

**From Switzerland, a
56 in. span, 1/6th scale
model of W.W.1's most
famous single place
fighting scout for multi R/C**



SOPWITH "CAMEL"

By Franz Meier

THE Sopwith Camel will always have a special place in the history of aviation. Developed in 1916 by Sopwith's chief designer Herbert Smith as a successor to the 'Pup' and 'Triplane', the Camel was used from the Spring of 1917 on the Western Front.

The new scout did not have the forgiving flying characteristics of its predecessors, demanding skillful handling from pilots if really successful use was to be made of this mount. Low speed handling was especially critical and was the cause of many crashes, in fact, it is said that there were more crashes due to this kind of mishandling, than due to enemy action.

Yet, despite such 'idiosyncrasies', the Camel was one of the most successful allied scouts during W.W.1 with more than 1,290 victories scored on this type. Its manoeuvrability in dog-fight encounters was superb and it was well armed with two synchronised Vickers machine guns. After conversion to the Camel, many pilots refused to fly any other type.

Total Camel production was 5,490 machines, which were used by the air arms of many nations, the last leaving R.A.F. service in 1922.

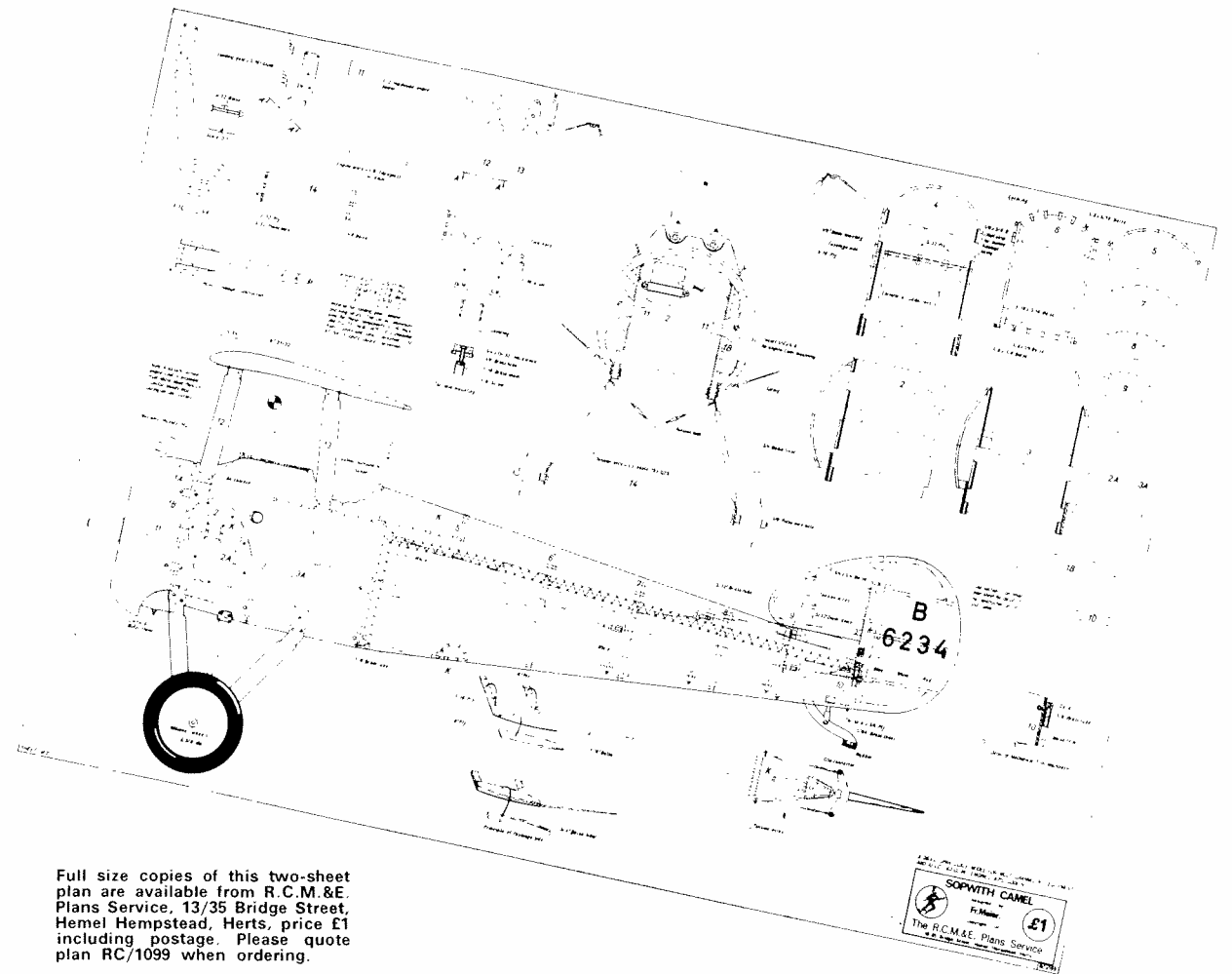
The Model

The prototype model was built 100% true to scale. Not only are the outline dimensions correct, but also ribs and spar arrangements conform to the full size structure. That such accuracy can have its disadvantages was proved with the prototype, because not only does the model look like the full size, it inherits the same flying characteristics!

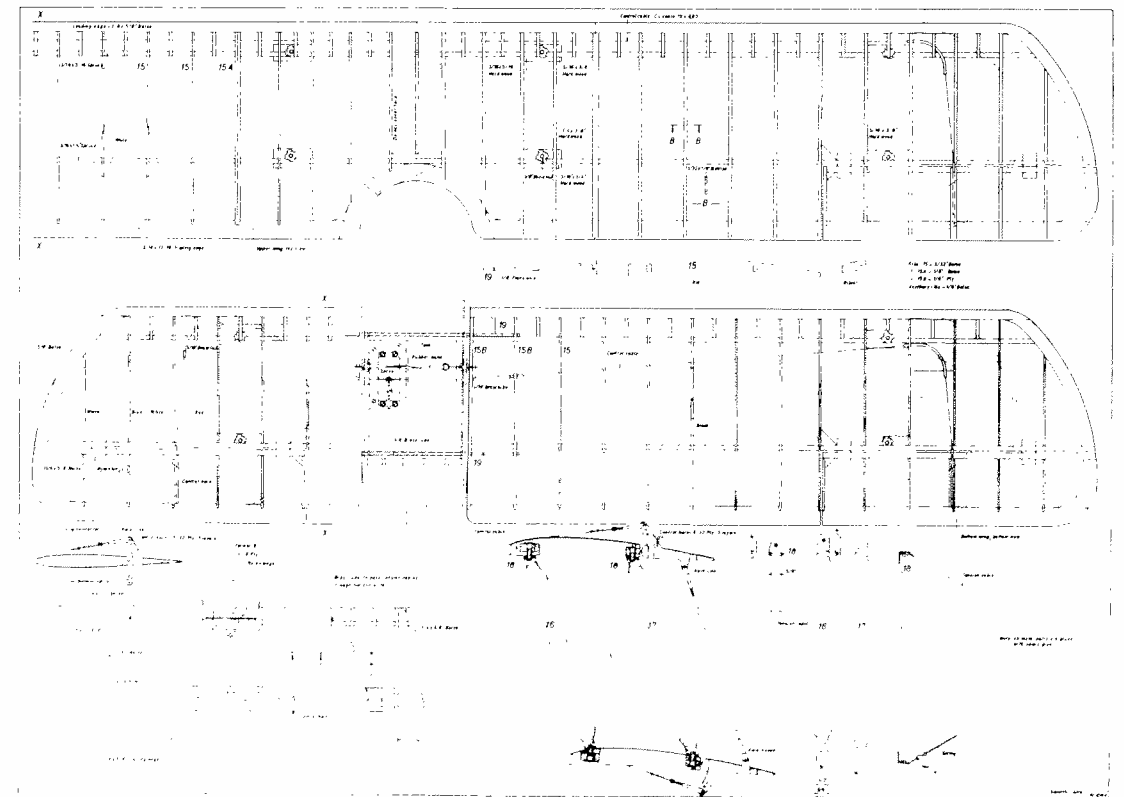
The low speed flight, especially, has its problems, and care must be taken on the landing approach. I was, however, pleasantly surprised at the take-off characteristics. Having expected snaking tendencies, I was pleased to find that the model can easily be held straight during the take-off run.

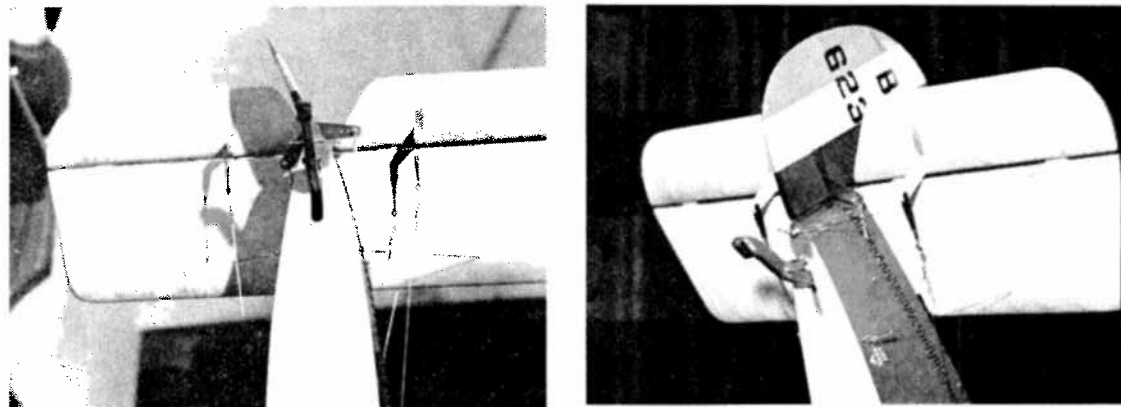
Since elevator control is extremely sensitive, proportional radio gear is very much advisable. During first flights, the ailerons were not very effective. This I had expected, since the Camel has the same wing section as my DH-2 (built previously). The result of this, is that the ailerons are not used to fly the model, and these control surfaces could be omitted, reducing the construction effort. (Coupled ailerons and rudder might be an interesting proposition here - Ed.).

First flights of the prototype model were attempted at Easter this year, at an airfield near Lake Zurich.



Full size copies of this two-sheet plan are available from R.C.M.&E. Plans Service, 13/35 Bridge Street, Hemel Hempstead, Herts, price £1 including postage. Please quote plan RC/1099 when ordering.





Full size aircraft use this field regularly, necessitating an early start with a deadline of 9 a.m. for completion of model flying. Weather for the first test hop was not ideal, rather cold and very windy. Dangerous though it was to attempt a test flight in these conditions, we assembled the model with cold fingers, started the engine and tested the radio equipment. In the strong wind, it was impossible to taxi the Camel crosswind. So we turned the nose into wind and opened the throttle slightly to taxi into wind—and at that moment it happened! After a run of a few feet, a gust lifted the model approximately 20 ft. It hung there immobile for a moment and then crashed back onto the runway. Luck was with us though, the propeller was broken and the wing tips scratched, but that was all.

Lead ballast weighing 150 grams was now mounted above the engine bearers, and the wing incidence reduced before we returned to the runway to try again. This time I opened up to full power immediately on commencing the take-off run which was smooth and straight. By

the time the model had climbed to 30 ft. and it was battling with the elements. In these conditions, a proper test flight was not possible and to add to the troubles, the engine proved to have too much right thrust, making a left hand turn almost impossible, while any application of right turn caused the model to dive in. (Not unlike the full size—Ed.). So the landing looked like being a problem, but fortunately, with the engine throttled back, the model became more controllable coming in slowly, dipped a little and finally touched down by the side of the runway, the wheels digging into the soft earth, turning the model over, coming to rest on its back like an exhausted soldier.

This first flight caused a lot of frayed nerves, but the Camel flew and it was down in one piece! Slight alterations here and there would cure its handling problems.

When designing the model, simplicity was a goal always most important. True fuselage section was achieved by a method I have found reliable, by using basic reinforced fuselage sides around which $\frac{1}{4}$ in. sq.

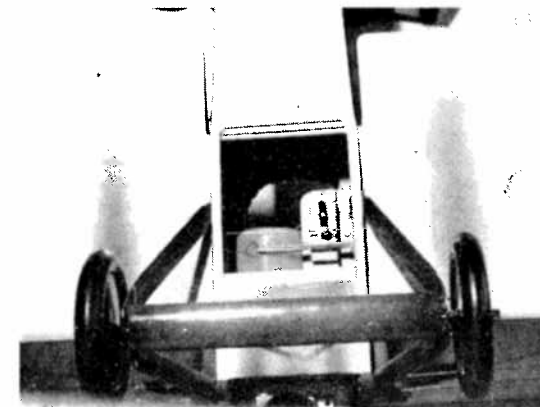
stringers are glued. Some problems arose with the engine mounting, due to the necessity to concentrate as much weight (and therefore equipment) as far forward as possible, to preserve the necessary balance point. To do this, I reclined the first former by $\frac{3}{4}$ in. and mounted the airborne power pack directly over the engine. In the case of the airborne struts, wing struts and landing gear, I deviated from normal practice, replacing the usual piano wire with aluminium strips. The bending of complicated shapes is difficult when using very thick piano wire, while there is little difficulty with aluminium. The correct cross section being achieved by gluing balsa strips to the ali. sheet and sanding the whole to the desired shape. An additional advantage of this method is the fact that the landing gear can be mounted after finishing the model and does not complicate fuselage construction.

The wings and tail cone are simple. The lower wing is built in two halves, connected with piano wire to the fuselage, while the upper wing is built in one piece without any dihedral and screwed to the cabane struts. I used an aileron linkage which duplicated the full size with the cables hidden in the wings. Rudder and elevator are also cable actuated as per the full size, the elevator servo travel being geared down to provide satisfactory travel for the scale area elevator and there is also provision for changing the tailplane incidence.

Most difficult part of the model is the engine cowl, since construction in balsa would be practically impossible. The answer here is a vacuum formed unit (one will be available from Micro Mold Plastics—Ed.).

Building the Camel

Since this is a true scale model, it is not a beginner's project, demanding some experience in building, and



Far left: the tail assembly showing scale type linkages to rudder and elevators. Centre left: another view of the tail end. Note tail skid and dummy lacing on fuselage side. Left: radio installation bay, showing tank position and aileron servo.

afterwards, in flying too. Construction will be made easier by thoroughly studying the plans before commencing the building.

Fuselage

First, prepare the basic fuselage side, following the scrap perspective detail drawing of assembly. The basic sides run from former 2 to the tailpost, while the ply doublers, glue to the sides to run between formers 1B and 4. When the basic sides with $\frac{1}{16}$ in. ply doublers are ready, we can add the $\frac{1}{8}$ in. ply reinforcers too.

The next job is to cut the slots in the fuselage sides, into which the formers 2, 3 and 4 key. Reference to the sections on the plan for these three formers will show how the fuselage sides are slotted to receive the keys on the sides of these three ply formers. The vertical $\frac{3}{16}$ in. sq. balsa strips on the rear half of the basic fuselage side can also be fitted at this stage, after which, assembly of the fuselage can commence, by slotting the sides and formers 2, 3 and 4 together, gluing well. The top side formers, 5, 6, 7, 8

and 9 are now cut and glued in place, together with the lower spacers.

The next step is the preparation of the cabane struts, which must be done precisely. Use alum. alloy $\frac{1}{16}$ in. thick of type HS 30-TF (to BS1470) cut into strips $\frac{1}{4}$ in. and $\frac{3}{8}$ in. wide strips (We've actually arranged that this material will be conveniently available from J. Smith & Sons (Clerkenwell) Ltd., 42-54 St. John's Square, Clerkenwell, London, E.C.1.—Ed.).

Shape a pair of struts, parts 12 and 13, as per the plan. Drill the holes and fix them temporarily to the fuselage. Adjust them and mark the positions of the holes on the fuselage. Next, face the metal struts with balsa strips as shown, and shape to section 'A', screwing and epoxy gluing the completed struts to the fuselage. Be sure to check all dimensions before the epoxy glue has cured!

Mount the fillers and former segments 1B, 2A and 3A and shape the fillers to the conical outline. Then add the planking, moistening the sheeting to follow

the shape where necessary. Plank the parts between formers 1 and 4, cutting the filler to fit over former 1B and 3 and glue in place.

Mount the $\frac{1}{4}$ in. x $\frac{5}{16}$ in. stringers and plank the sections from the filler to former 5 and the bottom of the fuselage from former 2 to former 3.

Before continuing with the fuselage we must now build the vertical tail so that we are in the position to mount the mechanical trim-mechanism. Here there is little to tell by way of construction instructions except that we must glue $1\frac{3}{2}$ x $\frac{1}{4}$ in. strips to the ribs to achieve the same section as per 'C' on the horizontal tailplane shown on the plan.

For mounting the vertical tail, we epoxy and bind a $\frac{1}{4}$ in. piano wire locating peg, into the $\frac{1}{4}$ in. sq. vertical spar.

The trim mechanism is used to set the angle of the horizontal tail plane, when the complete tail unit is glued together with the vertical tail assembly. This trim mechanism is built up from a brass tube and collar located at the fuselage tail so that the collar grub screw grips the vertical tailplane piano wire peg and thus holds the complete tailcone rigidly at the required horizontal tailplane incidence which can be readily altered to trim the model.

Once the vertical tail assembly has been built, complete with wire locating peg and trim mechanism, the latter can be epoxy glued in place behind former 10, making sure that the vertical tailplane is in fact VERTICAL, and leave to set.

We can now return to fuselage construction, adding the $\frac{1}{4}$ in. sq. dummy longerons, the $\frac{1}{8}$ x $\frac{1}{4}$ in. dummy lacing strip and the brass tubes for the rudder actuating cables, plus the planking at the rear fuselage near the tail skid. Make the bell-cranks for the rudder and elevator linkages and glue them to the fuselage. Mount the cables and fix them to the bellcranks. Pull the cables back into the fuselage and glue the lower $\frac{1}{4}$ x $\frac{5}{16}$ in. strips.

Now add former 1 and the fuselage floor, then sanding the structure to a smooth finish and dopping all over, particularly the front planked sections, which should receive several coats.

Having completed construction of the fuselage, it must be covered. Covering material is left to choice, but it is most important to remember that with such a short nose moment on this model, weight saved to the rear of the balance point will make the problem of achieving the correct





balance that much easier. Cover the top deck from former 5 rearward and the sides from former 4 back. After allowing to dry, we feed the control cables out through their guide tubes and cover the fuselage bottom.

Wings

Building the wings is no real problem. The top wing is constructed in one piece without dihedral, and the lower wing consists of two halves. It is important to carefully glue the reinforced parts near the blind nuts. The rear spruce spar is doubled at the aileron positions with 3/16 in. balsa strips and a 1/32 x 1/8 in. balsa cap strip is glued on top of each rib. The curved brass tubes for the aileron cables are only glued in after sanding the wing. The cables are then inserted and checked to achieve smooth operation.

Wing struts are made from the same material, and in the same manner as the cabane struts.

Horizontal tailplane

This is very simple and construction is no problem, so requires no specific instructions. Once complete, assemble the vertical and horizontal tail units to the fuselage before covering. The horizontal tailplane locates to the fuselage at its leading edge by means of a nylon hinge let into the leading edge and also into the 1/16 in. ply facing plate on the rear side of former 9. The hinge is necessary because of the adjustable incidence mechanism already mentioned in the fuselage construction

details. The hinge is pegged and the vertical and horizontal planes are brought together, trued up and glued together and finally, the 5/32 dowel reinforcer is inserted in the vertical tail, but only after covering and painting. When complete, the mechanical trim mechanism should allow the whole tailcone unit to move up and down 1/8 in.

Undercarriage

The landing gear is made from 1/16 in. alum. alloy to the same specification as the cabane and wing struts. The gear struts are cut and bent to shape as shown on the plans and balsa strips added to build up the thickness, before shaping to section in the same way as the cabane struts to section 'A'. Then we screw the undercarriage to the fuselage and mount the wheel axles.

Engine cowl

Construction of the engine cowl is not an easy job so a vacuum formed assembly, ready to use will be available from *Micro-Mold*. To mount the cowl, we first glue former 1A to the cowl, using a plastic glue or epoxy. Former 1A is to the same outline as former 1, but smaller in diameter by the thickness of the cowl material. The cowl is screwed to former 1 from the sides.

Radio installation

The basic details of radio installation are shown, the power pack being mounted to former 2 using a brass strip. For this we must provide two blind nuts in former 2. The

receiver is installed above the motor mounts on a balsa plate, glued to the mounts. Servo positions are also shown and it is an advantage to place the elevator servo in the centre, flanked by rudder and throttle servo units. To bend the metal Kwik-Links we anneal them in a flame. Do not solder the actuating cables, but jam them with brass tubes, thereby allowing easy subsequent adjustment of the cable length.

Apply oil at all friction points between cables and brass tubes, tightening the cables equally, but not excessively.

Finish

Fuselage and wings of the prototype model were covered in *Silron*, while medium tissue was used for ailerons and tailcone. You will note that on the plan fittings and embellishments such as the surround at the tailskid hole, the foot rest hole at the low fuselage edge near the cockpit and the access panel below the front cabane strut are all indicated 'K'. These details are made from thin card sheet and glued in place after covering. Rivets are imitated by small brass nails, using the same types as for the dummy lacing on the fuselage sides.

The model can now be painted, the top surfaces Khaki and the undersides beige. Markings and national insignia can be made from MonoKote.

Hinge the tail skid and mount the tail unit, then apply the imitation fuselage lacing. The S-hooks for the cables are similar to those used by model ship builders, while the springs are taken from model railway couplers. Finally, the surround to the cockpit well is made of leather.

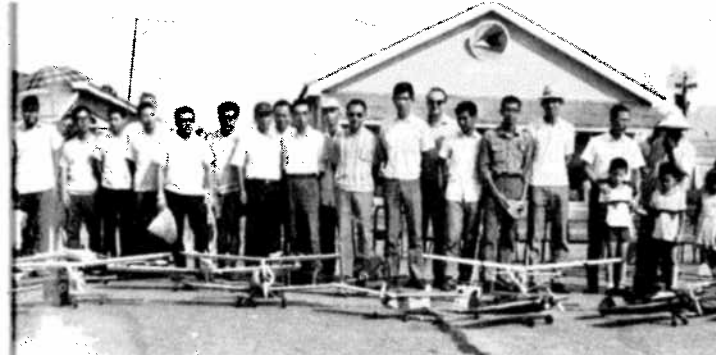
Flight preparation

Before flying be sure to make the obvious checks, such as balance point with tank empty, adding weight to bring the model to correct balance if necessary.

Downthrust on the engine should be 4 degrees. While taxiing the *Camel* is controlled easily with rudder, but care should be exercised on take-off, applying only small rudder corrections. Go easy on the elevator, because this model is very sensitive in this respect, while aileron control is poor.

The low speed characteristics are critical, so be sure to have enough speed on during the landing approach, correct a steep climb on neutral elevator with thermomechanical trim mechanism and begin aerobatic flying only after you have thoroughly 'felt out' the aircraft.

Good luck and good flying!



Carefree Cranfield

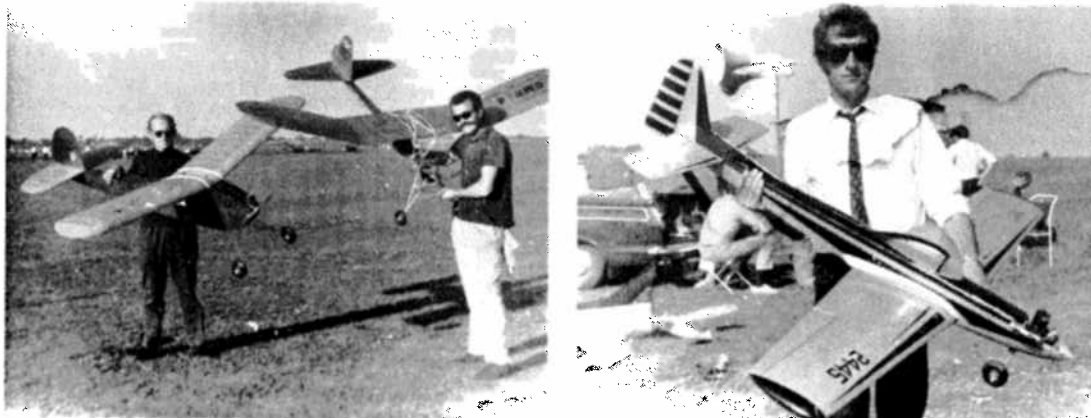
The South Midlands Area Gala at Cranfield is the sort of event that attracts a huge attendance, and it seems that an unusually high proportion of the people present are practising modellers who turn up year after year. This year, with near-perfect weather, the attendance seemed to be approaching that of the Nationals, and there were innumerable groups of people dotted all over the field just *flying models*. In view of this, I found the radio events just a touch disappointing. Although run to a non-standard schedule previous years events have featured a 'serious' aerobatic comp. that had attracted a big entry and a high standard of flying. This year for a change and taking advantage of the exclusive scale frequency allocation, that event was run quite separately and remote from the 'normal' contests, which took the form of several 'fun' competitions, including single channel. However, entries seemed low compared with previous years, and at least one competitor, this one, didn't find it quite as much 'fun' as a normal contest.

Nevertheless, somebody exercised quite a bit of enterprise in working out the 'aerobatic' comp. Each competitor was required to do a stall turn, three loops, five seconds inverted, three rolls, fly through a limbo 'goal', do an eight turn spin and a spot landing, in five minutes. This turned out to be fairly easy

(except for the limbo - I had never indulged in this form of lunacy before, and the *Striker 2B*, even throttled right back, seemed to zoom through at about 1.5 kiloknots in the near zero-wind conditions) which resulted in several of us scoring maximum points. Consequently there was a 'jump-off' against the clock' using the same schedule. First man off, John Landridge went for a 'clear round' if you'll excuse me continuing the show jumping metaphor, which he did in a respectable, if not spectacular time, while the rest of us came a mucker trying to go faster.

Peter Ashmore, using a *Merco 61 Moonglow*, took-off down wind and knocked thirty seconds off Landridge's time but incurred 'five faults'. I pulled straight into the stall turn from take-off, did both the loops and the rolls in one pass, did the inverted with the throttle shut to be as slow as possible when half-rolling back towards the limbo, but I misjudged it slightly and that put me out of the money! With everyone furiously trying to save time, Don Baxter saved a bit too much when climbing for the spin because his 'Gangster' was still spinning gaily when it became contiguous with the deck! All great fun, no doubt, but a bit daunting if you are flying your best, and in my case,

Left: prehistoric monsters at Cranfield, our columnist on the left with 'good' model replica which uses genuine 1936 Brown engine, which John Haggart's Chet Lanzo 1937 replica has new-fangled 1936 'Rocket' power. Right: John Langridge won novelty aerobatic event.



Straight & Level

by Peter Russell

Left: R/C modelling on Taiwan. Larry Hoffman sent this and other pictures on following pages. Scene here at Shinchu Air Force base.

only, aerobatic model. I escaped with a graunched leading edge but several others were not so lucky.

There might be just a hint of truth in the rumour that these 'fly-for-fun' events are aeroplane breakers. Still, an interesting experiment that could be developed (like replacing the limbo with a normal, but easy manoeuvre), and an enjoyable day. I imagine it was a great success from the organisers point of view.

Les Cigognes

I've just had a letter from 'W.E.' Mick Wilshere telling me about his (second) visit to the famous 'Circus des Cigognes'. He says:

'As at previous events, the weather was hot, about 90 degrees on the runway. Powerhouse Frances Plessier was again in charge and with a non-stop performance of R/C flying on the equivalent of our Farnborough airfield at Bretigny, about 5,000 cars were in attendance, and about 10,000 spectators. All the usual and unusual events were in progress, i.e. parachute dropping, streamer cutting, limbo, pylon race, leaflet (with lucky programme numbers) dropping plus some delightful flying with what I would describe as powered gliders. There was also an enormous Fokker Tri-motor with a Super Tigre 60 (adv.) and two O.S. Wankel engines which flew superbly and sounded even better. I flew in a relay race with a task of taxi, take-off, three loops, touch and go, three rolls, land and next man away. It was between bi-