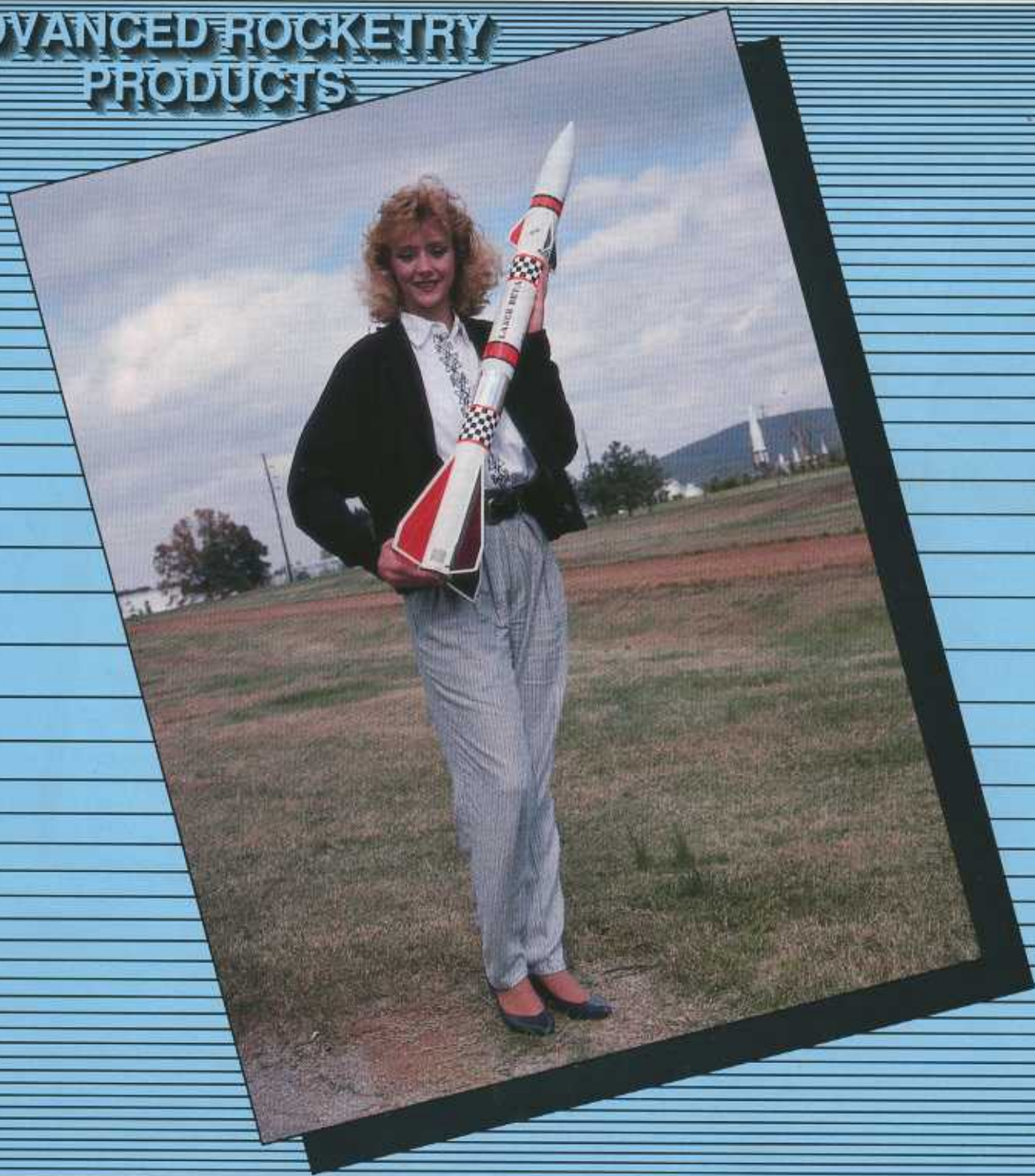


NORTH COAST ROCKETRY

ADVANCED ROCKETRY
PRODUCTS



CATALOG 891 \$3.00

From Your Friends at North Coast Rocketry

Hello!

Welcome to the **1989 North Coast Rocketry catalog**. North Coast Rocketry has undergone some dynamic changes since we published our last catalog in 1987. Dan Kafun has joined the company as an owner, bringing with him valuable machinist's skills, as well as an "average guy" perspective.

Dan's addition will be helpful, as NCR's operations have grown significantly since 1987 to handle our ever increasing number of customers. It seems that advanced rocketry has really taken off and grown in the past two years, and we've been working hard to keep up. With your help and support, NCR is now able to offer more rocketry products than any other company except Estes. And, we intend to give Estes a run for the money in the long run!

NCR was formed by Matt Steele and Chris Pearson in 1983 to provide a source for advanced rocketry kits, motors and related products. Since then, NCR's staff has grown to include Matt's wife, Robyn (who handles Customer Service), Ann Heutsche and Dawn Swenson (Catalog Mailings & Correspondence), Jimmy Williams (Machinist / Launchers), Transolve's John Fleischer (Electronic Payloads), Toni McKinnon (Parachute and Streamers), Chas Russell (Consultant) and George Gassaway (Designer).

We have worked hard at improving our kits and product line. Our average turn around time on shipments is 48 hours, meaning you get your order faster. If you have problems, please give us a call on our customer service line **(205) 883-6020**. You can also order using that phone number. **MasterCard** and **VISA** are now accepted. This should make ordering much easier.

We're in the process of upgrading our kits and parts. In late 1988, we introduced our new **Godzilla™ Shock Cord Mount System** (Patent Pending) in the Big Brute and Thunderbolt. This system is easier to install, lighter in weight, and inherently more reliable. Over the course of the year, we'll be integrating the mounts into all of our kits. The mount kit is also available separately. Also in 1989, we'll be introducing **"Dura-Ply"** centering rings in our kits. **"Dura-Ply"** is a material that offers greater strength and dimensional stability than plywood.

Since the demise of CMR, no company has come forward to fill the gap in quality lightweight kits and parts for the competitor. NCR has solved that problem, with lightweight nose cones, tubes, and contest proven kits. Advanced rocketry isn't just high power; it can also be the challenge of competition. That's why no one but North Coast offers more to the advanced rocketeer.

So here it is! Hopefully, you'll find something that interests you in the catalog. Give us a call, write us a letter, and keep 'em flying high!

Matt, Chris, Dan, and the whole gang at NCR



**NORTH COAST
ROCKETRY**

How To Use This Catalog

Before you browse any further, take a quick second to look over this page. It will help explain some of the things you'll find further on. In this year's catalog, we've added some features that should make it easier to select the best kit for you.

First of all, we've added a skill level system. This should help you gauge the level of difficulty that each kit presents. Each kit has a "skill level indicator", with the pointer indicating the model's relative degree of difficulty to build and fly within the difficulty group. Below are examples of each.

Easy: If you've flown Estes kits in the past, particularly D12 powered models, then these models should be fairly easy to build. The only different techniques used in these kits are the substitution of epoxy, plywood, ripstop nylon, and Aerofoam for the materials and components that Estes usually uses. As a general rule, "Easy" kits should be the first ones you purchase from NCR.

Skill Level



Moderate: These kits represent more challenge than the "Easy" kits. Typically, these equate to Estes Skill Level 4 kits. They require familiarity with basic high power building skills in order to build successfully.

Skill Level

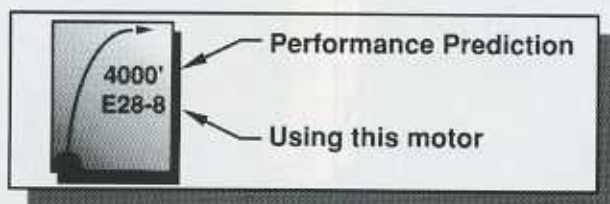


Difficult: These kits require skills not normally learned by building and flying Estes kits or other model rockets. Examples include composite motor clusters, staged clusters, built up fins, added detailing, and Class B motor (i.e., H, I, & J) powered rockets. These kits are recommended for experienced modelers only.

Skill Level



Secondly, we've tried to answer the age old question of "how high do they go?". Each kit has an "altitude indicator" that presents the performance prediction of that model with certain baseline motor types we sell. These are only predictions, though, so your actual altitudes may vary. These predictions will make it easier to pick the model that best suits your flying field, and they should give you some insight as to the relative performance of similar models. The altitudes were calculated using a specially written prediction program. The values were then rounded off to the nearest 50 feet due to the variances between models and motors.



We've also tried to make it clear what type of motor goes into what type of model. This has really become a problem, with 6 diameters of rocket motors now available on the market. Below are the motor diameter symbols, and what they mean.

13 mm



13 mm: (.5" diameter x 1.75" long)

These are the Estes 1/2A and A "Mini" engine series, and are used in our competition series. Motors of this diameter fit our CBT-50 tube.

18 mm



18 mm: (.690" dia x 2.75" long)

These are the "standard" size motors. Currently, Estes manufactures 1/2A, A, B & C black powder propellant motors in this size, and MRC makes A, B & C motors. Aerotech manufactures composite propellant D & E motors in this size. Motors of this diameter fit our BT-7 and CBT-74 tube.

24 mm



24 mm: (.945" dia; length varies from 2.75" to 4.83")

This is the Estes "D12" size. Estes makes black powder D motors, while Aerotech makes E, F, & G composite propellant motors in this size. Motors of this diameter fit our BT-9 tube.

29 mm



29 mm (1.125" diameter; length varies from 3.25" to 10.50")

This is the standard "high power" motor size, first popularized by Flight Systems, Inc. Aerotech manufactures Class C composite motors in the F & G range, and Class B H motors. Motors of this diameter fit our BT-11 tube.

1.50"



1.50" (length varies from 7.50" to 13.0")

Aerotech produces a large variety of H and I motors in this diameter. Motors of this diameter fit our BT-15 tube.

2.125"



2.125" (length varies from 5.0" to 12.875")

This is the "Professional Motor" diameter. Aerotech makes I & J and larger motors in this size. Motors of this diameter fit our BT-21 tube.

Please be aware that the weights listed in the catalog are typical weights only. Your kit or part may vary due to a number of factors.

The catalog is organized into the following basic sections for your convenience:

- NCR High Power Kits
- NCR Launch Controllers and Launch Pads
- NCR Competition Kits
- Aerotech Rocket Motors
- Transolve Electronic Payloads
- PIC Adhesives
- NCR High Power Parts
- NCR Competition Parts
- Ordering Information

A Typical North Coast Rocketry Kit

What to Expect

If you have never built a **North Coast Rocketry** kit before, you'll find a number of differences between our kits and other rocket kits. In general, our kits are designed to be stronger and tougher than other kits, so you can use high power E, F, and G motors time after time. Below is a look at the individual components that make a North Coast advanced rocketry kit unique.

- **Nose Cone:** North Coast offers an exclusive line of Aerofoam cones for all of its airframe tubes. Aerofoam is a very light polyurethane foam that has a smooth finish like plastic, but weighs less. It is strong, durable, and yet safe in high power rockets. NCR also offers a blow molded styrene nose cone for its BT-39 kits.

- **Payload Section:** Most kits from NCR feature a large, spacious payload section. Common payloads flown in NCR kits are the ALTM-1 Altitude Data Logger, the XMTR-1 Transmitter, and the BEEP-1 Audible Beeper.

- **Bulkhead:** NCR bulkheads consist of a tube coupler, a screw eye, and a plywood insert. These bulkheads seal off payload sections, and are lighter and stronger than balsa bulkheads.

- **Screw Eyes:** These are similar to standard rocketry screw eyes, but considerably larger in size.

- **Shock Cord:** One of the keys to flying models time after time is having a shock cord that won't break after a few flights. North Coast uses a braided elastic cord, rather than rubber, for all of its kits. The elastic is stronger, doesn't burn as easily, and doesn't hang on the side of the tube.

- **Parachute:** All of our parachutes are made of ripstop nylon with heavy duty shroud lines sewn into the parachute for strength. You'll really have to try to strip a shroud line off of these chutes!

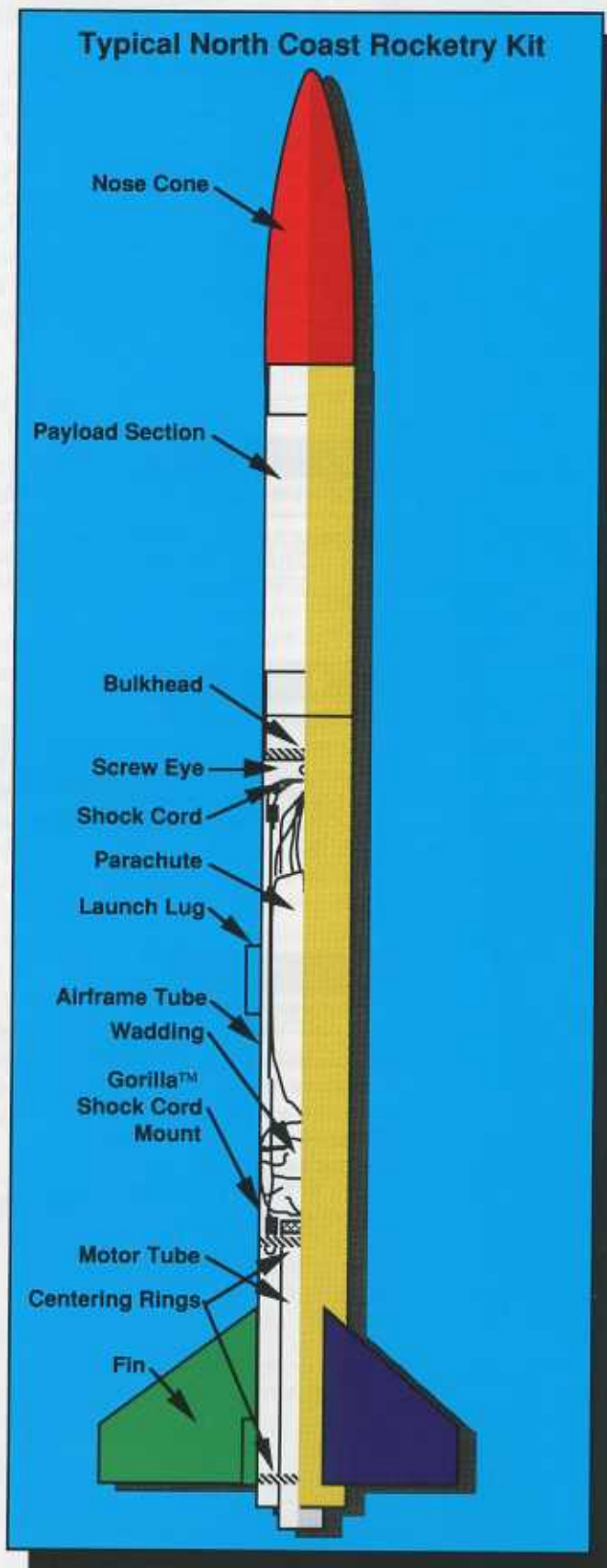
- **Launch Lug:** Heavy duty, large diameter lugs for big rocket kits. All kits come with 1/4" diameter lugs standard. The bigger BT-39 kits also include 3/8" and 1/2" lugs.

- **Airframe Tubing:** NCR airframe tubes are thick wall, heavy duty tubes that won't crimp in flight, and won't dent on the ground. These are the key reason why you can fly an NCR kit again and again.

- **Gorilla™ Shock Cord Mount:** Our newest innovation! This new mount is stronger and more reliable than other shock cord mounts. It's also easier to install!

- **Centering Rings:** Made of either Duraply or aircraft plywood, these are precision rings made to adapt motor tubes to airframe tubes.

- **Fins:** Made from 5 ply birch plywood (generally 1/8" thick), these fins are strong enough to fly on high power rockets. They also are easier to sand and finish.



NAR/HIA MODEL ROCKET SAFETY CODE

1) Construction: My model rockets will be made of light-weight materials such as paper, wood, rubber and plastic, without any metal or other hazardous materials as structural parts.

2) Engines: I will use only pre-loaded factory made NAR certified rocket engines in the manner recommended by the manufacturer. I will not alter or dismantle model rocket engines or their ingredients in any way, or attempt to reload these engines.

3) Recovery: I will always use a recovery system in my model rockets that will return them safely to the ground so that they may be flown again. I will use only flame resistant wadding in my rockets.

4) Weight Limits: My model rockets will weigh no more than 1500 gm (53 oz) at liftoff and the engines will contain a total of no more than 125 gm (4.4 oz) of propellant. My model rockets will weigh less than the engine manufacturer's recommended maximum liftoff weight for the engines used, or I will use engines recommended by the manufacturer for my rockets.

5) Stability: I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.

6) Payloads: My model rockets will never carry live animals, or payloads that are intended to be flammable or explosive.

7) Launch Area: I will launch model rockets outdoors in a cleared area, free of tall trees, power lines, and buildings. I will insure that people in the launch area are aware of the pending rocket launch and are in a position to see the rocket's liftoff before I begin my audible five second count down.

8) Launcher: I will launch my model rockets from a launch rod or other device which provides a rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so that the end of the rod is above eye level or will cap the end of the rod when approaching it. I will cap or disassemble my launch rod when not in use and will never store it in an upright position. My launcher will have a jet deflector device to prevent engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, and other easy-to-burn materials.

9) Ignition System: The system I use to launch my model rockets will be remotely controlled and electrically operated and will contain a launching switch that will return to "off" when released. The system will contain a removable safety interlock in series with the launching switch. All persons will remain at least 15 feet from the model rocket when I am igniting engines totalling 30 N-sec or less of total impulse and at least 30 feet from the model rocket when I am igniting engines totalling more than 30 N-sec total impulse. I will use only electrical igniters that will ignite my rocket engine(s) within one second of actuation of the launching switch.

10) Launch Safety: I will not let anyone approach a model rocket on a launcher until I have made sure that the safety interlock has been removed or the battery has been disconnected from the ignition system. In the event of a misfire, I will wait one minute before allowing anyone to approach the launcher.

11) Flying Conditions: I will launch my model rocket only when the wind is less than 20 miles per hour and under conditions where the model will not fly into clouds, fly near aircraft in flight, or be hazardous to people or property.

12) Pre-Launch Test: When conducting research activities with unproven designs or methods I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.

13) Launch Angle: I will not launch model rockets so that their flight path will carry them against targets. My launch device will be pointed within 30 degrees of vertical. I will never use model rocket engines to propel any device horizontally.

14- Recovery Hazards: If a model rocket becomes entangled in a power line or other dangerous place, I will not attempt to retrieve it

Always follow the NAR/HIA Safety Code and all local laws and ordinances when flying rockets.

Think Safety At All Times!



NEW North Coast Rocketry Kits for 1989!



BIG BRUTE

The perfect high power demo rocket! This rugged sport model can be flown nearly out-of-sight on F motors, or punch it into orbit on a G! The **Big Brute** features slow, realistic take-offs, and is perfect for the new White Lightning motors! Recovery is by colorful 24" rip-stop nylon parachute. The **Big Brute** also incorporates our new Gorilla™ Shock Cord Mount. If you are looking for an impressive flying model, but have a small field, this should be perfect!

Recommended motors:

F10-4, F15-4, F20-4, F25-6, F60-6, F80-5, G25-5, G40-7, G60-5, G80-7

Length: 35"
Diameter: 4.0"
Weight: 16 oz
Catalog # K-53
Price \$24.00

Skill Level



Easy Moderate Difficult



29 mm



JUNO-1

The **Juno 1** is the historic vehicle that launched America's first satellite, Explorer 1, into orbit. George Gassaway built the prototype **Juno-1** for the 20th anniversary of the Explorer 1 launch. It was so neat, we decided to make a kit of the **Juno 1** available to everyone. This is a kit for experienced modelers, as it includes built up plastic fins, a multiple section nose cone, and a number of scratch built parts. The **Juno-1** is worth the effort as it makes a terrific attention getter.

Recommended motors:

F15-2, F20-2, G25-5, G60-5

Length: 47.75"
Diameter: 4.0"
Weight: 25 oz
Catalog # K-58
Price: \$49.00

Skill Level



Easy Moderate Difficult



29 mm



AQM-127A SLAT

The **SLAT** (Supersonic Low Altitude Target) is the Navy's newest target drone. It uses a solid rocket booster to kick the bird up to Mach 2.2, where a liquid fueled ramjet takes over. The **NCR SLAT** features a similar flight profile, using a D12 to boost the model before igniting the upper stage composite motor. This is really a two stage model in one airframe! The **NCR** kit includes a vac formed booster nozzle and conduit covers, built up plastic fins, and two color decals.

Recommended motors:

Booster: D12-0 Sustainer: E6-4, E10-4, E15-4, E30-4, E50-4, D12-3

Length: 29"
Diameter: 2.70"
Weight: 12 oz
Catalog # K-54
Price: \$25.00

Skill Level



Easy Moderate Difficult



24 mm



NEW North Coast Rocketry Kits for 1989!

MINI KATANA

For those of you who have asked for a scaled down version of our popular Katana, here it is! The **Mini Katana** has a main motor tube designed to fit a 24 mm motor, with up to seven 18 mm motor mounts surrounding the main motor mount. The result is plenty of smoke and fire, but without the expense. The model is designed to be flown with either a single motor or a cluster of 2, 4, or 7 18 mm motors. The 18 mm motor mount ducts ejection charges so any delay can be used.

Recommended motors:

(Single motor option)

D12-3, E10-4, E15-4, E30-4, E50-5, F32-10, F44-10, F72-10

Length: 33"

Diameter: 2.70"

Weight: 14 oz

Catalog # K-56

Price \$23.00

Skill Level



Easy Moderate Difficult



24 mm



XENON

Here's a model that will catch everyone's eye! The NCR **Xenon** features a real Xenon flashing strobe in a clear nose section. The strobe is bright enough to be seen in bright daylight. Sunrise and sunset flights are truly impressive! Besides being a unique demonstration bird, the model has a myriad of R&D applications.

Recommended motors:

F10-4, F15-8, F20-8, F25-6, F25-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 41.5"

Diameter: 1.88

Weight: 15 oz

Catalog # K-55

Price \$50.00

The **Xenon** is also available without the strobe.

Catalog # K-55A

Price \$22.00

Skill Level



Easy Moderate Difficult



29 mm



STARION

Sleek and sophisticated, the NCR **Starion** will convince people that advanced rocketry kits are as much models as they are rockets. Built around a BT-39, the NCR **Starion** features long lean lines accentuated by balsa conduit covers. If you've built a Phantom 4000, you're ready for this bird. It's a show stopper!

Recommended motors:

F20-4, F80-5, G25-5, G60-5

Length: 50"

Diameter: 4.0"

Weight: 30 oz

Catalog # K-57

Price \$49.00

The **Starion** is also available with a 1.5" motor mount.

Catalog # K-57A

Price \$54.00

Skill Level



Easy Moderate Difficult



29 mm



North Coast Rocketry Kits



QUANTUM 1

The **Quantum 1** is the perfect model rocket for those becoming familiar with high power rocketry. It is also ideal for those experienced modelers who want single motor reliability and high performance. The spacious payload section is well suited for an XMTR-1 or an ALTM-1 electronic payloads. A superb performer, and the price tag is easy on the wallet, too. The **Quantum 1** features a 24" bright orange ripstop nylon parachute for reliable recovery.

Recommended motors:

F10-4, F15-4, F20-8, F25-6, F60-6, G25-5, G40-7, G60-10, G80-7

Length: 44"
Diameter: 2.44"
Weight: 13 oz.
Catalog # K-19
Price: \$20.00

Skill Level



QUANTUM 3

The **Quantum 3** is perfect for those becoming familiar with high power cluster rockets. Experienced modelers will find the **Quantum 3** combines reliability and high performance for an outstanding value. Most rocketeers seem to prefer the ease of clustering three D12's, but for spectacular flights, three *White Lightning* G55 motors. Again, a large payload section is provided for lofting one of our electronic payloads.

Recommended motors: (3 required)

D12-7, E6-4, E10-8, E15-7, E30-8, E50-10, F32-10, F44-10, F72-15, G55-15

Length: 54.5"
Diameter: 2.44"
Weight: 17 oz.
Catalog # K-21
Price: \$23.00

Skill Level



24 mm



PHANTOM 1800

The high performance **Phantom 1800** is a great model rocket for becoming familiar with high power rocketry. This bird goes together quickly, and yet can fly to great heights! Impressive high altitude flights can be made with the long burn F10, F15, or G25 motors, or try and hit Mach 1 with the short burn F80 and G80 motors. Recovery is by a 18" bright orange ripstop nylon parachute. A real screamer!

Recommended motors:

F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 25.5"
Diameter: 1.88"
Weight: 10 oz.
Catalog # K-22
Price: \$17.00

Skill Level



29 mm



PHANTOM 2600

The high performance **Phantom 2600** is another good model to get started in high power with. Impressively sized, this bird goes together quickly, is easy to prep, and really performs! Try an G80-7 in this one if you're ready for real excitement! Recovery is by a bright orange 24" ripstop nylon parachute. The Phantom 2600 kit is rugged enough to withstand many, many flights, even on the toughest fields.

Recommended motors:

F10-4, F15-4, F20-4, F60-6, G25-5, G40-7, G60-10, G80-7

Length: 32.5"
Diameter: 2.70"
Weight: 14 oz.
Catalog # K-23
Price: \$22.00

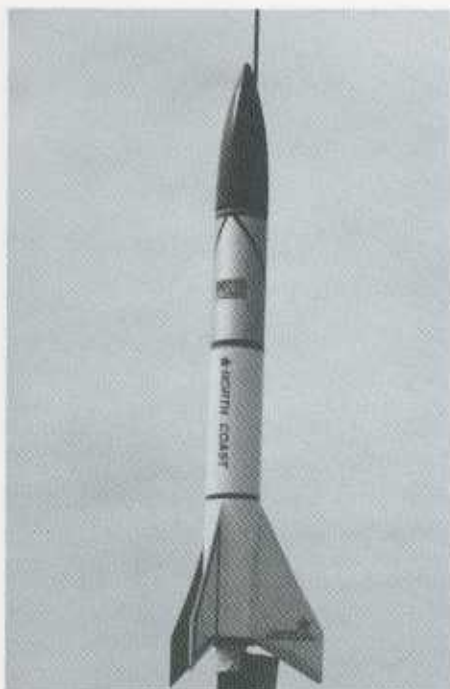
Skill Level



Easy Moderate Difficult



29 mm



PHANTOM 4000

The **Phantom 4000** is the perfect BIG rocket for becoming familiar with high power rocketry. Great for demonstration flights with it's slow, realistic lift offs, and graceful recovery, this bird is a must! The **Phantom 4000** is our most popular kit. Recovery is by a 36" bright orange ripstop nylon parachute and heavy duty shock cord system. No one will think this is a toy when you bring it on the launch field!

(Model and photo by Jack Gurner)

Recommended motors:

F10-2, F15-2, F20-4, F25-6, F60-, F80-5, G25-5, G40-7, G60-5, G80-7

Length: 50"
Diameter: 4.00"
Weight: 25 oz
Catalog # K-24
Price: \$27.50

Skill Level



Easy Moderate Difficult



29 mm



PHANTOM 4000 HD

The **Phantom 4000 HD** is our response to those of you who asked for more power! Designed for the NCR 1.5" or 2.125" motor tube, the **Phantom 4000 HD** features plywood through-the-wall fin attachment for extra strength. Perfect for getting your Tripoli Class B motor confirmation flight.

(Model and photo by Tom Beach)

Recommended motors:

Type A: H45-10, H65-10, H100-10, H145-15, I95-15, I132-15

Type B: H35-10, I32-10, I65-10, I115-10, I140-15, J100-15, J125-15

Length: 56"
Diameter: 4.00"
Weight: 36 oz
Catalog # K-31A (1.50" motor mount)
Catalog # K-31B (2.125" motor mount)
Price: \$36.00

Skill Level



Easy Moderate Difficult



1.50"



2.125"



North Coast Rocketry Kits



ORBIT

The ultra high performance **Orbit** is a great rocket for those who want to fly high power on smaller fields. This bird goes together quickly, and yet can fly to great heights! For standard 29mm motors, this is our highest flying bird. A stock **Orbit** placed in the top ten in F Altitude at NARAM-30! Recovery is by a 6" x 60" bright orange ripstop nylon parastream. As with all NCR kits, the **Orbit** features pre-cut plywood fins and a decal sheet.

Recommended motors:

F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 23.5"
Diameter: 1.88"
Weight: 6 oz.
Catalog # K-39
Price: \$16.00

Skill Level



29 mm



CORPORAL

The NCR **Corporal** is a sport scale model of one of the USA's first battlefield ballistic missiles. Experience realistic, slow liftoffs with F10-4 power! Never before offered in a model rocket kit, this design will be unique in your collection. The **Corporal** has been redesigned for 1989 for even easier assembly and incorporation of our new Gorilla™ Shock Cord Mount system. Decals included to match the **Corporal's** flight test paint scheme

Recommended motors:

F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 41.5"
Diameter: 1.88"
Weight: 13 oz
Catalog # K-41
Price: \$20.00

Skill Level



29 mm



RENEGADE - X

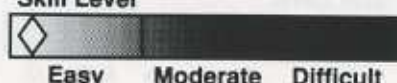
Looking for a long, lean and rugged sport design? The NCR **Renegade - X** is it! If you are looking to get into high power, but your budget is tight, the **Renegade - X** is perfect for you. The thick wall body tube and pre-cut plywood fins insure that this rocket will last for a large number of flights, while still being capable of great altitudes on composite motors. A 24" bright orange ripstop nylon parachute brings it back to earth, time and time again!

Recommended motors:

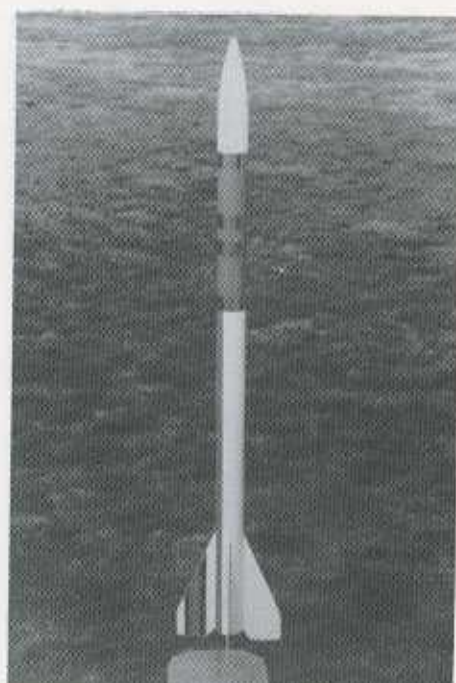
F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 41.5"
Diameter: 1.88"
Weight: 12 oz.
Catalog # K-40
Price: \$20.00

Skill Level



29 mm



THUNDERBOLT

The high performance **Thunderbolt** is a step up the high power rocketry ladder. Impressively sized, this bird goes together quickly, is easy to prep, and really performs! Try a G40-7 in this one if you're ready for real excitement! The Feshkins-Biales fin design contributes to the model's low drag coefficient. Custom decals and a 24" bright orange ripstop nylon parachute are also included.

Recommended motors:

F10-4, F15-4, F20-4, F25-6, F60-6, F80-10, G25-10, G40-7, G60-10, G80-7

Length: 27"
Diameter: 2.70"
Weight: 12 oz.
Catalog #: K-44
Price: \$17.00

Skill Level



LANCE BETA

The **Lance Beta** represents a future tactical nuclear missile for use across the world. Both a bright development test paint scheme and an operational olive drab paint scheme are featured, as well as realistic, detailed decals. The **Lance Beta** also features a large payload section that is perfect for beacons such as the XMTR-1. The **Lance Beta** is impressive both in the air and on the ground.

Recommended motors:

F10-4, F15-4, F20-4, F25-6, F60-6, F80-10, G25-10, G40-7, G60-10, G80-7

Length: 45"
Diameter: 2.70"
Weight: 22 oz.
Catalog #: K-47
Price: \$28.00

Skill Level



ELIMINATOR

Classic sporty lines grace the NCR **Eliminator**. Designed with high performance and utility in mind, the **Eliminator** features a large payload section, four swept back pre-cut plywood fins, custom decals, and a 24" bright orange ripstop nylon parachute. The **Eliminator** is perfect for our ALT-M-1 altitude data logger and other electronic payloads.

Recommended motors:

F10-4, F15-4, F20-4, F25-6, F60-6, F80-10, G25-10, G40-7, G60-10, G80-7

Length: 45"
Diameter: 2.70"
Weight: 21 oz.
Catalog #: K-45
Price: \$22.00

Skill Level



North Coast Rocketry Kits



BRIGHTHAWK

Designed to be a scale "look alike", the NCR **Brighthawk** features 100 small screws to add the final details to an impressive kit. The model includes a detailed payload section, fin sections, a special decal sheet, and strap on booster segments. This is sure to be the centerpiece of your collection.

Recommended Motors:

F60-6, F80-5, G25-5, G40-7, G60-10, G80-7

Length: 53"
Diameter: 2.70"
Weight: 32 oz
Catalog # K-33
Price \$40.00

The **Brighthawk** also can be fitted with two additional motors in the strap on boosters with our **Strap On Kit**. Includes the necessary centering rings, thrust rings, and motor tubes.
SOK-1 (24mm motors) \$6.00
SOK-2 (29mm motors) \$6.00

Skill Level



AEROBEE HI TEST

The NCR **Aerobee Hi-test** is a scaled up version of the Model Missiles, Inc. (MMI) model rocket kit that was made famous during the late 1950's. This "grown up" version should really bring smiles to the faces of the "old-timers" around your flying field! Of course, they never had it so good, since the **Aerobee Hi Test** is capable of over 1700 feet on a single G40. Sure beats clustering B motors, like they did in the old days!

Recommended motors:

F10-4, F15-4, F20-8, F25-6, F60-6, F80-10, G25-10, G40-7, G60-10, G80-7

Length: 45"
Diameter: 2.70"
Weight: 17 oz.
Catalog # K-5
Price: \$24.00

Skill Level



29 mm



STAR SPANGLED G BIRD

The **Star Spangled G Bird** shows off your true patriotic colors. This long, lean, award winning design is perfect for demos and fun fly sessions! Includes white star decals to achieve that final "Star Spangled" effect. Heavy duty construction throughout ensures fun on every flight. If you want to own one high power bird that's taller than you, the **Star Spangled G Bird** is it. Be careful carrying it through doorways, though!

Recommended motors:

F10-2, F15-4, F20-4, F25-6, F60-6, F80-5, G25-5, G40-7, G60-10, G80-7

Length: 78"
Diameter: 2.70"
Weight: 26 oz.
Catalog # K-38
Price: \$35.00

Skill Level



29 mm



SABER SR

The NCR **Saber SR** is a graceful cluster model. Using a trio of 24mm motors in the outboard strap ons and a 29mm motor in the core, the **Saber SR** really gets up there. Can be flown with the core motor only for extra versatility. A 34" long payload section and decals are included.

Recommended Motors:

Single Motor Power:

F10-2, F15-4, F20-4, F25-6, F60-6, F80-5, G25-5, G40-7, G60-10, G80-7

Strap Ons (3): D12-X*, E6-X, E10-X, E15-X, E30-X, E55-X, F32-X, F44-X
*indicates that any delay will work

Length: 60.5"
Diameter: 2.44"
Weight: 28 oz.
Catalog # K-43
Price: \$38.00

Skill Level



VIKING

The NCR **Viking** is one of our kits that is really generating a lot of excitement. A big 4" diameter main vehicle provides plenty of payload and parachute space, while the two strap on motors add extra kick. If you've been waiting to move up in model size, this is the model for you!

Recommended motors:

Core: G60-5, G80-7 (single motor only)

Outboard Motors (2):

F10-X, F15-X, F20-X, F25-X, F60-X, F80-X, G25-X, G40-X, G60-X

Length: 67"
Diameter: 4.0"
Weight: 46 oz.
Catalog # K-48
Price: \$49.00

The **Viking** is also available with a 1.5" motor mount for extra performance.

Catalog # K-48A
Price: \$54.00

Skill Level



VIKING II

The NCR **Viking II** is a scaled down version of the **Viking** designed for smaller fields and budgets. The core vehicle is powered by a 29mm motor with 18mm C, D, or E motors in the strap ons. Bob Hegwood said "The kit is well worth the price tag, and it has been very well received at demos. You can fly it in fairly small areas, and it will keep coming back time after time." (Courtesy MIVARS Apogee)

Recommended motors:

Core or single motor power: F10-4, F15-4, F20-8, F25-6, F60-6, F80-10, G25-10, G40-7, G60-10, G80-7

Outboard Motors: B6-X, C5-X, C6-X, D8-X, D21-X, E25-X

Length: 44"
Diameter: 2.44"
Weight: 18 oz.
Catalog # K-52
Price:

Skill Level



North Coast Rocketry Kits



SPOIL SPORT

Here's the kit for those rocketeers who enjoy clustered rockets. The **Spoil Sport** is a good sized model that will attract attention wherever it appears. Construction is straight forward, and tough enough for a cluster of 4 G55 motors. For lots of fire and smoke, as well as ease of ignition, nothing beats four D12's in a **Spoil Sport**. A favorite demonstration bird that can be tailored to meet the requirements of whatever field you are flying off of.

Recommended Motors: (4 required)
D12-5, E6-8, E10-8, E15-10, E30-10, E50-10, F32-15, F44-15, F72-15, G55-15

Length: 57.5"
Diameter: 2.44"
Weight: 18 oz
Catalog # K-4
Price: \$27.50

Skill Level



24 mm



MINI SPOIL SPORT

A fun kit for those who like to use 18mm motors for impressive fire and smoke flights! The **Mini Spoil Sport** flies great on clusters of Estes black powder motors. If that's a little tame for your taste, try putting four 18mm E25 motors, and watch this baby go nearly out of sight. This bird will appeal to those rocketeers with limited flying fields, as well as those who want to ease into clustered model rockets. Where else but at **NCR** are you going to find such a kit?

Recommended Motors: (4 required)
B6-2, B6-4, C6-5, C6-7, D8-8, D21-7, E25-7

Length: 40.5"
Diameter: 1.88"
Weight: 14 oz
Catalog # K-3
Price: \$22.00

Skill Level



18 mm



What they're saying about the Mini Spoil Sport...

"North Coast Rocketry's **Mini Spoil Sport** is one of the more affordable ways to enjoy high power rocketry. This rocket puts on a spectacular show with a cluster of four 18mm motors - no composites required!

The **Mini Spoil Sport** was a fun kit to build and is big enough to allow a bit of imagination in decoration - with a 12 ounce rocket and four motors, who's going to worry about a few grams of paint and shiny tape affecting its performance? The model kicks up there, and it's exciting to watch the flames from those four motors as it takes off!"

- Kathleen Harrington, from the Dec 88 American Spacemodeling.

"The **Mini Spoil Sport** is a smaller version of the NCR **Spoilsport**, and it utilizes four 18mm motors in a cluster arrangement for exciting liftoffs. If you want the challenge associated with clustering more motors, but don't want to lose the model every time you launch, this kit is perfect."

- Bob Hegwood, MIVARS Apogee



HYPERSONIC 1800

Awsome... simply awesome is the only way to describe the **Hypersonic 1800**. Want to see a rocket fly to over a mile high with ease? Try the NCR **Hypersonic 1800**! Recovery is by a high visibility parastream. It makes great flights whether you use H motors, or install an adapter and use F or G motors! Features fiberglass, through-the-wall fins for strength and ease of finishing. This is a superb kit for atmospheric research projects, or just plain high flying!

Recommended Motors:

H45-10, H65-10, H100-10, H145-15, I95-15, I132-15, I210-15

Length: 41.5"
Diameter: 1.88"
Weight: 17 oz.
Catalog # K-34
Price \$30.00

Skill Level



HYPERSONIC 2300

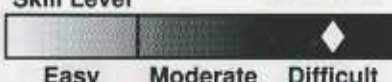
For sheer power, this is it! Flights over a mile high and near Mach 2 are possible with the **Hypersonic 2300** and it's 2.1" motor mount! This is the ultimate high flyer in the NCR kit line. The **Hypersonic 2300** features through-the-wall fin mounting, fiberglass fins, and a parastream for recovery. Not recommended for people with weak hearts or backs, children under 21 years of age, or pregnant women. This baby cooks! Recommended for experienced Class B motor flyers only.

Recommended Motors:

H35-15, I32-15, I65-5, I115-15, I140-15, J100-15, J125-15

Length: 44"
Diameter: 2.44"
Weight: 22 oz.
Catalog # K-35
Price \$35.00

Skill Level



REPLICA 2560

The NCR **Replica 2560** is a semi-scale version of the Enerjet 2650 sounding rocket that was made famous during the early 1970's.

Skill Level



Reduced Size Version

Recommended motors: (3 required)

D12-5, E6-8, E10-8, E15-10, E30-10, E50-10, F32-15, F44-15, G55-15

Length: 40.5" Dia: 2.44"
Weight: 15 oz Catalog # K-7
Price: \$24.00



Full Size Version

Recommended motors: (3 required)

F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-15, G40-13, G60-15

Length: 49.5" Dia: 2.70"
Weight: 20 oz Catalog # K-8
Price: \$27.00



North Coast Rocketry Kits

SONIC SEDUCTION

The **Sonic Seduction** is perfect for both sport and research work. Just about any altitude can be reached with the proper combination of motors. You can rely on the low cost and smoke of D12's for low altitude flights, or put a composite E, F or G into the **Sonic Seduction** and really see it take off. It's a lot of fun, either way.

Recommended Motors: (3 required)
D12-5, E6-8, E10-8, E15-10, E30-10, E50-10, F32-15, F44-15, F72-15, G55-15

Length: 54.5"
Diameter: 2.44"
Weight: 14 oz
Catalog # K-17
Price: \$27.00

Skill Level



24 mm



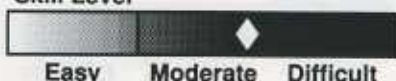
SUPER SONIC SEDUCTION

The **Super Sonic Seduction** is the scaled up version of the **Sonic Seduction** for use with larger motors. Perfect for both sport and research work, as incredible altitudes can be reached with the composite F or G motors. Lots of payload space for electronic payloads such as the **XMTR-1** or **ALTM-1**.

Recommended Motors: (3 required)
F10-8, F15-8, F20-8, F25-9, F60-9, F80-10, G25-15, G40-13, G60-15, G80-15

Length: 80.5"
Diameter: 2.70"
Weight: 27 oz.
Catalog # K-18
Price: \$32.00

Skill Level



29 mm



HYPER SONIC SEDUCTION

This is the Ultra Large Scale version of the **Sonic Seduction**, based around the BT-39, and featuring three 1.5" motors for power. Just imagine the look on the faces on the launch field when you show up with this bird! Plenty of payload room for advanced payloads. The three motor cluster arrangement can thrust the **Hyper Sonic Seduction** to altitudes of over one mile!

Recommended Motors:
H45-10, H65-10, H100-10, H145-15, I95-15, I132-15, I210-15

Length: 94"
Diameter: 4.0"
Weight: 60 oz.
Catalog # K-32
Price: \$65.00

Skill Level



1.50"



ASAT - 21X

The NCR ASAT-21X is an advanced vision of future anti-satellite prototypes. The NCR concept includes a payload/seeker section detailed with real screws, custom decals, and simulated antennas, hatches, and fin supports to give it a realistic look. A big bird that's impressive on display or in the air!

Recommended motors:
G25-5, G40-7, G60-5, G80-7
Length: 67"
Diameter: 4.0"
Weight: 40 oz.
Catalog # K-49
Price \$49.00

The ASAT 21-X is also available with a 1.5" motor mount.

Catalog # K-49A
Price \$54.00

Skill Level



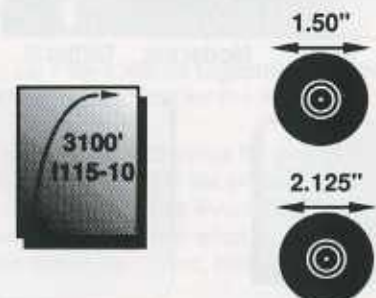
ORION

The NCR Orion is an advanced rocket designed for the professional experimenter and rocketeer. Experience one of our top of the line kits! Super large payload section and heavy duty construction are perfect for research flights.

Recommended motors:

Type A: H45-10, H65-10, H100-10, H145-15, I95-15, I132-15
Type B: H35-10, I32-10, I65-10, I115-10, I140-15, J100-15, J125-15
Length: 67"
Diameter: 4.0"
Weight: 60 oz
Catalog # K-51A (1.50" motor mount)
Catalog # K-51B (2.125" motor mount)
Price: \$55.00

Skill Level



REDWING ASP

The Redwing Asp is a sport scale quality model that will impress everyone. At over seven feet tall, the Redwing Asp is a fantastic addition to your collection! Features scale-like fin flares, plastic fin detailing, nose probe, and a huge 48" ripstop nylon parachute. No toys here!

Recommended motor:
G60-5

Length: 84"
Diameter: 4.0"
Weight: 48 oz.
Catalog # K-50
Price \$55.00

The Redwing Asp is also available with a 1.5" motor mount for additional performance.

Catalog # K-50A
Price \$60.00

Skill Level



North Coast Rocketry Kits

KATANA

The NCR **Katana** features a six fin, custom motor mount cluster design for power, stability, and superior strength. The payload section is 12" long and 4" in diameter, which is large enough for almost all payloads. The specially design motor mount options allow you to pick the type of power you want to put in this beast. Choose from the chart (lower right) to pick the motor mount you want to fly with. Please specify the type when ordering.

Length: 67"
Diameter: 4.0"
Weight: 60 oz.
Catalog # K-36A, C, D, E, F
Price: \$60.00

Skill Level



Five different motor mount options are available!



MAGNA

The NCR **Magna** is an experimental rocket designed with the experienced rocketeer in mind. The model's large size makes it easy to track and recover, yet this baby really gets up there. The dramatic slow lift off will impress everyone. It is a workhorse model, capable of great altitudes, even with large payloads. Choose from the chart (lower right) to pick the motor mount you want to fly with. Please specify the type when ordering.

Length: 84"
Diameter: 4.0"
Weight: 65 oz.
Catalog # K-37A, C, D, E, F
Price: \$70.00

Skill Level



Five different motor mount options are available!



TYPE A



4 29mm motors
3 24mm motors

TYPE C



1 1.5" motor
6 24mm motors

TYPE D



1 1.5" motor

TYPE E



1 2.125" motor

TYPE F



7 29mm motors

THE "RIGHT STUFF" PACKAGE

Here's a deal that gives you all the "right stuff" to get going in high power. First of all, we've taken the popular **Big Brute** kit and built our package around it. Then, we've gone ahead and added almost everything you'd need to get the bird built and in the air. Included in this deal are:

(2) **F25-6 motors** or equivalent for sky high flights

(1) **PIC 4/12 Minute Epoxy** to glue the whole thing together

(1) **PIC "Best Choice" CA** for tacking and sealing

(1) **PIC Pronto Accelerator** to make using CA even easier

(1) **PIC Coating Poxy** for a glass like finish on fins and body tubes

(1) **PIC Skin Shield** for protecting your hands while working with epoxies

(20) **PIC Mixing Cups** to make mixing epoxy easy and clean

(75) **PIC Mixing Sticks** for mixing epoxy without making a mess

(12) **PIC Epoxy Brushes** for applying Coating Poxy to fins and tubes

(1) **TR-3 Technical Report** on *Model Rocket Adhesive Techniques*

(1) **TR-4 Technical Report** on *Model Rocket Paint and Finishing Techniques*

(6) **RW-1 Spare Igniters** (just in case!)

Add it all up, and this would cost almost \$100! But, NCR has specially priced this package at \$80, nearly a 20% savings. Of course, there's plenty of epoxy, CA, mixing cups, coating poxy, brushes and igniters for future use, too. If you want to get started in high power, this is the way to go.

Catalog # RSP-1 \$80.00



BUILDER'S SPECIAL

The Builder's Special is just perfect for scratchbuilding those high power custom designs. An assortment that includes just about everything one needs, all at a low, discounted price. Save over 20% over buying separately! Included in the special are:

- 1 BT-7 Body Tube
- 1 BT-9 Body Tube
- 1 BT-18 Body Tube
- 1 BT-23 Body Tube
- 1 BT-26 Body Tube
- 1 NC-9 Nose Cone
- 1 NC-11 Nose Cone
- 1 NC-18 Nose Cone
- 1 NC-23 Nose Cone
- 1 NC-26 Nose Cone
- 5 TR-7 Thrust Rings
- 5 TR-9 Thrust Rings
- 5 TR-11 Thrust Rings
- 2 CR-9-18 Centering Rings
- 2 CR-11-18 Centering Rings
- 2 CR-9-23 Centering Rings
- 2 CR-11-23 Centering Rings
- 2 CR-9-26 Centering Rings
- 2 CR-11-26 Centering Rings
- 3 SE-1 Screw Eyes
- 2 SE-2 Screw Eyes
- 2 ea. LL-1, LL-2, LL-3 Launch Lugs
- 2 yards SC-1 Shock Cord
- 3 yards SC-2 Shock Cord
- 4 yards SC-3 Shock Cord
- 5 GSCM-1 Gorilla Shock Mounts

Catalog # BSP-1 \$70.00

THE SUPER DELUXE "RIGHT STUFF" PACKAGE

Want practically EVERYTHING to get started in high power? You won't find a better set up than this! Besides including all of the Right Stuff package, we'll add the following:

(1) **HPLP-1 High Power Launch Pad**, simply the best launch pad available anywhere at any price

(1) **LC-1 Launch Controller**, designed with high power in mind

(1) **BAT-1 Battery and Charger**, for hassle-free, easy to carry power

(1) **K-39 Orbit kit**, to really get people's attention that you've got some serious altitude capability

(2) **F25-9 White Lightning motors** or equivalent, just for the fun of it

This is a \$335 value for only \$285!!! Save \$50 over the list price. You were going to get all this eventually anyhow, weren't you? Think what kind of present this would be... (hint, hint!)

SDP-1 \$285.00



North Coast Rocketry Launch Pad

HIGH POWER LAUNCH PAD

There have been a lot of requests for a heavy duty, high power launching pad that will handle the large 1/4", 3/8" and 1/2" launch rods. We are pleased to introduce the **High Power Launch Pad**. This is a rugged, all metal tripod launcher that will handle up to 10 pound rockets.

The launcher features a heavy duty blast deflector, "no slip" legs, and a launch lead clip that secures the launch leads. Also, it offers 360° azimuth rotation and elevation adjustment from zero to plus or minus 30°. It comes painted in "NASA Blue".

The following launch rods are included:

- A 3 foot, 1/8" diameter rod
- A 3 foot, 3/16" diameter rod
- A 2 piece, 6 foot, 1/4" dia rod

These rods are held firmly in place firmly with a set screw, making changes between rod diameters very quick and easy.

In addition, all tooling is included to equip your pad with a 3/8" and 1/2" diameter rod, if you decide you need one.

The launcher tears down easily for transport, too.

Catalog # HPLP-1
Price: \$110.00

LAUNCH PAD ACCESSORIES

Extra Larger Blast Deflector
10" X10"x.5", fits 1/2" rod, for BIG birds!
Catalog # BD-1
Price: \$15.00

1/8" Diameter, 36" Stainless Rod
Catalog # LR-3-1/8
Price: \$4.00

3/16" Diameter, 36" Stainless Rod
Catalog # LR-3-3/16
Price: \$5.00

3/16" Diameter, 72" Stainless Steel 2 Piece Rod
Catalog # LR-6-3/16-2PC
Price: \$9.00

1/4" Diameter, 72" Stainless Steel 2 Piece Rod
Catalog # LR-6-1/4-2PC
Price: \$10.00

3/8" Diameter, 72" Fiberglass Rod
Catalog # LR-6-3/8
Price: \$12.00

1/2" Diameter, 72" Fiberglass Rod
Catalog # LR-6-1/2
Price: \$14.00

Longer rod lengths available on request.

What they're saying about the HPLP-1 High Power Launch Pad...

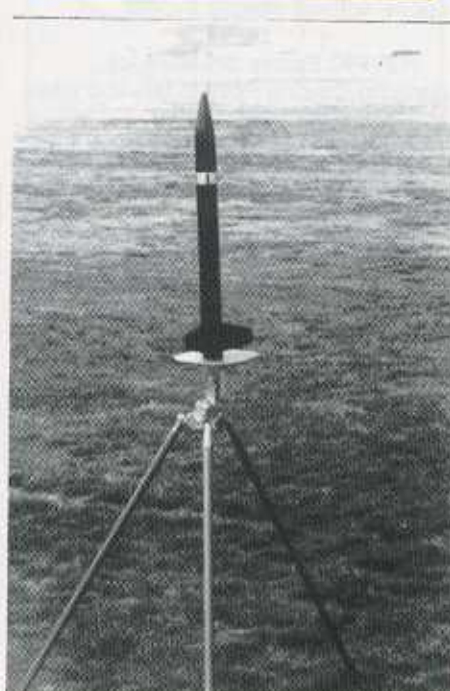
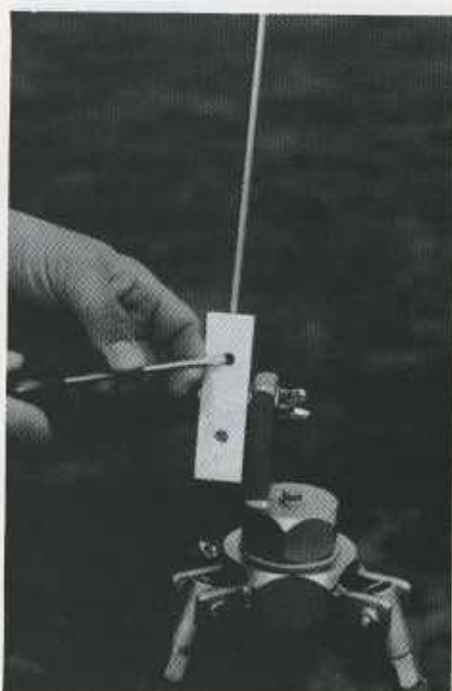
I am not the kind of person to write letters to people commenting on products, but I HAD to write you and tell you how very, very impressed I am with the launch pad you recently sent to me. I have been a model rocketeer for 25 years and have launched from everything under the sun but I have never seen, or heard of a better pad than the one you just sent. It is excellent and will serve me well for many years in both high power and standard configurations.

May I make a suggestion? Sections around the country should buy this unit as the "club launch pad". It provides the stability, flexibility, and SAFETY sections should be preaching.

Once again, thanks for a beautiful job!

Sincerely,

Don Lamar
Ft. Wayne, IN



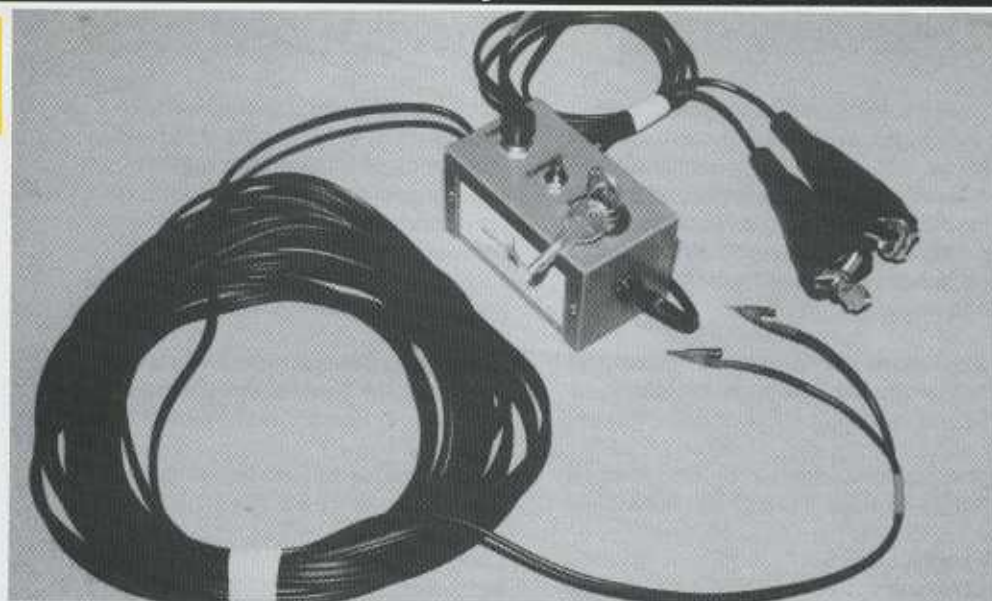
North Coast Rocketry Launch Controllers

LC-1 LAUNCH CONTROL

The NCR LC-1 Launch Control is the high power launch controller you've been looking for. The LC-1 has all features that you would build into a launch controller: An audible continuity checker (who wants to squint in the sun trying to see if the dim little light is on?); a safety key that looks like a key; fifty feet of cable; and heavy duty battery clips. There's nothing wimpy about this launch controller. The LC-1 should last a lifetime.

Catalog #
Price:

LC-1
\$50.00

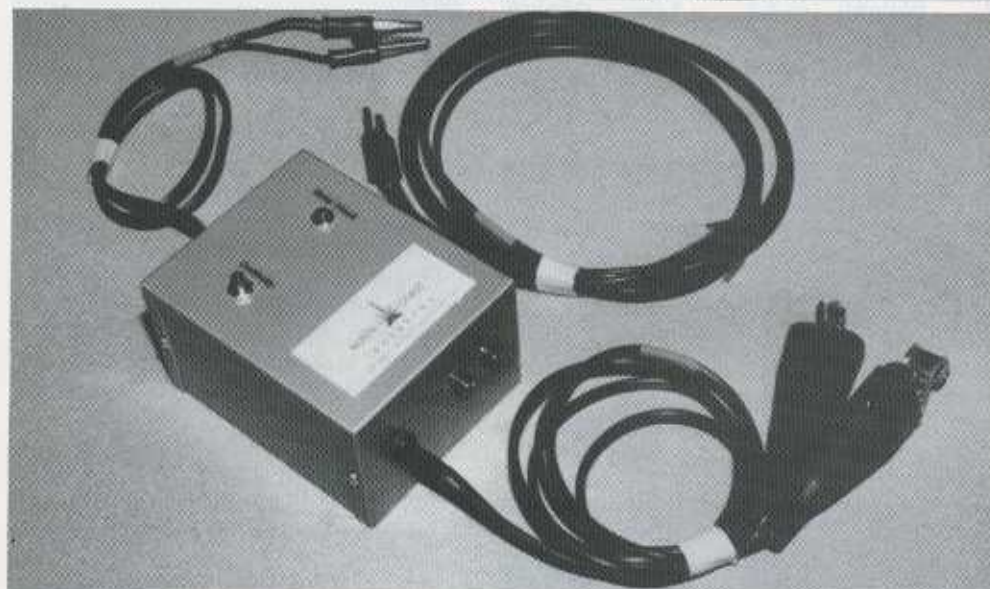


RL-1 RELAY LAUNCHER

The RL-1 Relay Launcher, is for bigger birds that need more power to the pad than the standard LC-1 can output. You set the RL-1 up near the pad, and hook it up to a battery. Then, RL-1 hooks up to the LC-1 or other launcher controller. When you press the fire switch on your launcher controller, the RL-1 kicks in and delivers maximum power from the battery near the pad. An absolute must for clustered composite models. Heavy duty construction throughout.

Catalog #
Price:

RL-1
\$50.00

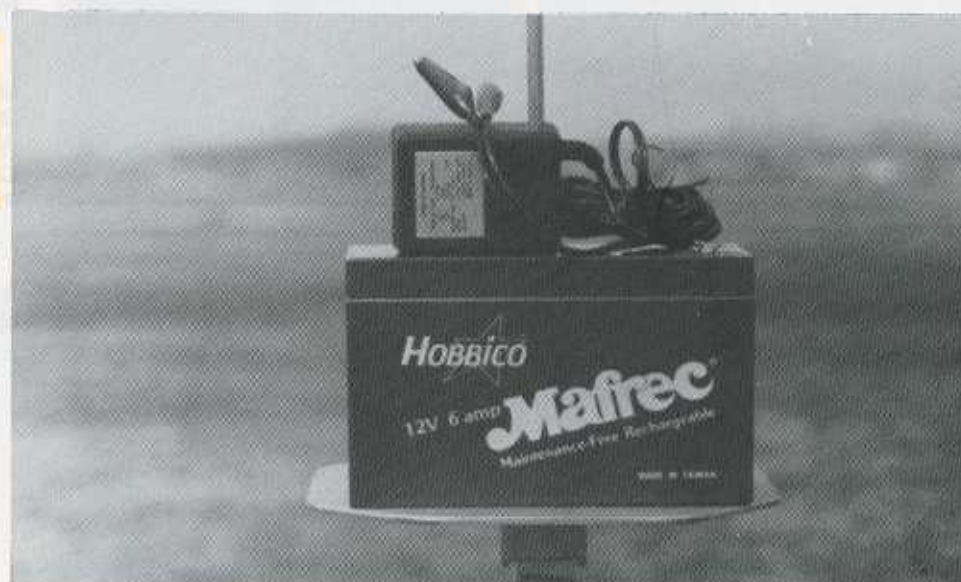


LAUNCH CONTROLLER BATTERY

For years, finding the right battery for your launch system was a pain. Now, it's here! We're offering a maintenance free, rechargeable 12 volt, 6 amp battery that is perfect for rocketry. It is a sealed, lead calcium battery that weighs less than 6 pounds and measures 5.9" x 2.5" x 3.6". It charges overnight, and the charger is included!

Catalog #
Price:

BAT-1
\$37.50



North Coast Rocketry Competition Kits

WHIPLASH A

The **Whiplash A** is a contest proven parachute duration design by Matt Steele. The length of the body tube makes it easy to pack the parachute in. Kit includes lightweight vac-formed plastic nose cone, plastic 18" parachute, a chrome mylar tape strip, and balsa fins.

Applicable Competition Events:
1/2A Parachute Duration, A Parachute Duration

Recommended motors:
1/2A3-2T, 1/2A3-4T, A3-4T, A3-6T

Length: 13"
Diameter: .54"
Weight: 1 oz.
Catalog #: K-59
Price: \$5.00

Skill Level



WHIPLASH B/C

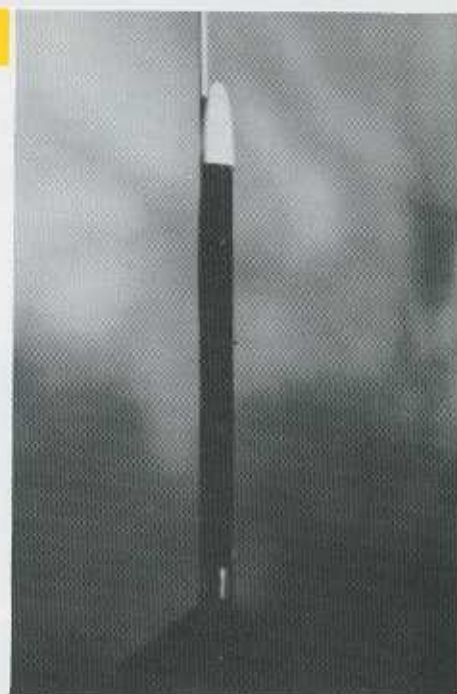
The **Whiplash B/C** is a parachute duration for 18mm motors. Designed by Matt Steele, the **Whiplash B/C** is easy to put together and fly, yet it can be very competitive. Kit includes lightweight vac-formed plastic nose cone, plastic 18" parachute, a chrome mylar tape strip, and balsa fins.

Applicable Competition Events:
A Parachute Duration, B Parachute Duration, C Parachute Duration

Recommended motors:
A8-3, B4-6, B6-6, C6-7

Length: 13.5"
Diameter: .73"
Weight: 1 oz.
Catalog #: K-60
Price: \$6.00

Skill Level



BACKLASH A

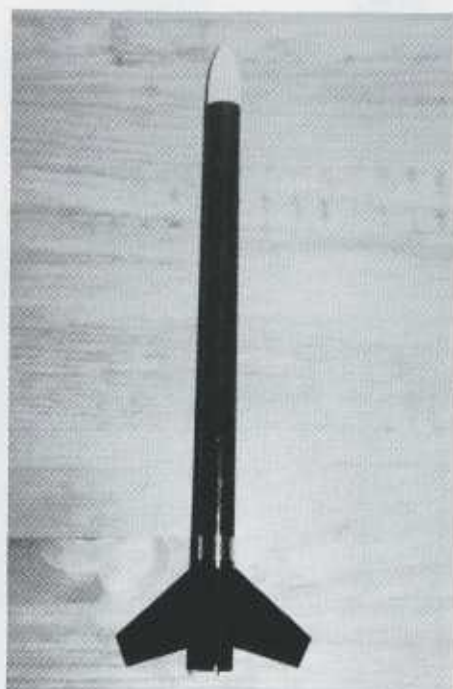
The **Backlash A** is a contest proven streamer duration design by Matt Steele. An earlier version of the bird set a US National record in A Streamer Duration. A 4" x 40" Micafilm streamer is used to get the reliable winning performances. Kit also includes lightweight vac-formed plastic nose cone, and a chrome mylar tape strip.

Applicable Competition Events:
1/2A Streamer Duration, A Streamer Duration

Recommended motors:
1/2A3-2T, 1/2A3-4T, A3-4T, A3-6T

Length: 13"
Diameter: .54"
Weight: 1 oz.
Catalog #: K-61
Price: \$5.00

Skill Level



North Coast Rocketry Competition Kits

ROTAROC A

The **Rotaroc A** is the most successful helicopter duration design ever. It has held more National records than any other design, and swept the competition at NARAM-30, winning in all four divisions. Designed by George Gassaway, the Rotaroc A is fun to fly, even if you're not into competition.

Applicable Competition Events:

1/2A Helicopter Duration, A Helicopter Duration

Recommended motors:

1/2A3-2T, A3-2T, A3-4T

Length: 15.5"
Diameter: .54"
Weight: 1.5 oz.
Catalog #: K-62
Price: \$8.00

ROTAROC B/C

The **Rotaroc B/C** is a contest winner, and a former US National Record holder in both B and C Helicopter Duration. Designed by George Gassaway, the Rotaroc B/C is a good sized model that is especially popular at demos as well as contests. Try one and see!

Applicable Competition Events:

B Helicopter Duration, C Helicopter Duration, D Helicopter Duration

Recommended motors:

B4-2, B6-2, C5-3, C6-3, D8-4

Length: 19.5"
Diameter: .73"
Weight: 1.5 oz.
Catalog #: K-63
Price: \$9.00



BACKLASH B/C

The **Backlash B/C** is a streamer duration for 18mm motors. Designed by Matt Steele, the **Backlash B/C** uses a Micafilm streamer to reduce the chance of streamer failure. Kit includes lightweight vac-formed plastic nose cone, plastic 6" x 60" streamer, chrome mylar tape strip, and balsa fins.

Applicable Competition Events:

A Streamer Duration, B Streamer Duration, C Streamer Duration, Precision Duration

Recommended motors:

A8-3, B4-6, B6-6, C6-7

Length: 13.5"
Diameter: .73"
Weight: 1 oz.
Catalog #: K-62
Price: \$6.00

Skill Level



13 mm



Skill Level



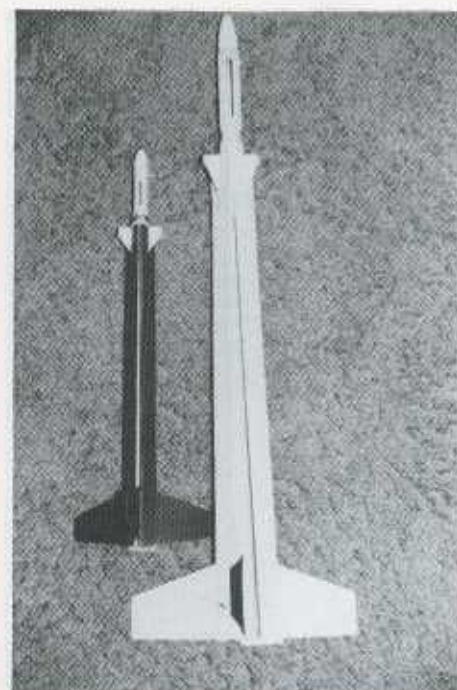
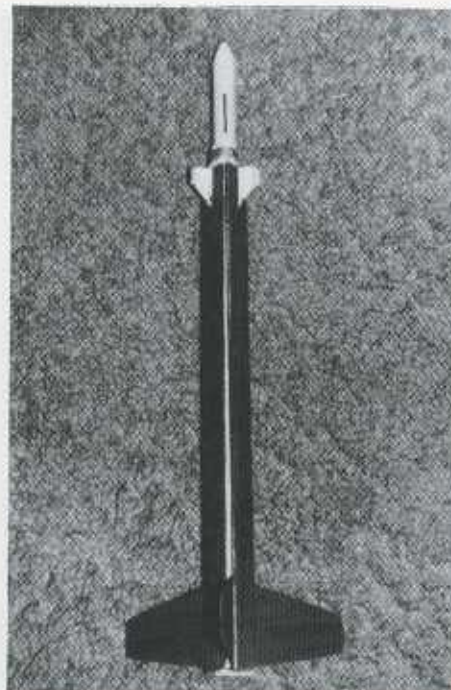
18 mm



Skill Level



18 mm



North Coast Rocketry Competition Kits

STILETTO A

The **Stiletto A** is sure to be a winner. Based on a simple wing planform, this is the perfect glider to get started with in competition. Yet, the **Stiletto A** will win it's share of contests, too, as it broke the US Record Holder in 1/2A BG. The **Stiletto A** includes a vac-formed nose cone, streamer recovery on the pod, and a chrome mylar tape strip.

Applicable Competition Events:
1/2A Boost Glide Duration, A Boost Glide Duration

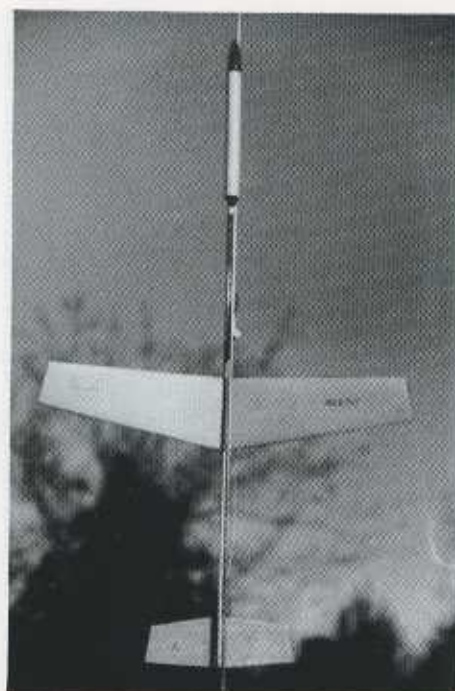
Recommended motors:
1/2A3-2T, A3-2T, A3-4T

Length: 26.5"
Diameter: .54"
Weight: 1.5 oz.
Catalog # K-64
Price: \$9.00

Skill Level



13 mm



STILETTO B

The **Stiletto B** is the easy way to get started in full size boost gliders. It trims easily, and is nearly immune to death dives, making it a reliable competition model. It's sure to be a winner. The **Stiletto B** includes a vac-formed nose cone, chrome mylar tape strip, and streamer recovery on the pod.

Applicable Competition Events:
B Boost Glide Duration, C Boost Glide Duration

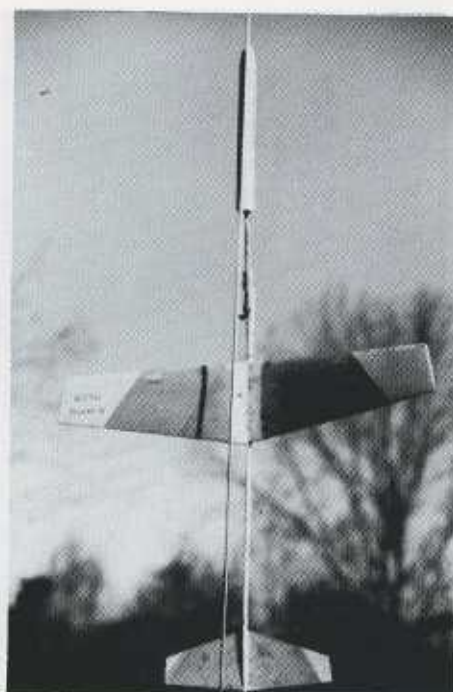
Recommended motors:
B4-2, B6-2, C5-3, C6-3

Length: 29"
Diameter: .73"
Weight: 1.5 oz.
Catalog # K-65
Price: \$10.00

Skill Level



18 mm



MINI NOMAD

The **Mini Nomad** is another contest winner, this time for the rocket glide event. It is a simple, reliable design that uses an auto elevator to flip the tail up at transition. What goes up on this bird comes down... all in one piece!

Applicable Competition Events:
1/2A Rocket Glide Duration, A Rocket Glide Duration

Recommended motors:
1/2A3-2T, A3-2T

Length: 16.5"
Diameter: .54"
Weight: 1.5 oz.
Catalog # K-65
Price: \$9.00

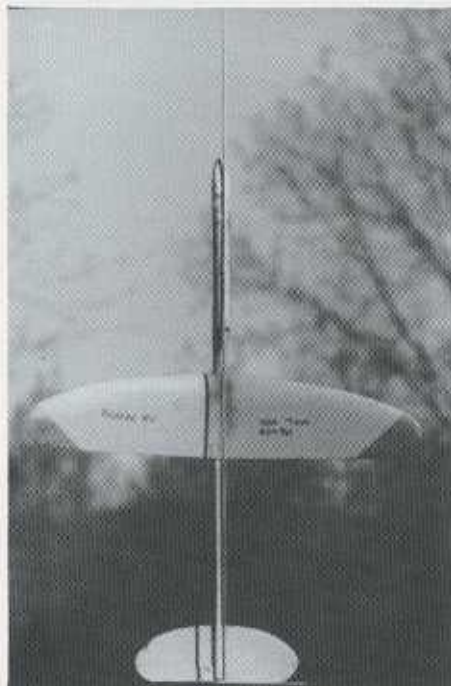
Skill Level



13 mm



North Coast Rocketry Competition Kits



NOMAD

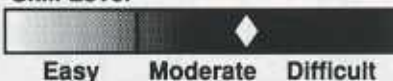
The **Nomad** was designed for the B and C rocket glide event. The **Nomad** goes back a long ways, having placed at NARAM-19, and yet is still competitive today. It goes together easy, and is a fun sport model, too, if you're not into competition.

Applicable Competition Events:
B Rocket Glide Duration, C Rocket Glide Duration

Recommended motors:
B4-2, B6-2, C5-3, C6-3

Length: 23"
Diameter: .73"
Weight: 2 oz.
Catalog # K-66
Price: \$10.00

Skill Level



GEMINI DE

The **Gemini DE** answers the need for a reliable Dual Egglofter, now that the classic event has returned. Who else but NCR would be capable of building on our high power experience to bring you a winning dual egglofter? Features vac-formed capsule, a 24" ripstop nylon parachute, Gorilla™ Shock Cord Mount, and both 3/16 and 1/4" launch lugs.

Applicable Competition Events:
D Dual Eggloft, E Dual Eggloft, F Dual Eggloft, E Single Eggloft, F Single Eggloft

Recommended motors:
D12-3, E10-4, E15-7, E30-7, E50-7, F32-10, F44-10

Length: 24"
Diameter: 1.0"
Weight: 9 oz.
Catalog # K-67
Price: \$20.00

Skill Level



24 mm



GEMINI FG

Want to loft two Grade A eggs to over 2,000 feet and return them safely? The **Gemini FG** is the way to do it! Here's the answer to reliable, safe dual egglofting. The kit features vac-formed capsule, a 24" ripstop nylon parachute, Gorilla™ Shock Cord Mount, and both 3/16 and 1/4" launch lugs. Designed by Matt Steele and Chris Pearson.

Applicable Competition Events:
E Dual Eggloft, F Dual Eggloft, G Dual Eggloft, E Single Eggloft, F Single Eggloft, G Single Eggloft

Recommended motors:
F10-8, F15-8, F20-8, F25-9, F41-9, F60-9, F80-10, G25-10, G40-10, G60-10, G80-10

Length: 24"
Diameter: 1.21"
Weight: 10 oz.
Catalog # K-68
Price: \$21.00

Skill Level



29 mm



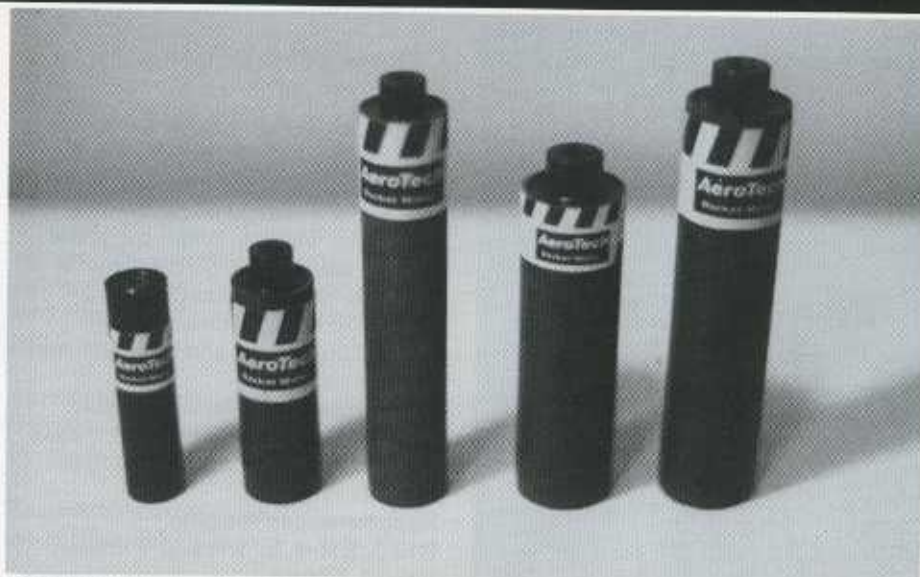
Aerotech Motors

Step into the exciting world of advanced composite rocket motors by **Aerotech**! These motors use propellants similar to that used in the Space Shuttle Solid Rocket Motors.

All of these motors offer increased reliability and performance over black powder motors of similar size and weight. Using high tech materials, **Aerotech** has established the highest reliability rate in the advanced model rocket motor market.

Due to increased demand, the "fire and smoke" effects of **Aerotech's White Lightning** propellant have been incorporated into a larger number of motors. For sheer excitement, try a **White Lightning** motor!

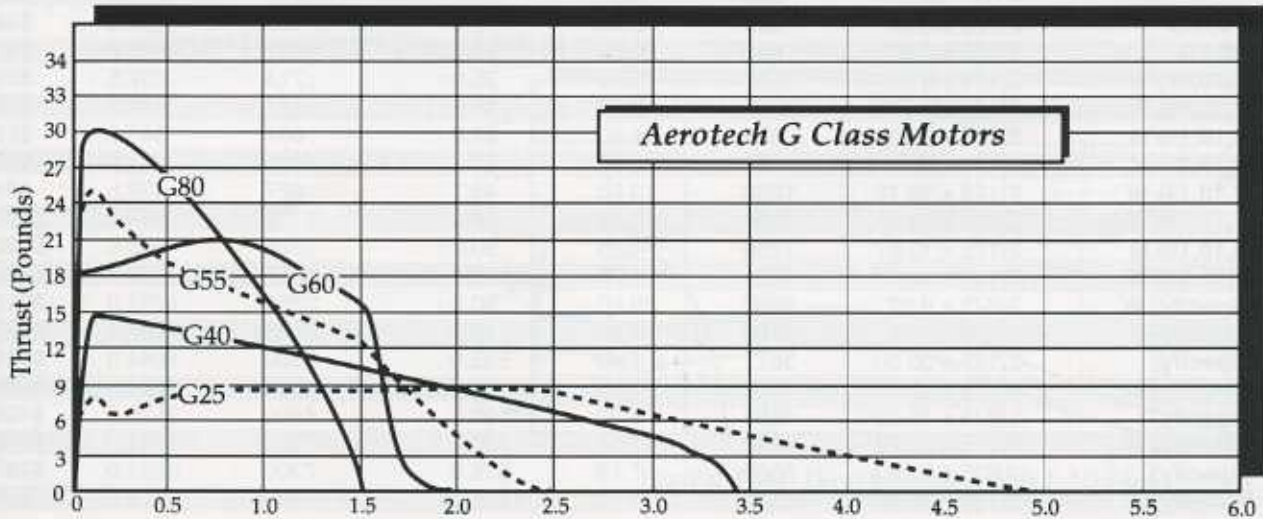
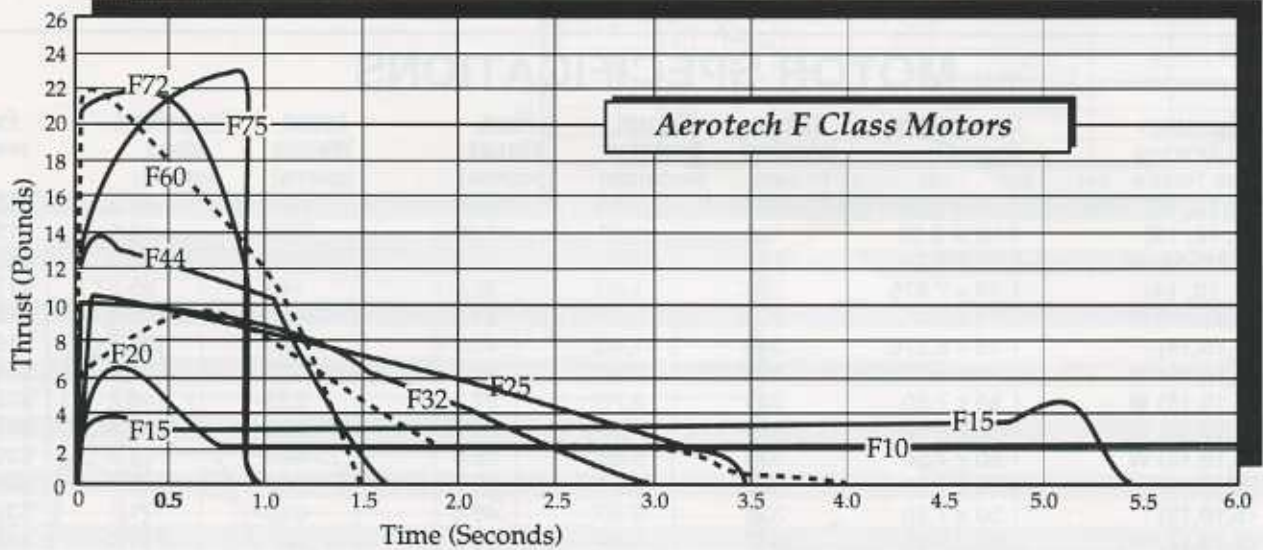
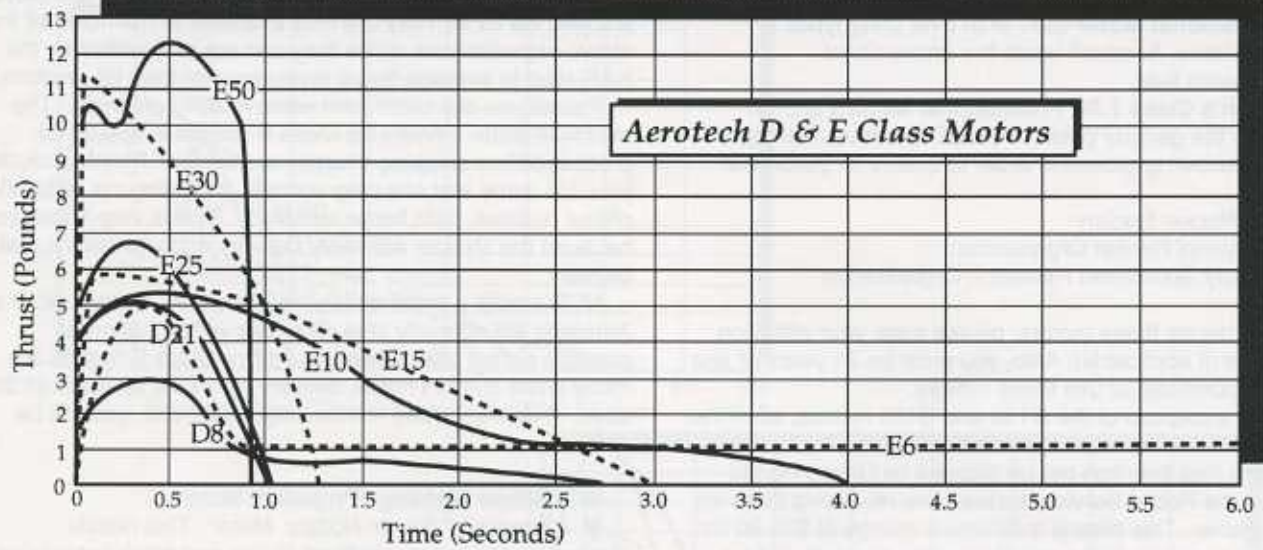
All motors on this page are currently certified by the NAR and are DOT Class C Toy Propellant Devices. Igniters and instructions are included.



Above: Aerotech motors come in a variety of sizes and power. From left to right are the 18mm D8, the 24mm E15, the 24mm F44, the 29mm F10, and the 29mm G60. No special purchase restrictions apply to these motors.

MOTOR SPECIFICATIONS

<u>Motor Designation</u>	<u>Dimensions</u> (inches)	<u>Total Impulse</u> (Newton-sec)	<u>Thrust Duration</u> (Seconds)	<u>Initial Mass</u> (Grams)	<u>Propellant Mass</u> (Grams)	<u>White Lightning</u>	<u>Price</u> (Each)
18mm Diameter Motors:							
D8 (2, 4, 8, 12)	.69 x 2.75	20	2.4	18.5	9.6	No	\$10.95
D21 (4, 7, 10)	.69 x 2.75	20	.9	23.6	9.6	No	\$6.95
E25 (4, 7, 10)	.69 x 2.75	20	1.0	23.8	13.8	No	\$7.95
24mm Diameter Motors:							
E6 (2, 4, 8)	.94 x 2.75	40	7.2	39.7	21.5	No	\$11.95
E10 (2, 4, 8)	.94 x 2.75	40	4.0	39.2	15.6	Yes	\$7.95
E15 (4, 7, 10)	.94 x 2.75	40	3.0	45.4	17.8	Yes	\$6.95
E30 (4, 7, 10)	.94 x 2.75	40	1.3	46.8	19.2	No	\$6.95
E50 (5, 10, 15)	.94 x 2.75	40	0.8	38.4	18.4	No	\$7.95
F32 (5, 10, 15)	.94 x 4.87	80	2.5	76.8	43.4	Yes	\$11.95
F44 (5, 10, 15)	.94 x 4.87	80	1.7	73.5	36.4	Yes	\$11.95
F72 (5, 10, 15)	.94 x 4.87	80	1.1	73.1	36.8	No	\$11.95
G55 (5, 10, 15)	.94 x 5.50	120	2.2	103.7	62.5	Yes	\$11.95
29mm Diameter Motors:							
F10 (2, 4, 8)	1.125 x 3.25	80	7.9	69.4	40.7	No	\$15.95
F15 (2, 4, 8)	1.125 x 3.25	80	5.3	68.5	37.7	No	\$15.95
F20 (4, 8, 12)	1.125 x 4.87	80	4.0	84.0	36.1	Yes	\$11.95
F25 (6, 9, 12)	1.125 x 4.87	80	3.0	81.7	35.6	Yes	\$10.95
F60 (6, 9, 12)	1.125 x 4.87	80	1.6	82.5	37.9	No	\$10.95
F80 (5, 10, 15)	1.125 x 4.87	80	1.0	85.0	38.1	No	\$11.95
G25 (5, 10, 15)	1.125 x 4.75	120	4.8	105.0	54.1	Yes	\$15.95
G40 (7, 10, 13)	1.125 x 4.87	120	2.7	118.0	55.1	Yes	\$14.95
G60 (5, 10, 15)	1.125 x 4.87	120	2.0	108.0	55.9	Yes	\$15.95
G80 (7, 10, 13)	1.125 x 4.87	120	1.5	119.8	56.9	No	\$14.95



Aerotech Class 1.3C Professional Motors

North Coast Rocketry is pleased to present the **Aerotech 1.3C Professional Motor** line. With over thirty types of motors available, Aerotech leads the professional hobby/research field.

Aerotech's Class 1.3C Professional Motors are not available to the general public. Instead, one must belong to one of the following groups in order to qualify for purchase:

- Tripoli Rocket Society
- Professional Rocket Organization
- University Sponsored Research Organization

When ordering these motors, please state your affiliation and number (if applicable). Also, you must be 21 years of age or older to purchase or use these motors.

With the exception of the G110 and G125 motors, all of the Aerotech Class 1.3C motors are classified at DOT Class B. This means that they can not be shipped by United Parcel Service or the Postal Service. Instead, we must ship them via a freight carrier. This means a minimum charge of \$25.00 for shipping. You will be billed actual shipping charges, but be forewarned: It's not cheap to buy these motors. DO NOT send any shipping fees with order!

The G110 and G125 are DOT Class C motors, and can be shipped via UPS. They are only available to members of the above organizations, since they can not be certified by the NAR (due to average thrust levels greater than 80 newtons).

Please use our order form when making an order. The minimum order amount for Class B motors is \$50.00 of product before shipping charges are added. Please include your full name and shipping address, including zip code and phone number, both home and work. This is very important because the shipper will verify delivery address before making delivery.

NCR stocks a small quantity of Class 1.3C motors. NCR or Aerotech will normally ship all orders within a short as possible period after receipt, but since Class B motors are many times custom made, delivery may take upwards of 30 days. If delivery delay will be longer than this, you will be notified.

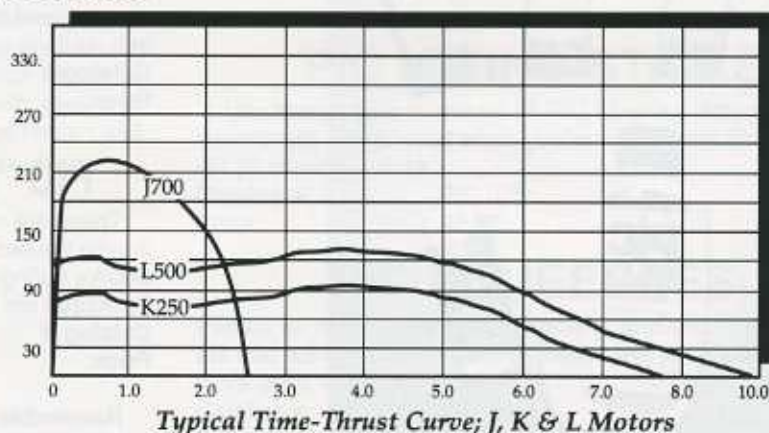
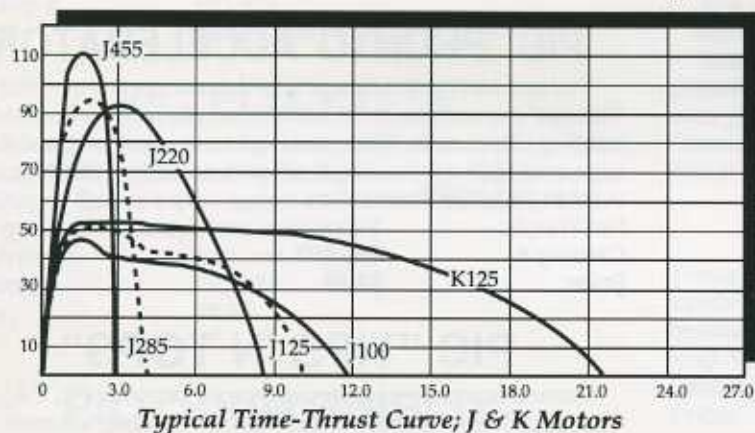
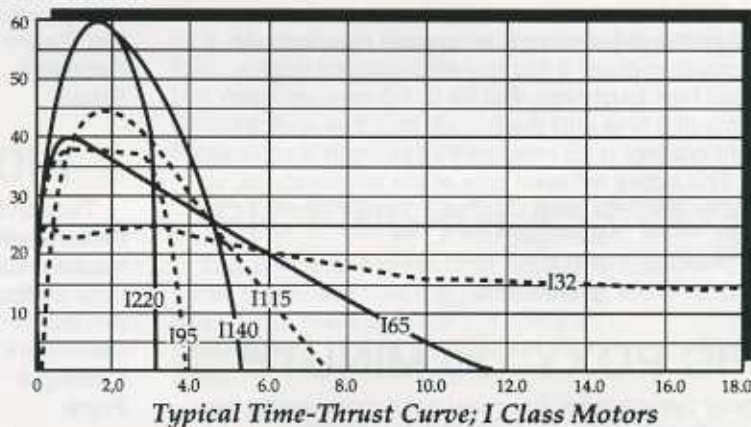
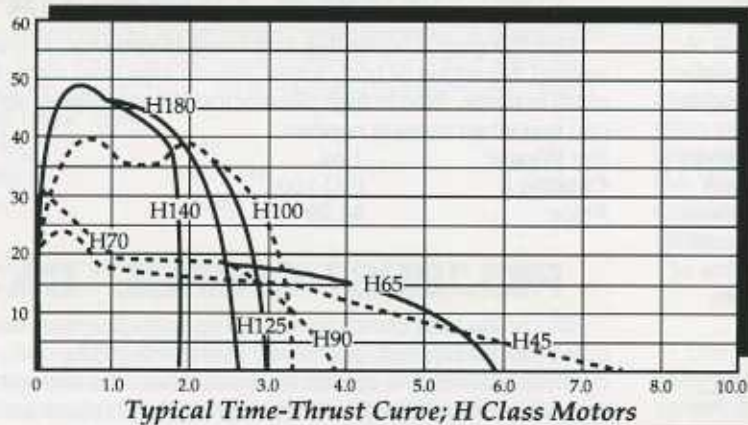
W = "White Lighting" Propellant Motor

M = "Medusa" Seven Nozzle Motor. This nozzle arrangement creates a brilliant plume and more impressive sound effects when fired. Exclusively from **Aerotech!**

MOTOR SPECIFICATIONS

Motor Designation	Dimensions (inches)	Total Impulse (n-sec)	Thrust Duration (seconds)	Peak Thrust (pounds)	Initial Weight (grams)	Propellant Mass (grams)	Price (each)
W = White Lightning							
M = Medusa Nozzle							
G110 (5, 10, 15)	0.94 X 5.50	120	1.10	20.00	TBD	62.5	\$15.95
G125 (5, 10, 15)	1.13 X 5.50	125	1.00	20.00	TBD	62.5	\$15.95
H55 (6, 10, 14) W	1.13 x 6.75	200	3.00	15.6	140	82.9	\$17.95
H120 (6, 10, 14)	1.13 x 7.875	200	1.40	36.5	145	85.5	\$17.95
H70 (6, 10, 14) W	1.13 x 7.75	200	3.00	24.0	172	102.6	\$19.95
H140 (6, 10, 14)	1.13 x 8.375	240	1.40	43.7	180	105.7	\$19.95
H90 (5, 10, 15) W	1.13 x 10.437	320	2.70	28.0	200	111.2	\$24.95
H125 (5, 10, 15) W	1.50 x 7.50	320	2.70	37.5	225	146.2	\$29.95
H45 (5, 10, 15) W	1.50 x 7.50	320	7.50	28.7	320	166.2	\$39.95
H65 (5, 10, 15) W	1.50 x 7.50	320	5.00	25.0	320	166.0	\$39.95
H100 (5, 10, 15)	1.50 x 7.50	320	3.20	38.7	309	177.4	\$39.95
H145 (5, 10, 15)	1.50 x 7.50	320	2.20	45.0	312	171.1	\$39.95
I95 (5, 10, 15) W	1.50 x 9.25	405	4.00	38.0	371	216.3	\$49.95
I210 (5, 10, 15)	1.50 x 9.25	420	2.00	75.0	377	222.8	\$49.95
I132 (5, 10, 15) W	1.50 x 13.00	640	4.00	51.0	557	324.4	\$69.95
H35 (10, 15)	2.125 x 5.00	320	8.00	19.0	427	188.5	\$39.95
I32 (10, 15)	2.125 x 7.50	640	20.00	19.0	641	376.9	\$69.95
I65 (5, 10, 15) W	2.125 x 8.50	640	10.80	35.0	714	337.5	\$69.95
I115 (5, 10, 15) W	2.125 x 8.50	640	6.20	45.0	677	341.9	\$69.95
I140 (5, 10, 15) M	2.125 x 8.50	640	4.80	57.0	691	347.8	\$69.95
I220 (5, 10, 15) M	2.125 x 8.50	850	3.00	55.0	695	351.9	\$69.95
J100 (5, 10, 15) W	2.125 x 10.12	1280	10.80	43.7	827	439.5	\$99.95
J125 (5, 10, 15) W M	2.125 x 13.87	1280	10.00	48.0	1115	643.3	\$129.95
J285 (5, 10, 15) M	2.125 x 13.87	1280	4.25	90.0	1095	663.0	\$129.95
J700 (5, 10, 15) M	2.125 x 12.87	1280	1.75	195.0	1055	609.1	\$129.95
K125 (Specify) W	3.875 x 9.62	2560	20.00	50.0	2350	1252.0	\$249.95
K325 (Specify)	3.875 x 9.62	2560	8.00	118.7	2390	1288.0	\$249.95
L1500 (Specify)	2.125 x 30.00	3617	2.40	535.0	2300	1644.0	\$395.95
L250 (Specify) W	3.875 x 15.62	4500	20.00	100.0	4300	2504.0	\$499.95
L500 (Specify)	3.875 x 15.62	4850	8.30	190.0	4400	2576.0	\$499.95
M500 (Specify) W	3.875 x 27.62	8150	17.00	320.0	7200	4531.0	\$999.95
M1000 (Specify)	3.875 x 27.62	8500	7.10	575.0	7300	4661.0	\$999.95
N3050 (Specify)	3.188 x 45.00	11543	3.78	1200.0	7400	5579.0	\$1299.95

Aerotech Class 1.3C Professional Motors



PIC Adhesives

PIC ADHESIVES

So many times, people have asked us, "What adhesives should we use to build our North Coast rockets?". We looked around the past few years, but couldn't really identify a superior brand to recommend. That is, until **PIC Adhesives** were introduced. After extensively sampling their product line, we were delighted. We use **PIC Adhesives** exclusively on all of our demo and R&D models. As such, North Coast is proud to be the only manufacturer to offer an complete line of superlative adhesives that should meet ALL of your hobby needs.

"PIC POXY" 4 1/2 MINUTE

This two part epoxy system is what you'll need to build most high power rockets! It has fast setting action, high strength, and high toughness. Pot life is 3-5 minutes, and handling time (the time until the bond is tack free and can support light loading) is 15 minutes. Full strength is achieved one hour. This epoxy will even cure at low temperatures, so it's great for on the field fixes! Our most popular epoxy.

Net Weight: 9 oz. set
Catalog # PIC 905
Price: \$10.49

"PIC POXY" 30 MINUTE

This epoxy system is for when you need more mixing time. Typical uses include motor mounts, shock cord mounts, and fin fillets. Pot life is 30 minutes, and handling time is 6 hours. Full strength is achieved in 24 hours. This epoxy is suitable for paper, plywood, fiberglass, composites, and other common high power materials.

Net Weight: 9 oz. set
Catalog # PIC 930
Price: \$9.49



PIC "QUICK CURE" CA

This CA glue is water thin and cures in seconds. Perfect for sealing the edges of body tubes, launch lugs, and for tacking parts in place. Sold in high density translucent bottles so you can see when more is needed.

Net Weight: 1 oz.
Catalog # PIC 100
Price: \$4.99

PIC "BEST CHOICE" CA+

This is the best choice for overall construction use. Medium cure rate (30 second), gap filling, fillet forming CA+ cyanoacrylate that is perfect for areas where the strength of epoxies is not required. Ideal for tacking fins in place until epoxy cures. Use with PIC Pronto for best results.

Net Weight: 1 oz.
Catalog # PIC 101
Price: \$4.99

PIC "SLOW CURE" CA++

This CA has the longest, most spreadable characteristics in the business. Super thick, s-l-o-w cure rate allows for maximum time to align parts before cure. Recommended for large surfaces and areas. Use with PIC Pronto for best results.

Net Weight: 1 oz.
Catalog # PIC 102
Price: \$4.99

PIC "PRONTO" ACCELERATOR

You just can't build without this! A bond accelerator that "freezes" the surface of CA adhesives, allowing for "instant" bonding. Perfect for fillets, tacking fins in place until epoxies cure, and 1001 other uses. It will also assist the "skinning over" of PIC POXY adhesives.

Net Weight: 2 oz.
Catalog # PIC 802
Price: \$4.99

PIC "TIPS 'N TOPS"

Spare dispensing nozzles and nozzle caps for PIC CA, CA+, and CA++. Handy for special jobs needing trimmed nozzles, and to prevent spillage. Four nozzles and caps per bag.

Catalog # PIC 650
Price: \$.89

PIC "MICRO DROPPER" TIPS

These are not only a must for anyone who uses CA, but they're the best we've ever seen. These tips allow fine control of CA's during application, minimizing waste and mess. Packaged ten to a pack, these will delight the master modeler.

Catalog # PIC 660
Price: \$1.75

Remember our Order Hotline when you need CA's or Epoxy QUICK! Call (205) 883-6020!

"PIC APART" DEBONDER

This water based liquid softens and removes CA glues from hands, tools, clothing and work surfaces. It will also allow the debonding of glued parts, so corrections can be made. This is a "must have" item.

Net Weight: 1 oz.
Catalog # PIC 500
Price: \$3.49

"PIC 'N PATCH" FILLER

A fast drying, lightweight fluffy paste that fills plywood, Aerofoam, fiberglass, and balsa. Recommended for use with our Aerofoam nose cones, to fix dents, dings, or bubbles. Apply in thin layers, and sand minutes later. Doesn't crack or shrink. Thins with water, and has a long shelf life.

Net Weight: 8 oz
Catalog # PIC 600
Price: \$4.99

"PIC COATING POXY"

This is the way to finish high power models! A two part brushable low viscosity epoxy system for finishing, fiberglassing, and laminating composites. It sands smooth and easily with a minimum of hassle, and adds incredible strength to any area. Pot life is 9 minutes, and handling time is 1.5 hours. Full cure is achieved in 6 hours. There are none of the fumes or flammability problems that polyester resins have.

Net Weight: 4.8 oz set
Catalog # PIC 975
Price: \$9.99

"PIC POXY LITE"

A 1:1 epoxy paste that has hundreds of uses. Use it to get fantastic fillets, repair landing damage, and build up low areas or fairings. Sands super, carves well, and mixes easily. Add strength to areas without the weight!

Net Weight: 6 oz set
Catalog # PIC 980
Price: \$8.99

PIC "SKIN SHIELD"

This hand cream is rubbed onto the flesh before working with PIC CA's, epoxies, paints, etc. A microscopically thin layer protects the hands, yet your hands feel normal. Actually forces CA glues away from the skin. Washes off with soap and water, so you don't have to go to work with orange fingers and glue on your hands.

Net Weight: 100 ml bottle
Catalog # PIC 700
Price: \$8.99

PIC "RESIN WACKER"

At last! A way to clean up epoxy resins from your hands, models, workbench, and clothes. If you use epoxy, you NEED this! Apply **Resin Wacker** to the problem area, wipe it and the resin away, and rinse with water. That's it! It's non-toxic, contains no solvents, and works on almost every surface.

Net Weight: 1 oz.
Catalog # PIC 900
Price: \$3.99

PIC "SLICKER"

This is a barrier for both epoxies and CA glues. Want to keep glue out of somewhere? This is what you need! Prevents the migration of CA's (particularly the Quick Cure CA) into hinges, push rods, pins, and other moving parts. It acts as a release agent for epoxies for molded or cast parts. Non toxic, and cleans up easily.

Net Weight: 20 ml tube
Catalog # PIC 730
Price: \$4.99

PIC FIBERGLASS CLOTH

This 3/4 oz. fiberglass cloth is ideal for reinforcing fin/body joints, tubes, and finishing models. Apply with PIC Coating Pox. One sheet per package, 36" x 30".

Catalog # PIC 022
Price: \$4.99

PIC MIXING CUPS

Perfect for mixing epoxies, resins, and other liquids. These polyethylene cups hold eight ounces and are calibrated for easy proportional mixing. 20 cups per package.

Catalog # PIC 035
Price: \$5.75

PIC EPOXY BRUSHES

These are great for applying PIC Finishing Epoxy, as well as sanding sealers, resins, and other liquids where disposable brushes are necessary. The brushes are 3/8" wide, and 6" long. 12 brushes per pack.

Catalog # PIC 050
Price: \$2.30

PIC MIXING STICKS

Use these sticks to mix up all PIC Epoxies. Why mess around with scrap wood when you're making the perfect model? 75 sticks per pack.

Catalog # PIC 075
Price: \$2.95

PIC SQUEEGEES

Perfect for making fillets, fiberglassing, and smoothing out fillers and adhesives. Try a set of these, and you'll find even more uses. 3 per pack.

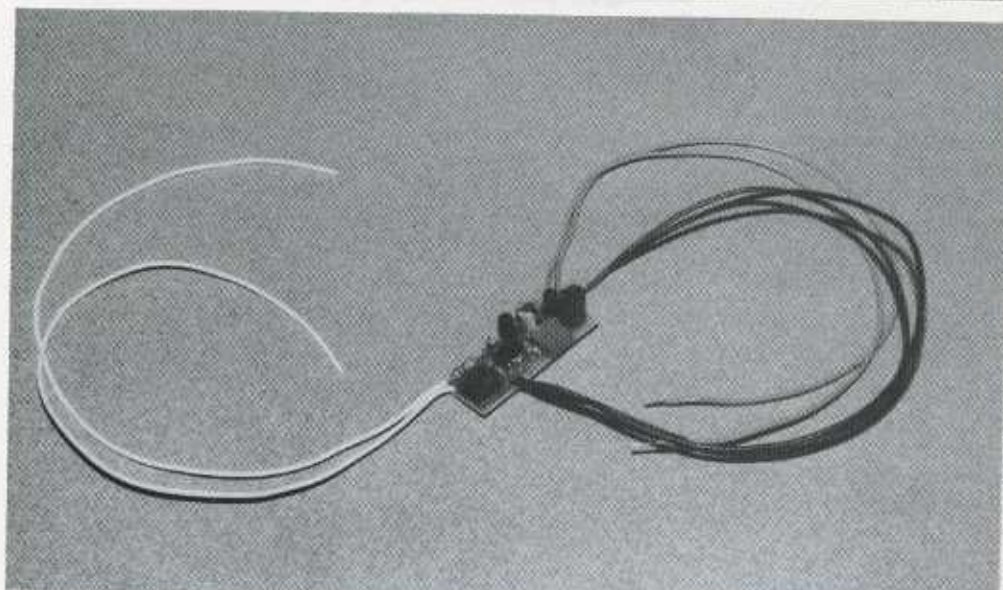
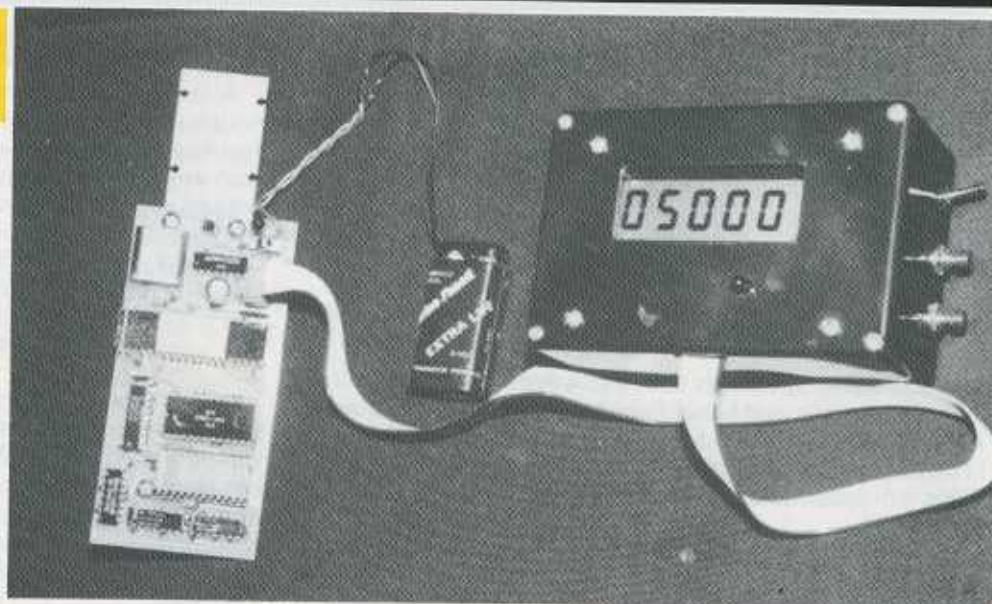
Catalog # PIC 010
Price: \$3.79

North Coast Rocketry /Transolve Payloads

ALTM-1 ALTITUDE DATA LOGGER

The **ALTM-1** is an altitude data logger that records your model's altitude every half second and then displays it on the **DSPL-1** digital readout when the model is returned. The **ALTM-1** uses a vacuum reference strain gage sensor which is accurate to ± 50 feet! And, the whole thing fits inside an 12" length of BT-23! Quarter second recording intervals also available on a custom basis; please call for a quote.

Weight: 6 oz (+ 9v bat)
Catalog # ALTM-1/DSPL-1
Price: \$200.00



VEET-1 TIMER

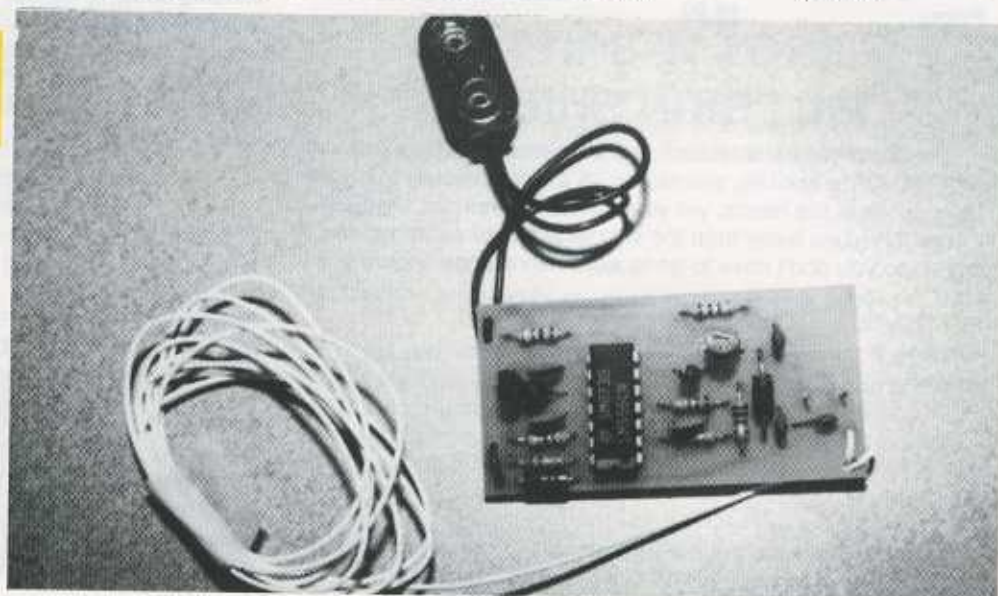
The **VEET-1** is a Variable Electronic Ejection Timer that will allow delayed deployment of your recovery system. Program it for an ejection delay, and use your motor ejection charge to kick out a small chute or parastream. Then, at just the right time, the **VEET-1** will eject a larger chute, for a safe landing and minimal drift. It features programmable delays from .5 sec to 40 seconds, and is small enough to fit in most high power rockets.

Weight: 1 oz (+ 9v bat)
Catalog # VEET-1
Price: \$30.00

XMTR-1 TRANSMITTER

With the **XMTR-1** transmitter beacon, here's a way to never lose an expensive kit again! A mere 1 oz. (without a nine volt battery) and just 1.2" x 2.4" x 0.5" in size. Comes assembled, with you supplying the crystal to match your 27 MHz walkie talkie. Over 1000' range on the ground, and much more in the air with a 100 mw transmitter. Directional antenna plans included.

Weight: 1 oz (+ 9v bat)
Catalog # XMTR-1
Price: \$45.00



BEEP-1 AUDIO LOCATOR

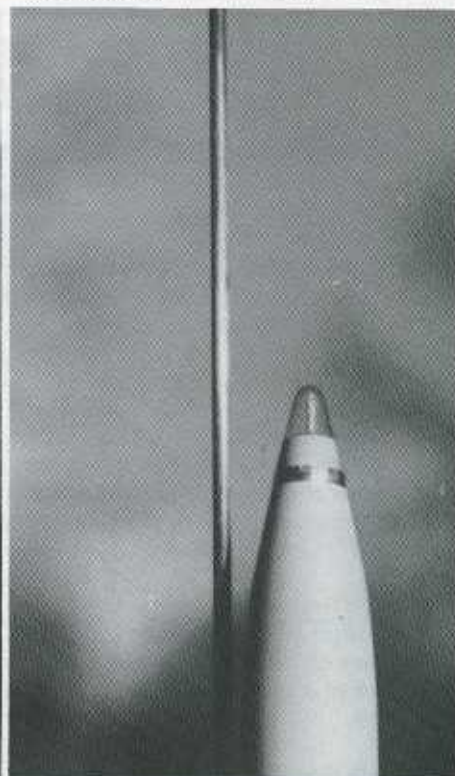
The **BEEP-1** is an audio locator for finding your models when they land on the ground. In other words, a high pitched buzzer! A must for payloads like the **ALTM-1**, where you can't afford to lose a model. We're not talking about a wimpy buzzer here, either, as it puts out 95 db! It fits inside a **BT-18**, and comes completely preassembled. It can use two or three 9 volt transistor batteries for power, depending on how long you want to look and listen for your model.

Weight: 2 oz (+9v bat)
Catalog # BEEP-1

XENON FLASHING STROBE

Looking for something really flashy? Well, we couldn't resist the pun! Anyways, the **Xenon Flashing Strobe** is a real Xenon strobe that can be used for Mach 1 attempts, velocity analysis, or just plain fun at dusk or dawn. This is a tiny sucker... it can fit in a **BT-11** tube if you replace the twin AA battery holder. That makes it perfect for those minimum diameter supersonic rocket attempts. Otherwise, it's an easy fit into a **BT-18** or larger tube. You can vary the flash rate by using 2, 3, or 4 AA cells. It's rugged enough to take hard landings, too.

Weight: 1 oz (+ battery)
Catalog # XEN-1
Price: \$25.00



Suggested Launch Vehicles for the **ALTM-1**:

Quantum 1 and Quantum 3
Eliminator
Lance Beta
Star Spangled G Bird
Saber SR
Sonic Seduction
Super Sonic Seduction
Big Brute
Phantom 4000 and 4000 HD
Starion

Suggested Launch Vehicles for the **XMTR-1**:

Xenon
Hypersonic 1800
Hypersonic 2300
Quantum 1 and Quantum 3
Eliminator
Lance Beta
Sonic Seduction
Super Sonic Seduction
Big Brute
Phantom 4000 and 4000 HD

Suggested Launch Vehicles for the **BEEP-1**:

Xenon
Hypersonic 1800
Hypersonic 2300
Quantum 1 and Quantum 3
Eliminator
Lance Beta
Sonic Seduction
Super Sonic Seduction
Big Brute
Phantom 4000 and 4000 HD

North Coast Rocketry Publications

NCR TECH REPORTS

New to high power, or looking for more information on a particular subject? North Coast offers these technical reports to help you out. Each report is \$2.00.

Reports 1-5 and 6-10 are also available in bound sets for the special price of \$7.50 each

TR-1 through TR-5 Set

Catalog # TR-1/TR-5
Price: \$7.50

TR-6 through TR-10 Set

Catalog # TR-6/TR-10
Price: \$7.50

NCR Tech Report #1

Clustering Black Powder Motors

How to safely and reliably ignite clusters of black powder (i.e., Estes, MRC and FSI) motors using the latest techniques.

Catalog # TR-1

NCR Tech Report #2

Clustering Composite Motors

How to safely and reliably ignite clusters of composite (i.e., Aerotech) motors. Explores igniter installation techniques and flashbulb igniters in depth.

Catalog # TR-2

NCR Tech Report #3

Model Rocket Adhesive Techniques

An overview of available adhesives, how they work, and what are the best applications of each type.

Catalog # TR-3

NCR Tech Report #4

Model Rocket Paint and Finishing Techniques

An overview of paints and fillers available for rocket use. Includes comments on how to use each type.

Catalog # TR-4

NCR Tech Report #5

Staging High Power Rockets

Techniques on how to stage high power cluster rockets. An in depth look at a subject few have published articles about.

Catalog # TR-5

NCR Tech Report #6

Radio Transmitters and Rocketry

An overview of transmitters developed for rocket use in the past 25 years, including the state of the art XMTR-1.

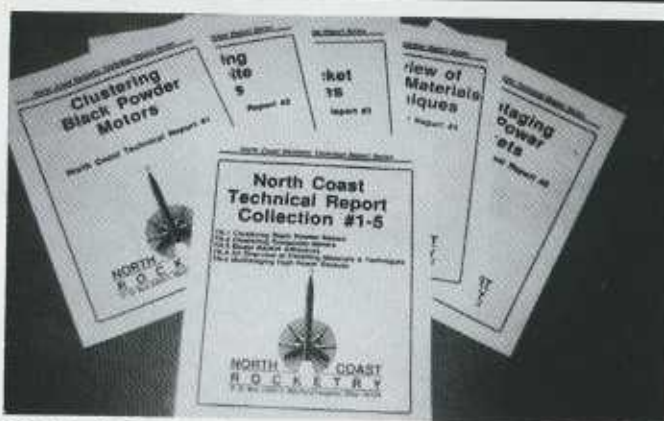
Catalog # TR-1

NCR Tech Report #7

Electronic Staging of Model Rockets

How to build and use electronic staging systems such as the VEET-1.

Catalog # TR-7



NCR Tech Report #8

Model Rocket Launch Control Systems

An overview of launch control systems. An in depth look at how to determine the right system for you. Includes relay systems, flashbulb safe launch controllers, and audible continuity systems.

Catalog # TR-8

NCR Tech Report #9

The Care and Feeding of Rocket Launchers

How to maintain and improve your current launcher. Includes painting, cleaning, helpful tools, and transport.

Catalog # TR-9

NCR Tech Report #10

Composites in Model Rockets

An in depth essay on composite materials such as fiberglass, aramid fibers, and carbon fibers, and how to use each one in model rockets. Based on NARAM-25's winning R&D report, now updated to include the latest techniques.

Catalog # TR-10

ROCKETRY BOOKS

Second Stage, Advanced Model Rocketry

Authored by Mike Banks, this is a great addition to your collection if you're a "born again" rocketeer returning to the hobby after a few years away.

Catalog # BK-1
Price: \$8.50

Countdown, The Complete Guide to Model Rocketry

By Mike Banks. A good book to get started in rocketry with. Lots of illustrations and helpful techniques.

Catalog # BK-2
Price: \$16.95

The Rocket Book

A basic rocketry book by Bob Cannon and Mike Banks. Great if you want a refresher of the basics. Lots of photos.

Catalog # BK-3
Price: \$12.95

AIRFRAME TUBES

North Coast Rocketry High Performance, High Strength Airframe Tubes are the industry standard. We built our business around these tubes, and we think you'll like them. Our tubes have thick walls so that they can take the power of E, F, G, and H motors without reinforcement. If you want strength, you've got it! If you want a lighter weight tube, the inner layer can be peeled out easily. All tubes are brown in color, and glassine coated. They sand, prime and paint very easily.

The BT-15 and BT-21 are extra thick for super strength as 1.5" and 2.125" motor mount tubes or minimum diameter airframes.

All airframe tubes are 34" in length.

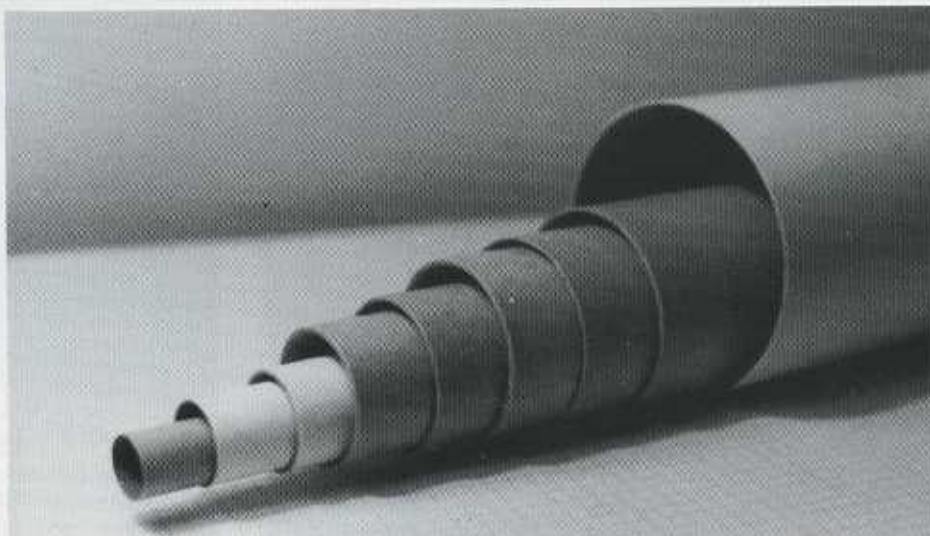
Catalog #	ID	OD	Thickness
BT-7	0.72"	0.76"	.020"
BT-9	0.95"	1.00"	.025"
BT-11	1.14"	1.21"	.035"
BT-15	1.53"	1.65"	.060"
BT-18	1.80"	1.88"	.040"
BT-21	2.14"	2.26"	.060"
BT-23	2.36"	2.44"	.040"
BT-26	2.62"	2.70"	.040"
BT-39	3.89"	3.97"	.040"

Catalog #	Price
BT-7	\$2.00
BT-9	\$3.00
BT-11	\$3.50
BT-15	\$4.50
BT-18	\$4.50
BT-21	\$4.75
BT-23	\$4.75
BT-26	\$4.75
BT-39	\$5.75

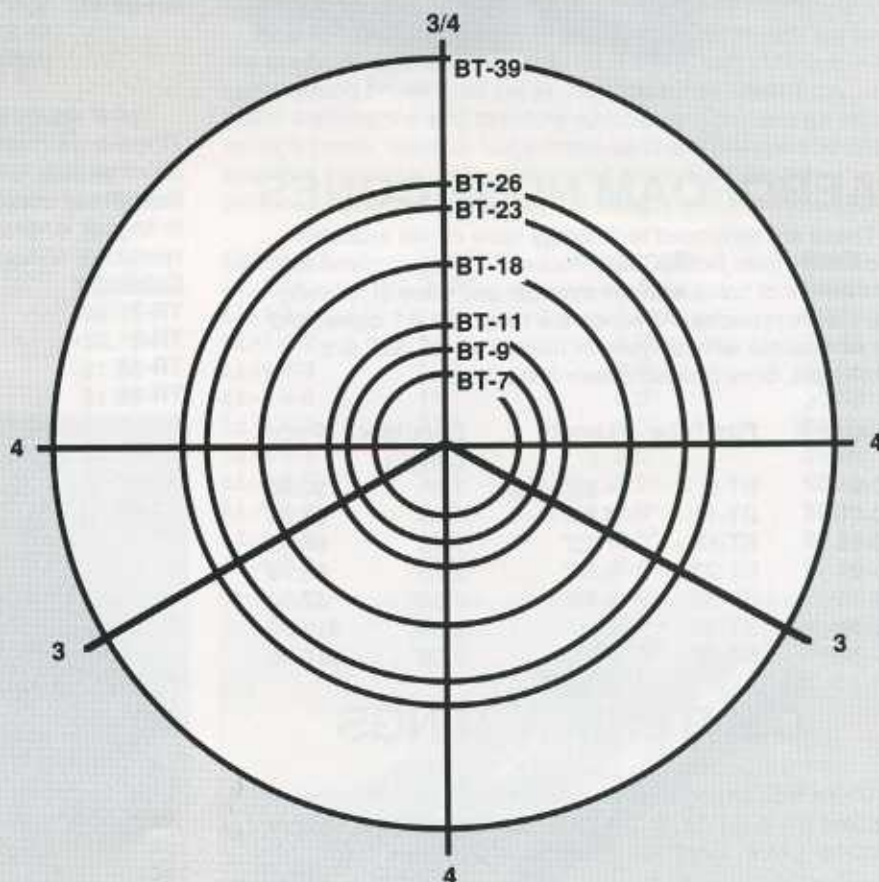
MOTOR TUBES

Identical in construction to our airframe tubing, these motor tubes have thickwall construction that resists burn-through and adds strength.

Catalog #	Tube	Length	Price
MT-7	BT-7	3"	\$0.75
MT-9/6	BT-9	6"	\$1.00
MT-11/6	BT-11	6"	\$1.25
MT-11/6	BT-11	12"	\$1.50
MT-15	BT-15	17"	\$2.75
MT-21	BT-21	17"	\$3.00

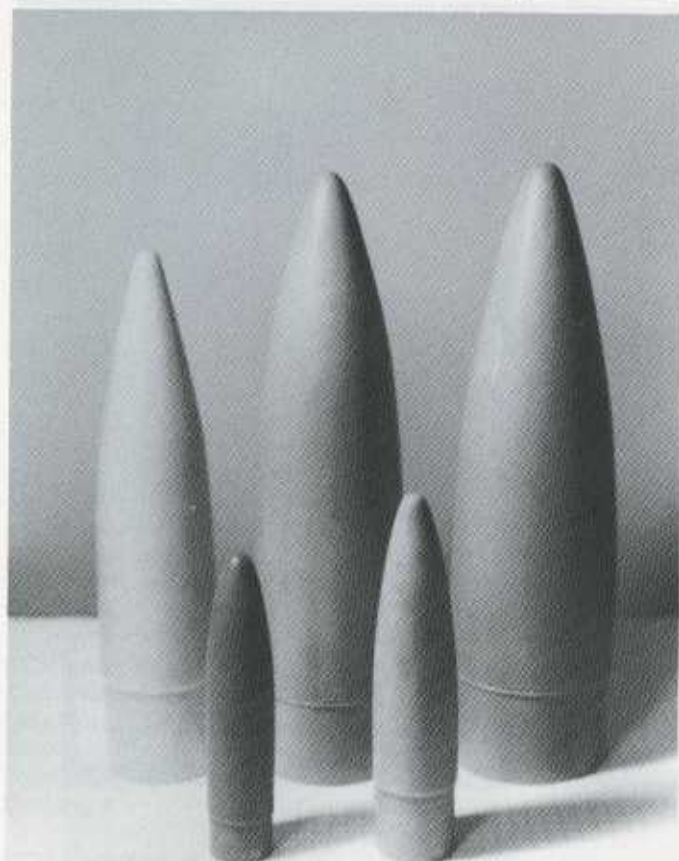


North Coast Rocketry High Strength Airframe Tubing



Body Tubes Shown in Actual Size Diameters

North Coast Rocketry Components



AEROFOAM NOSE CONES

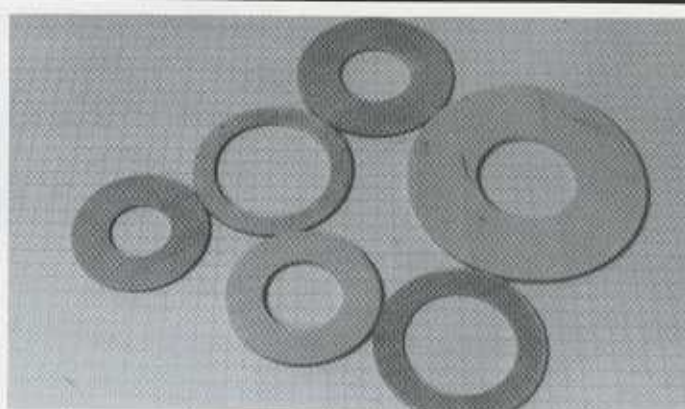
These are advanced technology nose cones available exclusively from North Coast Rocketry. They combine the light weight of balsa with the strength and ease of finishing that plastic provides. All cones are roughly a 4:1 ogive, and are compatible with all types of paint. The NC-39P is a lightweight, blow molded plastic nose cone.

Catalog #	Fits Tube	Length	Shoulder Length	Price
NC-9	BT-9	4.25"	1.0"	\$2.50
NC-11	BT-11	4.50"	1.25"	\$3.00
NC-18	BT-18	7.25"	1.75"	\$4.75
NC-23	BT-23	8.50"	2.25"	\$5.75
NC-26	BT-26	8.50"	2.25"	\$7.50
NC-39	BT-39	16.0"	2.00"	\$16.00
NC-39P	BT-39	16.0"	2.00"	\$16.00

CENTERING RINGS

These high strength rings are made from aircraft plywood to adapt BT-9, BT-11, BT-15 or BT-21 motor tubes to larger diameter tubes. Great for scratch built designs.

Catalog #	Fits Tube	Motor Tube	Price
CR-18-9	BT-18	BT-9	\$0.75



Catalog #	Fits Tube	Motor Tube	Price
CR-18-11	BT-18	BT-11	\$0.75
CR-23-9	BT-23	BT-9	\$1.00
CR-23-11	BT-23	BT-11	\$1.00
CR-23-15	BT-23	BT-15	\$1.00
CR-26-9	BT-26	BT-9	\$1.00
CR-26-11	BT-26	BT-11	\$1.00
CR-26-15	BT-26	BT-15	\$1.00
CR-26-21	BT-26	BT-21	\$1.00
CR-39-9	BT-39	BT-9	\$1.25
CR-39-11	BT-39	BT-11	\$1.25
CR-39-15	BT-39	BT-15	\$1.25
CR-39-21	BT-39	BT-21	\$1.25

THRUST RINGS

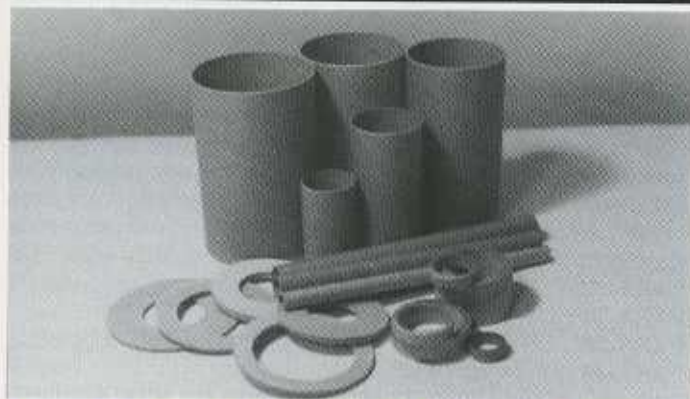
Spiral wound kraft paper rings to hold motors in place. These are a must for high power rockets, as you just can't count on tape to hold the motor in place. If you want the flexibility of using different length motors, epoxy them in as far in as your longest motor, and then use a tube coupler as a spacer for shorter motors.

Catalog #	Fits	Price
TR-7	BT-7	5 for \$1.75
TR-9	BT-9	5 for \$2.00
TR-15	BT-15	1 for \$1.00
TR-21	BT-21	1 for \$1.25



Don't forget!
You can get those parts you need QUICK!
Call (205) 883-6020

North Coast Rocketry Components



MOTOR ADAPTERS

For mounting 24mm motors in a BT-11 tube, this kit eliminates the use of masking tape wrapping and increases reliability. The motor adapter kit consists of two centering rings, a BT-9 motor tube, thrust ring, and instructions.

Catalog #	Length	Price
MA-1	6"	\$2.50

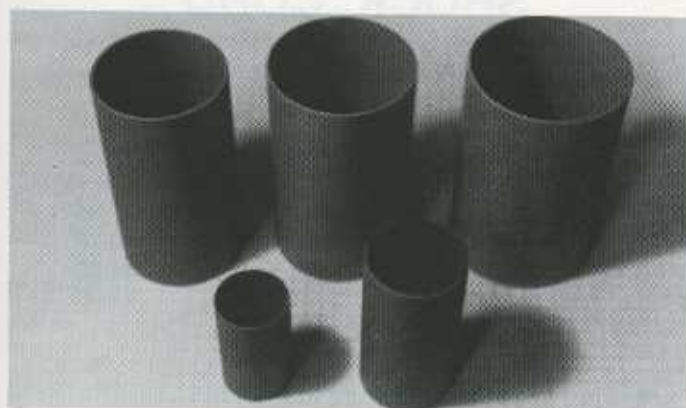
These motor adapters for use in our BT-15 and BT-21 tubes. The motor adapter kit comes with a 12" motor tube, adapter rings, thrust ring, and instructions.

Catalog #	Adapts:	Price
MA-3	1.125" motors to BT-15	\$3.50
MA-4	1.50" motors to BT-21	\$4.00

TUBING COUPLERS

Spiral wound paper couplers that fit inside our airframe tubing. For use as motor spacers or joining airframe sections.

Catalog #	To Fit Tube	Length	Price
TC-7/1	BT-7	1.0"	\$0.50
TC-7/2	BT-7	2.0"	\$0.50
TC-9	BT-9	1.5"	\$0.75
TC-11	BT-11	2.0"	\$0.75
TC-15	BT-15	3.0"	\$1.00
TC-18	BT-18	3.0"	\$1.00
TC-21	BT-21	4.0"	\$1.25
TC-23	BT-23	4.0"	\$1.25
TC-26	BT-26	4.0"	\$1.75
TC-39	BT-39	6.0"	\$2.50



BULKHEADS

Hollow tubing bulkheads are perfect for nose blocks and payload sections. These kits consist of a tubing coupler, pre-fit plywood backing plate, and a screw eye. These are stronger, lighter, and more durable than solid bulkheads.

Catalog #	To Fit Tube	Length	Price
BH-9	BT-9	1.5"	\$2.00
BH-11	BT-11	2.0"	\$2.25
BH-18	BT-18	3.0"	\$2.50
BH-23	BT-23	4.0"	\$2.75
BH-26	BT-26	4.0"	\$3.00
BH-39	BT-39	6.0"	\$3.50

ADAPTER RINGS

Spiral wound kraft paper adapter rings for mounting motor tubes into airframe tubes or larger motor tubes.

Catalog #	Adapts	Length	Price
CR-9	BT-9 to BT-11	1.75"	\$0.50
CR-11	BT-11 to BT-15	2.0"	\$0.75
CR-15	BT-15 to BT-18	3.0"	\$0.75
CR-21A	BT-15 to BT-21	3.0"	\$1.00
CR-21B	BT-21 to BT-23	4.0"	\$1.00

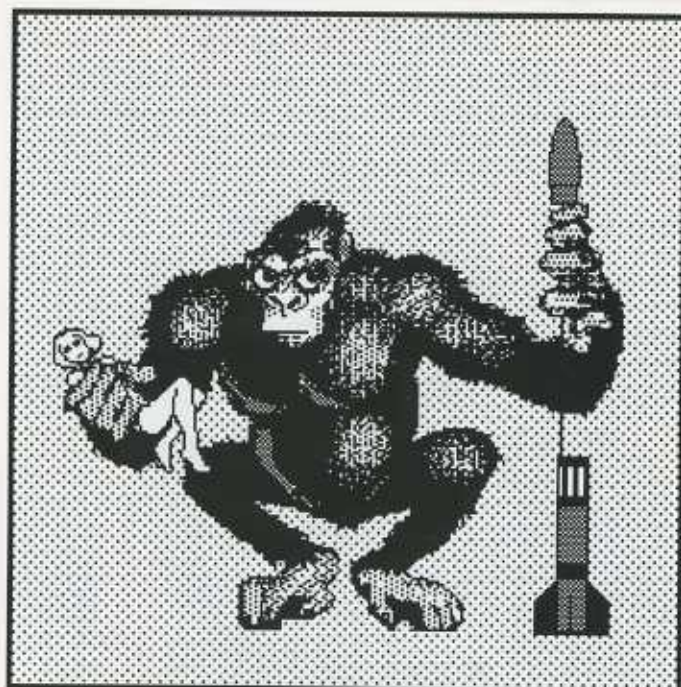
LAUNCH LUGS

New for 1989! The LL-3/16 is a white 3/16" launch lug just like everyone else sells. The LL-1/4, LL-3/8, and LL-1/2 are spiral wound brown kraft paper, now **glassine coated** for better appearance and moisture resistance. They are perfect for high power rockets! Lugs come up to 6" in length and are available to fit all popular launch rod sizes. You can buy smaller lengths pre-cut, or buy a 6" length and cut it yourself.

Catalog #	Fits Rod	Length	Price
LL-3/16	3/16"	1.5"	\$0.25
LL-1/4-1	1/4"	1.0"	\$0.25
LL-1/4-2	1/4"	2.0"	\$0.25
LL-1/4-3	1/4"	3.0"	\$0.25
LL-1/4-6	1/4"	6.0"	\$0.50
LL-3/8-2	3/8"	2.0"	\$0.25
LL-3/8-3	3/8"	3.0"	\$0.25
LL-3/8-6	3/8"	6.0"	\$0.50
LL-1/2-2	1/2"	2.0"	\$0.25
LL-1/2-3	1/2"	3.0"	\$0.25
LL-1/2-6	1/2"	6.0"	\$0.50



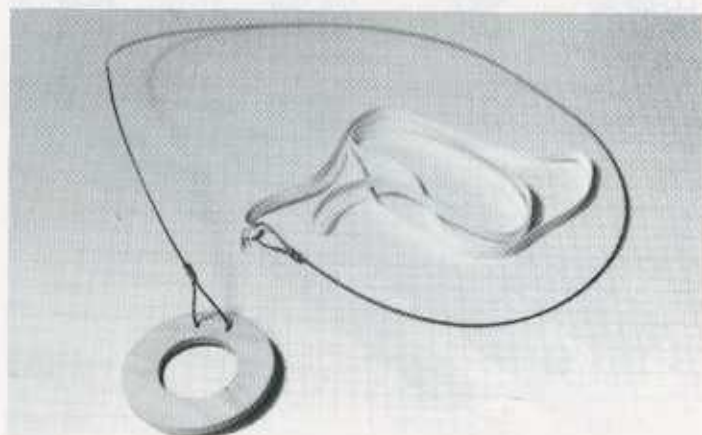
North Coast Rocketry Recovery Supplies



GORILLA™ SHOCK CORD MOUNTS

This is an industry exclusive, extensively tested by NCR to provide the most reliable and safest shock mount system for high power rockets available today. The **Gorilla™ Shock Cord Mount System** (patent pending) will probably outlast the rest of your rocket! The kit consists of 30" of nylon covered steel cable, two cable connectors, and complete instructions. All you do is drill two holes in your centering ring, slide one end of the cable through, and crimp the connector. Then, make a loop for the shock cord on the other end. The unique design leave the walls of the body tube clean, so parachutes and wadding can't catch! The **GSCM-1** is fine for small models up to BT-23; use the **GSCM-2** for larger models. Order shock cord and centering ring separately.

Catalog #	Cable Diameter	Breaking Strength	Price
GSCM-1	.037"	120 lbs	\$2.50
GSCM-2	.063"	270 lbs	\$2.75



PARACHUTES

These are the same high quality parachutes that go in all our kits. Simply the best in the business! Our parachutes are orange ripstop nylon that resists burning and does not "set" when stored folded up. Shroud lines are 60 lb test twisted nylon cord. The edges are serged to prevent fraying.

Catalog #	Diameter	Price
PARA-18	18"	\$7.00
PARA-24	24"	\$9.00
PARA-36	36"	\$12.00
PARA-48	48"	\$17.00

STREAMERS

Bright orange ripstop nylon streamers are just the ticket for those high altitude flights that would drift too far on a parachute. These feature attachment loops at both ends.

Catalog #	Width	Length	Price
STR-1	4"	40"	\$7.00
STR-2	6"	60"	\$9.50

PARASTREAMS

A **Parastream** is a long streamer with a small parachute attached at the top. The idea is to get a fast decent rate, but not as fast as just a streamer. They are highly visible at long distances, and particularly suited for heavier high flying models, such as the **Phantom 2600**. They use 3/4 oz ripstop nylon construction and come with an 18" parachute.

Catalog #	Width	Length	Price
PS-4X40	4"	40"	\$9.00
PS-6X60	6"	60"	\$12.00

SCREW EYES

Screw eyes for attaching recovery systems to either nose cones or bulkheads. Chrome plated, these are great for high power rockets.

Catalog #	Length	Eye Size	Price
SE-1	1 3/16"	3/8"	\$0.25
SE-2	1 7/8"	1/2"	\$0.050
SE-3	2 1/4"	3/4"	\$0.75

SHOCK CORD

Heat resistant, high strength elastic cord that is the best shock cord available. Don't mess around with anything else! Specify length that you want in yards.

Catalog #	Width	Maximum Model Mass	Price Per Yard
SC-1	.25"	12 oz	\$0.75
SC-2	.50"	24 oz	\$0.75
SC-3	.75"	48 oz	\$1.00
SC-4	1.0"	60 oz	\$1.25

TRIM MONOKOTE

For all of those out there who have asked us how we get such super finishes on our display models, **Trim Monokote** is the answer! Why fuss with masking tape, paint, primer and a lot of hassle, when making perfect models can be as easy as applying a sheet of **Trim Monokote**? The stuff looks great, is easy to work with, and can even be painted over! Each sheet is 5" wide x 36" long, which will cover a number of models. Please specify color.

<u>Catalog #</u>	<u>Price</u>
TMK-1	\$2.00

Available in the following solid colors:
Black, Red, White, Blue, Orange, Yellow, Chrome, and Gold

<u>Catalog #</u>	<u>Price</u>
TMK-2	\$2.25

Available in the following checkerboard patterns:
Red on White, Black on White, Red on Clear, Black on Clear

<u>Catalog #</u>	<u>Price</u>
TMK-3	\$2.50

Available in the following solid colors:
Day-Glo Red, Day-Glo Orange

PRISMA TRIM

This is a pressure sensitive, textured metalized film that reflects every color of the rainbow. Easily cut with scissors or a knife. Makes for spectacular effects, and really dresses up a model. Each sheet is 12" wide by 24" long.

<u>Catalog #</u>	<u>Price</u>
PRISM-1	\$5.00

Available in the following colors:
Red, Silver, Gold, and Blue

GLITTER TRIM

This is an ultra brilliant pressure sensitive, metal flake film. The film adds spectacular effects to your models that you just can't do any other way. And, it's easy to use! Easily cut with scissors or a knife. Each sheet is 12" wide by 24" long.

<u>Catalog #</u>	<u>Price</u>
GLITTER-1	\$5.00

Available in the following colors:
Red, Silver, Gold, and Blue

ADHESIVE MYLAR

This is a pressure sensitive, one mil thick metalized mylar film that contest modelers have grown to know and love. It's super for decoration, too! Each sheet is 9" wide by 12" long. Available in either silver or gold. Please specify color.

<u>Catalog #</u>	<u>Price</u>
AM-1	\$1.50

NCR T-SHIRTS

You don't want to be without this attractive light blue T-shirt with the North Coast logo in white! A small logo is on the front, while a larger logo is on the back. Let everyone know you're a high power flyer! The light blue color is cool on the field, too! Available in small, medium, large, and extra large. Please specify size when ordering.

<u>Catalog #</u>	<u>Price</u>
TS-1 (S, M, L, or XL)	\$8.50

NCR HATS

You've asked for them, so here they are! Attractive, one size fits all baseball hats with the North Coast Logo prominently displayed. The hats are blue with mesh tops for comfort in the hot sun.

<u>Catalog #</u>	<u>Price</u>
HAT-1	\$6.50



North Coast Rocketry Competition Components

COMPETITION BODY TUBES

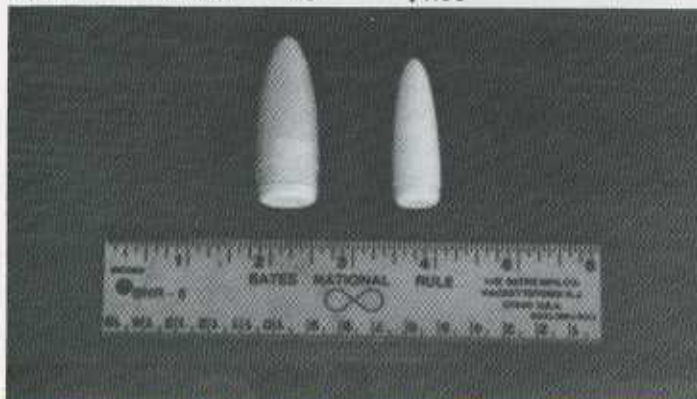
Competition modelers have different requirements than high power flyers, so we've designed some tubes especially for competition. These are light weight, easy to sand, and easy to finish. And, they beat the competition in price, too!

Catalog #	ID	OD	Length	Price
CBT-5/9	.515"	.535"	9"	\$1.00
CBT-5/18	.515"	.535"	18"	\$1.50
CBT-7/12	.710"	.730"	12"	\$1.25
CBT-7/18	.710"	.730"	18"	\$1.75

COMPETITION NOSE CONES

Competition nose cones have been in short supply since the demise of CMR. Now, NCR is proud to introduce their own line of polystyrene plastic nose cones. These are lighter in weight than any other BT-5 or BT-7 nose cone, and they don't require any finishing. The NCR **Competition Nose Cones** are CAD generated 2:1 ellipses, the theoretical optimum shape. The cones come with a nose, a base, shock line, and complete instructions.

Catalog #	Fits	Length	Price
CNC-5	CBT-5	1.0"	\$1.25
CNC-7	CBT-7	1.5"	\$1.50



MICAFILM STREAMERS

Micafilm is a tough light material that is very difficult to rip. Because of that, it makes good streamer material. When reliability counts, this is what you need. Available in common sizes. Red in color for maximum visibility in the air and on the ground. Includes anchor cord, adhesive strip and instructions.

Catalog #	Width	Length	Price
MSTR-1	4"	40"	\$4.00
MSTR-2	6"	60"	\$5.00
MSTR-3	8"	80"	\$6.00

COMPETITION EGG CAPSULES

The best competition egg capsules ever made were by CMR. Until now, that is. NCR has revived the famous CMR nose cone in both its single and dual incarnations. These are light weight, low drag capsules that make you really have to try to break an egg. The cones come with a two piece capsule, base, shock line, and complete instructions.

Catalog #	Fits	Length	# of Eggs	Price
EGG-7	CBT-7	6"	1	\$5.00
EGG-9	BT-9	6"	1	\$5.25
EGG-11	BT-11	6"	1	\$5.25
DEGG-7	BT-7	7"	2	\$6.50
DEGG-9	BT-9	7"	2	\$6.50
DEGG-11	BT-11	7"	2	\$6.50
DEGG-18	BT-18	7"	2	\$6.50



TRACKING POWDER

Bright red tempra paint in an easy to use squeeze bottle. Is great in the sky, and cleans up easy if you get it on you while handling it on the ground. Great for demos, too! Four ounce bottle.

Catalog #	Price
TRACK-1	\$3.00

PLYWOOD FIN STOCK

Want the same tough plywood that NCR uses in its kits for your own custom designs? We have it, in two sizes that should meet your requirements. Plywood sands and finishes easily, and is durable in flight and on the ground.

Catalog #	Width	Length	Price
PLY-6/12	6"	12"	\$1.50
PLY-12/12	12"	12"	\$3.00

END BURNER IGNITERS

Replacements for Aerotech and Vulcan end burner igniters. The igniters are 3" long and come with complete instructions. Six per package.

Catalog #	Price
RW-1	\$2.50

CORE BURNER IGNITERS

Replacement igniters for all Aerotech and Vulcan core burning motors. Leads are 7" long, and igniters are continuity safe. Can also be used in other composite motors. Comes complete with instructions. Six per package.

Catalog #	Price
EB-1	\$2.50

DEEP COREBURNER IGNITER

Similar to the EB-1 igniter, except that they have 9" leads to insure top of the core ignition for those deep-cored G, H, and I class motors. Six per package.

Catalog #	Price
EB-2	\$2.75

FLASHBULB IGNITERS

The traditional flashbulb igniter has been taken one step further! These are pre-made for your convenience. Why bother wiring your own, when you can buy these? They feature 12" leads and a 1" length of fast thermalite.

Catalog #	Price
FB-1	\$1.00

ELECTRIC MATCHES

Offered exclusively by North Coast, these electric matches have a greater amount of pyrogen to insure ignition. These igniters feature small diameter heads to fit most motors (including D12's), and 60" leads. For spectacular, reliable ignition, these are great. Check them out with your launch system before installing into your rocket motor; some electrical systems will set them off during the continuity check.

Catalog #	Price
EM-1	\$1.50

THERMALITE WICK

For special ignition challenges, we offer fast or slow thermalite wick in 39" lengths. The fast type typically burns at 5 inches per second; the slow at 1.25. For use with electrical ignition systems only!

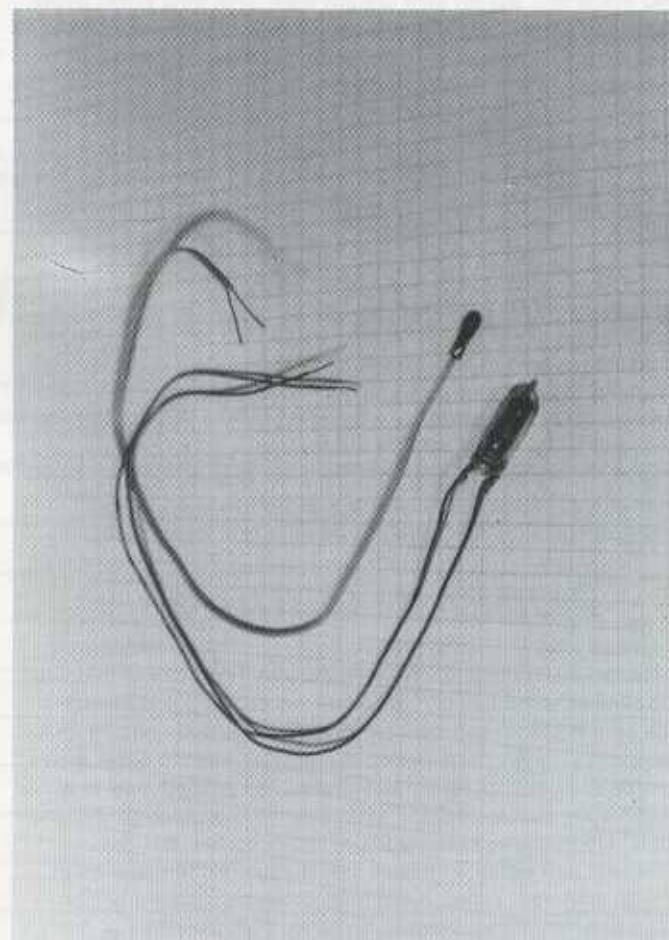
Catalog #	Rate	Price
TMW-1	(Fast)	\$3.00
TMW-2	(Slow)	\$3.00

SURE-SHOT REPLACEMENTS

Replacement wick in 1" lengths for use with flashbulbs or standard igniters. Great for clustering. Instructions included. Ten per package.

Catalog #	Price
RW-2	\$1.00

Below: A typical Electric Match (left) and Flashbulb Igniter (less thermalite wick).



Catalog Corrections

The price of the Viking II (K-52) is \$25.00.

G55 motors are \$15.95, not \$11.95.

The price of the XEN-1 Xenon Strobe is now \$29.95.

How To Order

BY TELEPHONE...

You may place your order with North Coast Rocketry by using our convenient phone hot line, 1-205-883-6020. This number is can be used 24 hours a day. To talk to Robyn and Matt in person, try to call from 7-10 PM Central Time during the week, or all day Saturday or Sunday. We can ship phone orders using Visa, Master Card, or COD. To make it easy when you order, be sure to have the catalog numbers and quantities ready when you call.

BY MAIL..

Please use our order form when making an order by mail. The minimum order amount is \$10.00. New order forms will be sent with each purchase. Be sure to add the appropriate handling and shipping fees.

Please include your full name and shipping address, including zip code and phone numbers. Our preferred method of shipment is via United Parcel Service, but orders with a post office box will be sent via the mail. This may entail extra expense to you. Check or money order for payment in full must be included with your order. **Please make checks payable to North Coast Rocketry.**

Send all orders to:
North Coast Rocketry
P.O. Box 240017
Mayfield Heights, OH 44124

SHIPPING/HANDLING FEES..

Shipping and handling fees are a necessary evil. We wish we didn't have to charge them, but boxes, packing, etc., do cost money. So, we've tried to simplify things as much as possible. For motors, igniters, tech reports and/or books, the shipping/handling fee is \$3; for all other orders, add \$5. This is, of course, good only if you live in the lower 48 United States or have an APO/FPO number. If you don't, well...

FOREIGN ORDERS....

United Parcel Service has recently expanded their service to Canada and most of Western Europe. Because of this, we can now ship most of our products without any problems. Motors are still a problem due to their hazardous nature, but we're working the bugs out on that. If you want to order from outside the continental United States, the easiest way to order is with Visa or Mastercard. That way, we can charge you the actual shipping fees plus a \$3.00 handling fee. It is the cheapest and easiest for both you and us. Otherwise, send \$10.00 with your order. Additional shipping charges will be billed after shipment. Please be patient when ordering; there's a lot of paperwork to go through, particularly if its the first time we're shipping to your country. If you would like more information on how to get motors, please drop us a line.

Prices subject to change without notice.

SHIPPING...

North Coast Rocketry will normally ship all orders within a short as possible period after receipt. On occasion, if a product is temporarily out of stock, we will notify you within 30 days. Your order will be filled as soon as possible, but in no event, later than 90 days after receipt of your order. If your order cannot be filled within 90 days, your money will be cheerfully refunded. We don't have to do this very often, though.

CLASS 1.3C MOTORS...

Class 1.3C motors require special handling and shipping procedures. Our minimum order is \$50.00 before shipping and handling is added in. You will be billed actual freight charges, which usually has a minimum charge of \$25.00. If you are a Tripoli member, you must be confirmed in order to purchase I, J, and larger size motors.

RESPONSIBILITY...

North Coast Rocketry and its suppliers certify that they have exercised reasonable care in the design and manufacture of their products. As NCR can not control the storage or use of its products, we can not assume any responsibility for product storage, transport, or use. The buyer assumes all risks and liabilities therefore, and accepts and uses the products based on these conditions. No warranty, either expressed or implied, is made regarding these products, except for the replacement of those products which are determined by us to be defective in manufacture.

By ordering from North Coast Rocketry, the buyer understands and acknowledges the above paragraph, and agrees to hold harmless North Coast Rocketry from any claim arising from use or association of their products.

(This is all legal gobbledeygook, but we have to put it in. In other words, it means "If you buy from us, you assume all risks and liabilities". That's reasonable, isn't it?)

PROBLEMS...

All inquiries will be personally answered promptly. If you have a problem with a North Coast Rocketry product, let us know.

Before we ship a product to you, we carefully inspect it to insure that it is in perfect condition. If it arrives in less than perfect condition, call us at (205) 883-6020. We are more than upset when anything comes between our service and your satisfaction. If UPS damages the box or parts inside, you'll have to call the them, too. They have the responsibility to fix your problem. But call us, so we can expedite shipment of your replacement items.

If you have to return an item to the plant, please send it to: North Coast Rocketry, 5500 Kenbridge Dr., Highland Heights, OH 44143. If you have a copy of the receipt, please send it along. It'll help us with our records, but it's not necessary to get your replacement order processed.

Thank you for ordering!

North Coast Rocketry Order Form

**No One
Offers
The Advanced
Rocketeer
More!**



**No One
Offers
The Advanced
Rocketeer
More!**

Ship to:

Name _____ Date _____

Address _____ Age _____

City _____ State _____ Zip _____

Day Phone* _____ Evening Phone* _____

Signature* _____ Tripoli #** _____ NAR # _____

*All credit card orders MUST include phone number and signature.

**All orders for Class 1.3C motors MUST include a signature, phone number, and a Tripoli number.

Payment Method: ☐ Cash ☐ Check ☐ Money Order ☐ COD ☐ MasterCard ☐ Visa

Card Number

Expiration Date

Month Year

All orders must be accompanied by payment in US funds.

Quantity	Catalog #	Description	Unit Price	Total Price

Shipping/Handling Fees and Information:

For orders with only motors, igniters, tech reports and/or books, add **\$3.00**.
 For all other orders in the continental United States and Ontario, add **\$5.00**.
 For orders outside the continental US, add \$10.00. Orders will be shipped by **UPS Ground**. Please allow 10 days when ordering. **UPS Next Day Air** and **UPS Second Day Air** services are available on COD or charge card orders. The actual shipping fee plus \$2.50 handling fee will be added. Please remember that motors can not be shipped by air. **Thank you for your order!**

Subtotal

Credits or
Balance Due

Shipping Fee

Total Enclosed

North Coast Rocketry Mailer

Fold Here First

From:

Place
Stamp
Here



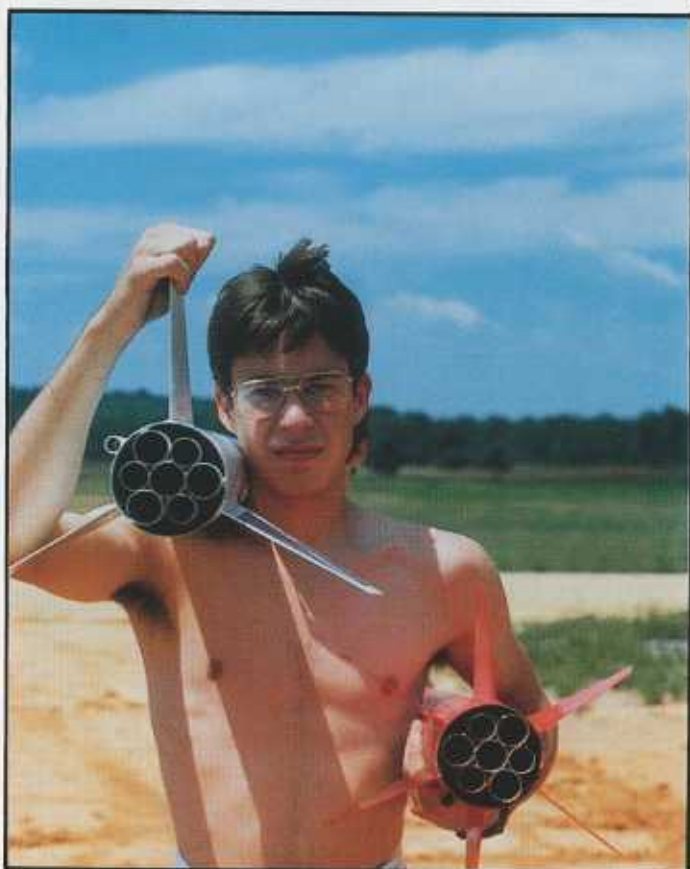
TO:

North Coast Rocketry
P.O. Box 240017
Mayfield Heights, OH 44124

Hasten!

Fold Here Last

Catch The Excitement of North Coast Rocketry!



No One Offers The Advanced Rocketeer More!



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Model rockets, model rocket motors, and ignition materials are inherently dangerous products and their use requires proper knowledge and experience by consumers. Consumers are warned of the dangers of model rockets, model rocket motors, and ignition materials, and are instructed to obtain proper training in their storage and use.

Special Thanks to our models:

Lori Horton, Traci Reeves, Ann Heustche, Jason Haynes, and Jack Gurner

And to our photographers:

Vince Huegele, Jerry Schaefer, Tom Beech, Jack Gurner, and Lee Olyniec

National Association of Rocketry • Tripoli

NATIONAL ASSOCIATION OF ROCKETRY

The National Association of Rocketry (NAR) is the official non-profit national organization for model rockets. Model rockets are, by definition, rockets weighing less than 1500 grams, and having less than 125 grams of propellant on board at lift off. The NAR establishes safety rules, certifies records, publishes technical literature, sponsors contests, and promotes model rocketry.

The NAR plays a big role in getting legislation changed and in educating the public about rocketry. But the biggest reason to join is to meet the people involved. There's a broad spectrum of people, from astronauts and professional engineers, to shoe salesmen and auto workers. Everyone has an interesting story to tell, a unique design, and a "secret project" that they'll share with you.

North Coast Rocketry is a big supporter of the National Association of Rocketry. As a matter of fact, Matt is a Trustee in the association. NCR also helps sponsor national meets, conventions, and international contests.

Dues are reasonable. For members under 21 years of age, the dues are \$15.00; for those 21 or over, the dues are \$25 per year. Your membership entitles you to a one year subscription to *American Spacemodeling Magazine*, Product Discount Coupons, and a NAR Technical Services catalog. You can also get \$100,000 personal and \$1,000,000 club liability insurance. And, you can have the fun of meeting other NAR members through local, regional and national level events.

To join the NAR, write to: National Association of Rocketry, 2140 Colburn Dr., Shakopee, MN 55379.

TRIPOLI ROCKETRY ASSOCIATION, INC.

The National Organization of Advanced, Non-Professional Rocketry

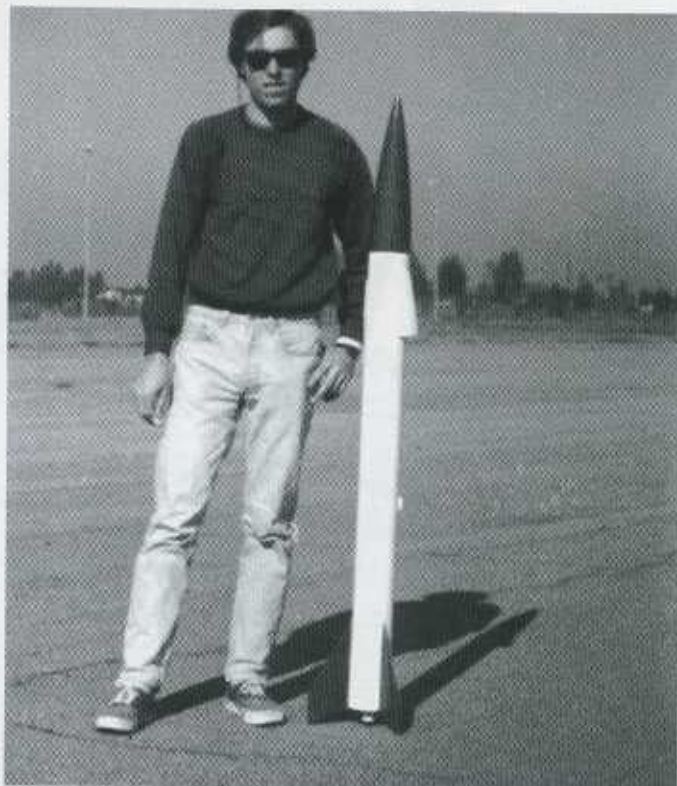
Tripoli is the official rocketry organization for people who are looking for fun in rockets larger than what is endorsed by the NAR. Advanced, non-professional rocketry is based on the same principles that model rocketry is, only scaled up to H, I, J and beyond. As with model rockets, motors are bought from certified manufacturers, and rockets are non-metallic in construction. Tripoli is not a basement bomber "amateur" rocketry association. Instead, they are a group of people who want to fly rockets larger than 1500 grams.

Tripoli membership is \$25.00 per year. That membership will entitle you to a subscription to the *Tripolitan* journal. Once you are a member, you earn the right to build and fly high power models by having another Tripoli member or official "certify" that you have the skills and experience necessary to fly these larger models. Once you have become certified, you may buy the Class 1.3C motors of your choice.

North Coast Rocketry also actively supports Tripoli. Chris Pearson has been awarded a lifetime membership on the basis of his early support and efforts on behalf of the organization.

Tripoli also sponsors local and national level events. These are often quite spectacular, with many high powered birds being flown in a single day. They are often worth attending, even if you just want to watch.

To join, send your money to: Tripoli Rocketry Association, P.O. Box 891373, Houston, TX 77289



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