

THE AVI MINIROCS



On April 2, 1971 at the Massachusetts Institute of Technology (MIT), the world of model rocketry was changed forever. The first Minirocs were revealed to the public, and experienced model rocketeers attending the MIT Model Rocketry Convention could not believe their eyes when they saw how the Minirocs performed. The Minirocs met with instant acceptance from experts, from contest fliers, and from national champions.

Within weeks, major national and international records were shattered by the Minirocs. They went on to win gold medals in international meets, huge trophies at the U.S. NARAM meets, and blue ribbons wherever they showed their tail fins to other models in competition.

The rocket designers struggle to reduce the size, weight and aerodynamic drag of their rocket designs. In model rocketry, we're strictly limited by the amount of power we may use, and we cannot "hop-up" factory-made motors. In order to reduce the weight and drag of model rockets, we must therefore use materials that are as light as possible and use very sophisticated streamlining techniques. But there are limits to how far we can go using standard 18-millimeter-diameter model rocket motors; their weight and frontal area cannot be reduced.

The answer was a smaller model rocket motor: the Minijet. By reducing the motor diameter to 13 millimeters (about half an inch), it became possible to build models so much smaller that their total weight could be reduced by more than 50% while their drag was cut by as much as 46%.

This doubled the altitude possible with a given amount of total impulse (motor power).

The light weight and small size of the Minijet motors also made possible new design technologies.

The result is the Minirocs. They are not scaled-down versions of standard model rockets. Modern design technology was used. New materials were incorporated into the designs. The opportunity for major change was grasped, and many totally new features were worked into the Minirocs. All of this makes the Minirocs the most advanced, up-to-date model rockets available.

SQUEAK

The Miniroc for the brute-force types who enjoy cloud-bursting. The smallest airframe that could be put around a Minijet and safe streamer recovery. Real low-drag design. 3-caliber ellipsoidal balsa nose. Sheet balsa fins are special high aspect ration low-drag shapes.

Pipsqueak has *never* been tracked with a B3-7m Minijet pushing it; it goes completely out of sight. This is why Pipsqueak is a Twin Kit. We *know* you are going to lose the first one you build! Diameter: 0.600". Length: 6.0". Basic non-motor weight: 0.212 oz. Recommended motors: 1/2A3-5m, A3-6m, B3-7m (if you don't want it back).

Kit No. 3
Price: \$1.50
(75 cents
per model)

SUPER STAR

The competition Miniroc! Its competition wins and records, national and international, are too many to list here. Where Super Star flies, it wins! It should. It was designed to. Uses 5-caliber balsa nose and three sheet balsa fins designed for maximum efficiency and minimum drag. Its length permits installation of parachutes up to 24" in diameter or streamers longer than 5 feet. With a B3-7m, it was tracked to an international altitude record of 1190 feet. Diameter: 0.600". Length: 9.0". Basic no-motor weight: 0.353 oz. Recommended motors: 1/2A3-3m, 1/2A3-5m, A3-4m, A3-6m, B3-5m, B3-7m.

Kit No. 3-0910
Price: \$1.00
(only a dollar!)

TAURUS-I

Don't let its appearance fool you. Taurus-I is not only a great sport model, but a ferocious contest competitor. It demonstrates the fact that even a small increase in drag has little effect on the overall outstanding Miniroc performance. Features 5-caliber balsa nose, 4 sheet balsa trapezoidal fins. To customize, add the optional T-5 "boosters" on either side. Comes with 10" poly chute. Diameter: 0.600". Length: 9.00". Basic no-motor weight: 0.388 oz. Recommended motors: 1/2A3-3m, A3-4m, B3-5m.

Kit No. 3-0920
Price: \$2.00

ASTROBEE D

An exact 1/10th scale model of the Space General Corporation's new Astrobee D sounding rocket. An excellent kit for your first scale model. Can be super-detailed into NARAM-quality scale bird. Scale balsa ogive nose. Scale payload compartment. Die-cut sheet balsa fins. Material included for scale launching lugs. Decal sheet contains all markings for Astrobee D Round S/N-2 flown at White Sands. Diameter: 0.600". Length: 15.6". Basic no-motor weight: 0.565 oz. Recommended motors: 1/2A3-3m, A3-4m, B3-5m.

Kit No. 3-0921
Price: \$2.00

ASP-I

The famous and popular ASP-I. Prototype developed in 1955 to probe radioactive clouds of Operation Redwing at Bikini Atoll in the Pacific. One of the first rockets to be scaled by modelers. The Miniroc ASP-I is a basic scale kit with balsa ogive nose and die-cut balsa fins. Full instructions given for super-detailing the basic kit with spinnerons and flares, plus full data on three different scale paint jobs. Decal includes markings of Round S/N-1 flown at White Sands in 1956. Diameter: 0.600". Length: 13.0". Basic no-motor weight: 0.600 oz. Recommended motors: 1/2A3-3m, 1/2A3-5m, A3-4m, A3-6m, B3-5m, B3-7m.

Kit No. 3-0922
Price: \$2.00

DELTA KATT

The world's first pop-pod canard boost glider! Delta Katt doesn't look like it will hold its own with the sleek, long-winged, high-efficiency contest B/G's, but don't let looks fool you! It gits up there, pops its pod, and hangs in a glide. Like the other Minirocs, it has a long list of national and international records as well as contest wins. It can be put together quickly and easily by a beginner, too. Sheet balsa parts, balsa pod nose. Full decal sheet with USAF markings. Pod diameter: 0.600". Wing area: 17.65 square inches. Boost weight (no motor): 1/2A3-1m, B3-3m.

Kit No. 3-0930
Price: \$2.50



AVI MINIJET® MODEL ROCKET MOTORS

The ultimate in small, economical, efficient model rocket propulsion!

The unanimous choice of the 1972 U.S. Space Model Team for the First World Championships in Yugoslavia!

The model rocketeer's continual battle against weight and aerodynamic drag is limited by the size and weight of available designs were restricted to a minimum of about 0.70" in diameter because of the standard 18x70mm. motor casing. Various techniques were developed by motor manufacturers to reduce the weight of the standard casing.

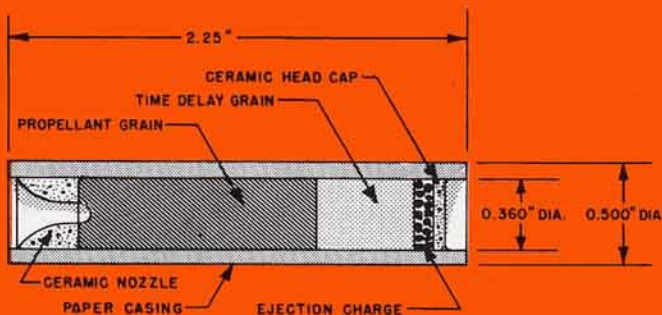
In early 1971, the Minijet Breakthrough occurred. Myke Bergenske, now President and General Manager of AVI, perfected the Minijet motor with its smaller 13x57 millimeter casing.

With Minijets, it was possible to reduce the size of a model rocket and hence the aerodynamic drag by more than 46%.

The Minijets also offered a striking reduction in motor weight—and thus total model weight. Both the standard Type B3-3 and the Minijet B3-3m have the same power and thrust, but the B3-3m Minijet weighs less than half of the B3-3!

Lower weight, smaller diameter, but equal power and thrust are the secrets behind the Minijets' outstanding performance.

Serious model rocketeers immediately began to use the Minijets to establish a whole series of new and impressive US and international model rocket performance records.



Although it's obvious that terrific performance can be obtained by model rockets designed to use the small Minijets, it is not so readily apparent that the Minijets can improve the performance of standard-size model rocket designs! Large models weighing up to 2.5 ounces can and have been flown with the Minijets. All of the AVI model rocket designs with the exception of heavy models such as Vostok, Titan and Nike-Tomahawk have been flown with the Minijets.

AVI Minijets are not only the first of the mini-motors, they are the most reliable, the most inexpensive, and the most utilized by contest fliers.

MODEL ROCKET MOTOR CODING:

All AVI model rocket motors are identified by a Type Code printed on them in accordance with the US standards of the NAR. This Type Code is designed to indicate the important specifications of a motor and to help you select the correct motor for your model.

A typical Type Code might read: B3-5m

The first letter indicates the NAR total impulse range in accordance with the accompanying chart. This tells you the amount of total power or total impulse of the motor.

The first number indicates the average thrust of the motor. Thus, a B3-5m would have less thrust than (but equal power to) a Type B6-4 and would not be able to lift as heavy a model.

The number following the dash indicates the number of seconds of time delay built into the motor before the ejection charge is activated to deploy the recovery system. Thus, our example has 5 seconds of time delay before activating the ejection charge. A dash-zero engine has no time delay and is used in the lower stages of a multi-staged model.

The small letter at the end of the Type Code indicates a casing size other than the standard 18x70mm. size. The standard size carries no letter. The AVI Minijets are designed by the small letter "m" following the Type Code.

AVI MOTOR COLOR CODING:

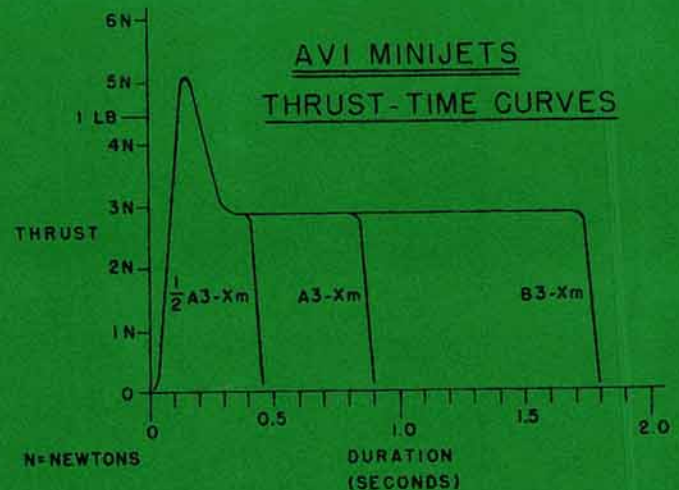
To make it easier for you to tell which motor you have inserted into your model, AVI has pioneered the use of a colored ring around the nozzle of the engine casing that will tell you at a glance the NAR motor type. The color coding for the nozzle-end ring is as follows:

TOTAL IMPULSE RANGE	COLOR
1/2A	brown
A	purple
B	blue
C	green

NAR MODEL ROCKET MOTOR TOTAL IMPULSE-RANGES

(AVI MOTORS)

TYPE LETTER	TOTAL IMPULSE (newton-seconds)
1/2A	0.626—1.25
A	1.26—2.50
B	2.51—5.0
C	5.0—10.00



AVI MINIJETS® MOTOR SPECIFICATIONS

SIZE: 13 x 57mm. (0.50 x 2.25 in.)

NAR TYPE	Total Impulse (N-sec)	Max. Thrust (Newtons)	Avg. Thrust (Newtons)	Duration (sec.)	Total Wt. (grams)	Propellant Wt. (grams)	Time Delay (sec.)	Price*
1/2A3-1m	1.20	5.0	3.0	0.43	5.5	2.2	1	\$1.05
1/2A3-3m	1.20	5.0	3.0	0.43	6.0	2.2	3	\$1.05
1/2A3-5m	1.20	5.0	3.0	0.43	6.5	2.2	5	\$1.05
A3-0m	2.20	5.0	2.9	0.91	7.0	3.0	0	\$1.15
A3-2m	2.40	5.0	2.9	0.91	7.5	3.0	2	\$1.15
A3-4m	2.40	5.0	2.9	0.91	8.0	3.0	4	\$1.15
A3-6m	2.40	5.0	2.9	0.91	8.5	3.0	6	\$1.15
B3-0m	4.80	5.0	2.8	1.86	9.0	6.0	0	\$1.25
B3-3m	4.80	5.0	2.8	1.86	9.5	6.0	3	\$1.25
B3-5m	4.80	5.0	2.8	1.86	10.0	6.0	5	\$1.25
B3-7m	4.80	5.0	2.8	1.86	10.5	6.0	7	\$1.25

*STANDARD PACK OF 4 MOTORS, 5 IGNITERS AND WADDING.

BULK PACK OF 25 IDENTICAL MOTORS AND 30 IGNITERS AVAILABLE TO DEALERS, SCHOOLS AND CLUBS ONLY.
 PRICES: 1/2A3-Xm: \$6.00 A3-Xm: \$6.50 B3-Xm: \$7.00

MINIJET ASSORTMENT #1 (4 ea. of 6 packs): \$27.40

MINIJET ASSORTMENT #2 (3 ea. of 8 packs): \$33.00

**AEROSPACE
VEHICLES INC**

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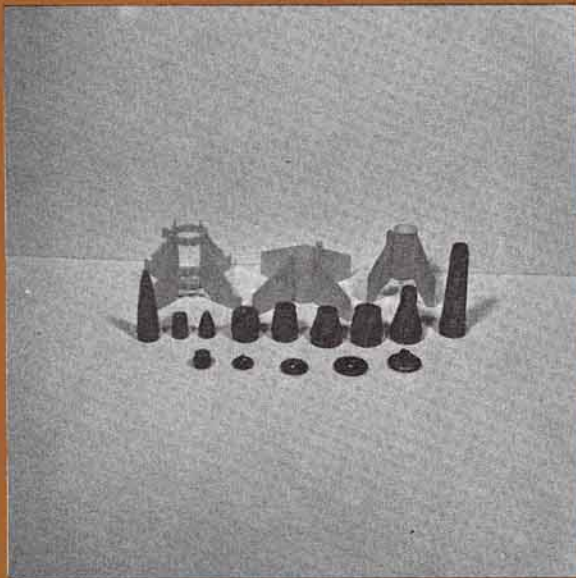
MINERAL POINT, WISC. 53565



THE AVI ASTROLINE FUN-FLYING SERIES

THE FUN BIRDS From AVI!

Model rocketry is fun! The AVI Astroliners were designed for the fun of model rocketry: flying. They go together quickly and easily. You spend your time on the flying field instead of in the workshop. The Astroliners take the tedious assembly work out of model rocketry for those who are interested in flying.



All Astroliner models feature plastic noses and plastic fin assemblies requiring no sanding, shaping, cutting, filling or painting. They use standard AVI millimetric paper body tubes. Streamer or parachute recovery systems are included.

The AVI Astroliners must be good if "imitation is the sincerest form of flattery." They were the first of their kind. Other model rockets came along with plastic noses and fin assemblies. But none match the performance, ease of assembly, and durability of the Astroliners.

The AVI Astroliners are designed to fly with standard AVI Thruster-18 model rocket motors and can be launched with the AVI Lunar-Lectric ground support equipment—launcher and controller.

And the Astroliners are great for those important demonstrations to show other people what your hobby is all about.

REDSTONE MAVERIC



With plastic space capsule nose and 4 clip-in plastic fins, Redstone Maveric is a customizer's dream with a complete selection of chrome plastic parts included. There are several ways to put this one together. Try it with 4 fins or with 3 . . . with the T-15 nose tube or without . . . with all the semi-scale detail or cleaned-up. Purists say this one is over-designed, but modelers keep on flying it because it gets up there and coughs up a big 14" chute that's easy to pack in the 30mm. paper body. This is a real fun bird. Diameter: 1.171". Length: 16". No-motor weight: 1.375 oz. Recommended motors: A3-2, B-3-3, B6-4, and C6-4

Kit No. 3-0822

Price: \$1.50

VIPER



Viper doesn't look it, but it's a contest bird for small fields in Par Duration competition. And it's hard to beat in Spot Landing contests because it flies exactly the same way every time to its one-piece cruciform fin assembly. It features an all-plastic nose cone and a 10" chute for recovery. If you can't put this one together and get it to fly, you should maybe go back to crayons and construction paper. Diameter: 0.984". Length: 16". No-motor weight: 1.375 oz. Recommended motors: A3-2, B3-3, B6-4, and C6-4.

Kit No. 3-0823

Price: \$1.70

MOON GO



This big, impressive hammer-headed monster lumbers off the pad in a slow, realistic lift-off. At apogee, the sky is full of Moon Go parts as the plastic space capsule separates from the big booster body, and both come down on their separate chutes. This one is a favorite. Easy to put together. Impressive in flight. The one-piece plastic fin assembly is molded in bright fluorescent color. The kit is loaded with customizing goodies and full-color decals. This one's for fun. Diameter: 1.171" maximum. Length: 21". No motor weight: 1.87 oz. Recommended motors: B3-3, B6-4, and C6-4.

Kit No. 3-0841

Price: \$2.00

REDSTONE QUASAR



Punch that button, and this mighty 2-foot rocket thunders aloft. As it peaks-out, the 14" parachute blossoms, bringing it in for a soft landing. This one looks like something from the Cape. In spite of its size, it's easy to assemble with all-plastic nose cone, transition couplers, and plastic clip-on fin assembly. Diameter: 1.171" maximum. Length: 24.25". No-motor weight: 1.80 oz. Recommended motors: B3-3, B6-4, and C6-4.

Kit No. 3-0842

Price: \$2.00

AQUARIUS



"Ignition! We have a lift-off!" The huge rocket strains to leave the pad, then moves skyward as thrust is converted into velocity. Aquarius is on its way! This is the Big Bird from AVI! Then the 14" chute brings it home for a perfect landing. It's got a payload section capable of carrying an ounce of payload on a skyward mission. The nose cone, transition coupler, and clip-on tail fins are high-impact plastic for easy assembly. Aquarius is a biggy with plenty of room for chutes, payload, and customizing parts. Diameter: 1.171". Length: 23.5". No-motor weight: 1.585 oz. Recommended motors: B3-3, B6-4, and C6-4.

Kit No. 3-0845

Price: \$2.00

MARTIAN PATROL



This AVI Astroliner is unbelievable! Take a long, sleek model with plastic nose cone, transition coupler, and clip-on plastic fins; it makes a great bird all by itself.

But add two foam-plastic flying saucers to the fins during boost, and you've got the wildest wierdo ever to blast free of Planet Earth.

At apogee when the chute pops, it ejects those two flying saucers which flutter back to earth on their own, performing some of the wildest aerobatics you've ever seen. Diameter: 1.171". Length: 20". UFO diameter: 5". No-motor weight: 1.94 oz. Recommended motor: C6-4 ONLY.

Kit No. 3-0844

Price: \$3.00

NIKE PATRIOT



This big payload-toter can lift two ounces of payload to 500 feet using a Type C6-2 motor. It's a husky model with a unique one-piece integral plastic tail fin assembly and engine mount. Nike Patriot also features a 3-caliber plastic nose and transition coupler with a payload section 1" x 6". Recovery is with a 14" chute. Diameter: 1.378". Length: 21". No-motor weight: 2.29 oz. Recommended motors: B6-4, C6-2, C6-4.

Kit No. 3-0849

Price: \$3.00



HYPERSONIC (MACH 10) SERIES

Flying Model Rockets

for Sport and Competition

The AVI Hypersonics feature standard model rocket construction techniques and materials proven in over 15 years of flying: paper tube bodies, balsa or styrene noses and transitions, and sheet balsa fins.

Each kit comes complete with all parts, instructions, and decals. All you provide are glue, modelling tools, paint, and your creative craftsmanship.

The AVI Hypersonics not only help you develop your basic modelling techniques, but they can be flown successfully in competition.

Use standard AVI Thruster-18 solid propellant model rocket motors to fly the AVI Hypersonics.



STEP UP TO THE CHALLENGE OF GLIDE RECOVERY

FLAT CAT

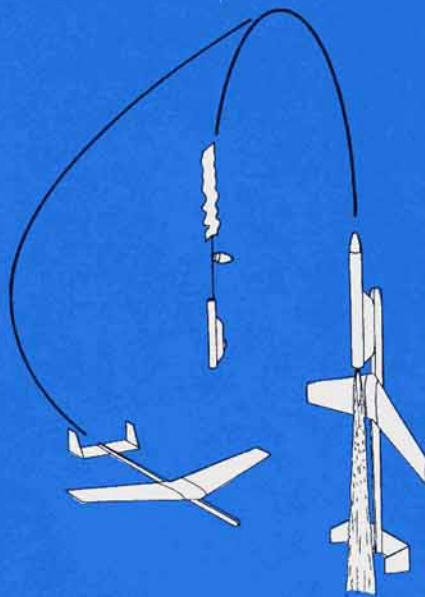
In 1965, G. Harry Stine began the development of a beginner's boost-glider. In 1968, the Flat Cat was born. In 1970, it became a kit. Flat Cat is the most universal boost-glider design ever, ideal for research, efficient for competition, and easy for the beginner. Thousands have been built and flown all over the world.

Flat Cat has a booster pod that pulls the all-balsa glider aloft, detaching at streamer ejection. Gliding weight is 0.81 oz. with a wing area of 36 sq. in. Experts have reduced this weight in half by careful streamlining. With an A3-2 engine, Flat Cat should make a flight of 45 seconds to one minute. Contest flights of over 6 minutes have been made using the B3-3 motor.

Other specs: Wing span: 13.75". Liftoff weight (no motor): 1.095 oz. Pod diameter: 0.788". All balsa glider.

Kit No. 3-0216

Price: \$2.50

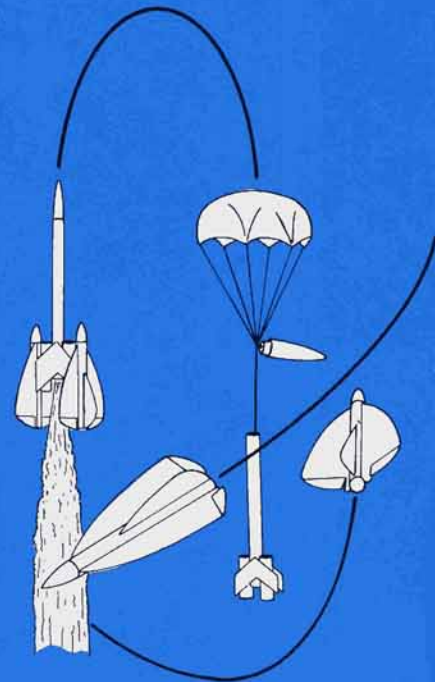


LUNAR PATROL

Bill Fileccia's great parasite boost-glider kit! At liftoff, motor in the central "core" carries aloft two delta-wing gliders which detach when the core ejects its recovery parachute. As the core descends, the two gliders swoop and turn to float in for a perfect landing. Paper tube bodies and balsa noses and flying surfaces. Basic tube dia. 0.788". Length: 15". Weight: 2.05 oz. (no motor). Recommended motors: A3-2, B3-3, B6-2, C6-4.

Kit No. 3-0215

Price: \$3.00

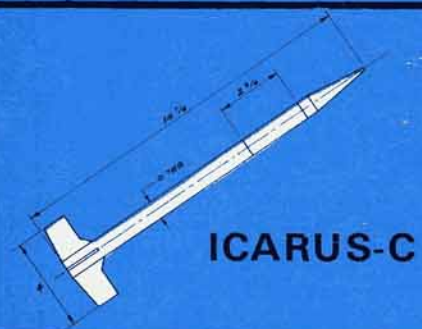




LAMBDA PAYLOADER

Light weight, hi-acceleration payload lifter. Zero to 3 oz. payload capability in clear compartment 0.945" dia. x 3.15" long. Length: 15". Weight: 0.95 oz. with no payload or motor. Booster dia. 0.788". 14" poly recovery chute. Recommended motors: A3-2 or B3-3 (no payload); B6-2, B6-4, C6-2, or C6-4 with payload.

Kit No. 3-0204
Price: \$1.50

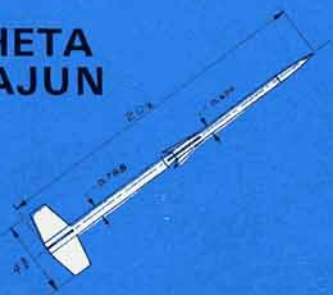


ICARUS-C

Contest payloader. Will loft standard NAR-FAI payload to about 200 meters (650 feet). Diameter 0.788". Length 15". Payload capability 0 to 2 oz. in 0.748" dia. x 1.89" compartment. Basic weight (no motor or payload): 0.776 oz. Recommended motors: A3-2, B3-3 (with no payload); B6-2, B6-4, C6-2, or C6-4 with payload.

Kit No. 3-0205
Price: \$1.50

THETA CAJUN



Patterned after NASA rocketsondes. Mini-payload compartment capable of taking payloads up to 2 oz. in space 0.55" dia. x 7.00" long. Basic booster dia. 0.788". Length 21" overall. Basic weight (no motor or payload): 0.95 oz. 10" poly recovery chute. Recommended motors: A3-2, B3-3, B6-4, or C6-6.

Kit No. 3-0207
Price: \$2.00

FLARE PATRIOT



NAR Quadrathon model—parachute duration, altitude, payload carrying, and spot landing. Payload compartment 0.748" dia. x 1.89" long takes up to 2 oz. Booster body 0.984" dia. 14" poly recovery chute. Basic weight (no motor or payload) 1.06 oz. Recommended motors: A3-2, B3-3, B6-4, C6-4.

Kit No. 3-0212
Price: \$2.00

MICROSONDE III



This one is NOT for beginners! 3-stages to loft payloads to altitudes of more than 1000 feet. Parachute recovery of top stage; tumble recovery of booster stages. Maximum payload capability 1 oz. in 0.945" dia. x 3.15" long. Booster dia. 0.788". Length 24.75". Basic weight: (no motors or payload): 1.6 oz. Recommended motors: 1st stage C6-0 ONLY—2nd stage C6-0 or B6-0—top stage A3-4, B6-6, or C6-6.

Kit No. 3-0209
Price: \$3.00



ZENITH II PAYLOADER

Big, easy-to-build 2-stager to introduce you to multi-staging. Transparent payload compartment 0.945" dia. x 3.15" long capable of lifting 2 oz. to more than 1000 feet. Basic diameter 0.945". Length 22-7/8". Basic weight (no motors or payload) 1.60 oz. Recommended motors: C6-0 or B6-0 in booster, A3-4, B6-6, or C6-6 in upper stage.

Kit No. 3-0211
Price: \$3.00



AVI ASTROSCALE* FLYING MODEL ROCKETS

Here's the realism and pride of scale modelling!



Building a flying miniature replica of a real-life space vehicle is one of the ultimate challenges of model rocketry. Scale modelling combines the thoroughness and patience of good craftsmanship with the heart-stopping, cross-your-fingers suspense of the count-down. But to see your little model rise from the earth and drive toward the sky is an experience second only to watching the launch of a real one.

AVI has pioneered two important areas of scale model rocketry. First, we developed scale model rocket kits that are easy to put together and are excellent beginner's kits. They serve to introduce novices to the exciting world of scale modelling, and they've been tried and tested in this role by clubs and schools.

Finally, we pioneered the all-plastic "show-or-go" scale model rocket kit. You can build these precision-engineered all plastic models in several versions either as static shelf models or as actual flying models designed for AVI Thruster-18 model rocket motors.

Built-up non-flying versions of the AstroScale models have been donated to the National Air & Space Museum of the Smithsonian Institution in Washington D.C. where they are now part of the national collection, models showing important milestones in man's conquest of aerospace. You can have the same models in your own collection.

*T M & ©1972 by G. Harry Stine

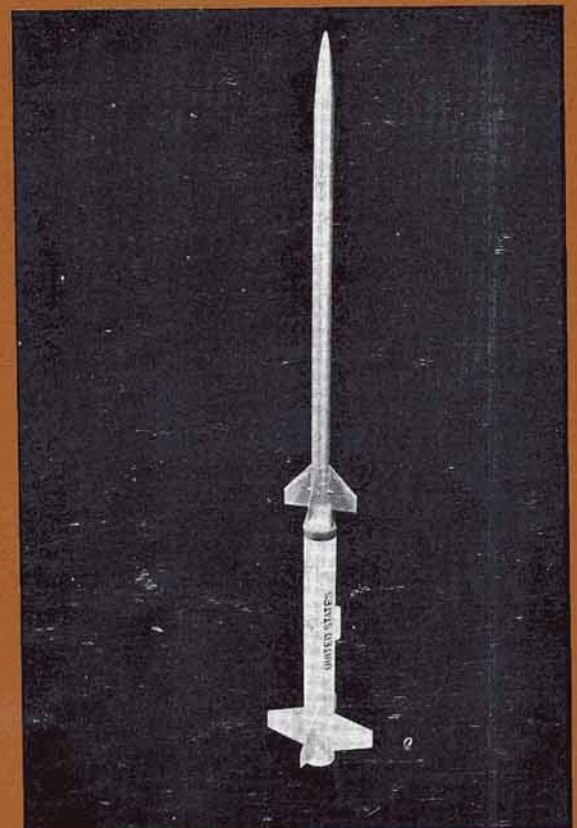
New!

NIKE-TOMAHAWK

The real Nike-Tomahawk was originally developed by Dr. Robert Womack at Sandia Corporation for the purpose of carrying large payloads into the upper atmosphere for studying weather patterns. Working directly from drawings and photographs supplied by Sandia Corporation and the Thiokol Astro-Met Division, AVI created the 1/11th scale model Nike-Tomahawk kit. A single-staged model, the AVI Nike-Tomahawk features plastic nose cone, plastic upper stage tail assembly, plastic scale plastic coupler, and plastic Nike tail assembly with integral motor mount. The recovery parachute is packed into the Tomahawk section. Diameters: 1.378" and 0.788". Length: 30.875". No-motor weight: 3.53 oz. Recommended motors: B6-2, C6-4.

Kit No. 3-0850

Price: \$3.50

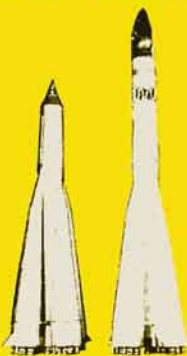


**AEROSPACE
VEHICLES INC**

P.O. BOX 77

MINERAL POINT, WISC. 53565

**USSR RD-107
VOSTOK/SPUTNIK
LAUNCH VEHICLE**



Both the prototype and the model hold a number of "firsts". The Soviet RD-107 vehicle lofted the world's first unmanned earth satellite, Sputnik-I, into orbit on October 4, 1957. With an additional upper stage, it was the launch vehicle for Yuri Gagarin's first manned earth orbital flight on April 12, 1961. The model was the first all-plastic show-or-go model rocket. You can build it to stand as an accurate shelf model or as a flying model. You can build it in two versions—the one that launched Sputnik-I or the one that lofted Gagarin. This model in 1/100 scale has been internationally acclaimed as the most accurate replica of man's first probes into space. Built-up models of this kit are at the Federation Aeronautique Internationale in Paris and at the National Air & Space Museum of the Smithsonian Institution in Washington, D.C. Model comes with all 32 rocket nozzles, clear plastic Sputnik shroud, clear plastic Vostok shroud with clear view of cosmonaut and Vostok vehicle, 4 strap-on boosters, and complete, authentic data book giving all available information on weight, thrust, dimensions. Includes drawing released by U.S.S.R. No motor weight: 4.9 ounces. Length: 15". Recommended motors: B6-2, C6-4.

Kit No. 1-90

Price: \$4.00

**USAF TITAN IIIC
LAUNCH VEHICLE**



The Titan IIIC was developed by the Martin-Marietta Corporation for the U.S. Air Force. Boasting a lift-off thrust of over 2 million pounds, it has been overshadowed by the bigger manned Saturn vehicles. Yet TITAN IIIC has been routinely placing into earth orbit large communications satellites and special USAF space payloads. It was the rescue launch vehicle in the motion picture, "Marooned." In the 1970 decade, TITAN IIIC and its derivatives are scheduled to launch a number of spacecraft, including the 1975 Voyager Mars Lander.

The AVI kit is a faithful replica developed from official USAF and Martin-Marietta blueprints. You can build it to fly with a Type B6-2 or C6-4 motor, and it comes with 4 clear plastic fins to stabilize it in flight. Or you can build it as a non-flying shelf model with all stages separable and all Aerojet-General liquid propellant rocket engines highly detailed from official drawings. No-motor weight: 4.4 oz. Length: 12.75". Recommended motors: B6-2 or C6-4.

Kit No. 1-9002

Price: \$4.00

NIKE SMOKE



A 1/11th scale model of the NASA Nike Smoke meteorological rocket developed under the direction of NASA Langley Research Center and flown at NASA Wallops Station and Cape Kennedy. The AVI Nike Smoke features easy construction with a one-piece all-plastic tail assembly and integral motor mount, a scale plastic nose cone, a 35-mm body tube, and a 14" parachute. Many clubs have used the Nike Smoke kit as a beginner's scale bird to teach their new members the rudiments of scale modelling. Diameter: 1.378". Length: 19.25". No-motor weight: 2.40 oz. Recommended motors: B3-3, B6-4, C6-4.

Kit No. 3-0846

Price: \$3.00

SANDIA TOMAHAWK



A 1/11th scale model of the Thiokol TE-416 Tomahawk launched by Sandia Corporation for the Atomic Energy Commission at Tonopah, Nevada on December 6, 1967. All details of the original are preserved in the precision one-piece plastic tail assembly—all bolts, joints, rivets, and airfoil shapes. Master modellers will want to super-detail this one with nose antennas and other scale details not contained in the kit. The Sandia Tomahawk kit was developed from drawings and photographs supplied by Sandia Corporation and by Thiokol's Astro-Met division. Diameter: 0.788". Length: 18.50". No-motor weight: 1.10 oz. Recommended motors: A3-2, B3-3, B6-4, C6-4.

Kit No. 3-0848

Price: \$2.00



THE FAMOUS DOLLAR ROCKETS FROM AVI

They said it couldn't be done. So we did it. And then they copied us!

PIONEER-I

This was the first inexpensive, simple, high-performance model rocket. 12 inches long, it features a polished 3-caliber paraboloid plastic nose cone, the shape that aerodynamicists say is literally perfect. The swept tri-form (3-fin) plastic tail assembly slips over the rear end of the 20-millimeter-diameter paper body tube. The launch lug is incorporated into one of the fins for lower drag. Recovery is by means of an 18-inch streamer. No shaping or sanding required. Flies to 400 feet with a Type A3-2 motor, to 900 feet with a B3-3, and to 1500 feet with a C6-6.

Pioneer-I is not only an ideal beginner's model, but it is also a reliable performer that is completely at home in contest flying. It has a long history of contest wins and national records to its credit.

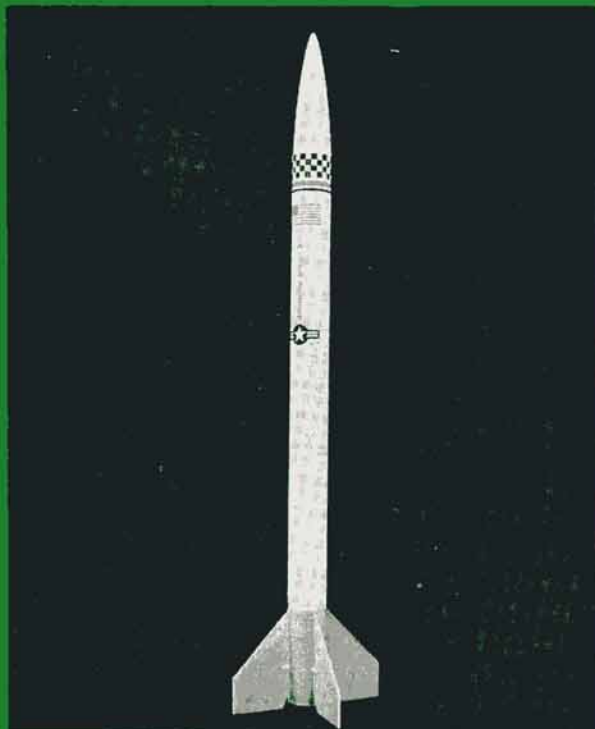
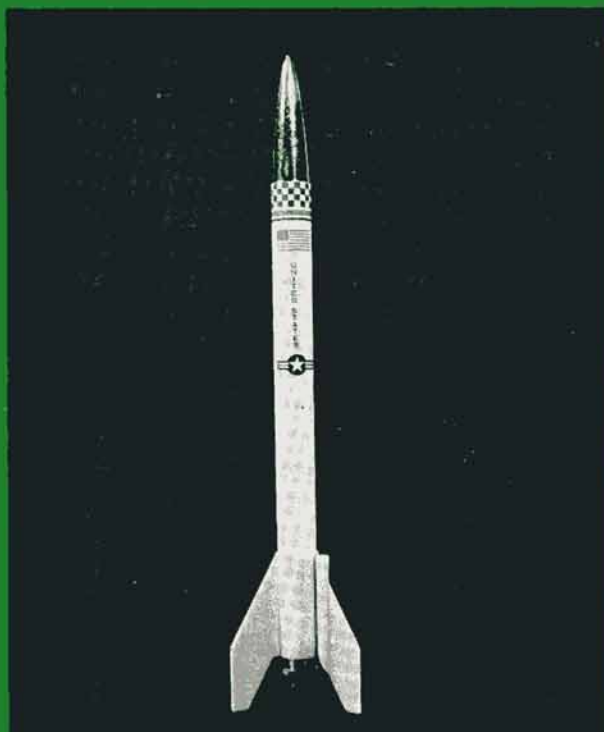
Diameter: 0.788" Length: 12"

No-motor weight: 0.81 oz.

Recommended motors:

A3-2, A3-4, B3-3, B6-4, B6-6, C6-4, C6-6

Kit No. 3-0810 Price: \$1.00 (only a buck!)



STAR HAWK

The Pioneer-I companion in economy (only a buck) but with improved performance. They said the Pioneer-I tail assembly had too much drag, so we designed an all-plastic tail assembly that was flush with a T-20 body tube.

Star Hawk features the same simple construction of the Pioneer-I with plastic nose cone, paper body tube, and all-plastic tail assembly. Streamer recovery is used. Star Hawk is both a beginner's model and a seasoned contest performer at home in such NAR events as altitude, streamer duration, parachute duration, predicted altitude, and spot landing. If you are handy with a file and sandpaper, you can clean up and further streamline the plastic tail assembly for even greater performance. But, even at that, right out of the box the Star Hawk is an out-a-sight 2000-foot model with a C6-6 belling in its tail!

Diameter: 0.788" Length: 14"

No-motor weight: 0.88 oz.

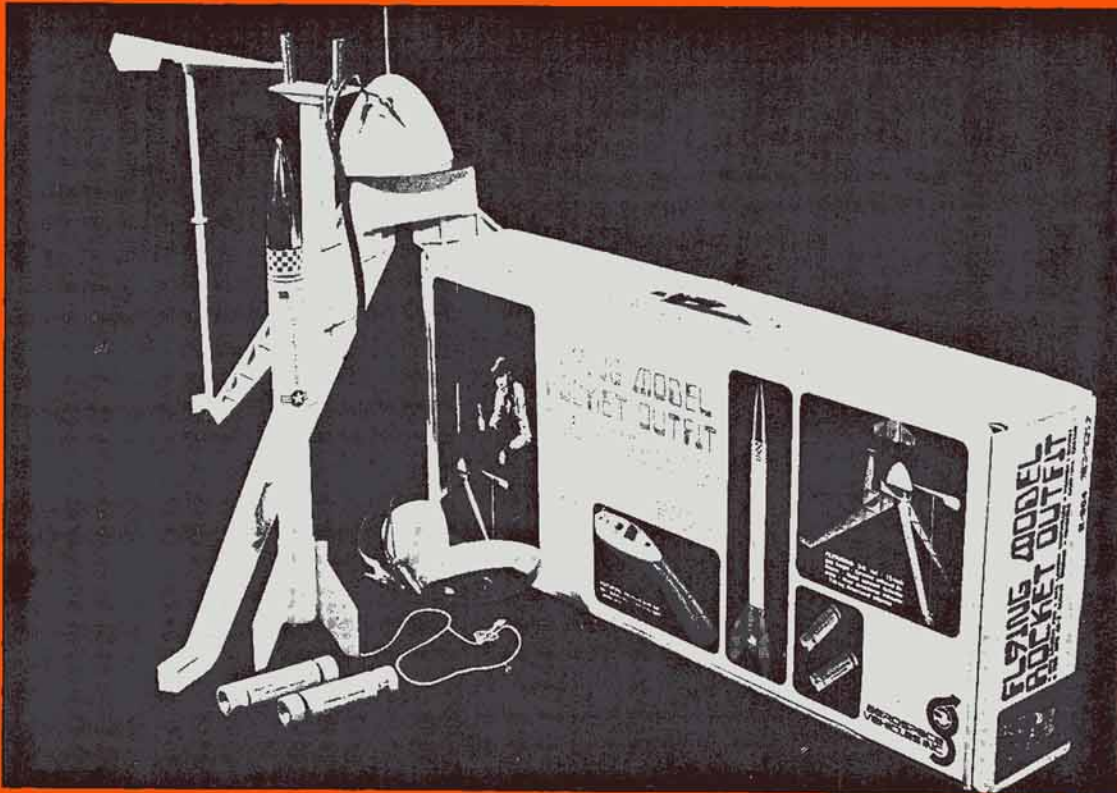
Recommended motors:

A3-2, A3-4, B3-3, B6-6, C6-4, C6-6.

Kit No. 3-0847 Price: One Dollar (\$1.00)



Pioneer-I Starter Set



EVERYTHING YOU NEED TO GET STARTED IN MODEL ROCKETRY

Here in one package is every item you need—except tools, sandpaper, glue, paint, and battery—to get started in model rocketry. It's all packaged in a sturdy corrugated box that can later be used for a range box and a storage container for all the equipment.

The model is the Pioneer-I, field-tested and proven in thousands of flights by beginners and experts alike. Pioneer-I goes together quickly and easily with no special skills required. It features a precision plastic nose, paper tube body, one-piece plastic tail unit to insure straight flight, and streamer recovery. Pioneer-I is a high-performance model; it holds several U.S. model rocket performance records homologated by the National Association of Rocketry (NAR).

The launch pad is a rugged unit capable of launching almost any model rocket. It knocks down quickly for carrying and storage. The special ceramic jet deflector prevents electrical short-outs and channels the exhaust gases away from the model and the pad. A tilt-leg adjustment permits compensation for weathercocking of the model and wind drift in flight.

The launch controller features a positive safety key that will not allow the model to be launched unless it is in the controller handle. A continuity light reports that the ignition system is hooked up properly and ready to launch when the safety key is inserted. The electrical launch controller meets all specifications of the NAR and the National Fire Protection Association Code 41-L.

Hardware is included to permit the use of a powerful "hot shot" or similar heavy-duty 12-volt dry cell—or you can attach the adapter that allows you to plug the launch controller into the cigarette lighter plug of the family car so that you have available the tremendous capacity of the car battery.

Two Type A3-2 AVI solid propellant model rocket motors are included. One is used on each flight. Additional motors of varying degrees of power are available separately. The Type A3-2 motor will propel the Pioneer-I to an altitude of 400 feet.

The Pioneer-I Starter Set comes with a complete instruction manual with directions for assembly and use of the model, the launch pad, and the controller.

This is the ideal way to get started because you will be able to use the launch pad and controller over and over again for years as you progress in model rocketry.

Kit No. 3-0904

Price: \$8.95



PARTS, PARTS, PARTS...

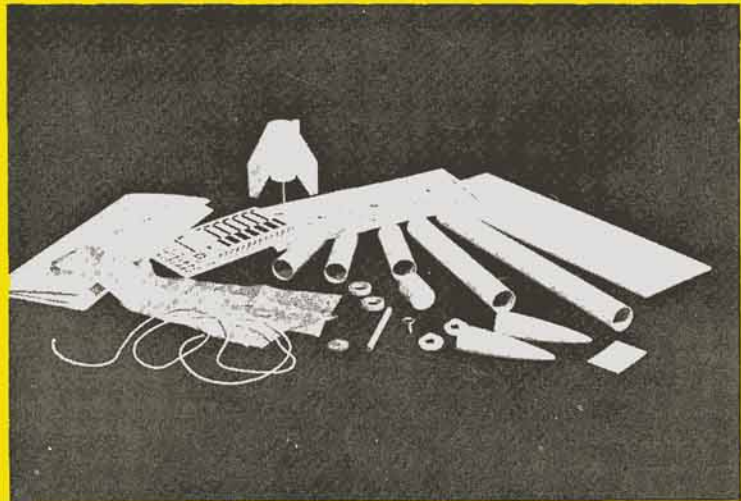
AVI makes available a complete line of model rocket parts for the custom builder—balsa noses, plastic noses, quality millimetric paper body tubes, motor mounts, recovery devices, etc.

However, most modelers and dealers prefer the AVI special parts packages—assortments of custom parts packaged in one container and designed to provide most of the essential components normally needed. (AVI is happy to provide any of its parts to modelers and dealers in any quantity, so please write for details.)

PEGASUS

It started out as a customizer's model rocket kit for building any one of 4 different Pegasus designs. But it turned out to be one of the best parts assortments available. Pegasus contains the following parts:

- 2 ea. 19mm thrust rings
- 2 ea. 19mm motor compartment tubes
- 1 ea. T-20 x 9" body tube
- 1 ea. T-20 x 6" body tube
- 1 ea. T-20 x 2.75" body tube
- 1 ea. Pioneer plastic fin unit
- 1 ea. 3/32" sheet balsa for fins
- 1 ea. launch lug
- 1 ea. T-20 balsa coupler
- 2 ea. T-20 Type 620PA plastic noses
- 1 ea. 10-gram nose weight
- 2 ea. recovery streamers
- 2 ea. shock cords and shock locks
- 1 ea. decal sheet
- 1 ea. screw eye
- 2 ea. motor clips



Instructions are given for building 4 different Pegasus model designs, including a 2-stage Pegasus. Or you can simply use the parts to exercise your technical creativity!

Kit No. 3-0843

Price: \$2.25

MINIROC PARTS ASSORTMENT

Another collection of necessary parts for the custom builder and contest flier who wants to design and build his own high-performance Miniroc for the AVI Minijet motors. The Miniroc Parts Assortment contains 4 each of the following AVI parts:



- T-15 x 8" body tube
- T-15 Type 620A 5-caliber ogive balsa nose
- T-14 motor tube for Minijets
- T-14 thrust ring
- Shock mount
- Shock cord
- Screw eye
- Launch lug
- and 2 5-gram nose weights

There are literally an infinite number of different Miniroc designs you can build using this Parts Assortment. Most modelers have sheet balsa on hand or can get it readily at their local hobby store, so that is not included in the kit.

Kit No. 3-0950

Price: \$3.00



AVI GSE (Ground Support Equipment)



LAUNCH PAD

Get your models started right!

Every model rocket requires a launch pad for a safe and stable flight. The launch pad is the model's initial guidance system while it is still moving too slowly for the fins to exert their stabilizing effect. The launch pad also determines the model's direction of flight.

The AVI Launch Pad is a piece of GSE (Ground Support Equipment in Cape Kennedy parlance) that you will use for years with all sorts of model rockets. So we've built-in lots of features to make it useful, durable, and versatile. The sturdy tripod design provides a stable base on nearly all terrain and incorporates a tilt-leg adjustment topped by a wind vane for programming the launch angle up to the maximum permissible 30° from the vertical. The launch rod is 1/8" in diameter and 36" long; it disassembles into two lengths for easy transportation and storage. An umbilical mast is included on one launcher leg to support the weight of the electrical launching wires and thus prevent their weight from pulling the igniter out of the model. The kit includes an AVI exclusive: a parabolic ceramic jet deflector designed to direct the motor exhaust away from your model, the launch pad, and the ground in a manner that is safe. The ceramic deflector also prevents electrical short-outs between the firing wires and the deflector, giving you greater launch reliability.

The AVI Launch Pad comes in an easy-to-assemble kit that breaks down for compact transportation in your range box. Its rugged durability and versatility has been proven by years of hard use on club ranges.

Kit No. 3-0150 Price: \$5.00

AVI ELECTRIC LAUNCH CONTROLLER

All model rockets are ignited by electrical means because this is the safest possible way to do it. National regulations and most local rules require electric ignition. The AVI Launch Controller provides you with a way to achieve safe, positive, reliable electric ignition.

The Controller has a handle-shape and is molded from high-impact plastic. It contains all necessary electrical safety features—recessed launching button, igniter continuity light, and safety key. The electrical launching circuit is not "armed" until the safety key is inserted and turned, and the continuity light indicates a go condition of the circuit. 15 feet of electrical cable is provided between the controller and the launch pad end of the cable. 10 feet of cable is provided for attachment to a high-capacity battery (not included). AVI recommends a list of commonly available power dry cells given in the instructions for positive ignition. However, an adapter is provided for plugging the system into the cigarette lighter receptacle of an automobile so that this high-capacity source can be used.

This rugged unit, field-tested under hard use for years by clubs, comes as an easy-to-assemble kit with no soldering required. You will use it for years with confidence in your model rocket launching activities.

Kit No. 3-0151 Price: \$4.50



SPECIAL COMBINATION:

The AVI Launch Pad plus
the AVI Launch Controller

Kit No. 3-0152 Price: \$8.50

You save a dollar and get
a complete launch system!



AVI THRUSTER-18[®] MODEL ROCKET MOTORS

The new standard of quality and performance.

A better product at a better price.



The AVI Thruster-18[®] model rocket motors are miniature solid propellant rocket units specifically designed for propelling the AVI model rockets. They are made in a range from Type A through Type C. They are the USA "standard" size of 18 millimeters diameter (0.690 inches) and 70 millimeters long (2.75 inches). This standard 18 x 70mm. size will fit most model rockets and may therefore be used to propel models other than the AVI kits.

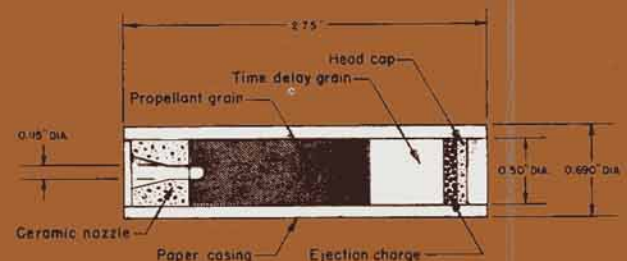
All AVI model rocket motors carry the Safety & Contest Certification of the National Association of Rocketry (NAR) signifying that they conform to the standards established by the Federation Aeronautique Internationale and the National Fire Protection Association Code 41-L.

AVI Thruster-18 model rocket motors are reaction motors designed specifically for the sole purpose of propelling AVI model rockets and other similar model rockets. They are scientifically designed, produced on automatic machinery, and subjected to rigid statistical quality controls. It is very important that care be exercised in their use. ALL INSTRUCTIONS must be read thoroughly first and followed completely. Model rocket motors are designed for one purpose only. They are not toys, and their mis-use must be absolutely avoided.

HOW DOES A THRUSTER-18 WORK?

Refer to the cutaway drawing that shows a typical AVI model rocket motor. The various parts are labelled.

The motor is started by an electrical igniter consisting of a piece of nichrome wire with a bead of "suibb" material on its tip. This is inserted into the nozzle by the modeler before launching. When an electric current of 2 amperes at 6 volts is passed through the igniter, its temperature rises above the 550 degree F. needed to ignite the propellant with which it is in contact.



The solid propellant grain burns only on its surface from the nozzle end forward like a cigarette. The combustion process takes place at very high temperatures producing about 2000 cubic inches of gas for every ounce of propellant material. This gas is created very rapidly and rushes out of the special ceramic de Laval rocket nozzle at a speed of about 1800 miles per hour. This hot rush of gas produces thrust which propels the model rocket skyward.

Once the propellant grain is used up, the time delay grain is automatically ignited. It produces very little thrust and allows the model rocket to coast to apogee. It includes a special chemical which produces a smoke trail to permit you to see the model at very high altitudes.

When the time delay grain is exhausted, the ejection charge is automatically activated. This produces a quick puff of gas to pressurize the inside of the model rocket and expel the recovery device.

When the recovery device brings the model back to a gentle landing, the expended motor can be removed and discarded. The model rocket is then ready for another flight with a fresh model rocket motor installed.

All AVI model rocket motors are intended for only a single use and must be discarded after they are used.

**AEROSPACE
VEHICLES INC**

P.O. BOX 77 MINERAL POINT, WISC. 53565

MODEL ROCKET MOTOR CODING:

All AVI model rocket motors are identified by a Type Code printed on them in accordance with the US standards of the NAR. This Type Code is designed to indicate the important specifications of a motor and to help you select the correct motor for your model.

A typical Type Code might read: B3-5m

The first letter indicates the NAR total impulse range in accordance with the accompanying chart. This tells you the amount of total power or total impulse of the motor.

The first number indicates the average thrust of the motor. Thus, a B3-5m would have less thrust than (but equal power to) a Type B6-4 and would not be able to lift as heavy a model.

The number following the dash indicates the number of seconds of time delay built into the motor before the ejection charge is activated to deploy the recovery system. Thus, our example has 5 seconds of time delay before activating the ejection charge. A dash-zero engine has no time delay and is used in the lower stages of a multi-staged model.

The small letter at the end of the Type Code indicates a casing size other than the standard 18x70mm. size. The standard size carries no letter. The AVI Minijets are designed by the small letter "m" following the Type Code.

AVI MOTOR COLOR CODING:

To make it easier for you to tell which motor you have inserted into your model, AVI has pioneered the use of a colored ring around the nozzle of the engine casing that will tell you at a glance the NAR motor type. The color coding for the nozzle-end ring is as follows:

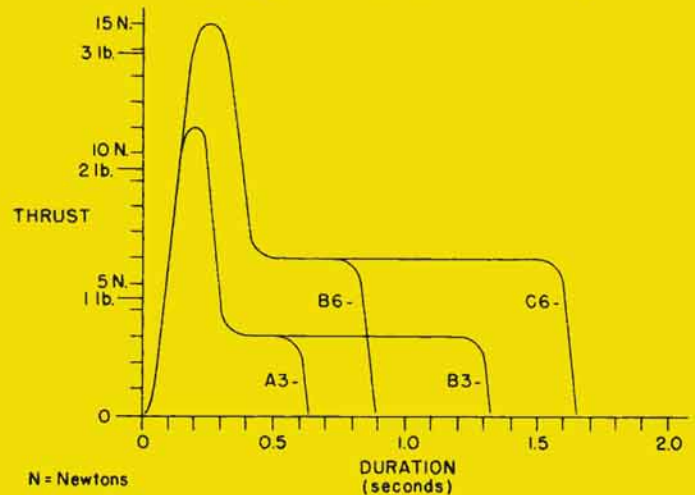
TOTAL IMPULSE RANGE	COLOR
1/2A	brown
A	purple
B	blue
C	green

NAR MODEL ROCKET MOTOR TOTAL IMPULSE-RANGES

(AVI MOTORS)

TYPE LETTER	TOTAL IMPULSE (newton-seconds)
1/2A	0.626—1.25
A	1.26—2.50
B	2.51—5.0
C	5.0—10.00

THRUST vs. TIME CURVES:



AVI THRUSTER-18's® MOTOR SPECIFICATIONS

SIZE: 18 x 70mm (0.690 x 2.75 inches)

NAR TYPE	Total Impulse (N-sec)	Max. Thrust (Newtons)	Avg. Thrust (Newtons)	Duration (sec.)	Total Wt. (Grams)	Propellant Wt. (Grams)	Time Delay (sec)	Price*
A3-2	2.40	11	3.4	0.63	18.0	3.2	2	\$0.90
A3-4	2.40	11	3.4	0.63	18.5	3.2	4	\$0.90
B3-4	4.80	11	3.4	1.32	20.4	5.5	3	\$1.00
B6-0	4.80	15	6.0	0.90	16.9	6.0	0	\$1.00
B6-2	4.80	15	6.0	0.90	18.5	6.0	2	\$1.00
B6-4	4.80	15	6.0	0.90	19.6	6.0	4	\$1.00
B6-6	4.80	15	6.0	0.90	19.9	6.0	6	\$1.00
C6-0	9.60	15	6.1	1.64	19.9	11.0	0	\$1.20
C6-2	9.60	15	6.1	1.64	21.7	11.0	2	\$1.20
C6-4	9.60	15	6.1	1.64	22.6	11.0	4	\$1.20
C6-6	9.60	15	6.1	1.64	23.5	11.0	6	\$1.20

*STANDARD PACK OF 3 MOTORS, 4 IGNITERS, AND WADDING.

BULK PACK OF 25 IDENTICAL MOTORS AND 30 IGNITERS AVAILABLE TO DEALERS, SCHOOLS, AND CLUBS ONLY.

PRICES: TYPE A: \$6.75 TYPE B: \$7.50 TYPE C: \$9.00

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