



ALL NEW 8-1

CLIMBS TO  
OVER 1000 FEET!



# ASTRON ONLY 700

## SCOUT

A "SCOUT" FOR THE RELIABLE, DELETED

... (unclear) ...

### Estes Industries, Inc.

... (unclear) ...

... (unclear) ...

# ASTRON SCOUT

## Assembly Instructions

THE ASTRON SCOUT ROCKET CONSISTS OF THE FOLLOWING PARTS AS ILLUSTRATED IN THE DRAWING AT RIGHT.

1. NOSE CONE CAT # 161-BNC-1
2. BODY TUBE CAT # 161-BT-3
3. THREE FINS CAT # 161-BF-1
4. MOTOR HOOK (MUSIC WIRE) CAT # 161-MH-1
5. MOTOR RETAINING WIRE (COPPER) CAT # 161-RW-1
6. REINFORCING MATERIAL FOR FINS AND MOTOR HOOK WIRE CAT # 161-GR-1
7. LAUNCHING LUG CAT # 161-LL-1

FOR ASSEMBLING YOUR ROCKET YOU WILL NEED A SHARP KNIFE OR RAZOR BLADE, A SMALL PIECE OF FINE GRIT SANDPAPER, A TUBE OF EXTRA FAST DRYING MODEL AIRPLANE CEMENT, AND A PAIR OF SCISSORS.

CHECK TO MAKE SURE YOUR KIT IS COMPLETE. READ COMPLETE INSTRUCTIONS, STEPS TWO THROUGH EIGHT BEFORE BEGINNING.

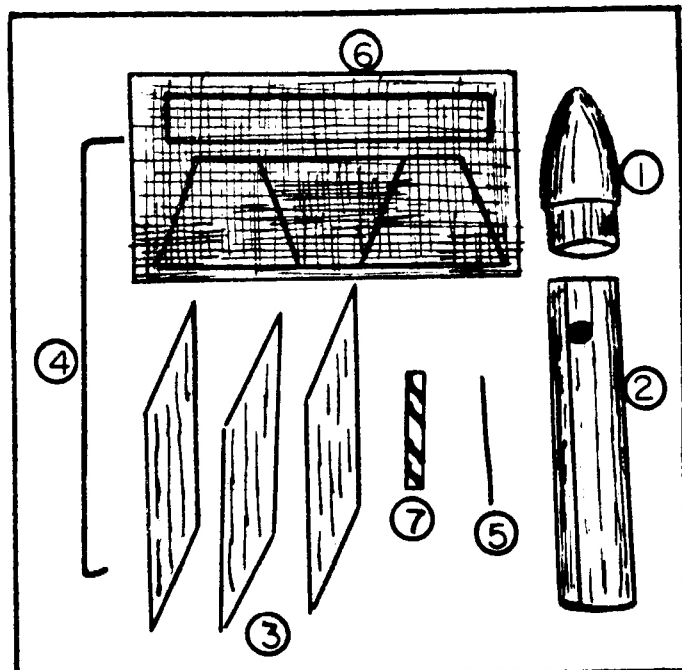
1-2. FITTING THE NOSE CONE. APPLY QUICK DRYING MODEL AIRPLANE CEMENT TO UPPER  $\frac{3}{8}$ " OF BODY TUBE (END WITH THE HOLES) AND TO LOWER PART OF NOSE CONE. FIT PIECES TOGETHER IMMEDIATELY UPON APPLICATION OF GLUE. WIPE OFF EXCESS GLUE.

3. APPLYING THE FINS. GLUE THE FINS JUST TO THE RIGHT EDGE OF THE FIN GUIDE MARKS ON THE BODY TUBE. THIS WILL POSITION THE FINS DIRECTLY IN LINE WITH THE PRESSURE RELIEF HOLES. CAREFULLY ALIGN THE FINS SO THEY EXACTLY FOLLOW THE GUIDE MARKS PROVIDED ON THE BODY TUBE AND ARE POSITIONED AS SHOWN IN THE BOTTOM VIEW DRAWING. THE FINS SHOULD SET AS FAR TO THE REAR OF THE ROCKET AS POSSIBLE AS SHOWN IN THE SIDE VIEW DRAWING.

4. THE MOTOR CATCHING HOOK. THE MOTOR CATCH HOOK EXTENDS FROM NEAR THE FORWARD END OF THE BODY TUBE TO APPROXIMATELY  $1\frac{1}{2}$ " BEYOND THE REAR OF THE BODY TUBE. TO INSTALL, FIRST PUNCH THE LONG 90 DEGREE END OF THE MOTOR CATCH HOOK THROUGH THE SMALL HOLE AT THE UPPER END OF THE BODY TUBE INTO THE Balsa NOSE CONE. BE CAREFUL TO PUNCH THIS HOLE STRAIGHT INTO THE NOSE CONE SO THAT THE SMALL END CAN BE POSITIONED POINTING TOWARD THE CENTER AXIS LINE OF THE ROCKET. SEE (4) BOTTOM VIEW DRAWING. NEXT, WORK A SMALL AMOUNT OF GLUE INTO THIS HOLE. THEN APPLY GLUE TO THE BODY TUBE ALONG THE LINE WHERE THE WIRE WILL BE SECURED. IMMEDIATELY PLACE THE WIRE IN POSITION, BEING SURE IT IS RUNNING EXACTLY PARALLEL TO THE BODY TUBE AND IS SECURELY AGAINST IT. WIPE OFF EXCESS GLUE.

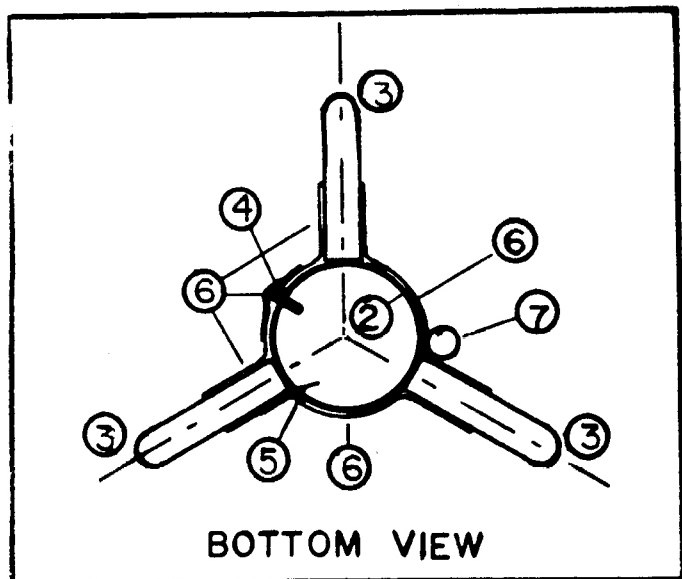
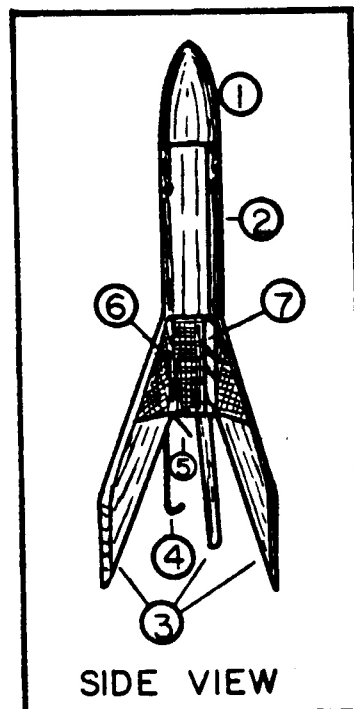
5. THE MOTOR RETAINING WIRE. GLUE THE SMALL COPPER MOTOR RETAINING WIRE ALONG THE BODY TUBE, LEAVING  $\frac{3}{8}$ " PROJECTING BEYOND THE REAR END OF THE BODY TUBE.

6. APPLYING THE GAUZE REINFORCING. THE GAUZE REINFORCING IS A MUST IF YOU ARE TO GET MANY FLIGHTS FROM YOUR ROCKET. FIRST, CUT ALL PIECES FROM THE GAUZE STRIP, CLOSELY FOLLOWING THE LINES. THEN APPLY THE THREE FIN REINFORCEMENTS, ONE AT A TIME, IN THE FOLLOWING MANNER.



A. APPLY GLUE OVER THE AREA TO BE REINFORCED.  
 B. QUICKLY SPREAD THE GLUE EVENLY WITH YOUR FINGER AND THEN APPLY THE GAUZE WITH THE NARROW END FORWARD.  
 C. SMOOTH THE GAUZE EVENLY TILL FREE FROM ALL WRINKLES. (IF THE GAUZE PROJECTS BEYOND THE EDGES OF THE FINS OR BACK OF THE TUBE, IT MAY BE TRIMMED AFTER DRYING THOROUGHLY.)

D. IMMEDIATELY APPLY A COAT OF GLUE OVER THE GAUZE AND SPREAD EVENLY AND SMOOTHLY WITH YOUR FINGER. BE SURE THE GAUZE FITS TIGHTLY INTO ALL CORNERS AND OVER WIRES AS CLOSELY AS POSSIBLE TO PROVIDE MAXIMUM STRENGTH. AFTER ALL 3 FIN REINFORCEMENTS HAVE BEEN COMPLETED, APPLY THE LONG MOTOR HOOK REINFORCEMENT COVERING THE ENTIRE ATTACHED PART OF THE MOTOR HOOK WIRE. THIS DOUBLE REINFORCEMENT IS NECESSARY OVER THE REAR OF THE MOTOR HOOK WIRE SINCE CONSIDERABLE STRESS IS APPLIED TO THIS JOINT WHEN THE MOTOR IS PUT INTO OR REMOVED FROM THE ROCKET. NEXT, APPLY SUCCESSIVE COATS OF GLUE OVER ALL REINFORCEMENTS UNTIL THE HOLES IN THE GAUZE HAVE BEEN FILLED WITH GLUE AND THE SURFACE IS SMOOTH. TWO OR THREE COATS SHOULD BE ADEQUATE. BE SURE TO SMOOTH EACH COAT THOROUGHLY, USING YOUR FINGER. ALLOW A FEW MINUTES BETWEEN COATS FOR DRYING. (FOR THE MORE EXPERIENCED, BETTER EQUIPPED MODELER, THE GAUZE REINFORCEMENTS MAY BE APPLIED USING CLEAR DOPE AND A BRUSH. THIS METHOD REQUIRES A LONGER DRYING TIME.) AFTER THE GLUE HAS THOROUGHLY DRIED, TRIM OFF ALL EXCESS GAUZE.



7. THE LAUNCHING LUG. THE LAUNCHING LUG SHOULD BE THOROUGHLY GLUED INTO THE CORNER MADE BY A FIN WITH THE BODY TUBE AS SHOWN IN THE DRAWING. BE SURE THE LUG IS ALLIGNED WITH THE BODY TUBE SO THE ROCKET WILL BE LAUNCHED IN A VERTICAL DIRECTION.

8. FINISHING. SAND THE FORWARD AND OUTER EDGES OF FINS TILL ROUNDED. SAND THE NOSE CONE AND REMAINING SURFACES UNTIL SMOOTH. THEN COAT WITH DOPE, SAND AND PAINT YOUR ROCKET ACCORDING TO STANDARD MODELING PROCEDURES. REMEMBER IN FINISHING YOUR ROCKET, THE SMOOTHER THE FINISH THE LESS WIND DRAG, AND THE BETTER THE ROCKET WILL FLY.

## ASTRON SCOUT -----DESIGN AND FLIGHT INFORMATION-----

MOST MODEL ROCKETS REQUIRE PARACHUTES, STREAMERS, OR OTHER DRAG MEMBERS TO BREAK THEIR AERODYNAMIC STABILITY DURING THEIR DESCENT. THESE SYSTEMS USUALLY WORK WELL BUT THEY HAVE SOME DISADVANTAGES. PARACHUTES AND STREAMERS ADD UNNECESSARY WEIGHT AND BULK. IF THE WIND IS BLOWING, A PARACHUTE ROCKET WILL END UP A LONG WAY FROM THE LAUNCH AREA. IF TREES ARE PRESENT ANY ROCKET WHICH RETURNS IN TWO PIECES CONNECTED WITH A STRING IS LIKELY TO END UP 40' OFF THE GROUND LOOKING LIKE A FANCY BIRD'S NEST.

THE ASTRON SCOUT IS RADICALLY NEW IN ITS DESIGN. ALTHOUGH, OFF HAND, IT WOULD SEEM IMPOSSIBLE TO MAKE A ROCKET FLY UPWARD AND THEN REFUSE TO FLY DOWN AGAIN, IT CAN BE DONE. THIS IS WHERE THE ASTRON SCOUT DIFFERS FROM MOST MODEL ROCKETS. IT FLIES UP AND THEN COMES TUMBLING DOWN, HEAD OVER HEELS, IN ONE PIECE WITH NO PARACHUTE TO CARRY WITH THE WIND OR CATCH IN A TREE. CAREFULLY READ THE ENCLOSED TECHNICAL REPORT, NO. TR-1. THEN READ THE FOLLOWING PARAGRAPHS. YOU WILL NOT ONLY LEARN HOW THIS ROCKET DOES THE "IMPOSSIBLE", BUT YOU WILL ALSO LEARN ONE OF THE MOST IMPORTANT PRINCIPLES OF ALL ROCKETRY, LARGE OR SMALL, REGARDLESS OF THE TYPE OF RECOVERY SYSTEM EMPLOYED.

THE ASTRON SCOUT ROCKET IS DESIGNED SO THAT, IN FLIGHT, THE MOTOR SETS FORWARD AGAINST THE NOSE CONE. WITH THE MOTOR IN THIS POSITION, THE CENTER OF GRAVITY IS APPROXIMATELY  $5/8$ " AHEAD OF THE CENTER OF PRESSURE. ACCORDING TO THE PRINCIPLES OUTLINED IN TECHNICAL REPORT, NO. TR-1 YOUR ROCKET WILL BE STABLE AND FLY STRAIGHT.

WHEN THE ROCKET REACHES ITS PEAK ALTITUDE, AN EJECTION CHARGE, BUILT INTO THE MOTOR, IS ACTIVATED. THIS PRESSURIZES THE FORWARD END OF THE ROCKET BODY AND FORCES THE EXPENDED MOTOR CASING REARWARD. THE MOTOR CASING IS CAUGHT BY THE MOTOR CATCHING HOOK AND HELD IN THIS REAR POSITION. THIS SHIFTING OF WEIGHT MOVES THE CENTER OF GRAVITY REARWARD APPROXIMATELY  $3/4$ " SO THAT THE CENTER OF GRAVITY IS NOW BEHIND THE CENTER OF PRESSURE. WITH THE CENTER OF GRAVITY BEHIND THE CENTER OF PRESSURE THE ROCKET CAN NOT FLY AND WILL RETURN, IN A TUMBLING FASHION, TO A SOFT LANDING.

IF YOU DO NOT UNDERSTAND THIS PRINCIPLE YOUR ROCKET WILL STILL PERFORM CORRECTLY. IF YOU DO UNDERSTAND IT, YOU HAVE LEARNED ONE OF THE MOST IMPORTANT PRINCIPLES OF ALL ROCKETRY AND SHOULD BE ABLE TO BEGIN DESIGNING YOUR OWN ROCKETS.

FLYING YOUR ROCKET: THE BEST PLACE TO FLY YOUR ROCKET WILL BE ON A MODEL ROCKET RANGE. MOST RANGES ARE SET UP BY ORGANIZED GROUPS OF ROCKET ENTHUSIASTS. SOME OF THESE CLUBS ARE MEMBERS OF THE NATIONAL ASSOCIATION OF ROCKETRY, A NONPROFIT ORGANIZATION, WHICH HAS SET UP CONTEST AND SAFETY RULES USED THROUGHOUT THE COUNTRY. PERHAPS YOU MAY WISH TO JOIN ONE OF THESE CLUBS. IF THERE ISN'T ONE IN YOUR AREA YOU MAY WISH TO GET A FEW OF YOUR FRIENDS TOGETHER AND START ONE. TO FIND OUT WHAT CLUB MAY ALREADY BE OPERATING IN YOUR AREA, WRITE TO THE NATIONAL ASSOCIATION OF ROCKETRY, SUITE 1962-65, 11 W. 42ND ST., NEW YORK 36, N.Y. IF YOU DO NOT BELONG TO A CLUB AND NO MODEL ROCKET RANGE IS AVAILABLE IT IS BEST TO SELECT A PLACE, FREE OF TREES AND HOUSES, THAT IS LARGE ENOUGH IN WHICH TO RECOVER YOUR ROCKET. SINCE THE ASTRON SCOUT LANDS HARDER THAN SOME ROCKETS IT WILL BE PARTICULARLY IDEAL IF THE AREA IS COVERED WITH GRASS. LANDING YOUR ROCKET ON TOO HARD A SURFACE WILL QUITE OFTEN RESULT IN THE BREAKING OF A FIN. (BROKEN FINS CAN BE REPLACED, HOWEVER, AND YOUR ROCKET WILL BE AS GOOD AS NEW.) IF POSSIBLE, THE PLACE YOU SELECT TO FLY YOUR ROCKET SHOULD BE AWAY FROM PERSONS WHO ARE NOT PARTICIPATING OR WATCHING THE ROCKET LAUNCHING. ALSO, A MODEL ROCKET SHOULD NOT BE FLOWN IN HIGH WINDS OR IN THE VICINITY OF FLYING AIRCRAFT.

REPLACING THE MOTOR: AFTER EACH FLIGHT OF THE ASTRON SCOUT THE EXPENDED MOTOR MUST BE REMOVED AND REPLACED WITH A NEW ONE. TO REMOVE THE MOTOR, SPRING THE MOTOR CATCH HOOK OUT OF THE WAY AND PULL THE MOTOR OUT BEFORE RELEASING THE HOOK. NEXT, BE SURE THE PAPER CAP EJECTED FROM THE OLD MOTOR IS REMOVED. CHECK TO MAKE SURE THE ROCKET BODY IS FREE FROM DEBRIS AND RESIDUE BUILD UP. AFTER YOU HAVE FLOWN YOUR ROCKET SEVERAL TIMES A DEPOSIT OF EJECTION CHARGE RESIDUE MAY BUILD UP ON THE INSIDE OF THE ROCKET BODY. IF THIS DEPOSIT BECOMES EXCESSIVE IT MAY INTERFERE WITH THE PROPER FIT OF THE MOTOR. YOU CAN REMOVE THIS DEPOSIT BY SCRAPING WITH A KNIFE BLADE OR SIMILAR OBJECT.

WHEN THE NEW MOTOR IS BEING INSTALLED IN THE ROCKET BODY CHECK TO BE SURE IT IS LOOSE ENOUGH TO EASILY SLIDE FORWARD AGAINST THE NOSE CONE. WITH THE MOTOR RESTING AGAINST THE NOSE CONE YOU SHOULD BE ABLE TO EXPEL IT BY FIRMLY SHAKING YOUR ROCKET. DO NOT FIRE YOUR ROCKET IF YOU CANNOT DO THIS.

BEFORE THE ASTRON SCOUT ROCKET IS PUT ON THE LAUNCH PAD, BE SURE THE MOTOR IS INSTALLED IN THE ROCKET BODY WITH THE NOZZLE END OF THE MOTOR EVEN WITH THE REAR OF THE BODY TUBE. THE MOTOR IS RETAINED IN THIS POSITION BY BENDING THE RETAINING WIRE OVER THE END OF THE MOTOR. UPON IGNITION, THE THRUST OF THE MOTOR WILL MOVE IT FORWARD AGAINST THE NOSE CONE. IT WILL STAY THERE UNTIL THE EJECTION CHARGE FORCES IT REARWARD AT THE APEX OF THE FLIGHT.

MOTORS: THE ASTRON SCOUT MODEL ROCKET IS DESIGNED TO BE FLOWN ONLY WITH MOTORS MANUFACTURED BY ESTES INDUSTRIES. THE WEIGHT DISTRIBUTION (CENTER OF GRAVITY--CENTER OF PRESSURE RELATIONSHIP) OF THIS ROCKET IS VERY CRITICAL AND OTHER TYPES OF MOTORS WILL NOT WORK. THE TYPES RECOMMENDED ARE THE  $\frac{1}{2}$ A.8-2SM, A.8-3SM, A.8-4SM, AND THE B.8-4SM. THEY WILL ALL PERFORM SATISFACTORILY. YOU SHOULD BE ABLE TO GET ABOUT 420' USING THE  $\frac{1}{2}$ A MOTORS AND OVER 1200' FROM THE B MOTORS. CAUTION: FOR BEGINNERS AND THOSE LIMITED TO SMALL FLYING FIELDS, THE  $\frac{1}{2}$ A MOTOR IS THE BEST. A SMALL ROCKET 1200' UP IS AWFULLY DIFFICULT TO SEE AND MAY COME DOWN SEVERAL HUNDRED FEET FROM THE LAUNCHING AREA. LEARN TO FLY YOUR ROCKET WITH THE SMALLER MOTORS THEN GO TO THE LARGER ONES. THIS WAY YOU WILL LOSE FEWER ROCKETS.

FIRING YOUR ROCKET: MUCH GREATER REALISM AND SAFETY ARE POSSIBLE BY FIRING YOUR ROCKET ELECTRICALLY. TO ADD TO THE REALISM, A COUNT DOWN IS USUALLY GIVEN; 5----4-----3----2----1-----FIRE. THE FIRING SWITCH IS DEPRESSED AT THE PROPER TIME SO THE ROCKET INSTANTLY ZOOMS SKYWARD AT THE WORD FIRE. IF A GROUP IS PRESENT, A COUNT DOWN IS A MUST IN ORDER FOR THE OTHERS TO KNOW WHEN THE ROCKET IS GOING TO BE LAUNCHED.

FOR LAUNCHING YOU MAY CONSTRUCT A FIRING SYSTEM OF YOUR OWN DESIGN, OR YOU MAY ORDER ONE FROM ESTES INDUSTRIES OR FROM THE STORE WHERE YOU PURCHASED YOUR ROCKET. THE LAUNCHING RAIL FOR THE ASTRON SCOUT MUST BE AT LEAST 18" LONG.

STORING YOUR ROCKET: IN DRY CLIMATES YOU NEED PAY NO SPECIAL ATTENTION TO THE STORING OF YOUR ROCKET. JUST SET IT UP ON A SHELF. IN EXTREMELY HUMID CLIMATES IT WILL BE NECESSARY TO PROTECT YOUR ROCKET FROM MOISTURE. IT SHOULD ALWAYS BE KEPT IN A DRY PLACE. IF YOU ARE STORING YOUR ROCKET FOR A LONG PERIOD OF TIME UNDER EXTREMELY HIGH HUMIDITY, IT SHOULD BE DRIED THOROUGHLY AND PLACED IN A TIGHTLY CLOSED POLYETHYLENE BAG. THE RESIDUE WHICH BUILDS UP ON THE INSIDE OF THE ROCKET BODY IS EXTREMELY HYDROSCOPIC. IT WILL BECOME WET IF EXPOSED TO EXCESSIVE HUMIDITY.

# ASTRON SCOUT



Kit No. K-1

**SMALL  
STEADY**

**only 70¢**

- CLIMBS TO OVER 1000'!
- UNIQUE RECOVERY!
- A "MUST" FOR BEGINNERS!



Industries, Inc.

Small Steady  
Paraglider



The following is a list of the contents of the bag...

1. A rolled-up document (likely a patent or technical drawing) containing the following drawings:

- Fig. 1: A circular diagram with a diagonal line and various labels.
- Fig. 2: A smaller diagram below Fig. 1, also with labels.
- Fig. 3: A simple diagram consisting of a vertical line with a horizontal crossbar.

2. Several wooden sticks or tools, possibly used in the process described in the document.

The document is written in English and appears to be a technical specification or a patent application. The drawings are detailed and show various components and their relationships.

# ASTRON SCOUT

Pat. No. 3114317

----- ASSEMBLY INSTRUCTIONS -----

The Astron Scout Rocket Kit consists of the following parts as illustrated in the drawing at right:

1. Nose Cone	Part# BNC-30D
2. Body Tube	BT-30A
3. Fins, Pre-cut	BFS-60S
4. Motor Hook	MH-1
5. Motor Retaining Wire	RW-1
6. Gauze Reinforcing Material	GR-1
7. Launching Lug	LL-1A

For assembling your rocket you will also need a sharp knife or razor blade, a piece of fine grit sandpaper, fast drying model glue or cement, a sharp pencil, and a pair of scissors.

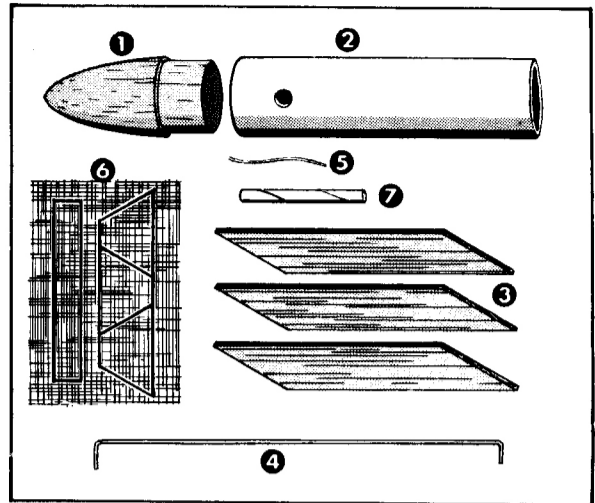
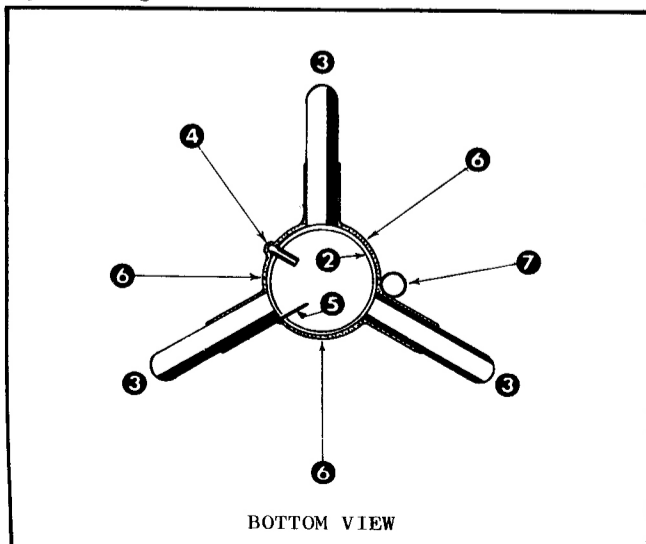
Check to be sure your kit is complete. Then read the complete instructions, steps one through eight, before beginning construction.

**1. FITTING THE NOSE CONE:** Apply glue to the upper 3/8" of the body tube (end with the holes) and to the lower 3/8" mating surface of the nose cone. Fit the pieces together immediately after application of the glue. Wipe off any excess glue.

**2. MARKING THE TUBE:** Before the fins are glued to the body it will be necessary to mark the tube to position the fins equally around its circumference. To do this, center the lower end of the body exactly on the bottom view drawing below. Turn the tube so that the small (1/16") hole at the top of the tube is exactly over the catch hook position, indicated on the drawing by (4), with the large hole over the opposite (lower right hand in the drawing) fin. Using a sharp pencil, mark the tube base exactly on the outside edges of the fins (3) in the drawing. The two marks for each fin should be 3/16" apart if this has been done correctly. If this step is carried out properly, the motor hook (4) will fall exactly between two of the fins on the rocket.

**3. ATTACHING THE FINS:** Apply a light coating of glue to one end of one fin and press this end of the fin to the body between two of the marks made in step 2. One side of the fin should then be exactly on one mark, the other side on the other. Align the fin by sighting down the body from the top and adjusting the fin until it is exactly in line with, and parallel to, the center axis of the body. This must be done carefully or the performance of the rocket will be impaired. Repeat this procedure with the other two fins, being careful not to move the previously attached fins out of line. Do not set the rocket on the fins or apply any pressure to them until the glue has dried.

**4. THE MOTOR CATCH HOOK:** The motor catch hook extends from near the forward end of the body tube to approximately 1 1/2 inch beyond the rear of the body tube. To install, first punch the long 90 degree end of the motor hook through the small hole at the upper end of the body tube into the balsa nose cone. Be careful to punch this hole straight into the nose cone so that the small end can be positioned to point directly to the center axis of the rocket as at (4) in the bottom view drawing. Next, work a small amount of glue into this hole. Then apply glue to the body tube along the line where the wire will be secured. Immediately place one wire in position, being sure it is running exactly parallel to the body tube and is securely against it. Wipe off any excess glue.

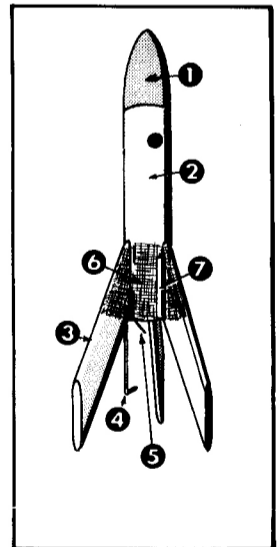


**5. THE MOTOR RETAINING WIRE:** Glue the small copper motor retaining wire along the body tube, leaving 3/8 inch of its length projecting beyond the rear end of the body tube.

**6. APPLYING THE GAUZE REINFORCING:** The gauze reinforcing is necessary if your rocket is to be flown more than once or twice. First, cut all pieces from the gauze strip, closely following the lines. Then apply the three fin reinforcements, one at a time, in the following manner:

- Apply glue over the area to be reinforced.
- Quickly spread the glue evenly with your finger and then apply the gauze with the narrow end forward.
- Smooth the gauze evenly until it is free from all wrinkles. (If the gauze projects beyond the edges of the fins or back of the tube, it may be trimmed after drying thoroughly.)
- Immediately apply a coat of glue over the gauze and spread evenly and smoothly with your finger. Be sure the gauze fits tightly into all corners and over wires as closely as possible to provide maximum strength.

After all three fin reinforcements have been completed, apply the long motor hook reinforcement covering the entire attached part of the motor hook wire. This double reinforcement is necessary over the rear of the motor hook since considerable stress is applied to this joint when the engine is put into or removed from the rocket. Next, apply successive coats of glue over all reinforcements until the holes in the gauze have been filled with glue and the surface is smooth. Two or three coats should be adequate. Be sure to smooth each coat thoroughly, using your finger. Allow a few minutes between coats for drying. (For the more experienced, better equipped modeler, the gauze reinforcements may be applied using clear dope and a brush. This method requires a longer drying time.) After the glue has dried thoroughly, trim off all excess gauze.



**7. THE LAUNCHING LUG:** The launching lug should be thoroughly glued into the corner made by a fin and the body tube as shown in the drawing. Be sure the lug is aligned with the body tube so the rocket will be launched in a vertical direction.

**8. FINISHING:** Sand the forward and outer edges of the fins until rounded. Sand the nose cone and remaining surfaces until smooth. Then coat with sanding sealer, sand again with very fine grit sandpaper, and paint your rocket according to standard modeling procedures. When finishing your Astron Scout remember that the smoother the finish, the less wind drag, and the better the rocket will fly.

## ----- DESIGN AND FLIGHT INFORMATION

# ASTRON SCOUT

Most model rockets require parachutes, streamers, or other drag members to break their aerodynamic stability during their descent. These systems usually work well, but they have some disadvantages. Parachutes and streamers add unnecessary weight and bulk. If the wind is blowing, a parachute rocket will end up a long way from the launch area. If trees are present any rocket which returns in two pieces connected with a string is likely to end up 40 feet off the ground looking like a fancy bird's nest.

The Astron Scout is radically different in its design. Although, at first thought, it would seem impossible to make a rocket fly upward and then refuse to fly down again, it can be done. This is where the Astron Scout differs from most model rockets. It flies up and then comes tumbling down, head over heels, in one piece with no parachute to carry with the wind or catch in a tree. Carefully read the enclosed technical report, no. TR-1. Then read the following paragraphs. You will not only learn how this rocket does the "impossible," but you will also learn one of the most important principles of all rocketry, large or small, regardless of the type of recovery system employed.

The Astron Scout rocket is designed so that, in flight, the engine sits forward against the nose cone. With the engine in this position, the center of gravity is approximately  $5/8$ " ahead of the center of pressure. According to the principles outlined in Technical Report TR-1, your rocket will be stable and fly straight.

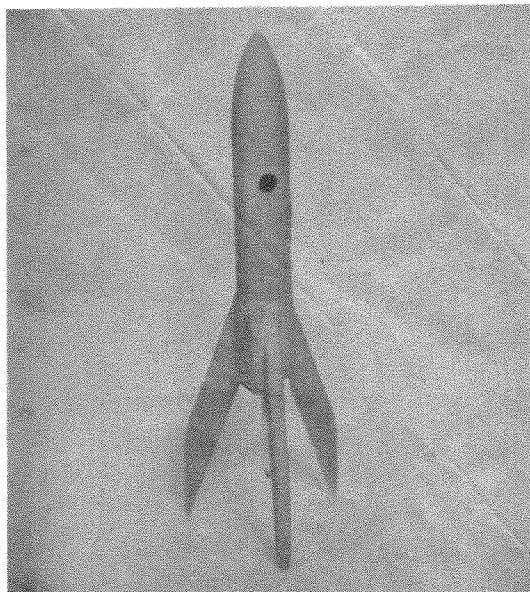
When the rocket reaches its peak altitude, an ejection charge, built into the engine, is activated. This pressurizes the forward end of the rocket body and forces the expended engine casing rearward. The engine casing is caught by the motor catch hook and held in this rear position. This shifting of weight moves the center of gravity rearward approximately  $3/4$  inch so that the center of gravity is now behind the center of pressure. With the center of gravity behind the center of pressure the rocket can not fly straight and will return, tumbling, to a soft landing, since the wind drag on an unstable object is extremely high.

If you do not understand this principle your rocket will still perform correctly. If you do understand it, you have learned one of the most important principles of all rocketry and should be able to begin designing your own model rockets.

**FLYING YOUR ROCKET:** The best place to fly your rocket will be on a model rocket range. Most ranges are set up by organized groups of rocket enthusiasts. If there is no model rocket club in your area, you may wish to start one. Estes Industries has available a Guide for Rocket Clubs which contains considerable information on forming and operating a model rocket club. To obtain a copy, send a stamped, self-addressed envelope to Estes Industries.

If you do not belong to a club and have no model rocket range available, it is best to select a place, free of trees and houses, that is large enough in which to recover your rocket. Generally such a location should be at least 1000 feet on each side, with the rocket launched from the center of the area. Since the Astron Scout lands harder than some rockets, it will be particularly ideal if the area is covered with grass. Landing your rocket on too hard a surface may result in the breaking of a fin. (Broken fins can be replaced, however, and the rocket will be as good as new.) The place you select to fly your rocket should be away from persons who are not participating in or watching the rocket launching. Also, a model rocket should not be flown in high winds or in the vicinity of low flying aircraft.

**REPLACING THE ENGINE:** After each flight of the Astron Scout the expended engine must be removed and replaced with a new one. To remove the engine, spring the motor catch hook out of the way and pull the engine out before releasing the hook. Next, be sure the paper cap ejected from the old engine is removed. Check to make sure the rocket body is free of debris and residue build up. After you have flown your rocket several times a deposit of ejection charge residue may build up on the inside of the rocket body. If this deposit becomes excessive it



may interfere with the proper fit of the engine. You can remove this deposit by scraping with a knife blade or similar object.

When the new engine is being installed in the rocket body check to be sure it is loose enough to easily slide forward against the nose cone. With the engine resting against the nose cone you should be able to expel it by firmly shaking your rocket. DO NOT FIRE YOUR ROCKET if you can not do this.

Before the Astron Scout rocket is put on the launch pad, be sure the engine is installed in the rocket body with the nozzle end of the engine even with the rear of the body tube. The engine is retained in this position by bending the retaining wire over the end of the engine. Upon ignition, the thrust of the engine will move it forward against the nose cone. It will stay there until the ejection charge forces it rearward at the apex of the flight.

**ENGINES:** The Astron Scout model rocket is designed to be flown only with Series I and Series II engines manufactured by Estes Industries. The weight distribution (center of gravity--center of pressure relationship) of this rocket is very critical and other types of engines will not work. The types recommended are the 1/4A.8-2, 1/2A.8-2, A.8-3, A.8-4, and B.8-4. They will all perform satisfactorily. You should be able to reach about 420 feet using the 1/2A engines and over 1200 feet with the B engines. **CAUTION:** For beginners and those limited to small flying fields, the 1/4A and 1/2A engines are the best. A small rocket 1200 feet up is very difficult to see and may come down several hundred feet from the launching area. Learn to fly your rocket with the smaller engines before going to the larger ones. This way you will lose fewer rockets.

**LAUNCHING YOUR ROCKET:** Much greater realism and safety are possible by launching your rocket electrically. To add to the realism, a count down is usually given: "5- -4- -3- -2- -1- -Mark." The launch switch is depressed at "Mark," and in a fraction of a second the rocket is zooming skyward. If a group is present, a count down is a must in order for the others to know when the rocket is going to be launched.

For launching you may construct an ignition system of your own design, or you may order one from Estes Industries or from the store where you purchased your rocket. The launching rail for the Astron Scout must be at least 30" long.

**STORING YOUR ROCKET:** In dry climates you need pay no special attention to the storing of your rocket. Just set it up on a shelf. In extremely humid climates it will be necessary to protect your rocket from moisture. It should always be kept in a dry place. If you are storing your rocket for a long period of time under extremely high humidity, it should be dried thoroughly and placed in a tightly closed polyethylene bag. The residue which builds up on the inside of the rocket body is extremely hygroscopic, and will become damp and sticky if exposed to excessive humidity.





ESTES  
A DIVISION OF TRUEN

# MODEL ROCKETRY

SCIENTIFIC SPACE AGE HOBBY



ESTES

## Astron SCOUT

- EASY-TO-BUILD
- EDUCATIONAL



70¢

### SCOUT

KIT NO. K-1

\$ .70

#### SPECIFICATIONS

Length 7"  
Body Dia. 0.745"  
Weight 0.28 oz.

#### RECOMMENDED ENGINES

1A3-3, 1A6-3, A5-4,  
A8-3, M-A, C6-5

(Use 1A3-3 for Best Results)

TUMBLE RECOVERY

For your nearest dealer or distributor, contact your nearest retailer or contact us at 1-800-4-A-ROCKET. For more information, visit our website at www.estes.com. © 1999 Estes Industries, Inc. All rights reserved. ESTES is a registered trademark of Estes Industries, Inc. in the U.S. and other countries. ESTES INDUSTRIES, INC. 10000 W. 15th Ave., Denver, CO 80202

## THE ASTRON SCOUT

### CHANGING ENGINES

**REPLACING THE ENGINE.** After each flight the expanded engine must be removed. Spring the catch hook out of the way and pull the engine out before reassembling the body. Make sure the rocket body is removed from the old engine in reverse. After you have flown your rocket several times a department of aeration change will take you further up on the scale of the rocket body. If this department also has a stock of with alternate with the proper fit of the engine. You can remove this department by comparing with a knife blade or similar object.

### CHECK NEW ENGINE FIT

When a new engine is installed in the rocket body it must be loose enough to allow it to slide forward against the nose cone. With the engine moving against the nose cone you should be able to expect it to slide out your rocket. DO NOT LAUNCH YOUR ROCKET if you cannot do this.

When you are putting the Scout on the launch pad, be sure the nose cone is in the proper position with the rear of the body tube. The engine is held in position by the launch pad. The retaining apparatus at the top of the engine. It is also there with the position change before it is removed at the end of flight.

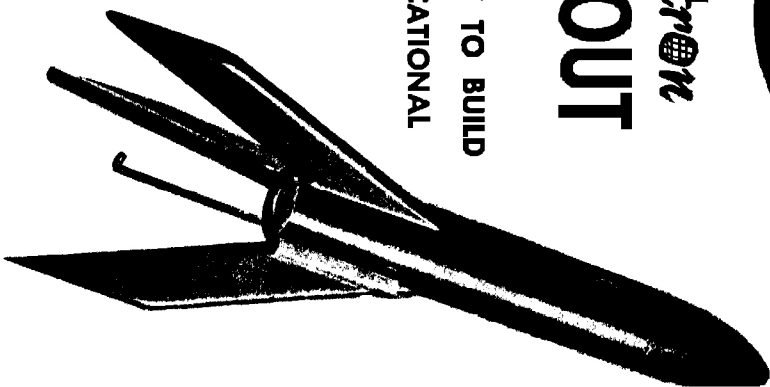
### SLIGHT OF ENGINES

When you are ready to launch your Scout, be sure the engine is in the proper position. It is also there with the position change before it is removed at the end of flight.



**ESTES****Astron****SCOUT**

- EASY TO BUILD
- EDUCATIONAL

**70¢****KIT NO K-1****SCOUT****\$.70****SPECIFICATIONS**

Length **7"**  
 Body Dia. **0.765"**  
 Weight **0.28 oz.**

**RECOMMENDED ENGINES**

**1/4A3-2, 1/4A6-2, A5-4,  
 A8-3, B6-4, C6-5**  
 (Use 1/4A3-2 for First Flight.)

**TUMBLE RECOVERY****INFORMATION ABOUT THE ASTRON SCOUT****WHY IT WORKS**

Most model rockets require parachutes, streamers or other drag members to slow their descent. These systems work well, but they also have some disadvantages. Parachutes and streamers add unnecessary weight and bulk. If the wind is blowing, a parachute rocket will end up a long way from the launch area. If trees are present any rocket which returns in two pieces connected with a string is likely to end up 40 feet off the ground looking like a fancy bird's nest.

The Astron Scout is radically different in its design. Although, at first thought, it might seem impossible to make a rocket fly on the way up and then refuse to fly down again, it can be done. This is where the Astron Scout differs from most model rockets. It flies up but then comes tumbling down, head over heels, in one piece with no parachute to carry with the wind or catch in a tree. Read the enclosed technical report (No. TR-1) carefully. Then read the following paragraphs. You will not only learn how this rocket does the "impossible," but you will also learn one of the most important principles of all rocketry, large or small, regardless of the type of recovery system used.

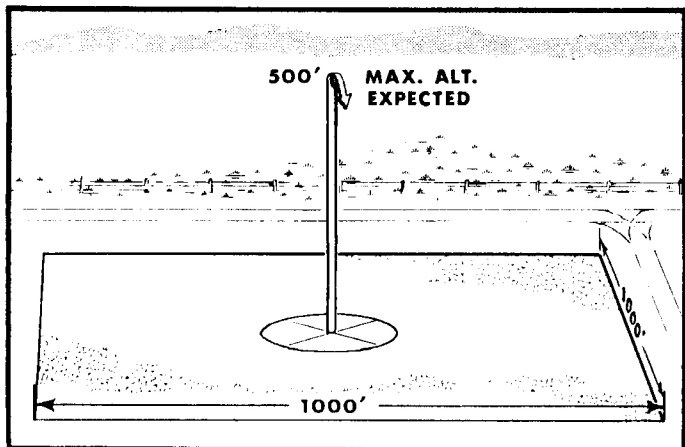
The Astron Scout is designed so that in flight the engine sits forward against the nose cone. With the engine in this position, the center of gravity is about 5/8" ahead of the center of pressure. According to the principles outlined in Technical Report TR-1, your rocket will be stable and fly straight.

As the rocket reaches its peak altitude, the ejection charge in the engine is activated. This charge produces gas which pressurizes the space between engine and nose cone and forces the engine casing rearward. The engine casing is caught by the catch hook and held in this rear position. This shifting of weight moves the center of gravity back about 3/4 inch so it is now behind the center of pressure. With the center of gravity behind the center of pressure the rocket cannot fly straight and returns, tumbling, to a soft landing, since the air drag on an unstable object is extremely high.

If you do not understand this principle your rocket will still perform correctly. If you do understand it, you have learned one of the most important principles of all rocketry and should be able to begin designing your own model rockets.

**WHERE TO FLY**

**WHERE TO FLY YOUR ROCKET:** The best place to fly your rocket will be on a model rocket range. Most ranges are set up by organized groups of rocket enthusiasts. If there is no model rocket club in your area, you may wish to start one. Estes Industries has available a Guide for Rocket Clubs containing information on forming and operating a model rocket club. To obtain a copy, send a stamped, self-addressed envelope to Estes Industries.



If you do not have a regular model rocket range available, select a place, free of trees and houses, that is large enough to allow recovery of your rocket. Generally the area should be at least 1000 feet on each side. Launch the rocket from the center of the area. Since the Astron Scout lands harder than some rockets, it will be ideal if the area is covered with grass. Landing your rocket on too hard a surface may result in the breaking of a fin. (Broken fins can be replaced, however, and the rocket will be as good as new.) The place you select to fly your rocket should be away from persons who are not participating in or watching the launching. Also, a model rocket should not be flown in high winds or near low flying aircraft.

**CHANGING ENGINES**

**REPLACING THE ENGINE:** After each flight the expended engine must be removed. Spring the catch hook out of the way and pull the engine out before releasing the hook. Next, be sure the paper cap ejected from the old engine is removed. Make sure the rocket body is free of debris and residue build up. After you have flown your rocket several times a deposit of ejection charge residue may build up on the inside of the rocket body. If this deposit gets too thick it will interfere with the proper fit of the engine. You can remove this deposit by scraping with a knife blade or similar object.

**CHECK NEW ENGINE FIT**

When a new engine is installed in the rocket body it must be loose enough to easily slide forward against the nose cone. With the engine resting against the nose cone you should be able to expel it by shaking your rocket. **DO NOT LAUNCH YOUR ROCKET** if you can not do this.

Before putting the Scout on the launch pad, be sure the nozzle end of the engine is even with the rear of the body tube. The engine is held in this position by bending the retaining wire over the end of the engine. At ignition the thrust of the engine moves it forward against the nose cone. It stays there until the ejection charge forces it rearward at the apex of flight.

**CHOICE OF ENGINES**

**ENGINES TO USE:** The Astron Scout model rocket is designed to be flown only with Series I and Series II engines manufactured by Estes Industries. The weight distribution (center of gravity - center of pressure relationship) of this rocket is very critical and other types of engines will not work. The types recommended are the 1/2A6-2, the A8-3, the B6-4 and the C6-5. The model can also be flown with 1/4A3-2, A5-2, A5-4, B4-4, B6-6, B14-5 and C6-7 engines. **CAUTION:** For beginners and those limited to small flying fields, the 1/2A and A engines are best. Larger engines will often take the model out of sight. Learn to fly and follow your model with the smaller engines before going to the larger ones. This way you lose fewer rockets.

**LAUNCHING**

**LAUNCHING PROCEDURE:** Always launch your model using a standard electrical system with a 1/8" diameter guide rod at least 30" long. For information on building a launcher, check the instructions which came with your engine. Follow the countdown procedure given below when flying to eliminate mistakes and to provide greater realism and safety.

**COUNTDOWN CHECKLIST**

- 12- Select an engine and install an electrical igniter as directed in the instructions which came with the engine.
- 11- Insert the engine into the body tube, making sure it slides easily. Bend the retaining wire to hold the engine in place.
- 10- Remove the safety interlock or key from the launch control panel. (If a simple spring switch is used, install the protector on the switch to separate the contacts.) Carry the key or interlock on the person of the launch control officer.
- 9- Place the rocket on the launcher. Check to be sure the panel is disarmed. Clean the micro-clips and attach them to the igniter.
- 8- Clear the launch area, alert the recovery crew and the trackers.
- 7- Check for low flying aircraft and unauthorized persons in the launch and recovery areas before beginning the final countdown.
- 6- Arm the launch panel.

5  4  3  2  1 **LAUNCH!**

**STORAGE**

**STORING YOUR MODEL:** In a dry climate the rocket may be just set upon the shelf where it won't be knocked off or crushed. In humid climates it will be necessary to protect the rocket from moisture. It should always be kept in a dry place. If it is being stored for a long period under extremely high humidity it should be dried thoroughly and placed in a tightly closed plastic bag. The residue which builds up on the inside of the rocket body is hygroscopic and will become damp and sticky if exposed to excessive humidity.

# PARTS LIST

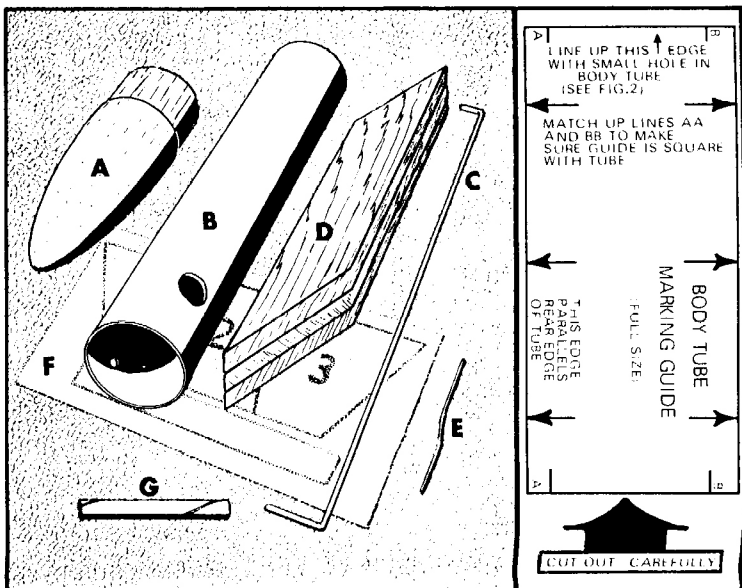
Your Astron Scout model rocket kit consists of the following parts as illustrated in the drawing at right:

- (A) 1 Nose Cone—Part #BNC-30D
- (B) 1 Body Tube—Part #BT-30A
- (C) 1 Engine Hook—Part #MH-1
- (D) 3 Precut Fins—Part #BFS-60S
- (E) 1 Engine Retaining Wire—Part #RW-1
- (F) 1 Gauze Reinforcing Material—Part #GR-1
- (G) 1 Launching Lug—Part #LL-2A
- (H) 1 Technical Report—Part #TR-1

In addition to the material included in your kit you will also need the following tools and supplies:

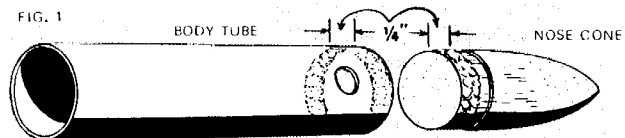
- 1) Modeling knife or single edge razor blade
- 2) Scissors
- 3) Extra-strong white glue
- 4) Ball point pen or pencil
- 5) Fine and extra fine grit sandpaper
- 6) White paint or dope

Read the entire assembly instructions carefully before beginning work on your rocket. Then start construction, following each step in order, checking off each step as it is completed.

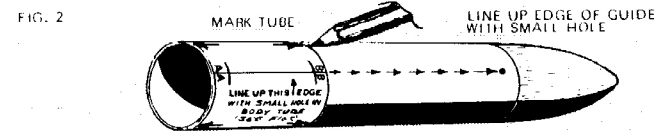


## A S S E M B L Y

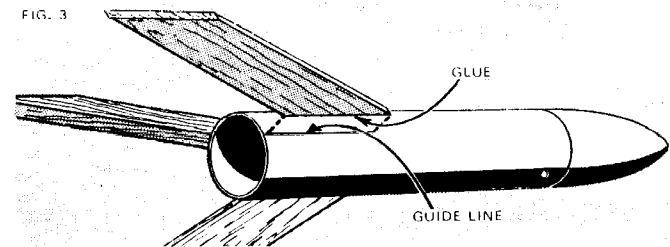
## I N S T R U C T I O N S



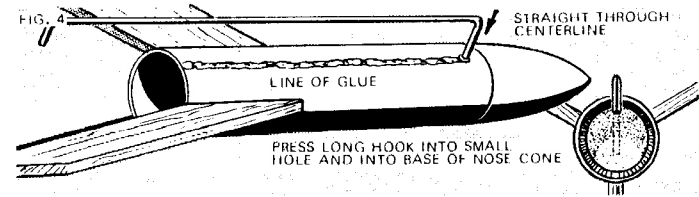
1. **INSTALL THE NOSE CONE:** Apply glue to the upper 1/4" of the body tube (the end with the holes) and to the lower 1/4" of the mating surface of the nose cone. Fit the pieces together and wipe off any excess glue.



2. **MARK THE TUBE:** Cut out the body tube marking guide. Wrap it around the body tube with the hole locations on the guide lined up with the hole locations on the tube. Mark the body at each of the arrow points. Remove the guide and draw a straight line connecting each matching pair of front and rear marks as shown.



3. **ATTACH THE FINS:** Apply a light coating of glue to one end of one fin and press this end of the fin to the body alongside one of the lines made in step 2. Hold the fin in place so it sticks straight out from the body until the glue starts to stick, then repeat the same procedure with the other two fins. Do not set the rocket on its fins or apply any pressure to them until the glue has dried.



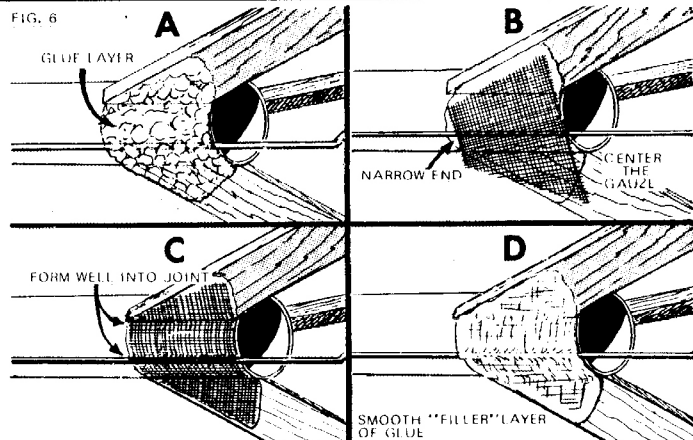
4. **MOUNT THE ENGINE CATCH HOOK:** The engine catch hook extends from near the forward end of the body tube to about 1-1/2 inch beyond the rear of the body tube. To install, first punch the long bend end of the hook through the small hole at the upper end of the body tube and into the balsa nose cone. Be careful to punch this hole straight into the nose cone so the wire goes through the centerline of the rocket as shown in the rear view drawing. Squirt a small amount of glue into the hole and apply a line of glue to the body tube straight back from the hole where the main section of the hook will fit. Push the wire into position, being sure it is running parallel to the body and is securely against it. Wipe off any excess glue.



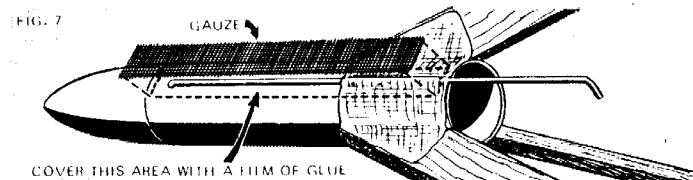
5. **ADD THE ENGINE RETAINING WIRE:** Glue the small copper engine retaining wire to the rear of the body tube so 3/8 inch of its length projects beyond the rear end of the body tube.

6. **REINFORCE THE FINS:** The gauze reinforcing is necessary if your rocket is to be flown more than once or twice. First cut out sections 1, 2 and 3. Apply these, one at a time, in the following manner:

- A. Apply glue over the area to be reinforced.
- B. Quickly spread the glue evenly with your finger and then apply the gauze with the narrow end forward.

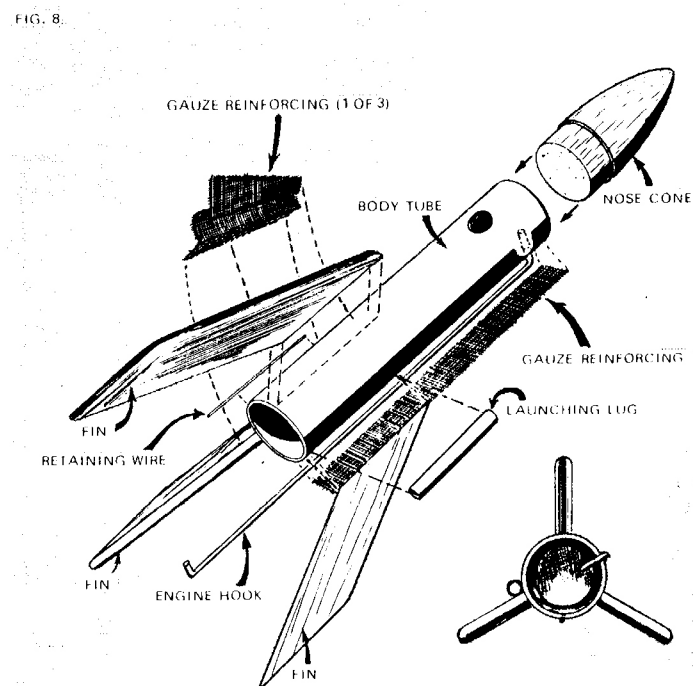


C. Smooth the gauze evenly until it is free from all wrinkles.  
D. Immediately apply a coat of glue over the gauze and spread it evenly with your finger. Be sure the gauze fits tightly into all corners and over wires as closely as possible to provide maximum strength.



7. **SECURE THE ENGINE HOOK:** After all three fin reinforcements have been completed, cut out the long rectangular section of gauze. Apply this piece over the engine catch hook in the same manner as the fin reinforcements. Let all the glue dry for several minutes, then apply until all the holes in the gauze have been filled with glue and the surface is smooth. Allow time for drying between coats. After the last coat has dried thoroughly, trim off all excess gauze.

8. **INSTALL THE LAUNCHING LUG:** Glue the launching lug into the corner made by a fin and the body tube. Be sure the lug is aligned with the body tube so the rocket will get a straight start.



9. **FINISH YOUR BIRD:** Sand the forward and outer edges of the fins until rounded. Sand the nose cone and remaining surfaces until smooth. Then coat all balsa surfaces with sanding sealer, let dry and sand again with very fine sandpaper. Repeat this until all holes in the balsa are filled. Paint your model a bright color for easy visibility. Remember that the smoother the surface of the model, the higher it will fly.



A QUALITY COMPANY

Recommended for Ages 10 to Adult  
Best Performance Designed to Fly Over  
10 Miles of Age When Flying Model Rockets

1 MODEL KIT Parts and glue are included.  
1 MODEL REPORT Purchase at Extra low prices.

# Flying Model Rocket

## The Rocket SCOUT



- EDUCATIONAL
- EASY TO BUILD
- HIGH PERFORMANCE

### SKILL LEVEL

1-Beginner 2-Intermediate 3-Confident 4-Advanced 5-Expert

### SPECIFICATIONS

Length 7" (178 mm) Weight 0.2 lb. (90 g)  
Body Dia. 0.75" (19 mm) Thrust Recovery

### RECOMMENDED ENGINES

1-1/2" E, A, B, M, & C  
Use 1-3/8" E for Total Thrust Engines and Thruster Installation

K-1

0120

ESTES INDUSTRIES

MINNETONKA, MINN. 55345

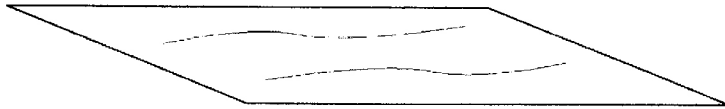
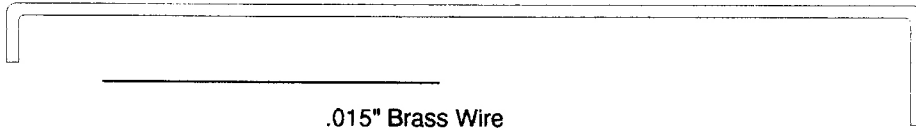
Astron

Classic Plan

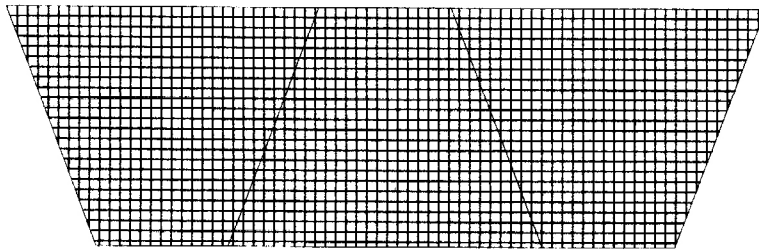
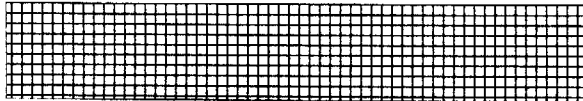
# Scout

Design by Estes Industries  
Drawn by Peter Alway

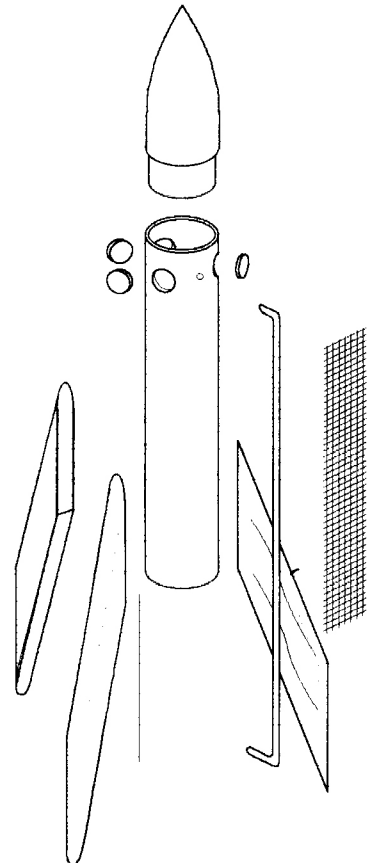
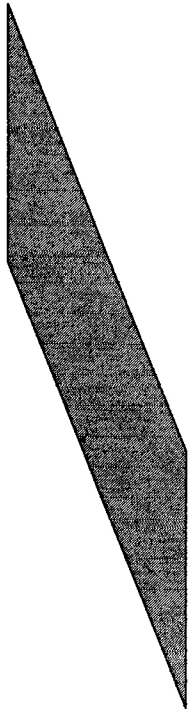
1/16" Steel Wire



3/16" Balsa



Gauze Reinforcing

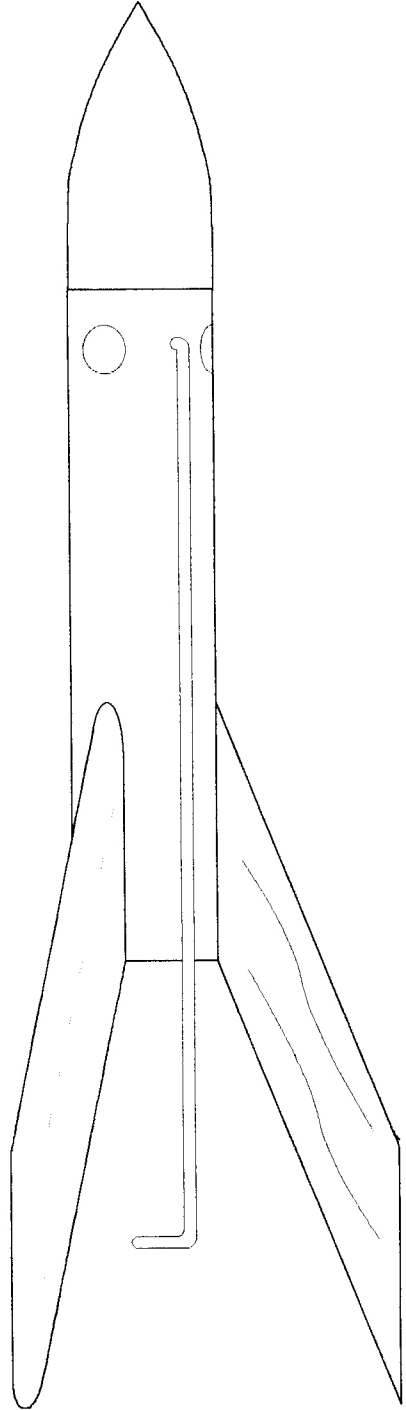
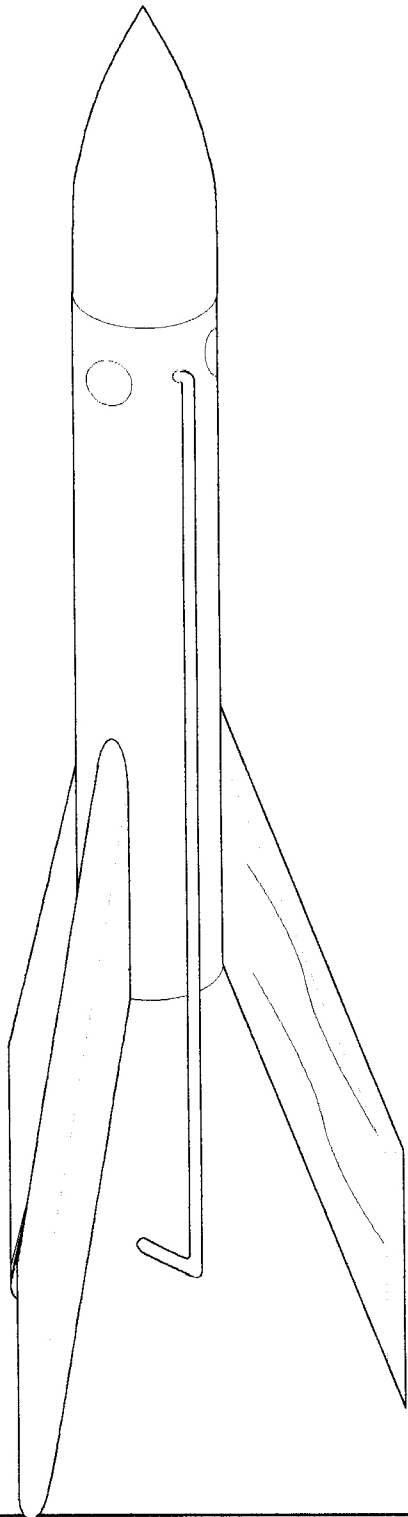


Classic Plan

*Astron*

# Scout

Design by Estes Industries  
Drawn by Peter Alway

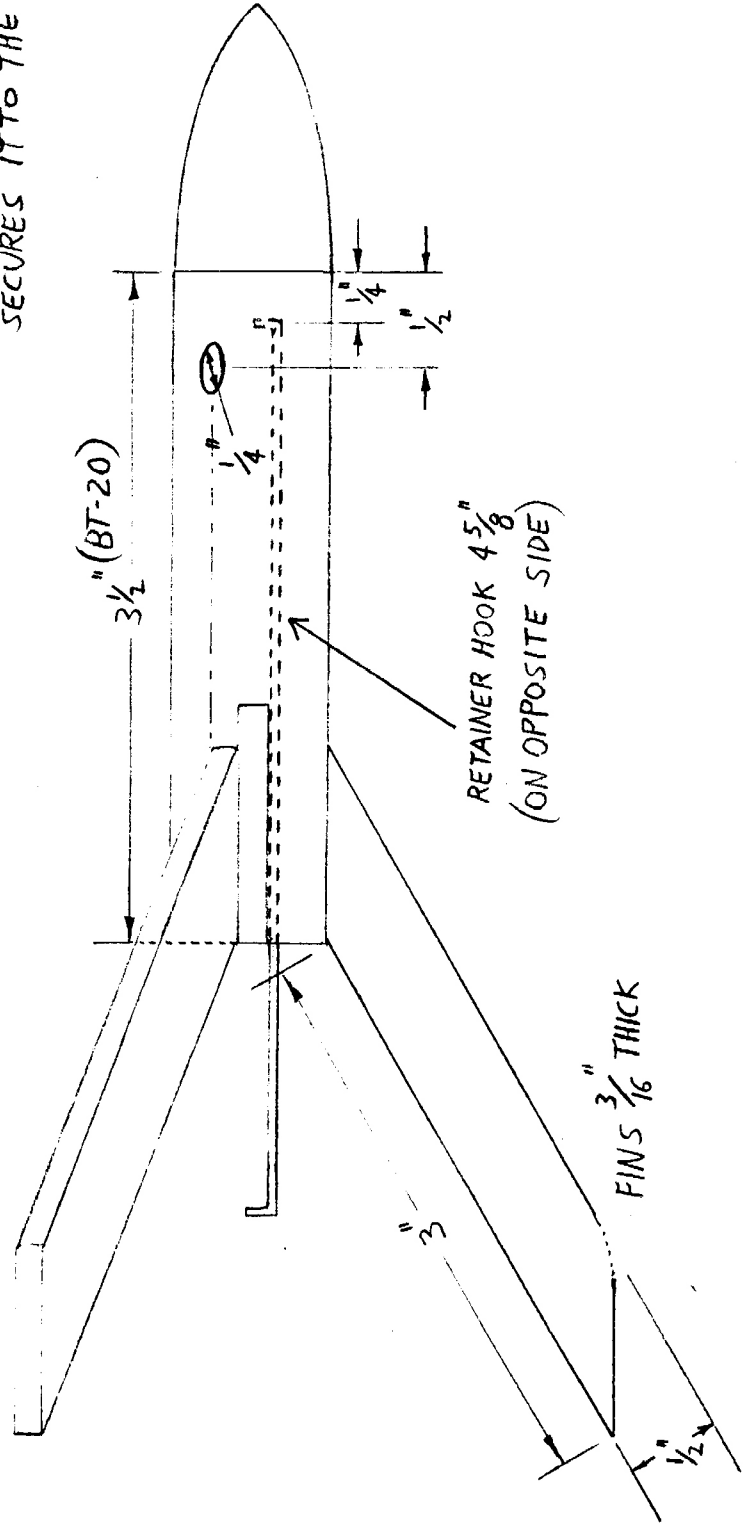
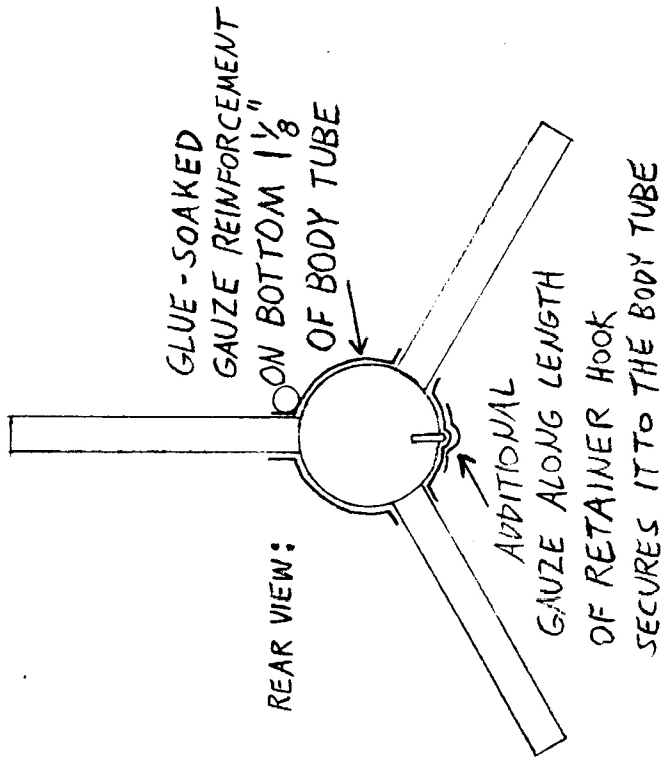




# SCOUT

ESTES K-1, #1201

SOURCE: MEASUREMENTS FROM  
ASSEMBLED KIT



ESTRES

ESTRES

## Astron Scout

By looking at the photo of the finished model in the 1963 catalog compared to the photo in the 1970 catalog the following should be noted:

- 1) The nose cone seems blunter on the older version.
- 2) The body tube on the older version had 3 vent holes.
- 3) The fins are swept tighter on the old version.

The drawings by Peter Alway seem to be accurate for the older version.  
The other drawing looks like it's accurate for the newer version.