Character scale. The Ju 52 shows personality, even from the underside. George chose Croatian markings for this 1940s workhorse.

Kit contents, all superb quality as you would expect.

GRAUPNER

JUNKERS Ju52/3M

George Stringwell tries a tri-motor

Being newly fascinated by the prospect of '400' powered mini scale models, the offer of a kit powered by no less than three of these motors to review, even when coupled with a deadline which would mean a bit of midnight oil burning, was difficult to resist. I didn't resist it!

What do you get....?

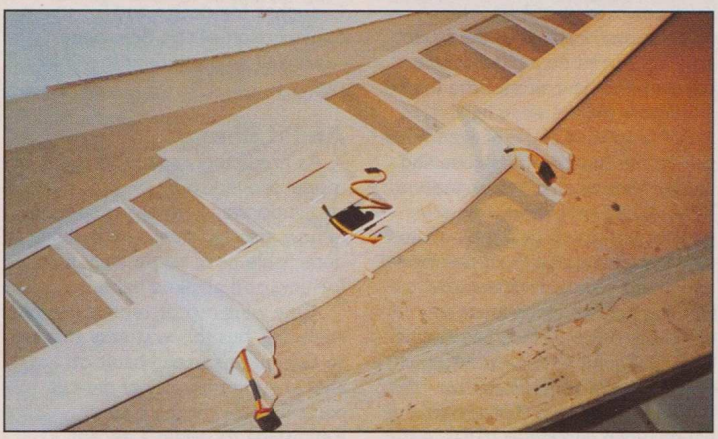
For your money. The kit is not cheap but is beautifully executed and very complete. There are masses of die cut Liteply and balsa sheets. The cutting on the ply is just about the best I have ever seen, on the balsa it is not quite so impressive but still perfectly adequate. The uncut 1.5mm sheet and strip material is of good quality and generally the right grade for the job. The ailerons/flaps (which are underslung completely separate from the wing on this aircraft) are accurately machined to aerofoil section.

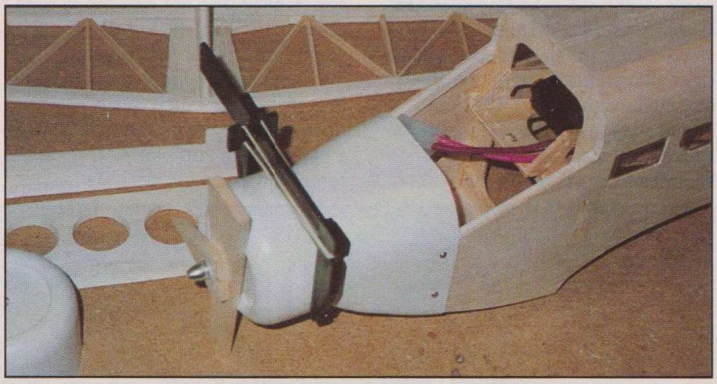
The 'hardware' is impressive, radial cowlings, complete fuselage nose sheath and nacelles moulded in white plastic, clear moulded side windows, superbly light wheels, snakes, aileron servo mounts, pre-bent wire parts etc. Plus, half a dozen polybags containing a plethora of small bits, special moulded aileron/flap mountings, collets, screws, spring loaded hatch catch, wingbolts, u/c plates, servo terminations as well as all the more usual control horns and clevises, etc. There is no covering material in the kit, but there is a large sheet of vinyls giving the markings for the Swiss civil version shown in the box art. Two clear and comprehensive plans plus a photo instruction sheet (in German) and an English translation of this take care of the paper work. The additional motor pack, equally impressive, contains three each of Speed 400s, suppression capacitors, pairs of mounting shells, scale like prop. adapters, spinner nuts and specially moulded semi scale 6.5" x 4" props plus wiring and plugs.

Welcome to weight watchers..

As a novice at this electric scale game, I took notice of the several people better qualified than me who had emphasised the importance of 'adding lightness'. The degree to which the Liteply fuselage formers and nacelle motor mounts were carefully fretted away to contain much more fresh

Needs an authentic background to show off the character of this aeroplane. We'll try a shot with a hangar in the background sometime





Top :George uses his own versatile fuselage jig for accuracy and speed. Wing construction shows capped ribs, servo housings and ply motor mounts. Cowling aligned for screw hole drilling. Note sloping battery tray aiming pack out through canopy in event of an arrival. Idea works well!
Bottom :Completed airframe. Note gap between flaps/ailerons and underside of wings.

air than plywood indicated that Graupner also thought it important, the design weight being quoted as 1600 grams. Accordingly, I took time to weigh all the bits before starting to build and including all the electronics and flight battery, they came to 1,510 grams obviously not much leeway there! I decided I was going to have to be careful, especially as I wanted to do a military version which would require painting.

One obvious weight saving measure is to use cyano adhesive wherever possible, but as I have dreadful problems with getting cyano to stick anything, (except my person to the bench, floor or model!), I elected to use my faithful PVA, but applied with a syringe and taking great care to use the smallest possible amount.

This being a kit review, I did not want to indulge in wholesale changes and in any case the basic structural design of the model looked to be pretty well weight optimised and most of the balsa was the grade I would have chosen myself. Accordingly, I settled on the following measures;

Replace my standard Rx with a micro one saving 25 grams (at a price!)

Replace the timber used to build the complete tail unit (I built the one with the kit parts as well for comparison) saving 22 grams. Use only one of the mounting shells for each motor and lighten this one by drilling then lock the motor in place with a nylon cable tie (see photo) saving 10 grams per motor - 30 grams total. Further very careful judicious lightening of the battery cradle and other ply parts by drilling saving 15 grams.

So what about deviations...?

This is a 'sport' scale model, but how accurate is it? Well, the general outline and proportions are very good. There are really five immediately obvious deviations; the cowlings are the wrong shape (not surprising as the correct shape has a 'return' which would be difficult to mould in one piece). The undercarriage has only one leg instead of an oleo plus two other struts, the prominent exhaust systems have been missed off and the well known corrugated finish is absent. Most obvious of all, the thrustline of the wing mounted motors is set up parallel to the centre line instead of with out-thrust (i.e. at right angles to the leading edge) as in the full-size. What you do about these is really down to the individual.

I decided to ignore the first item, and shelve the next two, plus the addition of a dorsal gun position which my military version should have until the model was finished and test flown, as to remedy them would cost, yes, you guessed it, weight. As far as the corrugations were concerned, it would be possible to try some visual 'trickery' but I decided to leave this for the moment. But what to do about the wing mounted motors? Obviously, the set up on the full-size was aimed at making it easier to fly with one wing engine dead. (Incidentally, a second hand report via my soaring friend Alan Cooper, now into full-size flying, indicates that the 'real' one IS very easy to fly and the chap who had flown the South African one said it was just like a big glider!")

On an electric model, the asymmetric problem was not going to arise and I presume the reason for using parallel thrustlines is to minimise drag and avoid power loss. I agonised on this right up to the point of fitting the nacelles and eventually did it as per plan, simply because this IS a review model.

The other choice to be made concerned the flaps. These are shown as non-operational on the plan, but the instructions point out that they can be actuated if desired. I decided that they might well be very useful both for extra lift on take off and as a landing aid and therefore 'invested' the necessary extra 25 grams to make them operable by fitting an extra set of snakes and micro servo in the centre section.

How did it build then...?

Very well indeed. It is my kind of airframe, a light, rigid, obviously carefully designed structure. The wing construction is very straightforward, with the 1.5mm spruce spar caps integrated with the top and bottom 'D' box sheeting and full depth spar web pre-slotted for the ribs. Cap strips and a split trailing edge complete a light and satisfying structure. I did disagree with Graupner about the building sequence - they recommend building the fully sheeted centre section and outer panels complete and then assembling them using the dihedral braces and threading the snake outers and motor wiring through. Whilst this is OK, I think it is far easier to get perfectly accurate joints of all the sheeting if you build the panels on to each other, propping up the finished ones as necessary and this is the way I did it.

The fuselage is very easy to assemble thanks to the accurate components and slotted, well matched sides. I did mark centre lines on all the formers and used my fuselage jig to get it dead straight. The central motor mount is a cantilever construction of Liteply and again it all slots together beautifully. The top turtle deck has three stringers fitted into the pre-slotted formers and is then sheeted in four pieces with 1.5mm balsa whilst the bottom is also sheeted with 1.5mm. The wing fixing comprises a double dowel at the front and two nylon bolts at the back. It is important to drill the dowel holes in the fuselage former before sheeting the bottom.

The tailplane and fin are straightforward structures, built on the plan from 6mm thick strip and sheet. The elevator comprises two laminations of 3mm and the rudder three of 1.5mm with local ply reinforcement. As mentioned, I did build another set of components for half the weight, much of which was due to saving the glue used in

Scale character. George Stringwell reckons (on the quiet) that there's not much compression on that motor.

laminating the kit structures. Nylon/metal pin hinges are provided - essential in the case of the rudder as the steerable tailwheel is attached directly to this component and hence some stress will be thrown on the hinges.

Fitting power and control gear was easily accomplished as per instructions, although I did modify the motor mounts as described to save weight. The plastic cowlings and nacelles need care when trimming to shape it is easier to take plastic off than put it back on! The entire nose cowling back to the cockpit and including the radial cowl ring is assembled into one piece and held by four screws, whilst the nacelle fairings are permanently glued to the wings and the radial cowls retained by screws. (Incidentally, if you cannot get Stabilit Express to glue the plastic parts, don't use 5 minute epoxy as it does not hold. Strangely enough I found balsa cement was perfect for bonding the plastic nacelles to the balsa sheeting.)

The flight battery installation is clever. A 'Liteply' crate assembled from die cut components slides in through the cockpit opening at an angle of about 35 degrees to the horizontal. The rear of this is locked in place by a fuselage former, the front by two self tapping screws into a hardwood rail. This 'crate' is a good sliding fit for the power pack and simply removing the cockpit/hatch enables access for charging or insertion/removal. Perhaps more importantly, in the event of a 'nasty', the battery 'pack has a clear exit route out of the airframe, destroying only the cockpit hatch en route!

The radio fit comprised a 15 gram, five channel Simprop Nano Rx, four HiTech S101 micro servos and the recommended Picomos 33 speed controller with BEC (very nice but expensive - any controller capable of handling 30 amps should do).

Finishing

The recommended finish is silver Ecocover, which I presume is similar to Litespan, to simulate the Swiss civil version for which the markings are provided. The airframe is quite rigid enough to allow film covering, however, the instructions make much play of the fact that a 'tissue like' finish, such as Ecocover or Litespan is preferable to a high gloss film for flight efficiency! There is no doubt that if you want the lightest possible finish, then the civil version covered in Ecocover or Litespan is going to provide it. However, I had already decided that I wanted to model a military version and had found an excellent colour drawing of a Croatian Ju52 with very dark green top surfaces and pale blue undersides plus some interesting markings.

I covered the open frame areas of the wing and tail in 5 micron clear mylar and then the whole airframe in Esaki lightweight tissue, green on top and white underneath (both these items from Mike Woodhouse who advertises in *Aeromodeller*). Three coats of thin dope were used, then the lightest possible spraying with car cellulose Rover British Racing Green(!) and Powder Blue being pretty close. The Croatian markings were created by drawing them with a permanent Lumacolour pen on a white Solartrim base, then spraying with a matt protective coat. The fuselage band is Humbrol yellow enamel and the checker board unit insignia on the rudder is cut from a water slide transfer sheet. So there it sat, finished weight 1585 grams (phew!) with a seven cell 1750 SCR pack, C.G. about 3mm in front of the plan position, just waiting for the weather....

Flying - Part 1

This should really be entitled 'Not Flying!' Have you ever had that feeling the fates are against you? First of all, with the deadline looming, the weekend forecast looked horrible but Thursday dawned bright, clear and very cold, so I booked a morning off work, summoned up the Editor and a clubmate and prepared to go flying.

Snag number one, only one of my Challenger transmitters has a mixer, which I wanted to use for coupled ailerons and rudder. When I took it off charge and switched it on, the needle stayed in the black for all of thirty seconds - obviously a cell had collapsed. With no time to fiddle, the other Tx would have to be used with separate rudder and elevator.

Then, walking out to the launch area, I stepped on a patch of ice, went up into the air and the model and I both hit the deck hard. I suffered bruises and a banged head, the model landed on its nose and cracked the centre motor mount. When I had recovered my equilibrium, the Editor's cyano and some masking tape fixed the model and range checks with motors running proved to be fine.

The ground surface precluded an R.O.G which was the way I really wanted to do it as this model is an awkward shape to hand launch. However, Chas .got it away nicely and for a few seconds, all was well. Then the model started to lean left. I eased in some right aileron but it went more left, more aileron with no effect and just as I went for the rudder it suddenly tip stalled to the left. From ten feet, there was no chance of recovery and it hit the frozen ground hard. At least I now know that the battery shoots out as designed!

Damage, considering the light airframe, heavy contents and considerable thump, was surprisingly slight, being mainly confined to the fuselage front end forward of the wing seat, whilst one wing engine mount was fractured. It will all repair without problems but not in time for this report so watch the column for the (hopefully) successful second flight.

What happened? Well, the wing taper is quite sharp and there is no washout, so a tip stall will not be hard to induce. I reckon the drag of the down-going left aileron stalled the wing tip and caused it to flick out against the applied control. I think it will definitely be better with coupled aileron and rudder. Some aileron differential might also be a good idea.

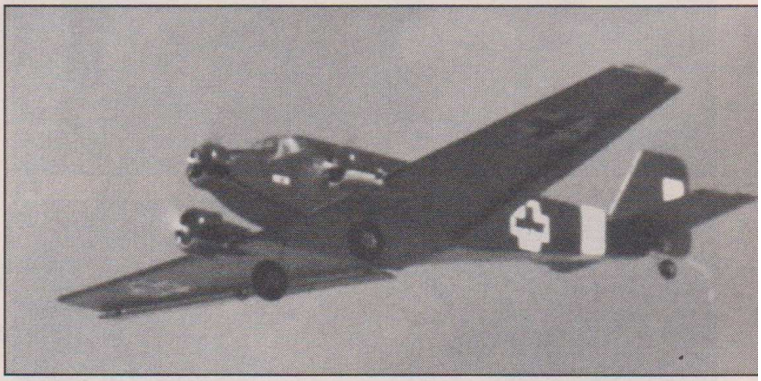
I am particularly annoyed by the setback, as I have rarely enjoyed building a model so much. The finished model certainly does look the part, oozing character and it sounds delightful with all three motors on full song. Full marks to Graupner for design and construction of this one, once repaired I am confident it will fly well.

And it does

As predicted, repairs to the model proved to be straightforward, involving splicing in new fuselage sides and building a detachable nose turtle deck from formers and planked balsa.

One wing motor mount needed replacing, but this was easy thanks to Graupner's useful habit of showing the majority of die-cut parts full size on the plan. Refinishing to retain a decent appearance was actually more time consuming than the actual structural part of the repair.

The weather for the 'second first flight' was much more hospitable, springlike sunshine with a light breeze and pleasant temperatures. I felt entirely confident this time as I had built in a bit of 'insurance' - two to one differential on the ailerons, 1/8 inch 'up' on each aileron for washout effect, coupled aileron/rudder via a 'Y' lead and a little nose weight to bring the C.G.10 mm forward of the plan position. The only down-side factor was that the model now weighed slightly heavier at 1670 grams.



I still had not found either a tarmac runway or a bowling green, so it would have to be a handlaunch again; with the Editor glued to his camera this time, I asked for volunteers and my old thermal soaring friend Bob Jones stepped forward - brave man. We need not have worried. I selected 10 degrees down flap, opened the throttle and off it went, as easily as that.

The model climbed out dead

straight at a nice angle and when I started to turn at 50 feet over the boundary hedge, the control response was crisp and precise with no hint of problems. What did surprise me was the rate of climb, which was much better than I was anticipating. After 30 seconds it was high enough to pull up the flaps and throttle back to about two thirds power. On this first flight I simply concentrated on flying the model smoothly, leaving experiments with flap settings, etc., until later. It does fly quite quickly, but one could hardly expect scale speed performance from a model of this size and loading, especially when the full-size was such a slow aeroplane.

After four or five minutes of flying around, much of it at two thirds throttle, I had failed to discover any bad handling habits at all and was happy to try first a dummy approach, and then a landing whilst I still had enough battery to do a 'go-round' if necessary. Since I was leaving flap experiments until later, the model fairly whistled in with the motors just ticking over (I have them set up so that trim movement is needed to bring in the brake). Its manners were impeccable and I was able to flare it and touch down smoothly, although it was tripped gently onto its nose by the rough

Motor pack includes props, adapters, mounts and capacitors.

ground before it had chance to run to a stop.

Checking the amount of battery remaining indicated that, with moderate use of full power, flights of six to eight minutes are going to be the norm. One thing which was a pleasant surprise to me, as a newcomer to electric scale, was the amount of performance available at full throttle. This aeroplane does not stagger around the sky in an underpowered manner as one might expect, it flies very positively. I am quite sure it would loop, but have no intention of subjecting it to any such undignified manoeuvre - whoever heard of an aerobatic Ju52!

However, in view of the sprightly performance, I would think that the wing motors could be safely mounted 'squinting' as on the full-size if seeking greater scale fidelity. A bonus is the sound which the model makes, especially at half to two thirds throttle. Not in any way loud, but somehow just the way one would expect a Ju52 to sound!

I am really looking forward to exploring the flight envelope with the flaps; in particular 45 degrees flap and some power should enable slower and steeper landing approaches. Possibly the use of flaps in flight will enable the model to be presented better with slower fly-bys, etc. I think that the C.G. can now go back to the design location, but I thoroughly recommend the aileron differential and coupled aileron rudder to other builders, I am sure they contribute to the sweet and predictable handling.

Having confirmed the splendid flying capabilities, I am now going to add a few details such as exhausts, dummy undercarriage struts and top gun position - and then, hopefully, have a lot of fun with this model. Just think - if anyone had suggested a three and a half pound, five function electric sport scale tri-motor as a practical weekend model just a few years ago, the men with the white coats would have been called out! Such is progress that Graupner's Junkers 52/3m is exactly that. I love it! ●

Specifications

Span:	59" (1·5m).
Length:	38". (.97m).
Power:	Three Speed 400s with seven cell pack.
Controls:	Ailerons, elevator, rudder, throttle and optional flaps.
Weight:	Quoted 55 ounces (1·6kg).
Wing area:	2·9 sq feet.
Wing loading:	19 0unces per square foot. (420sq ins.).
Kit price:	£99·95.
Motor pack:	£35·95.

Available from: Gliders, Brunell Drive, Newark, Notts, NG24 2EG (01636 610539).