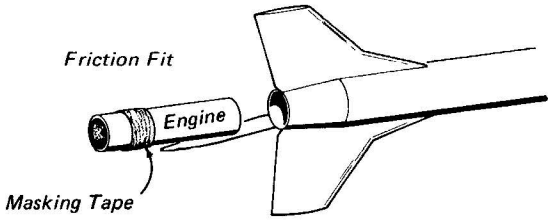
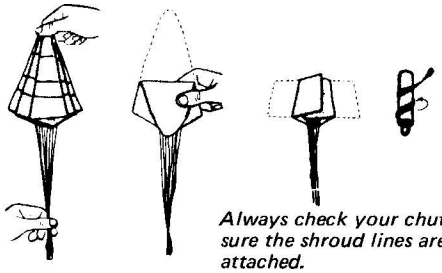
FLIGHT PREPPING

MOUNTING THE ENGINE: The engine MUST be mounted securely into the rocket to prevent engine "kickout" and insure proper parachute ejection. Wrap strips of masking tape around the engine to "friction fit" it snugly into the rocket. A gentle tugging should not remove engine from rocket.

TIP: If you find it difficult to remove the expended engine after flying, simply push it out from the front, with your launch rod.

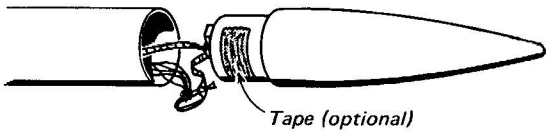


1. Inspect shock cord and fastener for firm bond.
2. Insert Flameproof Parachute Wadding according to its instructions.
3. Tuck in shock cord.
4. Inspect chute for good condition. Roll tightly as shown, and insert . . . must be able to slip out easily.



Always check your chute to be sure the shroud lines are firmly attached.

Nose cone should fit snugly, yet loose enough to eject.



Do not leave the rocket sitting in the sun for long periods as this may soften the adhesives.

Carefully prepare and check all parts of your rocket before each flight.

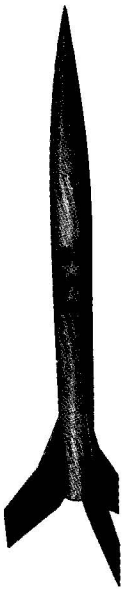
Launch the STARFIRE from a 1/8" diameter x 36" long launching rod.

Referring to the specific instructions which accompany Centuri launchers and firing panels, mount the rocket on the launcher and prepare for ignition. Avoid eye injury by capping the exposed tip of the launch rod when not actually launching. Follow instructions and the Safety code, and have many happy hours with Model Rocketry!

AWARD WINNING

STARFIRE

Catalog No. KC-12



The STARFIRE was designed and built by Centuri's President Lee Piester for competition in the First International Model Rocket Championship Meet held at Dubnica, Czechoslovakia in 1966. The STARFIRE won an award in the parachute duration event with a 16" parachute.

The STARFIRE now comes with two parachutes - - one small, and one larger. Take your pick!! Fly it first with the smaller chute, then fly it again with the larger one. Measure the time from chute ejection until touch down. This time is called "Chute Duration". Of course, the duration will be longer with the larger chute. Be careful to use the large chute only in calm weather, when there is no wind.

Please observe all local, state and federal laws when flying model rockets. Use electrical launchers and flameproof wadding for safe flights.

Centuri

MODEL ROCKETEER'S SAFETY CODE

CONSTRUCTION
My model rockets will be made of only lightweight materials such as paper, wood, plastic, and thin metallic foils, with the exception of payloads and engine holders made of wirelike material.

ENGINES
I will use only pre-loaded factory made model rocket engines in the manner recommended by the manufacturer. I will not change in any way nor attempt to reload these engines.

RECOVERY
I will always use a recovery system in my model rockets that will return them safely to the ground so that they may be flown again.

WEIGHT LIMITS
My model rocket will weigh no more than 453 grams (16 oz.) at liftoff, and the engines will contain no more than 113 (4 oz.) of propellant, as prescribed by Federal Regulations.

STABILITY
I will check the stability of my model rockets before their first flight except when launching models of already proven stability.

LAUNCHING SYSTEM
The system I use to launch my rockets will be remotely controlled and electrically operated, and will contain a switch that will return to "off" when released. I will remain at least 10 feet away from any rocket that is being launched.

LAUNCH SAFETY
I will not let anyone approach a model rocket on a launcher until I have made sure that either the safety interlock key has been removed or the battery has been disconnected from my launcher.

LAUNCH AREA
My model rockets will always be launched from a cleared area, free of any easy-to-burn materials, and I will only use non-flammable recovery wadding in my rockets.

BLAST DEFLECTOR
My launcher will have a blast deflector device to prevent the engine exhaust from hitting the ground directly.

LAUNCH ROD
To prevent accidental eye injury I will always place the launcher so the end of the rod is above eye level or cap the end of the rod with my hand when approaching it. I will never place my head or body over the launching rod. When my launcher is not in use I will always store it so that the launch rod is not in an upright position.

POWER LINES
I will never attempt to recover my rocket from a power line or other dangerous places.

LAUNCH TARGETS AND ANGLE
I will not launch rockets so their flight path will carry them against targets on the ground, and will never use an explosive warhead nor a payload that is intended to be flammable. My launching device will always be pointed within 30 degrees of vertical.

PRE-LAUNCH TEST
When conducting research activities with unproven designs or methods, I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.

FLYING CONDITIONS
I will not launch my model rocket in high winds, near buildings, power lines, tall trees, low flying aircraft or under any conditions which might be dangerous to people or property.

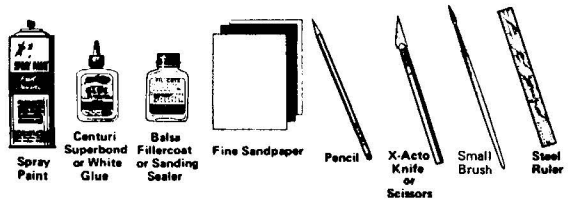
909,265

 IP-52-0672

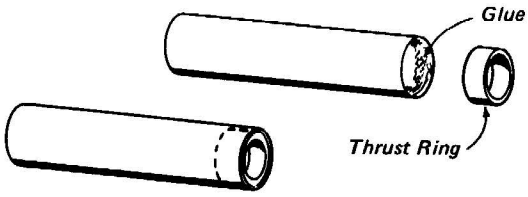
ASSEMBLY INSTRUCTIONS

FOR BEST RESULTS . . . FOLLOW DIRECTIONS CAREFULLY!

Besides the parts included, you will need the following tools to assemble and finish your rocket.



1 Run a bead of glue around the inside of one end of the 3" engine tube. Insert the thrust ring, flush with the tube's end.



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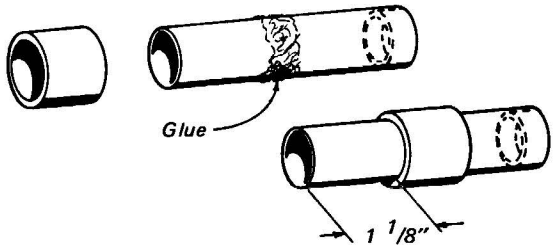

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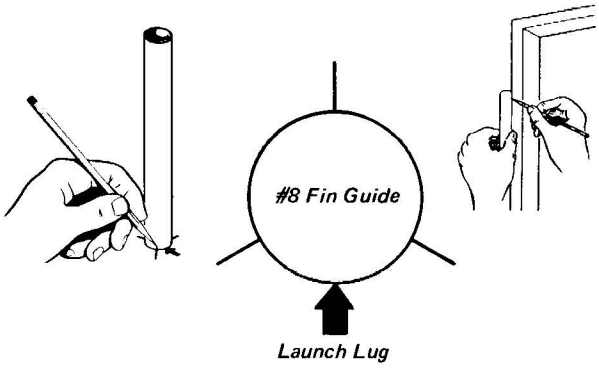
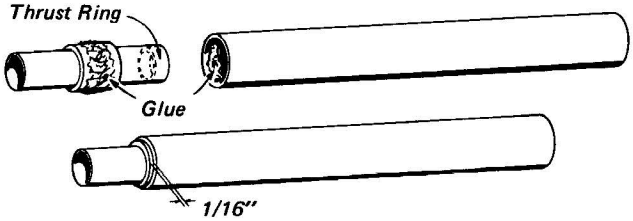
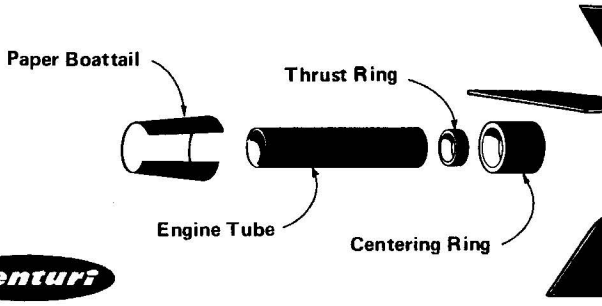


4 Run a bead of glue around engine mount centering ring and inside one end of the body tube. Insert the engine mount with a firm turning motion. Leave 1/16" of the centering ring sticking out.





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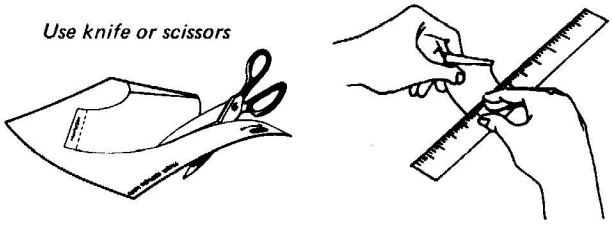
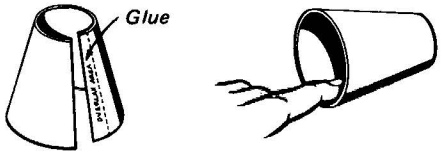
CENTURI ENGINEERING COMPANY
P.O. Box 1988, Phoenix, Arizona 85001

5 Cut out the paper boat-tail carefully. Pre-curl the paper (with shiny surface outside) by running it under a straight edge on a clean, flat surface. Curl paper carefully and gradually so as to prevent creases from forming.



6 Form the paper into a cone and apply a thin film of glue on the overlap area marked on the boattail. Be careful not to smear glue on the exposed part of the paper. Line up the edge of the paper with the dotted line and press together on a flat surface. Test-fit the shroud with engine tube and body tube . . . adjust if necessary.



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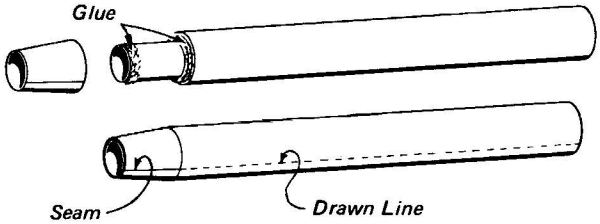
NOTE: BE SURE TO LINE PAPER SHROUD SEAM WITH ONE OF THE DRAWN FIN LINES, so the seam will be hidden when a fin is glued on later.



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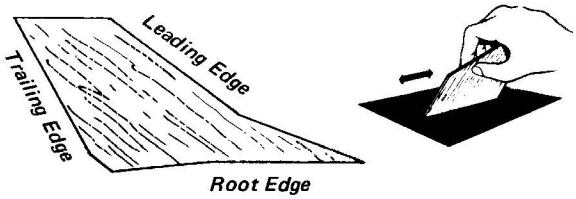

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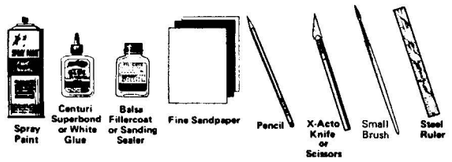

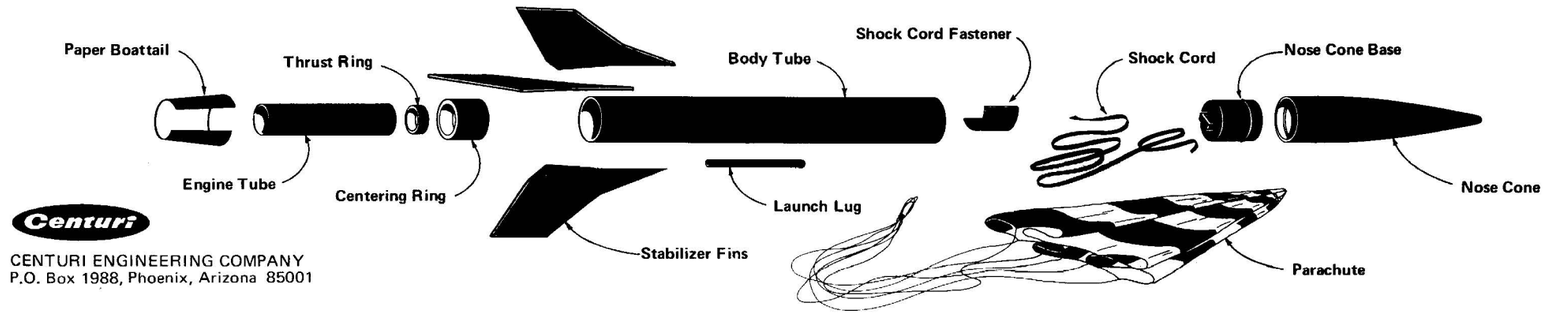

Centuri

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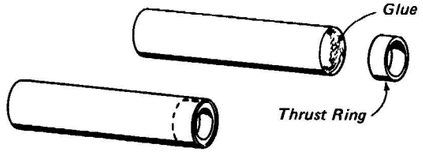

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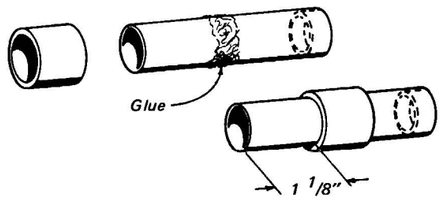

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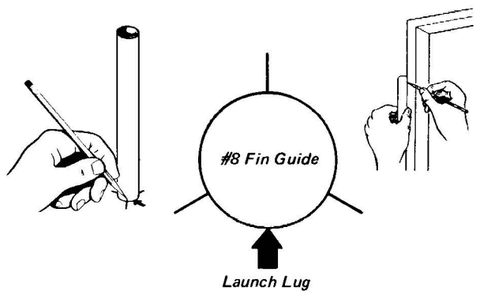

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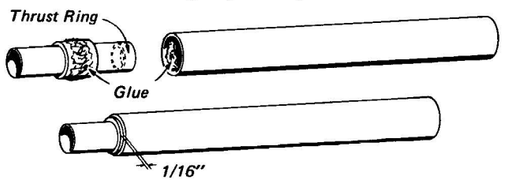

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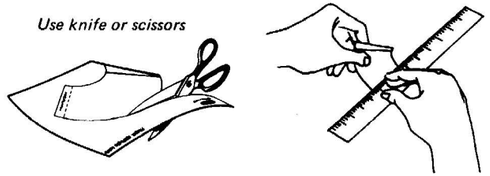

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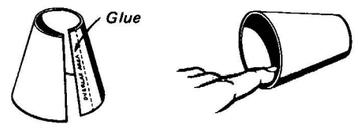

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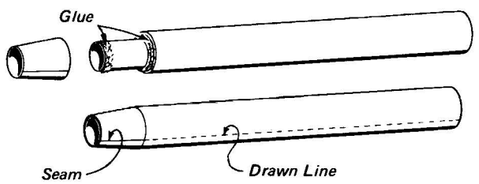

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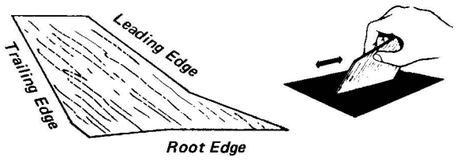
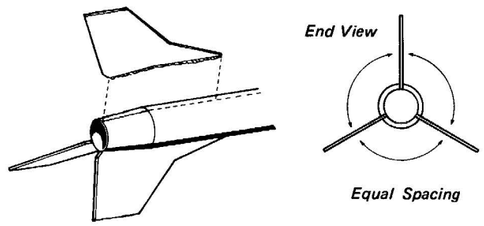
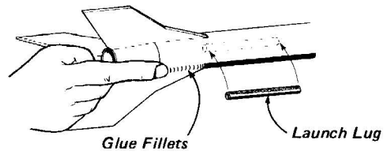


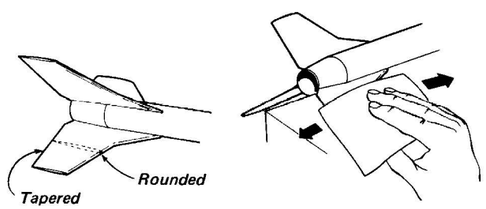
9 Apply a bead of glue to one fin's root edge and press onto the body tube along a drawn line. Remove, allow it to become tacky. Add fresh glue to fin, and reposition. Repeat with the other fins. Note how one fin should cover the seam on the paper boattail.



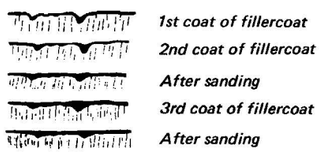
10 After the fin assembly has completely dried, run a bead of glue along both sides of each fin-body tube joint. Using the forefinger, smooth the glue into even fillets. Glue the launch lug onto the body. Make sure it is parallel with the body and centered laterally between two of the fins.



11 Sand the sides of the fins lightly, round the leading edges and taper the trailing edges. Lay the rocket on your work table edge to achieve this "airfoiled" shape.



12 Prepare balsa surfaces for a smooth and realistic finish. Fill the wood grain with Centuri fillercoat or sanding sealer. When dry, sand with fine sandpaper. Repeat until smooth.

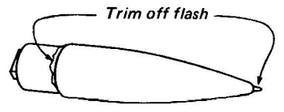


13 This kit contains a plastic nose cone for the forward end of your rocket. While a few other kits still use balsa cones, plastic is now the preferred choice of many rocketeers. It requires no sanding, sealing or painting to have a smooth attractive finish. Plastic is also more durable than balsa . . . it does not dent or "crunch" as easily.

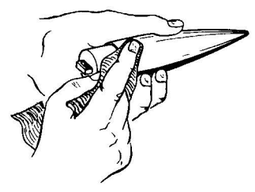
The Snap-Type nose cone is assembled by pushing the insert into the cone until the ridge snaps into the groove.

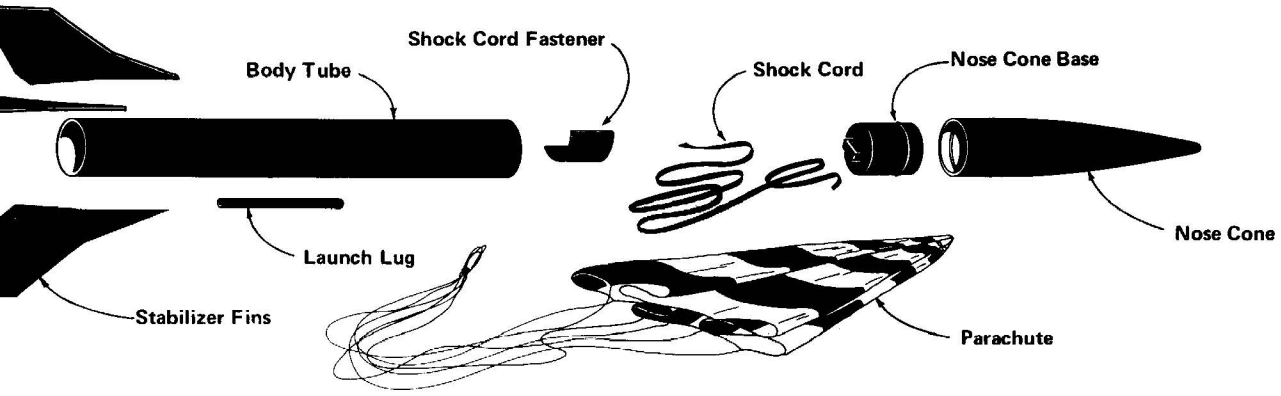
IMPORTANT: The snap-type cones should be assembled with care and good judgement, to avoid breaking the cone . . . Your insert may seem to be too tight a fit as you try to snap it in place. If so, play it safe by gluing the insert in place with plastic cement. (The ridge or ledge of the insert butts up against the base of the cone.)

For best appearance, trim away any plastic "flash" that may be on your cone.



Rub the cone briskly with a soft cloth to remove manufacturing oils, and produce a shiny finish.





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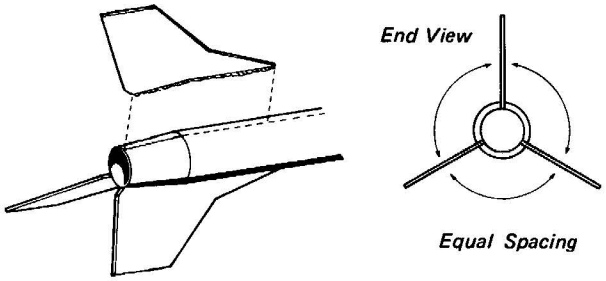

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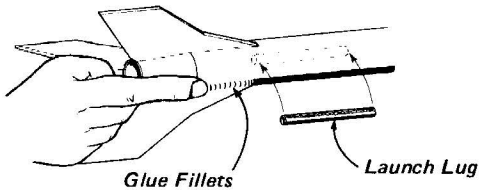

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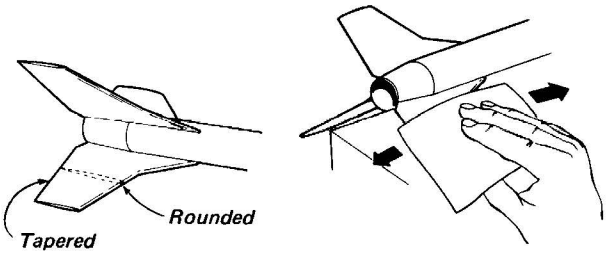

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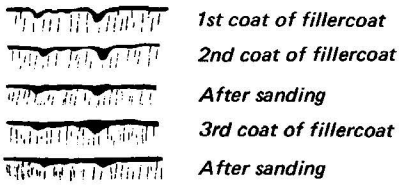

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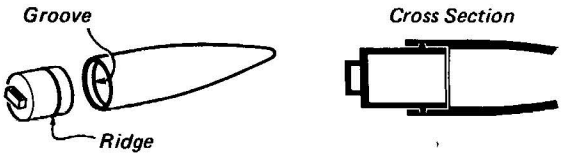

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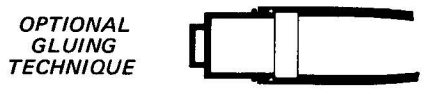

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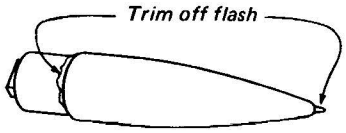

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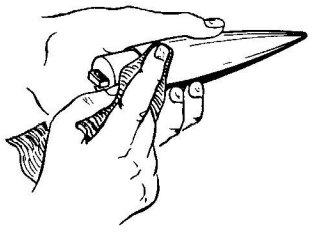
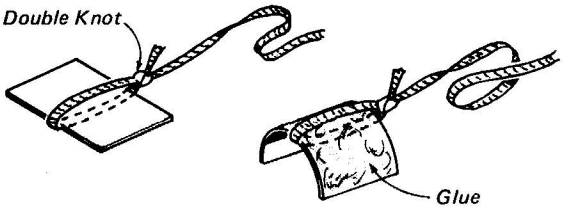
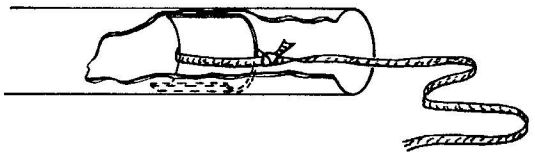


14 Tie one end of the shock cord around the heavy paper shock cord fastener (½" x 1"). Bend it neatly into a half-circle and apply glue to the entire outside surface.

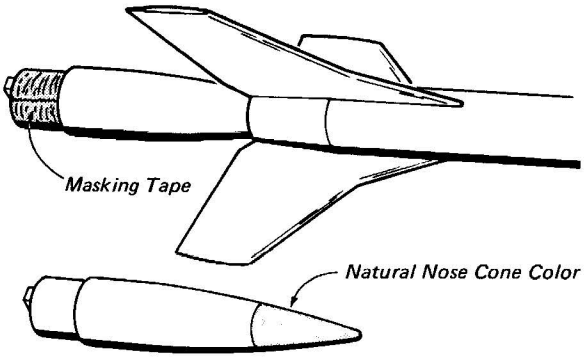


15 Insert the assembly into the forward end of the body tube. Make sure it's at least 1" into the tube, to allow room for the nose cone to be inserted later. Rub the fastener down firmly with eraser end of pencil, and hold until dry.



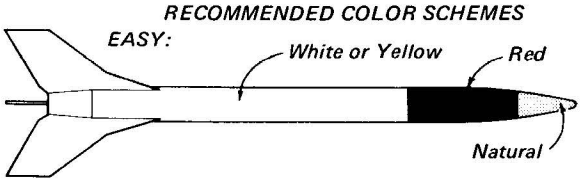
16 There are many ways to paint your rocket. We highly recommend the use of spray enamel paint . . . in the long run it is cheaper, easier and neater than brush-on paints. When painting plastic parts, never use dope or lacquer!

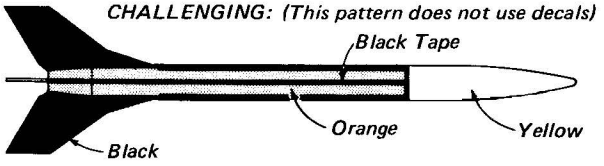
17 Here's a super easy technique: Cover the nose cone base with masking tape, and insert the nose cone into the engine tube making sure the cone is straight in the tube. Spray paint the entire rocket, remove the nose cone, and you automatically will have a snappy looking two-color cone!



18 Spray painting your finished model with a fast-drying enamel will produce the best results... IF IT IS DONE PROPERLY!! Most important is the number of costs of paint. DO NOT try to paint your model with one heavy coat! Instead, give it a couple of quick light coats first and then a finish coat. Let each coat dry before applying the next.

RECOMMENDED COLOR SCHEMES

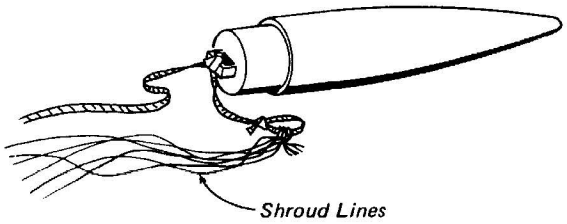




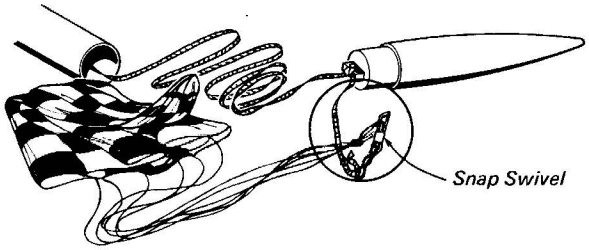
19 Apply the decals one at a time, according to instructions printed on the decal backing paper . . . but allow the paint to dry throughly, to avoid decal wrinkles.

DON'T FORGET TO INSTALL
YOUR NOSE CONE AND PARACHUTE!

20 Tie the end of the shock cord thru the nose cone eyelet, leaving a few inches of free cord extending. Tie this short piece of cord thru the shroud line loop in one assembled parachute.



TIP: To make it easier to change back and forth from the small chute to the bigger chute, try using "snap swivels" (not included). These are available from Centuri, and at most hardware, hobby, and fishing tackle stores.



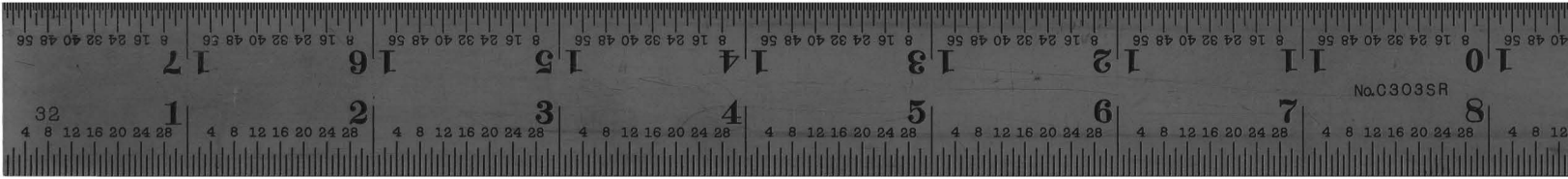
ENGINES

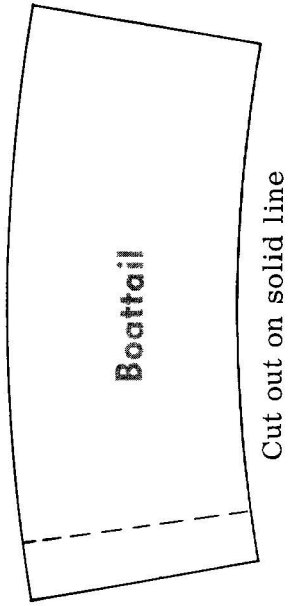
Igniters and complete engine installation instructions are included in "Engine Operating Instructions" which accompany all Centuri engines.

The STARFIRE can be launched with the following engines.

Engine	Approximate Altitude in ft.	Purpose
½A6-2 A5-4	150-250 300-400	Low Altitude - for first test flights and small launch areas.
B4-6 B6-6 B14-7	600-1000 550-900 500-800	Medium Altitude - for general flying and medium size launch areas.
C6-7*	1100-1800	High Altitude - for extremely high flights and large launch areas.

*Avoid using the larger chute in a C6-7 flight because the rocket may drift too far away for you to recover.





Cut out on solid line

Overlap area

Apply glue around here

1/16"

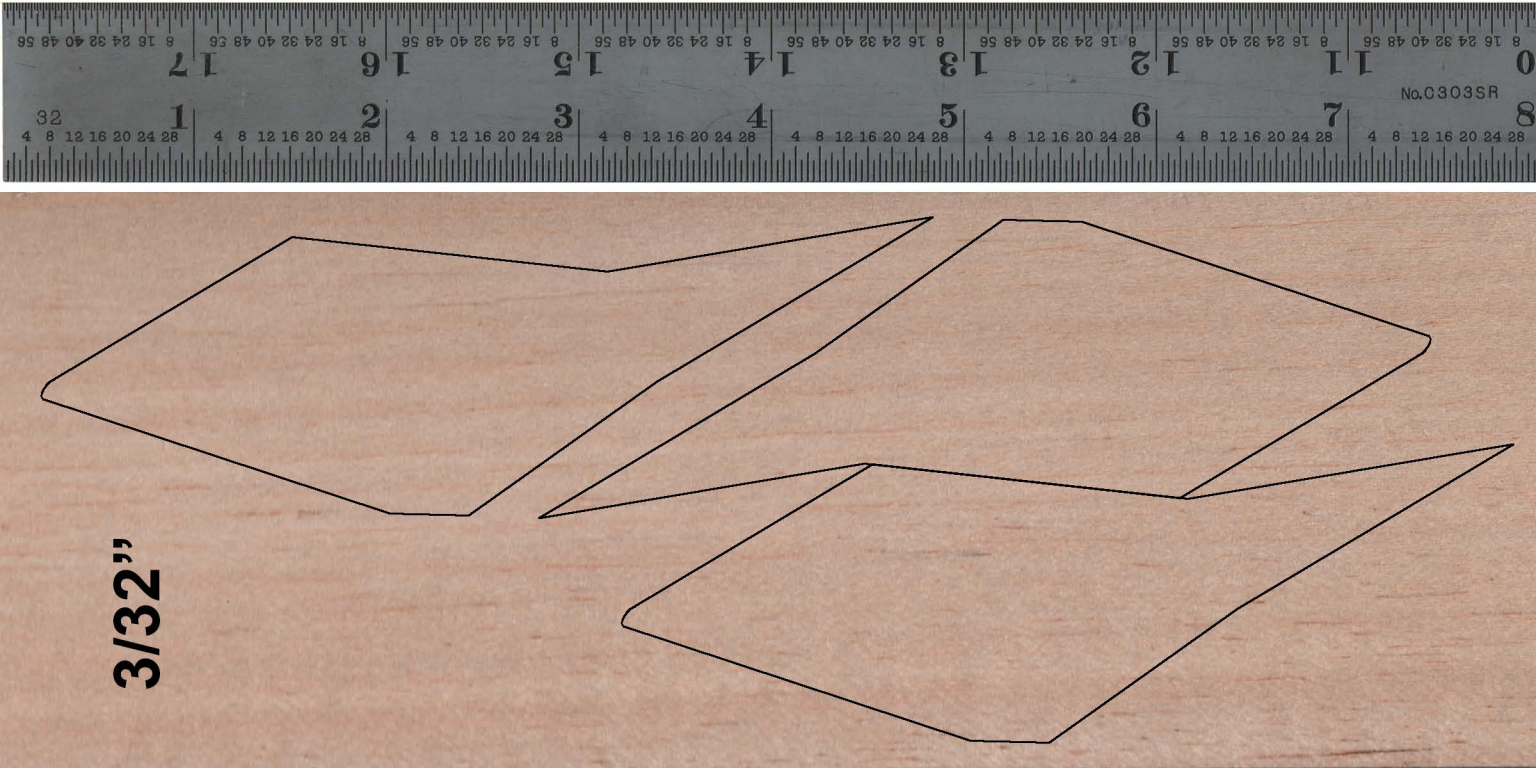
1 1/8"

1 Inch

BOATTAIL

For #7 to #8 tubes.

#15-20


No.C303SR
3/32”

Centuri

Centuri

Centuri

STARFIRE

M-346

Centuri SPECIFICATIONS

Designation	STARFIRE		
Length	16"	Net. Wt.	1 oz.
Recom. Engines	½A6-2 B4-6 B6-6 B14-7 C6-7		
Parachute Recovery			

IP-521

BONUS

METALLIC SPEC-PLATE

SIMPLY CUT ON DOTTED LINE, PEEL OFF BACKING, AND RUB ONTO ROCKET!

STAR

SPORT FLY

ASSEMBLY IN

INTRODUCTION & BACKGROUND

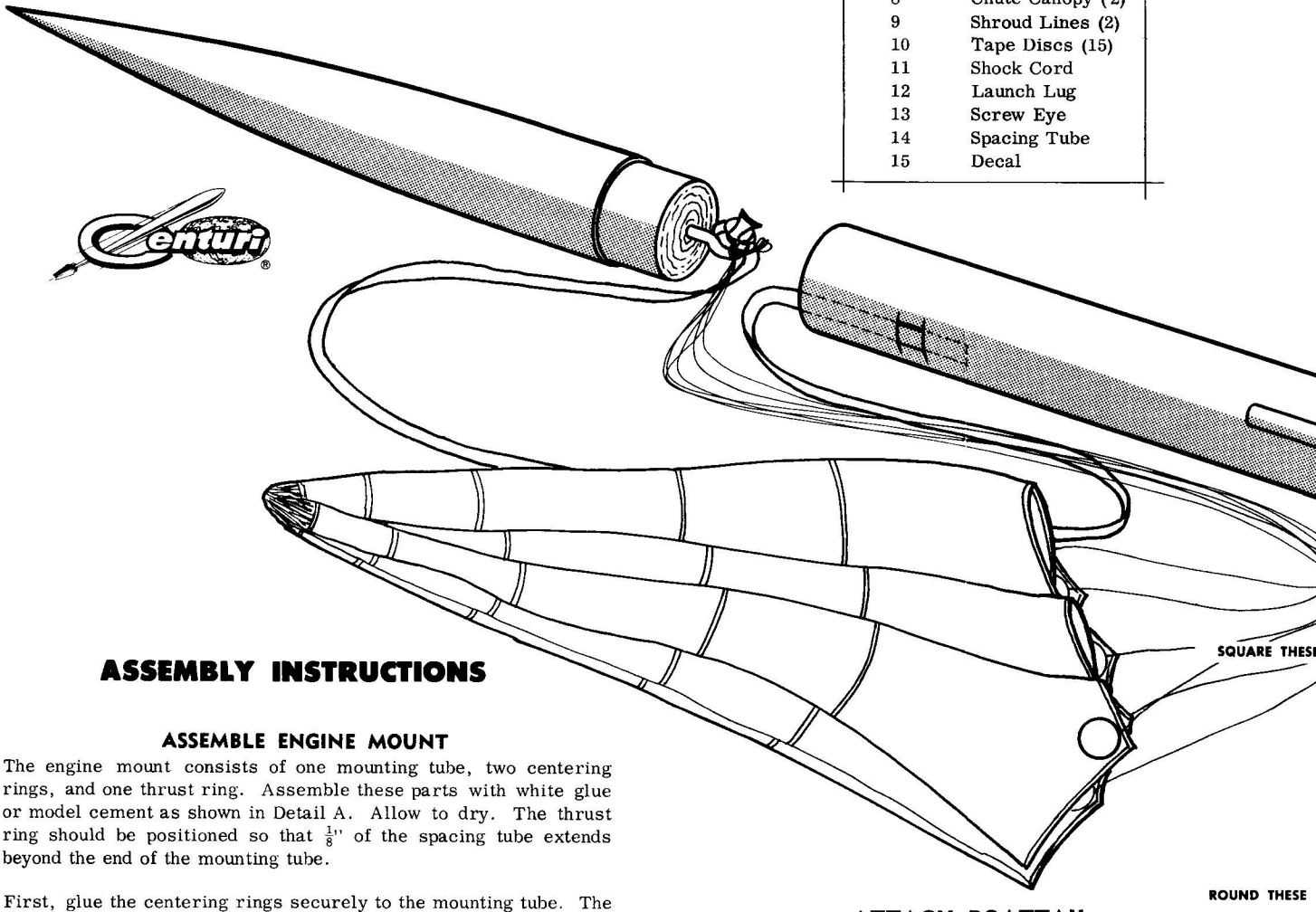
The STAR FIRE kit was originally designed by Leroy Piester, owner of Centuri Engineering Company, for competition in the Parachute Duration event of the First International Model Rocket Championship Meet held at Dubnica, Czechoslovakia, May 28th and 29th, 1966. At that time, it contained a 16" parachute and performed beautifully, winning an award in the competition.

The STAR FIRE now comes with two parachutes - - one 12" and one 20" chute. Take your pick!! Fly it first with the smaller chute, then fly it again with the larger one. Measure the time from chute ejection until touch down. This time is called "Chute Duration". Of course, the duration will be longer with the larger chute, but be careful to use the large chute only in calm weather, when there is no wind.

With a large chute and cross winds, it is actually possible for the descending rocket to reverse direction and rise vertically. This occurs because the parachute acts as an airfoil in cross-winds and actually provides lift.

PARTS LIST

PART NO.	PART NAME
1	Body Tube
2	Nose Cone
3	Centering Rings
4	Mounting Tube
5	Thrust Ring
6	Boat Tail
7	Balsa Fin Stock
8	Chute Canopy (2)
9	Shroud Lines (2)
10	Tape Discs (15)
11	Shock Cord
12	Launch Lug
13	Screw Eye
14	Spacing Tube
15	Decal



ASSEMBLY INSTRUCTIONS

ASSEMBLE ENGINE MOUNT

The engine mount consists of one mounting tube, two centering rings, and one thrust ring. Assemble these parts with white glue or model cement as shown in Detail A. Allow to dry. The thrust ring should be positioned so that $\frac{1}{8}$" of the spacing tube extends beyond the end of the mounting tube.

First, glue the centering rings securely to the mounting tube. The forward ring should be positioned even with the end of the mounting tube and rear ring 1-1/8" from the aft end of the mounting tube. Set mount aside and allow to dry.

After the mount has completely dried, apply a heavy bead of white glue around the top outer rim of both centering rings. Insert the spacing tube into the mount and push the mount into the body tube until 1/16" of the rear ring extends beyond the end of the body tube as shown in the Assembly Drawing.

To force the glue into the tube ring joints, lay the tube assembly on a flat surface and roll about one quarter turn about every three minutes. While this assembly is setting, move on to the next step.

ATTACH BOATTAIL

Cut out the printed paper "Boat Tail". Wrap around aft end of body tube/mount assembly to check fit. Apply glue to overlap area on boat tail first, fit boat tail tightly in place and seal overlap area together. Hold in place until glue sets. Next, apply glue around the centering ring and mounting tube area as shown in Detail B. Finally, slip formed boat tail over rear body section and allow glue to set.

ATTACH STABILIZER FINS

From the printed balsa sheet, carefully cut out the three fins. Sand the edges, as shown in Detail C.

STARFIRE

SPORT FLYING ROCKET

ASSEMBLY INSTRUCTIONS

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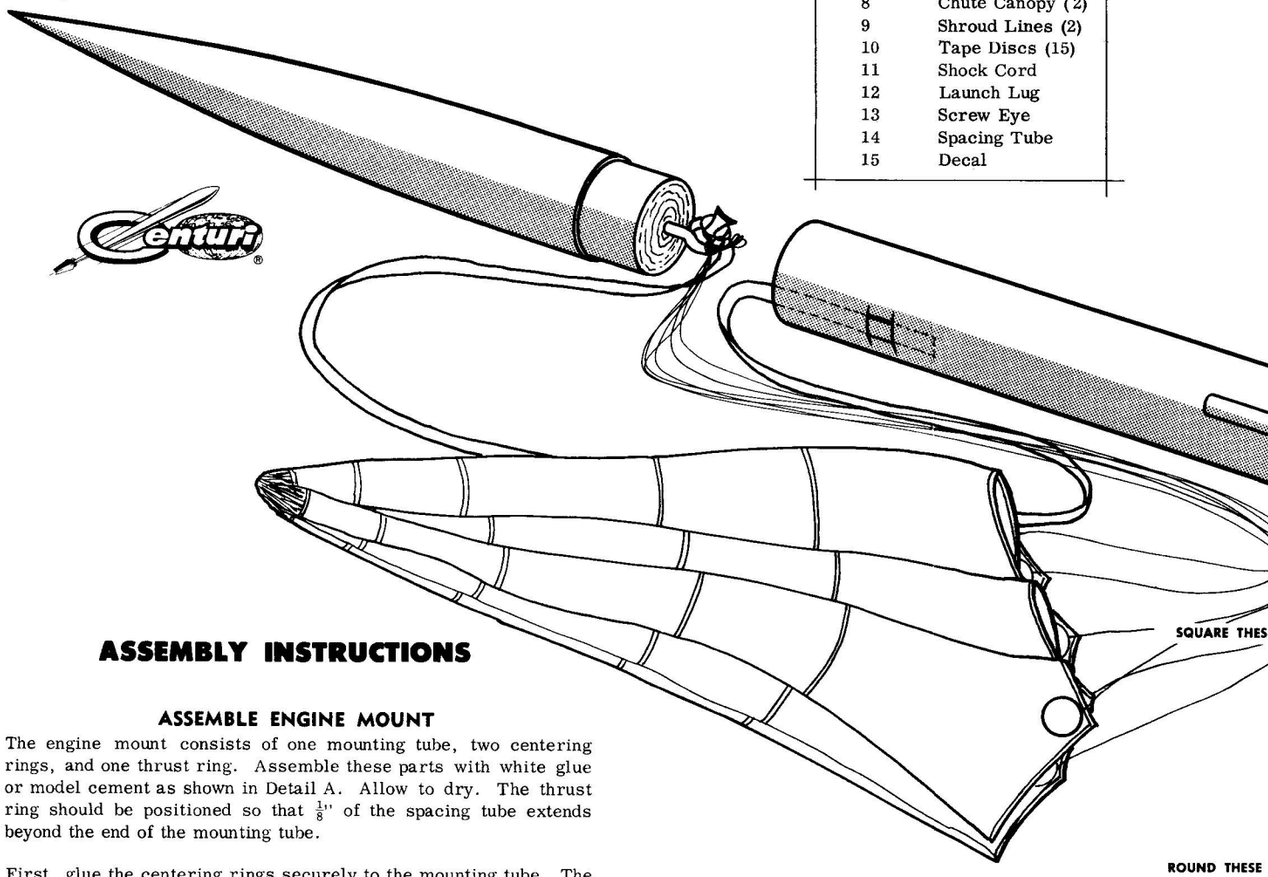
With a large chute and cross winds, it is actually possible for the descending rocket to reverse direction and rise vertically. This occurs because the parachute acts as an airfoil in cross-winds and actually provides lift.



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7	Balsa Fin Stock
8	Chute Canopy (2)
9	Shroud Lines (2)
10	Tape Discs (15)
11	Shock Cord
12	Launch Lug
13	Screw Eye
14	Spacing Tube
15	Decal

In addition to the parts supplied, you will need the following items to assemble the kit:

Modeling knife or single edge razor blade
White glue or modeling cement
Paint for finishing - preferrably spray type
Fine sandpaper - Scissors - Pencil or pen

RIG PARACHUTE & SHOCK CORD

To assemble the parachutes, follow the "Parachute Assembly Directions" enclosed.

Thread the screw eye into the center of the nose cone base, then unthread it. Squirt glue into the resulting hole, and screw the eye back into place. This glueing will keep the eye from pulling out during recovery. Tie the parachute shroud lines and rubber shock cord securely to the eye, trim off any loose ends.

ASSEMBLY DRAWING

Attach the free end of the rubber shock cord to the body tube as shown in the Assembly Drawing. Cut two slits, about 3/8" long and 3/8" apart in the body tube one inch down from the top end. Insert one end of the shock cord into the body tube from the top end, and depress the tube paper between the slits. Bring the cord end out through the first slit and back into the tube through the second slit. Apply glue to the connection to form a good bond.

Glue the launching lug to the body tube in the position shown. Fold up the parachute temporarily and insert it together with the shock cord into the forward end of the body tube. Push the nose cone into place, and the STARFIRE is ready for finishing.

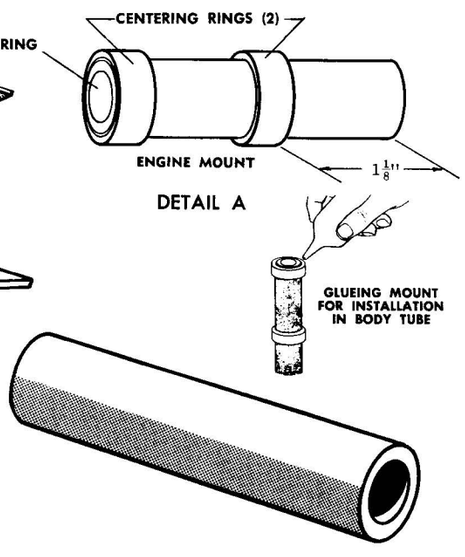
FINISHING THE STARFIRE

To obtain maximum altitude flights, all model rockets should be painted to a gloss finish. First, the grain texture of the nose cone and fins should be filled in with several coats of balsa filler. Sand smooth between applications. The body tube does not require this treatment. Finish entire model with a lightweight paint such as spray dope or laquerized enamel. To aid in tracking, use bright colors such as white, yellow, orange, or red. Flourescent colors are quite easy to spot at high altitudes.

LAUNCHING THE STARFIRE

The STARFIRE may be powered by any of the following engines:
½A.8-2 A.8-3 B.8-2 B.8-4

Complete engine mounting, ignition and launching instructions are included with all Centuri rocket engines. Launch the STARFIRE from a 1/8" diameter x 36" long launching rod. Use electrical ignition only, as outlined in the engine operating instructions.



The STARFIRE should be launched from the center of an open field measuring at least 500 feet on a side or having the equivalent area. Choose a clear, unobstructed launch site away from houses, highways, and trees.

Upon ignition, the STARFIRE will rise under power, high into the sky, coast on to maximum altitude, eject its parachute, and return to Earth for many more flights.

For further information concerning rocket kits, engines, ignition devices, launching apparatus, or accessories, write to:

CENTURI ENGINEERING COMPANY
PHOENIX, ARIZONA 85001

ASSEMBLY INSTRUCTIONS

ASSEMBLE ENGINE MOUNT

The engine mount consists of one mounting tube, two centering rings, and one thrust ring. Assemble these parts with white glue or model cement as shown in Detail A. Allow to dry. The thrust ring should be positioned so that ⅛" of the spacing tube extends beyond the end of the mounting tube.

First, glue the centering rings securely to the mounting tube. The forward ring should be positioned even with the end of the mounting tube and rear ring 1-1/8" from the aft end of the mounting tube. Set mount aside and allow to dry.

After the mount has completely dried, apply a heavy bead of white glue around the top outer rim of both centering rings. Insert the spacing tube into the mount and push the mount into the body tube until 1/16" of the rear ring extends beyond the end of the body tube as shown in the Assembly Drawing.

To force the glue into the tube ring joints, lay the tube assembly on a flat surface and roll about one quarter turn about every three minutes. While this assembly is setting, move on to the next step.

ATTACH BOATTAIL

Cut out the printed paper "Boat Tail". Wrap around aft end of body tube/mount assembly to check fit. Apply glue to overlap area on boat tail first, fit boat tail tightly in place and seal overlap area together. Hold in place until glue sets. Next, apply glue around the centering ring and mounting tube area as shown in Detail B. Finally, slip formed boat tail over rear body section and allow glue to set.

ATTACH STABILIZER FINS

From the printed balsa sheet, carefully cut out the three fins. Sand the edges, as shown in Detail C.

Cut out the Fin Positioning Guide, wrap it around the body tube base, and mark the fin locations with pen or pencil. Apply white glue or cement to each fin root chord edge, one at a time, and also along body tube where fin is to be attached. When glue has begun to set, place fin in position along the body tube. Stand the tube on its top end and allow glue to dry. With the Fin Allignment guide, check the angle between fins before glue has set.

For increased fin strength, run a fillet of the same glue along each fin/tube joint, after the initial glueing has thoroughly dried.

FIRE

ING ROCKET

STRUCTIONS

In addition to the parts supplied, you will need the following items to assemble the kit:

Modeling knife or single edge razor blade
White glue or modeling cement
Paint for finishing - preferrably spray type
Fine sandpaper - Scissors - Pencil or pen

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The STARFIRE may be powered by any of the following engines:
$\frac{1}{2}$A. 8-2 A. 8-3 B. 8-2 B. 8-4

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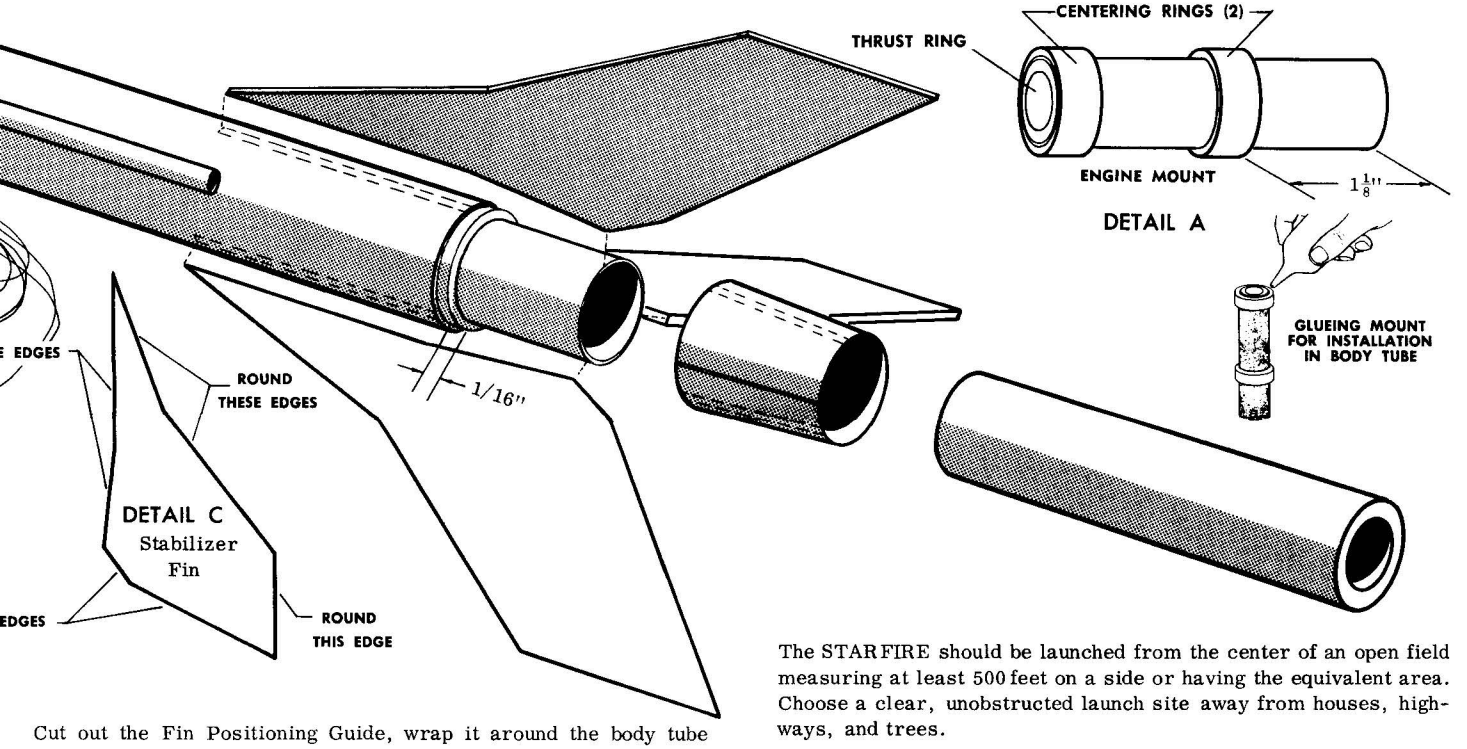
ASSEMBLY DRAWING



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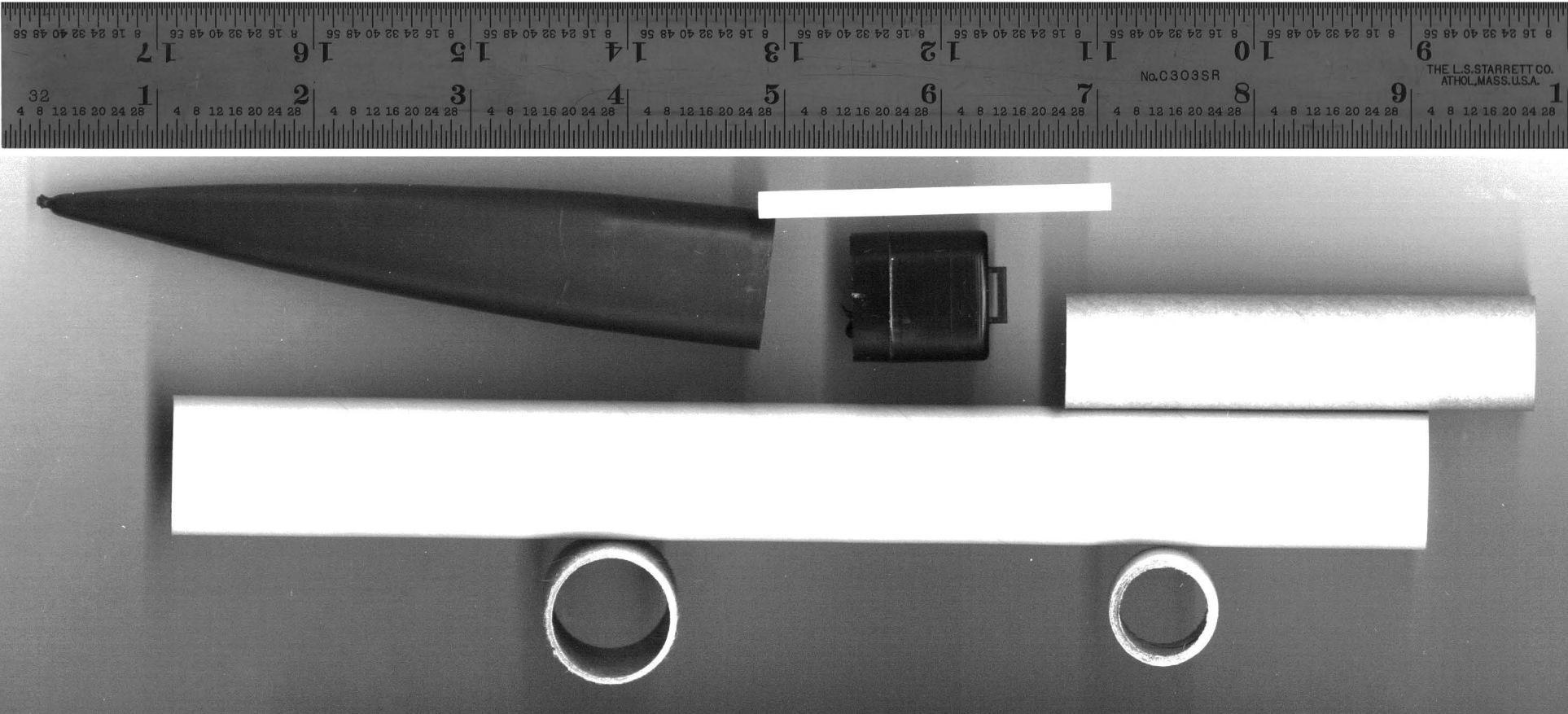
No.C303SR
THE L.S.STARRETT CO.
ATHOL,MASS.U.S.A.

Centuri Starfire #KC-12/#2129

Q	Desc	Stk Num	Size	Other
1	Plastic Nose Cone	PNC-89	4.6"L-StoT	
1	Plastic Nose Cone Base			

Original (Classic) kit had a BnC-89 Balsa Nose Cone 4.8" long
Later release kit has a PNC-89 Plastic Nose Cone 4.6" long

1	Body Tube	ST-88	8"L	
1	Centering Ring	7-8	.8"L	
1	Thrust Ring	TR-7		
1	Engine Tube	ST-73	3"L	
1	Balsa Sheet		3"W x 9"L x 3/32"T	
1	Boattail Sheet	15-20	Heavy Cardstock	
1	Launch Lug	LL-2	2.25"L	
1	Chute Pack	CP-12	12"	Red/Wht
1	Chute Pack	CP-20	20"	Red/Wht
1	Shock Cord	SC-18	26"L	
1	Decal	M-346	2"W x 4"L	Blue


STARFIRE
FLYING MODEL ROCKET
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