

Brolga by Aeroflyte 242

BROLGA has been designed as a lightweight thermal sailplane to suit the beginner/sports flyer and as such to suit conventional hand towing techniques. However we have included the option of bottom sheeting for those modellers wishing to use heavy bungee or winch towing. Balsa sheeting is supplied for this option, please follow the appropriate wing building instructions set out in this booklet.

If you wish to use your model for powered flights then follow the appropriate fuselage building instructions. For a powered flight you will need to purchase a suitable motor, propeller and a piece 40 x 50mm of 6mm ply to make your new front former.

ADDITIONAL ITEMS NEEDED:

2 Channel (or more) Radio Control Unit.
18-20 sq.ft. Aerokote film
Instant and epoxy glue
Colour stripe tape
Rubber Bands
Modelling tools

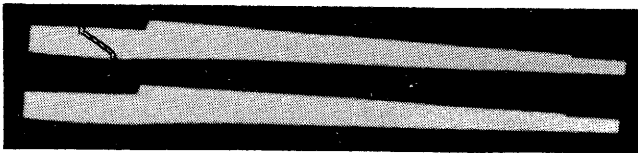
GENERAL BUILDING NOTES:

Before you begin building it is important to look at the plan carefully, reading and understanding the instructions before starting assembly. A good flat building board will enable you to build quickly and squarely. As needed remove each piece from its balsawood sheet with the help of a sharp pointed knife.

ADHESIVES: Be careful not to use too little or too much glue. Too little leaves the model weak. Excessive use of adhesives and paints can make the model heavy. Because of the variety of glues available, we suggest the following as a guide in selecting proper adhesives.

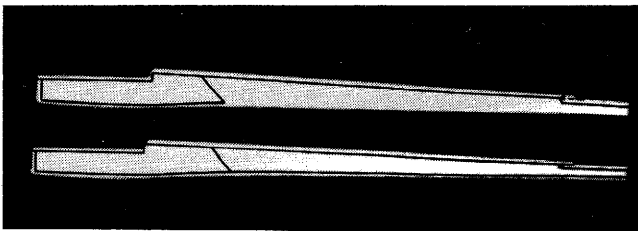
Most of the model, such as wing structure, etc., can be assembled using either C66 instant glue, epoxy or balsa cement. Instant glues make for rapid assembly. Slower setting glues are recommended for parts requiring careful placement. Water based glues are not recommended for broad areas such as fuselage doublers. For high stress joints such as polyhedral and dihedral joints use **24 hour epoxy**.

FUSELAGE



STAGE 1

- Glue Fuselage side 1 (FS1) to FS2.
- NOTE: Make one right fuselage side and one left fuselage side only.
- From plan cut to length and glue top (only) 4.8mm sq longerons on to fuse sides.
NOTE: 4.8mm sq x 215mm longeron under tailplane area.

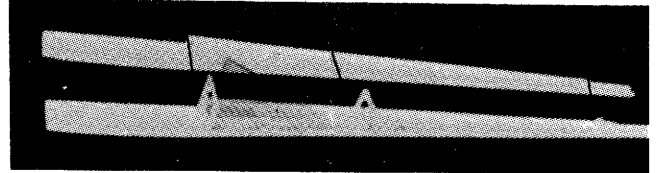


STAGE 2

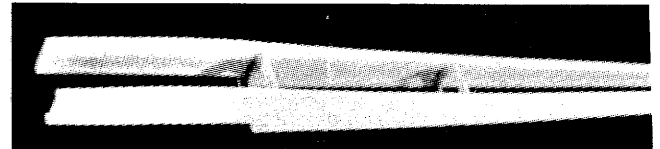
- Temporarily position doublers.1. and check for fit and correct placement (3mm in from nose) butting up to fuselage longerons.
- Glue doublers.1. to fuselage sides using instant glue or epoxy. Instant glue is applied smoothly in a series of ribbons to the doubler. When the doubler is set in position press down firmly. The glue will dry almost instantaneously. Use epoxy if more placement time is needed.
- The bottom 4.8mm sq longerons must be scarfed as shown on the plan to make the correct length.
- From the plan cut to length and glue the bottom longerons to sides to finish flush with the bottom fuse edge.

STAGE 3

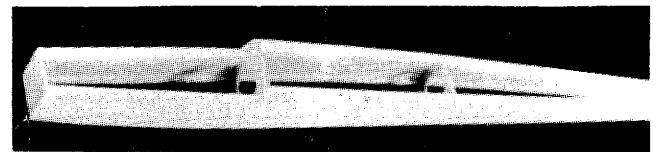
- Place fuse sides together drill 4.5mm holes as pinmarked for wing dowels.
- Drill 5mm holes where shown section A and B for formers F2, F3.



- Lay fuse sides over side view on plan and mark locations of formers F2, F3 and F4 carefully cut a hole in F4 to allow for 2 Nyrods at a later stage.
- Glue formers F2, F3 and F4 to right fuse side. It is important that formers stand straight till dry.

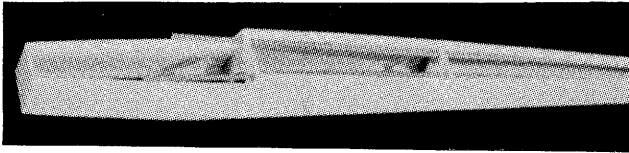


- Glue left fuse side to F2 and F3 and let dry thoroughly.



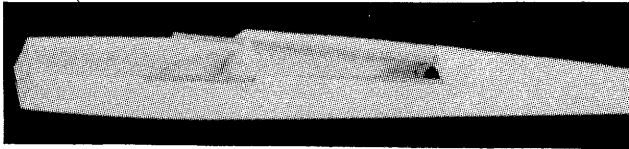
STAGE 4

- Position fuse assembly over top view outline on plan.
- Pull fuse nose together, glue F1 in place. Using masking tape to hold joint.
- Pull tail section and F4 together glue and hold with tape. (Use scrap balsa to fill in gap when dry).
- Align entire fuse over plan outline using heavy weights or bricks to hold in place till dry.



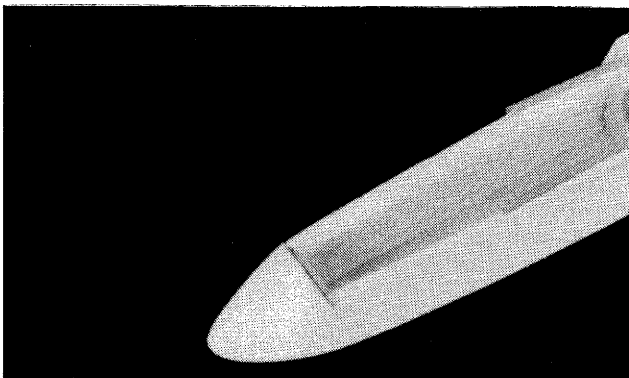
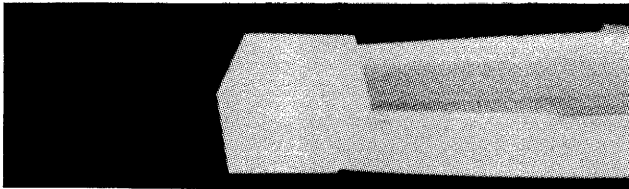
STAGE 5

- Fit nyrod outer sleeve in place by working a small round file through rear fuse sides to achieve correct exit angle shown on plan.
- Glue nyrod outer sleeve in place, leaving sufficient sleeve at servo end for later trimming.
- Trim rear outer sleeves only flush with fuselage sides.



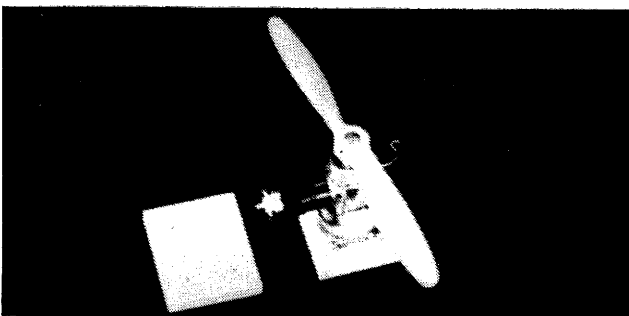
STAGE 6

- Carefully sand edges flush with 4.5mm longerons.
- From the 1.5mm die cut sheet glue top sheeting 2 to 7 and bottom sheeting 8 to 19 in place. Use a small piece of 1.5mm scrap to finish sheeting at tail.
- When dry carefully trim off scrap from top and bottom edges. Avoid cutting into sides.



STAGE 7

- If you intend using an engine move straight to stage 8.
- Glue nose block to fuse front. Carve roughly to shape shown on plan views.
- From 1.5 x 50 x 225 balsa sheet cut to size a balsa cabin floor doubler and glue inside the fuse nose.
- Glue servo rails 20, 21 and 22 in position (this will depend on the type and size of servos you are using).
- From the plan locate the correct position for 3mm ply tow hook doubler 23, glue securely in place inside fuse. Cut to size the 6 x 6mm hardwood strip and glue on top of 23.

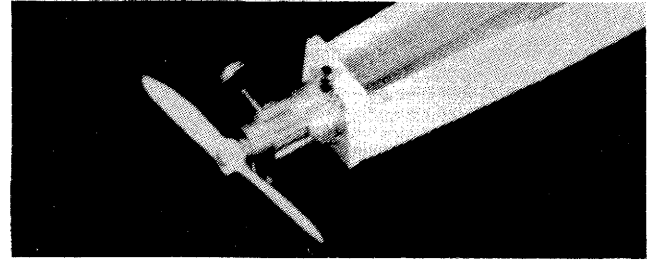


STAGE 8

NOSE MOUNTING ENGINE ONLY

- Remove tank from motor and rotate 90° so you can side mount your motor and help keep exhaust off the model.

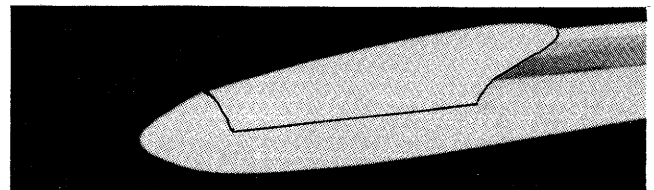
- Cut a 6 x 40 x 50mm ply former (not supplied).
- Place the engine on 6mm ply mount. Mark and drill 2.5mm or suitable holes for engine mounting screws. (Make sure the needle valve extends past the ply mount).



- Install engine on mount using screws, washers and nuts. Press mounted engine in position to mark nut locations on F1. Make recesses in former F1 for nut clearance.
- Lightly sand fuse front to remove high spots. Epoxy glue engine mount to fuse nose and leave to dry.

STAGE 9

- Glue F2A to the top of former F2.
- Carefully** trim canopy to fit your model using the moulded groove as a rough guide.
- Very lightly** tack glue canopy former 24 in position and shape nose block to suit.
- Drill a 3mm hole through 24 into nose block, cut short length to 3mm dowel placing it through the hole and glue to 24 only.
- Very lightly** tack glue 3 x 9mm balsa canopy rails to the top fuse sides, sand flush to fuse sides.
- Carefully glue the canopy in position to 24 and canopy rails only. Hold with tape till dry.
- Use a fine pointed hobby knife to finally separate the canopy assembly from the fuse body.



STAGE 10

- Glue a short piece of 4.8mm sq balsa to the front centre of F2A.
- Place canopy in position, drill a small hole in line with 4.8mm to take the PK fastening screw supplied.

STAGE 11

- Lightly sand the fuselage all over. Balsa wood filler can be used to fill small indentations and gaps. **NOTE: Excessive sanding of TP mounting area can alter the incidence angle which has been die cut on the fuse sides.** Sand this area as little as possible. If covering fuse with Aerokote or similar keep nose and fuse with minimum rounding of corners.

WING ASSEMBLY

STAGE 1

STANDARD WING SHEETING ONLY

- Working over left inboard panel on plan, pin inboard trailing edge (TE) sheeting 1.5 x 25 x 610mm in place.
- From 1.5 x 77 x 610mm cut cross grain centre sheeting from the front of leading edge (LE) butting up to the TE pin and glue in place.
- Cut 1.5 x 6mm cap strips to length approx. **4mm in from the front of LE** (cap strips are later sanded fair to the LE) to butt with TE. Glue and pin in place.
- Lay bottom main spar 4 x 6 x 610mm in position glueing to cap strips and centre sheeting.
- Glue ribs W3 in position to the LE, cap strips, mainspar and TE.
- Glue upper mainspar in position.
- Trim mainspars, LE and sheeting flush with plan.

STAGE 1 OPTIONAL BOTTOM SHEETING ONLY

- Working over left inboard panel on plan, pin inboard TE sheeting 1.5 x 25 x 610mm in place.
- Pin inboard optional LE sheeting 1.5 x 77 x 610mm in position (lay down approx. **4mm in from the front of LE**).
- From 1.5 x 77 x 610mm cut across grain centre sheeting to fit between LE and TE sheeting, pin and glue in place.
- Cut 1.5 x 6mm cap strips to fit between LE and TE sheeting, pin and glue in place.
- Lay bottom mainspar 4 x 6 x 610mm in position glueing to centre sheeting and LE sheeting.
- Glue ribs W3 in position to the LE, LE sheeting, cap strips, mainspar and TE.
- Glue upper mainspar in position.
- Trim main spars, LE and sheeting flush with plan.

STAGE 2

- Working over left wing tip on plan, pin TE sheeting 1.5 x 25 x 400mm in place.
- Cut 1.5 x 6mm cap strips to length (approx. 4mm in from front LE) to butt with TE glue and pin in place.
- Lay bottom mainspar 4 x 6 x 400mm in position and glue to cap strips.
- Glue ribs W4 to W8 in position.
- Glue upper mainspar in place.

STAGE 3

- Cut out the polyhedral template from the plan. Temporarily remove the left wing tip from plan and using the polyhedral template lightly sand mainspars to match template.
- Position out board and inboard panels together at polyhedral joint. Raise wing tip 80mm off table.
- Cut 1.5mm slot in W3 directly behind mainspars to allow for polyhedral brace 32.
- Join inboard to out board spars using polyhedral brace 32. Clamp until dry. (Trim brace to fit rib positioning).
- Glue LE and TE's together.

STAGE 4

- Repeat stages 1 to 3 for right in board and outer panels.

STAGE 5

- DO NOT USE GLUE YET:** Temporarily join wing panels using ply braces and over the plan. Observe and correct fit and placement of parts for proper dihedral angle (each tip should be about 108mm above the table). Separate panels and remove joiners.
- Permanently glue braces to one side of wing. Working carefully using slow setting epoxy glue. Clamp until dry.
- Apply epoxy to braces etc and join both wing halves. Again check for 108mm correct dihedral at each tip. Clamp braces and let dry thoroughly.
- Glue the four W1 and two W2 ribs in position.
- Examine entire wing top and bottom for any joints which still need to be glued.

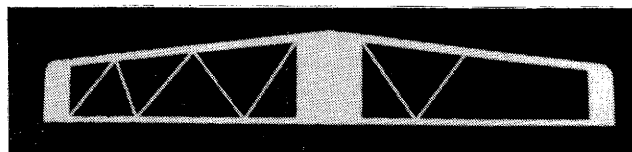
STAGE 6

- Cut 1.5 x 77 x 610mm balsa cross grain wing webs to size and glue in position directly behind mainspars on inner wing panels only.
- Trim leading edge sheeting 1.5 x 77 x 610mm to size. Glue sheeting securely to LE, ribs, top mainspar and centre joint.
- Lay wing tip leading edge sheeting 1.5 x 77 x 400mm over the plan and cut to size. Glue sheeting securely to LE, ribs and top mainspar.
- Trim inner TE sheeting 1.5 x 25 x 610mm to size. Glue sheeting securely to ribs, bottom TE sheeting and centre joint.
- Trim wing tip TE sheeting to ribs, bottom TE sheeting and centre joint.
- Cut 1.5 x 77 x 610 balsa cross grain wing webs to size and glue in position between top and bottom TE sheeting on inner panels.

STAGE 7

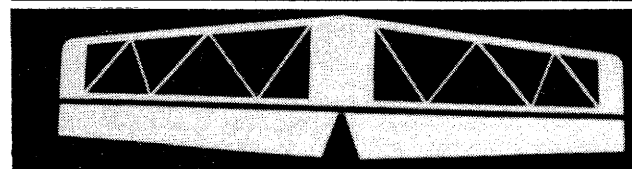
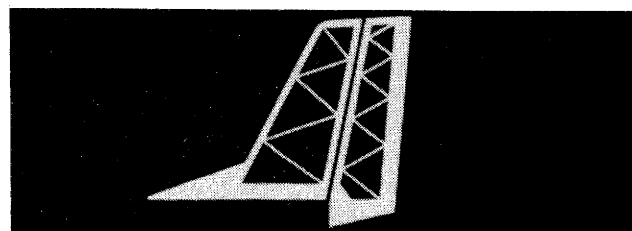
- Trim off excess spar material extending beyond ribs W8.
- Glue balsa wing tip blocks together as shown, making sure you have a left and right wing tip block.
- Temporarily place wing tip blocks to the corresponding wing tips and mark the wing section to the block.
- Carve and sand blocks to follow the tip section.
- Glue each tip in position on the wing.
- Check all wing joints for sufficient glue.
- Sand wing all over. Fair bottom cap strips and centre sheeting to the leading edge.
- If you have used bottom sheeting, fibre glass the centre wing joint with lightweight fibre glass cloth and resin (not supplied).
- Cut scrap mill ply braces to size shown and glue in position at wing centre. (Prevents rubber bands damaging TE).

TAILPLANE ASSEMBLY



STAGE 1

- The tailplane (T.P.) leading edge (L.E.) is laminated by glueing two 3 x 4.8 x 605mm balsa strips together. (Make sure of no twists whilst drying.)
- Cut balsa carefully to match with plan at centre joint and exact length at tips. Pin in position and glue at centre joint.
- Assemble T.P. outline using die cut tips 25 centre platform 26 and 4.8mm balsa square.
- From 1.5 x 4.8mm balsa strip, cut T.P. webs to size over plan. Glue in place.
- Let dry thoroughly.



STAGE 2

- Assemble fin and rudder in same manner as T.P. using fin fill in 27 and rudder base 28.
- Add scrap 4.8mm balsa gussets, and let dry thoroughly.

STAGE 3

- The rudder is **temporarily tack glued** to the fin. Flat sand the rudder fin assembly and T.P. for uniform smooth surfaces. Radius the leading edges of both T.P. and fin.
- Carefully separate fin and rudder.
- Using a sanding block, sand the front edge of rudder and elevators 29 to match plan view.
- Taper elevators 29 to match view on plan using sanding block.
- Bend wire elevator joiners as per plan. Temporarily fit wire joiner to elevators.
- The elevator and rudder can now be temporarily fitted to the fin and tailplane with the nylon hinges supplied. Cut thin slots in the tailplane, elevators, fin and rudder, push hinges into slots and check for free movement.
- Do not cement hinges till after the model has been covered.
Note: When glueing hinges in place and when drying, carefully wash out any excess glue from the hinge pins. Fit control horns and linkages making sure all linkages move freely.

WING COVERING

- Cut a piece of Aerokote slightly larger than one in board panel. Strip backing sheet away.
- Position film to the bottom of wing. Tack film across centre using an iron set at the correct temperature. (Experiment using scrap film).
- Working outward, tacking the outer edges of the panel pull out main wrinkles as you go.
- Seal edges of panel, then glide iron over interior area to tighten covering.
- Seal covering to all ribs. Trim edges. Wherever possible stick film down the verticle side of the rib or edge. When joining two pieces of film make sure you have at least 3mm overlap.
- In the same manner cover the entire bottom and then top.

WING TRUENESS/WASHOUT

- Take your time in truing the wing and setting the washout.
- Set in board panel on a flat surface to detect any warps. If warps are present twist the panel slightly in opposite direction and hold while gliding iron over the surface to retension. (A heat gun is useful).
 - Follow same procedure with other inboard panel. Re check first panel.
 - Block up wing so that one outboard tip is flat on surface.
 - Twist trailing edge tip up approx. 3mm for wash out (this prevents tip stalling at low speed). Retension film. Follow same procedure with either out board panel.

TAILPLANE, FIN, RUDDER AND ELEVATOR COVERING.

- Repeat same procedure as for wing.
- Do not cover the fuse/TP joining surfaces or the fin/TP joining surfaces.

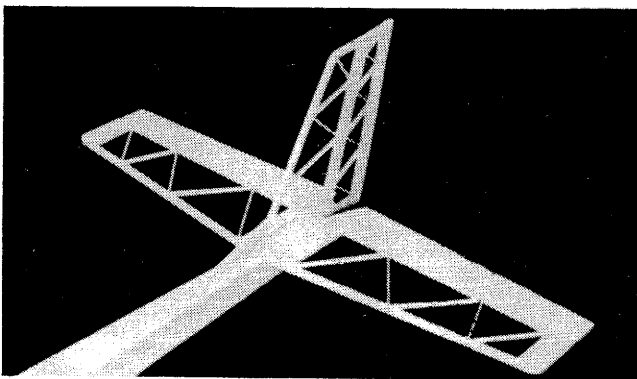
COVERING THE FUSELAGE

We advise the use of a non transparent film for the fuselage to avoid showing discoloured areas where fillers may have been used.

- Cover the fuse bottom first.
- Cover the sides.
- Cover the top of fuse last. (Do not cover TP platform).
- Use several layers to cover the underside of nose block about 150mm to minimise abrasion during landings.

WING AND TAILPLANE MOUNTING

- Rubber band the wing to the fuse using 200mm bands (not supplied). Square the wing to the fuselage by measuring from each fuse side to the polyhedral breaks on the wing LE. In the same way check from TE polyhedral breaks to the back end of fuse. Permanently mark the wing and fuse with matching line up points.



- Temporarily fit TP to fuse marking it for centre and adjust as necessary to line up with wing. Measure from TP tips to the fuse nose to make sure the two surfaces to be glued are free of film. Glue TP firmly in place. Leave to dry.
- Temporarily fit fin to TP check fin to be 90° to TP surface. View model from front and carefully align fin so it points **exactly straight** ahead. Mark position. Glue fin firmly in place square with TP. Leave to dry.

FINISHING

When covering is complete, bend the tow hook threaded rod to shape. Drill an undersized hole through the tow hook doubler 23 and 6 x 6mm strip. Screw threaded end into position and coat with slow drying epoxy, cement and fit all hinges and horns, and radio equipment. Check the servos for correct movement and centering, and connect the nyrods at each end. Adjust for centre neutral and equal movement either side of neutral for both rudder and elevator (about 8° movement up and 8° down is sufficient for the elevator whilst about 15° to 20° is required for rudder throw. When satisfied with all the links and movements (note: right stick on transmitter should give right rudder when the model is heading away from you, and pulling the elevator stick back towards you should give up elevator), fit the wings with rubber bands (at least three or four bands (AF 328 or 330 Accessories or similar) are sufficient). With the batteries and receiver foam mounted in their compartment check the balance of the model in both axis. The axial balance must be through the centre line of the fuselage. Adjust by adding weights if necessary.

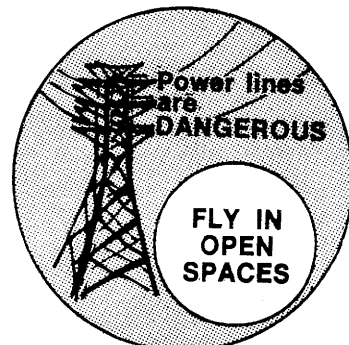
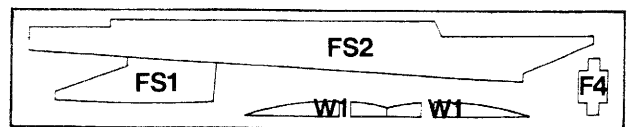
FIRST FLIGHT

When satisfied with the balances of the model, switch on the radio equipment (Tx and Rx) and launch the model from shoulder height gently *into* the wind. If the model glides flat, give a small amount of up elevator to "get the feel". Release the elevator and "feel" the rudder in the same way. Remember to give a small amount of up elevator with each rudder turn (to prevent model diving on turns). If with all controls at neutral, the model turns left or right or stalls or dives, move the trim controls on the transmitter to compensate, or if this is insufficient, Adjust the linkages on the model to suit.

When the model glides smoothly with no stick movement needed, attempt your first launch directly into the wind (we suggest a tow line launch off your second hook). Resist the temptation to pull up elevator or too much rudder correction whilst the model is being towed – if the model was trimmed correctly, it will tow straight up without correction. When model has reached the peak of the towline, (speed of climb is controlled by the towline helper in light winds running is necessary – in high winds, a slow walk is all that may be needed). Touch the down elevator to release the line, then let the model glide. Gentle corrections with rudder and elevator will give you your start to the exciting world of Radio Control Flying. Remember – always land into the wind.

The help of an experienced flyer may be to your advantage to obtain the best performance from your Brolga.

IDENTIFICATION OF PARTS.



Manufactured in Australia by the Aeroflyte division of Southern Model Supplies, Panorama, Adelaide, South Australia.