

BLACK BRANT V

ASSEMBLY INSTRUCTIONS

READ THESE INSTRUCTIONS CAREFULLY
BEFORE YOU START BUILDING

Additional materials and tools
required for construction:

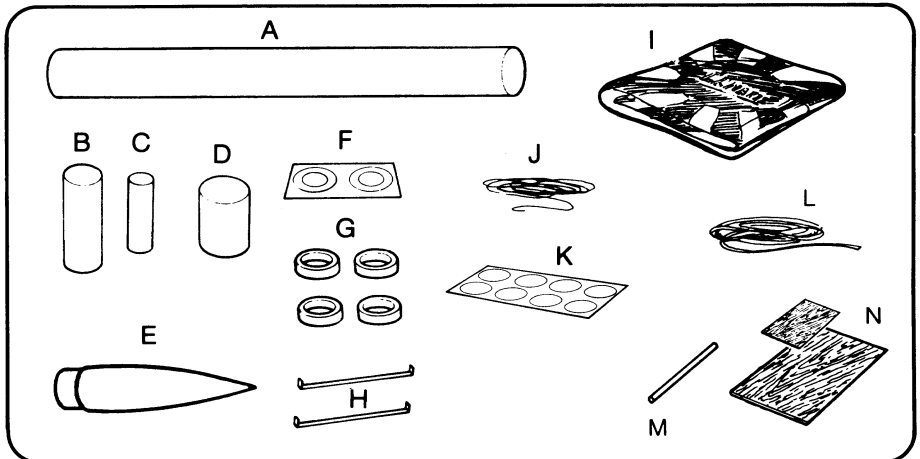
- modelling knife or
single edge razor blade
- white glue
- fine sandpaper
- butyrate dope
- cornstarch or talc
- sanding block
- masking tape
- paint - gloss cherry red
- paint - gloss white
- scissors
- ruler
- pencil

Additional items required to
fly the Black Brant V are:

- Heat Wadding
- Trans-A-Pad Launcher
- Countdown Controller
- Canaroc Engines
- masking tape

PARTS LIST

- | | |
|-----------------------------------|---------------------------------|
| A) 1 - PT-400 Body Tube (55.9cm) | I) 1 - Parachute (45cm) |
| B) 1 - ET-200 Engine Tube (7.0cm) | J) 1 - Shroud Line |
| C) 1 - ET-100 Engine Tube (7.0cm) | K) 8 - Tape Disks |
| D) 1 - CT-400 Coupler Tube | L) 1 - Shock Cord |
| E) 1 - BN-400A Nose Cone | M) 1 - Launch Lug |
| F) 2 - Centering Disks | N) 2 - Balsa Sheets |
| G) 4 - Centering Rings | O) 2 - Decal Sheets (not shown) |
| H) 2 - Engine Retainers | clear and white |



CONSTRUCT THE ENGINE MOUNT

A Cut a slit in the large diameter engine tube (ET-200) 7mm from one end (Fig. 1).

B Poke one end of the engine retainer into the slit. Put a double wrap of masking tape around the middle of the engine tube to hold the retainer in place (Fig. 2).

C Smear glue around the inside of the upper end of the engine tube, and slide one of the centering rings into place, sitting against the bent end of the retainer. This will act as a "fail-safe" engine block (Fig. 3).

D Glue a centering disk to one end of the coupler tube (Fig. 4). Cut a 5mm x 5mm notch from the remaining disk (Fig. 5).

E Slide the engine tube into the centering disk on the coupler tube, then slide the notched centering disk on the end of the engine tube and glue it into position on the coupler tube (Fig. 6). Center the coupler on the engine tube (leave the same amount of engine tube sticking out from either end). Apply a thick coat of glue to make a strong joint between the centering disks and engine tube (Fig. 7).

Fig. 1

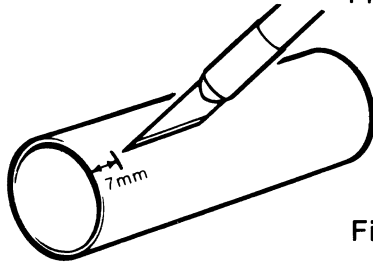


Fig. 2

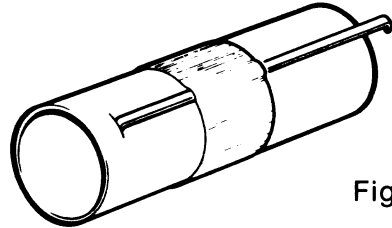


Fig. 3

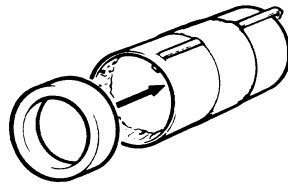


Fig. 4

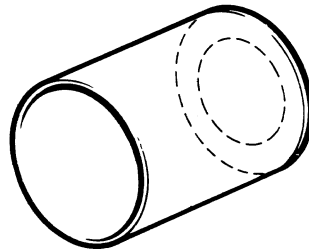


Fig. 5

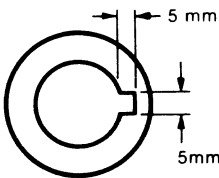


Fig. 6

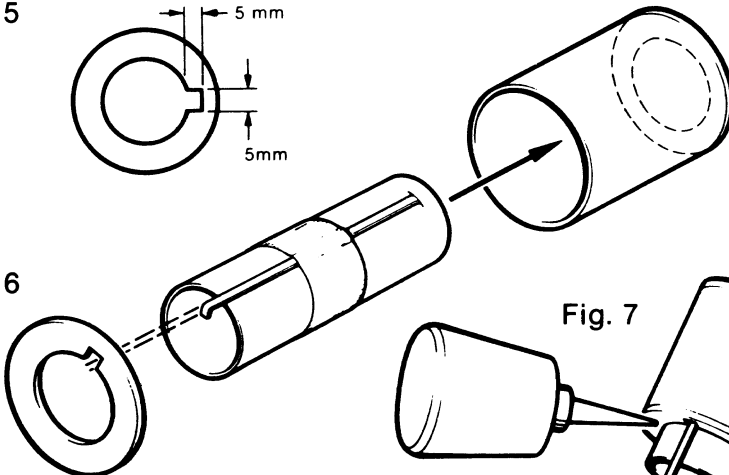
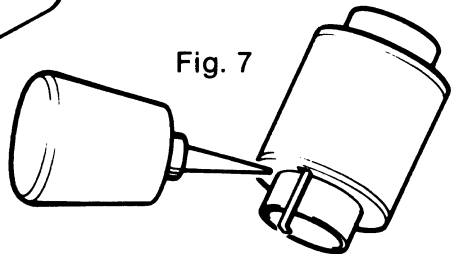
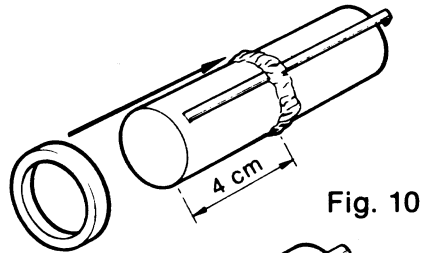
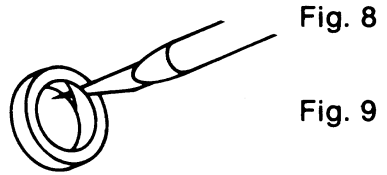


Fig. 7

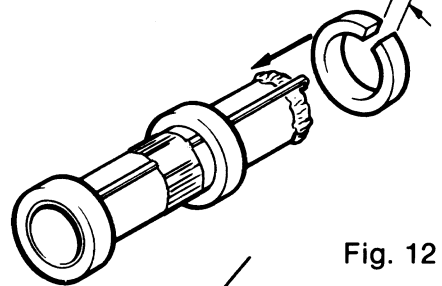
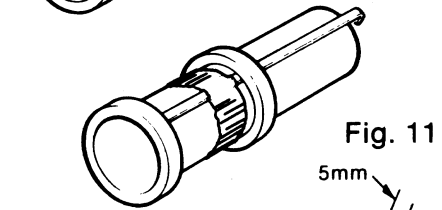


CONSTRUCT THE ENGINE ADAPTER (for 18mm engines)

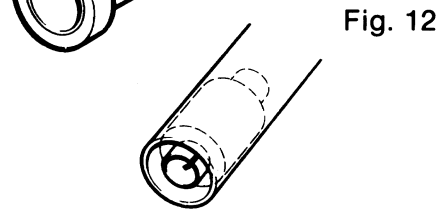
- A Cut a slit 7mm from the end of the small engine tube (ET-100). Push the end of the engine retainer into the slit.
- B Test fit a centering ring to slide onto the tube, and over the engine retainer. If it will not slide on easily, then peel a layer of paper from the inside of the ring (Fig 8). Smear glue around the middle of the tube on the outside, and slide the centering ring over the retainer and onto the glue (Fig. 9).
- C Glue a centering ring onto the front of the tube so that it is flush with the end (Fig. 10).
- D Put a double wrap of masking tape around the engine tube between the two centering rings. This will help keep the retainer from being pushed forward.



- E Cut a 5mm wide section from the last centering ring (Fig. 11). Smear glue around the outside of the tube at the rear, and slide the centering ring into place. Position it to be flush with the end of the tube.

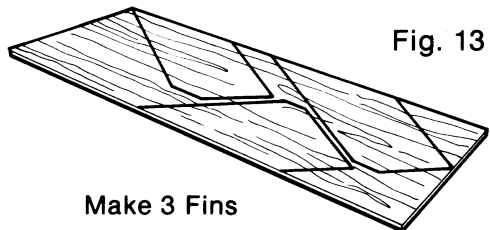


- NOTE: When the adapter is inserted into the engine mount to fly with 18mm diameter engines (B or C), the last centering ring will stick out of the tube. This is correct, as the ring's only function is to sit against the engine mount's retainer and prevent the adapter from moving.



GLUE IN THE ENGINE MOUNT

- A Smear a wide band of glue around the inside rear of the main body tube, 2cm up inside.
- B Slide the engine mount into the main tube until the base of the engine tube is flush with the end of the main body tube (Fig. 12). The end of the engine retainer must hang out the rear of the tube.



CONSTRUCT THE FINS

- A Cut out the fin and fin mount patterns from the pattern sheet.
- B Trace the fin pattern onto the thicker balsa sheet using the fin layout shown (Fig. 13). Be very

careful that the balsa grain direction is as shown on the pattern.

Trace out 6 sets (6 of each) of fin mount details on the smaller sheet of balsa. Again make sure that the grain direction is as shown on the patterns.

C Carefully cut out each fin and fin mount detail from the balsa sheets using a modelling knife or single edge razor blade. DO NOT ATTEMPT TO CUT THE BALSA IN A SINGLE STROKE. When cutting balsa, run the blade lightly along the line to be cut, barely applying pressure on the first stroke. On each stroke afterward, apply more force on the blade. After three or four strokes, the balsa will have a smooth clean cut. Attempting to apply too much force and making the cut in one stroke will usually tear the balsa, giving the fin an unsightly appearance.

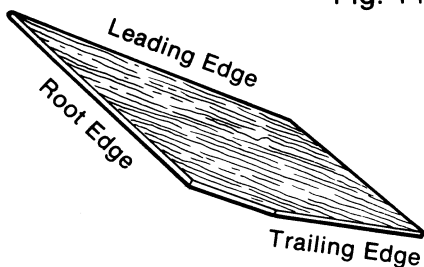


Fig. 14

D Round the leading edge of each of the fins (as shown in Fig. 14). Leave all other edges of the fins flat and squared off.

Bevel the edges of the fin mount details (as shown in Fig 15). The bevel should be quite pronounced, that is, it should be about 60°.

A set of fin mount details must be made for each side of each fin. Care must be taken, in order to avoid making a mistake when bevelling the details, since it is easy to make them all for one side — leaving none for the other side. It is best to lay out all of the details on a table, so that they are all pointing in the same direction, then take 3 of each type of detail, and flip them over. Bevel the details (as shown in Fig. 15) with a sanding block, on the side laying face up on the table.

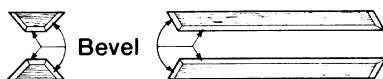


Fig. 15

E Glue a set of fin mount details to each side of each fin, using the positioning marks on the fin pattern to aid you in placing the details.

F The root edge of the fin, the edge that is attached to the body tube, must be perfectly flat if it is to have a strong glue joint when glued. Set a fin on the edge of a table, then holding the sanding block at right angles (90°) to the fin, sand the fin root very lightly with an up and down motion (Fig. 16). Do this until the root edge is completely flat. Test periodically by placing the root edge on a flat surface (such as a table top) to see if it sits flat. Repeat for the other fins.

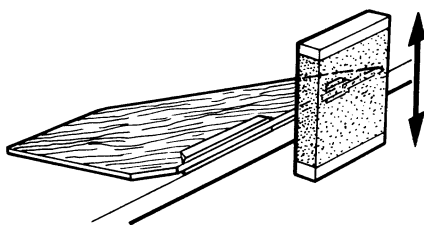


Fig. 16

FINISHING THE Balsa PARTS

Fig. 17

Raw balsa is unsightly, coarse and grainy if painted before the grain is "filled" and the surface is "sealed". Model rockets look professional if the time is taken to finish the balsa. The Canaroc Guide to Space Modelling contains tips on finishing and may be consulted for assistance.

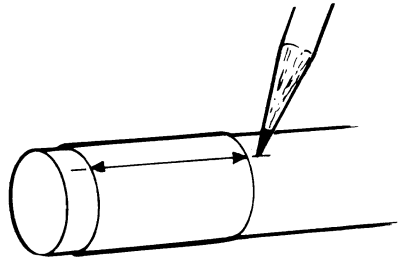


Fig. 18

A Butyrate dope is used in the most common method of finishing balsa. You will find it at most hobby outlets. To assist in filling the balsa grain, cornstarch, talc, or baby powder may be rubbed onto the balsa and worked into the grain. Brush a thick coat of dope onto each balsa part. Be sure to do both sides of each fin at once to avoid warping.

B After the dope has dried completely, lightly sand the balsa surfaces with fine sandpaper. The sanding operation removes the excess thickness of dope and speeds up the process of filling the grain.

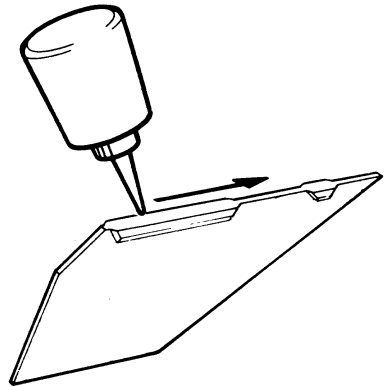


Fig. 19

C After repeating the doping/sanding operation three or four times, the balsa grain should be filled and the surfaces smooth. The last sanding operation should be done with extra fine sandpaper.

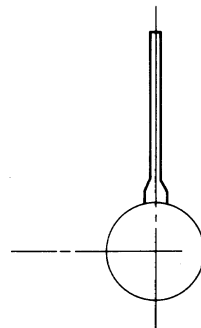
MOUNTING THE FINS

A Cut out the Fin Placement Guide from the pattern sheet.

B Wrap the Guide around the rear of the body tube (the end with the engine mount), and tape the ends of the guide together.

C Place a mark on the body tube where each fin position is shown by an arrow on the Guide. These marks will show you where to align the fins when glueing them to the tube (Fig. 17).

D Place a line of glue along the root edge of a fin (Fig. 18). Place the fin on the rear of the tube along the alignment marks. Set aside until the glue has set. Be sure that the fin is sitting at 90° to the tube when viewed from the end (Fig. 19).

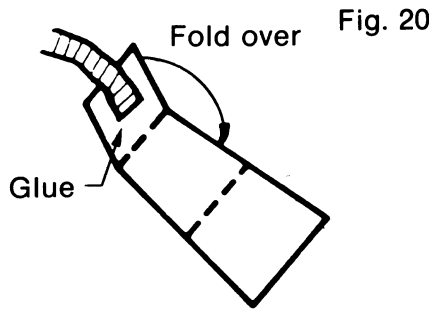


E Repeat the procedure to glue on the other fins. All fins should be evenly spaced around the tube when completed.

F Once all the fins have dried, lay a thin line of glue along each fin joint to form a "fillet" and strengthen the fin. Smooth out the line of glue neatly with the tip of your finger.

SHOCK CORD MOUNT

- A Cut out the Shock Cord Mount from the pattern sheet.
- B Construct the Mount as shown in Fig 20. Fold the panels so that the shock cord rolls up with it.
- C Spread glue on the folded side of the Mount and insert it into the front of the body tube at least 5cm inside. Press it firmly against the wall of the tube (Fig. 21).

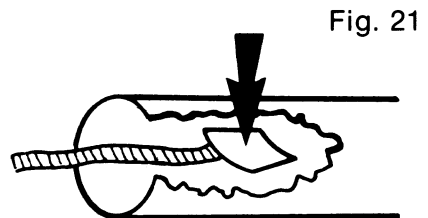
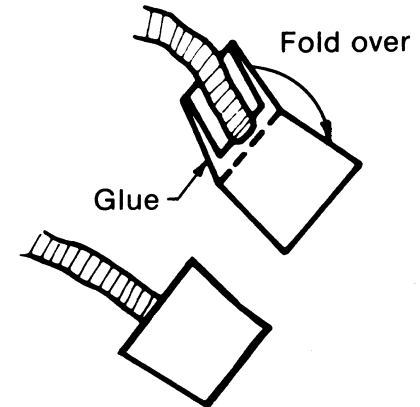


LAUNCH LUGS

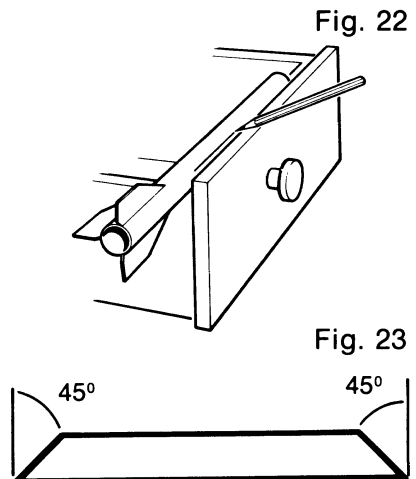
- A Slide the Fin Placement Guide back onto the model, just in front of the fins, then align the arrows with the corresponding fins. Mark the body tube along the seam of the Guide.
- Lay the model in a drawer sill, with the fins hanging over one side of the drawer (Fig. 22). Run a pencil along the lip of the drawer to extend the mark, all of the way up the tube. By using a drawer sill, you will be sure that the line is straight. Use a ruler to extend the line below the leading edge of the fins. Mark out the following positions on the main body tube, along the line just drawn:

Upper Launch lug
6.00cm from **top** of tube to
top of lug

Lower Launch Lug
6.25cm from **bottom** of tube
to **top** of lug



- B Cut the launch lug in half, using a razor knife, then glue the two pieces in position, using the above markings. Make sure that the lugs are properly aligned by sighting through them from the bottom of the model.
- C Once the glue has dried, cut the top and bottom ends of each lug off at a 45° angle, using the modelling knife or one edge razor blade (Fig. 23).



ATTACHING THE NOSE CONE

- A Pierce a hole with the modelling knife to attach shock cord.
- B Tie the free end of the shock cord to the eyelet and make a solid knot.
- C Trim off and sand smooth any flash along the seam of the nose cone.

PARACHUTE

- A Construct the parachute as instructed on the pattern.
- B Tie the knotted end of the parachute shroud lines to the eyelet in the base of the nose cone.

PAINTING

- A It is best to use spray paints on a scale model, they provide a superior finish and are easier to use than brush-on paints. Krylon spray paint is recommended, since the Krylon colors closely match the actual display colors of the Black Brant V.

First apply a uniform base coat of gloss white to the entire model. Paint should always be applied in thin coats to speed drying, and to prevent unsightly sags. When spray painting, hold the can about 20 to 30cm from the model and spray in light even strokes. Let each coat dry at least 2 hours before you apply another coat.

- B Once the first coat has dried (12 to 24 hours) locate the "White Fin," (it's the fin opposite the launch lugs). Use masking tape to mask off the "White Fin." Plastic wrap, or paper may be used to cover all but the root edges of the fin. Be sure to completely seal off the fin, since subsequent coats of paint can, and will get through any opening.

- C Seal down the edges of the tape with your fingernail, and give the entire model a coat of gloss cherry red. Depending on the thickness of this coat, you may or may not require an additional coat of paint.

- D Give the final coat of paint 1 to 2 hours to dry, then remove the masking tape by slowly peeling it back against itself, being careful not to peel off any paint.

- E Allow at least 24 hours for the paint to dry before applying decals.

DECALS

To make finishing of the model easier, two decal sheets are provided; a clear one with the "decal wrap around" on it, and a white one with the model's lettering on it. The white decal allows the "White Stripes", and lettering to be applied at once.

The following markings must be made on the model to aid in placing the decals.

Mark the positions of the two "White Stripes" as follows, using the Fin Placement Guide. Wrap the Guide around the body tube, just above the fins, and tape the ends of the Guide together. Align the Guide so that the arrows match up with the proper fins, and then mark out both White Stripes.

Lay the model in a drawer sill, with the fins hanging out over one side of the drawer. Run a pencil along the lip of the drawer to extend the markings made for the white stripes all the way up the tube. The lines must be extended to the bottom of the tube using a ruler.

Using the dimensions listed below, mark off the ends of each stripe.

Top of White Stripe:
5.65cm from **top** of tube

Bottom of White Stripe:
5.60cm from **bottom** of tube

There is a mark on the Fin Placement Guide, which is used to center the Igniter Access Door around the tube. The Guide must be properly aligned with respect to the white stripes and the fins, and a mark should be made on the tube about 4cm from the top. That mark corresponds to the centre of the Access Door (the rectangle on the "decal wrap around"). Use the

following measurements to aid you in properly placing the decal wrap around.

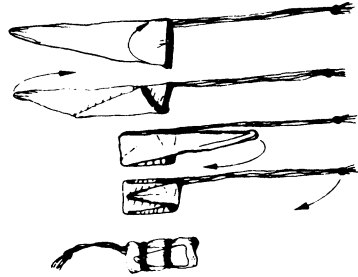
Igniter Access Door
4.00cm from **top** of tube to
top edge of door
Screw Details
3.80cm and 5.50cm
from **top** of tube

To apply the decals see instructions on back of decal sheet.

FLYING

- A Install the engine by sliding it into the engine tube until it is locked firmly between the two ends of the engine retainer. If the model is to be flown with 18mm diameter engines (B or C), then the engine adapter must be slid into the engine mount first.
- B Push a piece of heat wadding down into the top of the tube. The wadding serves to protect the plastic parachute from melting due to the hot gases of the engine's ejection charge. There should be a 2 to 3 cm thickness of wadding to create a good piston between the parachute and the engine.
- C Fold the parachute in the following manner:
- hold the tip of the parachute with one hand and the shroud lines with the other.

- gather together all of the free corners so that the parachute forms a triangle.
- fold over the corners
- fold over the parachute into thirds
- wrap shroud lines around the bundle.



- D Insert the parachute into the tube. Push in the shock cord and remaining shroud lines, then slide on the nose cone.
- E Install an igniter into the engine according to the instructions provided with the engine.
- F Slide the rocket onto the launch rod, sliding the rod through the launch lug. This will guide the rocket at the moment of launch.
- G Attach the igniter clips to the leads of the igniter.
- H Insert the safety key into your launch controller, give a 5 second countdown and press the button to launch your model.

For further tips see Canaroc's
GUIDE TO SPACEMODELLING.

CANAROC 



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