, that should find a following in future stunt circles. Photographs this month are not by Mike Billinton (it shows...Ed!) as he was away winning the 'Shell Marathon' - well done Mike.



ratio (or four-stroking point). Of equal importance is a capacity to operate on those large propellers and rich fuel settings in the unfussy and steady manner so desirable to control line stunt pilots.

This particular test was conducted 'blind' in that the OS hp figure, the actual

Left, the normal O.S. type silencer when fitted makes a neat, complete assembly - should be quite adequate for most applications.



differences between the 'stunt' and R/C versions are the simple open choke substituted for control line use, and a reduction of compression ratio to an unusually low 7.4/1 (5.66 Effective!) This latter point assumed some significance following in the test on this engine, and certainly linked in with comments by Claus Maikis in the July *Aeromodeller* concerning criteria to be used in 'assessment' of control line stunt engines. There are difficulties as he rightly points out - maximum hp alone hardly meets the bill, if only because the control line stunt 'regime' is a largish propeller and/or rich four-stroke fuel setting, one or both of which naturally drag rpm way down away from the potential maximum. Torque/weight ratio at rich fuel setting is a far more useful parameter, though for an engine tester this presents the problem of accurately maintaining one particular rich fuel/air

compression ratio, and the Claus Maikis data on the OS 35 FP, were all not known at the time of testing; in retrospect however, the above points were appearing in one way or another during the test and had indicated how well the FPS actually fulfilled its role as a light, low-speed, flexible, easy handling and durable machine. The precise maximum hp figure, though initially a matter of some surprise, eventually proved of little importance in the total package, and it is of interest that the manufacturer actually does not claim a hp figure for this 'S' version, (a figure of 1.0 hp at 15,000 rpm is however claimed for the 40 FP R/C engine)... they refer instead to the overriding importance of flexibility and ease of operation, and this clearly will include the normal four-stroking mode of control line aerobatic operations.

This is a useful place to refer back to that low compression ratio of 7.4/1... clearly if the two-stroke engine spends much of its time four-stroking then cylinder filling (and thus cylinder pressures) on those strokes when combustion *does* take place becomes higher than normal - as witnessed by occasional failures of big end bearings in model racing engines whilst four stroking. If, at the same time, rpm is at a low level (as a consequence of the use of large propellers), then for both these reasons, it can be seen that the 'normal' geometric compression ratios of around 10/1 could easily lead to ignition 'over-advance' - a dangerous condition, difficult to detect in the methanol burning engine.

Therefore the OS decision to set up the FP-S at a very low compression ratio makes a great deal of sense, because just as in the effectively supercharged tuned-pipe two-stroke (and the actually supercharged four-stroke), compensating reductions of compression ratio are often deemed necessary to prevent excessively high cylinder pressures and the onset of detonation.

In the case of the FP, the consequence then, is that the normal open exhaust full two-stroke performance is quite naturally somewhat restrained compared with the normal expectations of a .40 cu. in. engine... in fact it lacks the correct degree of ignition advance for the higher rpm and normal two-stroke operations - all of which points to the specialised nature of the control line aerobatic engine, why the power levels are quite low by usual standards, and the relative difficulty of 'assessment' as Claus Maikis pointed out. In passing, the rpm figures he quoted indicate power levels in the .5 to .6 area - if relying on published rpm

Left, liner, platon, crankshaft all very 'clean' and fully up to the standards set by O.S. Right, 'ball blasted' crankcase and finely finished cylinder head all make this engine a pleasure to own - let alone use.



to hp charts; and the .8 hp he quoted from the Graupner catalogue is for the 35 FP/R/C higher compression version. As can be seen, the dynamometer figures obtained during this test become explicable only in the light of the various points made above.

Mechanical detail

Normal schnuerle porting is used, even though this has not yet gained wide acceptance in control line stunt circles. As previously featured in certain OS engines the liner is rotated 30° to cause exhaust to exit towards rear/side of engine - the main purpose of which is to allow the gudgeon pin to traverse un-ported sections of the liner and thus both simplify construction and improve reliability by elimination of the usual circlips. Instead, PTFE end pads are used at either end of gudgeon pin.

Crankshaft: has a modest timing period of 176°, with a bore size of 8mm. The carburettor bore at 7.5mm. is somewhat larger than operators may normally use, and certainly a considerable increase on the radio control version at 5mm!

Liner/piston: this combination is refreshingly interesting to this writer at least... pointing in any case to OS determination to provide long life to the engine. The liner is unhardened steel coated on all surfaces with their nickel/silicon process - as used on the top OS racing engines. Although not the hardest of surfaces, it does provide low friction and good wearing properties when combined with the close-grained plain cast iron ringless piston. This item also has slightly unusual internal detail. To increase strength and improve symmetry of heat expansions together with low weight, the ferrous piston has thin internal ribs spanning the two normally relatively unsupported walls adjacent to the pin bosses. Indicative of OS computer controlled equipment is that both liner bore and piston mating surfaces are finish ground to a fit normally only obtainable with both internal and external honing. With this sort of quality at the very heart of the engine, reliability is ensured and continues to make OS engines a 'hard act' to follow for other manufacturers.

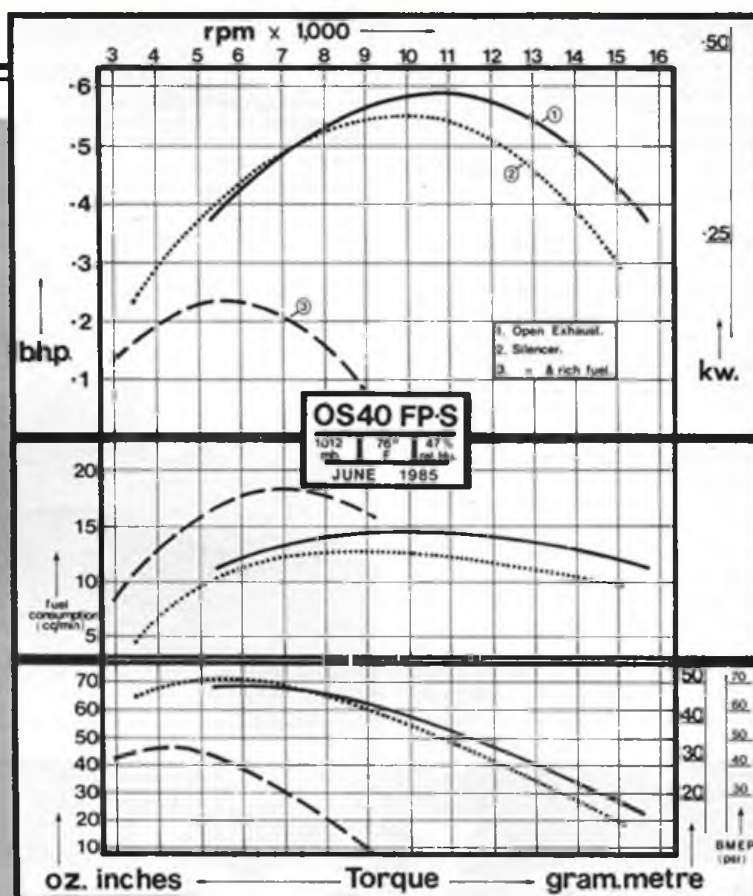
Crankcase: is diecast to the usual OS high standards. Equally the phosphor bronze main shaft bushing is of fine finish and superb fit. So good in fact, that a groove runs along two-thirds of its length to ensure that some oil reaches the front end of the bearing. Both piston fit and crankshaft fit have resulted in a very solid leak-proof crankcase compression, and which must contribute to the engine's consistent and steady operation in this control line stunt format.

Connecting-rod: is hollowed, hardened steel - superfinished, with PTFE pads at either end.

A standard silencer is fitted, with nipple for fuel pressurisation. Exhaust final outlet is 6mm. (inside diameter)

Performance

The rpm were checked on a variety of propellers covering a range from 4,000 to 12,000 using the OS recommended fuel, of 10% nitromethane, and 20% castor oil and 70% methanol, showed that because of the quality of fits, the running-in period was not going to be lengthy. The most immediate



impression was of a lazily docile and flexible manner of operation at either rich or normal fuel settings. The graph shows the three separate tests undertaken, and which also include fuel consumption checks. Actual fuel/air ratios could be deduced from these, and obviously the motor becomes less economical of fuel when operated at the richer fuel settings. The fuel curves also indicate the usual fuel to power relationship, though the control line aerobic flier will find the rich running curves of slightly more value.

The rpm point at which maximum power occurs - when running at rich fuel settings - is of some interest, coinciding as it does with rpm achievable when running the motor rich on the average stunt propeller sizes 11 x 5in., 12 x 6in. etc.

Future tests on specifically control line stunt engines should reveal just how the OS FP's torque/weight ratio (115oz in/lb on

normal fuel setting and 72oz in/lb. with rich fuel setting) will compare with other engines, though its low weight of 10oz. with silencer could well place it very high on any contemporary lists.

Summary

Having moved from reliance on hp as a major criterion of model engine performance, allowed the OS FP to be viewed in a quite different light. In fact the early experience of the engine as a fine flexible performer on the dynamometer did sit uneasily with the quite low hp figures, and it took this writer some time to come to terms with the underlying reality. Assuredly a control line aerobic pilot would have arrived at a much quicker, less tortuous assessment of this motor's quality than in this present review. One awaits therefore the likely contest successes to come, and which represent the *real* test.

OS 40 FPS

Dimensions & Weights

Capacity	- 396 cu. in. (6.49cc.)
Bore	- .835 in. (21.2mm)
Stroke	- .724 in. (18.4mm)
Stroke/Bore ratio	- .867/1
Timing Periods	- Exhaust - 142°
	- Transfer - 116°
	- Boost - 82°
	- Induction - Opens 41° ABDC
	- Closes 37° ATDC
	- Total - 176°
Exhaust port height	- 18in.
Combustion chamber volume	- 1.0cc.
Cylinder head squish	- .028in.
Squish band angle	- 10°
Squish band width	- .15in.
Crankshaft dia.	- .4722 in. (12mm)
Crankpin dia.	- .216in. (5.5mm)
Crankshaft bore	- .315 in. (8mm)
Crankshaft nose thread	- .247 in x 28 TPI (1/4 UNF)
Gudgeon pin dia.	- .1968 in. (5mm.)
Connecting rod centres	- 33mm.
Mounting holes	- 40 mm. x 17.5 mm x 3mm holes.
Width between bearings	- 32 mm.
Width	- 1.9 in.
Length	- 2.9 in.
Height	- 3.2 in.
Frontal area	- 4.1 sq in.
Weight (bare)	- 8 1/2 ozs. or 10ozs. with Silencer

Performance

Max. bhp	- 58 at 11,000 rpm (open ex/10% nitro)
	- 56 at 9,900 rpm (silencer/10% nitro)
	- 18 at 5,800 rpm (silencer/10% rich fuel setting)
Max. torque	- 72oz. in. at 5,600 (silencer/10% nitro)
	- 69 oz in. at 6,400 (open ex/10% nitro)
	- 45 oz in. at 4,000 (silencer/10% nitro & rich fuel.)

Rpm on standard propellers

	Open Exhaust	Silencer	Silencer/Rich
14 x 6 Zinger	6,141	6,181	4,226
13 x 6 Topflite M	8,078	7,890	-
13 x 6 MK Glass	8,442	8,233	-
12 x 6 Graupner Nylon	8,678	8,461	5,462
10 x 8.3 Graupner 3-blade	-	8,900	-
11 x 5 Topflite M	10,650	10,340	7,277
10 x 4 Zinger	13,000	12,410	-
9 x 4 Zinger	14,800	13,840	-

Performance Equivalents

Bhp/cu. in.	- 1.46
Bhp/cc.	- .089
Oz. in/cu. in.	- 181.8
Oz. in/cc.	- 11.09
Gm. metre/cc.	- 8.0
Bhp/lb(Bare)	- 1.12
Bhp/Kilo (Bare)	- .234
Bhp/sq in. frontal area	- 14

Manufacturer
O.S. Engines,
Osaka,
Japan
UK Distributor
Irvine Engines,
New Southgate,
London N11.

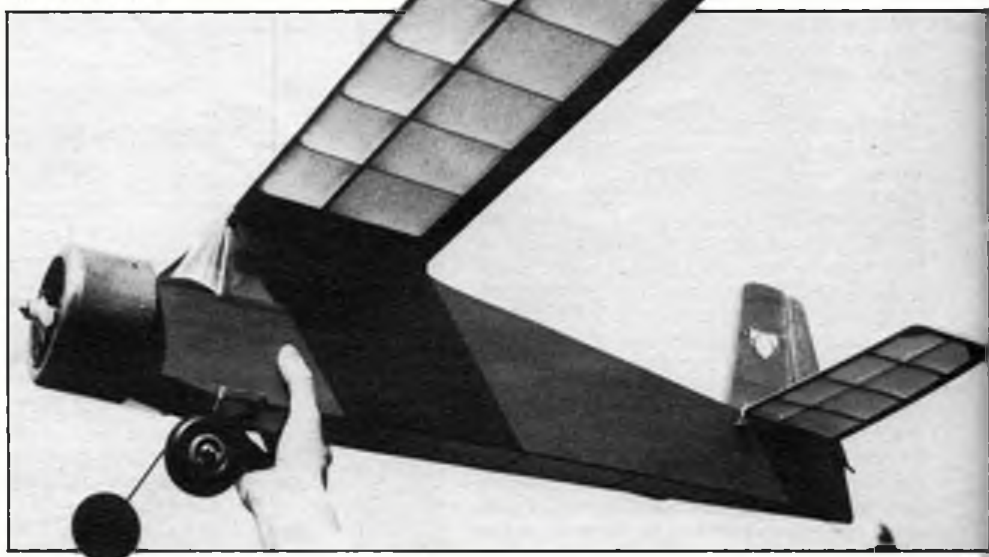
SO YOU REMEMBER those balmy summers of long ago when we were young and fit enough to run after models all day long? When the wind *never* blew at weekends and the only things we disturbed with our models were the larks out in the long grass.

Balsa was ninepence a sheet and we spent time picking balsa cement from our fingers. Building on the kitchen table, listening to 'Dick Barton', 'Monday Night at Eight' and 'Paul Temple' on the wireless, with the smell of coal smoke in the room. That first engine, maybe a *Frog 100* or *ED Mk II* that dad helped you buy for £4.4.00, paper rounds, *O' My dope* and cement, liquorice wood, *Eldorado* ice cream, threepenny Joeys' and National Service?

You do? Then come back with me to 1951. I was in the RAF at this time at Thorney Island (near Portsmouth and Hayling Island) and one of the chaps there was a guy called Pete 'Rinty' Monaghan who was flying a model which he called the 'Quo Vadis'...

I copied it and together we would go out onto the runway at weekends with the model in one hand and a bottle of fuel in the other

Built first in 1951 the 'Quo Vadis' certainly has that nostalgic look that appeals to so many of today's modellers - less strain, less stress...more fun.



Quo Vadis

Vintage type free flight sports model for 0.5 to 1.0cc motors — by Mike White

and fly all day long. Just putt-putting around and enjoying the simple pleasures of sport free flight and getting plenty of exercise chasing the occasional runaway-flyaway-model.

Normally we would aim for an ROG one circuit with a landing as near to the point of take off as possible. Sometimes though, due to overfilling the tank, a long flight would result, occasionally into the sea towards Hayling Island. One model was lost twice in this way but was recovered some days later not much the worse for wear.

Peter Monaghan hailed from Liverpool and we corresponded for a couple of years but eventually lost touch. So where are you

Pete? and others like Ron Early, Ken Bedwell and Wilf, who built Wakefields with names like 'Prangus Wizardium' and 'Digitus Extractum'.

As you, Pete Rinty Monaghan, are the true originator of the "Quo" it should be credited to you, but I did give you 33 years to get it down on paper didn't I...

Like so many others I am now into R/C but my two models of the "Quo" give me more pleasure than any other model I ever flew. So, for your simple enjoyment may I present the model exactly as it was built in 1951. On this version I even used balsa cement, tissue and dope and real double sided razor blades!

Fuselage

I like to start by making up a kit of parts as I find that this is the tidiest and quickest way. Cut out the two fuselage sides from medium balsa - 'C' grain if you can get it - but leave the holes for the cabin side windows, cut these out when the fuselage is complete.

Glue on the 1/8in. sq. balsa longerons and spacers making sure that you make *one* left and *one* right side. Make up the fuselage formers, bend the undercarriage and sew it onto F3. Using the sandwich method or a ply template, cut out the ribs, trimming R1 and R2 as shown on plan.

Using a square to ensure accuracy, glue F3 and F4 to one fuselage side and, when the glue has set, glue on the other side. Wait again for the glue to go off *completely*, then pull the sides together at the tail and glue together.

Now glue the crosspieces of 1/8in. sq. at top and bottom, top fuselage stringer and the sheeting at the nose. Glue F1 to F2 using the centre lines shown on the plans to ensure that the cowl is centred correctly.

Now for the only *nearly* difficult part of the whole model - C1, the cowl nose ring. From 1/4 in soft balsa sheet cut several strips from the width of the sheet 1/2 inch wide: i.e. so the grain runs across the 1/2 inch measurement. Join three pieces together, end to end and wrap them around a tin 3 1/4 in. diameter. A pet food can is this diameter, or close to it. Glue the two ends together and then wrap and glue two similar layers *over* the first and leave to dry *completely*.

Slide these pieces to one end of the can and ease C2 over the other end. Position it the correct distance from C1 and glue on 1/16in. sheet cowl sides. Eventually, when the glue is completely dry, cut off one end of the can and slide the completed cowl off.

Wings

Lay down the lower mainspar, lower trailing edge (TE) sheet and glue on all ribs. R4, R5 and R6 have to be trimmed to required length at the TE as shown. The two ribs R1 are set at an angle to accommodate



the dihedral using the template drawn on the plan.

Now glue on the top mainspar, $3/16 \times 1/8$ in. spar, top TE sheet and the leading edge (LE). Fill in between mainspars at R1 and R2 with $1/8$ in sheet and scrap infill at the TE centre.

When both wings are complete glue ribs R1 together and block up the tips $2\frac{1}{2}$ in. to give the required dihedral. Cut away each R1 and R2 in the way of the ply dihedral keepers, glue these in place and then glue on the top and bottom centre section sheeting, glue on the tips and sand all over ready for covering.

Tail Feathers

The fin and rudder are very simple but the tailplane does require a little explanation. Perhaps a lot of work for such a relatively simple model but if made properly, it will not warp and trimming the model will be that much easier...

Okay then...start by cutting the slots in the trailing edge as accurately as possible and pin this down over the plan. Pin into position the bottom centre section sheet and all the bottom $1/4 \times 1/16$ in. rib pieces. To these, glue and pin the mainspar, LE, top $1/4 \times 1/16$ in. rib pieces, centre section sheet and leave the lot to set off really well before

removing from the board.

Now, take some scrap $1/16$ in. sheet and trim to fit each rib between the top and bottom strips and between LE mainspar and TE: glue in place. The tips are now glued on and the sanding block put to work.

Covering

The original 1951 versions were of course tissue and dope covered as was this version. I used the same colour scheme as my original which was dark red fuselage and fin and yellow wings and tailplane. The cowling was silver with a metallic blue cowl ring.

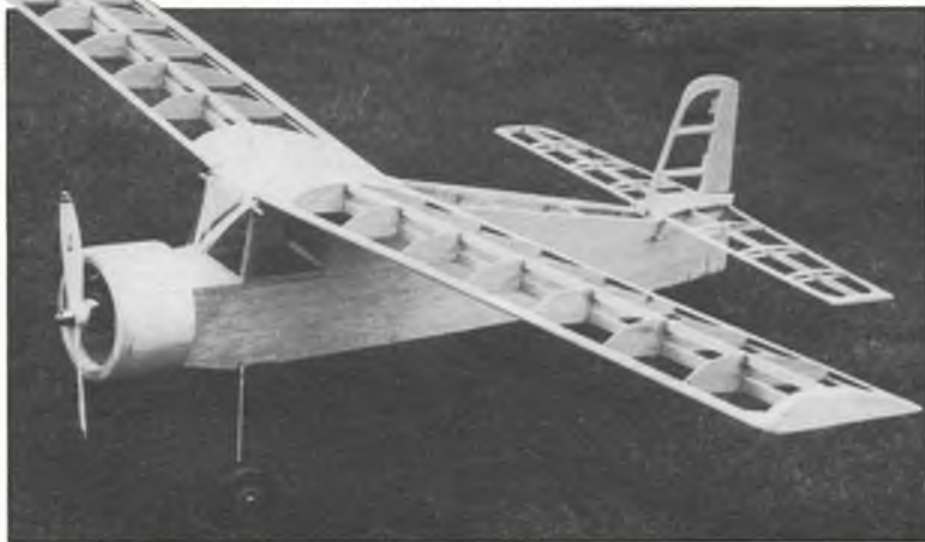
If covering with lightweight *Modelspan* thin clear dope 50/50 with thinners and after shrinking by spraying with water, dope tissue on to fuselage with three to four coats. I use full strength dope to fix tissue onto wings by coating structure with two coats then applying tissue pulling tight as it is applied.

A light spray with water, shrinks the tissue and when fully dried out three to four coats of the thinned dope. The last coat should have several large drops of castor oil added to plasticise the dope to prevent covering shattering in a sudden lumpy arrival.

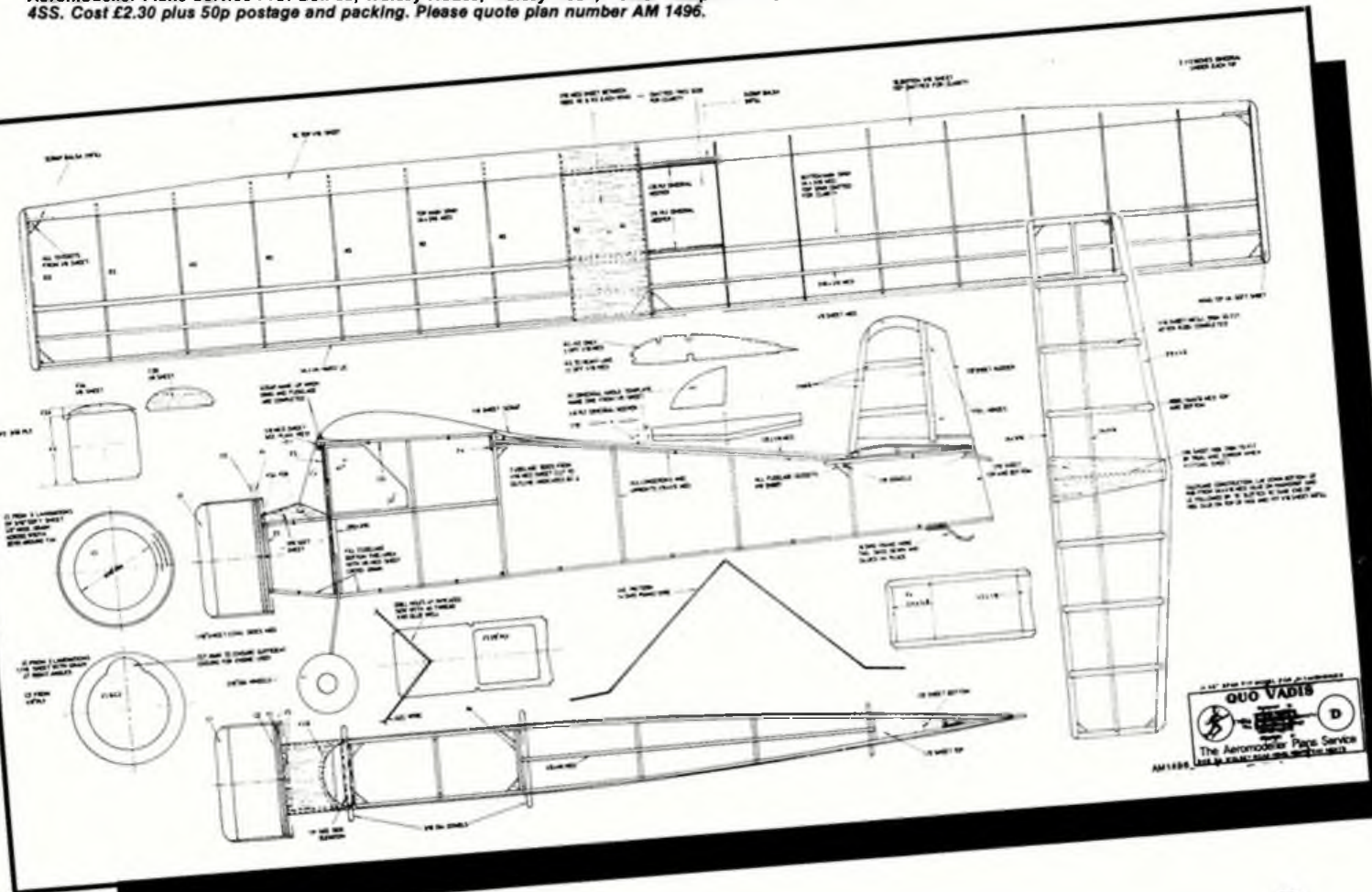
When water shrinking, treat top of wing first then pin down to board. Turn over and repeat on bottom. Dope is applied in the same way which will ensure warp free surfaces. The tailplane is covered in much the same way except 50/50 dope is used to fix the tissue to the framework and also to finish the surface, only two coats are applied. As an alternative, and a very good one, try using *Coverite 'Micafilm'*,

continued on page 537

Sheet sided fuselage and chunky radial front end, together with thick wing section - easy to build, slow to fly, 'tough on the bounce'...what more do you want for a leisurely afternoon's flying...



Full size copies of the one seventh scale plan below will be available for a limited period from Aeromodeller Plans Service P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead Herts. HP2 4SS. Cost £2.30 plus 50p postage and packing. Please quote plan number AM 1495.



ADVERSE YAW!

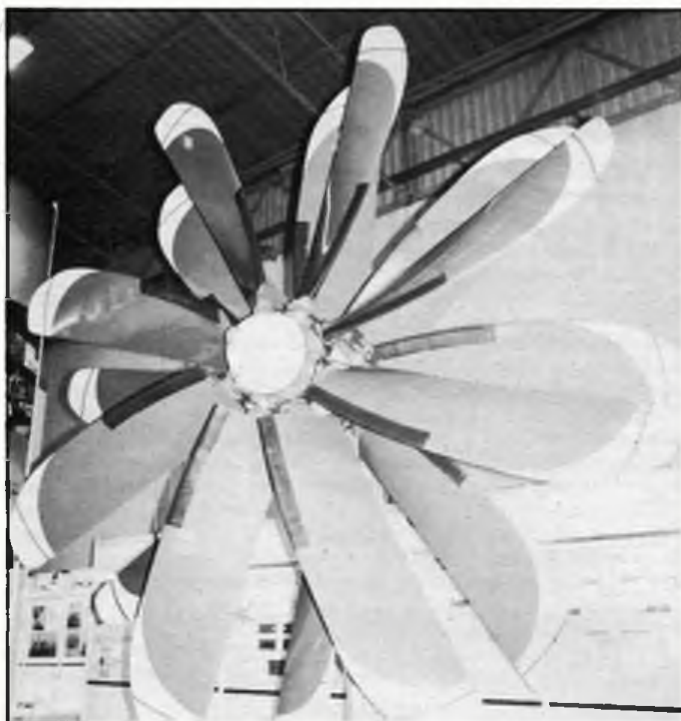
A regular, irregular view
on the world of aviation
from Ron Moulton...

UNLIKE OUR FULL SCALE military and air transport brethren, we modellers live by that simple shovel, the propeller, because it happens to be the only practical means we can use to convert power into thrust. But there are signs that the backroom boffins are coming round to rotary scythes in a big way....

Four years ago a Wellsian screw appeared in the NASA section of the US Pavillion at the Paris Airshow. It would have fitted one of those sci-fi War of the Worlds adventure illustrations where hovering spaceships spewed fire and brimstone at dragons while pre-laser light beams pierced purple atmosphere from turretted defences!

At the time the 'fan' seemed just another ploy to deceive the Russians into following a false trail. Then at Farnborough in '84, at a very small stand in the US industry section, there was a display of dynamic models

Right, this is the back end of the UDF as designed to replace fuselage pods on the MD-80 or Boeing 727. Blade sweep adds to the bizarre appearance. Will it ever come to modelling? Below, no this isn't a UDF or a Propfan, it's just a Russian 16 blade contra rotating Turboprop unit. Watch out Seagulls - you won't get through this one. The curved leading edge on the wide blades takes one back 70 years in blade shape.



including a miniature of the same scimitar shape and other coaxial multi banana blades that just had to be taken seriously. We had 'discovered' the UDF or *unducted fan*, a.k.a. the *Propfan*.

More recently, the '85 Paris Salon confirmed intent to have these devices fitted and flying on Gulfstream and Boeing 727 test beds by the time Paris comes round again. It's not easy for anyone brought up to understand that Rotol added a fifth blade for the Griffon because the Spitfire undercarriage wasn't long enough to increase diameter, when new eight or even ten blade

single rotation 'propulsors' are on the way for Mach .8 operation. The coaxial contra-fans for rear pods will have as many as 16 blades! Strangely, some of these shapes would look more suited to a submarine.

Not to be outdone, The Russians produced a massive 16 blade conventional propeller, complete with de-icing cuffs and the most basic configuration, to fit a new turbine. When the fire is stoked, this mighty windmill should pull anything off the deck in short order, and conversely it could become a new line in airbrakes for the approach.

How come we've been wasting our time on single bladers running up to 30,000 r.p.m. when the scientists are spending zillions doing just the opposite? Don't they know that some model gliders can fly faster than anything with a prop on the front? Time will tell if they've found a way of feathering 16 at once, containing the mass and keeping the whole thing quiet, - it's all in the interests of economy.

A Swedish entrepreneur displayed two RPV's (Remote Pilotless Vehicle) at Paris, very streamlined, devoid of any control surfaces and without any evidence of power

source but obviously of interest to visitors from east of Suez. One had a prop (only 2 blades) on the nose, the other a ring around the rear fuselage (with 4 blades). It was said to be 'new'. Crikey!! - Pete Holland had a ring prop design flying back in 1955 with just the same arrangement! (Prop - Secret, Plan PET 604)

Untold Tales

Tim Dannels of Denver is up to issue 79 of his *Engine Collector's Journal* and never ceases to amaze with this collation of personal recollections which would otherwise be lost to the world. Alf Dickau relates in this latest issue a tale so typical of the post '45 scene when wartime industry ran down to zero, and returning servicemen dreamt of setting up factories on a shoestring. This story concerns the Scrapper engine...

Alf was young, hopeful and poor as most but he called at the factory for his \$18.50 Super-Scrapper off the bus at Hartford (where Pratt & Whitney unwittingly supplied the machining). "Sorry lad, no Supers' - have a regular Scrapper instead". Disappointed he spent his 46 hours of earnings on the option, but changed his mind at the bus stop and went back for a refund. He got a bouncing cheque and no engine. The Scrapper just disappeared.

A year later he recognised a new engine,

the *Bobcat* in an advertisement bearing the same Scrapper features of rear rotary shaft, horizontal fore and aft needle valve and two exhaust stacks. So he called, and called, was offered a sales job, and told eventually to return one Wednesday. Come the day and he found the place bare, the birds had flown...

Years later he traced one of the machinists who had 30 or 40 examples, now rare as hens teeth, but he didn't wish to sell! Eventually an obituary announced his death so Alf went to the widow who said she'd sell the engines and went to fetch them. Alas, the large and heavy bag she carried was no crock of gold but four sets of barber tools! - The Scrapper/Bobcats had gone, and with them, Alf's hopes of realising his original boyhood ambition.

The sad part of this is that the same situation could apply to so many optimistic endeavours of those late '40's. There were literally hundreds of similar USA engine manufacturers. Isn't it strange that America has so few today. Good luck to Condor, Laser, Magnum, Dunham, PAW, Oliver, Forest Engineering, Davcal and of course Irvine here in the UK, - aren't we well off!

To catch a tiger

Dennis Bryant's hand measured drawings of the DH 82A 'Tiger Moth' we published in April were based on 'CDC the

oldest survivor of the breed and one that could well be claimed as truly an authentic De Havilland product. So when all the dimensions and shapes were assembled, checked and double checked by the tops in the 'Tiger' rebuilding business, we thought the job was the most definitive effort ever, beyond reproach...

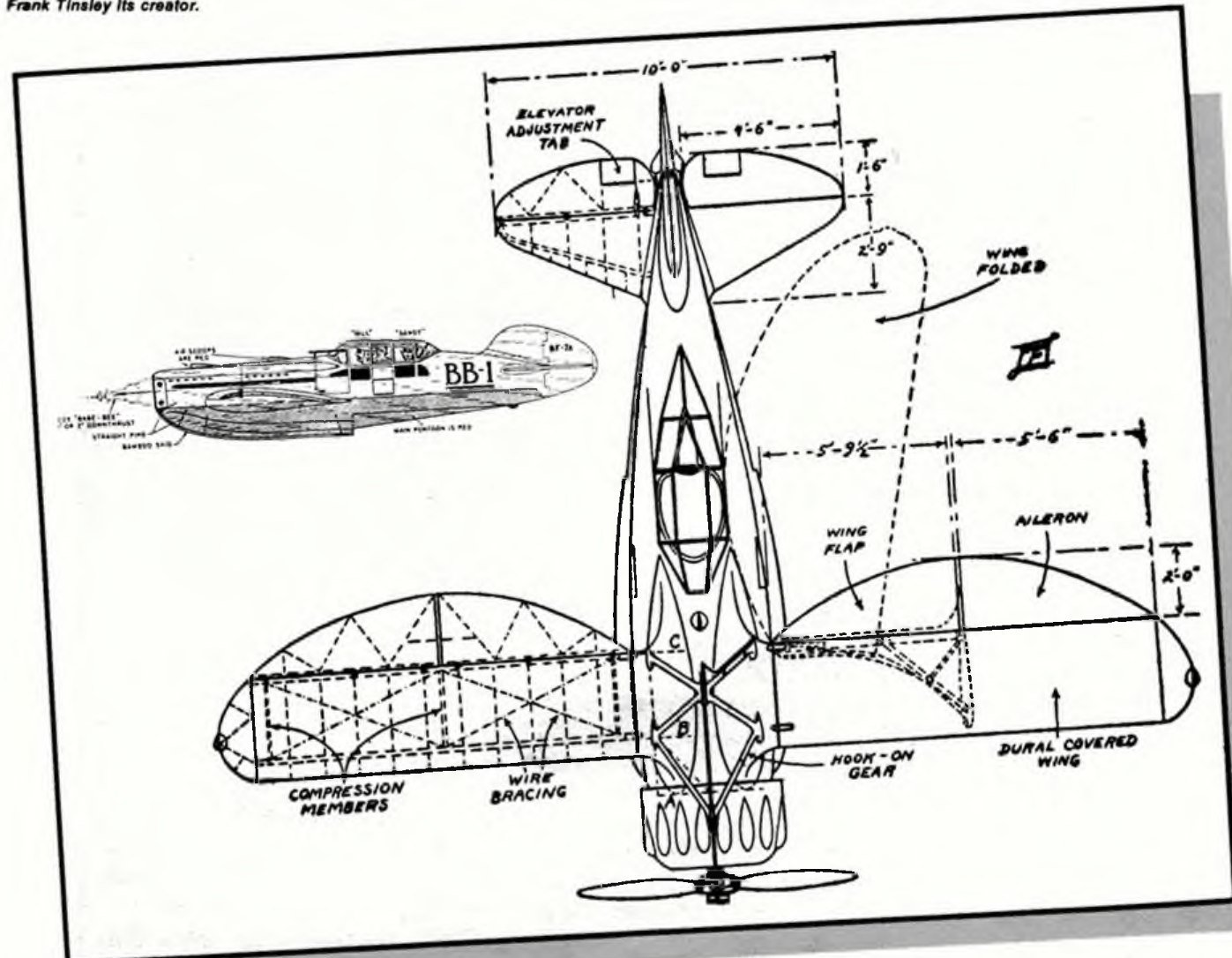
We hadn't allowed for Arthur Bailey, soon to celebrate 50 years of modelling and a 'Tiggy' fan to boot. "Why - he asked - is there a one inch difference over the tailspan, between quoted dimensions and your drawing?" *Oops!!*

Call in the Rabones, the plumb bobs, chalk for plotting on the Redhill hangar floor and what does Dennis discover but that at that hallowed home of the *Tiger Club*, all the tailspans vary one inch either side of the factory figure of the quoted 9ft 10in - which just goes to show as Arthur says "If you catch a Tiger by the tail it may be larger - or smaller - than the last one!"

Bill Barnes lives on

He may have been at his peak just over 50 years ago but to many, that freelance defender of civilisation Bill Barnes is still a hero. He was of course, pure fiction, produced by anonymous writers for a 10 cent pulp magazine that became *Bill Barnes Air Adventurer* of fond memory (*before my time...Ed!*). Brief mention in *Model Builder*

Left, Swedish RPV's, without visible means of power - one at rear using the ring prop principle, but rather peculiarly placed in this instance to smother the tail feathers with turbulent slipstream. Below, views of the "New Eagle" from B. Barnes Air Adventurer pulp novel of May '35 show the inventiveness of Frank Tinsley its creator.



revealed existence of a club which honoured Chas Verral, originator of many of the *Air Adventurer* stories on the 50th anniversary and led me to Bud Overn, leader of a BB cult.

For most devotees it wasn't so much the text as the drawings by Frank Tinsley that generated all the interest. In his time (the stories ran from *'Hawks of the Golden Crater'* in February '34 to *'Dead Man's Return'* in March '39) Frank Tinsley (FT) created a succession of imaginative designs ranging from transports to amphibians, fighters, bombers, convertibles and even a submersible! All well abreast, if not ahead, of current development.

My favourite always was the *New Eaglet*, a compact amphib biplane with Sparrowhawk hook for taking a rest on an airship and elliptical folding wings with a gull centre section. For school pad scribbles it was an inspiration in May '35, and it led to many a model, even a "solid" kit by the National MA Supply Co. of New York.

There were many other equally romantic shapes from FT's imaginative foresight, with names to suit: "*Scarlet Stormer*", "*Charger*", "*Bumblebee*", "*Hellion*", "*Silver Lancer*" and the "*Snorter*". Plans for all these are in Gordon Coddington's list of old timer drawings, one of the most comprehensive anywhere (includes so many kit plans, it costs Gordon \$2 to print each copy). If there's anyone else out there who read Bill Barnes, novels secretly by candlelight, I'd suggest a dose of instant nostalgia would come from joining up with Bud and Gordon in the BB fan club.

Art under the hammer

Intrigued by Sotheby's announcement of an auction at their New Bond Street, London, Showrooms on 21st June, where 103 lots of Aircraft "Profiles" were on offer, I was surprised to see those superb originals by James Goulding, Peter Castle, Ken Rush, Keith Broomfield and Terry Hadler knocked

down so rapidly and for sums that were nowhere near their cost to produce.

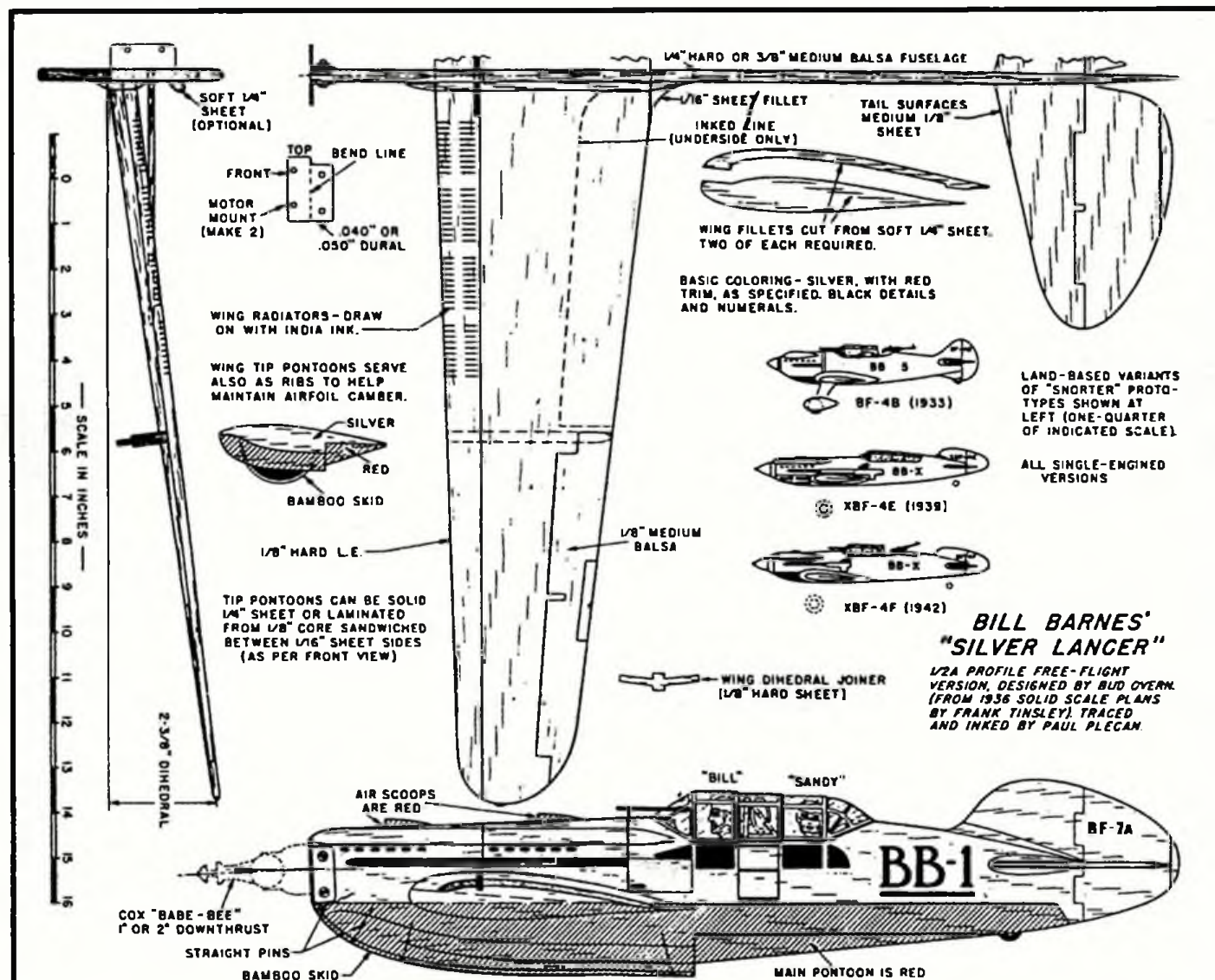
It's a sobering fact that once published, such art acquires a sort of commercial taint no matter how detailed or brilliant in quality. What will happen to them I wonder? Will they be cut up, framed and sold as paintings of a special art form for collector's to boast "That's a souvenir of Profiles"...

What of the background research, the colour matching, the hours of painstaking artistry in reproducing battle scars and intricate markings? All gone under the hammer and to whom? Mostly to one dealer. A sad but final conclusion of an era that will enrich in memory as the years roll by.

References

Engine Collector's Journal, P.O. Box 15162, Lakewood, Colorado 80215.
G. Coddington, 3724 John L. Ave. Kingman, AZ 86401, USA.
B.W. Overn, 13901 Holt Avenue, Santa Ana, California 92705, USA.

Below, Bud Overn's profile free flight "Silver Lancer" for a Cox .049 appeared 24 years back in *American Modeler*, and was then 24 years old as a full scale fictional creation. Bill Barnes is a timeless subject.



OLD TIMERS' SPECIAL! We don't think anybody under 40 years of age should be permitted to build this. If you're younger don't mention the fact when you write to Hobby Helpers for their full size drawings on Group Plan #1161 (60c) which includes Radi-O-Too and "Slingshot" combat winner.

American Modeler — November 1961

VIEWPOINT

Have you something to say? Perhaps 'viewpoint' is the place to say it... How do you react to the piece below? Is the underlying problem one of 'them and us', 'contest and non-contest'. There are further questions to be raised than just those below: What is a contest? Who pays for what? Should we divide ourselves against each other...and for what possible gain to anyone? This is Dave Hipperson's viewpoint — do you agree...or not?

SMAE Contests... A precarious future?

A well-known aeromodeller admitted to me recently that one of the highlights of his aeromodelling experience was his winning of a somewhat more than usually prestigious event I ran some years ago. No small accolade from a chap who regularly wins the Nationals. I have long believed that we need to improve the status of our domestic events and from time to time illustrated how we might go about this by running my own, or assisting with, contests, on behalf of the SMAE.

Events that appear important to their organisers soon attract similar respect from the contestants. I don't simply mean lavish prizes; actually, prizes could well be quite low on the list of priorities. What is *vital* is a dedicated Contest Director who *knows* the rules and *wants* the event to succeed. This leads naturally to trappings such as clear score boards, suitable control vehicles, accurate communication with the contestants and a better day for everyone.

Professionalism by definition costs money but for SMAE events that money is there, derived from entry fees and contest license sales. The revenue maintains the Contest Fund and in the past rather too little has found its way back into actual contest organisation.

However, things are now looking even worse. The SMAE Council have even *less* of this income to plough back into the domestic scene as a greater percentage of it is being spent directly on International participation. Moreover at least one member is actively lobbying not only for that, but has also a substantial increase in entry fees so that the level of international funding can be still higher.

Some Free Flight CDs may well be made to feel that they shouldn't take any expenses at all as the Free Flight Technical Committee will be under great pressure to make a profit on domestic events. Standards will inevitably slip lower — to the stage that some club contests reached a few years ago — self help affairs with no one person even taking control. Non events in fact.

It began of course with the decision some years ago to channel all the profit from the Nationals, directly into Team Travel. Since then the status of our premier event has been somewhat tarnished particularly when one hears officers of the SMAE quoted as saying the *only* reason we run a

Nationals is to subsidise our International Teams!

You will recall that when I was FFTC Chairman I made jolly sure that the running of the Nationals to a satisfactory standard came *first* so as to most benefit the enormous number of contestants that attended. Surely this is how all events should be...

It appears that as well as the profit from the Nationals going towards team travel, the profits from all Free Flight contests will be needed for International entries...but there's worse. No longer does all this Free Flight revenue benefit Free Flight Teams directly as it used to — oh no! Now all the profits from the three spheres FF, CL and RC are pooled and we take only a share. That wouldn't be so bad if all three disciplines made equal contributions but it would be unnecessary to pool them then wouldn't it?

Free Flight makes far the largest contribution because we have vastly greater numbers of entries. When the money is shared out it is on a 'per number in the team' basis! Sounds very fair...but... My point, and I am supported by a number of other contestants as well as the current Chairman of the FFTC, has always been that overseas FF teams should be expected — where at all possible — to *pay their own way*. We are a very small minority of ultra dedicated flyers. We would move heaven and earth to attend anyway! Of course if out of their concern for our performance abroad the SMAE membership, through the Council, would like to subsidise entry, travel and accommodation from the General Fund currently standing, I am reliably informed, at in excess of £50,000, then all well and good. But to use that already tiny revenue we make on our contests is self-defeating and ineffective, as it is a drop in the ocean compared to the actual cost of international participation anyway. We demoralise the grass roots of the hobby — eventually there may well be no-one interested in being in a British team at all!

What is more, in the past it has been the custom for the Team Manager to be paid his full expenses to the event plus out-of-pocket expenses incurred setting up the team's participation. Quite fair, as it's a thankless job with little reward and no flying. In the past these expenses have been born by the General Fund. Not any more! This year the Contest Fund pays for all the Team Manager's expenses too.



Dave Hipperson is a keen competitor who has always fought for the cause of the competitive modeller. Not always liked for his outspoken criticism, he nevertheless speaks with the force of honest opinion...

A prize for contest organisation

I am a member of the F1B Team this year and should be flying in the World Champs about the time you read this. I will be, along with eight others in the Team, in line for a portion of the SMAE's Team Travel Fund. Believing as strongly as I do that such a fund derived of your entry fees should not exist, nor be spent on me, I am — as I have said I would always do — reinvesting mine into domestic SMAE events. I am donating it all as a prize. Not at one particular event but to an organiser. I shall donate my share of the SMAE Team Travel Fund to the Contest Director who runs the best day's FF SMAE event in 1986! CD's of each and every day's SMAE centralised contests including the three days at the Nats will be eligible. This is not a back-door bribe for CD's to be extra helpful to me either! I have nominated a four-man panel to be the judges and no-one will ever know who they are.

They will assess CD's throughout the year on their clear communications with contestants, their period timing, their knowledge of the rules and accurate enforcement of same, their handling of crises, preferably not of their own making and their general contribution to the prestige of the day's meeting. They will not be expected to provide prizes over and above the usual SMAE ones and will not be held responsible for the weather!

What is more the winning CD will also receive two tickets to the SMAE dinner/dance where either the SMAE or if necessary myself, will present him or her with their cheque. Perhaps that will convince the SMAE Council that someone out here wants domestic events improved and is prepared to put his money where his mouth is.



SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED



Latest in glues... Loctite 'Super Glue Xtra' - stays where you put it and will fill 1mm gaps!

Fill that gap...

For years now, we have had many new glues and adhesives appearing that make our lives easier... either at the construction stage or (heaven forbid!) during traumatic repairs on the field. All modellers gain from the modern quick set epoxies and the many cyanoacrylate adhesives on the market. Perhaps the most critical user, is the competition flyer who desperately needs an accurate, rapid repair, so that he may finish his competition flights with a tried and tested model. Loctite 'Super Glue Xtra' may well find its way into many model boxes for this purpose alone! A cyanoacrylate adhesive with a difference - 'Xtra' is a thick colourless gel, that will not run or drip, it does not soak into porous surfaces and most important... it will fill gaps. So even if a few bits of your model have blown away by the time you reach it... 'Xtra' will reach the parts that others cannot fill...

This is not a cheap glue, but as a last resort 'save the day' measure, it could well earn a place in your field repair kit. Loctite 'Super Glue Xtra' is available generally, in 3 gram tubes at £1.99, or is on special offer from the *Balsa Cabin*, Unit 5, Mill Lane, Fullbridge, Maldon, Essex CM9 7LD at £11.95 (Normal price £14.32) for the more useful 20 gram size and also includes the spray-on activator.

Metal treatment

Many items on scale models try to represent an original, treated metal, finish (e.g. gun



Set up in metal finishing at home, 'Koldblak' will treat steel (non-stainless) and provide a neat, corrosion resistant black finish.

'bluing' or 'blacking'), painting can work - but even light spray coats may fill-in fine detail and spoil all that hard work put into accurately reproducing the real thing. Various metal finishing techniques are available but are often, either costly to have done, or utilise caustic baths that are not particularly safe to have around the home! A new item from *Duckhams Jenolite Division* is 'Koldblak' a simple, safe treatment for all types of non-stainless steel. This will give a corrosion resistant, black oxide finish that may well be what you have been looking for. At present 'Koldblak' is only available in five litre packs at £57.00 (!) but... the treatment has become so popular with gunsmiths that 165ml quantities will soon be available from gun shops at about £4.50. For more technical information phone Jenolite on 0784 35456.

More goodies from SAMS

If you are into luxury items, then here is the tops for the indoor modeller. Imported from the 'States is a 'super winder' made by Bob Wilder - cost is impressive tool. For £35 plus £1.50 postage and packing, you too can join the elite. With a ratio of 20:1 and a very clearly read dial, the 'Wilder Winder' will stand you in good stead for years - some have been around for at least eight years, so we know they last...

Choose a size to build? Both the *Schlueter* 'Pacific Ace' and the 'Black Bullet' are much in demand amongst vintage flyers. SAMS now have both these models available in versions with 20, 30 and 40 inch wingspans. They are supplied as 'partial kits' only (printed wood and plan in

Right, useful piece of equipment in anybody's workshop is a digital multi-meter - this one from *Selectronix*.

clear plastic tube). Prices are: 20in. £3.75; 30in. £5.25 and 40in. £7.49. All plus 15% post and packing. SAMS address: 2 The Drive, Blackmore End, Wheathampstead, Herts.

Hang in there

Amerang Ltd., distributors of many of this country's model aeroplane kits are just about to launch a rather novel electric powered, free flight, motorised hang glider - the 'Sky Hopper' (19 in. span). The kit is highly prefabricated, utilising a mixture of aluminium, plastic foam and die cut balsa parts and should go together quite quickly. 'Sky Hopper' comes complete with custom made flight pack consisting of twin Nicad batteries. Also included is a rapid charge battery field charger unit, that houses four 'C' type standard cells. Charging time for the flight pack is 60 secs and motor runs in the order of 20 seconds plus appear to be entirely feasible. An *Aero-modeller* review on the 'Sky Hopper' will tell all... watch this space!

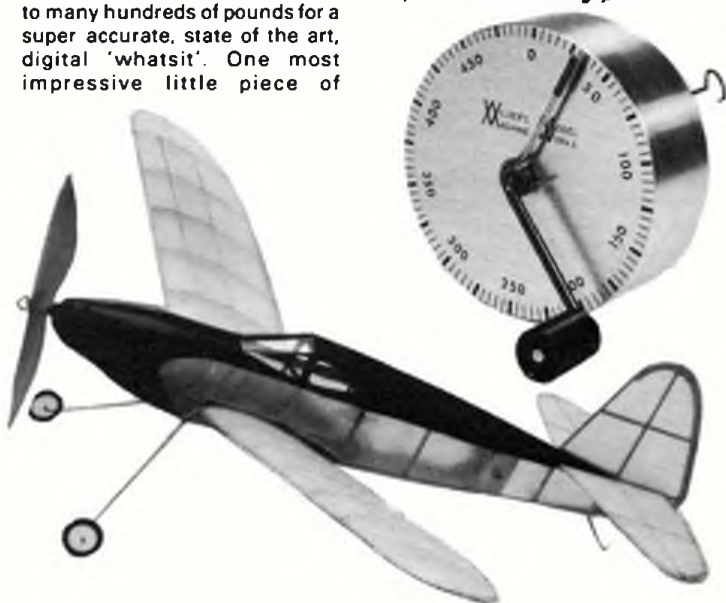
Compact meter

In this modern day and age, there are many things electric either in our workshops or in our models. Batteries of all kinds for R/C, electro-flight, soldering irons, glowplugs or landing lights on that scale control line job... Models may have a fair bit of wiring in them and even the odd transistor or two! A most useful item to have around is a multimeter - to check all those volts, amps and ohms. These range in price from a few pounds for a simple, moving coil meter up to many hundreds of pounds for a super accurate, state of the art, digital 'whatsit'. One most impressive little piece of



equipment for the electronics buff - or anyone who wants to be really 'with it' - is the DM30 from *Selectronix*. This is an ultra neat digital meter with a liquid crystal display (LCD) that not only covers a host of ranges for volts, amps and ohms but also has a continuity buzzer and test facilities for transistors and diodes. The display is a full half inch high and battery life is claimed for 300 hours, with automatic warning when batteries are down to 10%. For the aerobod who has nearly everything the *Selectronix* DM30 is a must! Supplied with test probe leads, battery, spare fuse and soft carrying case the DM30 costs £46.57 including vat, post and packing from *Selectronix Ltd.*, Tower house, Lower Kings Road, Berkhamstead, Herts. HP4 2AB.

Reminders from SAMS of Bob Wilder winder and *Schlueter* 'Black Arrow'. This attractive low wing aircraft is available in versions with 20, 30 and 40 inch wingspans.



the wings over the plan. The aileron balance weights are glued in place *after* covering.

Covering

Cover the model with the *lightest* tissue available. For fin and stabiliser it is advised to preshrink the paper on a frame. Do not use dope to shrink the tissue, only a light spray of water is necessary...

Details

Glue the turtledecks in place in front and behind the cockpit. Build up the noseblock from N1 and N2. Fit N2 into noseplate F3 and sand the noseblock to match to the fuselage. Make the dummy magneto and fit it into N1.

The landing gear and turnover bar are built from thin steel wire and fine balsa strips as shown on the plan. For assembly of the landing gear and turnover bar parts (wire and balsa) the use of balsa positive-forms is to be advised, (see fig 1). Wheels and dummy engine are made from light balsa block.

Colouring

For colouring, I use enamels as used by plastic modellers. (*Revell* or *Humbrol*). All parts get a very fine spray coat of white, because such a light coat looks better than plain white paper. Weight increase due to this white colouring was about 0.3 grams.

To spray the other parts of the model the areas were masked off and given a light coat of the correct colour.

Engine and wheels were painted with a brush since on these parts a thin coat

quickly wears off when handling the model. The colour scheme on the plan was inspired by the cover storey of *Sports Aviation*, May 1969!

Assembly

The dashboard, turnover bar and windshield are glued to the fuselage. Put the fuselage with the bottom side on to the building board. Fix the fuselage so that it cannot shift. Match the wings to the fuselage, block up the wingtips. Glue the wings to the fuselage, leave the wings blocked up correctly until the glue has set. Match the struts and glue them in place. When the wings are in place add landing gear, fin and stabiliser.

Propeller

A *North Pacific* prop is shown on the plan since it seems to me that most modellers would prefer a plastic prop. Using a plastic prop the model may need some balance weight in the tail. Using a self made balsa prop can save up to 1 gram. The prop on the photos has the same diameter as shown on

the plan, it features a pitch/diameter ratio of 1.3 (145mm pitch/110mm dia.).

Adjusting the model

A model that weighs 6 to 7 grams may need a rubber loop of 1.5 x 1mm, 300mm long. The model on the photos weighs 4.8 grams and got a loop of 1 x 1mm rubber. Rubber size depends upon hall-ceiling height or the climb pattern you want to achieve.

For the first flights wind 200 to 300 turns to the rubber. Trim the model using fin and stabiliser to get slightly descending flight.

After this, increase turns in steps of 200. The model now begins to climb... If instability occurs when more power is added, change the thrust line of the prop shaft - too much climb, stall: add more downthrust; turn radius decreases with more power: reduce side thrust.

I wish you a lot of happy flights and good landings with your Peanut-Volsplane.

Documentation: - Sport Aviation, May 1969.
- Sporting and Homebuilt Aircraft.
MacDonald Phoeby's Ltd, BPC Publishing Ltd, 1981.



With its extremely simple outline the 'Volsplane' must be considered as a good potential first peanut...



Quo Vadis — from page 531

especially try it with the matt side uppermost. Very like *Modelspan* tissue and it *doesn't* need doping.

Trimming and Flying

The December 1984 copy of the *Aeromodeller* contains an excellent article on trimming and flying and is to be recommended. If you can't get a copy send for a photostat (price £1.50) or get someone else to do the trimming for you!

However, if you are too impatient to wait for the friend, proceed as follows: Balance the model as shown on the plans and hand glide over long grass adjusting the tailplane

by packing the LE or TE up by 1/32in. at a time until a long straight shallow glide is achieved and glue the packing to the fuselage.

Offset the rudder 1/8 inch to the right and hand glide again to achieve a gentle right hand turn. Another shim may now be needed under the tailplane. Now with the engine running at just over its minimum rpm and with a minute amount of fuel in the tank hand launch slightly nose down...

Gradually increase the rpm until a gentle climb to the left is obtained. Do not adjust the rudder to get the left turn but rather offset the engine so that it is pointing to the left by whatever means are suitable for your engine. This adjustment must be *very* small indeed. Keep adjusting in this way until a

gentle climbing turn to the left under power and right turn on the glide is achieved.

If at any time during the trimming stage the model gets into a high, nose up attitude but will not climb i.e. close to a power stall, adjust the engine so that it is pointing down by a very small amount and try again.

Make sure that the CG is no further back than shown on the plan and do not overpower the model as it was not designed for straight up climbing fights! The original models were powered by *Frog* 100 engines that sit comfortably inside the cowl with just the compression screw bar sticking out.

Do enjoy this model, it is rugged and is a good stable sport flyer and the sound of a long stroke diesel engine takes me back to... is it really 33 years ago FRED?



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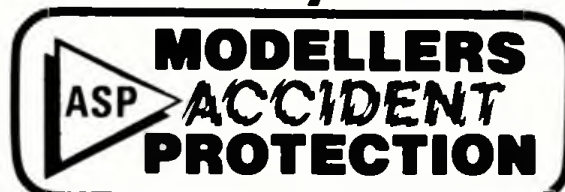
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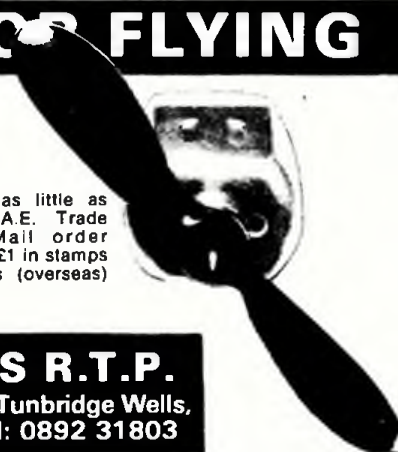
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DORNIER 27 by D. Garrett. A 27 in. (686mm) span model of modern German light plane. Plans include modifications to take .3-.75 cc engines.
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SOPWITH TABLOID by K. McDonough. A diminutive 1/12th model, span 25 1/2 in. (648mm). For .3 to .8 cc motors.
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FSP/681 Price £2.30

B.E.2e by K. McDonough. Lightweight and with large wing area, this 1/12th scale 40 1/2 in. (1036mm) model flies slowly. Detailed plan includes gun and camera! Power with 0.8-1cc motor.
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Appendix: Links to the plans

The original issue comes with a free plan (Akro Kat) printed front/back on a pull out banner of four sheets. The banner is not included in the document.

Volksplane Peanut by SiegfriedGlockner

FF Peanut Scale Rubber

[https://outerzone.co.uk/plan_details.asp?ID=13431 ...](https://outerzone.co.uk/plan_details.asp?ID=13431...)

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Hot Rock by Bob Tucker

CL Vintage 1948 Hot Rock presented in MIND THE LINES

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AKRO KAT by Dave Cowburn

CL for a novice stunter

[https://outerzone.co.uk/plan_details.asp?ID=6963 ...](https://outerzone.co.uk/plan_details.asp?ID=6963...)

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Super Nog Mk3, Mk4 by Tom Smith

FF Open power. Originally Nig Nog from Aeromodeller March 1961.
Presented in FREE FLIGHT SCENE

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'B' Boost Glider by Ian Dowsett

Presented in AT THE LAUNCH PAD

[Document Page: 39](#)

Quo Vadis by Mike White

Vintage type free flight sport model.

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Silver Lancer by Bill Barnes

Profile power model presented in ADVERSE YAW from American Modeler 1961

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