

## Chris Handley and John Bottomley build E & G Enterprises MD530F body

One evening the phone rang with a tone which denoted somebody of considerable importance was wishing to talk to me! In the event it was only one of our esteemed co-headhitters, enquiring as to the whereabouts of our resident Shuttle. It just so happens that my 1985 vintage Shuttle is not in the hands of Chris Handley (he of MFA Sport 500 fame), and is flying as well and reliably as ever. After discussions it was agreed that Chris would fit the body to the Shuttle — approaching the project from a beginner's viewpoint in that this was his first 'scale' helicopter project. To yours truly fell the onerous task of test flying the completed M/C and telling the world (?) about it!

The E & G Hughes 530F (basically a 500E with uprated engine/transmission in real life) kit arrives in a large box containing two vacuum formings stapled together and four parts bags stapled to the surplus plastic. To prevent rubbing damage in transit two sponge plastic blocks are stuck to the body sides. A colour photo on the box shows the finished product. The body is suitable for all Shuttles and the Kalt Baron 20/20MX (or Baron 28/30MX in US parlance).

The accessory bags contain specific hardware, mounting blocks, etc. for each machine. A most useful longer starter belt is provided, although we used a rear cone start conversion on our O.S.28H.

Availability of the kit is at present confined to the USA — although mail order is of course possible. The April '89 'RC Modeller' magazine carries an advert from Helicopter World Inc. of San José, California (408-436-1025) listing the kit at \$109.95 (£66) plus shipping and handling.

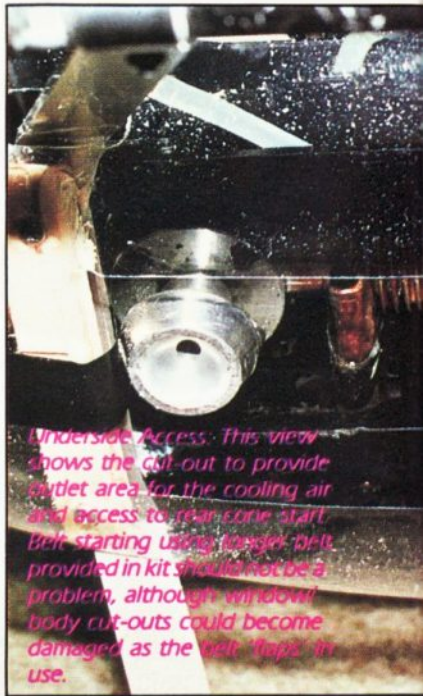
Kit contents are very complete but the following additional items were used/needed to finish the project as shown in the photos.

1. 'Zap-a-gap' and 'Poly Zap', plus 'Zip Kicker'; or equivalents.
2. 'Araldite' 24 hr. epoxy.
3. Paint aerosols (in our case 4: 3 white and 1 yellow).
4. White primer also in aerosols.
5. Acrylic household undercoat.
6. Electrical tape.
7. 1mm (.040") pin stripe tape — black.
8. Various grades of sandpaper.
9. 'Dremel' and cutting discs and grinder; scalpel and blades.
10. 4 x 4BA nuts, bolts, washers, anti-vibe washers and captive nuts.
11. Ball and ball link.
12. 50 hrs of patience plus a sense of humour!



*Before and After: Not strictly apples and apples. The Mk. 1 mechanics now hidden in the add on body, with a Mk. 2 for comparison. Interestingly the shorter main shaft of the Mk. 1 adds to the realism. Now for a 5 blade head!*

*Upper Body Brace: Close-up of swashplate area, also showing the upper body brace which firmly locates the top of the body shell relative to the sideframes.*



*Underside Access: This view shows the cut-out to provide outlet area for the cooling air and access to rear cone start belt starting using longer belt provided in kit should not be a problem, although window/ body cut-outs could become damaged as the belt 'flaps' in use.*

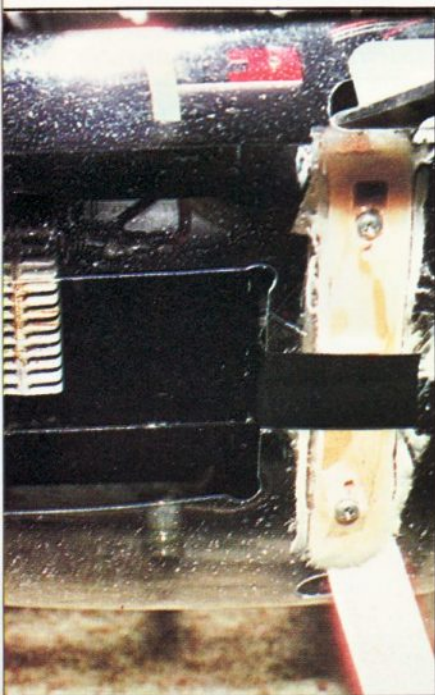




*It Flies: and very well too. The only adjustments required were: 1/2 turn richer on the main needle valve and 1 1/2 turns on the C/P servo linkage to give slightly more pitch. Handling is practically unchanged; tail response in the hover is a little 'stodgy' — blanketing effect of fin?*

*G Enterprises*

# 530F



*Orientation of Mechanics. Prepainting view of Shuttle mechanics installed in rear fuselage. There is more than adequate clearance all round.*



Very early in the construction we were unhappy about the sequence — particularly painting the inside of the body at an early stage. So, after some deliberation it was decided that the end result was the important thing, and so we did it our way. The main deviation from the instructions was to paint the outside of the body; and to do this very late in the assembly sequence so that maximum use could be made of the transparent body during construction and installation of the mechanics. A 21 page instruction manual is included in the kit and this contains a parts list, and a detailed procedure as the manufacturers see it. These instructions are well detailed and illustrated and the following notes are intended to supplement the manual plus highlight any difficulties we had. For reference purposes the 'step numbers' are used as sub headings to highlight particular points.

### Step 3

The vacuum formed polycarbonate fuselage is reasonably moulded, with such detail as cut lines, windows, etc. being moulded in. The flashing was removed with a sharp knife, so that a 'Dremel' type moto-tool plus cutting disc could be used. It is easier to cut out the body parts if the canopy is separated from the main body moulding first. Care is required when cutting up to the cut lines since they are a bit wobbly and one has to take a 'best' line. Once the halves are cut out, lay them on a flat surface and remove any bumps using sandpaper. Finally smooth the edges with No. 400 Wet 'n' dry. Trial fit the body halves together using clear self-adhesive tape. We found that the main body halves fitted reasonably well, but the windows on the canopy don't match at all. Similarly the cut lines on the canopy don't match.

### Step 4

Roughly cut out the side windows using a Dremel; then mark out the window shapes with striping tape, and grind up to the tape edges also with the Dremel. This procedure will give straight edges. Finally smooth edges as detailed above.

### Step 5

Clear self adhesive tape was used to hold body halves loosely together and allow pos-

itioning for best fit. Then using 'Poly Zap' and 'Zip Kicker' glue halves together. Very easy to do with the above materials, but make sure join is good, because once joined, the bond is permanent. Add the brace (HF) later.

### Step 6

Joining of canopy halves — we found it easier to start at the nose and work outwards. Use best fit since frame lines, etc. do not line up.

### Step 7

For this step the Shuttle mechanics need to be back inside the body. The canopy should be offered up to the main body and the edge of the canopy sanded until it matches the main body. When adding the doubler (5A), cut out the holes in both the doubler and the canopy first. Also we could see no reason why the doubler should be glued on the outside

fit for the blocks by forming a fillet between the body and the blocks.

### Step 15

The undercarriage clamps are a tight fit on the skids — bend them open so that they will slide on the skids without damaging or scoring them. Trial assembly using hardware provided revealed that the washers were too small, and the nuts and bolts were too soft. Any attempt at tightening them ruined them! In the end they were replaced by good quality 4BA items and spring washers. The clamps then worked well and produced a strong, 'wobble-free', assembly.

### Step 16

The existing holes in the sideframes were drilled out to accept the larger undercarriage mounting bolts provided in the kit. When we tried to tighten the

blind nuts using the bolts provided, we again had problems with bending of the bolts and distortion of the nuts (painful!). Once again we replaced the kit items from our stock and experienced no further trouble.

### Step 17

Place undercarriage struts in position and align holes. Once assembly is bolted in place a slight tweaking of the legs was required to allow skids to sit evenly on a flat surface. The whole assembly was tightly bolted up so that it would stay in position during spraying and re-assembly.

### Step 18 (inc. Step 12)

Remove undercarriage, but retain wooden blocks in place; then slide the body over the mechanics. Now an advantage of not painting the body becomes apparent! We can now see, using the template as a rough guide only, where the four mounting bolts should go. Drill holes in body and bolt body in place. It is now slightly easier to estimate where the cut outs for the u/c struts needed to be. The template was not much help, so Chris used the time honoured 'hit and miss' method, and on this occasion he was lucky with neat clearance holes resulting. An extra

### Summary:

*"Relatively inexpensive but, with a superb looking end result. Plenty of time and effort required to achieve it, though."*



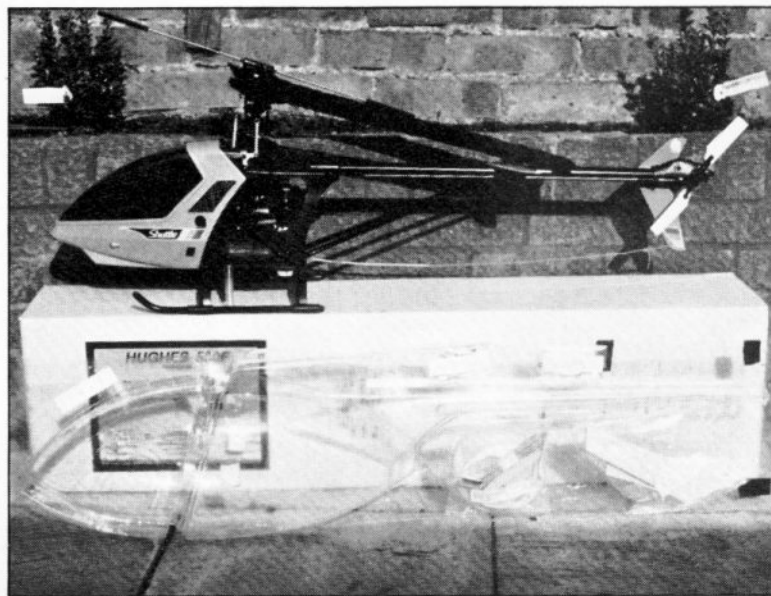
*Man and Machine: Chris Handley, who did the hard work of this review and the completed model.*

— it looks better out of sight inside — so that is where it went!

### Step 14

Using the mounting bolts provided, the wooden landing gear support blocks were positioned in the body on a bed of 24 hour epoxy. Due to the nature of polycarbonate, epoxy will not stick properly; so the blocks should be carefully broken away from the body after the epoxy has set, and reglued using 'Polyzap'. The purpose of the epoxy is to provide a perfect

*Kit contents: Substantial vacuum formed fuselage halves, with the various accessory packs stapled to the surplus material. Foam pads are used to prevent chafing in box. Mk. 1 Shuttle whose mechanics were used in review seen on box for comparison.*





ration of luck would have been necessary if the view had been obscured by paint! Next a trial fit of mechanics/body/undercarriage was carried out and any binding or rubbing sorted out. The cut out for the exhaust was done at this time.

### Step 11

(Apologies for out of sequence here). With characteristic skill we managed to break the upper body brace whilst bending it to fit, so another was produced from spare plastic. The brace sits behind the rotor mast and astride the side frames, and prevents the fuselage from wobbling about. We ran a piece of fuel tubing around the edges of the brace so that it wouldn't chafe and cut into the side-frames. At this stage, three (3) cable ties were used to hold T/R control rod tube in position.

### Step 20

Reasonable quality, soft balsa was provided for the tail feathers, and the only deviation here was to cut a slot in the tail plane to accept the fin. Not only is this much neater, it is also much stronger and rigid.

### Step 24

In our case, this was done part way through the painting process; purely for cosmetic reasons. The velcro was added with the 'hooks' half on the body and the 'fluffy' part on the canopy. Now the spraying could continue with the 'velcro' being oversprayed and thus continuity of the colour scheme was assured. Paint does not seem to have spoilt the effectiveness of the 'velcro'.

### Step 25

Cut a hole in the underside for exit of cooling air and also access to rear cone start. In our case it was also necessary to cut away some of the rear mounting block and undercarriage strut so that adequate access

*Remedy for Take-Off: Another view of the sports scale colour scheme using 'Berger' professional aerosols and black striping tape.*

could be gained for the rear cone start.

### Notes on Painting

As stated earlier we chose to paint the outside of the body rather than the inside. We also did that later in the building sequence with the benefits noted above. It is also felt that the amount of work required on the body prior to fitment would surely have damaged the paint. Using a hand shower, wash the plastic dust away and dry with a lint-free cloth. This also removes any mould release that might still be present. Mask off the window areas using electrical tape laid on the outside and trimmed off to the shape required. We found it advantageous to use striping tape to outline the window shapes, and then trim off the electrical tape to the edge so formed. Once again this is easily done through a transparent body. To avoid (we hoped) later problems with paint adhesion, the whole body was degreased with graphic cleaning agent. A pole was put through the tail section (rather like a lollipop stick — popsicle in the U.S. of A!) so that the body could be rotated for spraying. The body and the canopy were sprayed separately. For the colour scheme shown in the photos, two aerosol cans of white were used — in our case a proprietary car paint. Once the paint had thoroughly dried, the body was then fitted to the mechanics, and the velcro strips added so that the canopy could also be fitted. Striping tape was applied to the all-white body to outline the yellow areas. It was found to be surprisingly easy to produce the 'correct' or required outline by using the Mk. 1 eyeball. Thick paper was then

taped to the outline produced by the striping tape and the yellow paint sprayed on — also from an Aerosol.

### Painting the Tail

Firstly the fin and tailplane assembly was sanded smooth, then two coats of ordinary household white acrylic paint was brushed on, allowed to dry, and sanded off after each coat using No. 400 grade Wet 'n' Dry. Next a coat of white primer was sprayed, and finally the white top coat. Once the assembly had dried it was mounted onto the tail cone of the helicopter. For appearance's sake we shortened the stand-off blocks, and counter-sunk the fin to accept the bosses on the tail cone. 'Zap' was used to reinforce the wood around the holes. The final step was to mark out with striping tape the yellow areas and proceed as outlined above.

### Final Assembly and Finishing Touches

1. The foam vibration damper was pushed over the tail cone and along the boom into the rear of the fuselage. This method is simple and neat, and prevents the boom and rear fuselage from chattering.
2. On the Mk. 1 shuttles the 'Z' bend at the end of the pitch change rod must be cut off because it is impossible to refit with the body in position. We elected to use a ball link, with the ball held on to the pitch change lever with an M2 nut and bolt.
3. Rub undercarriage down with No. 400 Wet 'n' Dry, spray with primer then top coat.
4. Striping tape was used around windows and door shutlines. Since those moulded in were different from side to side, artistic licence was used to produce a pleasing effect. The yellow areas were also outlined with black striping tape to produce a sharp contrast. We think the results are effective.
5. The aerial was routed down the undercarriage and out to the tail.
6. The muffler exit pipe was extended using silicone tube, so that the exhaust would exit outside the body.
7. Vibration damper (51) was omitted since it apparently served no useful purpose.

### Flying

This really was a non-event, although the build up to the first

flight was quite exciting with most of the local chopper flyers taking a large number of pre-first flight photos. After all it was our first review model! In the event the Hughes felt like a normal Shuttle, although adjustments to the main needle valve and slightly increased collective pitch were found necessary to make the model feel comfortable. Circuits and hovering manoeuvres were quite normal, although the tail rotor did feel lumpy and stodgy. This was felt to be due to the substantial vertical fin area. Reduced gyro authority would probably help here.

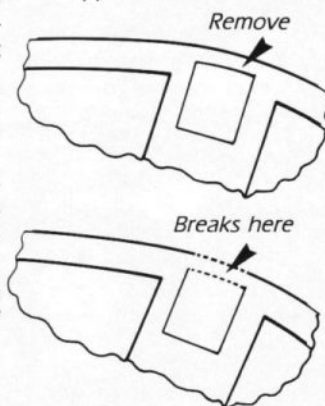
### Good Points

1. Vacuum formings are good quality.
2. Clear mouldings make cut-outs and mounting of mechanics relatively easy.
3. Velcro canopy mounting is neat and effective.
4. There is easy access to all necessities.
5. Good instructions.
6. Finished model looks good.

### Bad Points

1. Inaccurate cut lines, window lines, shut lines, etc.
2. Poor quality undercarriage mounting hardware, and also body mounting bolts, nuts, etc.
3. Wooden pre-cut body mounting blocks are inaccurate.
4. Cut out for mast and swashplate is wrong. It needs to be much wider and further back.
5. Mechanics need to be mounted further back inside the body, so that servo tray clears the front canopy.
6. Template hopeless.
7. Method of mounting canopy is difficult because of cut out for clip.

*Supposed to look like this.*



*Canopy can now be slid on.*