

FLYING SPACE MODEL CATALOGUE



CANAROC SPACE MODELS
IRWIN TOY LTD.
43 HANNA AVE.
TORONTO, ONTARIO
CANADA M6K 1X6

The word "CANAROC" in a bold, black, sans-serif font, followed by a red arrow pointing to the right.

CANAROC SPACE MODELS

WELCOME to the super exciting and high flying world of Canaroc Space Modelling. Space Modelling in Canada has come a long way and so has Canaroc.

You will notice some changes and many improvements to our line of fine products, the newest addition to our catalogue, THE STARCRUISER WARLOCK. As you can see from our new return address, Canaroc Products are now marketed by IRWIN TOY, LTD., and not only in Canada, but around the world.

What are these new items and improvements? Plastic nose cones and two way adapters; ever expanding STARFLEET Collection; all new Space Modellers Club; and a wider and better selection of award winning engines to name a few.

This is only the start. We will not be waiting for next year's catalogue to introduce new products, but as soon as they are developed and tested they'll be on the shelves of your local hobby stores.

So, get set to launch your own Canaroc Space Modelling Program and have FUN!

HAPPY FLYING!



CANAROC SPACE MODELS

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SKILL LEVEL

BEGINNER	NOVICE	INTERMEDIATE	ADVANCED	EXPERT
1	2	3	4	5

The skill levels as shown above are listed on each kit and the appropriate skill level required to build the kit is marked. These skill levels should be used as a guide in selecting your models. One should not start into space modelling with a skill level 5 kit, start with a skill level 1 kit and work up. As the skill levels increase normally, the complexity and the time required to build the kit will also increase.

Further information on building space models, may be found in the GUIDE TO SPACE MODELLING (No. 54059).



THE 1980 FOURTH WORLD SPACE MODELLING CHAMPIONSHIPS



7 SEPTEMBER TO
12 SEPTEMBER 1980

U.S. NAVAL
AIR ENGINEERING CENTER
LAKEHURST, NEW JERSEY

This will be the first time that the Space Modelling Championships will be held in North America or for that matter, in a non-communist country.

Canada will participate with a seven man team, team manager and as yet an undisclosed number of support crew. This Team is made up of senior members of the Canadian Association of Rocketry (CAR).

Events that will be flown are:

Payload	S2A
Parachute Duration	S3A
Eagle Boost Glider	S4D
Scale Altitude	S5C
Streamer Duration	S6A
Scale	S7
Sparrow Rocket Glider	S8A (Unofficial)

Members of the 1980 Canadian Team are: G. Illerbrun (Alta.), D. Hutchinson (Alta.), D. Lufkin (Alta.), J. Dyck (Alta.), P. W. Cook (Ont.), F. Gnass (Ont.), T. N. Tataryn (Ont.), and L. A. Broadbent (Ont.) Team Manager.

Any questions regarding the Team or the Championships, should be addressed to:

Mr. Larry A. Broadbent
Team Manager, 1980 Canadian Team
73 Taylor Avenue
Apt. 6
Chatham, Ontario
N7L 2T7

PARTS OF A MODEL ROCKET

1. Nose Cone

The forward end of a rocket. Acts to reduce the air pressure and allow the airflow to transition smoothly to the rest of the rocket. It is usually made from balsa wood or breakable plastic.

2. Body Tube

The outer airframe of the rocket. All other parts are connected to this piece. It is constructed of a lightweight, tightly wound paper tube.

3. Wadding

Flameproof material that protects the recovery system from the hot ejection gases of the engine. As well, it serves as a piston to push forward the recovery system.

5. Engine Block

Acts as a bulkhead to keep the engine from moving forward in the tube.

5. Fins

Serve to stabilize the rocket. They act like feathers on an arrow. Generally made from balsa wood, although plastic may be used.

6. Recovery System

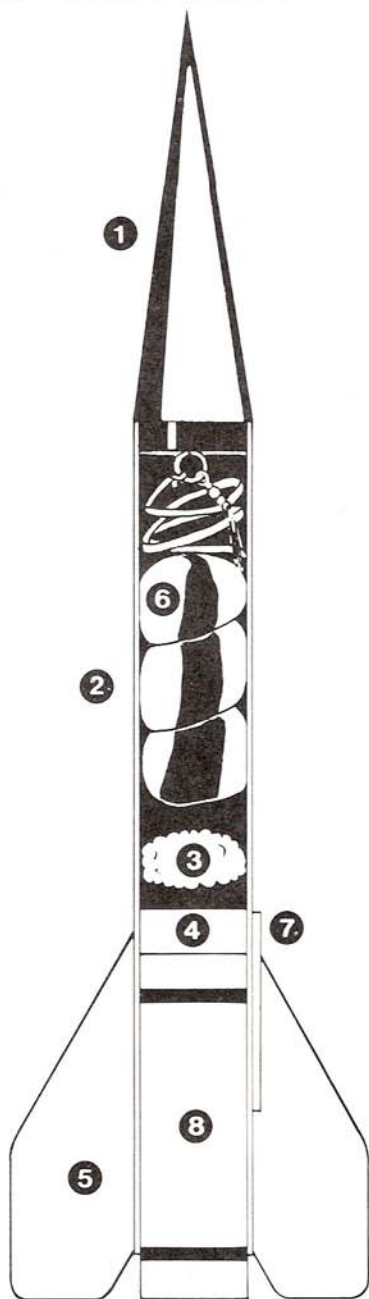
Usually a plastic parachute or a paper streamer. Serves to slow the model during descent. It is deployed at apex by a charge in the engine and ejected from the model.

7. Launch Lug

A thin slender tube that is attached to the side of the model. It slides over the 'Launch Rod' to guide the model during the first few feet of flight.

8. Rocket Engine

Solid propellant unit that serves to propel the model, supply smoke tracking, and eject the recovery system. Completely non-metallic, reliable, and safe to use.



FLIGHT OF A MODEL ROCKET

1. IGNITION

The rocket engine is started electrically by a 'hot wire' located in the engine nozzle.

2. LIFT-OFF

The rocket engines accelerate the model from the launcher.

3. BURNOUT

Occurs when all of the propellant is burnt. Usually occurs less than 100 m high. At this point the rocket is at maximum velocity of 400-600 km/h.

4. COASTING PERIOD

During the burning of the 'Smoke Tracking and Delay Charge' the model is allowed to decelerate and reach maximum altitude.

5. APOGEE

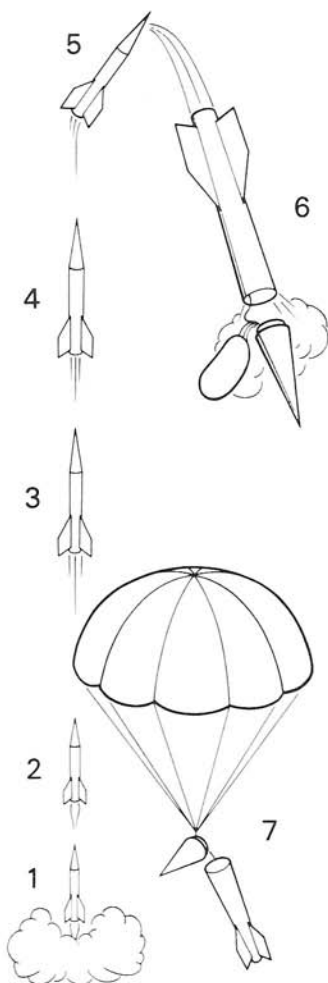
The model slows down, arcs over, and begins returning to the ground.

6. RECOVERY SYSTEM EJECTION

The 'Ejection Charge' in the engine ignites and pushes hot compressed gas forward into the rocket body. This pressurizes the tube and blows off the nose cone, ejecting the recovery system.

7. SOFT LANDING

The recovery system having deployed, the rocket descends slowly for a soft landing, ready to be flown again.



MODEL ROCKETRY IN THE SCHOOLS:

All over North America model rocketry has been playing a key role in motivating students in academic and vocational studies. It provides practical first hand application of principals taught in the classroom and is a unique tool for integrating science and technology into the practical skills.

Teachers have used model rocketry for:-

SCIENCE: Laws of motion, stability, ballistics, aerodynamics of flight, rocket propulsion, space flight, dynamics and kinematics.

MATHEMATICS: Practical application in calculating flight performance (theoretical altitude determination), trigonometry, (altitude tracking), principals of integral and differential calculus (thrust-time curves and rocket acceleration).

INDUSTRIAL ARTS: Use of tools, safety, power technology, electricity, electronics, photography, use of materials, custom fabrication, integration of practical skills into science and mathematics.

SPORT AND HOBBY: School competitions, and interschool competitions.

Here are a few examples of possible model rocketry projects:

PRACTICAL AERODYNAMICS: The Nomad flies like a rocket during powered flight, but glides like an airplane after the pod is ejected. The glider must be **trimmed** properly for a good glide by hand testing. Building and flying this kit gives students a first-hand feel for the principals of flight and aerodynamics.

ALTITUDE TRACKING: Students will never again ask what use mathematics has after they have visually tracked their own rocket and calculated its altitude using simple geometry and trigonometry.

ELECTRICITY: After a student has designed and built his own launch control system and used it to launch his rockets, the principals of electricity are much simpler.

ELECTRONICS: Build a simple light flasher for nightlaunching rockets. For a real challenge build a simple radio transmitter.

SUBJECT INTEGRATION: Challenge students to build and fly a rocket to carry one Grade A large hen's egg, then recover it unbroken!

These are only a few of the endless projects that can be instituted. Model rocketry has provided one of the most useful educational tools a teacher could have.

SKILL LEVEL 1

CHALLENGER

- THE BEGINNERS KIT
- SIMPLE TO BUILD
- PARACHUTE RECOVERY

SPECIFICATIONS:

length - 31.5 cm (12.5")
diameter - 2.5 cm (.986")



**RECOMMENDED
ENGINES**

A2-2	B6-4
A2-4	B14-5
A8-3	C6-5
B4-4	

Ideal for getting started in rocketry. CANAROC'S beginner's kit combines ease in construction with high performance ability. Basic design and operation makes it ideal for workshops, school, demonstration, etc. Recovery by 30 cm multi-colored parachute.

CATALOGUE No. 54000

CANAROC

SKILL LEVEL 1

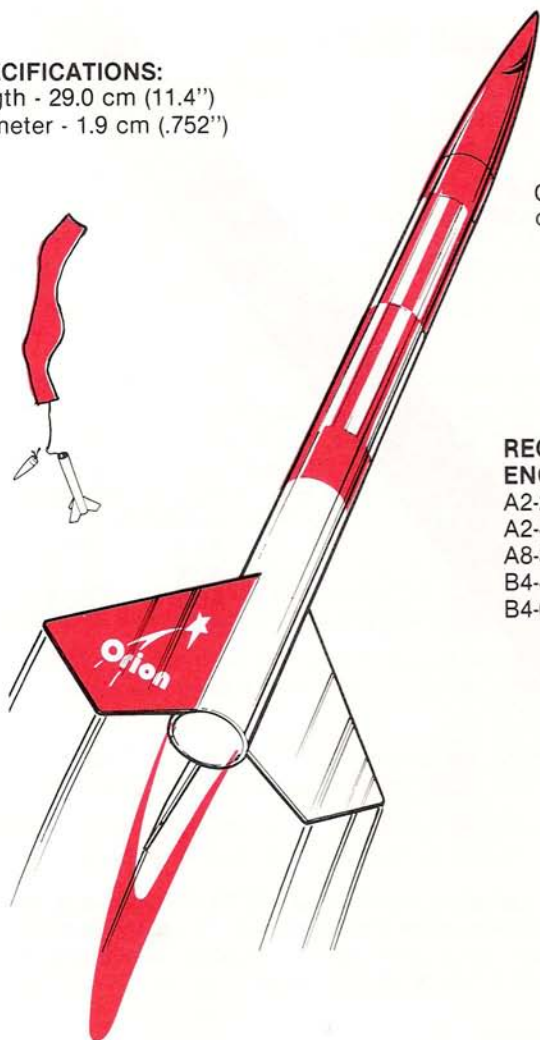
Orion

The Orion is an "easy build" high flying kit, featuring a plastic nose cone, two colour decals and a streamer to help recover it from those out-of-sight flights.

SPECIFICATIONS:

length - 29.0 cm (11.4")

diameter - 1.9 cm (.752")



Capable of flights
over 500 m.

**RECOMMENDED
ENGINES**

A2-2	B6-4
A2-4	B6-6
A8-3	B14-7
B4-4	C6-7
B4-6	

CATALOGUE No. 54001

CANAROC

SKILL LEVEL 2

FK-3

The ideal number two model, the FK-3 comes complete with a two colour Canadian Armed Forces style decal, which indicates a roll pattern. Altitudes in excess of 300 metres can be achieved using "C" engines.

SPECIFICATIONS:

length - 31.5 cm (12.5")

diameter - 2.5 cm (.98")



RECOMMENDED ENGINES

A8-3	B6-4
B4-4	B14-5
	C6-7

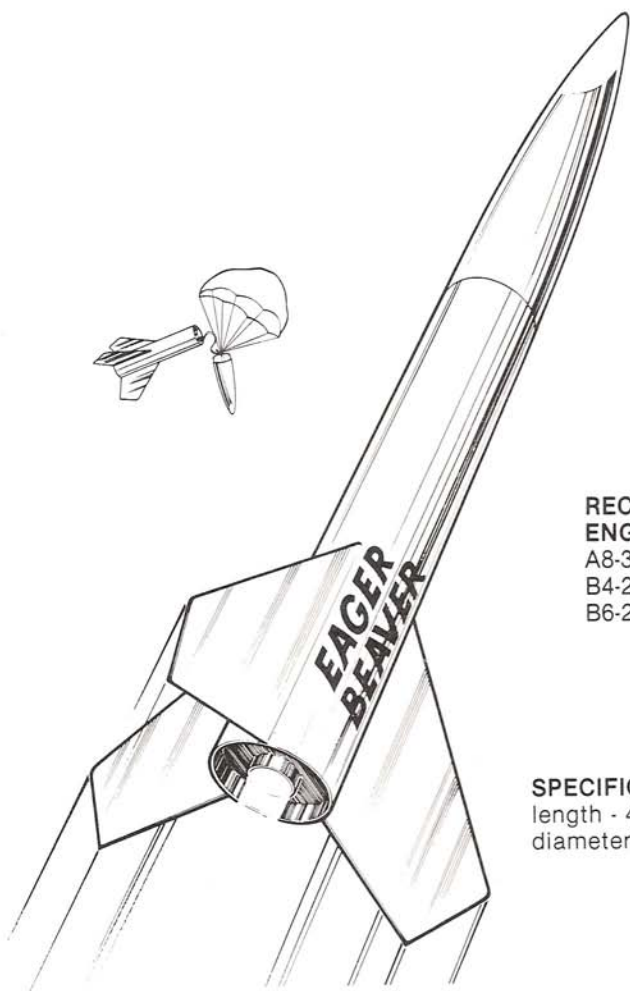
CATALOGUE No. 54013

CANAROC

SKILL LEVEL 2

EAGER BEAVER

Terrific sport flying model for small or large fields. Standard built kit accepts "D" engines, but also comes with an adapter to accept 18 mm engines.



RECOMMENDED ENGINES

A8-3	B14-3
B4-2	C6-3
B6-2	D12-5

SPECIFICATIONS:
length - 40 cm (15.5")
diameter - 4.2 cm (1.65")

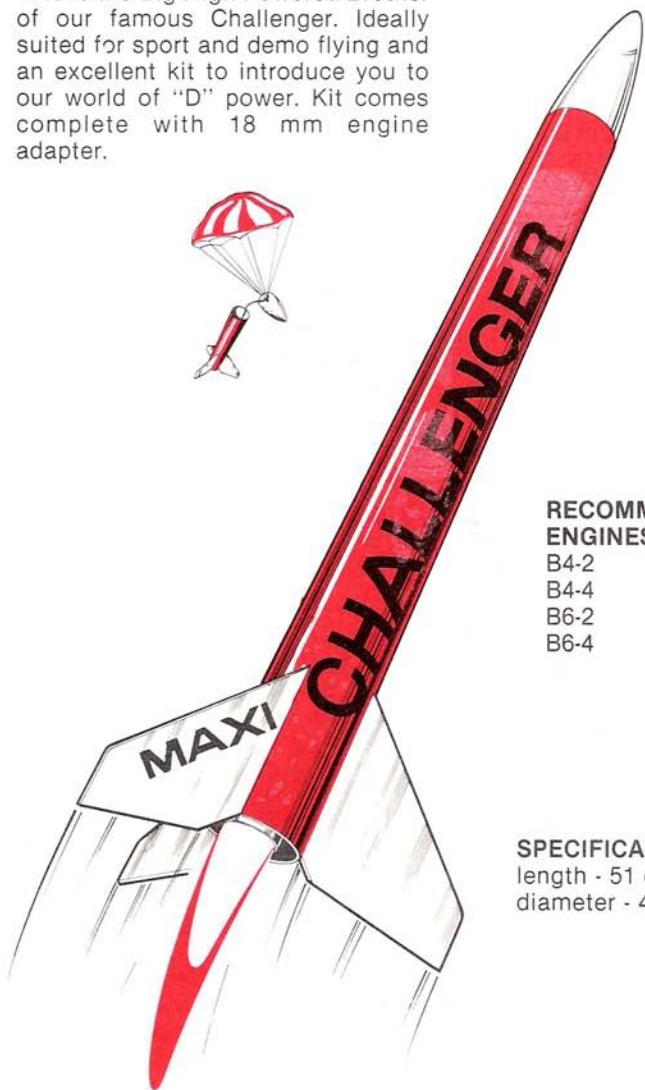
CATALOGUE No. 54009

CANAROC

SKILL LEVEL 2

MAXI CHALLENGER

This is the Big High Powered Brother of our famous Challenger. Ideally suited for sport and demo flying and an excellent kit to introduce you to our world of "D" power. Kit comes complete with 18 mm engine adapter.



RECOMMENDED ENGINES

B4-2	B14-3
B4-4	C6-3
B6-2	D12-5
B6-4	

SPECIFICATIONS:

length - 51 cm (20")
diameter - 4.2 cm (1.65")

CATALOGUE No. 54012

CANAROC

SKILL LEVEL 2

SUPER TORNADO

- OVER HALF A METER TALL
- SPIN STABILIZED
- HAS BOTH PARACHUTE AND STREAMERS INCLUDED

SPECIFICATIONS:

length - 57.0 cm (22.5")
diameter - 4.2 cm (1.65")



RECOMMENDED ENGINES

B4-2
B6-2
B14-3
C6-5
D12-5



Another BIG rocket from CANAROC. SUPER TORNADO was designed specially for demonstrations. Utilizing Spin Stabilization, it spins rapidly during flight creating a spectacular exhaust trail, and an audible and visual pulsing. The spinning effect acts like a gyroscope on the rocket, allowing it to fly straight up, unaffected by high winds 15-30 km/h. This allows it to be flown in small fields when used with large streamers. A fantastic sport flyer! Comes with 30 cm parachute and large streamer. Interchangeable engine mount allows it to be flown with standard engines. Includes decals.

CATALOG No. 54005

CANAROC

SKILL LEVEL 2

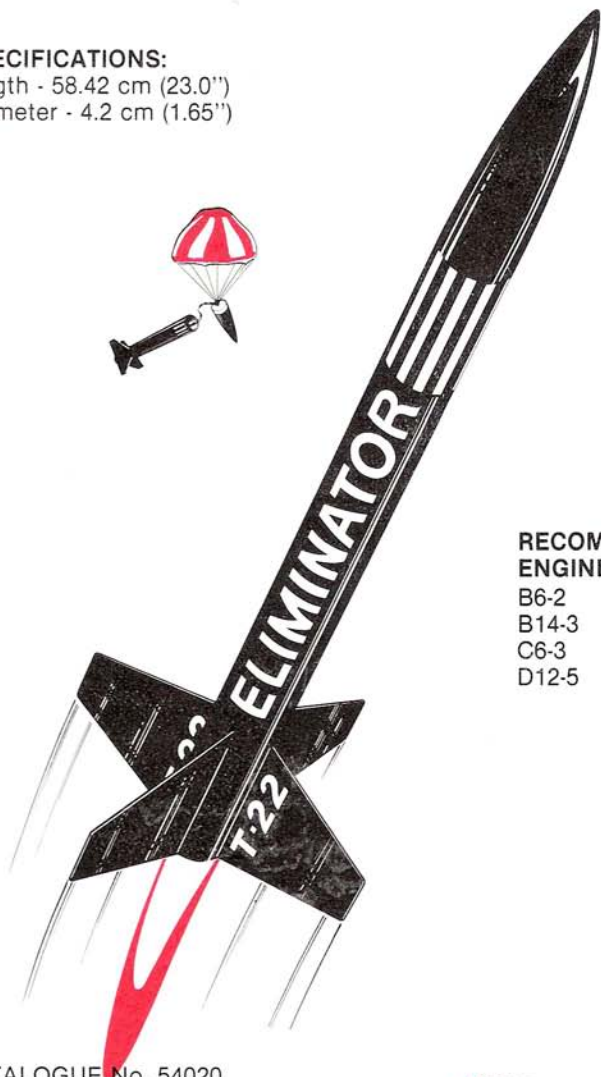
T-22 ELIMINATOR

A big impressive bird, this model will excite your friends and will surely be an "attention getter" at your next launch.

SPECIFICATIONS:

length - 58.42 cm (23.0")

diameter - 4.2 cm (1.65")



**RECOMMENDED
ENGINES**

B6-2

B14-3

C6-3

D12-5

CATALOGUE No. 54020

CANAROC

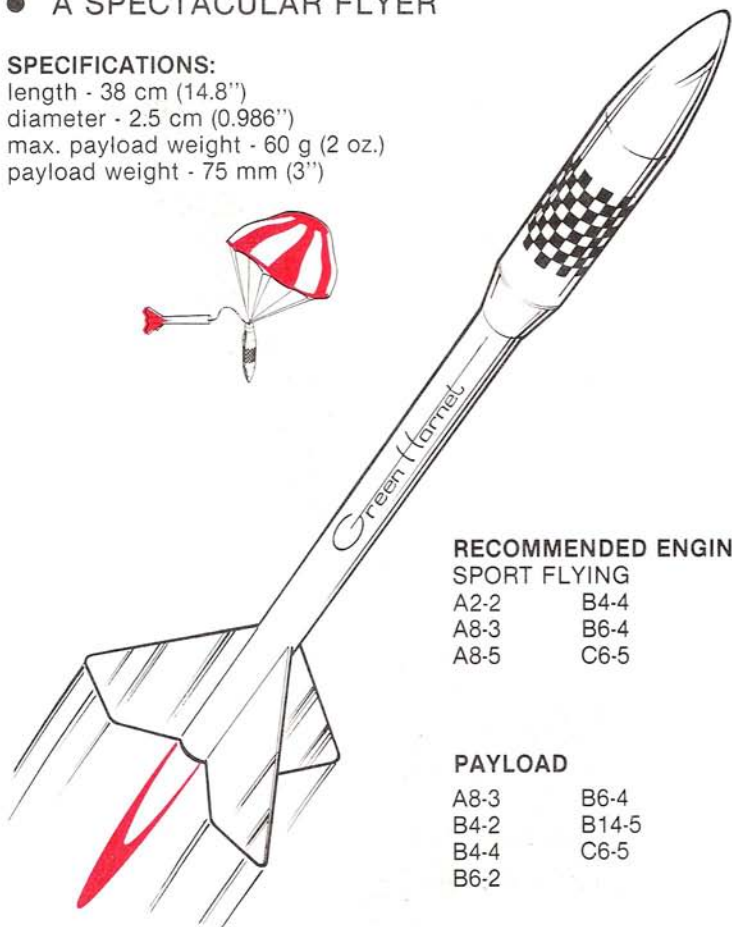
SKILL LEVEL 2

Green Hornet

- PAYLOAD MODEL
- EXCELLENT FOR BEGINNERS
- A SPECTACULAR FLYER

SPECIFICATIONS:

length - 38 cm (14.8")
diameter - 2.5 cm (0.986")
max. payload weight - 60 g (2 oz.)
payload weight - 75 mm (3")



RECOMMENDED ENGINES:

SPORT FLYING
A2-2 B4-4
A8-3 B6-4
A8-5 C6-5

PAYLOAD

A8-3 B6-4
B4-2 B14-5
B4-4 C6-5
B6-2

This is one of the most beautiful rockets available. Simple enough to be built by beginners, and has spectacular flight performance. Is equipped with a payload compartment so that it can be flown in competition or used to loft experiments. Includes parachute and decals.

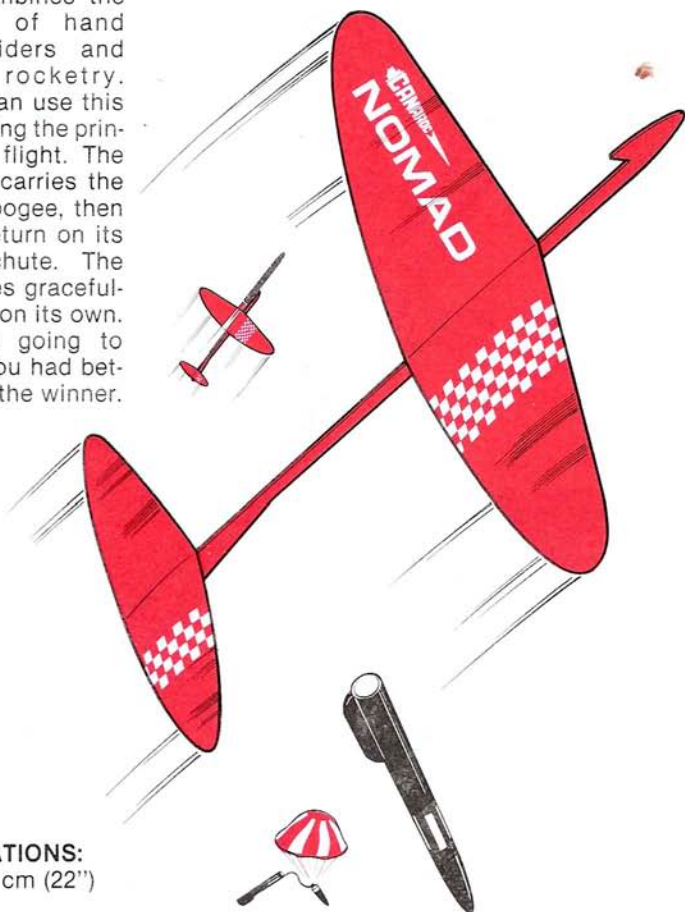
CATALOG No. 54007



NOMAD

The Nomad Boost/Glider is one of the most competitive gliders in the world. This bird was flown by members of the Canadian team at the First World Championship of Space Modellers in Yugoslavia. It has broken World and National records, and taken the top awards in Regional, National, and International Competition.

Nomad combines the fine arts of hand launch gliders and model rocketry. Teachers can use this kit in teaching the principals of flight. The Power-Pod carries the glider to apogee, then ejects to return on its own parachute. The glider circles gracefully to return on its own. If you are going to compete, you had better go with the winner.



SPECIFICATIONS:

length - 56 cm (22")

RECOMMENDED ENGINES

A2-2

B4-2

Pod:

length - 25 cm (10")

diameter - 1.9 cm (.752")

Glider:

length - 38 cm (15")

wing span - 30 cm (12")

CATALOG No. 54010



SKILL LEVEL 3

The BLACK BRANT Series model rockets are scale models of the CANADIAN designed sounding rockets manufactured by Bristol Aerospace (1968) Limited of Winnipeg, Manitoba.

The BLACK BRANT III, IV, and V rockets are used by the National Research Council, NASA, universities, and industries all over the world. They have been used primarily in research associated with the Aurora Borealis (Northern Lights) and ionosphere studies.



BLACK BRANT III

SCALE MODEL OF THE
CANADIAN SOUNDING ROCKET

SPECIFICATIONS:

length - 52 cm (20.5")
diameter - 2.5 cm (0.986")

The smallest of the series, the BB III is a low priced model of the most well known BLACK BRANT. The CANAROC kit is terrific for a rocketeer just starting in scale modelling. The highly scaled model includes two-color decals for lettering, insignias, screw details, hatch covers, and special white stripe material so that even the beginner can build an excellent scale model. With parachute recovery, this model is easy to build, and a great flyer as well.

CATALOG No. 54002

RECOMMENDED ENGINES:

A8-3	B6-4	C6-5
B4-4	B14-5	

CANAROC

SKILL LEVEL 3

BLACK BRANT IV

SCALE MODEL OF THE
CANADIAN SOUNDING ROCKET



The biggest of the BLACK BRANTS, the BB IV comes to you from CANAROC in the form of a towering, exceedingly impressive model. Its large size will make it a spectacle at your next launch or demonstration. The original prototype of the CANAROC kit was launched during the opening ceremonies of the First World Model Rocket Championships held at Vrsac, Yugoslavia, September 22, 1972 by the Canadian Model Rocket Team. It may be flown with standard size engines, or with the big "D" engines for spectacular flights. The BB IV comes with two-color decals for lettering, insignias, screw details, and hatch covers, as well as white stripe material so that anyone can achieve a professional looking model. Special detailing includes accurate scale fins, special conical stabilizer, and drag flap housing.

RECOMMENDED ENGINES:

B4-2 C6-5
B6-2 D12-5
B14-3

SPECIFICATIONS:

length - 101 cm (39.75")
diameter - 4.2 cm (1.65")

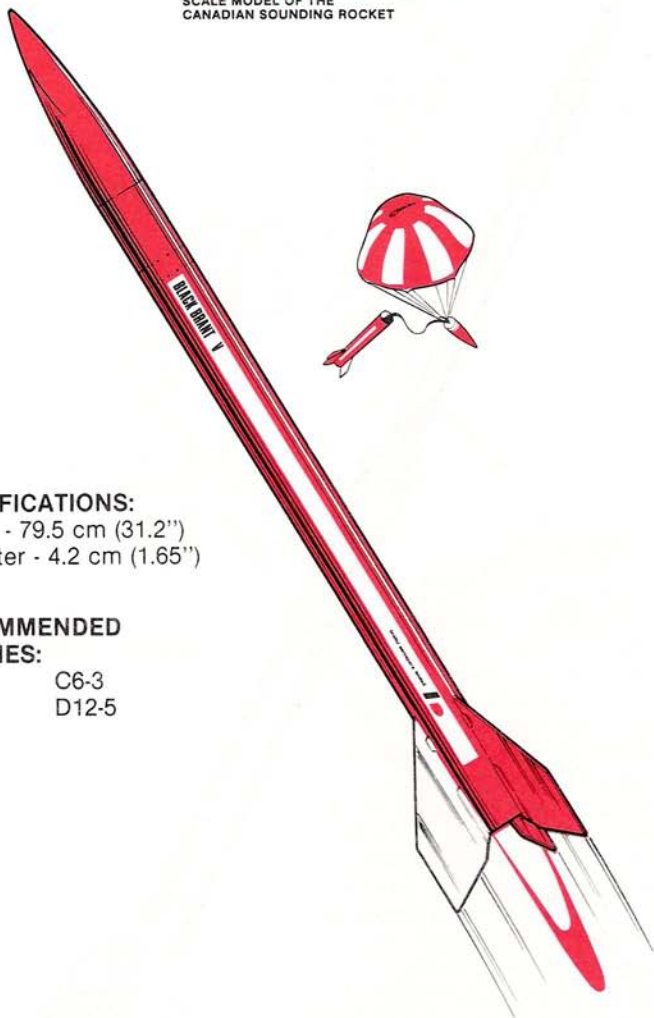
CATALOG No. 54003

CANAROC

SKILL LEVEL 3

BLACK BRANT V

SCALE MODEL OF THE
CANADIAN SOUNDING ROCKET



SPECIFICATIONS:

length - 79.5 cm (31.2")

diameter - 4.2 cm (1.65")

RECOMMENDED ENGINES:

B4-2 C6-3

B6-2 D12-5

B14-3

The BBV is a large single stage model rocket that will entice crowds with its slow, realistic lift-off. Two color decals give accurate scale detail for lettering, insignias, screw details, and hatch covers. Special white stripe material is included to allow anyone to achieve an excellent looking model. Recovery is by 45 cm parachute, and the kit comes complete with an adapter to allow flights with either standard B and C engines, or the big "D" engines.

CATALOG No. 54004

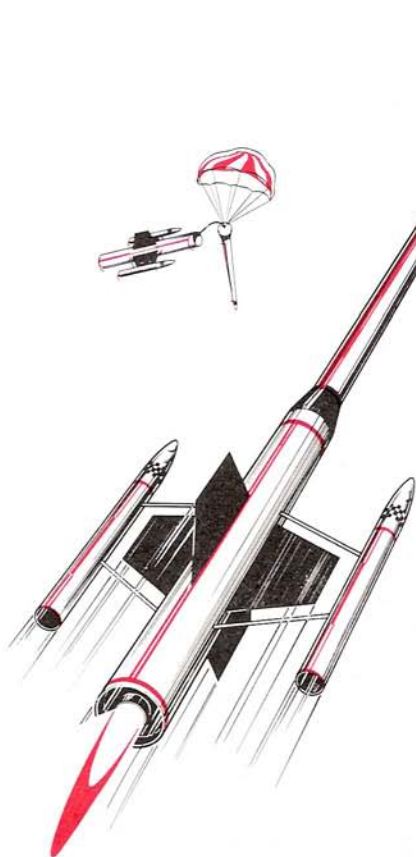
CANAROC

SKILL LEVEL 3

ORBITRON

- OVER A METER TALL
- A CHALLENGING ROCKET TO BUILD

This rocket not only looks impressive, but is exciting to fly with its slow realistic lift-off. This bird will be a challenge for anyone who has already built a few rockets. Besides being a very large rocket, its unique design will dazzle your friends and spectators.



RECOMMENDED ENGINES:

B4-2	C6-3
B6-2	D12-3
B14-3	D12-5

SPECIFICATIONS:

length - 107.5 cm (42.25")
diameter - 4.2 cm (1.65")

CATALOG No. 54008

CANAROC

SKILL LEVEL 3

STAR FLEET

Just one of the exciting STAR FLEET series from Canaroc. This is one of the dazzling kits you will ever build and fly. The FLEET's Starships are equipped with Hyperspace Drive as well as conventional Normal Space reaction Drive. The Class C Cruiser was designed to be the FLEET's fastest freighter and is used to transport passengers or special cargo over vast inter-stellas distances very quickly. It is also used to fuel and supply the FLEET in remote parts of the galaxy and outposts on the edge of known space.



RECOMMENDED ENGINES:
B4-2 C6-3

SPECIFICATION:
length - 94 cm (37")
diameter - 5.0 cm (1.96")

starship
antares

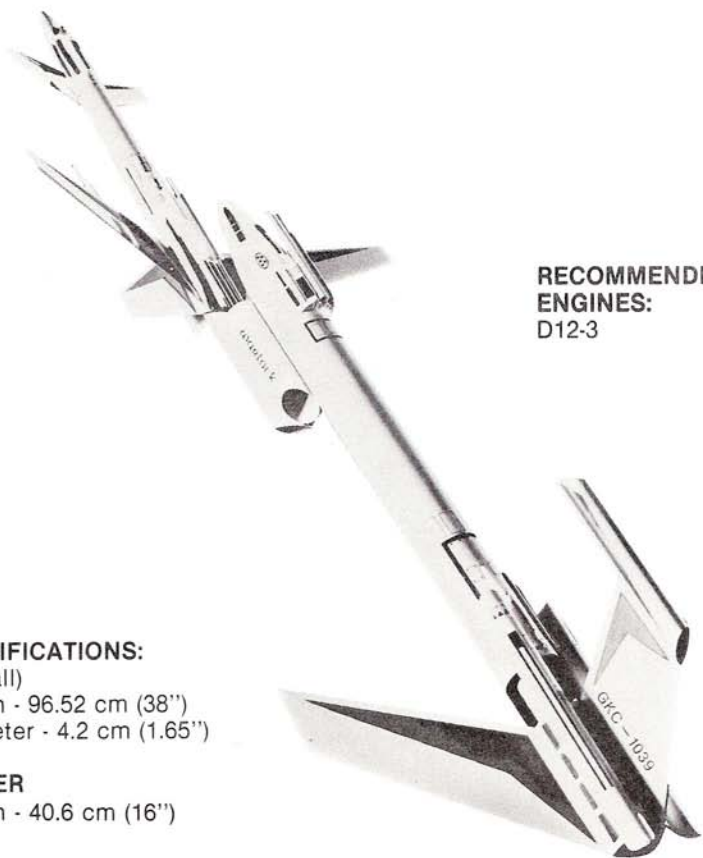
CATALOG No. 54014

CANAROC

SKILL LEVEL 5

STARCRUISER WARLOCK

One of the finest Starcruisers in the STAR FLEET. This impressive bird comes complete with two colour decals, plastic nose cones, wrap arounds and plastic cannons. Besides looking great and flying beautifully, at apogee when the ejection charge fires, it not only deploys the 'chute, but also releases the Starcruiser's glider for a gentle glide recovery.



**RECOMMENDED
ENGINES:**
D12-3

SPECIFICATIONS:

(overall)
length - 96.52 cm (38")
diameter - 4.2 cm (1.65")

GLIDER

length - 40.6 cm (16")

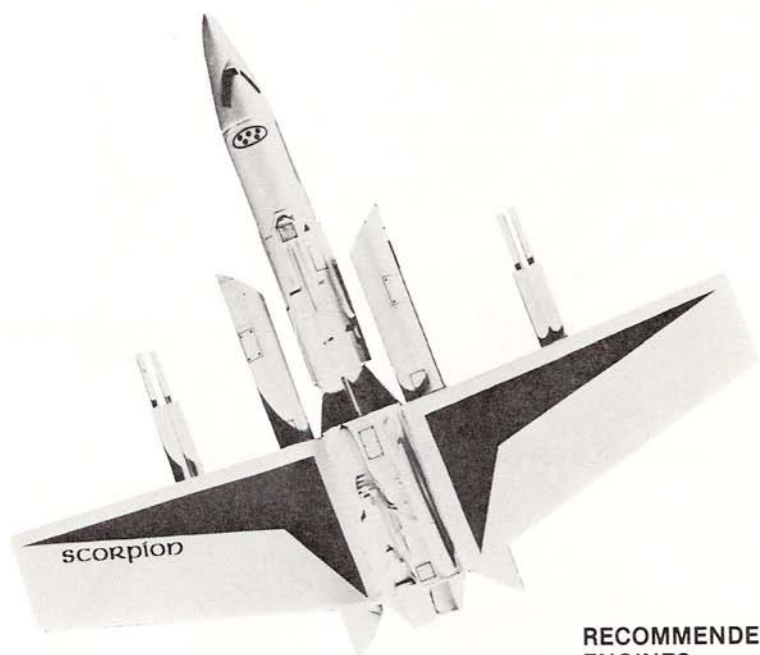
CATALOG No. 54015

CANAROC

SKILL LEVEL 4

STARFIGHTER SCORPION

A highly detailed and fantastically designed model of a STAR FLEET Starfighter. This kit comes with decals, pre-formed plastic nose cone, wrap-ons and more. An excellent model to build, display and fly.



**RECOMMENDED
ENGINES:**
B6-2 C6-3

SPECIFICATION:
length - 40.96 cm (16.125")
diameter - 25 cm (9.86")

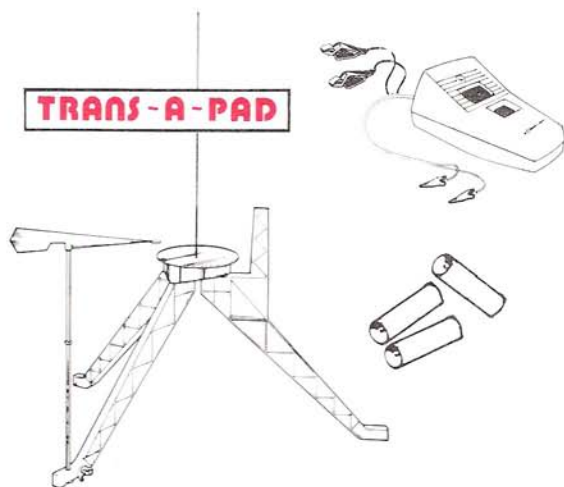
CATALOG No. 54016

CANADOC

CHALLENGER STARTER KIT

Contains everything you need to get started in Model Rocketry.

- CHALLENGER Rocket Kit
- TRANS-A-PAD Launcher
- LAUNCH CONTROLLER
- ENGINES



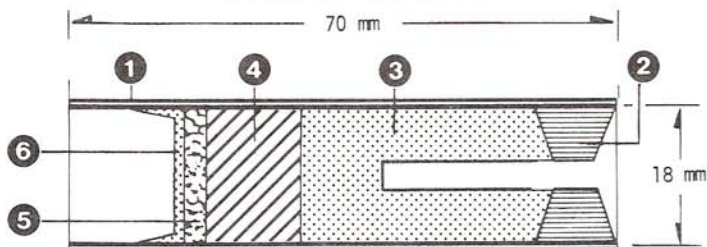
- GUIDE TO SPACE MODELLING: Contains everything a beginner needs to know about building and flying model rockets.
- LAUNCHING SUPPLIES: Flameproof recovery wadding.
- CANAROC CATALOGUE

Battery, paint, glue, modelling knife not included.

CATALOG No. 54321

CANAROC

THE ENGINE



1. CASING: A very strong flame-proof tube made of tightly wound paper. It houses all the engine components.

2. NOZZLE: A hole specially shaped to provide maximum thrust from the burning propellant.

3. PROPELLANT: A special mixture of chemicals, prepared and loaded into the casing under controlled conditions. The solid propellant is designed to provide a controlled thrust profile.

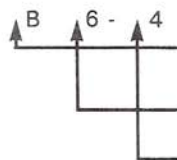
4. DELAY CHARGE: A smoke producing material that produces no thrust. It sets the time between the thrust phase and the ejection of the recovery system.

5. EJECTION CHARGE: Loosely packed charge that blows out the top of the engine when ignited. This pressurizes the body and ejects the recovery system.

6. RETAINER CAP: A paper or clay cap that holds the ejection charge in place.

THE ENGINE CODING SYSTEM:

In Canada and the United States, the system used to code an engine type is a letter, followed by a number, a dash and another number.

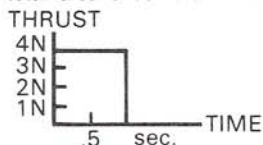


The letter gives the power category of the engine. Each consecutive letter is twice the power of the previous (a B engine has twice the power of an A).

The average thrust of the engine in newtons (metric unit of force).

Number of seconds of time delay after burnout. A "O" means there is no time delay or ejection charge (a booster engine).

The engine "power" is rated by categories of "Total Impulse". The total impulse is the total area under the "Thrust-Time" curve, and in its simplest case would be equal to the average thrust times the burn time. In the case of an imaginary engine with the "Thrust-Time" curve shown in the diagram, we see that it has a constant (also its average) thrust of 4 newtons and a burn-time of 1 sec.



$$\begin{aligned} \text{Total Impulse} &= (4 \text{ Newtons}) \times (1 \text{ second}) \\ &= 4.0 \text{ Newton-Sec.} \end{aligned}$$

which corresponds to the area under the curve.

ENGINES are categorized as follows:-

1/4A: 0.00 - .625 N's	C: 5.01 - 10.00 N's
1/2A: .626 - 1.25 N's	D: 10.01 - 20.00 N's
A: 1.26 - 2.50 N's	
B: 2.51 - 5.00 N's	

NOTE: It is important to realize that every engine in a particular category, "B" for example, has the same power regardless of the average thrust.



CANAROC ENGINE SELECTION CHART

CAT. NO.	ENGINE TYPE	TOTAL IMPULSE	THRUST DURATION	TIME DELAY	ENGINE MASS	PROPEL-LANT MASS	MAXIMUM LIFT-OFF MASS	MAXIMUM THRUST
		N-s	s	($\pm 20\%$)s	GRAMS	GRAMS	GRAMS	N
4090	A8-3	2.50	0.3	3	14.0	2.9	100	13.0
4094	A8-5	2.50	0.3	5	15.3	2.9	50	13.0
4098	B6-2	5.00	0.8	2	13.7	4.8	120	12.0
4099	B6-4	5.00	0.8	4	14.3	4.8	90	12.0
4050	B6-6	5.00	0.8	6	14.9	4.8	60	12.0
4052	B14-3	5.00	0.35	3	16.0	4.2	160	20.0
4053	B14-5	5.00	0.35	5	17.4	4.2	100	20.0
4054	B14-7	5.00	0.35	7	18.7	4.2	40	20.0
4056	C6-3	10.00	1.1	3	18.3	9.2	120	20.0
4057	C6-5	10.00	1.1	5	18.9	9.2	120	20.0
4058	C6-7	10.00	1.1	7	19.5	9.2	70	20.0
4060	D12-3	20.0	1.1	3	33.0	18.2	400	40.0
4061	D12-5	20.0	1.1	5	34.2	18.2	300	40.0
4696	D12-7	20.0	1.1	7	35.4	18.2	200	40.0

LREs (Light Rocket Engines)

4090	A2-2	2.50	1.3	2	14.9	5.0	50	4.0
4091	A2-4	2.50	1.3	4	15.5	5.0	25	4.0
4095	B4-2	5.00	1.2	2	16.4	7.6	100	4.0
4096	B4-4	5.00	1.2	4	17.0	7.6	70	7.0
4097	B4-6	5.00	1.2	6	17.6	7.6	40	7.0

IMPORTANT NOTES

All "A" through "C" engines are 18 mm in diameter and 70 mm long; "D" engines are 23 mm in diameter and 70 mm long.

Total impulse figures shown are a maximum.

LREs are specially designed for very light model rockets, please refer to recommended lift-off mass prior to use.

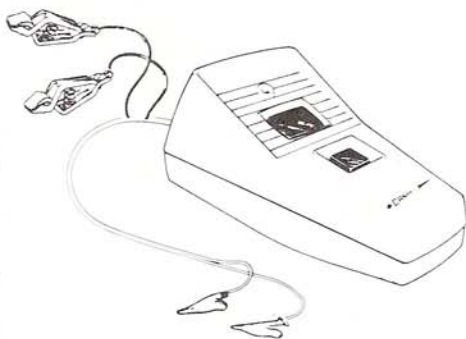
All Canaroc model rocket engine packages come complete with igniters and instructions.



COUNTDOWN

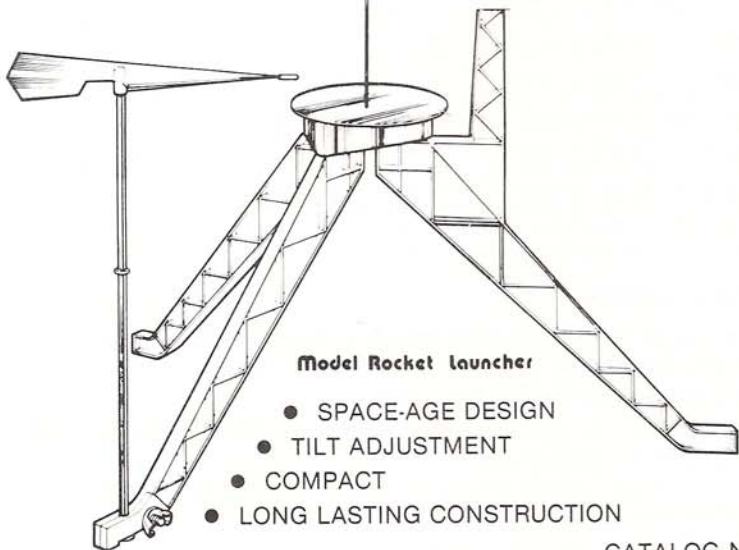
LAUNCH CONTROLLER

- EASY TO ASSEMBLE KIT
- CONTINUITY LIGHT
- SAFETY KEY
- RECESSED PUSH BUTTON
- 3.0 METER FIRING LINE
- 2.4 METER POWER CORD



TRANS-A-PAD

CATALOG NO. 54051



Model Rocket Launcher

- SPACE-AGE DESIGN
- TILT ADJUSTMENT
- COMPACT
- LONG LASTING CONSTRUCTION

CATALOG NO. 54050

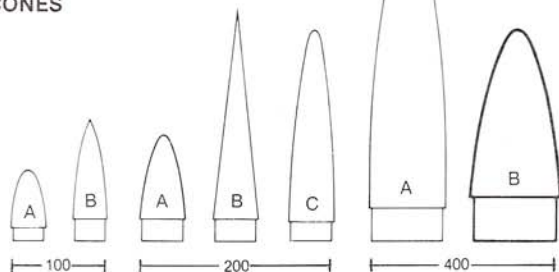
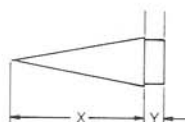
 CANAROC

PARTS AND ACCESSORIES

A BODY TUBES

CAT. NO.	DESCRIPTION	LENGTH	INSIDE DIAMETER	OUTSIDE DIAMETER
4062	PT-100	45.7 cm	1.8 cm	1.91 cm
4063	PT-200	45.7 cm	2.41 cm	2.5 cm
4064	PT-400	55.9 cm	4.09 cm	4.19 cm

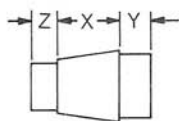
B PLASTIC NOSE CONES



CAT. NO.	DESCRIPTION	X	Y
4065	PN-100A	4.3 cm	0.7 cm
4066	PN-100B	7.0 cm	1.2 cm
4068	PN-200A	6.1 cm	1.0 cm
4069	PN-200B	12.0 cm	1.2 cm
4070	PN-200C	10.2 cm	1.3 cm
4071	PN-400A	17.7 cm	1.8 cm
4072	PN-400B	9.5 cm	1.9 cm

UNIVERSAL PLASTIC ADAPTERS

CAT. NO.	DESCRIPTION	Z	X	Y
4073	PA-1020 (Adapts a PT-100 with a PT-200)	1.2 cm	2.5 cm	1.2 cm
4074	PA-2040 (Adapts a PT-200 with a PT-400)	1.1 cm	5.1 cm	1.7 cm



C LAUNCH LUGS

- easy to finish, thin parchment tube; slides over standard size launch rods.

Catalog No. 4080 10/package

D SPARE IGNITORS

- package of twelve
Catalog No. 54057

E DEFLECTOR PLATE

- protects launch pads and deflects hot gases away from flammable

materials below the nozzle.
Catalog No. 54052

F CENTERING RINGS

- FOR CENTERING PT-100 tubes inside PT-200s.

Catalog No. 4076 10/package

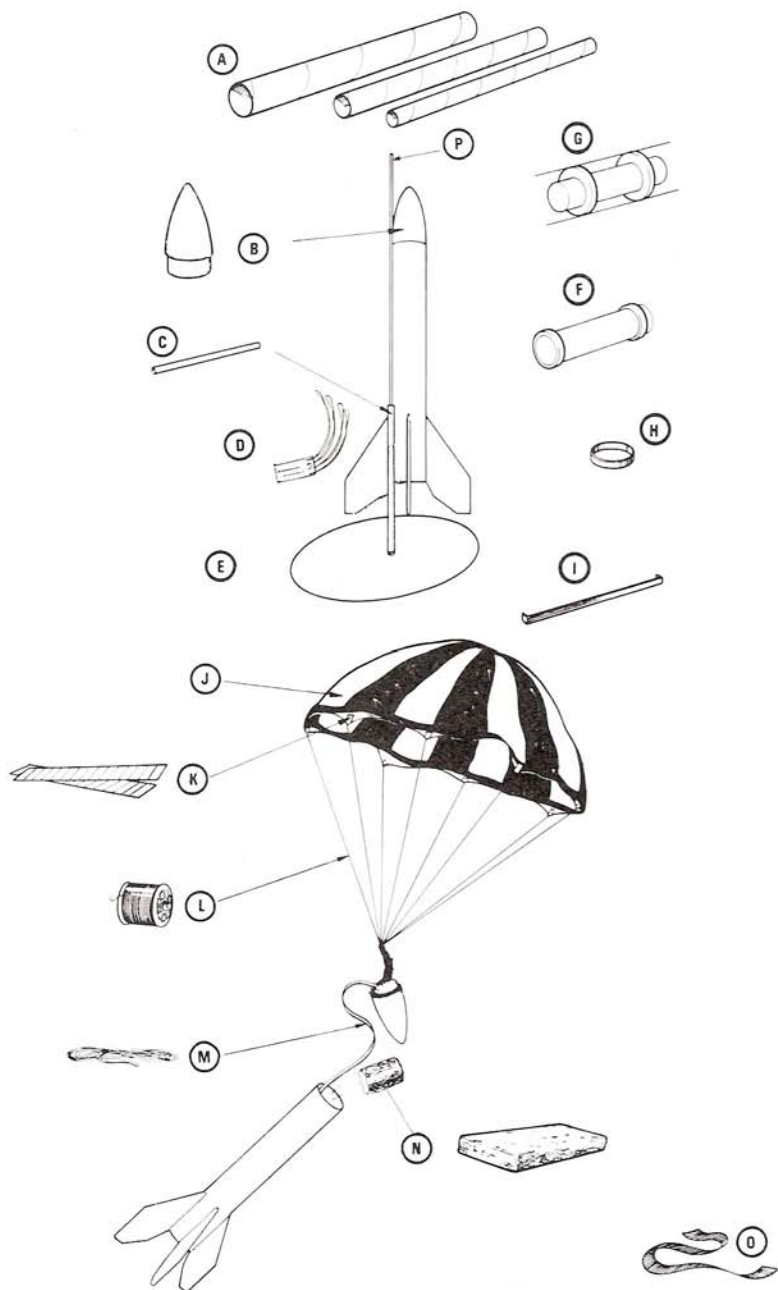
G CENTERING DISKS

- for centering PT-200 tubes inside PT-400s.

Catalog No. 4077



PARTS AND ACCESSORIES



CANARDC

PARTS AND ACCESSORIES

- H ENGINE BLOCKS**
- engine bulk heads for PT-100 tubes.
Catalog No. 4075
5/ package.
- I ENGINE RETAINER**
- thin spring steel clip for holding engine in place.
Catalog No. 4078
3/package.
- J PARACHUTES**
- rugged sport chutes; includes shroud lines and tape strips -red and white stripes.
30 cm diameter
Catalog No. 4085
45 cm diameter
Catalog No. 4086
- K TAPE DISKS**
- self-adhesive paper disks for attaching shroud lines to parachutes.
Catalog No. 4083 30/ strip
- L SHROUD LINES**
- spools of specially selected material for custom or competition chutes or streamers
Catalog No. 4082
- M SHOCK CORD**
- durable flat elastic cord 3 mm wide and 3 m long; cut it to desired length.
Catalog No. 4084
- N FLAME PROOF WADDING**
- used to protect the plastic parachute from the hot eject gases. 100 mm x 200 mm; enough for approximately 20 launchings.
Catalog No. 54055
- O STREAMER MATERIAL**
- material for making sport or competition streamers. 5 cm x 1 m.
Catalog No. 4087
- P LAUNCH ROD**
- two piece rod 91 cm (36") long, lower rod 1/8" diameter and upper 3/32" diameter.
Catalog No. 54056
- LAUNCH ACCESSORIES (not shown)**
Catalog No. 54053 Micro clips (2)
Catalog No. 54054 Battery clamps (2)

DESIGN OF THE YEAR AWARD

WIN A \$100.00 GIFT CERTIFICATE

Contest Rules.

1. All entries become property of Canaroc Industries Ltd.
2. Entry deadline will be December 31, 1980.
3. Entries will be judged on originality and practicality.
4. Prizes will be awarded during the year to any entries deemed exceptional by Canaroc's Development Department.
5. Any entry receiving a prize during the year is still eligible for the \$100.00 Gift Certificate.
6. The Certificate will be redeemable for \$100.00 of Canaroc model rocket supplies.
7. Send entries to — Canaroc Industries Ltd., Attention Development Department, P.O. Box 3275, Edmonton, Alberta T5L 4J1.



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MODEL ROCKET SAFETY CODE



1. CONSTRUCTION

I will always build my model rockets using only light-weight materials such as paper, wood, plastics and rubber without any metal structural parts. I will always construct my model with aero-dynamics surfaces, or a mechanism to assure a safe, stable flight.

2. ENGINES

I will use only pre-loaded, commercially available model rocket engines approved safe by the Department of Energy, Mines and Resources. I will never subject these engines to excessive shock, or extremes of temperatures, nor will I ever attempt their reloading, or alteration in any way.

3. RECOVERY

My model rocket will always have a recovery system to return it safely to the ground, so that my model rocket may be reflown. I will always prepare the recovery system with extra care so that it will always deploy properly.

4. WEIGHT LIMITS

My model rocket will not weigh more than 500 grams at liftoff, and the model rocket engines will contain no more than 125 grams of propellant.

5. FIRING SYSTEM

I will always use a remote, electrical system to ignite the model rocket engine(s). My system will include an ignition switch that will return to "off" when released, and a safety interlock switch to prevent accidental ignition.

6. LAUNCH SYSTEM

My model rocket will always be launched from a stable platform having a device to initially guide my rocket. This device will never be pointed below 30 degrees from the vertical. My system will have a jet deflector to prevent the engine exhaust from directly striking the ground, or easy to burn launcher materials. To protect myself and others from eye injury, I will position my launch rod or rail so that it is above eye level, or else I will place a large guard on the end between launchings. I will never place my body or hand directly over my loaded model rocket positioned on the launch system.

7. LAUNCH SITE

I will never launch my model rockets near buildings, power lines, or within nine (9) kilometres of an airport. The area around the launch system will be cleared of any easy to burn materials. I will always obtain the permission of the launch site owner(s) before I launch my model rocket.

8. LAUNCH CONDITIONS

I will never launch my model rockets in high winds, or under those conditions of low visibility which may prevent the complete observation of my model rocket in flight.

9. LAUNCH SAFETY

I will never leave the safety interlock key in my Firing System when I am not launching my models. I will remain at least five (5) metres away from any model rocket about to be launched. I will always announce to persons present that I am about to launch my model, and I shall give a loud count-down of at least five (5) seconds long.

10. ANIMAL PAYLOADS

I will never endanger live animals by launching them in my rockets.

11. TARGET

I will never launch my model rocket so that it will fall or strike ground or air targets, nor will I attach any explosive warhead or incendiary payload.

12. HAZARDOUS RECOVERY

I will never attempt to recover my model rocket from a power line, a high place in a tree, or any other dangerous place.

13. PRE-FLIGHT TESTS

Whenever possible, I will always test the stability, operation and/or reliability of my designs or methods previous to flight. I will launch unproven designs in complete isolation from other persons.

14. PERSONAL CONDUCT

I will always conduct myself in a responsible manner, conscious that the maintenance of safety for myself and others rests with my ability to design and construct sound, working models, and to enthusiastically abide by the above code.

CANADIAN ASSOCIATION OF
ROCKETRY
151 Slater Street, Suite 302
Ottawa, Canada, K1P 5H3



CANAROC SPACE MODELLERS CLUB

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- a membership card for your wallet.
- a 4" CSM Club Crest.
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- a decal sheet with different sized Canadian flags, and various decals identifying you with the Club.
- a Club memo pad.
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- "Space Modellers Gazette", the official newsletter filled with model rocketry news.

FOR FURTHER INFORMATION WRITE:

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