

Editor Briggs fits a Legend into the G. Fuzz



# Legend *into* G. Fuzz

Following on from Adrian Richmond, we have used the GMP Legend as our donor mechanics, so gaining extra Brownie points for no flybar.

On the whole we agree with pretty well everything that Adrian says about this latest offering from the G-Bros. Co., and therefore we'll skip the usual historical intro' and get right on to the job of showing you the easy way of slipping the Legend into this fuselage.

## Just so that you know

You may or may not know that we go to great lengths to find the easiest way of repeating the exercise of fitting X mechanics into Y fuselage and with this one we needed a little outside assistance.

## To begin with

When the Legend was first offered up to the fuselage, it appeared that this might not be a good marriage. The problem was — and it was the only one — that when the Legend tail rotor was positioned in the allotted place, the main shaft wanted to exit about two in-

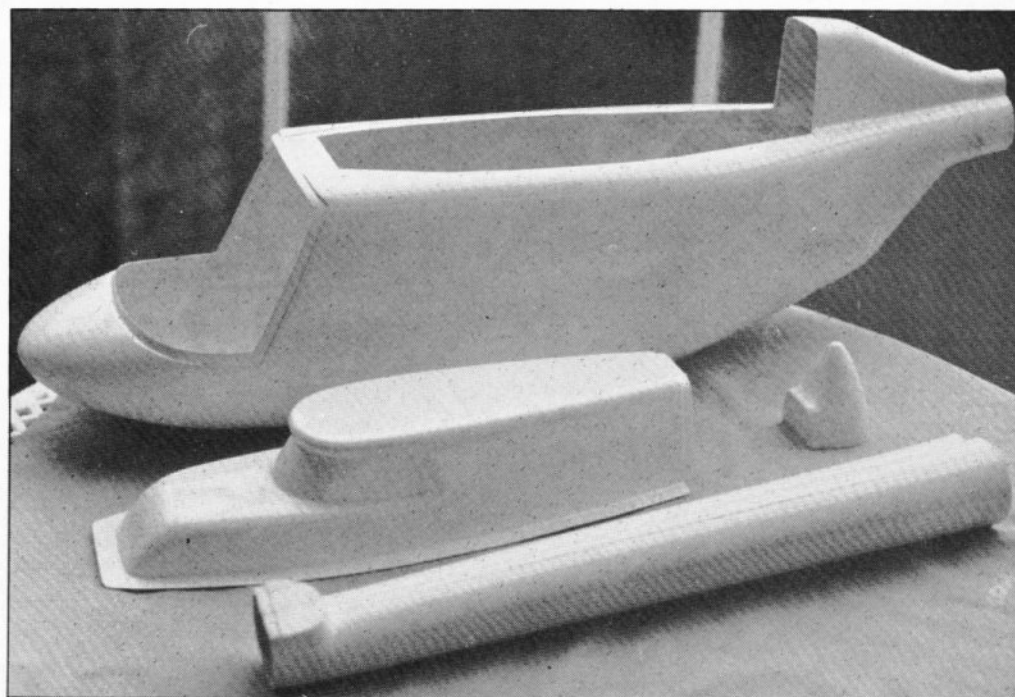
ches behind the scale position. This was unacceptable to our trained eye (never mind the untrained one) so we took the bull by the horns and chopped two inches off the GRP boom section and split the underside of this

to allow it to slide on to the joint again, only to realise that this didn't look right either.

*The Polyester GRP mouldings are bright shining white, only the windows need cutting out.*

Subsequent telephone calls from us to Dave George and Dave Nieman produced a replacement boom section from Dave G and a longer tail boom and tail drive belt from Dave N.

This new boom/belt combina-



tion was from the Hirobo BBL Hawk model which happens to be two inches longer than the Legend. Although this wasn't apparent at first sight. In fact the belt gives an extra two inches but the boom needs withdrawing from the sideframes by about 15-18mm — the Hawk tail boom socket is shorter than the Legend — which enabled us to get the correct belt tension. We easily achieved this by moving the front tail boom clamp back and drilling two new holes for the clamp bolts.

The Legend was thus modified and at the same time we rotated the tail assembly through 180 degrees which put the tail on the left side — to match the fuselage.

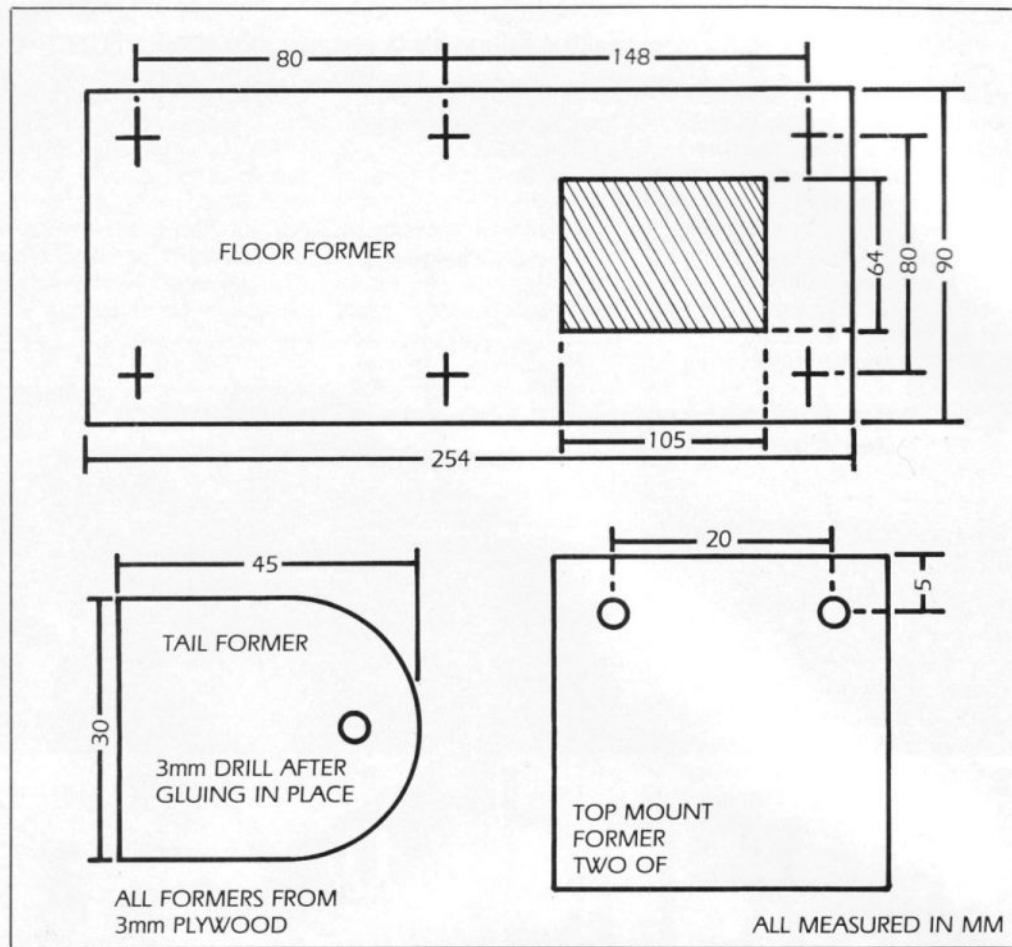
### Not only that

We then flew the model like this for a week or two to make sure that our mechanical changes hadn't upset the balance of things (which it hadn't) and we also took the opportunity to strap on some longer blades.

We had received from Modtec for our evaluation, two new pairs of glass blades. One pair of narrow chord symmetrical blades with a root thickness sized for Kalt (plus spacers for others), and these blades have been used elsewhere in an article which should be featured in our next issue.

The other pair had a reflex section and were Heim size in length and width but made for right hand rotation. Pretty normal you might think, but what

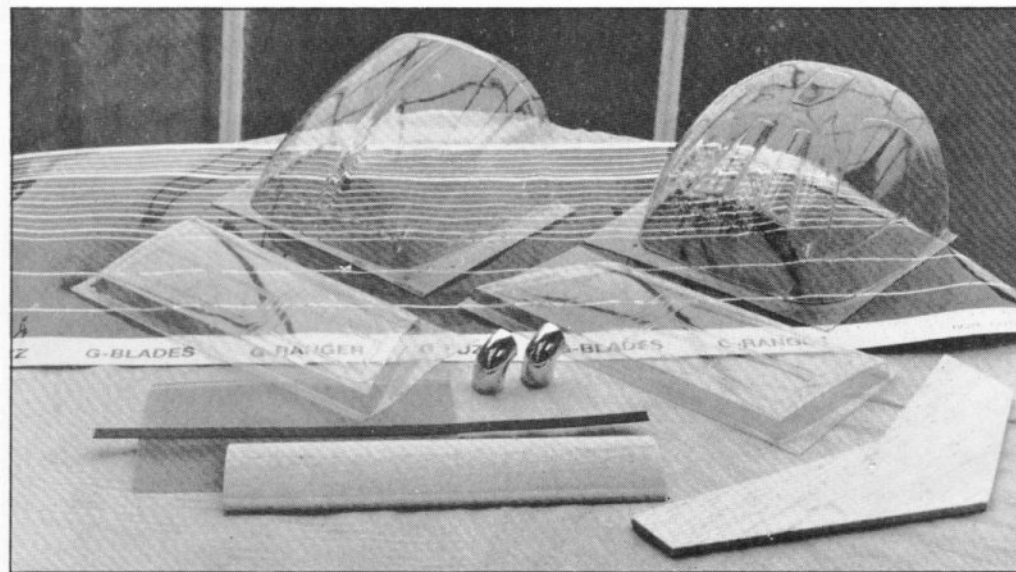
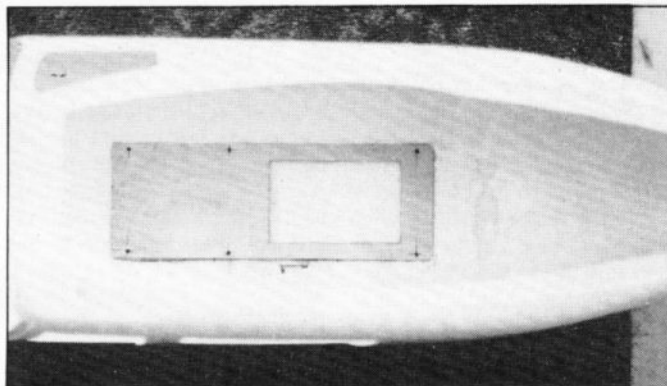
*The remaining contents of the kit, window material is made of a none brittle plastic. If you lose or break one, don't worry, they are available as individual items.*



made these blades more interesting was the chordwise C of G. It's about 29% — just perfect for a flybarless rotor head such as the Legend has.

With the proven mods and the new blades bolted on, the Legend was flown fairly extensively to try to identify any possible problems or pitfalls (due to our changes) before committing ourselves to adding the fuselage.

No problems were encountered, our impressions were as



*The ply floor reinforcement plate which helps to absorb the shock loads of unplanned heavy arrivals.*

follows.

In the hover the controls were perhaps a little less crisp but the model was less sensitive to interference from gusts. So more stable.

Aerobatics required more work to keep things tidy, it's worth mentioning here that these blades weighed in excess of 200 grams each against the originals 165 grams. Aerobatics were still good however.

Autos were where we saw the biggest improvement. The Legend in standard form is a good subject for autorotations



but one is always aware that a flybarless model is less tolerant of a decaying rotor speed and done tends not to take liberties.

With these Modtec blades however, the Legend flies in autorotation like a slightly loaded glider. With careful control, high speed/low angle descents can be made without loss of rotor speed, allowing 180 and 360 autos and even autos off the top of a loop.

Definitely a pair to have.

### Back to the Fuzz

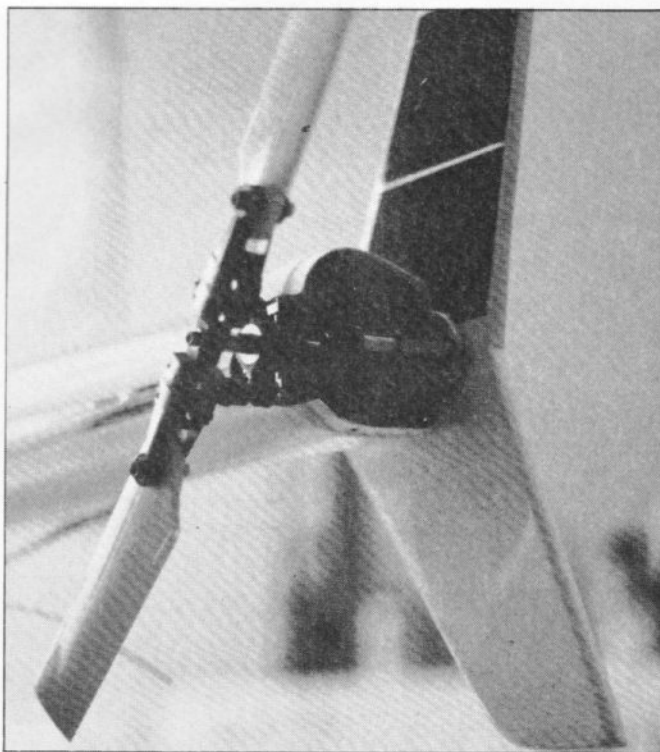
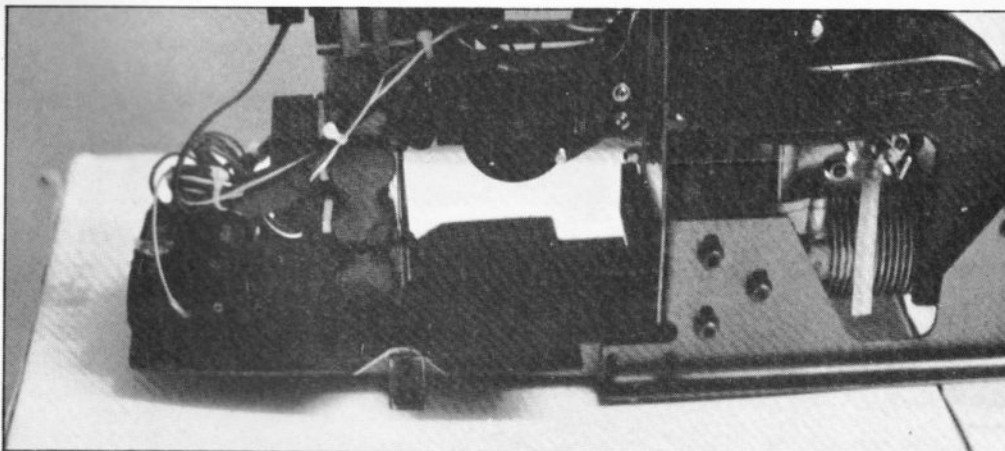
The Legend was then returned to the bench. The boom supports, canopy undercarriage, rotor head, and tail rotor assembly were removed. The remaining machinery was fed into the fuselage and juggled about to place it centrally and position the main shaft in the required spot. In this case about 1/4in behind the front panel line on the top of the removable lid.

The moulded boom was then slid onto the main fuselage section and a careful measurement confirmed that the tail rotor shaft (when fitted) would exit right on the join line of the tail cone. It was spot on.

The whole thing was then perched on top of the Legend undercarriage but didn't look at all correct. A spare Kalt Cyclone was offered up instead which showed an improvement but still didn't look quite right.

With the rear cross strut in its correct place, we then pushed the fronts strut forward until it sat under the panel lines which run down between the two side windows. This looked good so a careful measurement was made of the revised length between the cross struts before re-

*Cut-outs need to be made in the radio tray for access to the front u/c mounting brackets.*

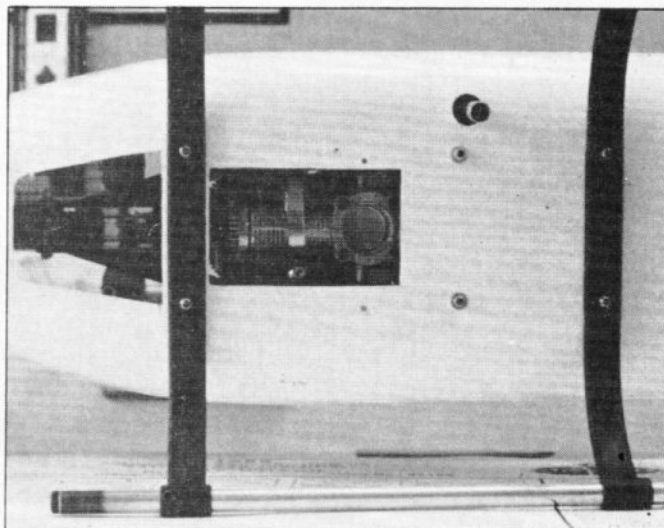


*Detail shot of the tail boom anchor point. Moving the tail rotor to the left hand side doesn't appear to have made any difference.*

moving the mechanics from the body.

Next, two small 90 degree brackets were fabricated as in the photos, these were cobbled up from an old damaged side frame (Hirobo 808). These brackets were then drilled and bolted to the front chassis runners in a position that would match the revised undercarriage layout. (See photos).

Bolting this lot directly to the floor of the fuselage is really asking for trouble. The slightest heavy arrival can easily damage the GRP shell, so we then made a 3mm plywood reinforcing 'footprint' of the mechanics, see sketch 'A' and the photos, with a cut-out for the engine cooling



*Underview showing the large cut-out for glowplug access. Without this plug changes would be very difficult. The two bolts below the exhaust stub are the original front cross strut mounting bolts.*

air to exit and 3mm holes drilled for the u/c mounts.

This ply former was then lightly tacked in place — with Zap — under the mechanics and this lot was then accurately repositioned in the fuselage, first dry fitted to check for correct placement and then permanently glued in place with Stabilit Express, an adhesive specially formulated for polyster GRP joints.

When the glue had set, the mechanics were then removed so that the u/c mounting holes could be drilled through the fuselage floor and the cooling air exit was also cut in the floor.

Then the mechanics were replaced in the body loosely and the boom section was pushed in place and held firmly in position with masking tape over the joint.

The mechanics were then raised slightly and pushed back far enough to allow the tail

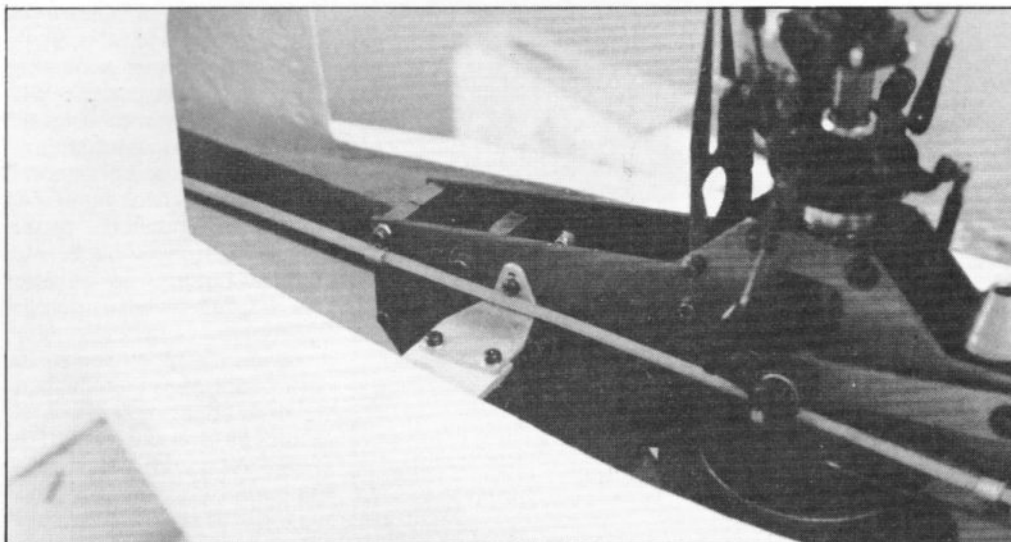
rotor assembly to be bolted on.

This done, the mechanics were then pushed back and forth and marks were made for removal of the body material for the tail rotor exit. Quite a large hole is required due to the style of the pitch linkage, but care with the grinding wheel will result in neat finished appearance.

When the tail shaft was in place with the necessary clearance and the mechanics were sitting in their prescribed position, we then removed the tape from the boom joint, pulled the boom back and applied Stabilit Express for a permanent bond. Ensuring everything was aligned correctly before the glue set.

### Rear Anchor

A plywood former was made up



The top mounting brackets (Kalt items) bolted in where the front boom clamp originally lived.

to reinforce the tail fin mount. This former was made longer (see photos) to serve as an anchor point for the Legend tail boom, using a 20mm long internally threaded spacer screwed in place of the nut on the rear of the pulley housing and a bolt through the ply former at the other end. Check the photos if that wasn't clear.

**Top anchor point**

The third and final mounting point for the mechanics is at the rear of the top of the side frames and consists of a pair of Kalt Long Ranger body mounting brackets. These are bolted on to the side frames using the top holes vacated by the front boom clamp that we relocated earlier. A small ply former (one on each side) is then interposed twixt the side frames and the body. These formers were bolted on to the brackets and secured to the fuselage with Flexi-Zap.

**Top lid**

The top lid was already trimmed for a good fit so next a 70mm hole was cut for swashplate clearance. This hole was ovalised to accommodate the top cone starter extension and further opened up at the back to give clearance for the swashplate anti-rotation bracket. This rear cut-out was then further extended another 10mm to allow the lid to be removed from the fuselage without unbolting the rotorhead.

Two more holes were cut out to accommodate the scale engine exhausts which were secured with silicone rubber.

One could go further and



grind out all of the intake holes and fill in these with the grill mesh material provided. This is for scale buffs so we left it out. Sorry Dave.

The lid was secured to the body with 2mm screws with

some small plywood internal backing plates Zapped in place for reinforcement.

**Windows**

The front screen and upper and lower windows were cut out to

the marked lines exactly and we were relieved to find that they were a perfect fit in the fuselage. The windscreen was secured with a 2mm self tap screw at each corner, which allows easy removal and better access, while the upper and lower windows were permanently fixed in place with Flexi-Zap. How did we manage before we had these hi-tech adhesives?

**Tail feathers**

A slot was knifed out of the tail boom to take the horizontal stabiliser. The stab' was covered in white Solarfilm, tacked in place with Zap and finished with a smooth fillet of white silicone glue to correct the errors made with the knife.

The fin is also solarfilmed and then held in place with two 3mm self tap screws.

**And finally**

This is the best bit. To finish, apply the decals. No rubbing down, no filling, no priming or painting, just decorate to taste with the large versatile decal sheet supplied in the kit and spice with a few stickers of our own taste. And that's it.

**Back at the field**

As would be expected the Legend is now a little less lively with the added weight of the fuselage. However it's no less pleasurable to fly, the aerobatics are a bit more sedate but with a fuselage to look at orientation is better, making long shallow autorotations much easier to judge.

Well done G. Bros. What's next? □

