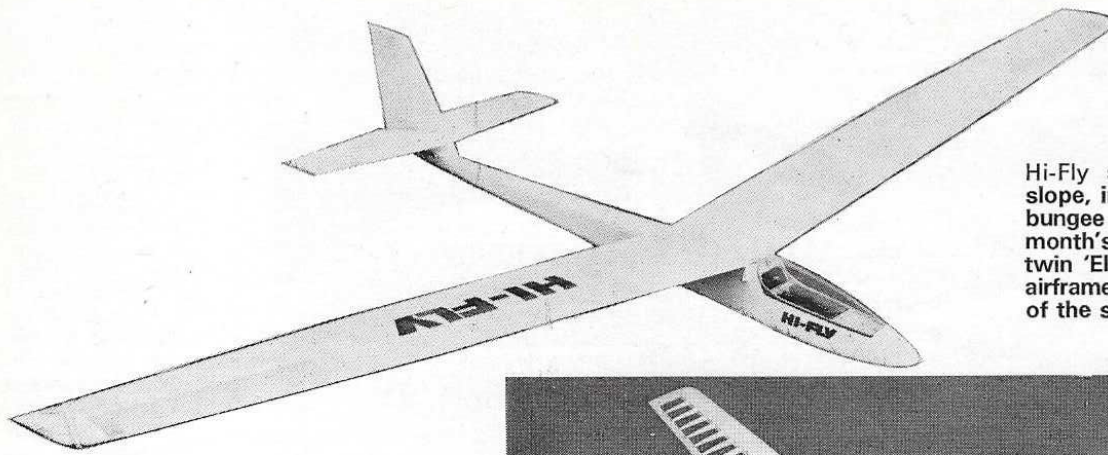


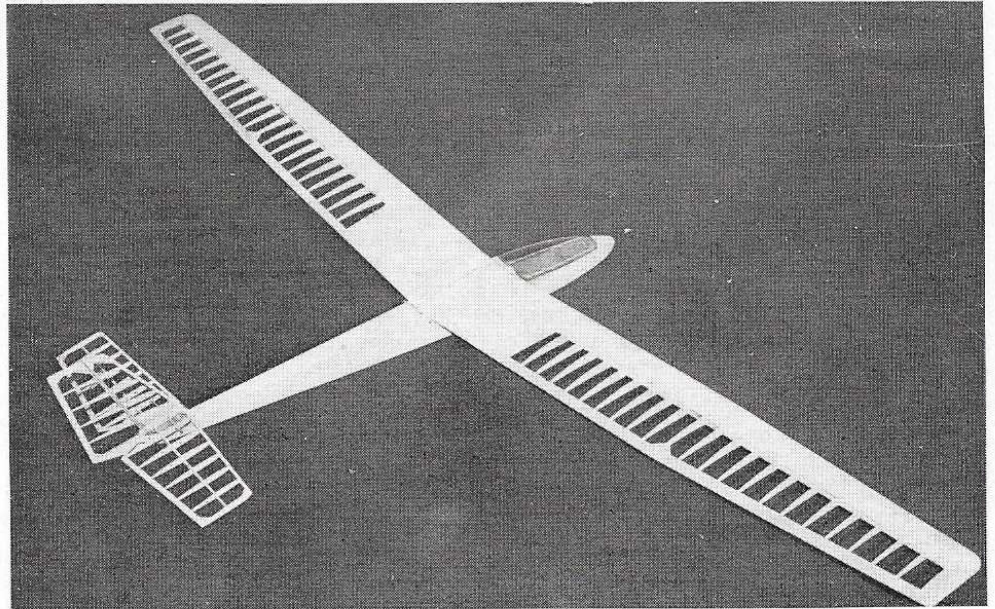
By
Peter Russell



Hi-Fly seems equally at home on the slope, in light or moderate winds, on the bungee or on a towline. Don't miss next month's thrilling instalment describing twin 'Electroprop'-powered version! Bare airframe below, rigged, gives some idea of the structure. At this stage it weighed just 16 oz.

R.C.M.&E.
Kit Review
No. 59

GRAUPNER
HI-FLY



THE review of this Graupner kit is rather different to earlier ones in the series, since it is really a review of *two* models. So to keep the whole thing tidy, it is proposed to deal with the building and flying of the 'Hi-fly' glider in this article, and have a separate review of the twin-electric powered version, probably next month.

First impressions

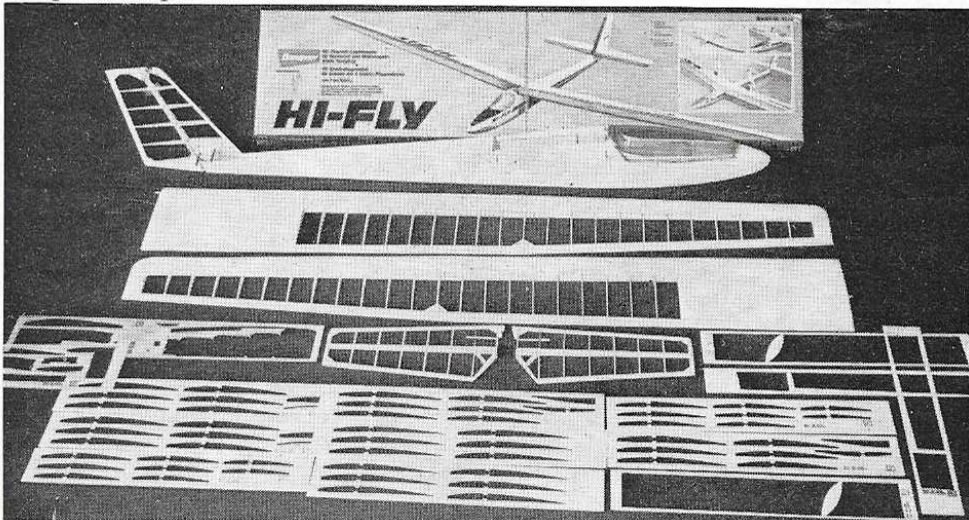
The Germans, and perhaps Graupner in particular, do such a thorough job on the 'paper work' in their kits that they often create an unfortunate illusion of complexity, and a cursory inspection of the kit, such as on the counter of a model shop, might easily discourage the potential purchaser, as it does seem

to indicate that this is a complicated way to produce a fairly simple model. In fairness, it should be mentioned that this builder rarely tackles kit models, so the impression might not be typical.

Once construction is actually under way, however, it soon becomes apparent that not only is it *not* complicated, but, in fact, it goes together very nicely, providing that you stick to the 'book'. One wag, who saw the model in its very early stages commented 'If that's a 'Schnellbaukasten', heaven help the 'langsam' ones!' There are indeed a lot of parts, but it was nevertheless completed much quicker than expected, in two weeks of leisure time, though it must be admitted that the evening sessions went on into the early hours, once or twice.

The die-cutting is very good, and as can be seen from the picture, there is a lot of it. Even the leading edge sheeting is die-cut and accurate. Some of the ply parts needed 'persuading' before they would leave their sheets, however. As for accuracy, the standard was very high indeed, perhaps half a dozen wing ribs needed minor adjustments, and the notches in the trailing edges were a bit generous. Of the construction itself, very little can be said, except that everything went together just as they said it should, and no errors were discovered either on the drawings or the instructional leaflet. The 'Explosionszeichnung' (exploded drawings) were particularly useful.

The kit is very complete and includes most of the necessary 'hardware' and two types of glue. For convenience, however, already-opened containers of 'Resin W' and Devcon were used, the former for most of the woodwork, and the latter for items like ply parts, wing and tail root fittings, and so on. One tiny nit-picking point that might bother some builders, however, was the rudder horn. The swept back rudder introduces a bit of very untidy geometry into the control linkage, in that the push rod has to go up, down, sideways and twist.



This shot of the bare, completed airframe includes all the 'empties' from the die cutting. Latter crisp and accurate on balsa, but ply parts needed some knife-work to get them out of the sheets.

Since the sweepback is merely a whim of fashion, rather demodé at that, it seems a pity that the elegant, straight-forward rudder of the type used on the Cirrus could not be used. All that be as it may, you can't use an ordinary linkage on a swept control surface, and it seems a pity that Graupner could not have included one of their own excellent 'ball and socket' linkages, which was the item finally used.

The 'up-and-down' control is Graupner's well tested 'all-flying-tail' in which a large nylon bellcrank is pivoted in the base of the fin. The bottom end is connected, via a 'Quick-link', to the 'elevator' push rod, whilst at the top end, the horizontal arm of the bellcrank has two wire 'pegs' protruding from it, spanwise, one concentric with the pivot and the other at the extreme end, the rearward end, of the arm. Onto these two pegs slip the two halves of the tailplane, or 'stabilator' as it is described here. All very neat and business-like, but it is essential to ensure that the whole thing is accurately aligned and without a trace of 'play'. This, together with the wing root arrangement, is about the only item of assembly in the whole model that needs any great skill or care. Of the wing, this is very similar to the Cirrus, with the same elegant and fashionable compound taper, but with a slightly shorter span and lower aspect ratio. The section is a thin, slightly concave underside aerofoil reminiscent of free-flight contest gliders. The construction is lighter than the Cirrus. Leading edge sheeting is confined, except at the extreme root, to the top surface only, and the heavy drag spar of the Cirrus is eliminated. The two halves are joined by a single approximately eight gauge steel peg, with two short 3/16 dowels at the leading and trailing edges to ensure alignment.

The fuselage is a very straightforward 'box-with-rounded-corners' deal (which can be sanded to a surprisingly elegant section, possibly not much inferior to the Cirrus) about which very little can be said.

Graupner included some wood filler and 'Modelspan' paper for covering, but

The Hi-Fly about to be projected into space for it's first flight. Trim was spot on and model soared easily in very light wind. Was landed, voluntarily, after 33 minutes, which can't be bad for a first flight. Needed some 'stick - in - the - corner' stuff on the way in, however, when wind got up a bit.



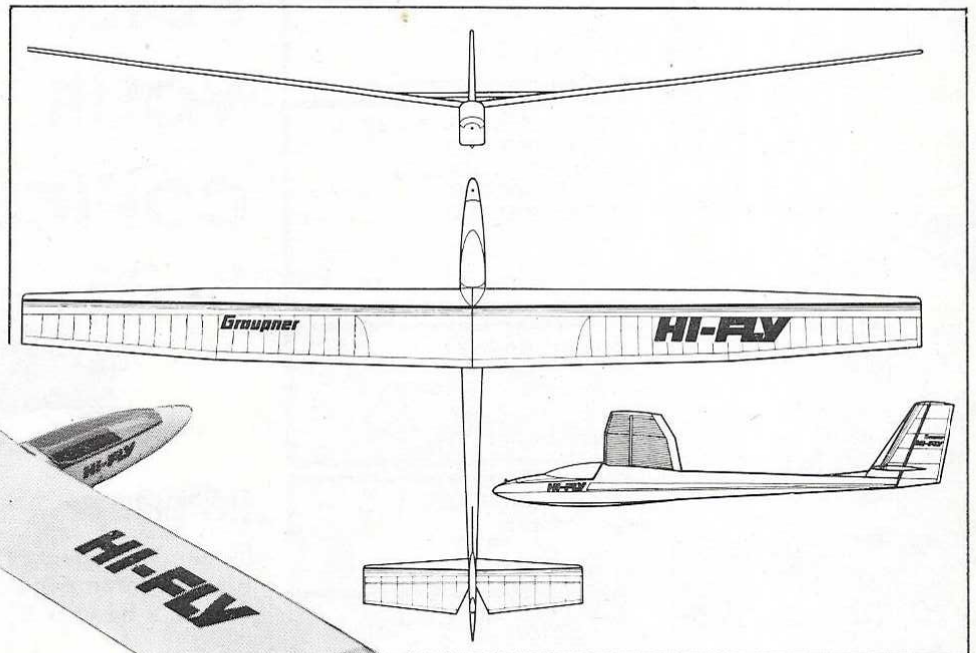
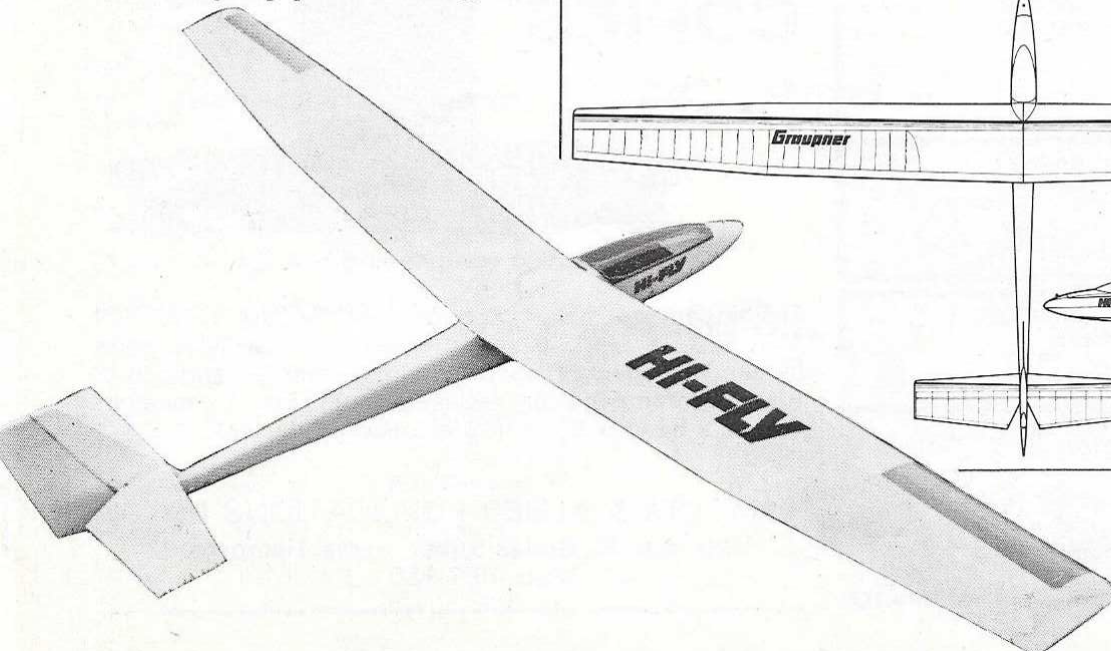
since most people seem to use 'dashing-away - with - the - smoothing - iron' type plastic films, currently, the review model was covered with this material. This led to some problems as the shrinking of the film caused some warps and deformation of ribs, here and there. The warps can be removed, but short of recovering, there isn't much that can be done about the other distortion. Also, since the Hi-fly wing and tail structures definitely come into the 'lightweight' category, perhaps the wing would have had better torsional stiffness if it had been covered in the conventional way.

As mentioned earlier, this writer rarely builds kit models, but can say that of the ones he has built, this one was the best, from every viewpoint.

Flying

Although Graupner provided the entire 'Elektroprop' outfit, along with the Hi-fly kit, it was felt that it would

be advisable to fly and report on the model as a glider first, as many people will want to build it purely as a glider. When complete and fitted with non-miniaturised avionics, the Hi-fly weighed a mere 31 ounces, an ounce or two lighter than advertised (the bare airframe, without covering, weighed an amazing 16 ounces) and the c.g. was 'spot on', without ballast. This must be just about unique. The first flight took place on a low hill where the terrain is not suitable for 'test gliding' so after a careful check on the c.g. position and the tailplane incidence, the model was 'thrown over the side' into a wind of 5-10 knots. From previous experience with other gliders, the lift was expected to be marginal, but the Hi-fly climbed steadily to about 300 feet, and showed itself to be near-perfect in trim. The control responses were O.K., but the tailplane appeared to be quite sen-



Rear three-quarter view at left shows elegant lines of Hi-Fly glider. General arrangement drawing above is to 1/20th scale.

Kit Review

GRAUPNER HI-FLY

sitive to small movements. The model could, nevertheless be trimmed to fly 'hands-off' for quite long periods. After it had been airborne some time, other models appeared, including a Cirrus, and none of them could out-soar the Hi-fly until a 'Wildflecken' appeared, and this *did* out-soar it, but it must be remembered that the 'W-F' with its high aspect ratio, 12 foot span and very light wing loading, would be expected to out-soar almost anything in these conditions.

After about 20 minutes, the wind got stronger and more turbulent. This was causing trouble for some of the other pilots, but the Hi-fly continued to handle well, and even penetrate quite well. At the end of 30 minutes it was decided to land it, and a combination of rather difficult terrain plus a, by now, distinctly turbulent wind led to some anxious moments on the approach, which took about three minutes. It was very difficult to hold the wings level during the final 20 feet, even with the stick thrashing from one stop

to the other, and the landing was pretty rough.

A few days later, the model was tested on bungee and tow line launches. Looking at the model, it appeared that the suggested position of the bungee hook was perhaps a little forward of the ideal position, and this appeared to be substantiated by the flight testing, though the difference is probably so small that it's not worth going to the trouble of moving it. The bungee was quite short, just two strands of quarter flat and nylon filament line, but the launches were good and several flights were around or just under three minutes. Height on the launch was, perhaps, 300 feet, though some of this was wasted in getting the model to drop the tow. Perhaps the hook provided could be shortened a bit if a lot of bungee launching is contemplated. As it was, a 'normal' release required a quite breathtaking dive, so the 'turn-off-the top' method was tried. With this method, when you get to the top of the launch, you simply turn 180 degrees and dive off downwind. This is quite spectacular and possibly dangerous, because if it then *failed* to release, for any reason, you would be in serious trouble. With the Hi-fly, however, this method was used repeatedly without problems arising.

Finally, the Hi-fly was tested on a 100 metre tow line, and here the long hook was an advantage because it was

possible to keep the model on tow as long as necessary without fear of it un-hooking itself. Although the wind was not ideal for good towline launching, several flights of 2½ to three minutes were possible. All this flying took place at below zero temperatures, and there was snow on the ground when the bungee and tow launches were tested.

Summing up, this is a simple, light, high performance model that will out-soar the Cirrus in some circumstances. It seems very satisfactory in all three soaring modes, and might be a real contender in thermal soaring contests. There are probably very few kit models available that fly better in weak to medium lift. The kit is well-engineered and complete, and represents good value, even at the current disadvantageous situation of the pound sterling relative to the mark.

Graupner 'Hi-fly' glider for slope and thermal soaring, power pod or twin electric power.

Main technical data

Wing span	91 inches
Length overall	45 inches
Wing area	620 sq. inches
Tailplane area	96 sq. inches
'Brochure' weight	34 ounces
Review model weight	31 ounces
Wing loading (based on total area)	6½ ounces per sq. ft.
Price of kit	£19.65