

Heinkel

Three sheets of plans accord stand-off scale 74 $\frac{1}{8}$ in. s model — for two similar designed by Chas Maun

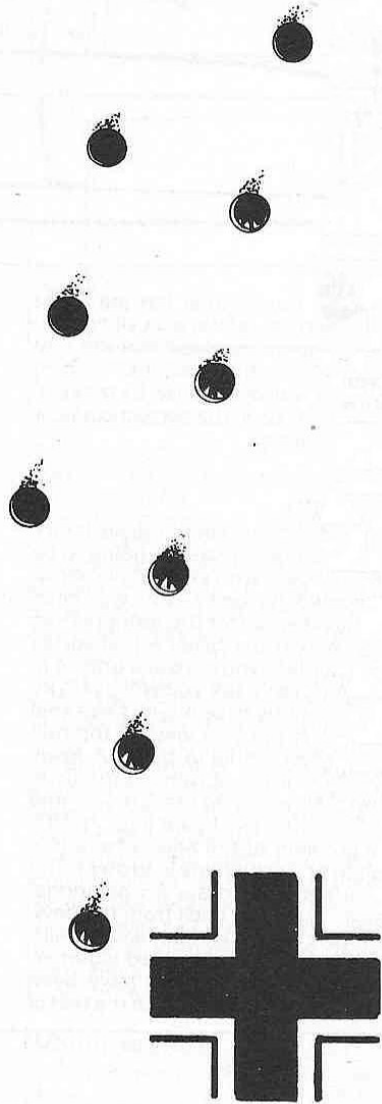
IN MAY 1941 I had my first view of the Heinkel 111, when I was very nearly on the receiving end of a mass attack on the London Dock area. From that time to this I have had an abiding fascination for this evil looking aircraft. From 1941 to 1974 this fascination lay relatively dormant, so glad was I to have escaped the attention of the Luftwaffe who, it seemed, had flattened large areas of London in an attempt to find me. However, my interest was reawakened in later years after seeing that characteristic glazed nose and curved wing again during the making of the film 'The Battle of Britain'. So keen was this interest that I have now built three Heinkels, each an improvement on the last. This design represents the culmination of these efforts and, I hope, means that I have now got it out of my system sufficiently to move on to other scale models.

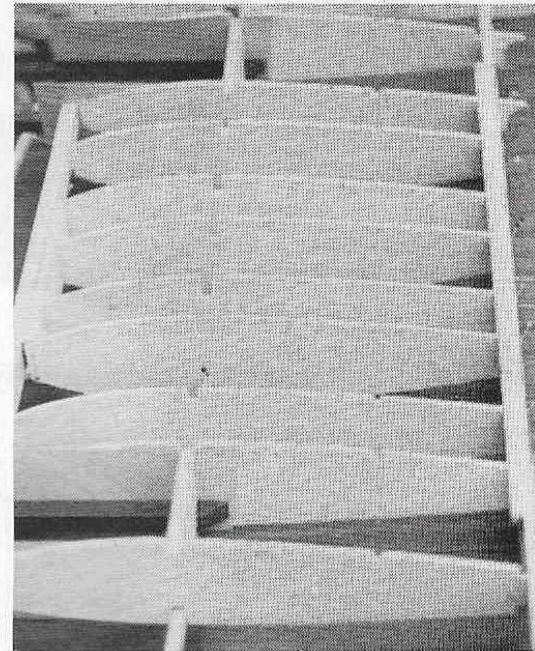
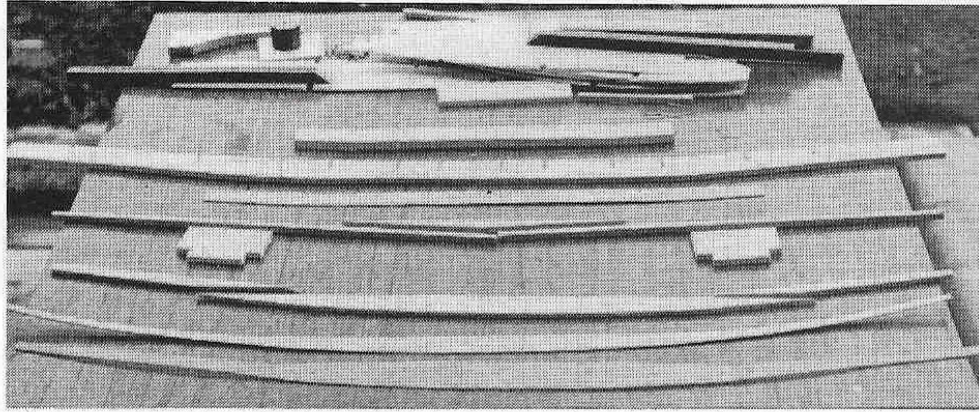
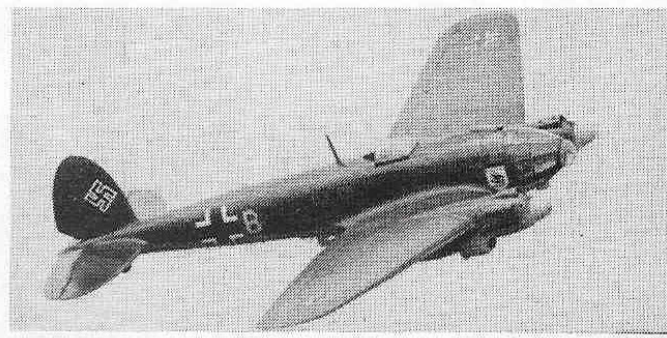
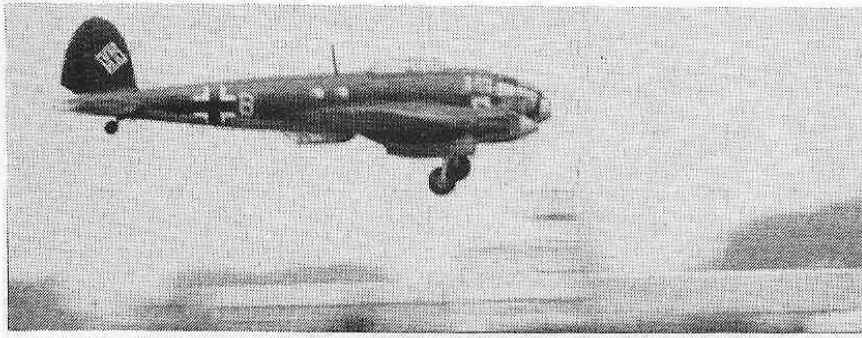
The model is to 1/12th scale (enlarged from MAP drawing 2926) and represents a Heinkel He111 H-2, which was one of the most produced variants. Since this is not a beginner's model (what Stand-off Scale twin engined model is?) I do not propose to attempt the glue A to B type of instructions. There is nothing particularly complex in the construction but there is a lot of it, and just to make life interesting Herr Heinkel appears to have designed the aircraft without the benefit of a straight-edge. The only obvious straight lines in the aircraft are the leading edges of the wings and the control surface hinge lines! The construction notes therefore assume a certain amount of experience in building and concentrate on the more difficult or unusual bits. The plans themselves contain as much detail as I could cram in and careful study should resolve any difficulties.

I always build the wings first, mainly because I enjoy building them and once completed their very presence gives me the enthusiasm to proceed, but also because they are needed to complete the fuselage.

Wings

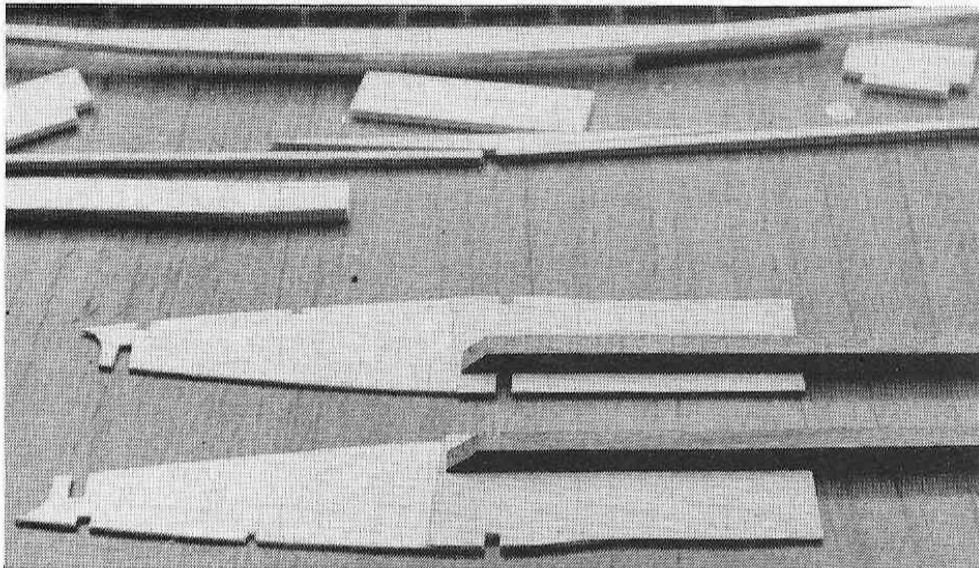
The wing is built in three sections, centre section and outer panels, using overlapping spars to join the sections. Start with the centre section by making up the main spars and their braces. To join the sections, which is done before the nacelles are added, place the centre section on the work bench and slot the outer panels onto the spar ends checking carefully for correct dihedral and a good fit for all the joints. The top section of the main spar, of $\frac{1}{4}$ in. sq. balsa, is added at this point. It may look a little daunting at first, but if built carefully the whole thing locks together to provide a very strong structure. Note that the outer panels have 2° washout and they should be jiggged up on the bench for this to be





Above, wing spars and doublers laid out ready for assembly.

The engine bearers fixed to the nacelle doublers and sides, below, ready for assembly with centre parts.

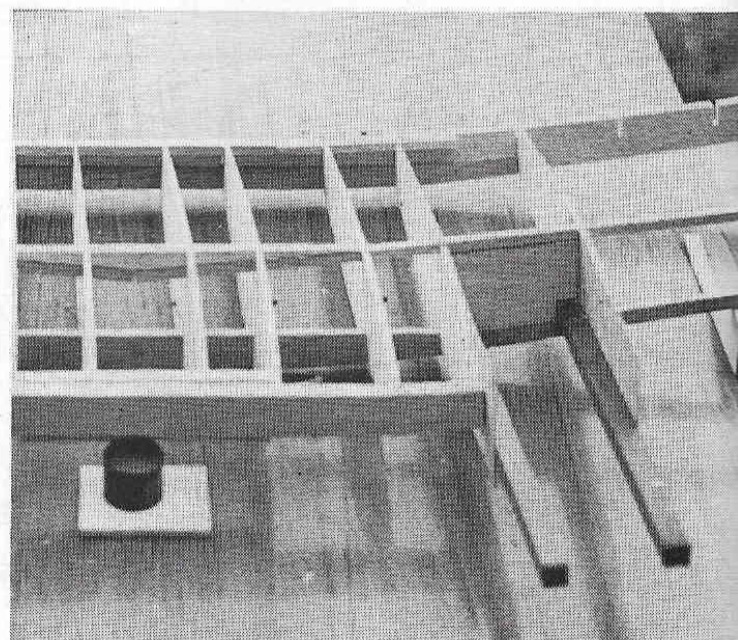
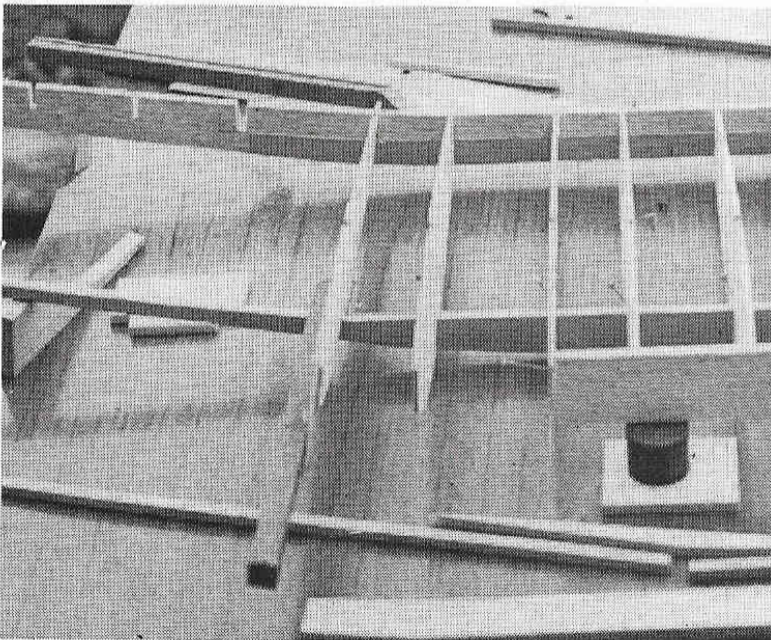


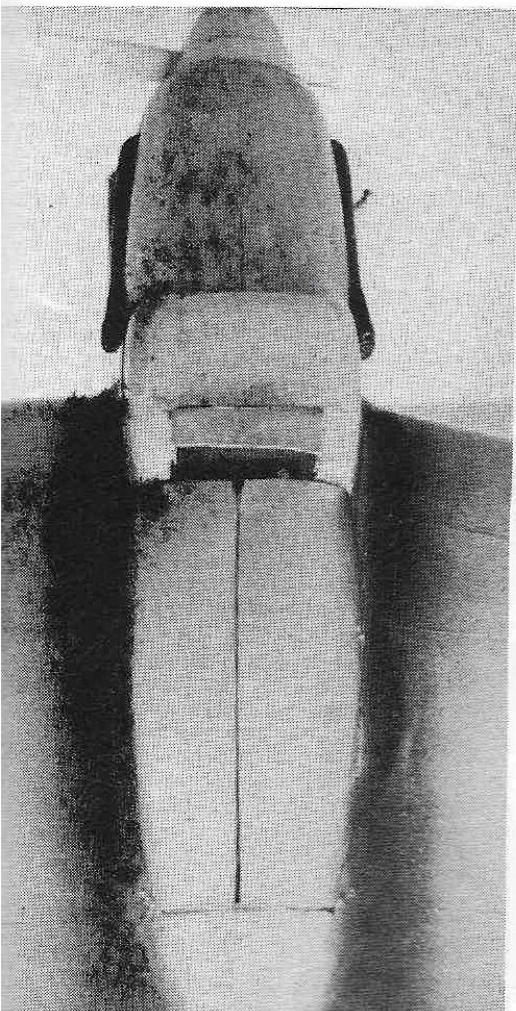
Next stage, the basic nacelles are assembled into the spars — outer ribs will be added next.

built in. All prototypes have used Rom-Air retracts as shown on the plan and all air lines, main air tank, flap, aileron and throttle control linkages, plus the sheeting doublers each side of the nacelles, should be installed before the upper surfaces are sheeted. (It is very difficult to try to install these afterwards!) After sheeting the outer panels from the tip to rib R3, the nacelles can be built into the wing and finally the centre section sheeted over. Fuel tanks go behind the engines, in their own bays, above the retract mechanisms and access is by removable hatches in the top of the nacelles. Tank bay floors can be made removable for access to the top of the retract units. Note that the

Wing assembly is quite straightforward, below is the centre bay awaiting the top spar.

The outer spars are added to the centre bay — all propped up for correct dihedral angles.





Finished nacelle from below with litho plate u/c doors closed, prototype cowls are block but glassfibre ones may be made available commercially.

radiators under the nacelles are fairly substantial, this is insurance against those wheels-up landings (of course you never have them but I do). Undercarriage doors are made from thin aluminium sheet formed round a milk bottle. Trial and error methods have proved entirely satisfactory — if you have a better way I would be glad to hear it.

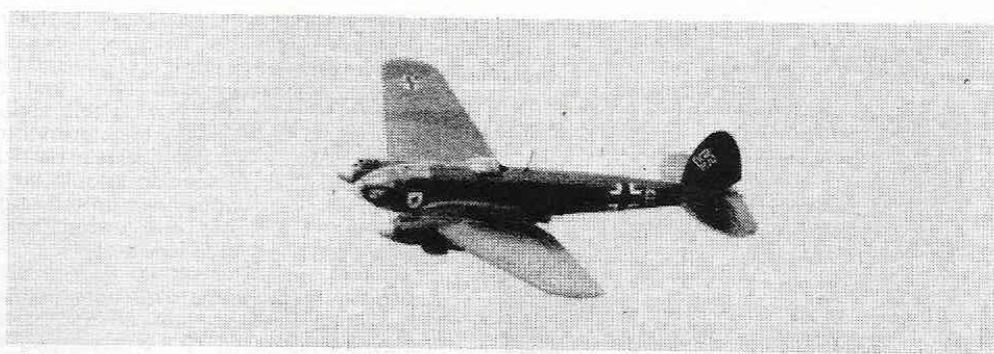
Flaps

The flaps are a bit of a work of art, since they have to mate to a curved wing t.e. spar, and are in themselves curved at their t.e. where they mate with the fuselage fairing. The best way I have found to build them is to glue the flap ribs to the flap i.e. spar and then apply the bottom sheet, curving it up to meet the ribs and match the curve of the spar. Using balsa with the grain crossed at scarf joints helps, as does the use of 'instant' glues. If the foregoing makes sense to you then you are already past the difficult bit, its harder to describe than to do. Note that the curved flap leading edge is planked with 1/32 in. balsa. Ailerons are straightforward sheet and ribs.

Fuselage

This is built up as two halves on horizontal crutches of 1/8 x 1/4 in. balsa, planked as two separate half shells. If the fuselage appears asymmetric do not worry too much, it is supposed to. Just to confuse you, it is necessary to have the tailplane built and ready before you join the two half shells since its i.e. fits into the bottom shell. I have found it a good idea to leave the half shells pinned down until the joining stage to prevent any 'banana-itis' developing. The glazed nose is built on to the fuselage but is removable for access to ballast and the battery pack. The nose framework is made up from 1/8 in. ply

Wheels down. This photo shows the simple door closing arms which are struck by the u/c legs — Rom-Air, nose-leg retracts were used.



pieces as shown on the plan, and glazed with acetate panels glued on with contact adhesive.

Careful work here will be rewarded with a superb glasshouse which is surprisingly strong. All the acetate joints are finally covered with Fablon strips, prior to painting and 'solid' areas of the nose can also be blanked off with Fablon. The hemispherical gun blister is cut from the top of dust cover of one of the figurine dolls so beloved of souvenir shops. As an alternative this can be moulded over a plug using the well known heated acetate and frame technique (never works for me but you may have mastered the system). The nose shape is emphatically asymmetric and this does create some strange illusions whilst building. As long as you know it is supposed to look like that all will be well! One further interesting point concerning the fuselage is that the control linkages at the tail end should be made up and connected before the tail cone is glued on, thus closing off the system. The only access afterwards is to break off the tail cone so it pays to get the system installed and operating smoothly before this cone is added. The gondola and dorsal canopy are moulded from acetate sheet, painted as necessary to simulate full-size.

Tailplane and fin

The tailplane and fin are built in two halves and then joined to ensure that warps are avoided. Note that the model has a long tail movement, the tailplane and fin must therefore be light. Wood sizes shown have proved adequate so do not be tempted to beef up the structure. The tailwheel is a castering unit and complex linkages to the rudder are therefore unnecessary. The elevator hinging system simulates the full-size and is detailed on the plans.

Engine cowls

The engine cowls are built up from balsa block carved to shape and given a coating of glass fibre cloth and resin internally to strengthen them. Silencers can be commercial units attached to the engine through the cowl but the model both looks and sounds better with internal silencers, exhausting in the scale position. Drawings of the silencers I made up for my models are included on the plan.

Retracts

The engine system shown on the plans is based on the Rom-Air and the legs are made from commercial steerable noscleg units modified to have one centre arm fitted into the Rom retract.

Other systems may require some thought. The system shown works well if properly built. The main air tank is built into the wing behind the mainspar with the charging valve accessible through one of the wheel wells.

Covering and finishing

Various prototypes have had the tissue and dope treatment and the resin and cloth finish, either works well but once again remember that the rear of the model must be kept light. The resin finish is stronger and is to be recommended for the wing since it is better able to cope with repeated handling.

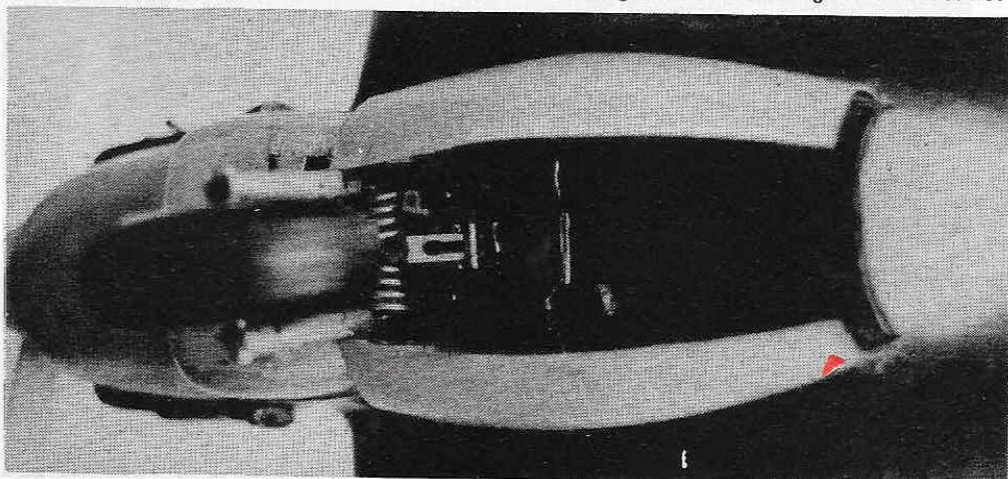
Fine details, correct insignia and dirtying up are essential parts to a model of this nature and make it absolutely ooze character since it is large enough to accept the treatment. Add insignia as your documentation provides, the MAP drawings provide a good basic guide. When dirtying-up note in particular that the wing underside to either side of the nacelle was usually heavily coated with sooty exhaust deposits. The glazed nose demands some interior detail. My pilots were made from mini action man type dolls suitably dressed. A miniature map of London was included as a final touch (the street where I live marked with an XI).

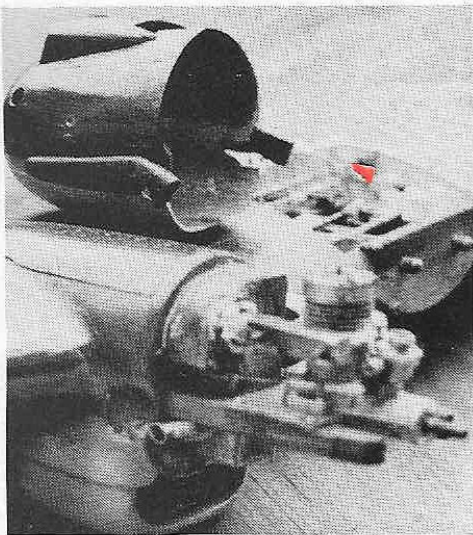
Radio installation

The flight battery goes in the fuselage just behind the nose and under the gunner's platform and is accessible with the glazed area removed. The receiver, rudder and elevator servos are located as far forward in the fuselage as possible (not in the detachable nose). Nose ballast will be necessary, the precise amount depending on your building, mine have all needed around eight ounces and this is fitted on the nose under the platform as far forward as possible. Aileron, flap throttle and retract servos are all mounted in the wing root in front of the mainspar.

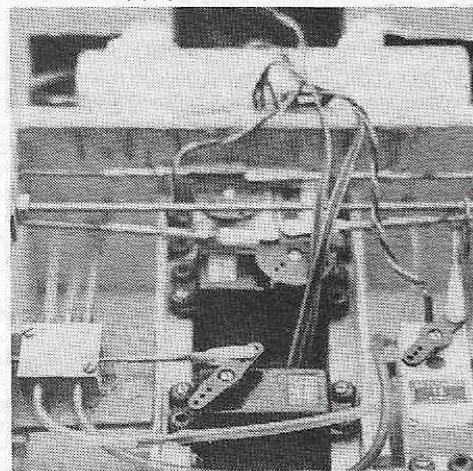
Flying the model

Flying the He111 is far simpler than might be thought on first looking at it. Whilst not

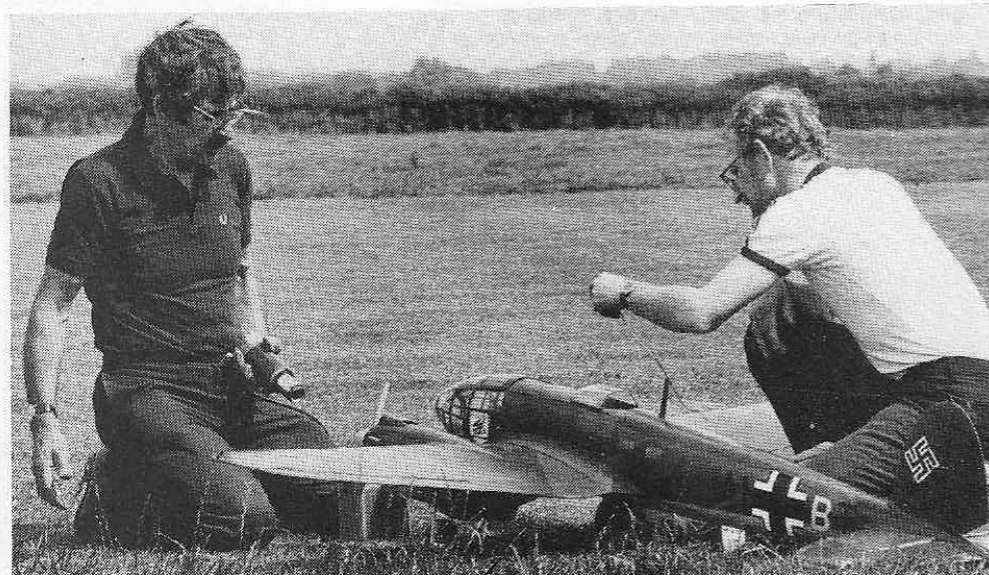
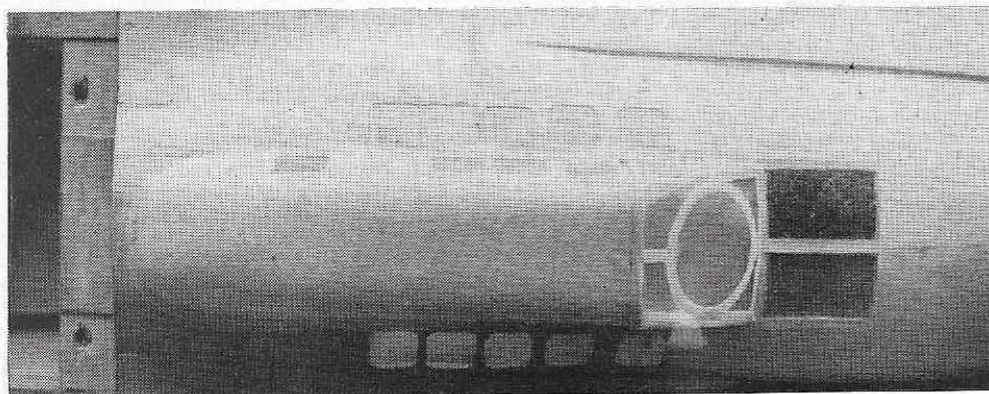




One of the two OS25 FSRs with home-built exhaust expansion box fed by rectangular manifold. Exit is to side at scale exhaust pipe position.



Aileron, flap, throttle and retract valve servos go between the three centre ribs. Below: the gondola moulding with Fablon and paint applied.



exactly a beginners model it has no real vices and is extremely stable. The flaps are useful as well as decorative but it is suggested that their use be investigated after that all important first flight. More on this aspect later. As with any model, check everything once more before first flight. Note in particular that the C of G position should be as shown on the plan with wheels up and empty fuel tanks. Full tanks and undercarriage down moves the C of G forward!

Engines should be set up and checked individually before they are run together. Aim for reliability rather than all-out power. Prototypes have used 10 x 6 props. It is not necessary to use a tachometer to set the engines since individual examples will vary slightly. As a matter of interest the asymmetric throb as the engines go in and out of synchronisation with each other is most realistic since full-size Heinkel 111s were noted for this characteristic.

On take-off a little right rudder may be called for at first but once the tail comes up the model will fly off with the merest hint of elevator. All the prototype models (three of them) are very stable indeed in roll, rather like a good trainer in fact. Elevator needs a touch more concentration since this surface is large. The Heinkel has more than adequate power with two .30 engines and can safely be flown at $\frac{1}{2}$ to $\frac{3}{4}$ throttle for more realism. However, when doing so it is advisable to be gentle on the controls, not because of any vicious tendencies developing but more because violent inputs cause loss of height which require more power to regain. Such activities look untidy and completely ruin the scale effect. Likewise loops and rolls are quite possible but equally wrong when looking for scale realism. The model can comfortably be demonstrated in tight turns near the ground but remember that more power may be required once into the steep turn. Low sweeping passes at half-throttle opening up for a steady roaring climb out are my own favourite manoeuvres, the impression of realism being really nerve tingling as the model rumbles past on its

bombing run and sweeps away into the distance.

However, back to more imperfect matters. The stall with flaps up is very gentle and straight with easy recovery. With the flaps down the stall is sharper and preceded by some rearing waggles from the back end which provide ample warning. Even so, recovery poses no problem, just open the throttles as you pull out having allowed the speed to build after the stall. Again no nasty wing dropping has been encountered.

On that first landing approach get the wheels down early and trim for a steady descent at low throttle finally shutting down to idle as you cross the threshold. The model settles in nicely with a little float and gentle elevator can result in beautiful flared three pointers. Enthusiastic waggling around with this control results in switch-back approaches and untidy bouncing down the runway. The retracts are likely to protest at this sort of thing although the rest of the airframe is tough enough to take almost anything bar flying into a wall (who said prove it?).

Once you are used to the model you may be interested in single engine performance. Here again common sense should dictate the necessary actions. The model will just maintain height on one engine if you are gentle with it, however you have to turn at some time and turning towards the dead engine is really not a very good idea. It can be done but the model will descend. Those large responsive ailerons are a great help here but turns towards the live engine are safer, smoother and easier. My own technique when one engine cuts is to throttle back slightly, set up a positive rate of descent to keep the speed up and prepare for landing. The best advice I can give about flying any twin with one engine is to keep away from stalling with the remaining engine at high throttle. The only way to do this with the Heinkel is to descend while trading airspeed for altitude in gentle turns to set up to land. Do not use full flap with one engine out. I must admit I have not tried this and having read the foregoing I am sure you will see that tempting fate is not my ideal. I suspect that full flap in these conditions would merely aggravate the asymmetric thrust problem already being dealt with.

The flaps on the model are large and effective, about 10° down for take-off is helpful but does induce up trim affects. More flap increases the nose up trim considerably but always controllably. Whipping the flaps up at slow speed causes instant aerodynamic panic followed by a sinking sensation until the airflow tidies itself up and goes back to work again. I found this out by whipping the flaps up at low level and low speed before opening the throttles and promptly did a neat wheels up landing without damage. The easiest technique I have found is to throttle back, push the nose down and then lower the flaps to correct this, it is then possible to retrim comfortably. In this state the Heinkel can be rumbled in very slowly but with a slightly higher throttle setting than normal. Overshoots call for open throttles and the initiation of a steady climb before gradually easing the flaps up. One of the most exciting and realistic sights of the Heinkel is to see it on final approach, flaps down like barn doors, wheels down and rumbling in to touchdown with the two engines churning away in an unsynchronised growl. Sights like that make the project worth the effort. Flown with the idea of aiming for realism results in the sight of one of the most exciting realistic and atmospheric models you are likely to see, it has never failed to attract crowds wherever it is flown and it is truly amazing just how many people react to seeing its shape and sound the sky. Model *Spitfire* and *Hurricane* pilots cannot resist the temptation to chase it — you have been warned!

Starting up for yet another flight session — the air shots on the preceding pages show that it is a model packed with atmosphere.