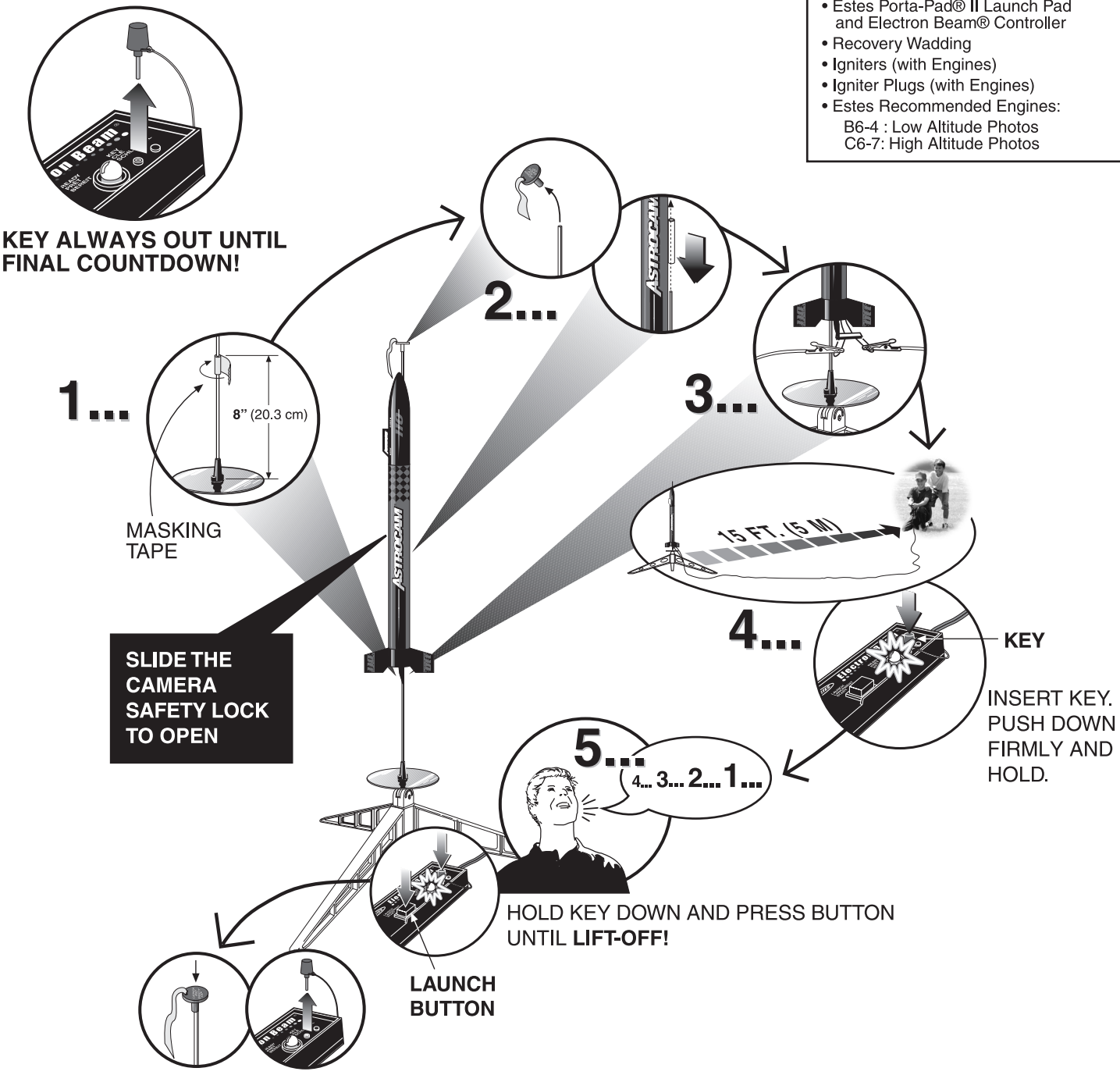


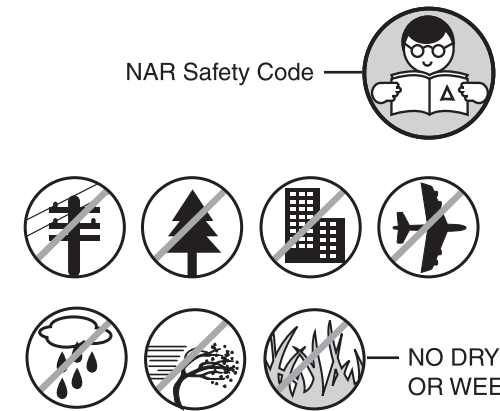
COUNTDOWN AND LAUNCH



- LAUNCH SUPPLIES**
(Sold Separately)
- Estes Porta-Pad® II Launch Pad and Electron Beam® Controller
 - Recovery Wadding
 - Igniters (with Engines)
 - Igniter Plugs (with Engines)
 - Estes Recommended Engines:
B6-4 : Low Altitude Photos
C6-7: High Altitude Photos

KEY ALWAYS OUT UNTIL FINAL COUNTDOWN!

PRECAUTIONS



PRE-LAUNCH CHECK
For safety, never launch a damaged rocket. Check the rocket's body, nose cone and fins. Also, check the engine mount, recovery system and launch lugs (2). Repair any damage before launching the rocket.

FLYING YOUR ROCKET
Choose a large field (500 ft. [152 m] square) free of dry weeds and brown grass. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great. Launch only with little or no wind and good visibility.

Always follow the National Association of Rocketry (NAR) SAFETY CODE.

MISFIRES
TAKE THE KEY OUT OF THE CONTROLLER. WAIT ONE MINUTE BEFORE GOING NEAR THE ROCKET! Disconnect the igniter clips and remove the engine. Take the plug and igniter out of the engine. If the igniter has burned, it worked but did not ignite the engine because it was not touching the propellant inside the engine. Put a new igniter all the way inside the engine without bending it. Push the plug in place. Repeat the steps under Countdown and Launch.

NO DRY GRASS OR WEEDS



www.estesrockets.com
Estes Industries
1295 H Street
Penrose, CO 81240
Printed in CHINA



FLYING MODEL ROCKET KIT INSTRUCTIONS

KEEP FOR FUTURE REFERENCE

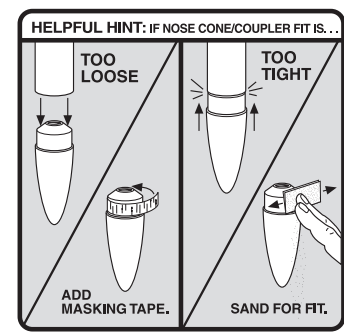
#1327

ASSEMBLY TIP

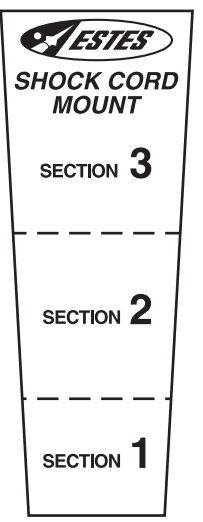
Read all instructions before beginning work on your model. Make sure you have all parts and supplies.
TEST-FIT ALL PARTS TOGETHER BEFORE APPLYING ANY GLUE. If any parts don't fit properly, sand as required for precision assembly.

PARTS

Locate the parts shown below and lay them out on the table in front of you. DO NOT USE THIS DRAWING TO ASSEMBLE YOUR ROCKET.

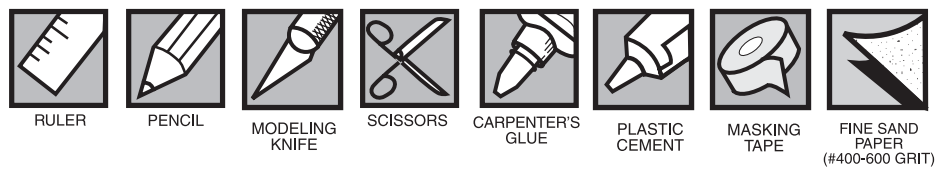


- Blue Engine Mount Tube (1) (30326-1)
- Centering Rings (1 card) (30090)
- Assembled Camera Cone (1) (60862)
- Decal Sheet (1) (60811)
- Body Tube (1) BT-56 (31659)
- Kodak® Film Roll (1) (60712)
- Engine Hook (1) EH-2A (35021)
- Assembled 12" (30 cm) Parachute (1) (35801)
- Shock Cord (1) 1/8" x 18" (38366)
- Plastic Fin Unit (1) (43071)
- Launch Lug (1) 1 1/4" x 1/8" (38175)



SUPPLIES

In addition to the parts included in the kit you will also need:

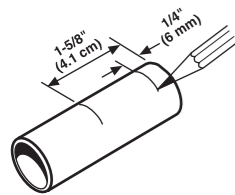


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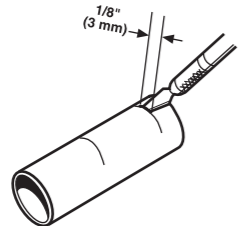
PRINTED IN CHINA



1. A. Mark the blue engine mount tube at 1/4" (6 mm) and at 1-5/8" (4.1 cm).



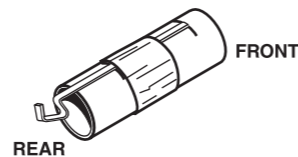
B. Use a modeling knife to cut a 1/8" (3 mm) wide slit at the 1/4" (6 mm) mark only.



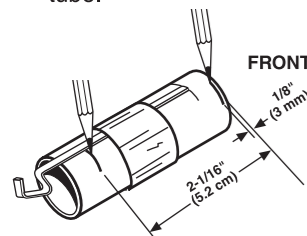
C. Run a line of glue from the slit to the 1-5/8" (4.1 cm) mark and insert engine hook.



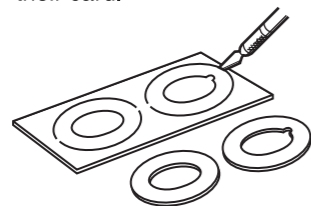
D. Be sure hook is straight, then wrap two layers of masking tape around the tube and hook just above the 1-5/8" (4.1 cm) mark.



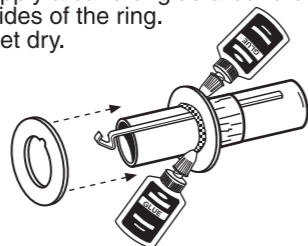
E. Make another mark at 2-1/16" (5.2 cm) and at 1/8" (3 mm) from the FRONT end of the tube.



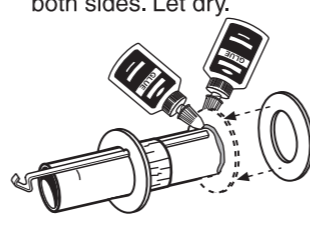
F. Use a modeling knife to carefully remove the centering rings from their card.



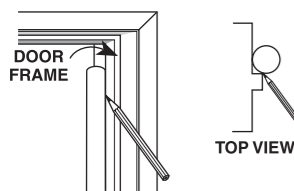
G. Slide the notched centering ring onto the tube from the rear with the notch over the engine hook until it touches the masking tape, then apply a band of glue around both sides of the ring. Let dry.



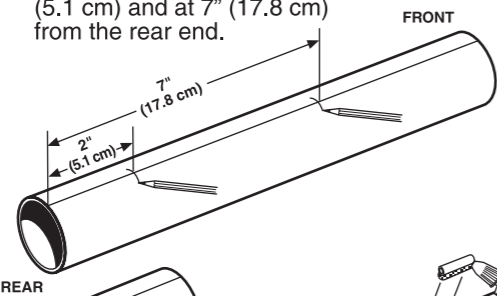
H. Slide the remaining centering ring onto the tube from the front, position over the 1/8" (3 mm) mark, then apply a band of glue around both sides. Let dry.



2. A. Use a door frame to lightly draw a straight line down the length of the body tube.



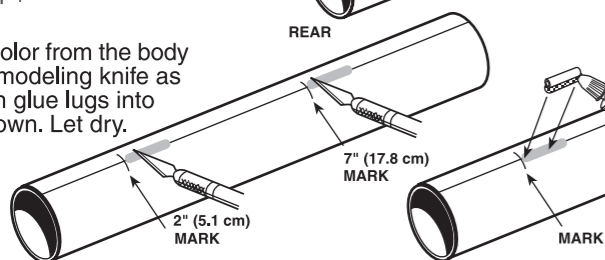
B. Mark the straight line at 2" (5.1 cm) and at 7" (17.8 cm) from the rear end.



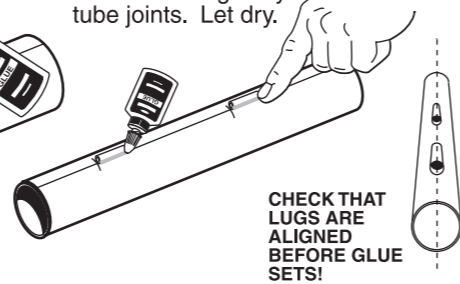
C. Cut the launch lug into two equal lengths. (Be careful to not crush the launch lug while cutting.)



D. Scrape the color from the body tube with a modeling knife as shown. Then glue lugs into place as shown. Let dry.

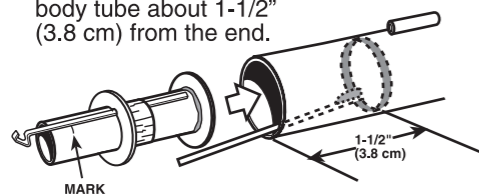


E. Apply glue fillets to both launch lug/body tube joints. Let dry.

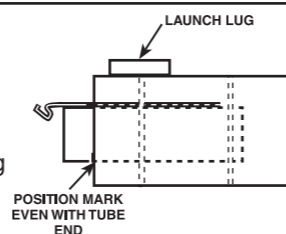


3. A. Test fit the engine mount into the rear of the body tube. You may need to sand the rings or the lip of the tube to achieve a good fit.

B. Apply a liberal amount of glue around the inside of body tube about 1-1/2" (3.8 cm) from the end.

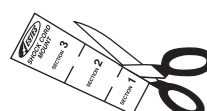


C. Align the engine hook with the launch lugs and slide the engine mount into the body tube in one continuous motion until the mark is even with the end of the body tube. (Do not pause when inserting the mount or the glue may set in the wrong place!) Let dry.

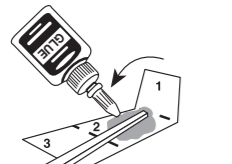


4. INSTALL SHOCK CORD MOUNT

A. Cut out shock cord mount from page 1.



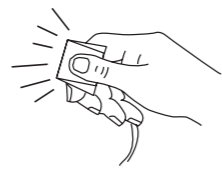
B. Apply glue. Fold forward.



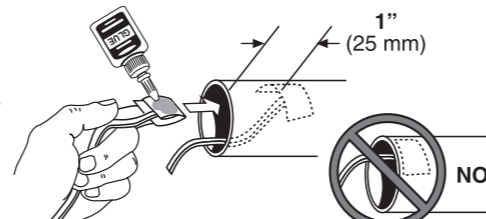
C. Apply glue. Fold forward.



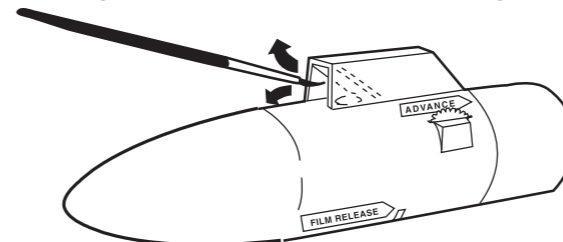
D. Squeeze tightly and hold for one minute.



E. Glue mount 1" (25 mm) inside body tube. Hold until glue sets. Let dry.



CAMERA MAINTENANCE



It is not recommended that the AstroCam® 110 Rocket be flown in areas with loose and dry soil, yet the camera may land on this type of terrain. When this happens, dust may collect on the mirror and lens and must be carefully removed before the camera is flown again. To do this, use a new, clean, small camel hair brush. Never use a brush that has been used for any other purpose, as any contaminants left in the bristles may mar the mirror and lens. Insert the tip of the brush into the mirror and lens cavity and stroke outward several times with very light pressure. Never insert any object into this cavity other than the brush for any purpose. Examine the mirror and lens carefully when cleaning to be sure all contaminants are removed. Clean the remainder of the camera's exterior with a soft cloth. AstroCam® 110 replacement parts can be ordered from Estes.

ABOUT FILM, FLIGHT AND FINISHED PHOTOS FROM YOUR ASTROCAM® 110

Flying the AstroCam® 110 rocket is fun and the photographic results exciting. The subjects which can be photographed are endless - city streets, schools, rural farmlands, etc. To achieve good pictures flight after flight, follow these simple guidelines.

Be patient! Wait for a calm, clear day and use only the recommended ASA 400 color film or equivalent.

Note: Estes recommends using only Kodak® Gold 110 Color Film in the AstroCam® 110 camera.

For greatest ground detail, launch from 9 a.m. to 11 a.m. in the morning or 1 p.m. to 3 p.m. in the afternoon. Flying earlier or later than this will affect the light level being reflected from the ground. This may cause some under exposure. Also, long shadows on the ground may hide some detail in the finished photograph.

Late spring, summer and early fall are the best times during the year to fly the AstroCam® 110 rocket because of higher sun angles. Again, light reflected from the ground plays an important part in photo quality.

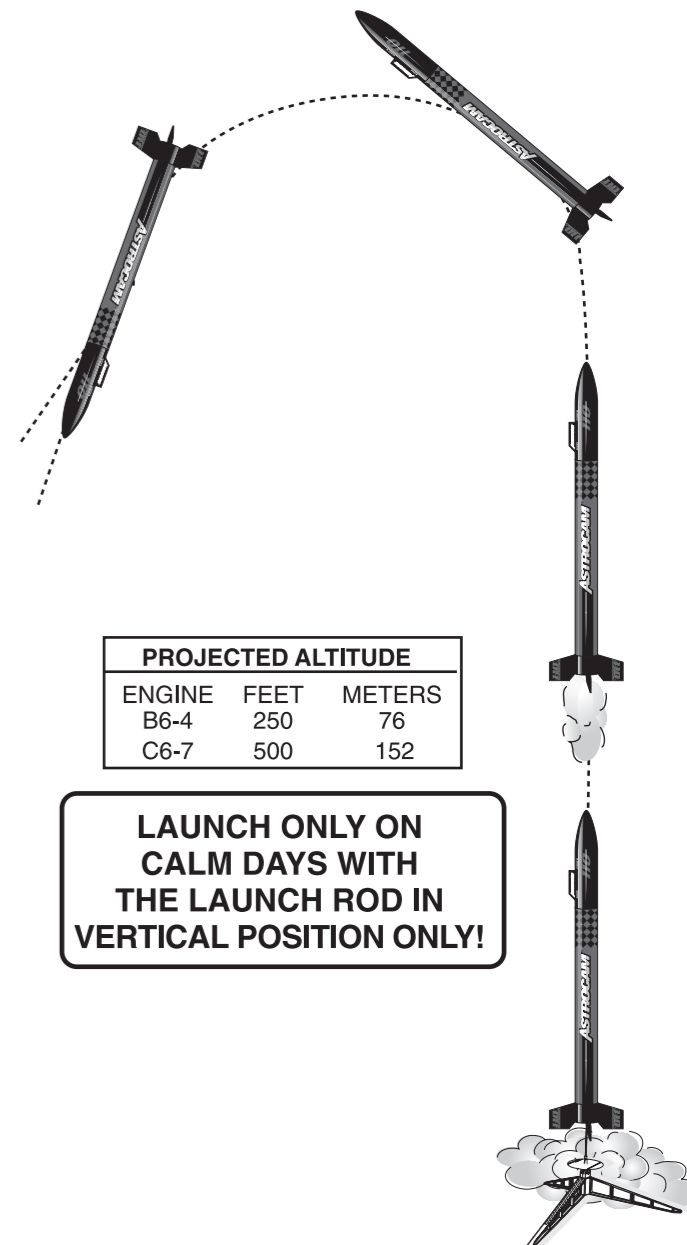
Always prep the AstroCam® 110 rocket carefully for each flight. Remember, you cannot expose the film as long as the safety lock is in the closed position. If you are unsure about shutter setting, release it and set it again. If you are unsure about whether the number appearing in the window has been exposed, advance to the next frame.

The **only** recommended engines for the AstroCam® 110 rocket are B6-4 and C6-7. The AstroCam® 110 rocket has been designed so that the engine type used will regulate the angle of the camera at the time of exposure.

For best photo results and maximum altitude, launch on calm or nearly calm days with LAUNCH ROD IN VERTICAL POSITION.

Never move the safety lock to the open position until the rocket is on the launch pad and you are actually ready to launch.

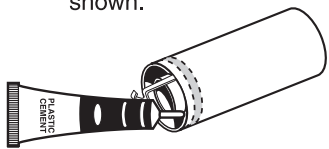
Always move the safety lock to its closed position and advance film immediately upon recovery.



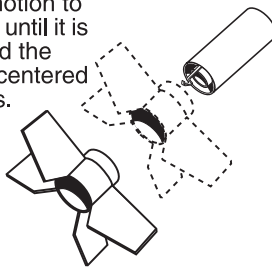
PROJECTED ALTITUDE		
ENGINE	FEET	METERS
B6-4	250	76
C6-7	500	152

LAUNCH ONLY ON CALM DAYS WITH THE LAUNCH ROD IN VERTICAL POSITION ONLY!

- 5. A.** Apply a heavy line of plastic cement around the inside rear of the body tube as shown.



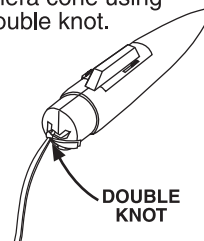
- B.** Use a twisting motion to insert the fin unit until it is all the way in and the launch lugs are centered between two fins.



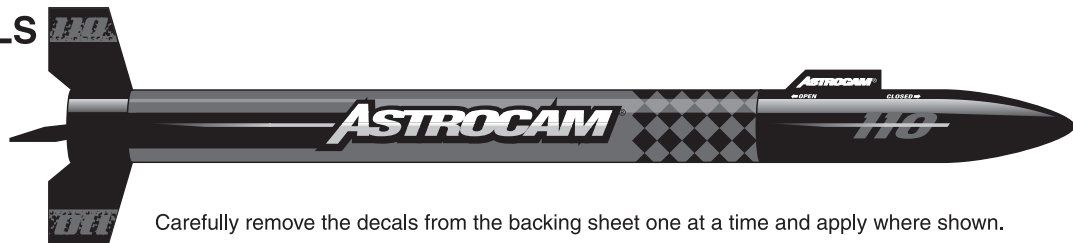
- C.** Stand the rocket on its fins. Let dry.



- D.** Tie shock cord to camera cone using a double knot.



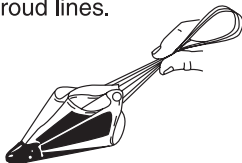
6. APPLY DECALS



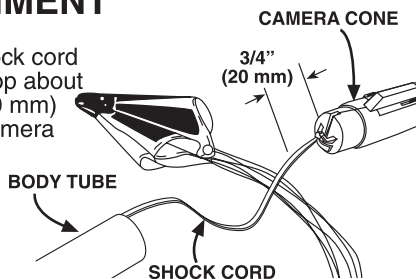
Carefully remove the decals from the backing sheet one at a time and apply where shown.

7. PARACHUTE ATTACHMENT

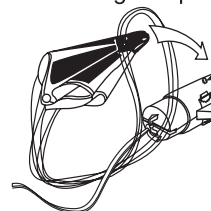
- A.** Form loop with parachute shroud lines.



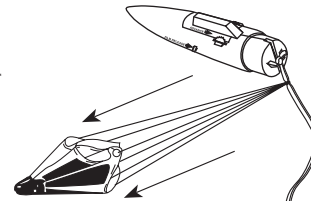
- B.** Lay shock cord over loop about 3/4" (20 mm) from camera cone.



- C.** Pass parachute through loop.

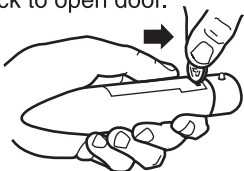


- D.** Pull tight.

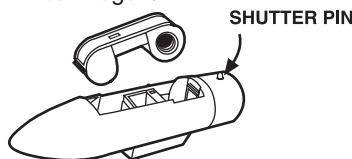


8. FILM INSTALLATION

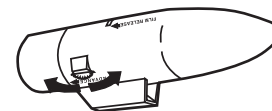
- A.** Insert a small coin into opening at rear of film door and press back to open door.



- B.** Insert film. Use ASA 400 color print 110 film cartridge **ONLY!**



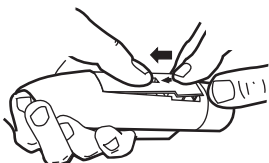
- C.** Rock advance wheel slightly to seat film all the way into camera.



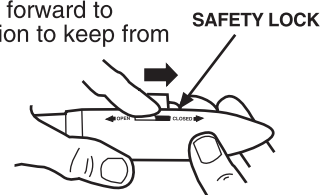
- D.** Insert front tab of film door under camera cone edge.



- E.** Press film door on with fingers.



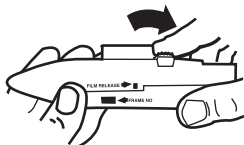
- F.** Push safety lock forward to "CLOSED" position to keep from exposing film.



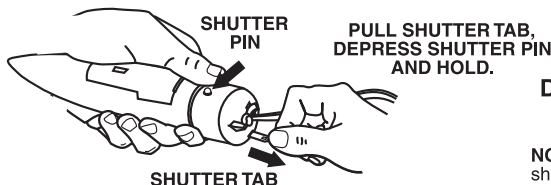
IMPORTANT: Place a piece of tape over the film door to secure it to the main body of the camera. This will prevent the film door from dislodging in the event of a hard landing during recovery.

9. CAMERA OPERATION

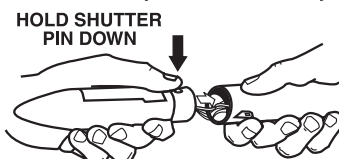
- A.** Depress the film release button to advance film. Release button as soon as film begins to move and advance film slowly until it locks into first frame. (Number may not be centered in window.)



- B.** Pull shutter tab back to cock shutter. Depress shutter pin to lock shutter in place and hold.



- C.** Keeping shutter pin pressed down, push camera all the way into rocket body.



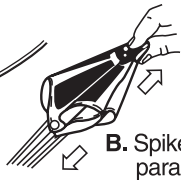
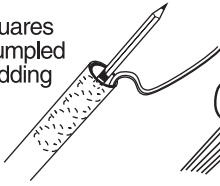
- D.** Push safety lock to "OPEN" before launching so a picture can be taken.

NOTE: When not in use never store camera with shutter cocked - you will wear out the shutter spring.

NOTE: Do not attempt to overwind or wind too fast as this may damage the camera.

PREPARING THE PARACHUTE FOR FLIGHT

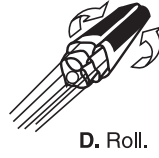
A. Insert 5-6 squares of loosely crumpled recovery wadding into rocket body tube.



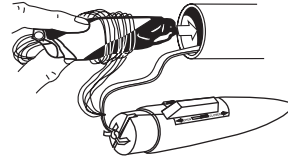
B. Spike parachute.



C. Fold.



D. Roll.



E. Wrap shroud lines loosely around 'chute. Insert 'chute and shock cord into rocket.

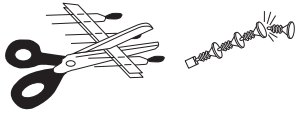
NOTE: Only Estes wadding (302274) is recommended.

IMPORTANT: Wadding must be in place and slide easily for rocket to work properly!

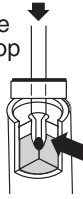
Parachute should slide easily into body tube. If fit is too tight, unfold and repack again.

PREPARE ENGINE

A. Separate igniter and igniter plug.

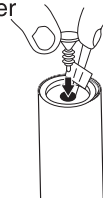


B. Hold engine upright, drop in igniter.



Igniter must touch propellant.

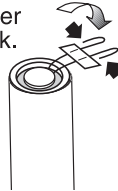
C. Insert igniter plug.



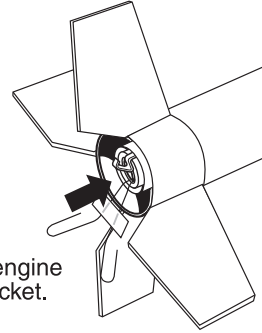
D. Firmly push all the way in.



E. Bend igniter wires back.



F. Insert engine into rocket.

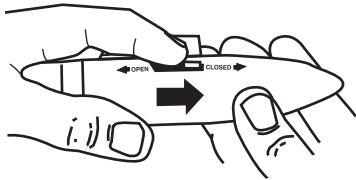


WARNING: FLAMMABLE

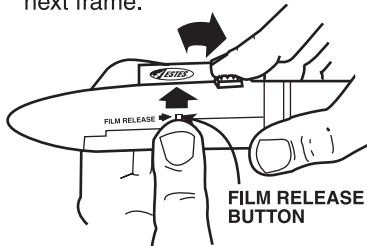
To avoid serious injury, read instructions & NAR Safety Code included with engines.
PREPARE YOUR ENGINE ONLY WHEN YOU ARE OUTSIDE AT THE LAUNCH SITE PREPARING TO LAUNCH!
 If you do not use your prepared engine, remove the igniter before storing your engine.

AFTER LAUNCH

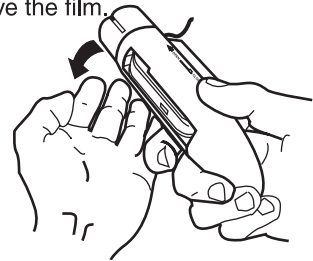
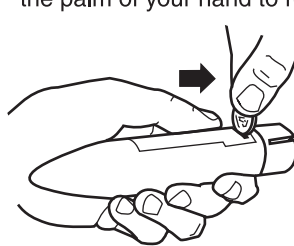
A. Push camera safety lock to "CLOSED" position immediately upon recovery to protect the picture just taken from further exposure.



B. Depress the film release button to advance film. Release the button as soon as the film begins to move. Advance film slowly with the advance wheel until it locks into next frame.



C. After the last picture has been taken, depress the film release button and advance the film until it stops at the end of the roll. Insert a small coin in the opening at the end of the film door and press back until the door catch releases. Holding the AstroCam® 110 with the film cartridge down, tap camera in the palm of your hand to remove the film.

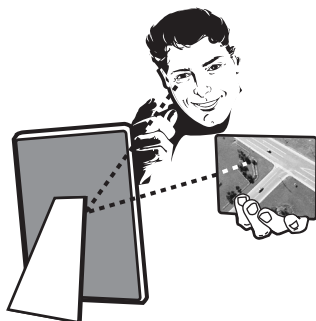


NOTE: Be sure to advance film immediately after taking a picture to avoid a double exposure.

NOTE: If you choose not to take all pictures on the roll, depress the film release and hold while advancing the film to the end of the roll.

FILM DEVELOPING

AstroCam® 110 pictures are reversed. To view your AstroCam® 110 photo, stand in front of a mirror and hold a picture chin high. The picture reflected in mirror will be correct. Enlargements from AstroCam® 110 negatives are recommended not to exceed 5" x 7" (13 cm x 18 cm) size unless the quality and sharpness of the negative is exceptional. Your local photo shop can provide the best assistance.



The photo shown here is typical of the quality to be expected from the AstroCam® 110 camera. It was taken in a residential section of Eunice, LA. The photo was taken during mid-afternoon using a stock AstroCam® 110. When flying your AstroCam® 110 in residential areas, always use a large vacant lot or field as a launch site. A thin hazy crescent at the edge of a photo, in some instances, is a partial image of the nose portion of the camera.

