

AVRO LANCASTER

**YES, WE HAVE DONE ONE RECENTLY, BUT IT WASN'T THIS BIG!
TONY NIJHUIS UPSIZES HIS PLAN TO 11FT. FOR GEARED
600 OR I.C. POWER**



Two words describe the new 'leccy Lanc - big and beautiful. Caused a storm around the shows this year, and now you can make your own!

Here's the gen. The Lanc needs four Speed 600 motors with 3:1 gearing, and APC thin electric props. Oh, and an owner who doesn't mind being dwarfed by his aircraft.

So spar, so good: forward spar tube, made from 4mm birch ply with spruce at the ends, ready to receive the wing panels.

Almost one year on from the launch of our very successful smaller electric Lancaster, designed around the ubiquitous Speed 400 and Gunther prop combination, it's now time to meet 'big brother'. Here, we move up to 600 / 660 (with gearbox) power.

Going back to a time before the smaller 'leccy Lanc was produced, the original intention was to design a large i.c. powered version, which would certainly have been my biggest project to date. In truth, I was slightly nervous about the idea of designing and building such a model from scratch, with only experience to tell me where to start hunting for the C of G position, and what the control



throws were likely to be etc. Hence the idea of building a smaller one, using cheap electrics, as a tester. If this Lanc would fly, and I was happy with the performance, I could then apply all the control settings to a scaled-up version at a later date.

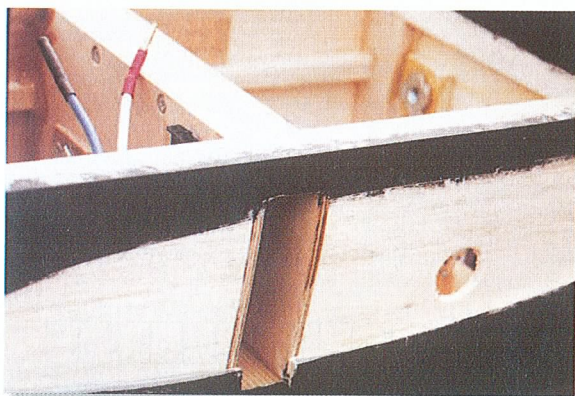
The enjoyment gained through operating the smaller Lancaster, which flew without the worry of an engine cutting or fuel soaking into the structure, soon made it my weekend 'hack'. As time went on, the thought of building a larger version with i.c. power grew less and less appealing - certainly, if it wasn't for the electric B-29 of Colin Straus, the big Lancaster may never have been built at all. But, seeing the B-29's first public outing at Old Warden last year

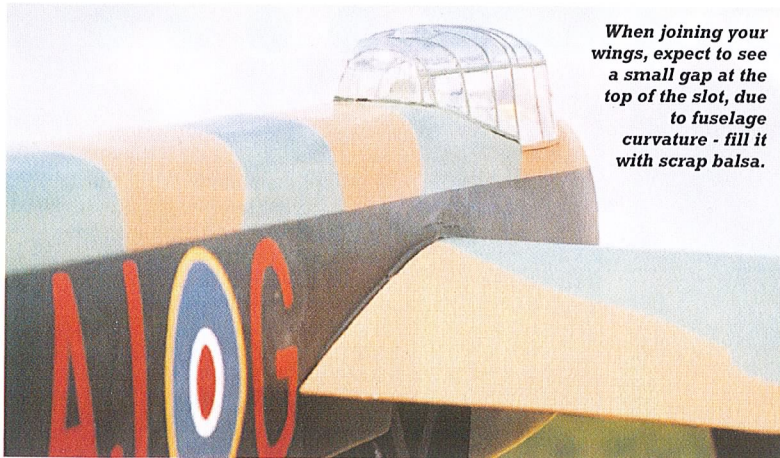
was a marvel, and instantly rekindled my interest in the larger Lanc, only this time I intended to raise the stakes and stay with electric power. If a 14ft. model weighing 36 lb. and powered by four Speed 700's could fly well - as Colin's model did - I knew I had a chance of making a 12ft. Lancaster fly on 600's with a target weight of 20 lb. The motivation stepped up another gear when I managed to purchase a job lot of industrial 2000SCR's from Ian Peacock, at 50p per cell.

So, the project was on. Just after Christmas 2001 the CAD plan was enlarged and modified to accommodate plug-in split wings for ease of transportation; the tailplane

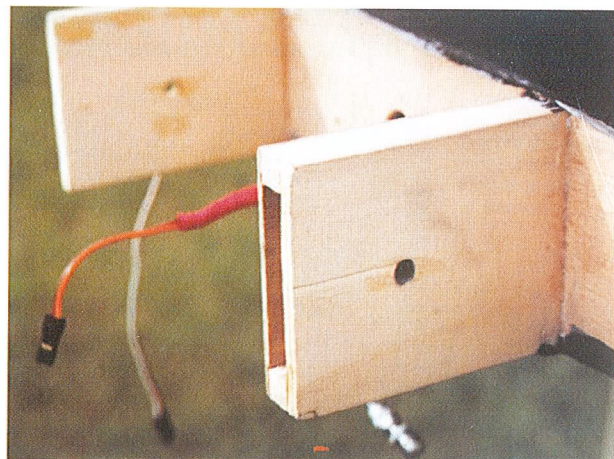
was also made detachable, but the fins were secured permanently. I also decided to modify the fuselage, turning it into the 'Dambusters' version with the ability to hold, rotate and drop an EPP bouncing bomb. With the example set by Colin's B-29 in mind, battery packs were fitted in the inner nacelles, an excellent idea as it concentrates all the weight over the main wheels. That way, if a rather heavy landing occurs, any shock load will be taken straight down the undercarriage legs.

It was also decided that to minimise the risk of multiple failure, each motor would be matched with its own battery pack and speed controller. Those of you who read the 'Lancaster Clinic' article in our





When joining your wings, expect to see a small gap at the top of the slot, due to fuselage curvature - fill it with scrap balsa.



The other bit - wing joining spars.

August edition of RCM&E may remember that I explained the virtues of limiting current draw for any given battery by adding multiple packs; what this does is limit the current, and subsequently the losses through each individual cell.

Having decided upon this set-up, the only thing left to choose was the type of motor, gearbox and prop to be used. Countless combinations, with different ratios, were tried before I eventually settled on a 600-size 3:1 gearbox, a type commonly available (I'd have liked to go with a slightly higher ratio, but was unable to find a source). Out of those props tried, the APC thin electric seemed to be the best.

All initial testing was carried out using a home-made test jig, which measured the thrust with everything connected to an 8-cell battery. On a freshly charged pack, my initial measurements using a 12 x 8" prop were around 2 lb. of static thrust at 19 amps current draw; I was conscious of the need to keep the draw to around 25 amps maximum. Above this point, the motor commutator can deteriorate reasonably quickly. The combined static thrust on eight cells per motor would have given me a projected thrust-to-weight ratio of 40% - acceptable, assuming I could hit the 20 lb. target. However, having additional power, if only for reserve, is no bad thing and since the optimum current draw had not been reached yet, testing continued.

I was convinced that using a finer pitch prop was the way forward, as was the need to increase the number

of cells. So, the 12 x 8 was replaced with a 12 x 6. By the time nine and then ten cells had been tested, the current was at a peak of 25 amps, and the thrust had risen to 2 lb. 10oz.

Measured through a power meter, the motor could be seen drawing 280W on a fresh pack, and dropping to settle at around 250W. This would give me a power-to-weight figure of 50W/lb. The rule of thumb with this type of model is that the power needed to maintain level flight will be about 35W/lb. When I used this calculation on my smaller Lancaster, the figure came out at 43W/lb! If proof was needed that this monster was going to fly, I now had it, and so construction could begin.

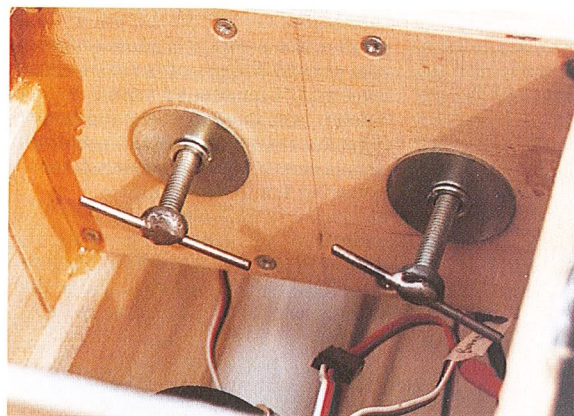
LIKE LADY GODIVA...

In early January 2002, construction began and then proceeded at pace. By the time she was ready for her test flight, almost three months had passed. Fortunately, I didn't have to cover and finish the model prior to proving the design, having already shown it would work with the smaller Lancaster. It was just a simple case of scaling up all the control movements on the rudder, elevator and ailerons; then, in theory, the model would fly as if already trimmed and set-up. A comforting thought.

However, not wishing to chance my arm with any further detailed work, I decided to fly the model in its 'birthday suit'. At this stage, the Lanc was already tipping the scales at 21 lb. and the 6 lb. worth of batteries didn't help. Although disappointed that I had overshot the ambitious

target weight, this was still good, and since every sheet of balsa had been selected correctly for the job in hand, I consoled myself by remembering that achieving anything lighter would have been detrimental to the strength and rigidity of the model. Also pleasing was the C of G, which came out about 12mm further forward than the calculated position, without ballast.

Wing retaining bolts complete the jigsaw. A neat and, above all, strong arrangement for a big aircraft.



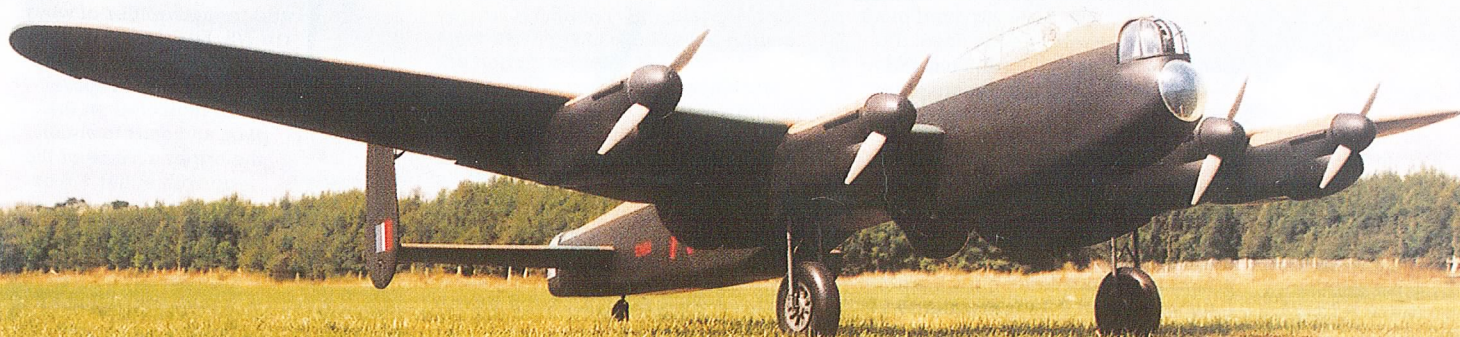
This allowed some leeway for the additional weight of covering materials and the rear turret.

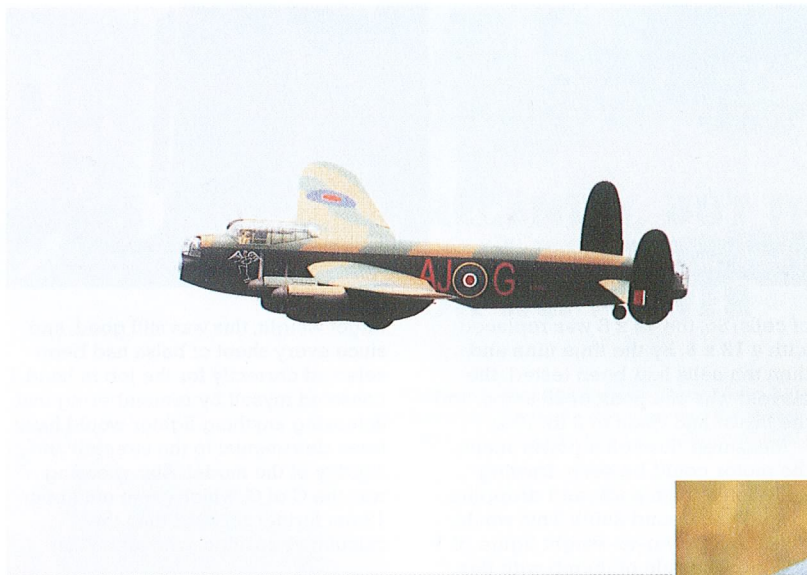
So, everything was looking good for the Lancaster's first flight. I won't jump ahead, but needless to say it was a great success, and the model was finished in haste so that it would be ready for static display at Sandown 2002.

CONSTRUCTION

On the whole, I followed the construction methods adopted with the

Large models always seem to perfectly capture the nostalgia of a 'plane such as the Lanc. Tony hasn't detailed the outside of his too much - but there's nothing stopping you? Dress yours up into a real show-stopper, and send us a pic.





Tune in next month to find out how you can dress the Lanc in all sorts of fine ways. Pic shows effective cockpit detailing on Tony's version.

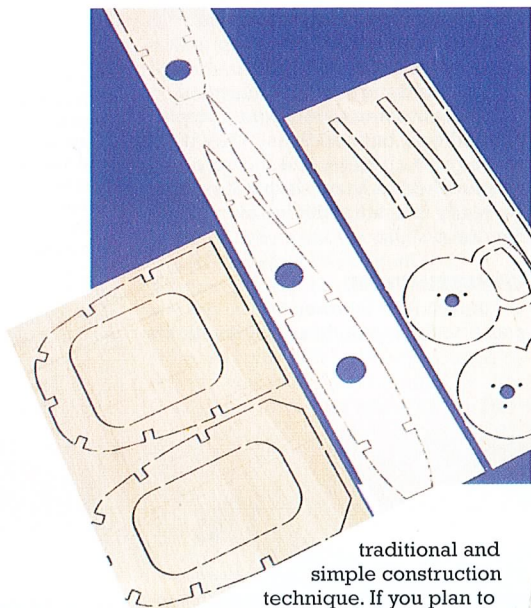
smaller Lanc, exceptions being the split plug-in wings and the removable tailplane. As mentioned earlier, another modification was made to reproduce the Dambusters version and details showing how to construct the bouncing bomb, the spinning mechanism and the bomb release mechanism are shown on the plan. Naturally, whether you follow this path is up to you, and I've also included the outline of some bomb doors (as they would have been on the Mk. III) to provide an alternative.

Although this is a big model, it is not difficult to build, using, as it does, a

Since you're losing 6 lb. worth of flight batteries, you have that weight to play with in terms of wood selection, covering and finishing. Do try and keep the tail end light on your i.c. version though, to avoid unnecessary additional ballast being added - rest assured, you will need some.

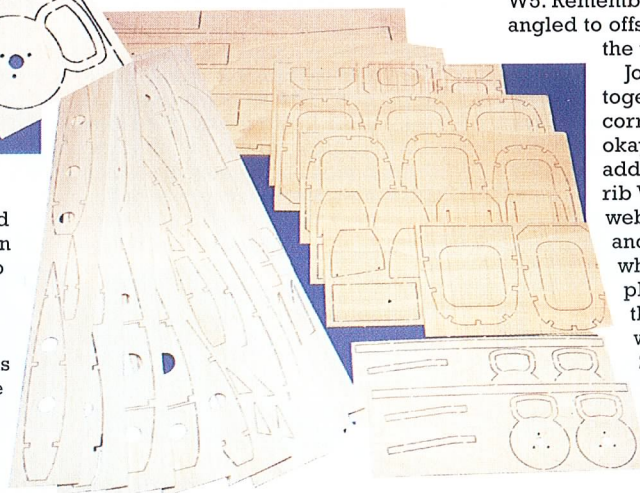
Due to the large wing area, even if your i.c. version tips the scales at 30 lb. plus, I have no doubt that it will still be a pussy cat to fly. In fact, it may well have better presence in the air, especially with penetration into wind suitably improved.

Returning to the electric version, balsa selection is critical. All wood for the prototype was obtained through SLEC who, in my opinion, produce the best quality available at the moment; unfortunately, you can only buy direct from them at the various trade shows they attend and, the good news is, they supply our RCM&E wood pack.



traditional and simple construction technique. If you plan to build the i.c. version, your choice of wood, although still important, is not as critical - I suggest you use a medium grade, as opposed to the light grade. In some areas such as the wing skin, increase the thickness from 1.6mm ($1/16$ "") to 2.5mm ($3/32$ ""), in order to enhance the durability.

Packing it in: Our monster CNC-cut wood pack will take much of the tedium out of cutting and sanding.



Throughout the construction, I used standard 36" lengths. A material list is detailed on the drawing, and this covers the main bulk of the wood required. Due to the sheer size of the model, gluing sheets end to end and edge to edge will become commonplace; where you need to join end to end, use a 25mm wide by 1.6mm thick bridging strip to reinforce your joint from the inside.

WINGS

Panels are constructed over the plan. Start making your inner panels by pinning the lower 9.5mm ($3/8$ "") sq. hard balsa main spars to the plan, then fitting the main plywood braces B1, B3 and B4. Do note that the

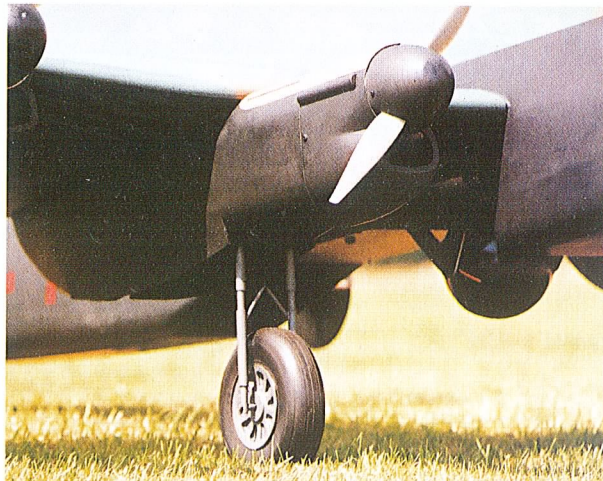
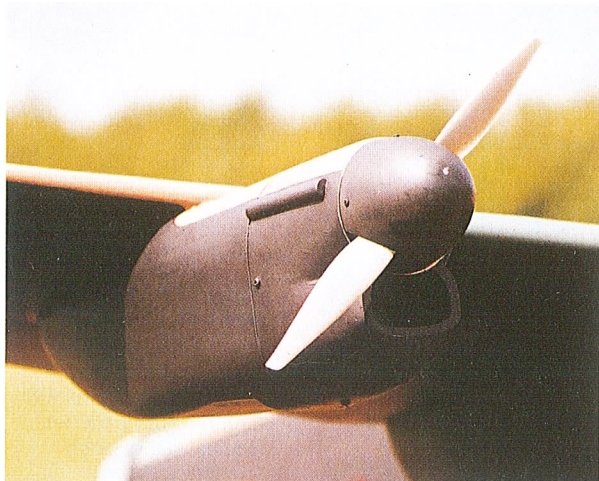


drawing advises cutting lightning holes in the main Birch ply brace B1 for the electric version, in order to save a little weight.

Fit the ribs W1 to W3, followed by the top rear 6mm sq. spar. Add both top main spars - again using hard balsa - and the remaining braces, B2 and B2a. At this stage, the i.e. can be fitted. This is made by laminating two strips of 9.5mm and 12.5mm balsa, to achieve the depth of wood.

Remove your wing assembly from the plan, and fit the remaining 6mm sq. spars at the rear. Complete the outer wing panels to this standard, but don't fit the forward part of rib W5. Remember: ribs W7 and W8 are angled to offset the nacelle against the wing dihedral.

Join the two panels together, checking for the correct dihedral... is it okay? Good, then you can add the remainder of wing rib W5. Fit 2.5mm shear webbing between the top and bottom main spars, where indicated on the plan, and start to sheet the upper surface of the wing with either 1.6 or 2.5mm medium soft balsa, depending on your choice of version (electric or i.c.). At this point, you will need to fit the aileron and



Close, and closer:
Inboard and
outboard nacelles
for the electric
version. If making
an i.c. Lanc,
replace the 6mm
litemply firewalls
with 6mm birch ply
or similar.

speed controller extension leads, the retract air tubing, and the motor wiring (or throttle cabling).

Next, begin to sheet the underside of the wing, leaving open sections where the nacelle sides NS1, NS2 and NS3 fit. Finally, make the ailerons, profile the i.e., and trim the wing tip. Give the wing a light sanding, ready for the nacelles to be fitted.

FUSELAGE

Cut out the lower fuselage sides from 4.5mm ($\frac{3}{16}$ ") balsa, and mark the positions of the formers and wing / tailplane root profiles, plus the location of the wing spar slots. You will have to splice about four sheets of 900mm (36") to make each side. Decide at this point which version of the Lancaster to go for, as it's last chance city!

Glue lengths of 9.5mm square balsa along the upper inside edge, so that they overhang by half the width. If you haven't acquired the CNC pack, make up all the formers, and glue F2 - F7 into position on one side of the fuselage only. Glue the other fuselage side into position, and fit the remaining formers. Add 9.5mm stringers to the top of the fuselage and try to make any splicing coincide with the point where they cross the formers.

Begin sheeting the top half using 3.2mm ($\frac{1}{8}$ ") 'soft' balsa. Again, you will need to splice or butt-join balsa sheet prior to skinning; note that you may have to wet the balsa surface, to

avoid the wood splitting. At this stage, It is also worth clamping the fuselage into a jig to avoid distortion, the latter a factor which can also be reduced by skinning both sides simultaneously. You will have to make a 50mm cut from the top across the sheet at F9 prior to bending, to allow for curvature in the fuselage.

Leave the fuselage to dry, before removing it from the jig. Next, from the details shown on the drawing, make up fillet strips to fit along the bottom edges, using 9mm balsa sheet. Add these strips at an angle of 45° so that they fit snugly against the formers. At this point, make a few saw cuts to a depth of about 25mm between F9 and F9a, and between F10 and F10a, in order to establish where the removable section for the tail is located. Where necessary, trim the lower edge of the fillet strip so that it sits flush with the bottom edge of the formers.

Start cross-sheeting the fuselage underside with 4.5mm balsa, leaving sections open between F4 and F7 to give good access when fitting the spar tube. Fabricate said spar tube using 4mm birch ply, then use spruce for the forward tube, and 3mm litemply / spruce for the rear ditto (as detailed on the plan). Spend a bit of time achieving a good 'snug' fit on the wing spar prior to fitting the tube into your fuselage.

Drill two sets of holes in the spar tube for wing securing bolts. Once happy, cut a vertical slot in the fuselage for the rear tube to slide into, and glue it to former F5. Accurately mark a line from the rear spar tube to the main spar tube, and cut a slot in the fuselage. Glue the main spar tube into position, and reinforce the area around the openings. For the 'Dambusters' version, 12.5mm ($\frac{1}{2}$ ") triangle and 4mm birch ply is used to strengthen the bottom edge.

Now, slide your wing panels into place. Due to the curvature of the fuselage, there will be a small gap along the top edge; this should be filled with scrap balsa, anchored to the fuselage. Alternatively, you can angle the root rib of your wing to match the curvature - the choice is yours. Finally, using the hole already drilled in your spar tube as a guide, drill through the spar itself, then

remove the wings and fit some 'T' nuts. Complete the cross sheeting, but leave the section between F4 and F6 open, then make removable panels. Start to build up the nose section from 12.5 and 9.5mm sheet, plus 12.5mm triangle stock. Trim and finish the tail end of the fuselage, and begin to profile using a razor plane and sanding block.

Mark the position of the tailplane root profile on both sides of the fuselage, then cut away the tail section. Finish by making the NiCad access hatch and seating area, then carefully cut the decking to reveal the cockpit opening.

Cut your battery hatches on top of the nacelles for easy access.



NACELLES

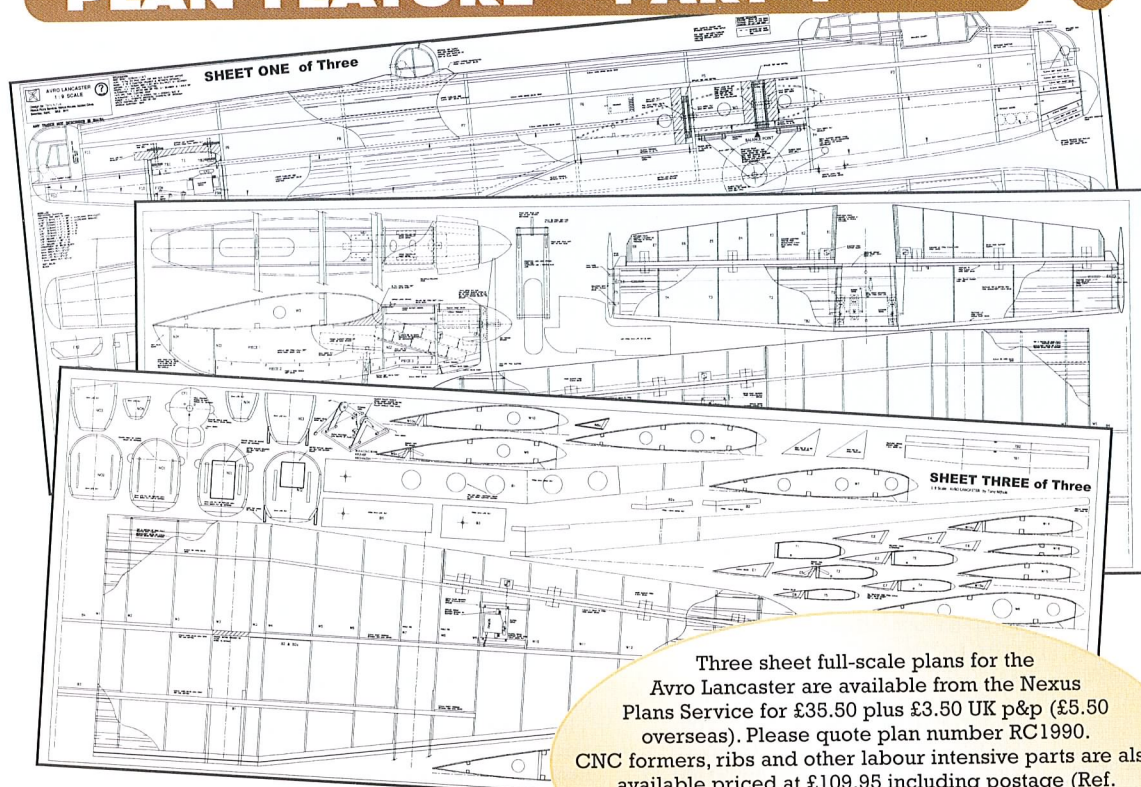
To begin making your nacelles, cut out the inner sides NS1, NS2 and NS3, plus all formers. Slide the formers onto the inner sides. If making the i.c. version, note that the 6mm litemply firewalls NI1 and NO1 should be replaced with 6mm birch ply or similar.

Fix each nacelle assembly into position. Fit the battery tray, and feed your wiring through the two outer nacelle formers NO1. For i.c. engines, install the motor mount, tank pipe-work and throttle servo, then fit the remaining formers. Cut out and fit the nacelle side pieces - 1 and 2 for the outer nacelle; 1, 2 and 3 for the inner nacelle - from 3.2mm soft balsa. Make sure you cut piece 1 slightly oversize, to allow for the bend / curvature of your nacelle sides.

Wow! Don't get too excited, there's quite a bit of work to do before you get this far. Still, you can at least draw inspiration from it. 'Majestic' is a word that springs to mind.



PLAN FEATURE - PART 1



Using 3.2mm soft balsa, sheet the upper surface of the nacelle, again noting that you may have to dampen the wood to aid curvature. Finally, 'cross' sheet the underside with soft balsa as shown on the plan, and fit a balsa block - roughly shaped

Three sheet full-scale plans for the Avro Lancaster are available from the Nexus Plans Service for £35.50 plus £3.50 UK p&p (£5.50 overseas). Please quote plan number RC1990. CNC formers, ribs and other labour intensive parts are also available priced at £109.95 including postage (Ref. CNCRC1990), as are vacuum formed mouldings for the canopy and turrets (CANRC1990); £19.99 plus £3.50 UK p&p (£5.50 overseas).

- to the rear of each nacelle. At the top edge of the nacelle, where it butts

against the underside of the wing, fill the gap with pre-shaped pieces of 3.2mm balsa. To finish, razor plane and sand the nacelle to a smooth, flowing shape.

If you intend to fit retracts, cut and fit the 6mm birch plywood bearers, remembering to reinforce your joints with 12.5mm triangle stock and plenty of epoxy glue. In order to gain access to the batteries, cut out a hatch as indicated on the drawing. You will need to make two hatch formers (i.e. two per hatch) in order to keep the rigidity, and the correct curvature. For the i.c. version, you may wish to fit hatches on all nacelles, to access the tank and throttle servo.

'TILL NEXT MONTH

Well, we seem to have run out of room for the moment. Still, I think that's enough to be going on with, so, in the meantime, why not get those parts ordered and get building. Next month we'll finish the job and get her in the air. Until then...

LANCASTER

KEEP THE FAITH, OH BRAVEHEARTS, FOR IT IS NEARLY TIME TO FLY THE MASSIVE ELECTRIC LANCASTER. TONY NIJHUIS FINISHES THE BUILD AND GETS US ALL FIRED UP

Yes, it will take up a lot of space at home... and in the car... and in the pits! But can you really resist it?

After building the fuselage and wings last month, plus the nacelles, we move on with haste, to the cowl.

COWLING MAD

This bit's simple enough. Cut out, from 12.5mm sheet balsa, the cowl sides; chamfer the front and rear faces, then tack-glue them to the nacelles. Fit the top and bottom pieces, again using both 12.5 and 9.5mm balsa, and fit the corner triangle to each. Cut cowl former CF1 and glue it in position. Finally, using a razor plane / sanding block, shape each cowl so that it flows smoothly into the nacelle. The cowls can now be removed, and retaining 'lugs' (made from 6mm plywood), fitted to the firewall of the nacelle. Drill the cowl where required and screw-fix it to the lugs.

Remember to number your cowls against their nacelles, to avoid any embarrassing mix up.

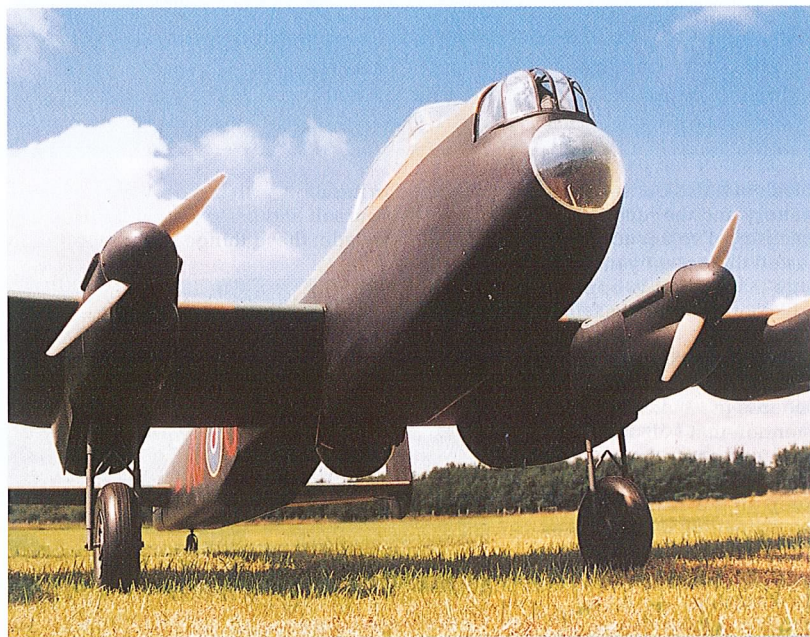
Tony applied his paint scheme by hand using Humbrol enamels. Go electric, and you won't even need the fuel-proofer.



Cowls are made using 12.5 and 9.5mm sheet balsa. Cut out the parts, tack-glue them onto the nacelle, then add corner triangles and the former CF1.

MOTOR MOUNTING

You shouldn't have any problems mounting 40-size i.c. engines, as this can be done using commercial bulkhead mounts, whilst fitting the motor in a side or inverted position. Don't be tempted to shoe-horn larger



engines in; a 40-size will be more than adequate. An in-cowl silencer would be advisable, to avoid too much 'cowl crunching', although a better alternative (if you can afford it) would be to use the .52 four-stroke engines, as these will operate quite happily in the inverted position.

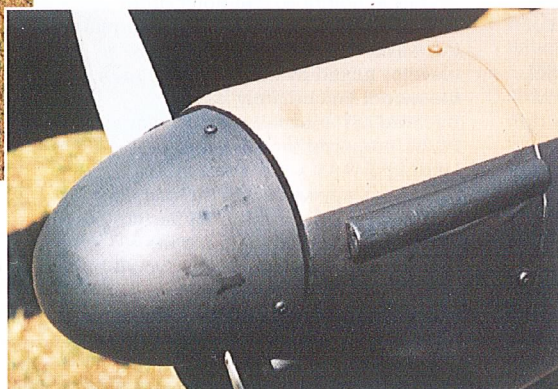
With the electric version, there are two options: either mount the motor / gearbox directly to the nose ring CF1, as you would with a conventional sport model, or create a cradle to support it from the firewall. I would suggest the first option, as this is the easiest and most accurate.

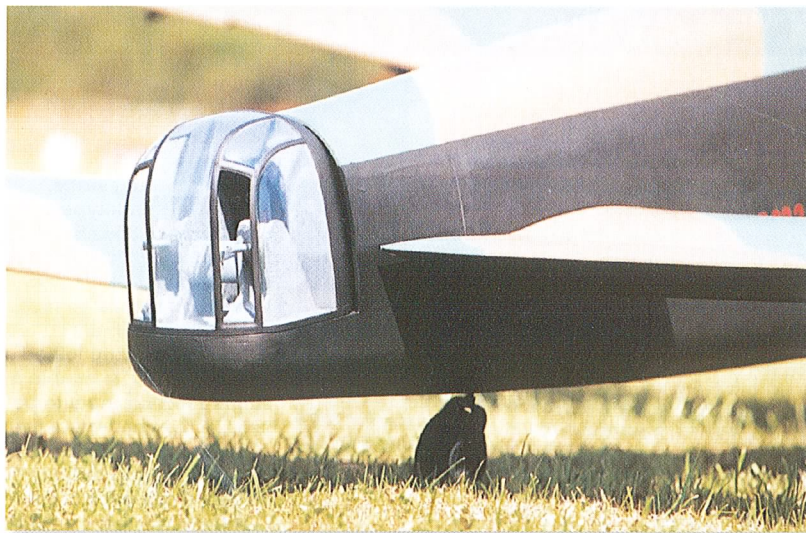
With regard to cooling, as long as you open up the air in-take in the chin of each cowl, both motor and battery pack will be more than happy.

TAIL & FIN

Construction of the tailplane is best tackled over the plan and 'upside down', so that the top of the assembly is flat. Only construct the frame over your plan - once complete, remove it, and taper both the top and bottom of the trailing edge flush with the ribs. Sheet the top surface with soft 1.6mm balsa, leaving the center-section open.

At this point, fabricate and fit the rudder pushrod, remembering to install a turret link for your rudder bellcrank in the centre-section of the tailplane. Using 3.2mm balsa, make up exit guides for the pushrod and fit them between formers T4 and T5. Now, make the fins from soft 12.5mm balsa, and temporarily offer them to the tailplane so that any necessary adjustments to the pushrod position and length can be made. When satisfied, remove the fins, and sheet





TOP LEFT: 12.5mm balsa is also used to make the pair of rudders.

TOP RIGHT: Guidelines for making simple guns are included on the plan. Well, you wouldn't want to miss them out on a model of this size, would you?

the underside with soft 1.6mm balsa. Once again, leave the center-section open, to allow access to the pushrod.

Next bit involves making up the two elevator halves, which are likewise built over the plan. Start by cutting the bottom skin outline as shown, and mark the rib positions; fit the angled leading edge of the elevator, then complete by adding those ribs. Finally, fit the horn support block. On the prototype electric version, I used strips of 25mm wide Solartex as full-length hinges - however, you may wish to use a pin type hinge and if so, support blocks for each one should be used.

Taking a piece of 4mm birch ply, cut and fit the two tail bolt support plates in the tailplane center-section, locating them against the l.e. and t.e. Reinforce the glue joints with 12.5mm triangular stock. Drill a 6mm hole in the center of both plates, position them on the fuselage and drill through the 'T' nut support plates. Finally, fix the 'T' nuts to the plates, and secure with epoxy.

Back on the tail section, fabricate and fit the bellcrank mounting plate, then secure the bellcrank itself. Connect the turret link, and once happy with the movement, glue the plate into position. Make two sets of elevator servo mounts and fit them to the removable fuselage under-section that's attached to the tailplane, then cut slots for the two elevator control horns to exit. Follow this by bolting the tail in position, whereupon you can fit and finally trim the fuselage under-section. Once happy, glue this into position. Remember to mark and then drill holes in the underside, so that you can access the securing bolts with a screwdriver.

Fabricate and fit the rudder servo mounting plates, then decide whether you want a steerable tail wheel, castor action, or a fixed unit. Details are shown on the plan for the steerable option, which can either be operated from the output arm of the rudder servo or by a separate servo.

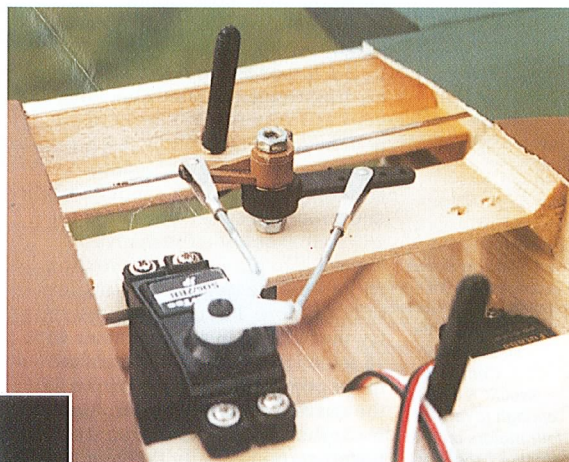
For the electric version, the target weight for an uncovered airframe minus any hardware should be around the 9 lb. mark. This will give you a chance of hitting the 23 1/2 lb. prototype weight. If things have escalated (they easily can) to over-bulky proportions, you may have to review the motor, gearbox and prop combination. More on that later.

FINISHING

As I mentioned earlier, using a lightweight covering for the electric version is important. In reality, there are only a couple of options

the paint to adhere. To finish, either spray or apply the latter by hand.

Even with a big model such as this, hand painting with Humbrol Enamels is my preferred option. Using the small 12ml tins, it only took three dark green and three of dark earth to finish the top camouflage, plus a



single 150ml tin of matt black to finish the bottom of the fuselage, the underside of the wings, and the tail. Only one coat of paint was needed as the coverage of these colours is excellent, and being electric, the model required no fuel proofing or any other sort of added protection. For the i.c. version, I would be tempted to glass-cloth and epoxy finish the model, to give

more surface protection, however, I suspect most modellers will still prefer to use the good old Solartex and paint route instead.

All the decals were hand painted, again using the Humbrol Enamels. Mind you, I happen to know Pyramid Models do a set of roundels that are just the right size (01462 731562).

GEARING UP

You may wish to fit the canopy and turrets prior to painting; either way, make sure you add a 1/8 scale pilot in the cockpit. After all, it's quite a big area to leave vacant! While we're on the subject of detailing, note that on

Rudder servo uses a turret link to send control rods left and right through the tailplane.

Tucked up, safe and sound: Elevator servo, snuggled in the back end.



available: either use a heavyweight tissue, or a lightweight Solarfilm product... eek!

So, what's the secret of achieving a good painted finish using a film covering? Well, the first thing to do is make sure all the film adheres to the wood surface, and that the overlapping joints are completely sealed down. Then, apply 'Prymol' etching fluid to the surface of your model. Prymol is a Solarfilm product, and readily available from model shops; applied sparingly, one tin will do a model this size quite easily. It etches away the covering surface, leaving a rough texture that allows



Pilots need to be at least 1/3 scale for realism. And don't forget to get two of 'em!

the plan, I've added templates to help you make a simple set of guns for the turrets. Hint: you may wish to make the front nose dome removable, in order to give easier access to the radio NiCad pack.

The Motor and gearbox units in my prototype are Multiplex Permax 600s (7.2V), with MPX ball-raced 3:1 gearboxes in harness. Since fitting these, I have come across the Jamara 600 (also 7.2V) with gearbox and prop driver set, complete for £24 - an excellent alternative.

Jamara also do a 660 7.2V version with the same gearbox set-up, for only £1 more. I'm now tempted to try these 660's in my Lancaster with 13 x 6.5" APC props, to give a tad more power if I need it. Obviously the current draw on full throttle will be higher, but remember that the power required to fly this model will be the same, and with a bigger prop, the efficiency will be slightly better. If you can source (I have been trying) a 3.5:1 or even 4:1 with a 660 size motor, and increase the prop diameter to a 14 x 5", the efficiency levels will improve greatly; after all, this is a big, slow model which requires big, slow turning props.

Two 10-cell battery packs are mounted piggy-back style on an angled shelf, and secured using

Velcro fastening strips. Also on the prototype, I used Protech 35 amp non-BEC speed controllers, mounted with Velcro and located on the inside faces of NS1. The controller wiring looms were joined, using 'Y' leads, to enable a single receiver input to be used. A twin battery of five 1300NiMH cells powers the receiver and radio, while a 4-cell pack of sub-C NiCads was used as the power source to spin my bouncing bomb.

Even though the prototype ended up 4 1/2 lb. heavier than Tony's target weight (with bomb fitted), the Lancaster flies just great.



For the retractable undercarriage, large Eurokit spring-air units from Ripmax were employed. With these cheaper retracts, I tend to replace the air tubing and air cylinder with Robart parts, mainly because the tubing is flexible, seals better, and does not crimp. Robart air cylinders generally hold a much larger volume as well, giving that extra bit of security.

When it comes to the undercarriage legs themselves, these were made from 10mm carbon-fibre rod (construction details are shown on the plan). Note that the legs are rigid, with only the tyre providing any form of suspension. So far this has proved very successful, mainly due to the lovely set of very light 6 1/4" tyres I acquired from Len Gardner. Don't bother looking elsewhere - you won't find a better and lighter wheel at this size (Tel. 01453 758553).

BIRTHDAY SUIT

The first flight took place in early April 2002 with the Lancaster in its uncovered form. This was mainly because I didn't want to make the

plastic canopies and turrets, or spend money on covering, until I could be sure that everything was going to work. At this point, the weight was around 21 lb.

When I arrived at the flying field, we had a wind blowing across the strip. Not ideal, so I only carried out some taxiing trials, to check the ground handling. In fact, as a result of the wind, the model needed a fair bit of rudder before she'd track straight along the strip, but once speed had built up, the rudders were almost neutralised. The tail came up very quickly and was easily balanced by a touch of 'up' elevator.

After three high speed runs at half power, I thought I would just attempt a short hop, then throttle back again... well, I couldn't help myself, honestly... she lifted to about two feet off the deck, and then sat for what seemed an age. At this point, I was running out of runway. Luckily, at the Hastings club, we have a 150 metre-long 'bowling green' runway - all one man's doing, and the envy of other clubs throughout the south east.

Anyway, full throttle was applied, and a blip of elevator held in; away she climbed, to the cheers of fellow club members who had all taken time out to give me a bit of airspace. What a great bunch of lads and



lasses (yes, we have lady flying members, you know). All the settings I'd programmed in from the successful smaller version worked a treat and although a fair amount of 'down' trim was required, no adjustments were needed for anything else. The model felt very comfortable and highly controllable, making her a dream to fly. And, the Lanc clearly wasn't short on power either.

After climbing to a safe altitude (only took one circuit), the motors were cut to about two-thirds throttle (on stick position), whereupon she would just about maintain height. On checking the stall, the aircraft slowed to almost a stand-still into wind, before wagging her wings and dropping the nose... all done at an incredibly slow pace. A couple of aileron and elevator turns proved that this beauty can be flown in a bank 'n' yank style, although you should be

A tale of three packs. Top: 10 x 1300SCR cells - use two to drive the smaller Lanc. Centre: 8 x 2400SCR cells - enough to turn all four motors on the smaller Lancaster. Bottom: 10 x 2000SCR cells - one pack per motor in the big Lanc.

To put a spring in your Lancaster's step, look no further than Len Gardner's wheels.





aware that the tail will hang in the turns, resulting in height loss. So, use the rudder, and make those turns look real.

Some time later - how long it was, I'm not exactly sure - I decided to call

isn't necessary. However, do note that, with the retracts down, drag becomes quite noticeable, and some 'up' elevator input is needed. Needless to say, this slows the rate of climb considerably so make sure



a landing, remembering that I'd been playing for a couple of minutes on the ground. To land the Lancaster is simplicity itself; she was lined up, the motors were cut to about 25%, and in she came, descending quite literally by herself. All I had to do was check the elevator on flair-out. When landing yours, once the wheels are down, chop the power to tick-over; don't be tempted to cut it too early, or the model will slow up due to that draggy airframe, and a lot quicker than you might expect. Put the Lancaster into a glide, and you will find you'll need a fairly steep angle in order to keep the forward air speed.

If you're thinking of putting flaps on this model, all I can say is, it really

that, as soon as you're away from the ground, you get those wheels up. Also, with an electric model of this size, you need to 'peak' your packs prior to flying - this will give 10% or so extra power, which is always a help during take-off.

Getting back to the story: safely on the ground again, I was very pleased. 'Daunting' may have been the concept, but that first flight made every late night building session more than worthwhile.

ON TO SANDOWN

Following the Lancaster's successful debut, I quickly finished her off in time for the Sandown show.

As with last year, when we had the launch of the small Lancaster, a clambering for the plan to be available through RCM&E was much in evidence - and so it was that we decided to feed this public demand. Hence, we have the drawings, plus a pack of CNC parts, canopy and turrets, with of course the option for i.c. engines which, I hate to say, did seem to be the preferred option for many who enthused over the model. Whatever version you end up with, I'm certain you'll enjoy flying it.

SECONDS OUT...

Flight 2 took place with the bomber in its finished colours, and equipped with a bouncing bomb. Now, she tipped the scales at 23½lb. - a fair bit over my target weight of 20 lb. However, with bigger models an extra couple of pounds in weight shouldn't make a lot of difference to the performance. The C of G was checked again, and found to be spot on; With the i.c. version, I think you

First flight was made with the Lancaster undressed, just in case she didn't work. She did, of course!

"Once the wheels are down, chop the power to tick-over; don't be tempted to cut it too early, or the model will slow up due to that draggy airframe, and a lot quicker than you might expect."



will have to add a pound or two of nose weight though.

Although that additional weight was noticeable, the model performed faultlessly. This time, I tried the EPP bouncing bomb; unfortunately, although it launched okay, it was too light to actually bounce with any realism. So, an alternative had to be sourced with extra weight. The answer was found in the form of a double-size tennis ball, purchased from a local toyshop and stripped of its covering to reveal a smooth, rubber surface. Two holes were drilled to allow the ball to spin on its

This model is every bit the venerable old bomber we all love so dearly.



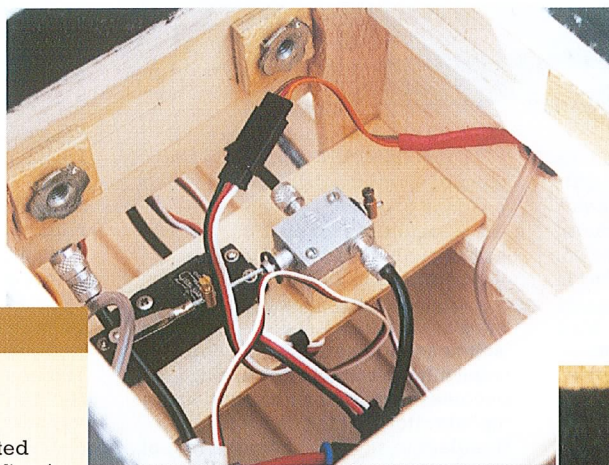
Retract valve and servo installation.

No problems getting everything in with this model!

Make life easier by purchasing the canopy set to go with your plan.

axis, and then I painted it using black Hammerite! Worked a treat. True, it adds almost a pound in weight, but subsequent flights revealed no real adverse effect. All I need now is a $\frac{1}{9}$ scale model of the Moehne Dam... any offers?

To date the Lancaster has had over 30 flights, with no sign of motor deterioration.



down. As for the building, I managed to construct my model in a single garage without any problems, although fitting it together does require more space.

Well, that's it. Choose your power source, gather the bits together and clean up the workshop. Oh, and make sure you send a photo or two of your finished Lanc to RCM&E, because we'd all love to see 'em!

DATAFILE

Name:	Avro Lancaster
Designed by:	Tony Nijhuis
Wingspan:	11 ft
All-up weight:	23 $\frac{1}{2}$ lb. without bomb fitted
Rec'd motors:	Speed 600 or 660 (geared) x 4 .40 cu. in. two-stroke x 4
Motors used:	MPX Permax 7.2V Speed 600, with MPX 3:1 gearboxes
Flight pack used:	10-cell 2000 SCR NiCads x 4
Speed controllers:	Protech 35A non-BEC

Full-scale plans for the Avro Lancaster are available from the Nexus Plans Service for £35.50 plus £3.50 UK p&p (£5.50 overseas). Please quote plan number RC1990. CNC formers, ribs and other labour intensive parts are also available priced at £109.95 including postage (Ref. CNCRC1990), as are vacuum formed mouldings for the canopy and turrets (CANRC1990); £19.99 plus £3.50 UK p&p (£5.50 overseas).

For the last 12 of these, I've been using the new Sanyo 3000NiMH high voltage, high capacity packs, which seem to be as good as NiCads. Of course, they have the obvious advantage that sortie times are increased from six to nine minutes. Believe me, even six minutes can seem a long time, so my old Sanyo 2000's haven't been pensioned off just yet!

So, on to the final question - will it fit in your car? Well, if you have a family hatchback or estate, you should have no problems with the back seats

