



HOW TO USE THESE INSTRUCTIONS: READ ALL INSTRUCTIONS BEFORE STARTING WORK ON THIS MODEL.

Ε.

contained in kit.

included in this kit.

- A. This rocket, incorporating basic model rocketry construction techniques, will help you in the continuing development of your rocketry modeling skills.
- C. Lay the parts out on the table in front of you. (Check inside tubes for any small parts.) D. Use the parts layout to match all parts

Collect all construction supplies that are not

- F. Test fit parts before applying any glue.
- G. The construction supplies required for each step are listed at the beginning of each step.
- H. Check off each step as you complete it.

B. Read each step first and visualize the procedure thoroughly in your mind before starting construction.

PARTS LAYOUT

SPACE CAMP **DECAL SHEET (1)** (037144) NOSE CONE (1) SPACE CAMP (072638) **PAYLOAD SECTION (1)** (031205)**TUBE COUPLER (1)** LAUNCH LUG (1) (072638)(038178) SHROUD LINE (1) (038237) BODY TUBE (1) (WHITE) ENGINE BLOCK CENTERING (085878) TAPE RINGS (1) (YELLOW) (1) RINGS (038407) (GREEN) (2) (030171-4) ELASTIC SHOCK CORD (1) (030151-2) 00000 ENGINE (038374) MOUNT **DIE-CUT BALSA** TUBE FIN SHEET (1) (BLUE) (1) (032808)(030326-1 **PARACHUTE (1)** (082054)CALES IS **ENGINE HOOK (1)** (035021)

EXTREMELY IMPORTANT: THE PARTS LAYOUT IS FOR REFERENCE ONLY! The parts layout is only intended to assist you in locating the parts included in this kit.

CONSTRUCTION SUPPLIES

In addition to the parts included in your kit, you will need these construction supplies. Each step shows which supplies will be required.



vellow)





ROCKET BUILDER'S MARKING GUIDE -EST 2227 (optional)

GLUE IS APPLIED TO SURFACES SHOWN IN RED.

(optional) (felt markers may be used instead)

ROCKET ASSEMBLY

1. NOSE CONE PREPARATION

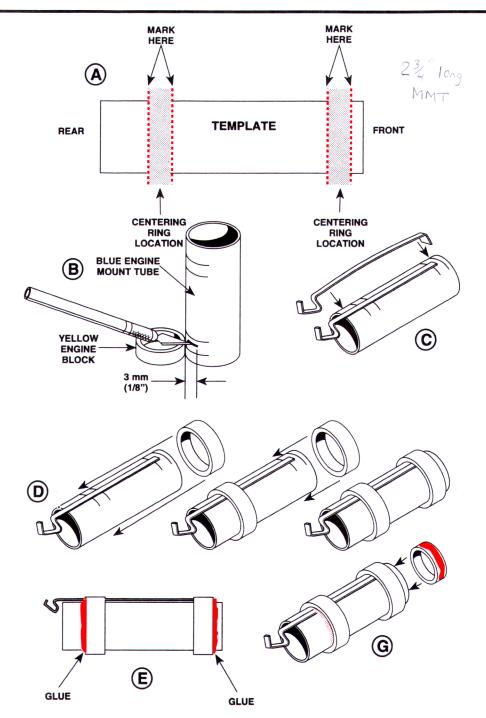
A. Snap the tube coupler and nose cone apart as shown. Save coupler for payload section assembly.

 (\mathbf{A})

- **B.** Clean off excess plastic.
- **C.** Set nose cone and coupler aside until step 7.

2. ENGINE MOUNT ASSEMBLY

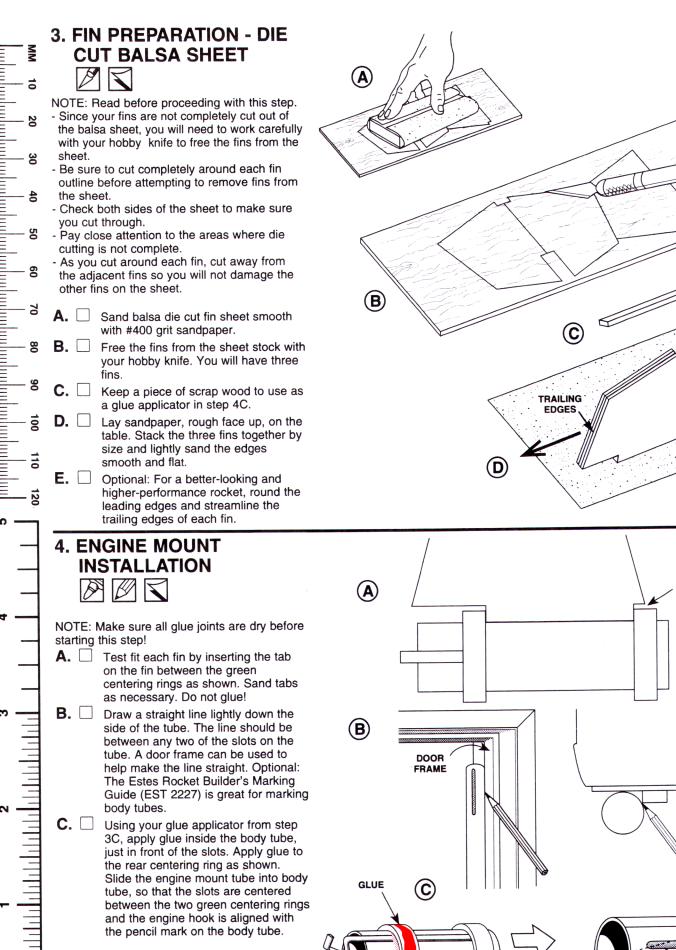
- A. Lay the blue engine mount tube on the template provided as shown and mark the tube with a pencil at all red lines.
- **B.** Place the yellow engine block against the side of the blue engine mount tube at the front end and use it as a guide for your knife to make a small 3 mm (1/8") wide slit in the side of the blue tube.
- C. Insert the engine hook into the slit in the blue tube as shown.
- **D.** Slide both green centering rings over the blue tube and engine hook so they are centered between their marks.
- **E.** Apply a ring of glue to the back of the rear centering ring and to the front of the forward centering ring.
- **F.** Uhile the glue is still wet, check the position by laying the engine mount on the template as in figure A. Adjust position of rings as necessary so they match the location shown on the template.
- **G.** Glue the yellow engine block ring inside the front of the blue tube so it touches the metal engine hook.



B

С

NCHES



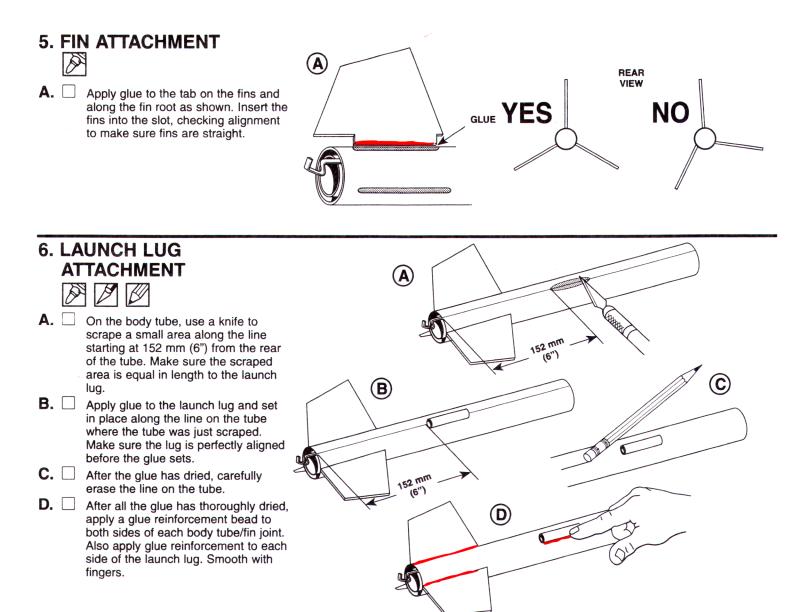
NCHE

LEADING

EDGES

SMALL GAP

HERE



7. PAYLOAD OR BODY EXTENSION ASSEMBLY

 (\mathbf{A})

NOTE: The forward section of your rocket can be used to carry objects aloft. If you want to launch experiments in your rocket, do not glue nose cone into payload section.

A. Locate the tube coupler from step 1.

- B. Clean off excess plastic. The plastic loop may have to be cleaned out with a hobby knife.
- **C.** Test fit the nose cone and tube coupler into the clear payload section.
- **D.** CAUTION: Make sure loop on tube coupler is on the outside when assembled.
- E. Remove coupler. Use a piece of masking tape to shim the shoulder for a tighter fit, and put back together.
- F. If the nose cone fits loose, you may lose your payload. Use a piece of masking tape to shim the shoulder for

Page 4 tighter fit.

(11-00) 84429

8. RECOVERY DEVICE ASSEMBLY

- A. Cut out parachute on printed edge lines.
- **B**. Remove tape from shroud lines, fold and cut into three equal lengths.
- **C**. Attach tape rings to top of parachute at each of the six corners and press firmly into place. Punch a hole through the parachute material with the point of a sharp pencil. (Do not use a dull pencil or ballpoint pen).
- **D.** Pass shroud line through hole in parachute and tape ring. Tie lines together with a double knot.
- **E**. Attach remaining lines to other corners to complete parachute.

9. SHOCK CORD ATTACHMENT

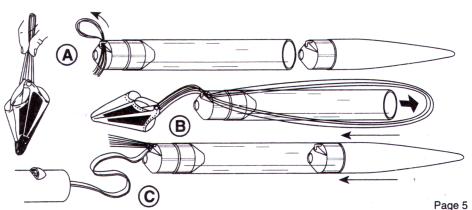
- A. U Cut out the shock cord mount at right. Crease the mount on the dotted lines by folding. Spread glue on section 2 and lay one end of the shock cord into the glue at a slight diagonal as shown. Fold section 1 forward. Apply glue to section 3. Fold forward again. Clamp the shock cord mount firmly between your fingers until the glue sets.
- **B**. Apply glue to back side of the complete shock cord mount. Push the shock cord mount against the inside of the body tube about 38 mm (1-1/2") from the forward edge. Make sure all the mount curves and contacts the tube wall before the glue sets. More glue may be added and rubbed into the shock cord mount for an even stronger bond.

B **A** D E C

CUT THIS OUT \mathbf{m} 38 mm (1-1/2") GLUE **(B)** YES NO

10. RECOVERY DEVICE AND SHOCK CORD ATTACHMENT

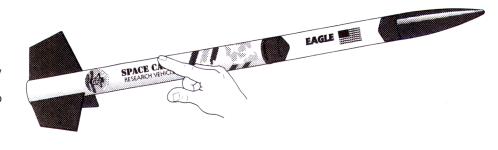
- A. Gather the shroud lines together, forming a loop at the end. Thread shroud lines through loop coupler.
- **B**. Remove nose cone. Pass tip of payload bay back through loop of shroud lines as shown. Pull lines tight.
- С. 🗌 Tie free end of shock cord to loop on coupler. Use a double knot. Replace nose cone.



11. FINISHING YOUR ROCKET



- **A**. Use the drawing on page 1 of the instructions as a decal placement guide or position decals as you like. Gently lift one decal at a time. Lightly lay it down in position. If position is correct, rub it down with your finger to remove bubbles and stick it securely.
- **B**. Fins may be colored with a magic marker or painted with spray paint.



B

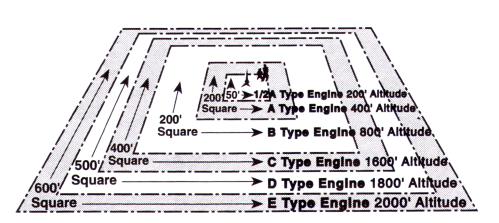


- A. Loosely crumple three squares of recovery wadding. Insert wadding into body, but do not pack tightly.
- **B**. Pull 'chute into spike shape. Fold top of 'chute down, then fold one side over. Roll 'chute tightly and wrap shroud lines around it.
- **C**. Push shock cord and 'chute down into body and socket nose cone into place. Make sure neither the shroud lines nor the shock cord are jammed between the coupler and body tube. CAUTION: 'Chute must slide easily into body. If it fits tightly, remove and repack 'chute.

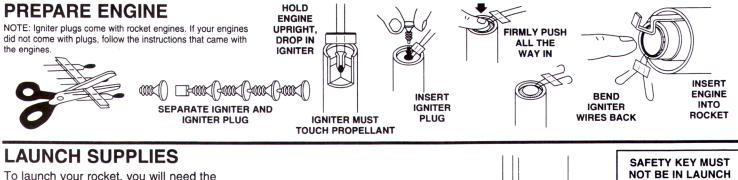
WHAT TO EXPECT WHEN FLYING YOUR EAGLE[™] SCRV ROCKET

 (\mathbf{A})

Your Eagle[™] Space Camp Research Vehicle represents the latest in model rocket design and component technology. Sporting an integrated engine mount and pre-aligned fin slots, the Eagle™ utilizes the maximum energy available from whatever recommended engine you use. No thrust is wasted. Using a C6-5 engine, the Eagle[™] will approach 305 meters (1000 feet). If your model is loaded with a payload, expect slightly less altitude for a given engine. Remember to "size" your field and engine properly. Fly "A" engines from baseball field-size areas. "C" engines from football field-size areas. At apogee (the highest point of your rocket's flight), the parachute will eject and the rocket will drift down range. The drift distance depends on the wind speed. Always keep wind conditions in mind when selecting your engine size. Enjoy flying your Eagle™.



 (\mathbf{C})



To launch your rocket, you will need the following items:

--Estes Electrical Launch Controller and Launch Pad

--Estes Recovery Wadding No. 2274

--Recommended Estes Engines: A8-3 (First Flight), 1/2A6-2, A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5 or C6-7

To become familiar with your rocket's flight pattern, use an A8-3 engine for your first flight. If your rocket is carrying a payload, use B or C engines only.

Use only Estes products to launch this rocket.

FLYING YOUR ROCKET

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 76 meters (250 feet) square. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great.

Launch area must be free of dry weeds and brown grass.

Launch only during calm weather with little or no wind and good visibility.

Don't leave parachute packed more than a minute or so before launch during cold weather (colder than 4° Celsius [40° Fahrenheit]).

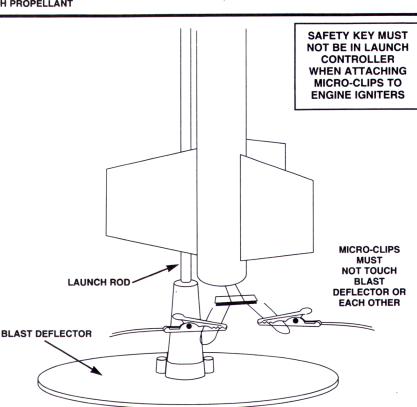
Parachute may be dusted with talcum or baby powder to avoid sticking.

If you use the E2[™] or Command Control[™] Launch Controllers to fly your models, use the following launch steps:

A. After attaching micro-clips, etc., insert safety key into the controller receptacle. If the igniter clips have been attached properly to the igniter, the red L.E.D. will now begin to flash on and off and the audio continuity indicator will beep on and off.
B. Hold the yellow (left) arm button down. The L.E.D. will stop flashing and the audio indicator will produce a steady tone.
C. Verbally count down from five to zero loud enough for the bystanders to hear. Still holding the yellow arm button down until the rocket ignites and lifts off.

FOR YOUR SAFETY AND ENJOYMENT

Always follow the National Association of Rocketry (NAR) MODEL ROCKETRY SAFETY CODE while participating in any model rocketry activities.



COUNTDOWN AND LAUNCH

(10) BE CERTAIN SAFETY KEY IS NOT IN LAUNCH CONTROLLER.

- (9) Remove safety cap and slide launch lug over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod. Make sure micro-clips are clean for a good electrical contact.
- (8) Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the metal blast deflector. Attach clips as close to protective tape on igniter as possible.
- \bigcirc Move back from your rocket as far as launch wire will permit (at least five meters 15 feet).
- (6) INSERT SAFETY KEY to arm the launch controller.
- Give the audible countdown 5...4...3...2...1

LAUNCH!!

PUSH AND HOLD LAUNCH BUTTON UNTIL ENGINE IGNITES

REMOVE SAFETY KEY FROM LAUNCH CONTROLLER. KEEP SAFETY KEY WITH YOU OR REPLACE SAFETY KEY AND SAFETY CAP ON LAUNCH ROD.

MISFIRES

If the igniter functions properly but the propellant does not ignite, keep in mind the following: An Estes igniter will function properly even if the coated tip is chipped. However, if the coated tip is not in direct contact with the engine propellant, it will only heat and not ignite the engine.

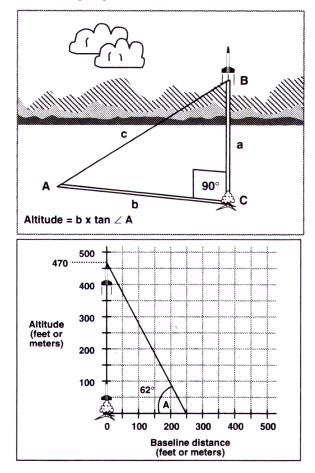
When an ignition failure occurs, remove the safety key from the launch control system and wait one minute before approaching the rocket. Remove the expended igniter from the engine and install a new one. Be certain the coated tip is in direct contact with the engine propellant, then reinstall the igniter plug as illustrated above. Repeat the countdown and launch procedure.

FLIGHT DATA CARD

Flight number	Date	Engine typ e	Altitude predicted/actual	Flight duration predicted/actual	Recovery device operation	Performance comments	Condition after recovery
			/	/			
			/	/			
			/	/			
			/	/			
			/	/			
			/	/			
			/	/			
			/	/		4	
			/	/			
			/	/			
			/	/			
			/	/			
			/	/			

SINGLE STATION TRACKING

- 1. In single station elevation tracking, make sure that the line from the tracking station to the launcher is 90 degrees from the direction of wind flow.
- 2. The angle of flight is assumed to be vertical.
- 3. The tracking scope is locked at the rocket's maximum altitude, the angle read, and the tangent of the angle found.
- 4. The tangent is multiplied times the distance from the tracker to the launcher, giving the rocket's altitude.



- 5. To solve graphically, plot the baseline distance on the horizontal axis.
- 6. Using the same scale, mark the vertical axis for altitude.
- 7. Plot the elevation angle at the baseline distance and extend the line of sight to the vertical axis.
- 8. Read the rocket's altitude off the vertical scale at the point of intersection.

SINES AND TANGENTS

Z	sin	tan	2	sin	tan	2	sin	tan
1	.02	.02	28	.47	.53	55	.82	1.43
2	.03	.03	29	.48	.55	56	.83	1.48
2 3	.05	.05	30	.50	.58	57	.84	1.54
4	.07	.07	31	.52	.60	58	.85	1.60
5	.09	.09	32	.53	.62	59	.86	1.66
6	.10	.11	33	.54	.65	60	.87	1.73
7	.12	.12	34	.56	.67	61	.87	1.80
8	.14	.14	35	.57	.70	62	.88	1.88
9	.16	.16	36	.59	.73	63	.89	1.96
10	.17	.18	37	.60	.75	64	.90	2.05
11	.19	.19	38	.62	.75	65	.91	2.14
12	.21	.21	39	.63	.81	66	.91	2.25
13	.22	.23	40	.64	.84	67	.92	2.36
14	.24	.25	41	.66	.87	68	.93	2.48
15	.26	.27	42	.67	.90	69	.93	2.61
16	.28	.29	43	.68	.93	70	.94	2.75
17	.29	.31	44	.69	.97	71	.95	2.90
18	.31	.32	45	.71	1.00	72	.95	3.08
19	.33	.34	46	.72	1.04	73	.96	3.27
20	.34	.36	47	.73	1.07	74	.96	3.49
21	.36	.38	48	.74	1.11	75	.97	3.73
22	.37	.40	49	.75	1.15	76	.97	4.01
23	.39	.42	50	.77	1.19	77	.97	4.33
24	.41	.45	51	.78	1.23	78	.98	4.70
25	.42	.47	52	.79	1.28	79	.98	5.14
26	.44	.49	53	.80	1.33	80	.98	5.67
27	.45	.51	54	.81	1.38			

For angles of 81° through 89°, the sine is .99, the sine of 90° is 1.00. Tangents over 80° are not given, as no sensible data reduction is possible for angles that great.

Estes #1766 – Eagle SCRV (Space Camp Research Vehicle)

There are multiple versions of this kit and the parts inventory differs slightly. This kit is based on HBT-1090 parts which are originally Centuri ST-10 tubes. The OD is 1.090" hence the 1090 designation. HBT stands for Heavy Body Tube. The Centuri tubes were always a little heavier than Estes tubes. Estes sometimes shows 1.0" or 1.1" for the diameter in the catalogs.

Here are the noteworthy differences in the Beta version and the more recent version.

- The Beta balsa is die-cut vs the recent Laser cut.
- The Beta kit came with an un-assembled parachute where the recent version has a pre- assembled parachute.
- The Beta version has elastic shock cord and the recent has rubber.
- The main body tube is the same 11" white 3 fin slotted tube even though the part numbers are different.
- The Beta engine tube is the thin wall blue BT-20J, the recent version has the heavier white WBT-20J.
- The nose cone numbers are different. The picture shows the shorter cone but the plans show the longer version. It is not clear if the longer cone was supposed to be used or not. I have not been able to find any images of this rocket using the longer cone so I'm assuming the parts list must have changed during production. The 1090 nose cone parts numbers do differ according to color but since both versions of this kit came in blue, I don't think that is the reason for the different numbers. The NC-1090 cones came in 2 different sizes and multiple colors. Yellow, White, Black, Pink (fuscia), Purple, Red (looks orange in the pics), and Blue have all been identified from web searches.

This is a list of other Estes kits that use 1090 parts:

2105 Hijax 2107 Fire Streak 2060 Bandit 2061 Rampage 2062 Dagger 2067 Delta Clipper 2114 Cork Screw 2131 MK-109 Sting Ray 2132 Banshee 2137 Flash 2158 AGM-57X Heat Seeker 2169 Dragonite 2182 Wacky Wiggler 1410/7261 Air Walker

	PARTS LIST KIT NO. 1766 - Eagle SCRV (Recent)								
Quantity	Description	Туре	Number	Details1	Details2	Details3	Details4	Comment	
1	Nose Cone/Tube Coupler	NC-1090	72639	OD 1.090"	3.5" Long	W/Coupler	Blue	Blow Molded	
1	PLASTIC BODY TUBE	PST-1090	31205	6" long	1.030" ID	1.090" OD	0.030" wall	Clear	
1	PAPER BODY TUBE	HBT-1090	31165	11" long	1.090" OD	1.030" ID	0.030" wall	White slotted for 3 fins	
1	LAUNCH LUG	LL-2B	38178	5/32" ID	1/8" rod	2-3/8" long		Mylar	
2	CENTERING RINGS	AR-201090	030151-2	0.25" long	0.737" ID	ID 1.043"	0.153" wall	Green	
1	ENGINE BLOCK	EB-20	30171-4	.708" OD	.65" ID	.25" thick	fits BT-20	Yellow	
1	PAPER BODY TUBE	WBT-20J	30408	2.75" long	0.710" ID	0.736" OD	0.013" wall	White	
1	ENGINE HOLDER	EH-2	35021	2.8" long	.100" wide	.025" thick	18/24mm	Thumb Saver	
1	Laser cut Balsa	BF-1766	32808	4" wide	6" long	3/32" thick	Layout Differs	Scan	
1	Shock Cord	SC-1	38362	24" long	1/8" wide			Rubber	
1	Parachute	PK-12	35801	12" dia.	12" x 6 Shrouds	LDPE plastic	Org/Wht	Preassembled	
1	Decal	KD-1766	37144	4.25" wide	5.25" long	Blk, Red, Blu	Self Stick	Scan	
			PAF	RTS LIST KIT N	10. 1766 - Eagle SC	RV (Beta)			
1	Nose Cone/Tube Coupler	NC-1090	72638	OD 1.090"	3.5" Long	W/Coupler	Blue	Blow Molded	
1	PLASTIC BODY TUBE	PST-1090	31205	6" long	1.030" ID	1.090" OD	0.030" wall	Clear	
1	PAPER BODY TUBE	HBT-1090	85878	11" long	1.090" OD	1.030" ID	0.030" wall	White slotted for 3 fins	
1	LAUNCH LUG	LL-2B	38178	5/32" ID	1/8" rod	2-3/8" long		Mylar	
2	CENTERING RINGS	AR-201090	030151-2	0.25" long	0.737" ID	ID 1.043"	0.153" wall	Green	
1	ENGINE BLOCK	EB-20	30171-4	.708" OD	.65" ID	.25" thick	fits BT-20	Yellow	
1	PAPER BODY TUBE	BT-20J	30326-1	2.75" long	0.710" ID	0.736" OD	0.013" wall	Blue	
1	ENGINE HOLDER	EH-2	35021	2.8" long	.100" wide	.025" thick	18/24mm	Thumb Saver	
1	Die-Cut Balsa	BF-1766	32808	4" wide	6" long	3/32" thick	Layout Differs	Scan	
1	Shock Cord	SC-1	38374	18" long	1/8" wide			Elastic	
6	Tape Disc	TD-3F	38407	1/2" dia.	Vinyl	Self-Stick	W/Center Hole	Set of 6	
1	Shroud Line	SLT-72	38237	72"	.020" diameter	Twisted cotton			
1	Parachute	PK-12	82054	12" dia.	1.25 mil thick	LDPE plastic	Org/Wht		
1	Decal	KD-1766	37144	4.25" wide	5.25" long	Blk, Red, Blu	Self Stick	Scan	













MODEL ROCKET ACCESSORIES NC-1090 NOSE CONES

Fits HBT-1090 body tubes (EST 303091)

^{adaptent} aux tubes de corps HBT-1090 (EST 303091)

OIFFES

ETENSPIT7

ESTES.) ROCKET BULK PACK

ROCKET SPECIFICATIONS: Projected ANYvols, 800 ft (274 or Langels: 28.25 in (18.4 cm) Disrement: 1.60 in (28 even) Recommy: 12 in (28.6 cm) RECOMMENDED ENGINES

This model kit requires assembly. Requires white or yellow glue, finishing sugplies, engines, starters, recovery wadding, and launch system - NOT INCLUDED.

1766

12 MODEL ROCKET KITS

8 1208 2018 Kisse Industries, LLC. All rights reserved Extent Industries, LLC. 1250 H Breet, Pervise, CO 9 (34):0409 Match III Guargatong, China, PH 080329 111-181



