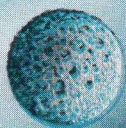




# ***CENTURI***

**MODEL ROCKETRY PRODUCTS**

*1963 ANNUAL CATALOG*



**CENTURI ENGINEERING COMPANY**

P. O. BOX 1988  
PHOENIX 3, ARIZONA



# Model Rocketry

## The New AeroSpace Sport and Scientific Educational Device

It was inevitable -- it had to come. Just as the development of flying aircraft brought on model aviation, so has today's Space Age rockets and missiles inspired the new Aero-Space sport of model rocketry.

This fascinating new hobby and educational device is growing with the same fury and fervor of its "big brother" missiles and rockets used by the armed forces and research institutions. Thousands of people, just like yourself are now enjoying the thrill of watching these miniature rockets rise off the launching pad, streak hundreds of feet into the sky, and return safely back to earth by their recovery systems. Most important though is the scientific understanding which results from these launchings. Beyond the textbooks, model rocketry offers a safe means for applying those scientific principles of aerodynamics, propulsion, mathematics and physics. Those principles which apply to the large missiles of research and defense can be demonstrated with model rocketry.

Model rockets are unique in that they contain no heavy metallic parts, they are powered by factory packed commercial engines, and are recoverable by means of parachute or other drag device. This eliminates the well known hazard of heavy falling objects and the dangerous mixing of chemicals.

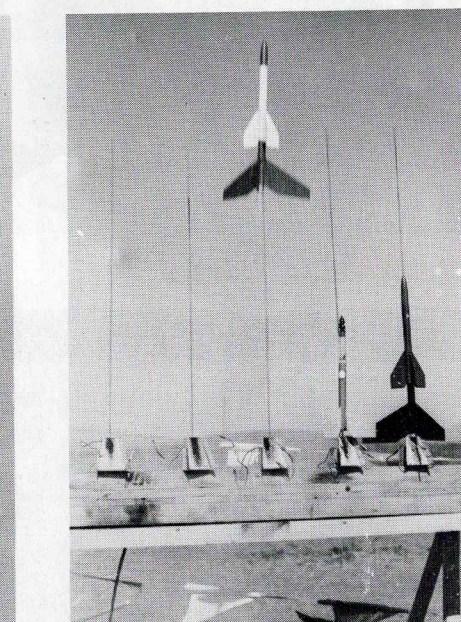
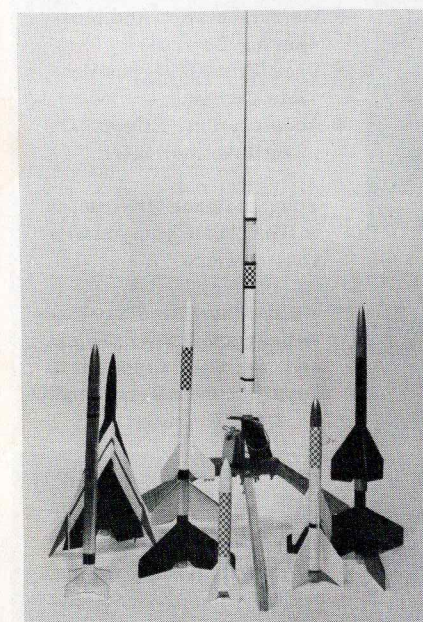
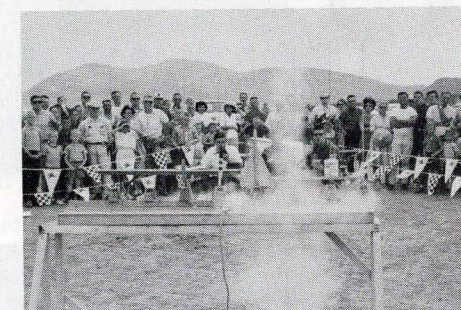
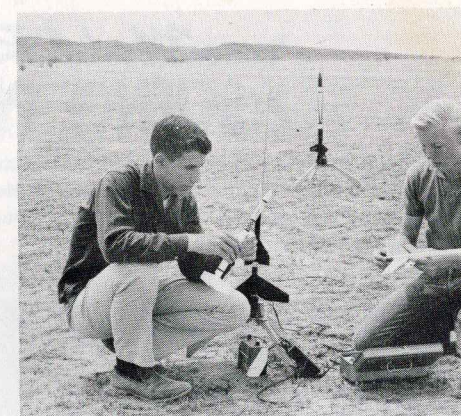
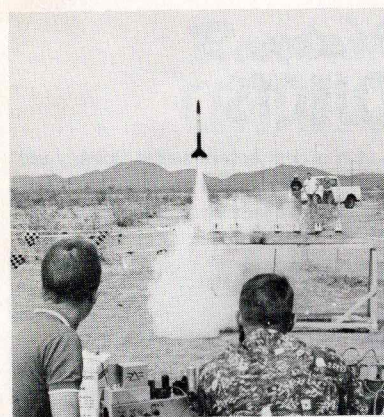
Unlike other forms of youth rocketry, model rocketry is not concerned with sheer size or power. Instead, emphasis is placed on design, creativity, reliability and safety. Lightweight materials including balsa wood, laminated paper, and plastic are engineered to give maximum strength with a minimum amount of weight.

Model rocketry has been praised by parents and teachers as a most worthwhile student activity. Students have found that model rocketry can be worked into terrific science projects using classroom and field demonstrations. See page three for more Science Project information.

Model Rocketry does not begin and end with the building and launching of just one model. There are many areas for experimentation and study, some of which are listed below:

Single Stage Models	Launching Techniques
Multi-Stage Models	Ignition Methods
Boost Glide Vehicles	Finishing Techniques
Recovery Devices	Tracking Systems
Design Stability	

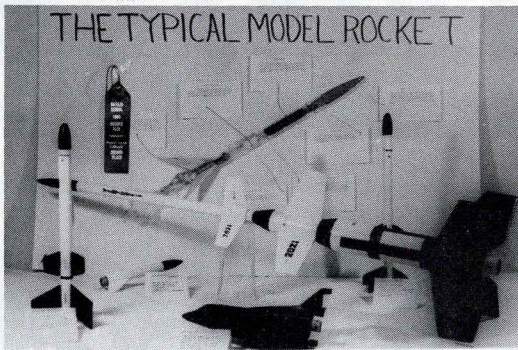
Centuri kits and assemblies are accompanied with instructions which actually "instruct and inform" in an educational manner. Our products are selected and designed with the "training factor" in mind; training in each of the areas listed above.





## Model Rocketry SCIENCE PROJECTS

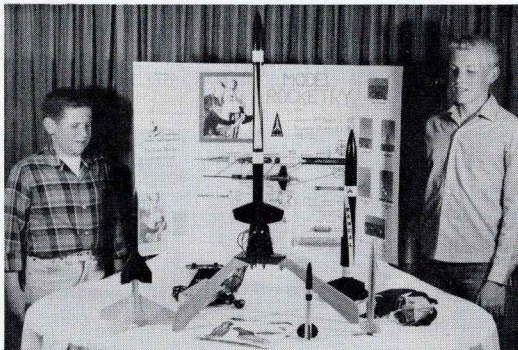
Are you studying chemistry, physics, math, or other sciences? Does your school hold a Science Fair, or do your science courses require research papers or science projects? Why not build your science project or research paper around model rocketry?



With your experience in model rocketry, what can be a better choice? Hundreds of students have entered rocketry exhibits in Science Fairs and have done very well.

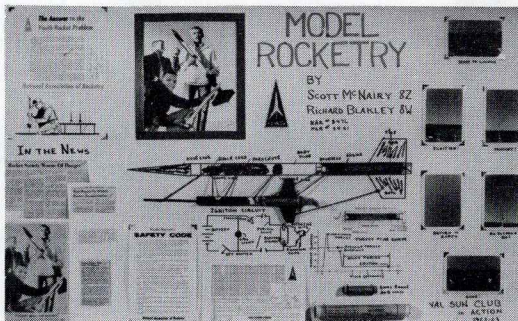
Following are examples of themes for possible projects:

- Study Of Nose Cone Shapes And Fin Design.
- Stability Of Flight.
- Mathematics Of Rocket Trajectories.
- Instrumentation And Measuring Devices.
- Drag Effects Versus Vehicle Design.
- Acceleration Effects On Small Animal Life.



Your science instructor will be glad to help you with your project.

We at Centuri would be glad to hear about your project and we will continue to supply your rocketry needs.



## Research & Development CERTIFICATE AWARDS

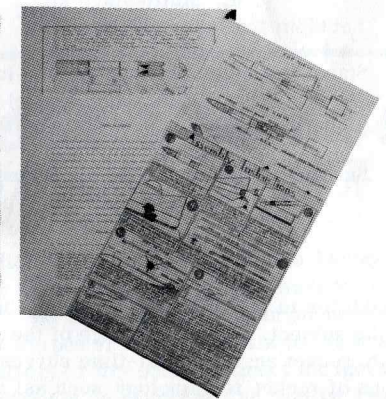
We, at Centuri strive to offer you the latest, most advanced products for use in model rocketry. Our Research and Development department is constantly searching for new ideas and working on advanced projects which contribute to your education and enjoyment.

Many valuable suggestions and ideas from model rocketeers have resulted in the improvement of our products and have even created new ones. You too, can participate in our Research and Development program and win valuable Certificate Awards worth up to \$25.00. This is an excellent opportunity to demonstrate your skill and ingenuity.

Write up your latest idea for improving one of the Centuri products or creating a new one which would be useful to all rocketeers. Include enough information such as drawings or photos, to make sure that your idea is made clear and precise. The following are examples of items which are constantly being improved and changed by our Research and Development Department.

New Designs	New Launching Methods	Painting & Finishing
Design Improvements	New Ignition Methods	Tracking Methods
Recovery Systems	New Parts & Accessories	Improved Materials

As the R & D program is an everyday affair, here at Centuri, we have not placed any limitations on the number of Awards to be presented. These Awards will be made as deserving entries are received.



### RULES:

All entries should include the following information:

- (1) Name, address, age.
- (2) Name of School, class.
- (3) Special interests, such as desired career, hobbies.

Example Entries

Entries will be judged on the basis of originality of thought, usefulness of the idea and neatness of preparation. All ideas should be tried and proven successful before you send them in. Explain your ideas with either a written description or scale drawings or both in as much detail as you feel is necessary to fully present your idea. Send us your entry today. Winners will be notified by mail.



## Your Program in Model Rocketry

Where can it all lead?? What can it do for you?? Of what real value is it?? These are questions which are asked of us everyday by students, parents, and teachers. The answer we give is that there is real value in a well planned program of model rocketry; value beyond enjoyment and the satisfaction of seeing your model rise off the launcher and streak skyward.

This extra value can only be realized by a sincere desire to learn. Tremendous career opportunities are available today in the Aero Space Sciences, and in view of the current trend, this is the "field of the future". A solid background in model rocketry will compliment and give meaning to your regular academic studies. Science instructors have included a model rocketry program as a regular portion of their student's laboratory work.

To assist you in planning such a model rocketry program for yourself, we have prepared the following schedule of activities which, when followed, will help to prepare you for your advanced studies:

Stage 1 Construct and launch several kits with:

- a. Streamer recovery
- b. Parachute recovery

Stage 2 Construct and launch:

- a. Multi-stage kit
- b. Boost-glider kit

Stage 3 Design, construct, and launch (with your own variations)

- a. Multi-stage model
- b. Boost-glide model

Stage 4 After the above program has been completed, construct and launch one of the larger "F" type models or kits with:

- a. Live payload - biological specimen
- b. Instrumentation - measuring devices, transmitters.

In addition to the above, read all of the available technical literature available on the subject. Take advantage of the Tech Reports available through the NAR. Study rocket engine thrust-time curves, and data charts. Understand the definitions of rocket terminology such as: specific impulse, total impulse, average thrust, aerodynamic drag, and acceleration. To demonstrate your knowledge and ability in model rocketry, try to work up a project for an extra credit report or a Science Fair.

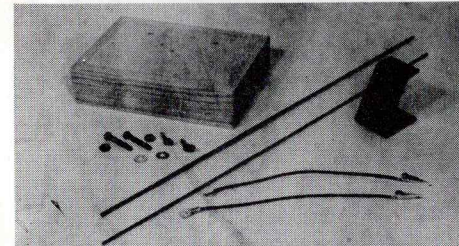
Do not stop here, or anywhere else for that matter; continue your studies in physics, math, and engineering sciences. The world and the space around it are yours to inherit. Do your part in the world effort to conquer the outer reaches of space and to better understand the world in which we live. Who knows? Maybe you will find yourself a career as an astronaut or missile scientist. We at Centuri will continue our efforts to develop materials which will aid your understanding of the Aero Space Sciences.

## Launcher-Assembly

### WITH IGNITION CLIPS

Complete Launching System  
Electrical Igniter Clips

Simply connect up your firing line to the binder posts, attach the ignition clips to the engine igniter material, and hook up 6 or 12 volt battery.



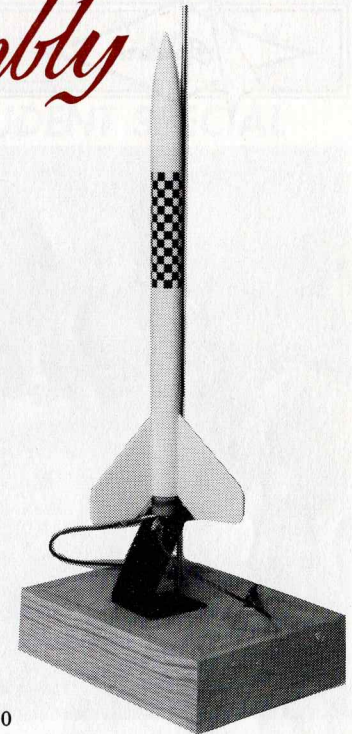
INCLUDES:

- Launcher Base
- 2 Piece Launching Rod
- Deflector Plate
- Hardware Set
- Stand-off Bracket
- Igniter Clips

*Price*  
**\$275**

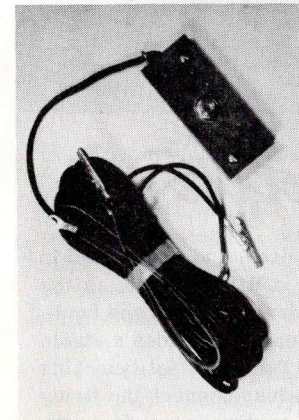
Catalog No. LIA-50

Shipping wt. 2 lbs.



Rocket not included

*New!!*



## Lectra Line

### IGNITION OUTFIT

The ideal ignition system for use with the Launcher Assembly above, the Launcher-Igniter Assembly on page 16, or the large Launcher-Igniter on page 44. Simply connect the power lead terminals to any heavy duty lantern battery or dry cell\*, connect the ignition leads to binder posts on launcher and you're ready to launch. The following items are included:

- 15 ft. of #18 Double Conductor Cable
- 2 Battery Post Terminals
- 2 Binder Post Clips
- Hand-Held Firing Switch
- Complete Operating Instructions

\*The following batteries are recommended:

Ray-O-Vac	No. 918
Eveready	No. 731
Burgess	No. TW1

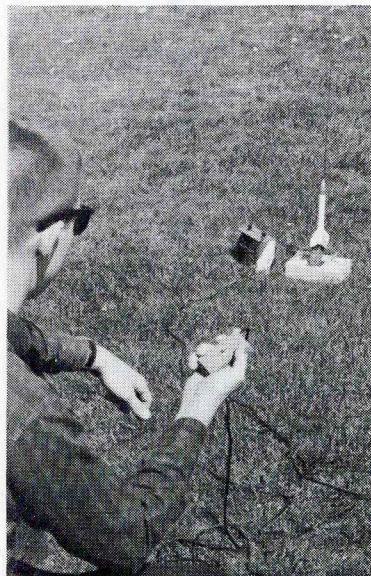
**\$250 Complete**

Catalog No. EFC-44  
Shipping wt. 1 lb.



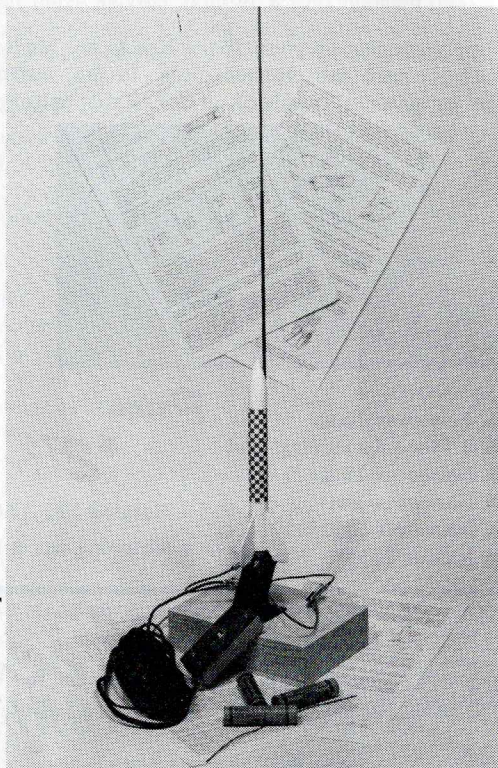
Centuri

## Starter Outfit



- MICRON SINGLE STAGE KIT
- LAUNCHER ASSEMBLY LIA-50
- LECTRA-LINE IGNITION OUTFIT
- 6 MODEL ROCKET ENGINES
  - 2 -  $\frac{1}{4}$ A. 8-4's    1 - A. 8-4
  - 2 -  $\frac{1}{2}$ A. 8-4's    1 - B. 8-6
- COMPLETE INSTRUCTIONS

## BEGINNER SPECIAL



## Rocketeer's Outfit

The Starter Outfit SK-100 provides you with everything needed to get started in this new Aero-Space hobby of model rocketry. First, and most basic is the Micron single stage rocket kit, which will aid in your understanding of the fundamentals of rocketry aerodynamics. The Launcher Assembly provides a stable platform from which to launch most all model rockets. The 36" steel launching rod guides your model into a straight flight trajectory. Just connect the firing cable to your 6 or 12 volt battery or dry cell and the system is ready to go.

Shipping wt. 2 lbs.

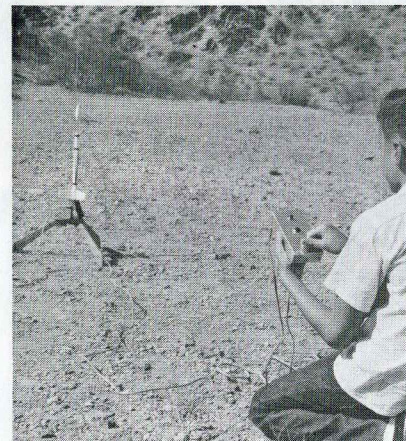
**SK-100    Special Price    \$6<sup>95</sup>**

No additional discount given on this Special

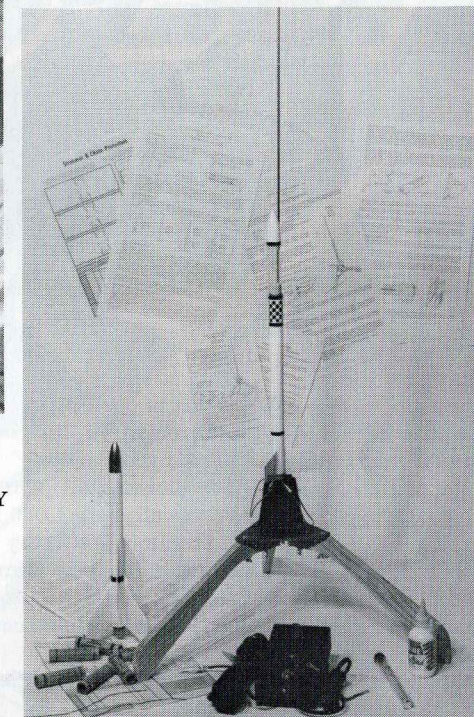
Centuri

## Starter Outfit

## STUDENT SPECIAL



- MICRO-PROBE 2 STAGE KIT
- PAYLOADER ROCKET KIT
- LAUNCHER-IGNITER ASSEMBLY LIA-77
- PROFESSIONAL FIRING PANEL EP-612
- 6 MODEL ROCKET ENGINES
  - 2 A. 8-4's
  - 2 B. 8-4's
  - 2 B. 8-0's
- COMPLETE INSTRUCTIONS



## Complete Ignition & Launching System

The most complete and most advanced model rocket outfit available anywhere. This assortment offers you the very best of Centuri's line in a comprehensive package which includes everything\* you will need to build and launch both a single stage Payloader carrier model and a two-stage Micro-Probe kit. The Launcher-Igniter Assembly and the professional type Firing Panel provide you with the basic equipment required to ignite and launch most all model rockets. This outfit would make a terrific gift for that aspiring rocketeer.

\*A 6 or 12 volt heavy duty lantern battery is needed to supply the ignition current for the Firing Panel. The Panels are normally equipped with 6 volt warning lamps. However, if you wish to use a 12 volt power supply, please specify this and your panel will come to you equipped with a 12 volt lamp.

Shipping Wt. 5 lbs.

**SK-250    Special Price    \$14<sup>95</sup>**

No additional discount given on this Special



# Micron

Single Stage Model

Only \$1.25

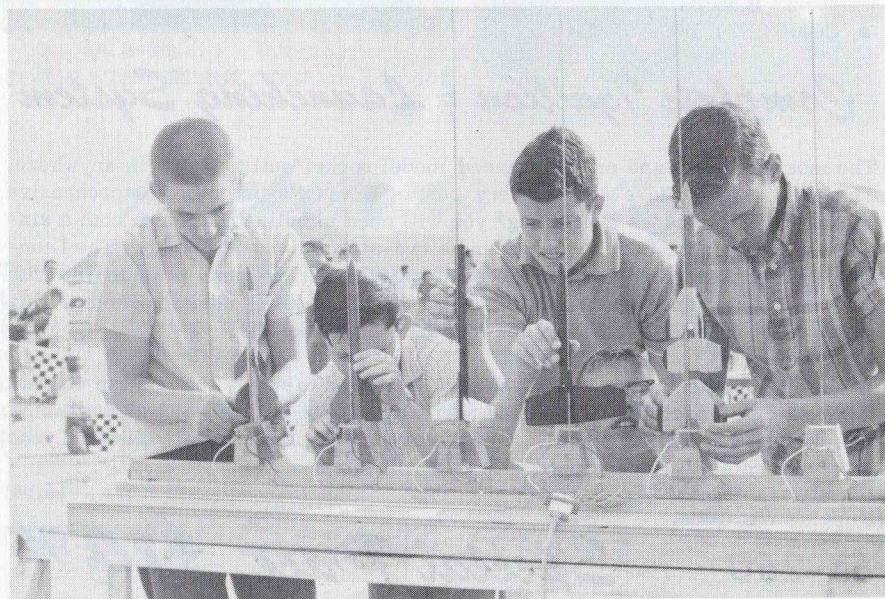
Cat. No. KA-5  
Shipping Wt. 8 ounces

## Recommended Engines

$\frac{1}{4}$ A. 8-4    A. 8-4  
 $\frac{1}{2}$ A. 8-4    B. 8-6

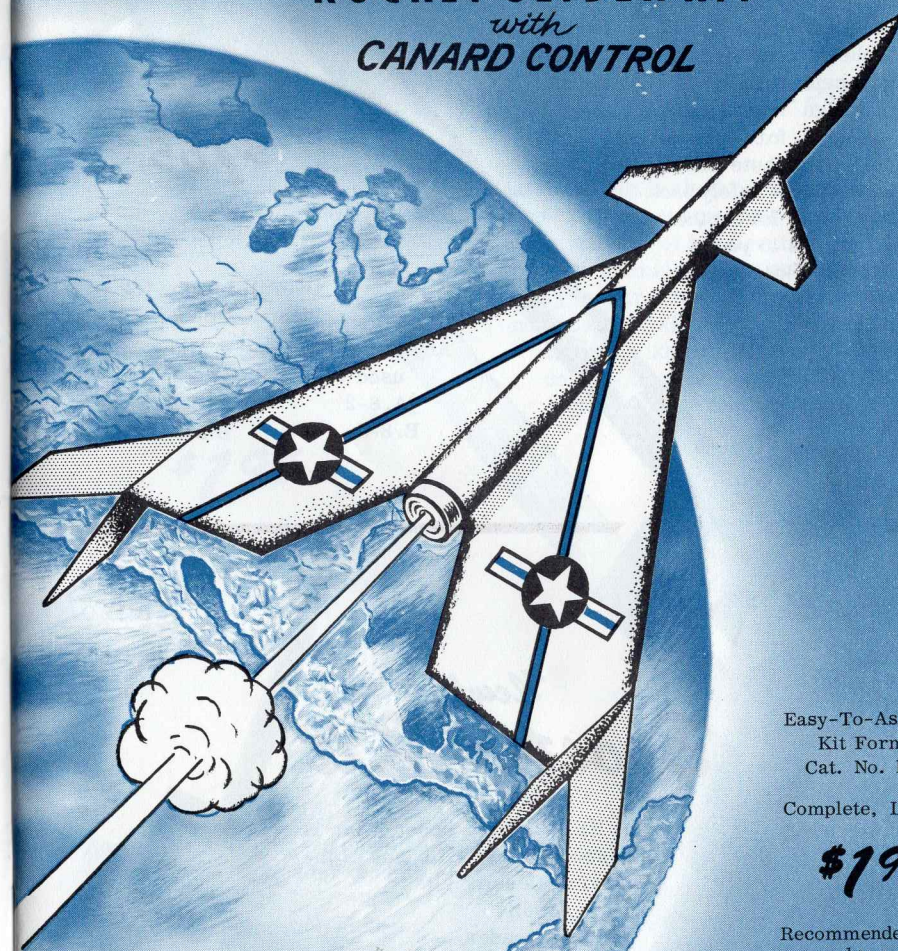
Net Weight 0.38 ounces  
Overall Length 8 $\frac{1}{2}$  inches

The single stage Micron kit is perfect for the beginner in model rocketry. Its basic stable design will aid your understanding of rocketry fundamentals. This model has been tracked to well over 2,000 ft., using a B. 8-6 engine. Streamer recovery system provides a soft landing so that the Micron can be flown again and again. Comes to you in easy-to-build kit form with easy-to-follow instructions.



# The New ACRO-BAT

ROCKET GLIDER KIT  
with  
CANARD CONTROL



Easy-To-Assemble  
Kit Form  
Cat. No. KBG-3

Complete, Less Engines

**\$1.95**

Recommended Engines:

$\frac{1}{2}$ A. 8-2  
A. 8-3  
B. 8-4

Powered flight straight up -- then glide return for a soft landing. New improved design incorporated canard control surfaces with delta wing to give longer glide duration time. With the insertion of a new rocket engine, the Acro-Bat is ready to fly again. Completed model measures 15" from tip to tail.



# Arcon SOUNDING ROCKET

1/8th Scale Model

Single-stage scale model of the upper atmosphere research vehicle. High altitude capabilities. The Arcon's basic design makes this kit the ideal rocket for beginner or novice. Parachute recovery system brings it safely back to earth, ready for another flight. Comes to you in easy-to-build kit form.

Cat. No. KB-2

**\$165**

Shipping wt. 8 ounces

Overall length 16"  
Weight 1 ounce

Any of the following engines can be used with this kit:

$\frac{1}{2}$ A. 8-2	A. 8-3
B. 8-4	B 3-5

*New!!*

## Booster Kit

Cat. No. KBB-20

The KBB-2 basic booster kit is designed for use with any of the following Centuri kits:

- Arcon
- Payloader
- Micro-Probe
- Black Widow Sustainer

ONLY

**85¢**

Shipping wt. 6 ounces

Recommended engines:

A. 8-0	B 3-0
B. 8-0	C. 8-0

# The Payloader Carrier Rocket

PLASTIC SEE-THROUGH CAPSULE

The ideal rocket kit for both beginner and novice. Excellent for demonstrations and displays. Study the effects of acceleration on insects and small animals with assured safe recovery by parachute. Kit includes payload nose cone, body tube, fin material and pattern, bulkhead, parachute pak, shock cord, contrasting checkerboard decal, and complete instructions.

**Only**

**\$195**

SINGLE STAGE MODEL  
Catalog No. KB-4

Shipping Wt. 8 ounces

Any of the following engines can be used with the Payloader model:

A. 8-3    B. 8-4    B3-5\*

\*For high acceleration studies.

The Payloader's low drag design permits high altitude exposure of live payloads, such as crickets, ants, beetles, and other insects. Plastic see-thru compartment in nose cone mid-section. Can be coupled with either the Basic Booster kit on page 11 or the Gliding Booster kit on page 14 for multi-stage operation. Completed model measures 15" from top to tail.



# BLACK WIDOW

## TWO-STAGE ROCKET KIT

With  
DUO - RECOVERY

### •HIGH ALTITUDE CAPABILITY

Simple enough for the beginner to build and launch, yet advanced in function and design.

Using the B. 8-0 and B. 8-6 engine combination, this "bird" has flown to well over 1,800 feet. The unusual "first stage" or "booster" glides slowly back to earth after separation. Sure-safe parachute recovery system brings the second stage safely back to earth, ready for another flight.

Only  
\$195

Catalog No. KB-6  
Shipping wt. 10 ounces

Finished model measures  
18" from tip to tail.

Recommended Engines:

Booster

B. 8-0

Second Stage

$\frac{1}{2}$ A. 8-4 A. 8-4 B. 8-6

## GLIDING BOOSTER KIT

Same unique design as Black Widow booster. Easily adapted to all Centuri single stage models.

Only  
\$100

Catalog No. KBB-10

Shipping wt. 6 ounces

# AERO-DYNE

## THREE-STAGE ROCKET KIT

REACHES ALTITUDES  
IN EXCESS OF 2,000 FEET

This new Centuri kit, designed for the advanced model rocketeer, demonstrates the method for reaching extreme altitudes through staging of engines. The simplified stage coupling technique results in reliable separation of stages.

As each stage engine is expended and falls away, the next stage engine ignites and takes over. The final stage climbs to well over 2,000 feet, then returns by parachute, ready for another flight.

CATALOG NO. KB-8

\$275

Shipping wt. 12 ounces

### RECOMMENDED ENGINES FOR THREE STAGE ARRANGEMENT

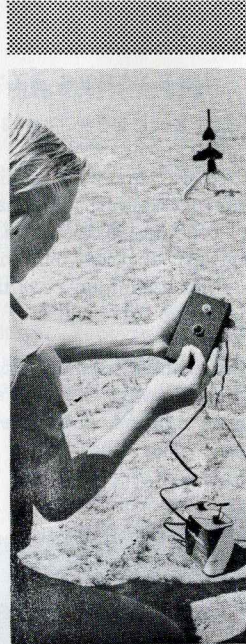
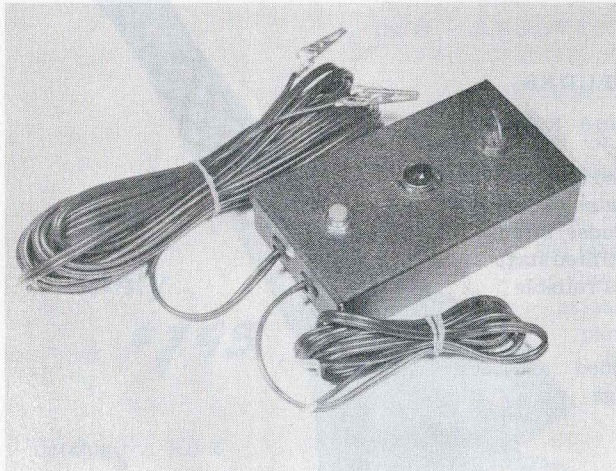
FIRST STAGE	SECOND STAGE	THIRD STAGE
B 3-0	A. 8-0	$\frac{1}{2}$ A. 8-4
	B. 8-0	A. 8-4
	B 3-0	B. 8-6
	C. 8-0	

Complete instructions for engine arrangements included with kit.



Centuri

## Basic Equipment



- ALL ALUMINUM PANEL BOX
- TOP QUALITY SWITCHES
- SAFETY ENGINEERED CIRCUIT
- EASY-TO-FOLLOW INSTRUCTIONS

## Professional Firing Panel

This professional type electrical firing panel provides a safe method for igniting your model rocket engines. Designed for use with the LIA-77 Launcher-Igniter Assembly and most other model rocket launchers. Safety interlock design requires that two switches must be closed to ignite rocket. Aluminum chassis measuring 5.5" x 3" x 1.5" has removeable face. Contains safety key switch, red warning light, and red firing switch. Includes 25 ft. of double conductor lead cable with connection clips. Available in either 6 or 12 volt model. Please specify voltage desired.

**EP-612** **READY-TO-OPERATE** **\$6<sup>95</sup>**

Shipping Wt. 1½ lb.

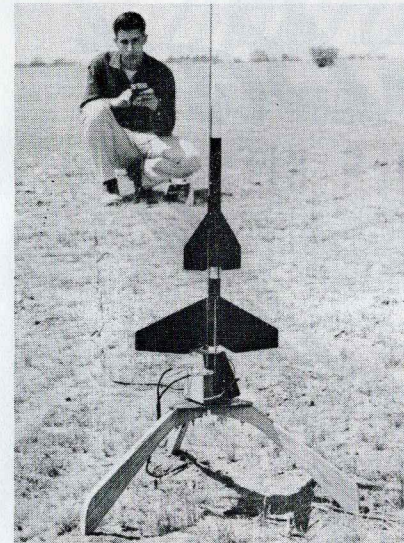
Battery not included

RECOMMENDED BATTERIES FOR USE WITH THIS PANEL

Ray-O-Vac No. 918    Eveready No. 731    Burgess No. TW1

Centuri

## Basic Equipment



- STURDY TRIPOD STAND
- STEEL EXHAUST DEFLECTOR
- 2 PIECE LAUNCHING ROD

## Launcher-Igniter Assembly

This heavy duty launching and ignition system is designed to handle most model rockets powered by the ¼A through E type engines. Can be used with either 6 or 12 volt battery. The Assembly includes the following:

**LAUNCHER BASE**---Self balancing tripod design permits launching from any type terrain. Collapsible for ease of transportation.

CATALOG NO. LB-77    Price \$1.85    Shipping wt. 2 lbs.

**IGNITER-DEFLECTOR**-----Combination igniter and exhaust deflector. Wire leads with micro-clips connect to engine igniter material for instantaneous ignition. Steel blast deflector directs hot exhaust gases away from base of rocket.

CATALOG NO. ID-77    Price \$2.00    Shipping wt. 10 ounces.

**LAUNCHING ROD**-Tempered steel rod 1/8" diameter x 36" long. Guides your model into a straight flight trajectory.

CATALOG NO. LR-77    Price 35¢    Shipping wt. 6 ounces.

**LIA-77 SPECIAL ASSEMBLY PRICE \$3<sup>75</sup>**

Shipping wt. 3 lbs.    Complete instructions and launching tips included.



# Aero-Bat

## ROCKET GLIDER KIT



**\$175**

Catalog No. KBG-1  
Shipping Wt. 10 oz.

### Boost-Glide AeroSpace Vehicle

Powered flight straight up, then glide return for a soft skid landing. Resembling and performing like the Dyna-Soar space vehicle, the Aero-Bat functions as both rocket and glider. With the insertion of a new engine, this model is ready to fly again. The original prototype Aero-Bat model made 106 demonstration flights before it was retired. The completed model measures 14" from cone to tail. Comes to you in easy-to-build kit form.

#### RECOMMENDED ENGINES

A. 8-3

B. 8-4

# Micro-Probe

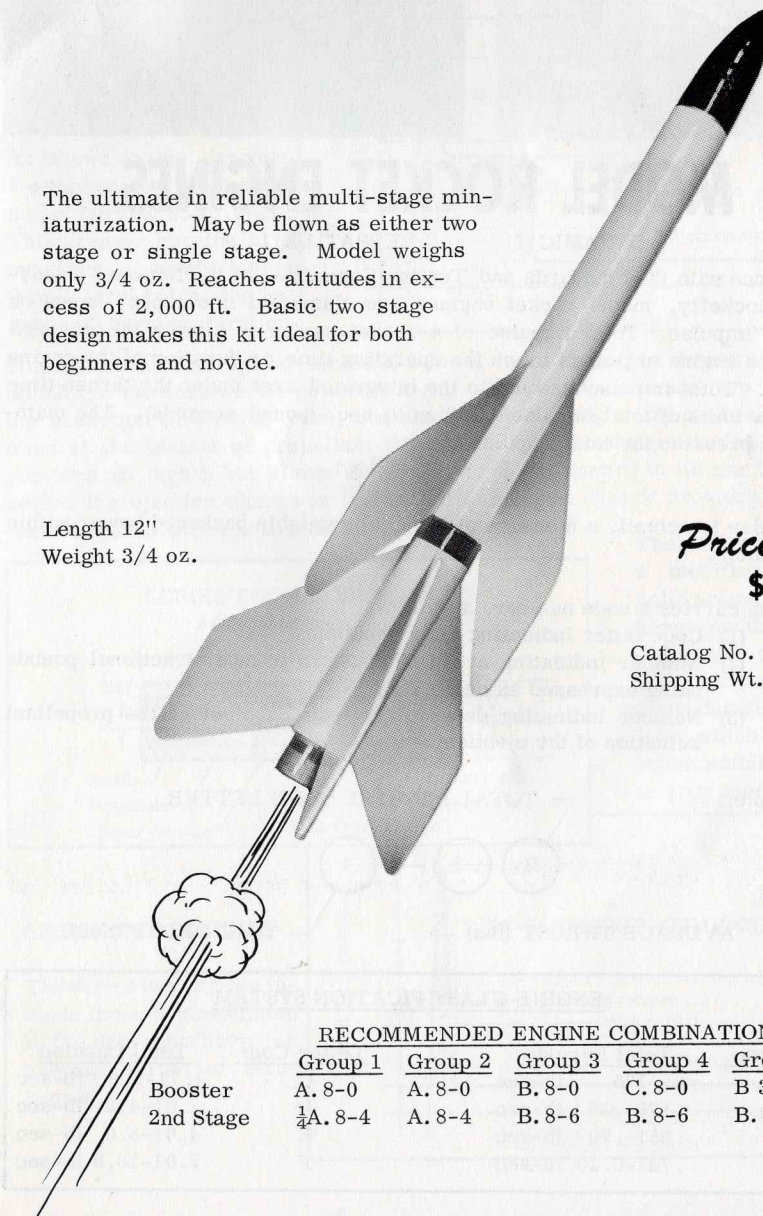
## TWO-STAGE PEE WEE ROCKET

The ultimate in reliable multi-stage miniaturization. May be flown as either two stage or single stage. Model weighs only 3/4 oz. Reaches altitudes in excess of 2,000 ft. Basic two stage design makes this kit ideal for both beginners and novice.

Length 12"  
Weight 3/4 oz.

*Price*  
**\$165**

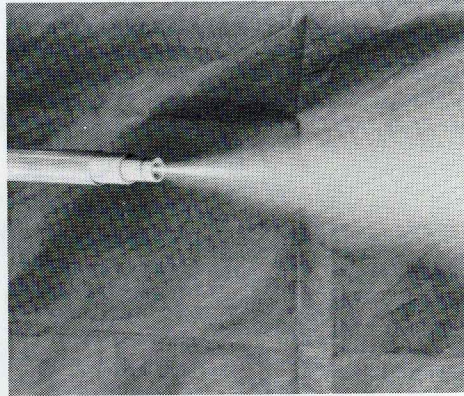
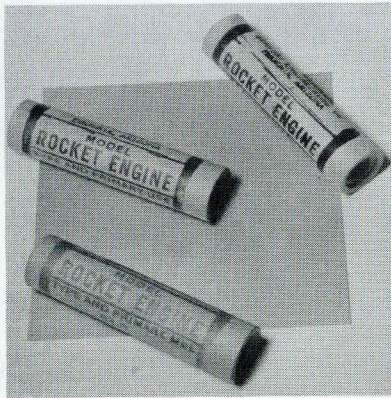
Catalog No. KB-10  
Shipping Wt. 8 ounces



#### RECOMMENDED ENGINE COMBINATIONS:

	Group 1	Group 2	Group 3	Group 4	Group 5
Booster	A. 8-0	A. 8-0	B. 8-0	C. 8-0	B 3-0
2nd Stage	$\frac{1}{4}$ A. 8-4	A. 8-4	B. 8-6	B. 8-6	B. 8-6





## MODEL ROCKET ENGINES

DYNAMIC!!

VERSATILE!!

In accordance with the Standards and Testing Committee of the National Association of Rocketry, model rocket engines are classified into types, based on their total impulse. Total impulse of a rocket engine is simply the average thrust of the engine in pounds times the operating time or duration of the engine in seconds. Total impulse is equal to the integrated area under the thrust-time curve. The units of total impulse are then lb-sec. (pound-seconds). The mathematical expression for total impulse is:

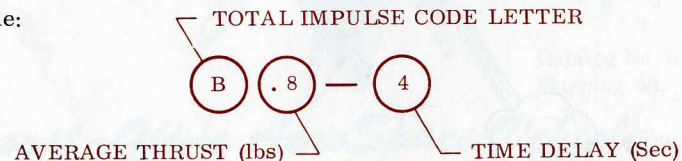
$$I_t = \bar{F} \times t$$

Total impulse is actually a measure of the total available packaged power within a rocket motor.

Each engine carries a code number, as follows:

- (1) Code letter indicating total impulse.
- (2) Number indicating average thrust in pounds, fractional pounds being expressed as decimals.
- (3) Number indicating delay time, from burn out of the propellant actuation of the ejection charge.

For Example:

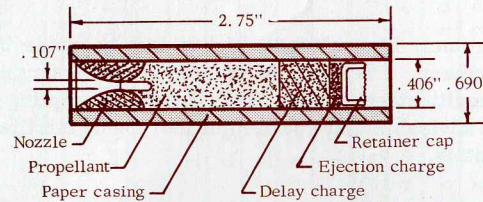


### ENGINE CLASSIFICATION SYSTEM

Letter Code	Total Impulse	Letter Code	Total Impulse
$\frac{1}{4}$ A	0-.175 lb-sec	C	1.11-2.0 lb-sec
$\frac{1}{2}$ A	.176-.35 lb-sec	D	2.01-4.0 lb-sec
A	.351-.70 lb-sec	E	4.01-8.0 lb-sec
B	.701-1.10 lb-sec	F	8.01-16.0 lb-sec

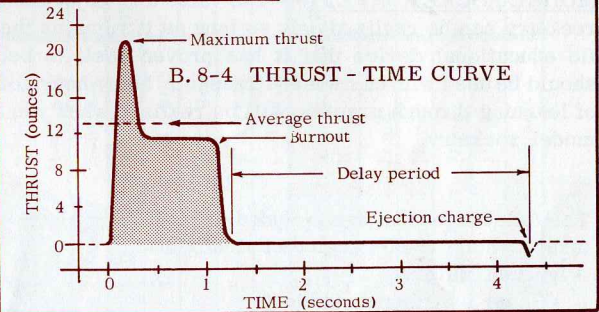
### SERIES ONE ENGINE DESIGN

B. 8-4 Model Rocket Engine



## MODEL ROCKET ENGINES

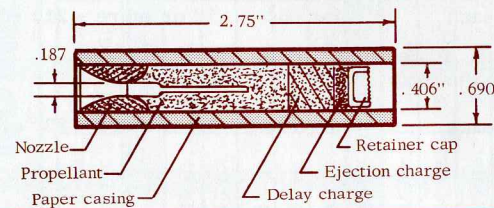
As shown in the drawing, the series two engine has a port burning solid grain. This greater burning area provides a much higher thrust level but at the expense of burning duration.



Following this high initial thrust is a lower level sustained thrust which is maintained for the duration of powered flight. Both series one and two engines, with the exception of booster types, contain a slow burning delay charge, which is ignited at the instant of propellant burn-out. This smoke producing delay charge provides no thrust but allows the rocket to coast upward to its maximum altitude before the ejection charge is ignited. The ejection charge provides a sudden release of gases which activates the recovery system.

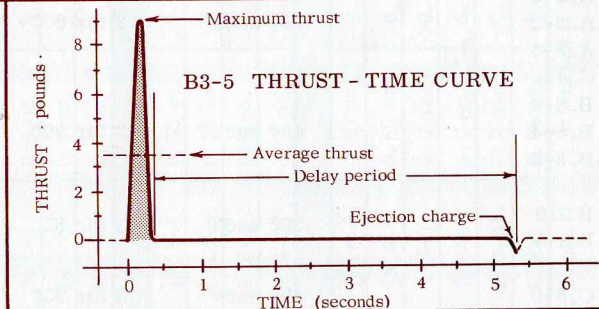
### SERIES TWO ENGINE DESIGN

B3-5 Model Rocket Engine



### SERIES TWO ENGINES

The series two engines include those engines listed in the data chart having an average thrust of three pounds.



### SERIES ONE ENGINES

The series one engines include all those listed in the data chart on page 22 having an area thrust of 0.8 lb.

The series one engine has a modified end burning solid propellant grain. As shown in the series one diagrams, these engines, upon ignition, produce a short duration, high thrust level which imparts sufficient stabilizing velocity to your model rocket.



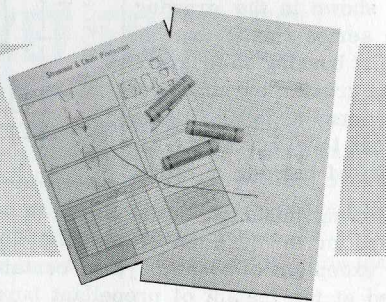
**BOOSTER ENGINE OPERATION**---Upon burn out of a zero delay engine, a flame issues forth from the forward end of the engine. This flame will reach effectively about 2" to auto-ignite the engine in the subsequent stage.

**MULTI-STAGE ROCKETS**---Extremely high altitude flights can be made by staging or coupling of engines together. The basic principles of multi-staging are demonstrated in all Centuri multi-stage rocket kits. Before attempting a multi-stage design, however, it is advisable that you become thoroughly familiar with single stage rocket fundamentals.

**MODEL ROCKET SAFETY**---The value and enjoyment associated with model rocketry can be realized only so long as it remains the safe hobby and scientific educational device that it has proven itself to be. Model rocket engines should be used with caution and respect. Many hours of fun and the satisfaction of learning through practice will be realized when you follow a safe program of model rocketry.

The following items are included with all those Centuri rocket engines listed below:

- Ignition Material
- Chute & Streamer Protectors
- Complete Mounting Instructions
- Complete Instruction for Ignition



## ROCKET ENGINE PRICES

CATALOG NO. &  
NAR CODE

Shipping Weight--1 ounce per engine  
PRICES

$\frac{1}{4}$ A. 8-0			
$\frac{1}{4}$ A. 8-2	25¢ each	3 for 65¢	12 or more - 21¢ each
$\frac{1}{4}$ A. 8-4			
$\frac{1}{2}$ A. 8-0			
$\frac{1}{2}$ A. 8-2	30¢ each	3 for 70¢	12 or more - 23¢ each
$\frac{1}{2}$ A. 8-4			
A. 8-0			
A. 8-2	35¢ each	3 for 80¢	12 or more - 26¢ each
A. 8-4			
B. 8-0			
B. 8-4	40¢ each	3 for 90¢	12 or more - 30¢ each
B. 8-6			
B 3-0			
B 3-5	50¢ each	3 for \$1.	12 or more - 33¢ each
C. 8-0	45¢ each	3 for 95¢	12 or more - 31¢ each

## ROCKET ENGINE DATA

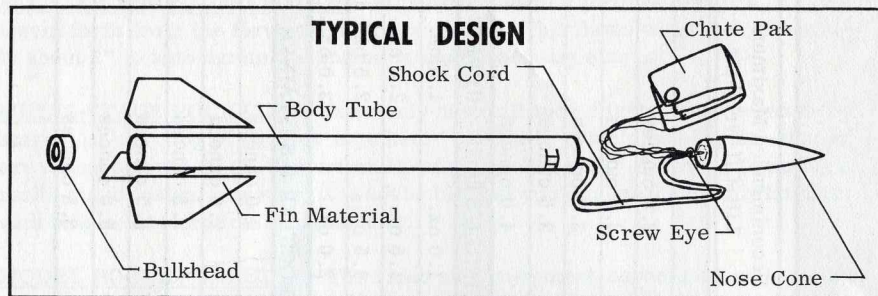
NAR Code Number	Initial Weight	Burn-out Weight	Maximum Thrust	Average Thrust	Thrust Duration	Total Impulse	Time Delay	Recommended Maximum Lift-Off Weight**
<b>SINGLE STAGE ENGINES</b>								
$\frac{1}{4}$ A. 8-2	0.53 oz.	0.45 oz.	23 oz.	0.8 lb.	0.15 sec	0.17 lb-sec	2-2 $\frac{1}{2}$ sec	2.0 ounces
$\frac{1}{2}$ A. 8-2	0.55 oz.	0.45 oz.	23 oz.	0.8 lb.	0.4 sec	0.35 lb-sec	2-2 $\frac{1}{2}$ sec	2.5 ounces
A. 8-3	0.6 oz.	0.45 oz.	23 oz.	0.8 lb.	0.9 sec	0.7 lb-sec	3-3 $\frac{1}{2}$ sec	3.0 ounces
B. 8-4	0.7 oz.	0.45 oz.	23 oz.	0.8 lb.	1.4 sec	1.15 lb-sec	4-4 $\frac{1}{2}$ sec	3.5 ounces
B 3-5*	0.7 oz.	0.45 oz.	9.0 lb.	3.0 lb.	0.35 sec	1.15 lb-sec	5-5 $\frac{1}{2}$ sec	4.0 ounces
<b>UPPER STAGE ENGINES OR SINGLE STAGE FOR FEATHER WEIGHT MODELS</b>								
$\frac{1}{4}$ A. 8-4	0.53 oz.	0.45 oz.	23 oz.	0.8 lb.	0.15 sec	0.17 lb-sec	4-4 $\frac{1}{2}$ sec	1.0 oz.
$\frac{1}{2}$ A. 8-4	0.55 oz.	0.45 oz.	23 oz.	0.8 lb.	0.4 sec	0.35 lb-sec	4-4 $\frac{1}{2}$ sec	1.5 oz.
A. 8-4	0.6 oz.	0.45 oz.	23 oz.	0.8 lb.	0.9 sec	0.7 lb-sec	4-4 $\frac{1}{2}$ sec	1.5 oz.
B. 8-6	0.7 oz.	0.45 oz.	23 oz.	0.8 lb.	1.4 sec	1.15 lb-sec	6-6 $\frac{1}{2}$ sec	2.0 oz.
<b>BOOSTER ENGINES</b>								
$\frac{1}{4}$ A. 8-0	0.53 oz.	0.45 oz.	23 oz.	0.8 lb.	0.15 sec	0.17 lb-sec	None	2.0 ounces
$\frac{1}{2}$ A. 8-0	0.55 oz.	0.45 oz.	23 oz.	0.8 lb.	0.4 sec	0.35 lb-sec	None	2.0 ounces
A. 8-0	0.6 oz.	0.45 oz.	23 oz.	0.8 lb.	0.9 sec	0.7 lb-sec	None	2.5 ounces
B. 8-0	0.7 oz.	0.45 oz.	23 oz.	0.8 lb.	1.4 sec	1.15 lb-sec	None	3.5 ounces
B 3-0*	0.7 oz.	0.45 oz.	9.0 lb.	3.0 lb.	0.35 sec	1.15 lb-sec	None	5.0 ounces
C. 8-0	0.75 oz.	0.45 oz.	23 oz.	0.8 lb.	2.0 sec	1.5 lb-sec	None	3.5 ounces
<b>BOOSTER &amp; SUSTAINER</b>								
								2.0 ounces
								2.0 ounces
								2.5 ounces
								3.5 ounces
								5.0 ounces
								3.5 ounces

\*Series II Engine (See page 20)

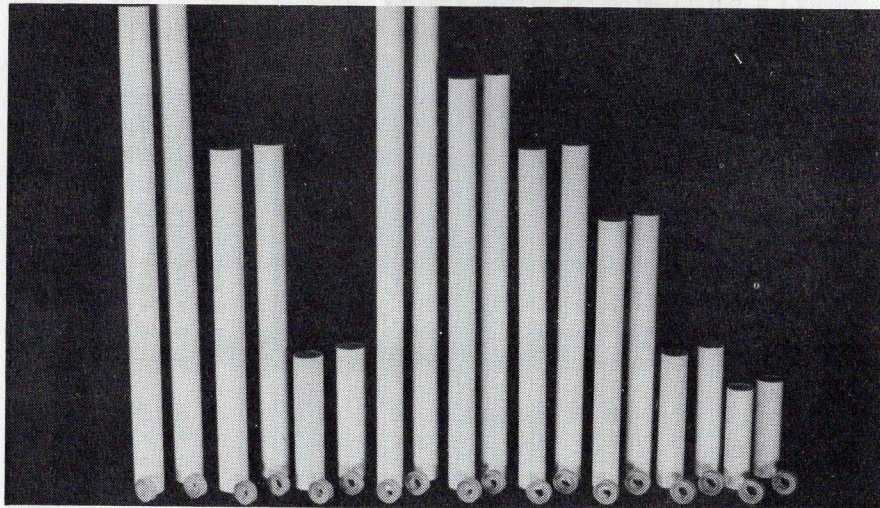
\*\*With Engines



## MODEL ROCKET PARTS-SECTION A



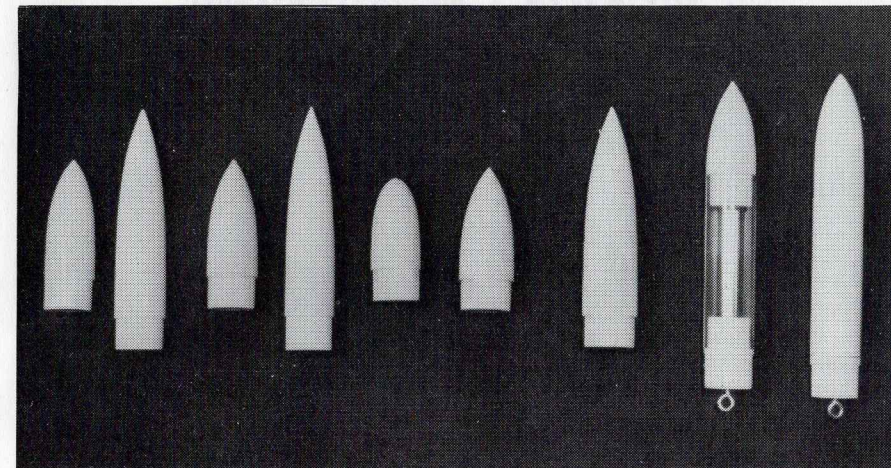
The following materials in Section A are for use with all those rocket engines listed on pages 21 and 22. The above drawing of a model rocket indicates how these parts can be combined to construct your own rocket design.



### BODY TUBES

For use as sustainer or booster bodies. Strong, rigid, round tubes constructed of lightweight laminated paper. Smooth finish reduces aerodynamic drag and offers excellent surface for painting and finishing. Wall thickness about .030". One engine mounting bulkhead included with each tube. Average shipping wt. per 3 tubes - 1 oz.

CATALOG NO.	PRIMARY USE	I. D.	LENGTH	PRICE
TB-713	Booster	.710	3"	10¢ ea. 3 for 20¢
TB-714	Booster	.710	4"	10¢ ea. 3 for 20¢
TS-718	Sustainer	.710	8"	15¢ ea. 3 for 30¢
TS-7110	Sustainer	.710	10"	20¢ ea. 3 for 40¢
TS-7112	Sustainer	.710	12"	25¢ ea. 3 for 50¢
TS-7114	Sustainer	.710	14"	30¢ ea. 3 for 60¢
TB-764	Booster	.765	4"	10¢ ea. 3 for 20¢
TS-7610	Sustainer	.765	10"	20¢ ea. 3 for 40¢
TS-7614	Sustainer	.765	14"	30¢ ea. 3 for 60¢



### NOSE CONES

**BALSA NOSE CONES**---Extremely lightweight, finely turned and smooth finished. Tangent-ogive design. Ideal for contest flying.

CAT. NO.	FITS TUBE I. D.	LENGTH	WEIGHT	PRICE
BC-711	.710	2.5"	0.07 oz.	35¢ ea. 3/.85
BC-713	.710	3.75"	0.12 oz.	40¢ ea. 3/1.00

**HARDWOOD NOSE CONES**---Surprisingly lightweight hollow bored for weight relief and payload space. Finely turned and smooth finished. Excellent for models requiring small fin area. Average shipping wt. 1 oz. each.

CAT. NO.	SHAPE	FITS TUBE I. D.	LENGTH	PRICE
HC-710	Parabolic	.710"	1.2"	35¢ ea. 3/.85
HC-712	Tangent-Ogive	.710"	2.1"	35¢ ea. 3/.85
HC-714	Tangent-Ogive	.710"	3.75"	45¢ ea. 3/1.20
HC-762	Tangent-Ogive	.765"	2.1"	40¢ ea. 3/1.00
HC-764	Tangent-Ogive	.765"	3.75"	45¢ ea. 3/1.20

All of the above cones are available with pin inserts for easy attachment of the shock cord. For this insert, add 5¢ per cone or 10¢ per 3 cones. Also specify "pin insert" on order blank.

**PAYLOAD CONE**---Lightweight, hardwood cone with see-thru plastic mid-section for small insect passengers. Fits .710 I.D. body tubes.

PC-71	85¢ each	Net wt. .55 oz. * Shipping wt. 1 oz.
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**PAYLOAD SECTION**---For carrying live specimens. Includes lightweight hardwood nose cone, body tube, adapter fitting, and screw eye for easy attachment of section to shock cord. Net wt. 0.39 oz.

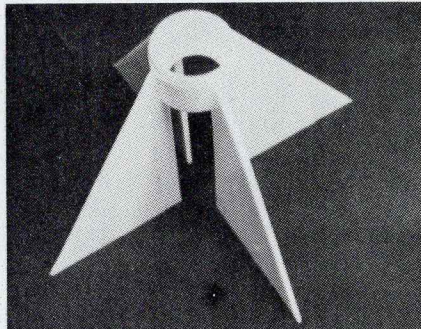
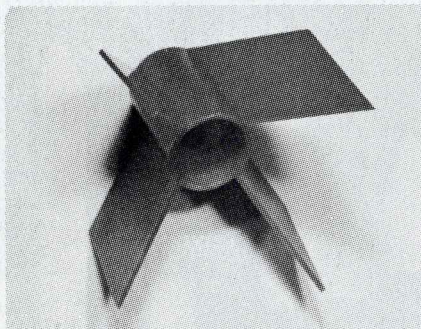
PS-71	75¢ each	Shipping wt. 1 oz.
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**VINYL NOSE CONE**---Semi-rigid yet flexible vinyl cone with styrene insert for easy attachment of shock cord. Fits the .765 I.D. body tube. Hollow interior offers space for payload. Net wt. .71 oz.

VC-76	75¢ each	Shipping wt. 1 oz.
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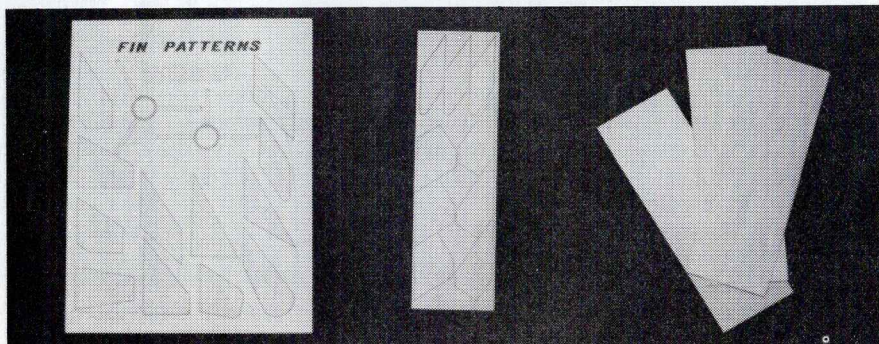


## STABILIZER FINS



(A) SPIN FIN UNIT---Molded plastic unitized fin set. The easy way to install stabilizer fins. For use with the TS-7614 body tube listed on page 23. Fins are angled to impart spin to the rocket for increased stability. Net weight 0.35 oz. PSF-76 Price 50¢ each 3 for \$1.20 Shipping weight 4 oz.

(B) PLASTIC STABILIZER FINS---Tough, lightweight plastic 3-fin unit. Easily attached to the TS-7614 body tube. This unit is just right for beginners. Net wt. 0.48 ounces. PF-76 Price 50¢ each 3 for \$1.20 Shipping weight 3 oz.



(C) FIN PATTERN SHEET---12 different proven fin patterns printed on heavy paper. Simply cut out pattern, place on balsa sheet and draw around to transfer pattern onto balsa. FP-12 Price 25¢ each 3 sheets for 50¢ Shipping weight 1 oz.

(D) BALSA FIN CUT-OUT---Select grade balsa sheet 3" wide x 9" long x 3/32" thick. Three sets of fin outlines printed on surface. Simply cut out and glue fins to body tube. For use with the TS-718, TS-7110, TS-7112 & TS-7114 body tubes. FMP-3 Price 35¢ each 3 sheets for 75¢ Shipping weight 1 oz.

(E) BALSA FIN MATERIAL---Extremely lightweight, select grain balsa sheets, excellent for model rocket stabilizer fins. Shipping weight 1 ounce per sheet.

CAT. NO.	THICKNESS	WIDTH	LENGTH	PRICE
BFM-8	1/16"	3"	9"	15¢ ea. 3 for 35¢
BFM-10	3/32"	3"	9"	15¢ ea. 3 for 40¢
BFM-12	1/8"	3"	9"	20¢ ea. 3 for 45¢

## RECOVERY DEVICES

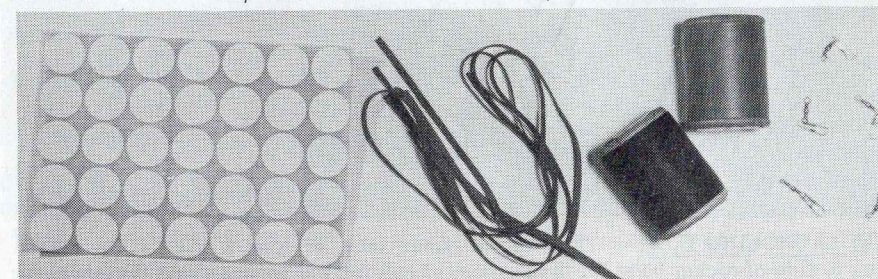


PARACHUTE PAK---Everything you need to make a model rocket parachute. Includes sheet of high visibility black plastic chute material, 4 tape discs and 50" of shroud line. CP-10 20¢ each 3 for 45¢ Shipping wt. 0.5 oz. ea.

PLASTIC CHUTE MATERIAL---One square yard of lightweight, high visibility black plastic sheeting. Sufficient material for 16 - 9" x 9" chutes or 9 - 12" x 12" chutes. Can be easily cut to your own desired shape. PCM-36 45¢ each 3 for \$1.20 Shipping wt. 2 oz.

SILK CHUTE MATERIAL---Imported lightweight Japanese silk, available in solid red or solid gold. Can be easily cut to desired shape. Please specify color. SCM-36 One Square Yard \$1.45 each Shipping wt. 2 oz.  
SCM-18 Square 18" x 18" 50¢ each Shipping wt. 0.5 oz.

DRAG STREAMERS---Two 1-1/8" wide x 20" long strips of red and white plastic tape. Use of this streamer provides sufficient drag for recovery of small model rockets. Net wt. 0.09 oz. RS-20 15¢ each 3 for 35¢ Shipping wt. 0.5 oz. ea.



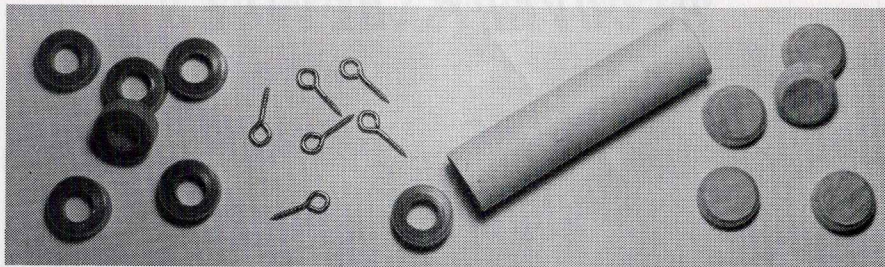
(A) TAPE DISCS---Sheet of 35 pressure, sensitive discs, used to secure shroud lines to plastic chute material. TD-35 20¢ per sheet 3 sheets for 45¢

(C) SHROUD LINE MATERIAL---Strong, fine lightweight cord. Perfect for model rocket chute shrouds. SL-70 70 yard spool 25¢ ea.

(B) SHOCK CORD---Strong, live action rubber cord which absorbs shock of the parachute ejection and opening. Perfect for all chute recovery models using 1/4A thru B type engines. 1/8" x 20". SC-20 10¢ each 3 for 20¢  
SC-20A 25 foot roll-----75¢ each

(D) SNAP SWIVELS---For quick, snap on attachment of shock cord to nose cone base. Net wt. 0.01 oz. SW-12 10¢ each 3 for 20¢





(A) ENGINE MOUNTING BULKHEADS---Thrust ring which the engine pushes against to lift the entire rocket vehicle. A must for most model rockets. Fits .710 I.D. body tubes. Hollow center allows passage of ignition flame or ejection gases.

BH-71 10¢ each 6 for 25¢ Shipping wt. 1 oz.

(B) MINIATURE SCREW EYES---For easy attachment of shock cord to nose cone base. Especially useful with balsa cones. Net wt. 0.01 oz.

SE-12 3 for 15¢ 6 for 25¢ Shipping wt. 1 oz.

(C) ENGINE MOUNT---For adapting engines to the .765 I.D. body tubes. Includes 3" long adapter tube, which slips into the .765 I.D. tube, and BH-71 bulkhead. Net wt. 0.1 oz.

EM-75 10¢ each 3 for 25¢ Shipping wt. 1 oz.

(D) SOLID BULKHEADS---Lightweight wood block for use where a solid blockage is required. Designed especially for use in the boost gliders where the ejection gases are used only to kick out the engine.

BH-71S 10¢ each 3 for 25¢ Shipping wt. 1 oz.



(E) LAUNCHING LUGS---Thin walled paper tube, 2" long x 5/32" I.D. Attach lug to side of rocket body for the purpose of guiding the rocket along the launching rod. Fits the 1/8" diameter rod shown on page 28.

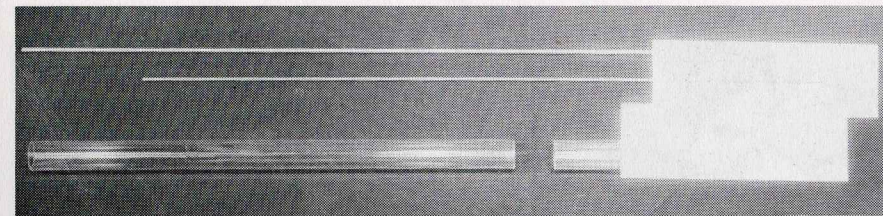
LL-5P 3 for 10¢ 12 for 25¢ Shipping wt. 1 oz.

(F) REINFORCING SILK---Lightweight, strong silk for strengthening fin-to-body glue joints. Apply with white glue or modeling dope.

SR-12 One square foot sheet 25¢ 3 for 60¢ Shipping wt. 1 oz.

(G) ALUMINUM LAUNCHING LUGS---Thin-wall strong aluminum tube which acts as launching guide when glued to rocket body tube. Slides easily over 1/8" dia. launching rod. 5/32" I.D. x 2" long.

AL-2 15¢ each 3 for 35¢ Shipping wt. 1 oz.



(A) PLASTIC TUBING---Clear tubing for use in making your own payload carriers.

CAT. NO.	O.D.	I.D.	LENGTH	PRICE
PT-3	3/4"	5/8"	3"	25¢ each Shipping wt. 2 oz.
PT-12	3/4"	5/8"	12"	65¢ each Shipping wt. 6 oz.

(B) LAUNCHING ROD---Two piece tempered steel rod. 1/8" diameter x 36" long.

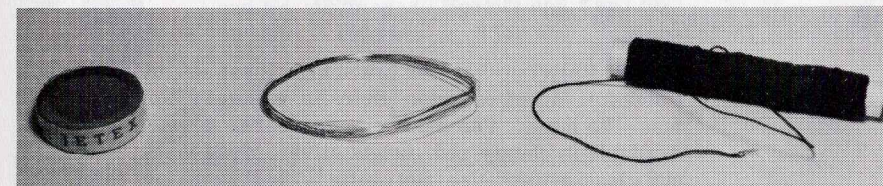
LR-125 35¢ each Shipping wt. 6 oz.

(C) HARDWOOD DOWEL---Selected white birch round dowels. Strong, straight and smooth. Ideal use as nose cone pin inserts and other modeling requirements. Shipping wt. 1 oz. each.

CAT. NO.	DIAMETER	LENGTH	PRICE
HD-8	1/8"	12"	Bundle of 6 - 20¢
HD-16	3/16"	12"	Bundle of 6 - 25¢
HD-4	1/4"	12"	Bundle of 6 - 30¢

(D) PRESSURE SENSITIVE PAPER---2" x 6" sheets of tough white paper with special adhesive on back. Simply strip off silicone paper backing and apply to any surface. Useful as reinforcing and hinge material.

SP-6 10¢ per sheet 3 sheets for 20¢ Shipping wt. 0.5 oz.



(E) JETEX IGNITER WICK---For use with Centuri rocket engines. Required for multi-stage ignition. 42" length in sealed canister.

JW-42 35¢ per tin 3 tins for 90¢ Shipping wt. 1 oz.

(F) NICHROME WIRE---Nickel-Chromium wire used as ignition element with Centuri rocket engines. Complete instructions for use included with all Centuri engines. About 2" required for each engine.

CAT. NO.	WIRE SIZE	LENGTH	PRICE
EW-32	#32	24"	15¢
EW-32A	#32	120"	50¢

(G) TENSION CORD---Thread like elastic cord for use with boost gliders, such as the Aero-Bat. Spring-like action is used to activate moveable or variable position aerodynamic surfaces.

TC-10 25 ft. roll - 50¢ each Shipping wt. 1 oz.





## FINISHING MATERIALS

To achieve maximum altitude flights with your model rockets, it is advisable to give them a smooth surface finish. Wind tunnel tests have shown that the surface finishes on model rockets can affect their altitude capabilities by as much as 60%. In other words, the smoother the surface, the greater the altitude.

A spray can type laquer or enamel gives the best finish. Nose cone and fins will require more than one coat. The grain texture of the fins and cone can be filled in with the application of several coats of balsa filler. Sand between coats and finish with a spray enamel or laquer. For ease of tracking, use bright colors, such as white, yellow, orange, red, or silver. Black is an excellent choice for high visibility against a blue sky.



**SPRAY PAINT**---Famous brand high gloss enamel. Perfect finish for model rockets. Dries in minutes. No brush--No fuss--No muss. Use indoors or outdoors. 6 ounce spray can available in cherry red, bright silver, gloss black, flat white and gloss white. Use flat white with fluorescent colors on page 30.

FP-2 \$1.20 each Shipping wt. 13 oz. each



**BALSA FILLERCOAT**---Seals and fills in the grain of balsa wood or hardwood fins and nose cones in preparation for the application of paint or modeling dope. Smooths out roughness. Simply brush on, allow to dry, and sand lightly to obtain the glass-like smooth finish necessary for maximum altitude model rocket flights.

MF-6 One ounce bottle 25¢ Shipping wt. 4 oz.

FDT-29 Thinner & Brush Cleaner 1 oz. bottle 25¢

Shipping wt. 5 oz.

**PLASTIC BALSA**---Fillet material for fin-body joints. This application strengthens and smooths over joint for streamlining effect. 1½ ounce tube.

MF-10 40¢ per tube Shipping wt. 2 oz.



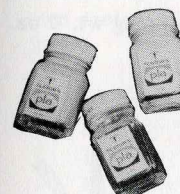
**FLOURESCENT SPRAY PAINT**---Hi-visibility, fast drying, laquer type paint in handy to use spray can. Trackers delight easy to spot at high altitudes. Available in cerise red, yellow orange, sunset gold, lemon yellow, red orange, and green. To obtain the full flourescent effect, these colors should be applied over a flat white base coat. Specify color.

FP-10 6 ounce pressurized can \$1.40 ea. Shipping wt. 13 oz.

**SPRAY DOPE**--No brush, no stirring. Just press the button and spray. Quick drying, beautiful finish for your models. 3 ounce pressurized can, available in gloss black, red and, white. Be sure to specify color.

FP-20 79¢ each

Shipping wt. 9 oz.



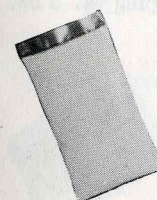
**PLA ENAMEL**--For hobby projects and model finishing. Use on wood, metal, plastic, and glass. Dries to hard durable finish. Fast drying, high gloss, excellent coverage. Easy to use. Available in No. 3 red, No. 14 yellow, No. 11 blue, No. 46 silver, No. 45 white, No. 47 black, No. 18 orange, and No. 48 thinner. Specify color and No.

FP-35 20¢ each 3 for 45¢ Shipping wt. 2 oz. each

**WHITE GLUE**---The perfect glue for model rocket usage. Quick setting and tremendous holding power. Adheres to wood, paper, and fabric. Comes in 2 ounce plastic squeeze bottle.

GL-39 40¢ each

Shipping wt. 5 oz.



**POWDERED BALSA**--Balsa wood ground to a very fine powder. When mixed with clear dope or model cement, it makes a lightweight, quick drying fillet and molding material. Easy to sand when dried.

BP-32 25¢ per bag

Shipping wt. 1 oz.





**FIREPROOFING SOLUTION** --- Prevents burning of tail fins or other parts exposed to hot exhaust gases. Simply apply with a brush, just like paint. Especially useful with swept fins.

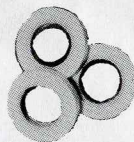
FP-13 2 ounce bottle 50¢

Shipping wt. 5 oz.

**MASKING TAPE** - Narrow masking tape for striping and color marking your models. Highly flexible for curved stripes. Seals tightly for clean edges, strips off clean. 12 ft. length rolls. Shipping wt. 1 oz. per roll.

MT-25 1/4" width 20¢ per roll 3 rolls for 50¢  
MT-38 3/8" width 20¢ per roll 3 rolls for 50¢  
MT-50 1/2" width 20¢ per roll 3 rolls for 50¢

The above widths can be mixed for the 3 roll price.



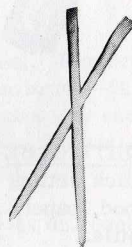
**SANDPAPER** --- 5 sheets, 2" x 4" in assorted grades. Extra fine, fine, and medium.

MF-15 5 sheet package 15¢

Shipping wt. 2 oz.

**PAINT BRUSHES** -- Useful for applying dope and PLA enamel to all models. High quality camel hair, firmly mounted with metal ferrules.

PB-20 1/4" width 15¢ each Shipping wt. 1 oz.  
PB-25 1/2" width 25¢ each Shipping wt. 1 oz.



**RUBBING COMPOUND** --- Necessary for obtaining a mirror-like finish on any dope finish. Adds the professional touch to your model paint job. Apply with clean dry cloth.

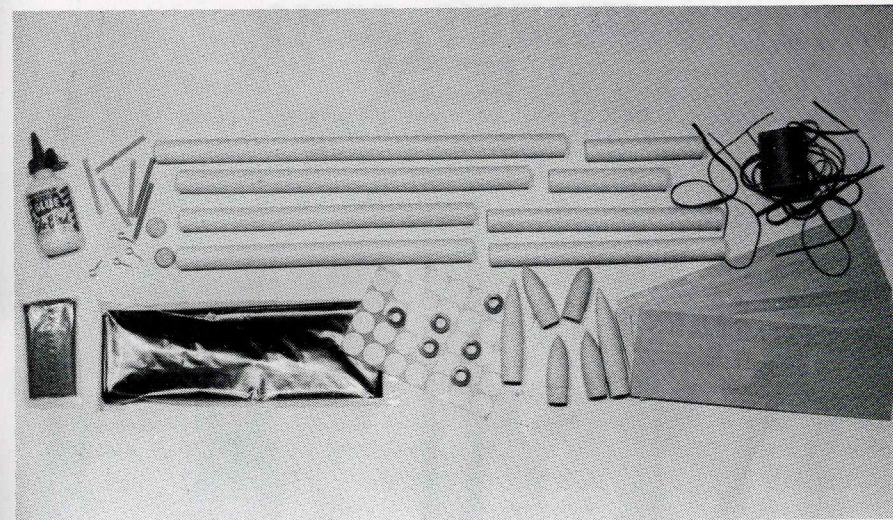
RBC-50 2 1/4 ounce jar 75¢

Shipping wt. 5 oz.

**GLOSS WAX** --- Apply to any painted surface with a soft cloth, let stand a few seconds, then polish lightly with dry cloth to obtain bright shining finish. Reduces air friction and consequently cuts down on drag.

GW-60 2 1/4 ounce jar 85¢

Shipping wt. 5 oz.



## DESIGNERS ASSORTMENT

SAVE!!

CATALOG NO. DA-100

SAVE!!

Everything needed to construct 4 single stage and 2 multi-stage rockets of your own design. This balanced selection of parts is offered to you at savings of over 25%.

2	4" Booster Tubes	TB-714	1	Balsa Fin Cut-Outs*	FMP-3
2	8" Body Tubes	TS-718	1	Fin Pattern Sheet*	FP-12
2	10" Body Tubes	TS-7110	1	Reinforcing Material	SR-12
1	12" Body Tube	TS-7112	1	Plastic Chute Mat'l.	PCM-36
1	14" Body Tube	TS-7114	6	Shock Cord	SC-20
2	Balsa Nose Cones	BC-711	1	Roll Shroud Line	SL-70
1	Balsa Nose Cone	BC-713	1	Sheet of Tape Discs	TD-35
1	Hardwood Nose Cone	HC-710	6	Mounting Bulkheads	BH-71
1	Hardwood Nose Cone	HC-712	2	Solid Bulkheads	BH-71S
1	Hardwood Nose Cone	HC-714	6	Launching Lugs	LL-5P
3	Balsa Fin Material	FM-32	4	Screw Eyes	SE-12
		1 Bottle White Glue	GL-39		

\*Not shown in photograph.

**\$7<sup>50</sup>**

Value

**Special Price**

Only **\$4<sup>95</sup>**

No additional discounts are given on this assortment.

Shipping Wt. 1 1/2 lb.



# MODELING TOOLS

**x-acto**

## PRECISION KNIVES & BLADES



no. 1-st 60¢



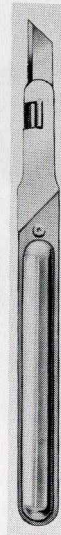
no. 2-st 75¢



no. 3-st \$1.00



no. 5-st \$1.20



no. 8-st 29¢



**no. 82 x-acto knife chest**—Nos. 1, 2 and 5 Knives plus 9 asst. extra blades. Handy, natural-finish wood chest. Wt. 1½ lbs. \$4.50



**no. 86 x-acto hobby chest**—Contains Nos. 1, 2, 5 knives and complete asst. of blades, gouges, routers, punches. Has X-acto planer, sander, spokeshave, balsa stripper, steel rule. In handsome fitted wood chest. Wt.: 2 lbs \$12.50

Fits No. 1 &amp; 3 handles

Fits No. 2 &amp; 5 handles

Fits No. 8 handle



No. 10 No. 11

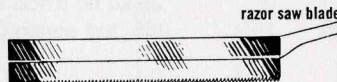


No. 24 No. 22



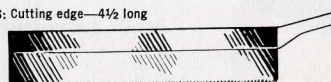
No. 8

All Blades 15¢ each 5 for 60¢

these fit  
no. 5 handle

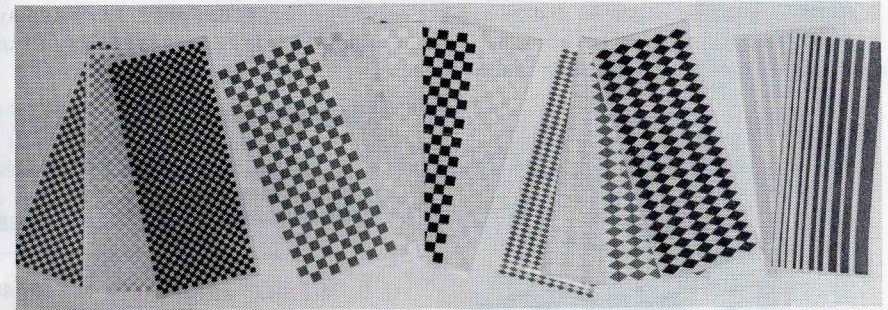
No. 34—¾" wide—40¢ ea.

razor saw blades: Cutting edge—4½ long



No. 35—1" wide—45¢ ea.

## Decorative Decals



(A) **SQUARE CHECKERBOARD**---Easy to apply sheet of glossy colorful checks on clear background. Adds color contrast to your models for ease of tracking. Available in the following sizes and colors: Be sure to specify color and size.

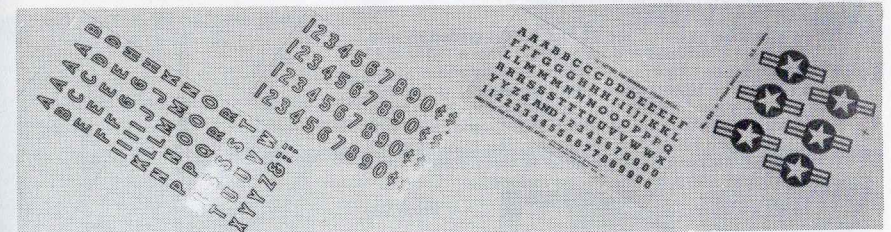
CAT. NO.	CHECK SIZE	COLORS AVAILABLE	PRICE
DC-25A	1/4"	Red, Black, Gold, White	25¢ ea. 3 for 65¢
DC-25B	3/8"	Red, Black, Gold, White, Silver	25¢ ea. 3 for 65¢

(B) **DIAMOND CHECKERBOARD**---Unusual color pattern. Same decal as above except checks are diamond shaped instead of square. Available in following colors and sizes. Be sure to specify color and size.

CAT. NO.	CHECK SIZE	COLORS AVAILABLE	PRICE
DC-27A	1/4"	Red	25¢ ea. 3 for 65¢
DC-27B	3/8"	Red, Black, White	25¢ ea. 3 for 65¢

(C) **COLOR STRIPE DECALS**---Ten stripes per sheet 1/32" thru 1/2" wide x 9" long. Use on your model to form either vertical stripes or horizontal rings. Available in black or yellow stripes.

DC-29	30¢ each sheet	3 sheets for 75¢
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(D) **LETTER DECALS**---½" high black bordered gold letters for your NAR number or other code markings. 59 letter characters per sheet.

DL-7	25¢ per sheet	3 sheets for 65¢
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(E) **NUMERAL DECALS**---½" high black bordered gold numerals for identifying your models. Four sets of numbers, 0 thru 9.

DN-5	25¢ per sheet	3 sheets for 65¢
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(F) **LETTERS & NUMERALS**---¼" high, all red numerals and letters used for identification of your models.

DLN-13	25¢ per sheet	3 sheets for 65¢
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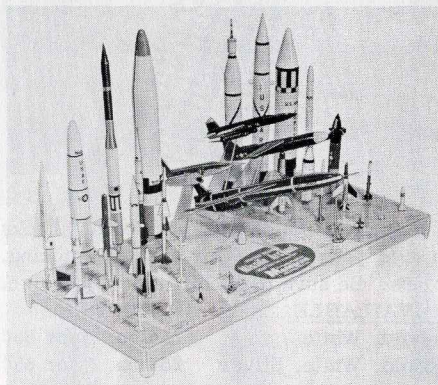
(G) **STARS & BARS - U. S. A. F. INSIGNIA**---Sheet of 6 red, white and blue Air Force emblems. Especially attractive on boost gliders, such as the Aero-Bat DSB-17

20¢ per sheet



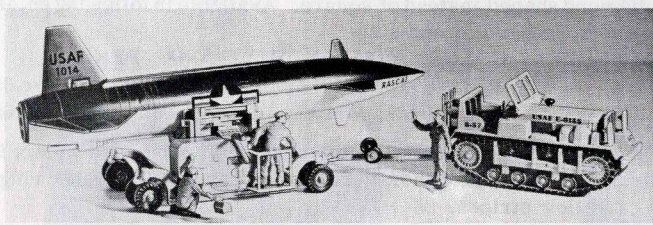
## PLASTIC SCALE MODELS

Those models on pages 35 and 36 are not operable, but make attractive display models for your room or workshop. They also provide "idea" material from which you can scale operating model rockets.



### U. S. MISSILE ARSENAL KIT PD40

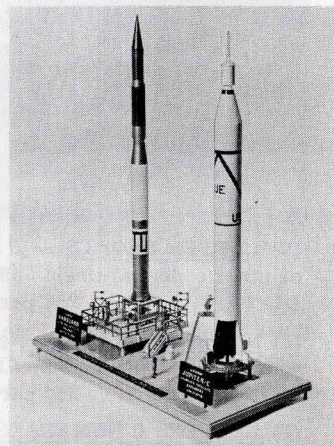
A complete collection of 31 authentic, identical scale and fully-detailed models of U.S. missiles and satellite vehicles, with identifying exhibition stand. All models are precision-molded in white, red or blue plastic to identical scale— $\frac{1}{32}$  inch to one foot. A specially-prepared 32 page illustrated book, "Know the Missiles," giving the story behind each missile, is included. Price \$2.98



### RASCAL GUIDED MISSILE KIT PD42

This is a faithful model of the 32-foot Rascal guided missile. It has a nuclear warhead and is launched from a flying B-47 bomber at surface targets up to 100 miles away and at supersonic speed. The Monogram model of the Rascal is 8 inches long and has hinged folding fins. Mounted in cradle on transporter-loader, which moves sideways and up and down with crank action, and hitched to the tractor, the total length is 11 $\frac{3}{4}$  inches. Amazing detail. Molded in three colors. Three working figures and authentic decals included.

Price 98¢



### U. S. EARTH SATELLITE SET KIT PD41

Authentic detailed kit containing two U.S. missiles or satellite launchers. It also commemorates two dates in America's Space Age activities. Kit contains authentic models of Army's Jupiter C missile with satellite "Explorer I," launched on January 31, 1958 and the Vanguard with satellite "Vanguard I," launched by Navy, March 17, 1958. Included are portable launchers for each missile, launching pad, four working figures and decals. Price 98¢

**PLEASE NOTE!!** For special packaging required for safe shipment of the Plastic Scale Models on pages 35 and 36, enclose 20¢ in addition to the listed price of each kit.

## Friendship 7 Mercury Capsule

FRIENDSHIP 7 MERCURY CAPSULE...

with **ATLAS BOOSTER**

ATLAS BOOSTER...

TRACTOR...

LAUNCHING PAD...

TRANSPORTER...

RAMP...

AUTHENTIC DECALS

NITROGEN TRAILER...

OF MERCURY AND ATLAS. OPERATING PARTS...

H-1833 Price... **\$2.49**

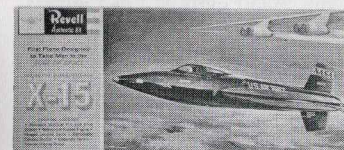


## NORTH AMERICAN X-15

•EXCITING FEATURES•

- Movable Vertical Fin and Dive Brakes •Removable Rocket Engine
- Hinged Landing Skids •Removable Canopy Section •Elaborate Decals
- Special Display Stand

Price.....98¢

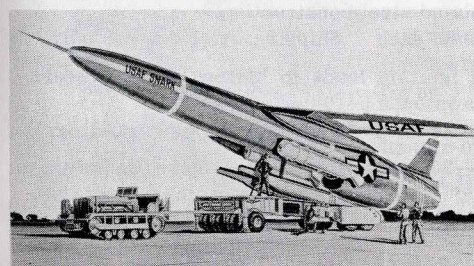


## REDSTONE MISSILE with MERCURY CAPSULE

Complete Redstone-Mercury Kit

- Redstone Booster
- Mercury Capsule
- Launching Pad
- Testing Unit
- PLUS:
- Retro rockets
- Escape rockets
- 3-man ground crew

H-1832 Price.....98¢



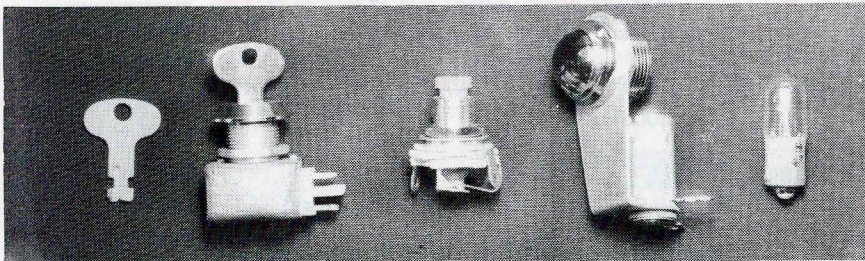
**Snark**  
Guided Missile

### SNARK GUIDED MISSILE KIT PD27

The Snark's range is 5000 miles and tests have proven it capable of delivering a nuclear warhead to any military target in the world at supersonic speed. Model was scaled from official blueprints, is 11 $\frac{1}{4}$  inches long, with wingspan of 6 $\frac{3}{4}$  inches. Kit includes, beside the missile, launcher and elevating cradle, tractor and four sculptured figures. Price 98¢



## ELECTRICAL SUPPLIES



**SAFETY LOCK SWITCH**---A must for every model rocket ignition system. Prevents accidental firing of engines. Key must be inserted and turned to close switch. Mounts in  $\frac{1}{2}$ " hole. Comes with one key.

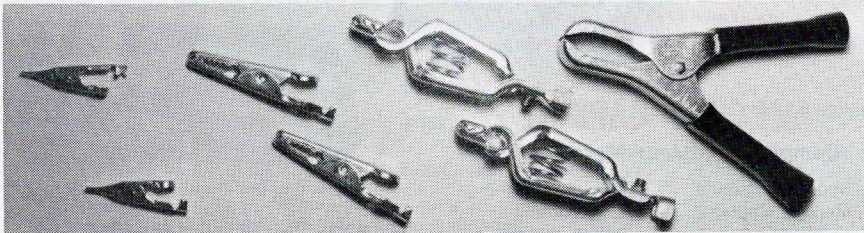
ES-36	\$1.75 each	Shipping wt. 2 oz.
ES-36K	Extra Key 25¢ each key	Shipping wt. 2 oz.

**PUSH BUTTON SWITCH**---Momentary type normally off. Excellent for firing switch. Bright red plastic push button. Mounts in  $\frac{3}{8}$ " hole.

ES-40	85¢ each	Shipping wt. 2 oz.
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**PILOT LIGHT ASSEMBLY**---Attractive  $\frac{3}{4}$ " red colored convex jewel with a chrome plated lens holder. Mounts in  $\frac{11}{16}$ " hole. Bayonet bulb socket. Perfect for warning arm light in your ignition circuit. Bulb not included.

EPA-14	65¢ each	Shipping wt. 2 oz.
EPB-6	6 volt lamp bulb-bayonet type	15¢ each
EPB-12	12 volt lamp bulb-bayonet type	22¢ each



**MICRO-GATOR CLIPS**---The very best clips for connecting ignition leads to the engine igniter material. Tiny flat jaws will firmly grip the finest wire. Length 1- $\frac{3}{32}$ ". Jaws open  $\frac{7}{32}$ ". Cadmium plated steel construction.

EMC-34	2 for 19¢	10 or more 8¢ each	Shipping wt. 1 oz. per pair
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**ALLIGATOR CLIPS**---Ideal for clipping ignition leads to battery posts. Steel (Cadmium plated). Length 1- $\frac{11}{16}$ ". Jaws open  $\frac{5}{16}$ ".

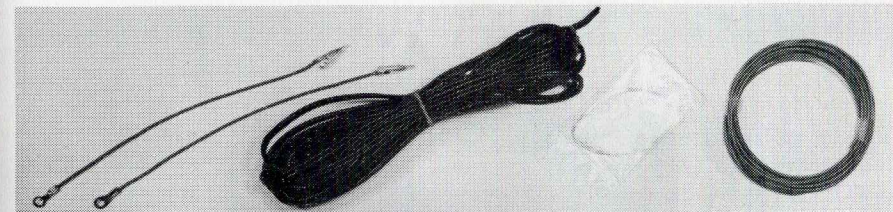
EMC-70	10¢ each	10 or more 8¢ each	Shipping wt. 1 oz.
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**HEAVY DUTY BATTERY TEST CLIPS**---20 ampere capacity. Steel (Cadmium plated.) Length 2- $\frac{7}{16}$ ". Jaws open  $\frac{5}{8}$ ". Meshing teeth on all three sides of each jaw.

EMC-27	2 for 35¢	Shipping wt. 3 oz.
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**BATTERY CLIPS**---Just the clip for use with automotive storage batteries. Jaws clamp solidly on terminal or bare battery post. 50 ampere capacity, 1- $\frac{1}{8}$ " jaw spread spans largest terminal. 3" overall length. Steel, bright copper plated. Comes with tough vinyl handle insulators in red or black. Please specify color.

EMC-46	40¢ each	2 for 75¢	Shipping wt. 4 oz. each
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**LEAD-CLIP ASSEMBLY**---Now a complete ignition clip and lead assembly with ring terminals attached. This is the same clip assembly used with the launcher on page 6. Simply connect ring terminal to firing line and your launcher is set up for electrical ignition. 6" insulated leads with tiny micro-clips.

ECA-44	Set of two	50¢	Shipping wt. 2 oz.
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**FIRING LINE**---Flexible, size 18, stranded, 2 conductor parallel insulated cord. Perfect for model rocket engine ignition systems.

EZP-12	12 ft. roll	65¢	Shipping wt. 5 oz.
EZP-25	25 ft. roll	\$1.00	Shipping wt. 10 oz.

**NICHROME WIRE**---Resistance type heating element wire for use as engine igniter material. Directions for use included with all Centuri rocket engines. Shipping wt. 0.5 oz.

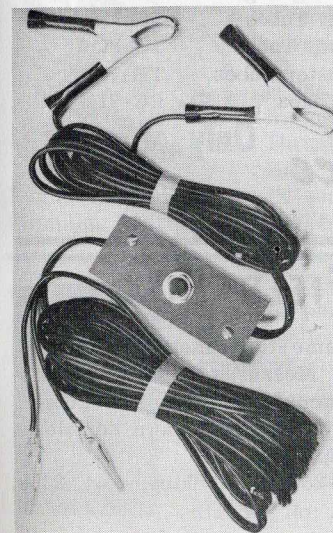
EW-32	#32 wire size	24" length	15¢
EW-32A	#32 wire size	10 ft. roll	50¢
EW-24	#24 wire size	12" length	15¢

**HOOK-UP WIRE**---No. 18 tinned copper stranded conductor with vinyl insulation. Ideal for wiring ignition circuit components. Available in black or red. Specify color desired. Strips easily and clean.

EW-10	10 ft. length	35¢	Shipping wt. 2 oz.
EW-25	25 ft. length	75¢	Shipping wt. 5 oz.

*New!!*

## Heavy Duty IGNITION OUTFIT



At last! Just what so many rocketeers have been asking for; a firing line setup which can work off of a car battery. The EFC-88 is designed to do just that, and can also be used with any other type battery or dry cell. The EFC-88's longer firing lead cable makes this outfit just right for use with the Aero-Dart model and the Launcher-Igniter on pages 43 and 44.

- Momentary contact push button switch
- 25 ft. firing lead cable
- 5 ft. battery lead cable
- Heavy duty battery post clamps
- Tiny Micro-Gator igniter clips

**\$395**

**Complete**

Catalog. No. EFC-88  
Shipping Wt. 1 $\frac{1}{2}$  lb.





## FIELD BOX SPECIAL

Catalog No. FBA-300

SAVE!! A must for every model rocketeer!! Use at your work table and on the launching range. Sturdy hammertone finished, all metal box measures 11" x 5" x 3-3/4". Comes to you, loaded with all those items which you will most likely need out on the launching range. Includes all of the following items:

6 Screw Eyes	SE-12	1 Sheet Tape Discs	TD-35
12 Bulkheads	BH-71	1 Tin Jetex Wick	JW-42
2 Chute Paks	CP-10	3 Lengths Nichrome	EW-32
3 Shock Cords	SC-20	6 Launching Lugs	LL-5P
1 Shroud Line	SL-72	3 8" Body Tubes	TS-718
1 Bottle White Glue	GL-39	3 10" Body Tubes	TS-7110
1 Reinforc. Mat'l.	SR-12	3 4" Booster Tubes	TB-714
1 No. 1 Xacto Knife		3 Nose Cones	BC-711

**\$8<sup>50</sup> Value** *Special Price* **Only \$5<sup>95</sup>**

No additional discounts given on this Special.



## FIELD BOX

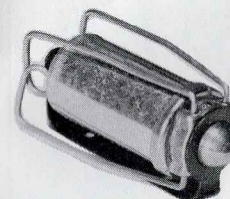
This is the same sturdy metal box as described above. Measures 11" x 5" x 3-3/4". Attractive hammertone finish. Three compartment tray. Has full-drawn seamless body with snap catch.

Cat. No. FB-250 \$2.50 Shipping wt. 2 lbs.

## JETEX

### Engines & Fuels

The light weight of JETEX engines has made it possible to design and fly models of missile proportions, that will, after the powered phase of a flight, descend in a gentle recovery trajectory. For full information on designing and flying JETEX powered missiles, see the handbook, "All About Jetex", listed below.



Engine & Clip with JX-50HT Price \$1.49  
Complete Instructions Shipping Wt. 4 ounces

**50-HT REACTION MOTOR**—Designed to fill the requirements of realistic missile type & scale jet performance. Develops over 5 ounces of thrust when fired with the new 50-HT fuel.

Weight Empty---0.3 oz.  
Weight Loaded---0.5 oz.  
Thrust-----5 oz.  
Max Duration---3-5 sec.

**50-HT FUEL**—Solid cored pellets, with wick & accessory tool.

20 Pellets---\$1.49  
Cat. No. JXF-50HT  
Shipping Wt. 5 oz.



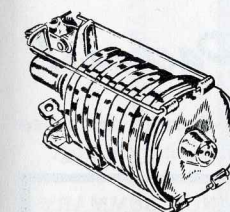
Engine & Clip with JX-50B Price 98¢  
Complete Instructions Shipping Wt. 3 oz.

**No. 50B STANDARD ENGINE**--Most popular of the JETEX range for rocket type missiles, model aircraft, speed boats, and race cars.

Weight Empty---0.2 oz.  
Weight Loaded--0.4 oz.  
Thrust-----0.6 oz.  
Max. Duration--16 sec.

**JETEX 50B FUEL**---Solid fuel pellets with wick and accessories.

10 Pellet Pak---59¢  
Cat. No. JXF-50B  
Shipping Wt. 3 oz.



Engine & Clip with JX-600 Price \$3.95  
Complete Instructions Shipping Wt. 8 oz.

**SCORPION 600 ENGINE** --Most efficient engine of the JETEX family; thrust is almost four times the total weight. Its very high power/weight ratio makes it of great value to the experimental modeler.

Weight Empty---1.6 oz.  
Weight Loaded--2.0 oz.  
Thrust-----6 oz.  
Max. Duration--12 sec.

**JETEX 600 FUEL & WICK**

JXF-600 10 Pellet Pak \$1.95  
Shipping Wt. 6 ounces



**JETEX HANDBOOK**--"All About Jetex", by Paul Del Gatto. 48 pages packed with information and illustrations showing the many applications of Jetex engines and fuels to both model aircraft and missiles. Includes such information as:

Principles of Jets & Rockets Designing Jetex Powered Missiles  
Jetex Operating Instructions Rocket Powered "Dyna-Soar"  
New 50-HT Engine & Fuel "Rocket" Their Way to Success  
Two Stage Rocket Space Ship

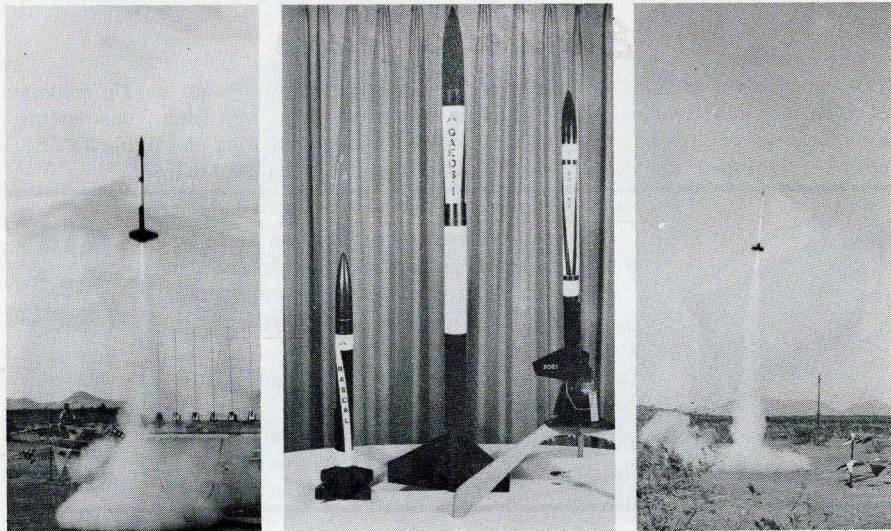
Catalog No. JX-100

Price \$1.00

Shipping Wt. 5 oz.



## MODEL ROCKET PARTS- SECTION B



The items contained in the following pages are designed for use with the 'F' type model rocket engines listed below. Before attempting to build and launch models using these engines, it is advisable that you design, build, and launch several models using the A & B type engines to become thoroughly familiar with rocketry fundamentals and flight characteristics. Two typical 'F' designs are shown on page 42.

## F-TYPE ROCKET ENGINES

MODEL F11-3 With Time Delay and Ejection Charge

Length-----8.0"  
Diameter ----1-1/16"



**3 for \$3.60**

Ignition Fuse--10" long---3 for 35¢

Use Special Order Blank

*Power Packed!!*

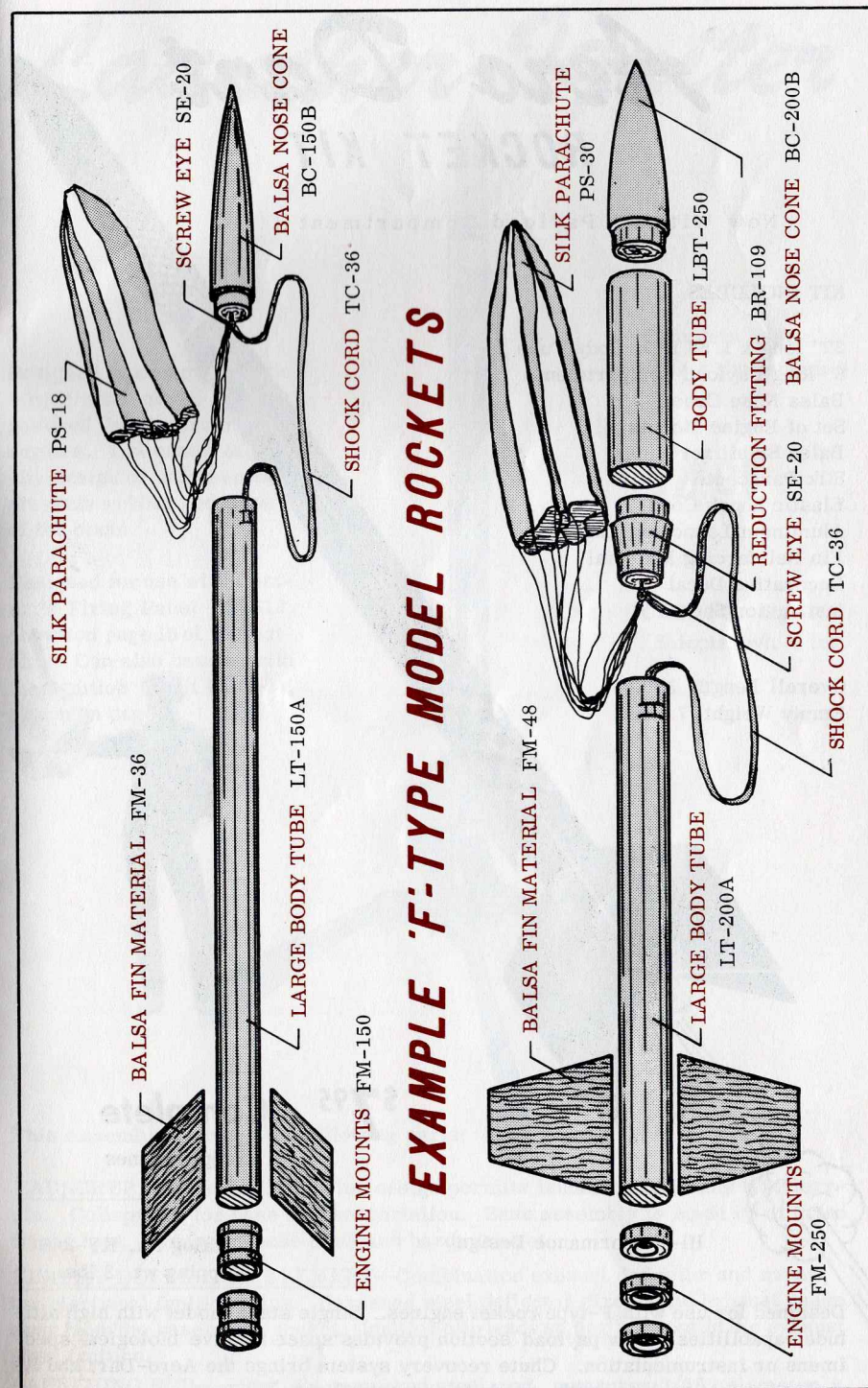
For use with the Aero-Dart kit and those materials in Section B of this catalog.

### ENGINE PERFORMANCE SUMMARY

TOTAL IMPULSE-----11.0 lb-sec.  
MAXIMUM THRUST-----20 lb.  
AVERAGE THRUST-----11 lb.  
THRUST DURATION ----1.0 sec.  
SPECIFIC IMPULSE ----54 sec.  
LOADED WEIGHT -----5 oz.  
EMPTY WEIGHT -----2.0 oz.  
TIME DELAY -----3-4 sec.

### PLEASE NOTE!!!

These engines are recommended for the advanced student of model rocketry only. The 'F' type engines and ignition fuse must be shipped express, direct from the factory. Please order these engines on the Special Order Blank only, available upon request.





# Aero Dart

## ROCKET KIT

Now With 6" Payload Compartment !!

### KIT INCLUDES:

22" long x 1.5" I. D. Body Tube  
6" long Payload Compartment  
Balsa Nose Cone  
Set of Engine Mounts  
Balsa Stabilizer Fins  
Silk Parachute  
Elastic Shock Cord  
Aluminum Launching Lugs  
Fin Reinforcing Material  
Decorative Decal  
Instruction Sheets

Overall Length 37"  
Empty Weight 7.5 oz.

Hi-Performance Design

Designed for use with F-type rocket engines. Single stage model with high altitude capabilities. New payload section provides space for live biological specimens or instrumentation. Chute recovery system brings the Aero-Dart and its payload safely back to earth, ready for another flight.

**\$7<sup>95</sup>**

**Complete**

Except Engines

Catalog No. KF-2  
Shipping wt. 3 lbs.

# Launcher-Igniter

Complete Assembly  
(Rocket Not Included)

**\$4<sup>95</sup>**

CAT. NO. LIA-100  
Shipping wt. 4 lbs.

Designed to accommodate the larger size model rockets powered by D thru F type engines. Low center of gravity design of launcher base prevents wobble and tipping of the stand.

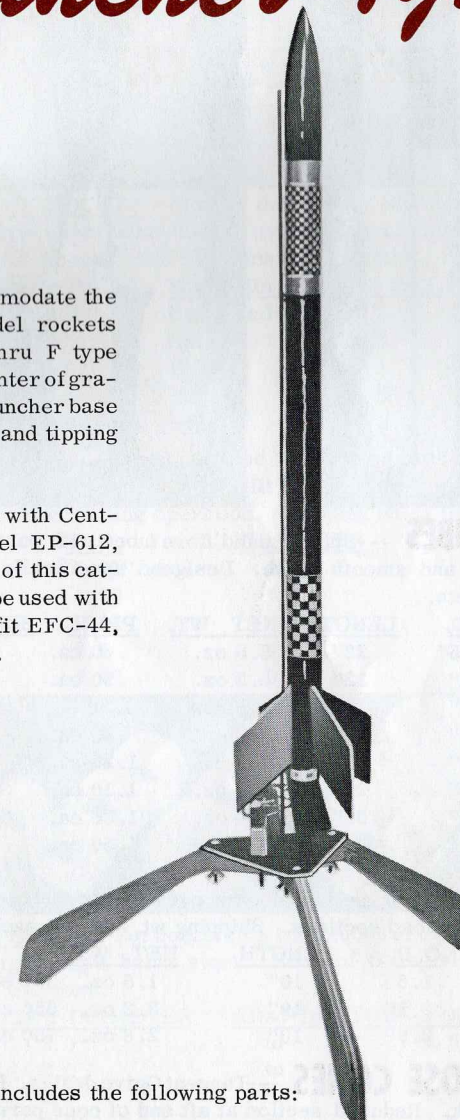
Designed for use with Centuri's Firing Panel EP-612, shown on page 15 of this catalog. Can also be used with the Ignition Outfit EFC-44, shown on page 6.

This Assembly includes the following parts:

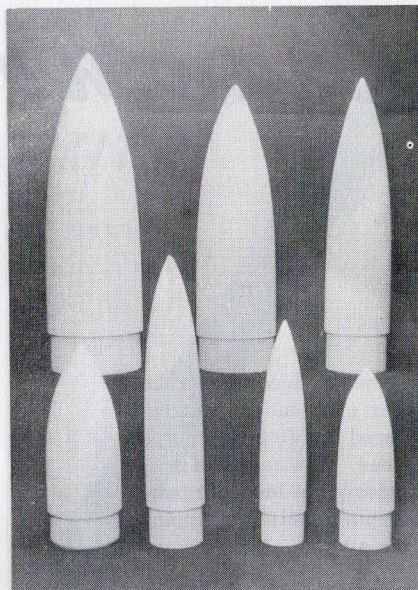
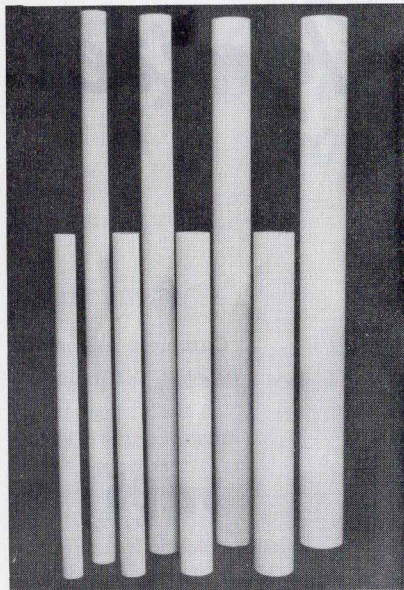
**LAUNCHER BASE**--Self balancing design permits launching from any type terrain. Collapsible for ease of transportation. Base assembly is made up of three tripod legs, triangular base plate and hardware set.

**IGNITER-DEFLECTOR ELEMENT**--Combination exhaust deflector and mount, for electrical ignition clips. Hardened steel deflector directs the exhaust gases away from the base of the rocket. Ignition clip leads spring back out of the exhaust after ignition.

**LAUNCHING ROD**---Straight tempered steel rod, measures 3/16" diameter x 36" long.







**LARGE BODY TUBES** ---Spiralwound fibre tubes with parallel wound jacket for added strength and smooth finish. Designed specifically for use in the large size model rockets.

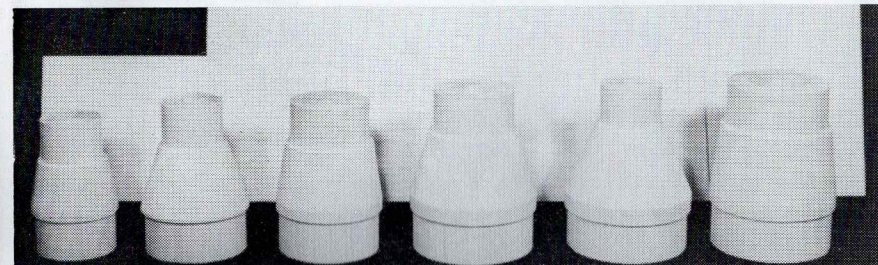
CAT. NO.	I.D.	O.D.	LENGTH	NET WT.	PRICE	SHIPPING WT.
LT-125	1.25"	1.35"	22"	3.0 oz.	.60 ea.	12 oz.
LT-150A	1.5"	1.6"	22"	3.3 oz.	.90 ea.	12 oz.
LT-150B	1.5"	1.6"	36"	4.9 oz.	1.20 ea.	18 oz.
LT-200A	2.0"	2.1"	22"	4.8 oz.	.95 ea.	14 oz.
LT-200B	2.0"	2.1"	36"	7.7 oz.	1.25 ea.	20 oz.
LT-250A	2.5"	2.6"	22"	4.2 oz.	1.10 ea.	18 oz.
LT-250B	2.5"	2.6"	36"	8.4 oz.	1.35 ea.	2 lbs.
LT-300B	3.0"	3.1"	36"	8.9 oz.	1.50 ea.	2 lbs.

**BOOSTER TUBES**--Same type as described above. These 10" sections are ideal for use as booster or payload sections. Shipping wt. 10 oz. each.

CAT. NO.	I.D.	O.D.	LENGTH	NET WT.	PRICE
LBT-150	1.5"	1.6"	10"	1.6 oz.	55¢ ea. 3 for \$1.20
LBT-200	2.0"	2.1"	10"	2.3 oz.	65¢ ea. 3 for \$1.40
LBT-250	2.5"	2.6"	10"	2.8 oz.	75¢ ea. 3 for \$1.75

**LARGE BALSA NOSE CONES** ---Tangent Ogive design. Expertly turned, high quality balsa stock. Reduced section at aft end of cone permits slip-fitting to body tube. These cones are designed for use with the large body tubes and booster tubes listed above.

CAT. NO.	FITS TUBE I.D.	LENGTH	O.D.	NET WT.	PRICE	SHIPPING WT.
BC-125	1.25"	6"	1.35"	0.4 oz.	\$ 1.00	2 oz.
BC-150A	1.5"	4.5"	1.6"	0.6 oz.	1.25	2 oz.
BC-150B	1.5"	8"	1.6"	0.7 oz.	1.50	4 oz.
BC-200A	2.0"	5"	2.1"	0.9 oz.	1.65	6 oz.
BC-200B	2.0"	8"	2.1"	1.3 oz.	2.20	8 oz.
BC-250	2.5"	8.5"	2.6"	1.6 oz.	2.50	12 oz.
BC-300	3.0"	9"	3.1"	2.0 oz.	3.45	16 oz.



**F-TYPE ENGINE MOUNTS**---Adapts the F-type engines to the large body tubes on page 45. Precision lathe-turned mounts permit slip-fitting of engines into body tubes. All mounts have 1.1" inside diameter. Shipping wt. 4 oz. each.

CAT. NO.	FITS TUBE I.D.	MATERIAL	NO. of PIECES	PRICE PER SET
FM-125	1.25"	Hardwood	2	.80
FM-150	1.5"	Hardwood	2	.95
FM-200	2.0"	Balsa	3	.85
FM-250	2.5"	Balsa	3	1.00
FM-300	3.0"	Balsa	3	1.25

**SOLID BULKHEADS**---For separation of sections within the rocket body tube. Solid balsa discs accurately cut to fit tightly into body tubes. Small  $\frac{1}{4}$ " hole through center from cutting operation. Shipping wt. 1 oz. ea.

CAT. NO.	O.D.	THICKNESS	PRICE
LB-125	1.25"	0.5"	25¢ each 3 for 60¢
LB-150	1.5"	0.5"	30¢ each 3 for 75¢
LB-200	2.0"	0.75"	35¢ each 3 for 85¢
LB-250	2.5"	0.75"	45¢ each 3 for \$1.00
LB-300	3.0"	0.75"	50¢ each 3 for \$1.20



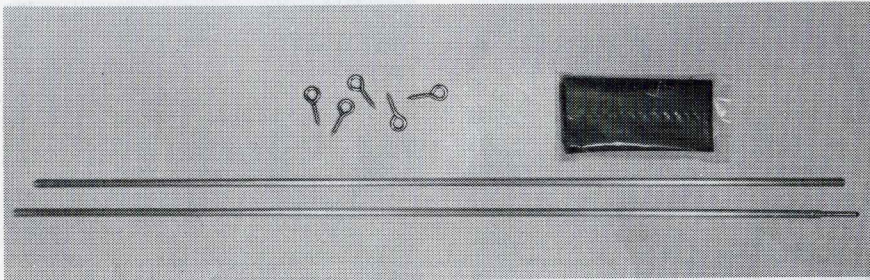
**REDUCTION FITTINGS**--For connecting body tubes of different diameters. Lathe turned from lightweight balsa stock. Ends of fitting slip into body tube ends. Shipping wt. 6 oz. each.

CAT. NO.	TUBE 1 DIAMETER	ADAPTS	TUBE 2 DIAMETER	PRICE
BR-101	2.0"	to	1.5"	1.65 each
BR-105	2.5"	to	1.5"	1.65 each
BR-109	2.5"	to	2.0"	1.65 each
BR-113	3.0"	to	1.5"	1.95 each
BR-117	3.0"	to	2.0"	1.95 each
BR-121	3.0"	to	2.5"	1.95 each

**BALSA FIN MATERIAL**---Select grain balsa sheet stock, excellent for models using E, F, and G type engines. Shipping wt. 10 oz. per length.

CAT. NO.	THICKNESS	WIDTH	LENGTH	PRICE PER SHEET
BFM-36	3/16"	4"	18"	35¢ ea. 3 for 95¢
BFM-40	3/16"	6"	18"	40¢ ea. 3 for \$1.00
BFM-44	1/4"	4"	18"	40¢ ea. 3 for \$1.00
BFM-48	1/4"	6"	18"	50¢ ea. 3 for \$1.25

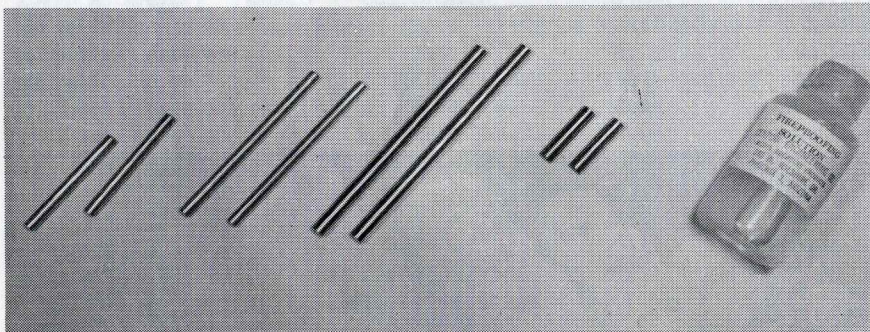




**REINFORCING SILK**--Used to reinforce joint between fins and body tube to prevent high acceleration "fin strip-off". Easily applied with glue or dope.  
 SR-144 25¢ each 3 for 60¢ Shipping wt. 0.5 oz.

**LARGE SCREW EYES**---Heavy duty screw eye for use with the large balsa nose cones and payload sections.  
 SE-20 3 for 15¢ Shipping wt. 0.5 oz.

**LAUNCHING ROD**---Two piece rod, 3/16" diameter x 36" long. Sections into two 18" pieces for storage and transportation.  
 LR-187 95¢ each Shipping wt. 8 ounces

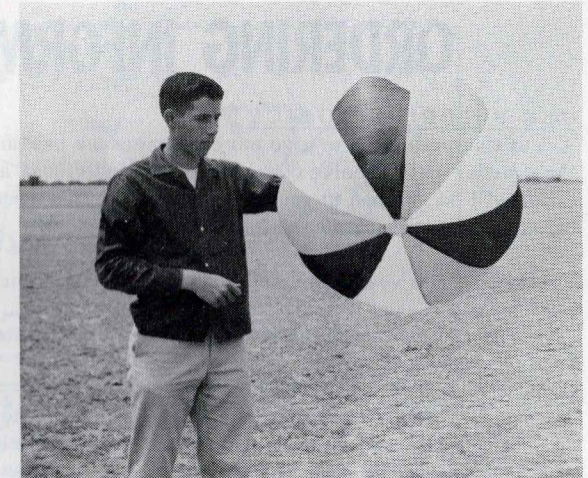
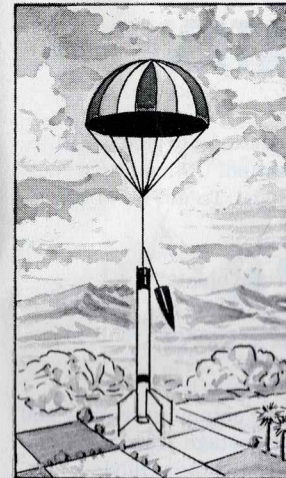


**LAUNCHING LUGS**-Thin wall aluminum tube which acts as launching guide when cemented to rocket body tube. Shipping wt. 0.5 oz.

CAT. NO.	O. D.	I. D.	LENGTH	FITS LAUNCHING	
				ROD DIAMETER	PRICE
AL-2	3/16"	5/32"	2"	1/8"	15¢ ea. 3 for 35¢
AL-5	3/16"	5/32"	3"	1/8"	20¢ ea. 3 for 45¢
AL-7	1/4"	7/32"	4"	3/16"	25¢ ea. 3 for 60¢
AL-9	1/4"	7/32"	1"	3/16"	2/30¢ 6 for 75¢

**FLAMEPROOFING SOLUTION**---Prevents burning of tail fins or other parts exposed to hot exhaust gases. Simply brush this solution on exposed parts, just like paint.  
 FP-13 2 ounce bottle 50¢ each Shipping wt. 5 oz.

CENTURI PAYS POSTAGE ON ORDERS OF \$5.00 OR MORE

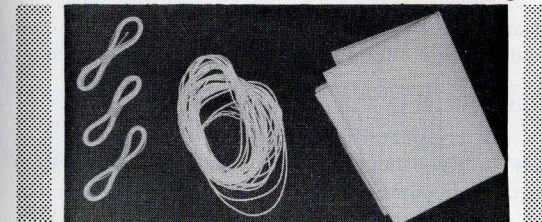


## SILK PARACHUTES

Professionally designed, hemispherical chute for sure safe recovery of large model rockets. Parabolic panels of alternating high-visibility colors. Durable pure silk canopy with strong nylon shroud lines. Shipping wt. 4 ounces each. RECOMMENDED MAX.

CAT. NO.	CANOPY DIAM.	ROCKET WT. (Empty)	COLOR PATTERN	PRICES
PS-12	12"	3 oz.	Red & White	\$ 1.75
PS-18	18"	7 oz.	Red & White	2.50
PS-24	24"	10 oz.	Gold, White, Black	2.95
PS-30	30"	14 oz.	Gold, White, Black	3.50
PS-40	40"	24 oz.	Gold, White, Black	5.75
PS-60	60"	48 oz.	Gold, White, Black	7.50

## PARACHUTE MATERIALS



**PARACHUTE SILK**--One square yard of lightweight imported silk, available in red, white, and gold. Please specify color desired.

SCM-36 Price \$1.45 Shipping wt. 2 oz.

**SHROUD LINE**--Strong, lightweight nylon cording. Same material as used in all Centuri parachutes. About 20 ft. required for an 8-panel 18" chute.  
 CSL-20 20 ft. roll - 50¢ Shipping wt. 1 oz.

**SHOCK CORD**---For large model rockets. Fabric elastic material 3/8" wide x 36" long. Absorbs shock of recovery ejection and chute opening.  
 TC-36 30¢ ea. 3 for 75¢ Shipping wt. 1 oz. ea.

## New!! Chute Kit



**SEW-IT-YOURSELF!!!**  
 Now you can make your own professional type silk parachute and save!! Kit includes patterns, directions, silk, and shroud line material to make one 18" hemispherical canopy parachute.

Cat. No. CK-300

**\$175**

Shipping wt. 4 oz.



# ORDERING INFORMATION

## OUR SHIPPING POLICY

We, at Centuri strive to give our customers the best and fastest service possible. Your order will receive our prompt and individual attention. Normally, your order will be shipped to you on the same day it is received. To aid us in bringing you this service, please follow these steps.

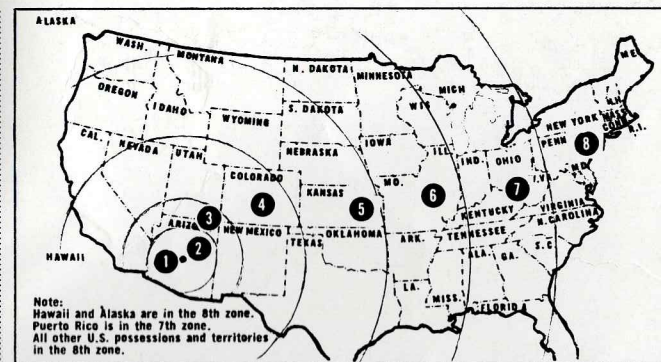
- 1) Print your name and address clearly on the order blank.
- 2) Enter quantity desired, catalog number, item description, unit price, and total price.
- 3) If your total order is less than \$5.00, enter all shipping weights and their total on the order blank. Add sufficient postage from the table of rates on the opposite page. Any overpayment will be refunded. **WE WILL PAY THE POSTAGE ON REGULAR ORDERS OF \$5.00 OR MORE.**
- 4) Unless otherwise requested, your order will be shipped Parcel Post. Orders containing 50 or more rocket engines must be shipped Express. Do not send money for express charges with your order. Charges will be collected upon delivery. If there is no agent in your town, specify your nearest express office.
- 5) All Arizona residents, add 3% State Sales Tax.
- 6) Full payment must accompany your order. No C.O.D. please. The best way to send your remittance is by money order, cashier's check, or your personal check. When sending cash with your order, be sure it is well wrapped.

PRICES IN THIS CATALOG become effective as of April 15, 1963 and replace those in previous catalogs. Prices in this catalog are subject to change without notice.

ROCKET ENGINE SHIPMENTS---We are permitted by the Postal Department to ship only 3 rocket engines per parcel. Even though all of your engines are shipped together at the same time, they often become separated in transit and may not arrive at the same time. Please be patient and they will all arrive in due course.

FORIEGN SHIPMENTS---Shipments of our rocket supplies to foriegn countries will require additional postage. Please check with your postal authorities and be sure to include sufficient postage. Any overpayment will be refunded.

RESPONSIBILITY---Our model rocketry products are intended for experimental and educational usage. Centuri Engineering Company, nor its officers or employees can accept any responsibility for accidents or injuries resulting from the use or misuse of our products. No warranty, either expressed or implied is made and the purchaser assumes all risks and liabilities. It is assumed that those purchasing materials from this catalog will use them in accordance with all laws applying.



## SURFACE PARCELS

NOTE: Any fraction of a pound over the weight shown takes the next higher rate.

Weight 1 Pound and Not Exceeding	Local	1 & 2 Up to 150 Miles	3 150 to 300 Miles	4 300 to 600 Miles	5 600 to 1,000 Miles	6 1,000 to 1,400 Miles	7 1,400 to 1,800 Miles	8 Over 1,800 Miles
Third class rates apply up to but not including one pound.								
2	\$0.24	\$0.33	\$0.35	\$0.39	\$0.45	\$0.51	\$0.58	\$0.64
3	.26	.38	.41	.47	.55	.64	.74	.83
4	.28	.43	.47	.55	.65	.77	.90	1.02
5	.30	.48	.53	.63	.75	.90	1.06	1.21
6	.32	.53	.59	.70	.85	1.03	1.22	1.40
7	.34	.58	.65	.77	.95	1.16	1.38	1.59
8	.36	.63	.71	.84	1.05	1.29	1.54	1.78
9	.38	.68	.77	.91	1.15	1.42	1.70	1.97
10	.40	.73	.83	.98	1.25	1.55	1.86	2.16

## AIR PARCELS

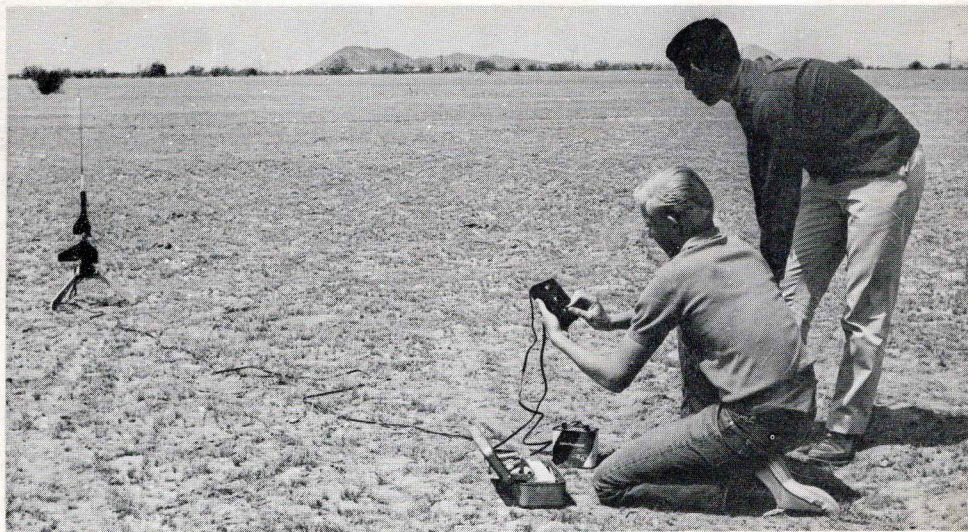
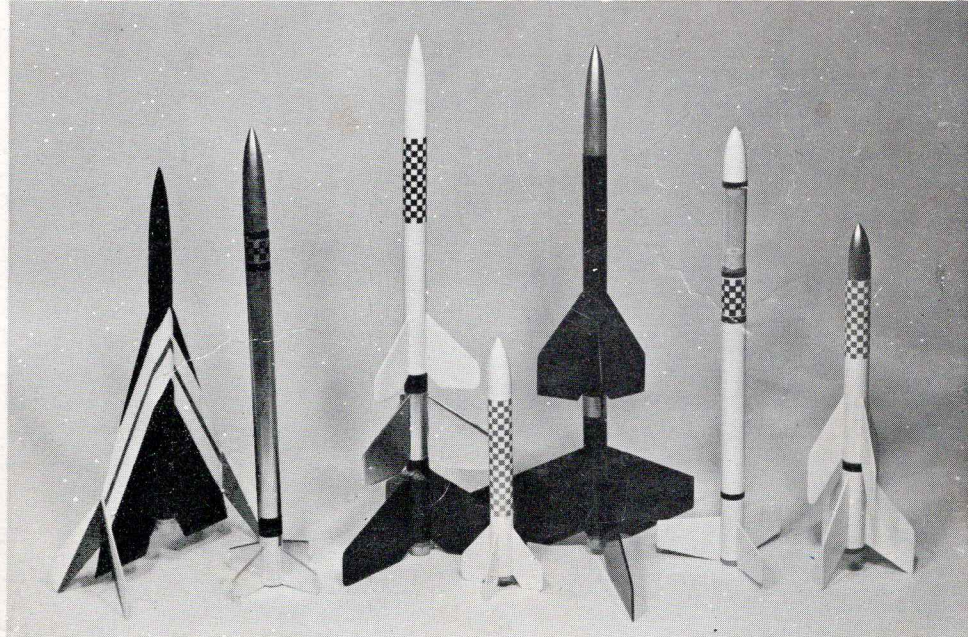
Air Parcel Post--First  
8 ounces-----8¢ /ounce

WEIGHT IN LBS. OVER 8 OZ. TO	1 2 3	4	5	6	7	8	WEIGHT IN LBS. OVER 8 OZ. TO
1	\$0.68	\$0.73	\$0.78	\$0.83	\$0.83	\$0.88	1
2	1.16	1.23	1.34	1.47	1.55	1.68	2
3	1.64	1.73	1.90	2.11	2.27	2.48	3
4	2.12	2.23	2.46	2.75	2.99	3.28	4
5	2.60	2.73	3.02	3.39	3.71	4.08	5
6	3.08	3.23	3.58	4.03	4.43	4.88	6
7	3.56	3.73	4.14	4.67	5.15	5.68	7
8	4.04	4.23	4.70	5.31	5.87	6.48	8
9	4.52	4.73	5.26	5.95	6.59	7.28	9
10	5.00	5.23	5.82	6.59	7.31	8.08	10

AIR MAIL SHIPMENTS---For extra fast delivery, request to have your order shipped via Air Parcel Post. For air shipments, be sure to include sufficient postage. See Air Parcel Post table. Any overpayment will be promptly refunded.

QUANTITY DISCOUNTS---A quantity discount of 20% is offered to individuals or groups placing a single order of \$30.00 or more. Do not include "Specials" in the discounted portion of your order, as these items have already been discounted 20% or more. Shipping terms on all discount orders are F.O.B. Phoenix, Arizona. Therefore, be sure to include sufficient postage on these orders.





## ***National Association of Rocketry***

We fully endorse the NAR as the leading organization in the field of youth rocketry. The NAR is the largest non-profit non-professional rocket and astronautic society in this entire country. Membership in the NAR is open to everyone. We encourage your participation in this fine organization. The benefits to be derived from membership in the NAR are far-reaching and will do much to compliment your interests in the aero-space sciences. For full information, write to:

**National Association of Rocketry**

**Suite 1962 - 11 W. 42nd Street - New York 36, N. Y.**

