

SAVE \$\$\$'s ON YOUR CINEROC FLYING BY
LOADING AND PROCESSING YOUR FILM

Flying the CINEROC

by Richard Fox

The Estes Cineroc is an amazing device — a light weight, fast shutter speed, aerodynamically streamlined camera which, when used properly, will produce movies rivaling NASA's most spectacular. It would be impossible to modify any other movie camera to meet all these requirements and still remain within the Cineroc's \$21.95 price. However the camera does have some faults. It requires warm weather, good lighting, careful preparation, and expensive film. Having flown many cassetts of Cineroc film, I would like to

describe how Cineroc results can be improved by proper preparation, and how money can be saved by processing your own film.

Planning the Flight

The Cineroc should be flown *only* on bright, sunny days. Cineroc movies taken on cloudy days will contain a colored image, but everything will look blue or gray with a very dark image. When you're spending \$6.75 per flight for film and processing it's best to wait for a good, sunny day.

The best time of day to fly your Cineroc is in mid-morning or mid-afternoon. At noon-time it's plenty bright, but with the sun directly overhead there are no visible shadows. Shooting about three hours after sunrise or three hours before sunset the shadows are long but there is still plenty of light. The result is a colorful movie with plenty of depth.

Unlike other model rocket activities where the ideal launch site is a clear, isolated, empty field, you want to fly your Cineroc out of crowded areas. Movies of a field of weeds receding into the background just aren't very interesting. On the other hand, pictures of a busy parking lot dropping away at several hundred miles per hour are spectacular. (Furthermore, if your chute fails, movies of a busy parking lot being *approached* at several hundred miles per hour are also quite spectacular!)

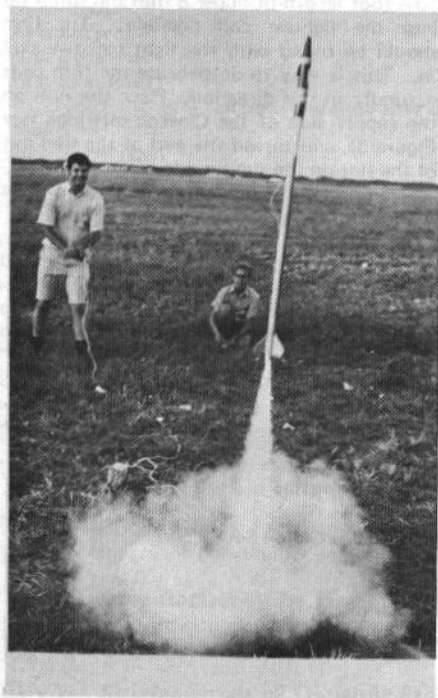
Movies of the bottom of your chute as the rocket descends to earth generally aren't very interesting either. If you attach the chute near the top of the Cineroc (see Figure 1) you will obtain pictures of the ground all the way down. No modification of the camera is required. A 12" chute is sufficient to bring the Cineroc down safely. Anything larger will only cause the camera to drift further away and hamper recovery.

The best launch vehicle is a two-stage rocket constructed from BT-60. You can use the Omega, or design your own bird; but with a two-stage model you obtain a beautiful

film of staging.

An impressive alternate vehicle is a single-stage BT-60 rocket powered by a high-thrust F-engine. While not giving a movie of staging, this vehicle does eliminate the hazard of staging failure. Also the F-powered vehicle will give a much higher and faster climbing flight.

If you want to do an interesting study of flight dynamics on your model rocket airframe, try boat-tailing the Cineroc down to BT-50 size, and fly it on a two-stage BT-50



An F100 powered Cineroc carrier will provide an impressive high-altitude flight. The one shown above was the first launch of a Cineroc in conjunction with a Foxmitter in an attempt to obtain sound movies from the flight.

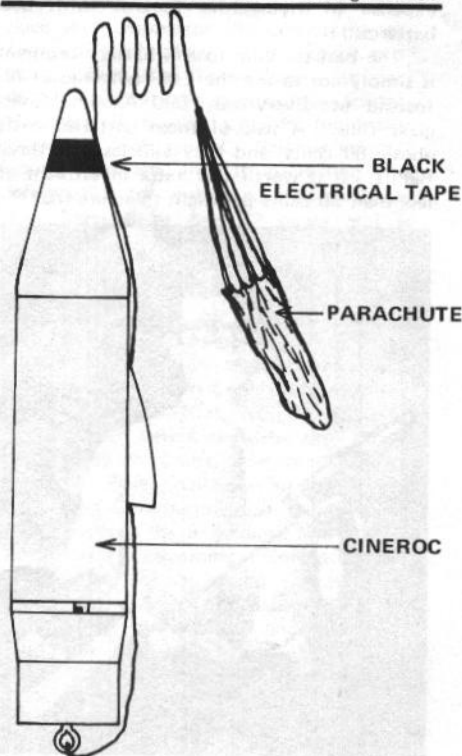


Figure 1. The parachute shroud line can be attached to the top end of the Cineroc in order to give impressive pictures of the ground during the descent.

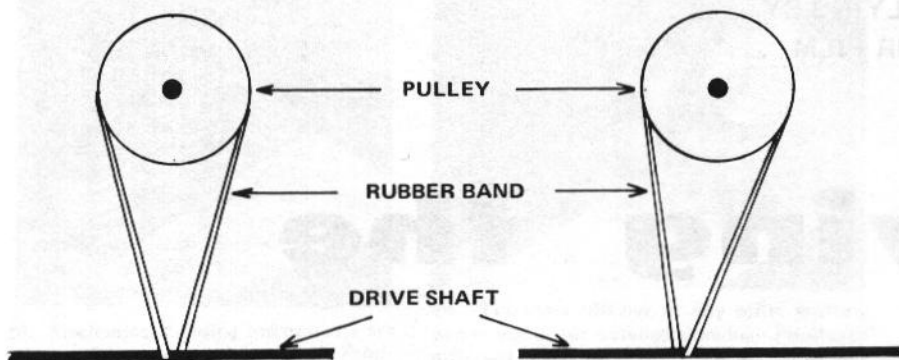


Figure 2. The rubber band must be put on the drive shaft and pulley in the correct direction (illustration at left). If assembled incorrectly (at right) the film will not wind through the camera.

carrier. The movies will show some wild flexing and whipping of the rocket body during thrusting, though the flight will look perfectly normal from the ground.

The Batteries

The batteries which power the Cineroc's electric motor are a continual problem. Estes packs two fresh NEDA type 910 zinc-carbon cells with each film package. These batteries will provide good results for one cartridge of film on a warm day if they are not too old. Unfortunately these batteries have a shelf life of only three months, and you have no way of knowing how long they have been sitting on the dealer's shelf before you bought them. (Perhaps Estes should mark an *expiration date* on each film package to allow rocketeers to avoid the disappointment and expense of flying the Cineroc with bad batteries.)

The best solution to this battery problem is simply not to use the Estes batteries at all. Instead use Eveready E90 Alkaline Energizer cells. A pair of these batteries costs about 80 cents, and they will last for three flights. It is worth this extra investment of less than 30 cents per flight to assure that the

expensive Cineroc film will be properly exposed. Furthermore, these batteries will work to much lower temperatures than the Estes ones, making it possible to shoot movies in any weather a reasonable rocketeer would be out in. (One word of caution, the Eveready E90 batteries have the opposite polarity of normal batteries. The plus side is on the bottom of the battery, not the top, and the batteries must be put in the Cineroc exactly opposite to the drawing in the instructions.)

Rubber Band Drive

The Cineroc uses a rubber band and pulley as a constant torque drive system for the take-up spool of the film cartridge. When there is only a small amount of film on the take-up side of the cartridge the spool will revolve quickly, however when the spool has a lot of film on it, towards the end of flight, the rubber band slips and the spool revolves more slowly.

When assembling the take-up system be sure to thread the rubber band so that the pulley rotates counter-clockwise. If it is hooked up backwards (see Figure 2) the take up spool will rotate backwards, no film will be wound up, and the film cartridge will jam after about 5 seconds. Also be sure that the rubber band contains no twists and that the teflon washer is on the correct end of the drive shaft, or the rubber band will slip excessively and the film will jam.

Loading Your Own Film

Estes sells film and developing for the Cineroc at \$6.75 per flight. This price pushes the upper limit of most rocketeers' budgets,

and you can realize a substantial saving by loading and processing your own film, especially if you plan a large number of flights.

Fast processing of the exposed film is another reason for doing your own processing. At last year's Pittsburgh Spring Convention a Cineroc film from the sport launch was shown to participants only two hours after the flight. You can't get that kind of turn-around time from any commercial processor.

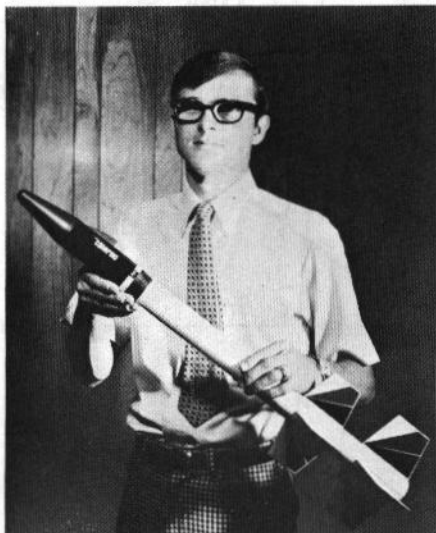
The first step in loading your own film is to obtain an *empty* Cineroc cartridge. Estes will not sell you empty cartridges nor will they return your cartridges to you after processing a roll of your film. (You can't expect them to sell you empty cartridges so you can save money by loading your own film, can you?) Thus, the only way to obtain an empty cartridge is to buy a roll of Estes Cineroc film and process it yourself (following the directions outlined in the next section of this article.)

The film used in the Cineroc is single-width Super 8 film which is available at all photo stores in 50 foot lengths. One 50 foot roll is enough film for *five* Cineroc flights. For black and white movies the film you want is Kodak Super 8 "Tri-X" which sells for about \$2.65. That works out to about 53 cents per flight. For color movies use the new Kodak Super 8 "Ektachrome High Speed 50-105" (ASA 125), which sells for \$3.75 per roll or about 75 cents per flight.

Transferring the film from the Kodak cassette to the Cineroc cartridge *must* be done in *total darkness*. Assemble the necessary materials — an empty Cineroc cartridge, a roll of Super 8 film, a 12" ruler, and a roll of scotch tape — in your darkroom (or closet) and you are ready to begin. Measure out a 10½ foot length of Super 8 film and roll it up into the tightest coil possible. The film should be rolled with the light sensitive side *in*. This is easy to do because the film coils naturally in this direction. Place the film on the supply side of the Cineroc cartridge (see Figure 3), and thread the end of the film out of the slot on the supply side of the cartridge.

Temporarily tape the cover back on the Cineroc cartridge, then turn on the lights. Check that the perforated holes of the film are on the bottom side of the cartridge and that the lighter colored side of the film is facing out. If the perforations are wrong the wrong end of the film is at the center of the coil. Try again!

Once the film is oriented properly in the cartridge a hole should be punched at the



Mike Dorffler, designer of the Cineroc, examines one of the early production versions. The Estes two-stage BT-60 Omega vehicle makes an ideal Cineroc carrier.

Table One
Suggested Darkroom Supplies

Superior Powdered Black and White Reversal Chemicals, ½ Gallon Set	\$ 3.25
Super 8 Daylight Tank (may be used in normal light)	\$24.50
or	
Junior Deluxe Super 8 Tray (must be used in total darkness)	\$12.95
Chemical Thermometer	\$ 1.50
16 ounce beaker	\$.80
Stirring Rod	
5 half gallon plastic bottles	

The above are available from Superior Bulk Film Company
442-450 North Wells Street
Chicago, Illinois 60610

Write for their 64 page catalogue of home movie supplies.

THREE NEW ROCKETRY BOOKLETS

Just off the presses at Estes Industries, Penrose, Colorado, are three new brochures which thoroughly cover all aspects of model rocketry as an educational tool and as an exciting club activity. The new brochures—*Aerospace Education and Model Rocketry*, *Space Age Technology*, and *Guide for Aero-Clubs*—were prepared and printed at the Estes plant in Penrose.

Aerospace Education and Model Rocketry is an educator's guide for teachers of grades four through ten. It was written by Daniel F. Saltrick, principal of Surrattsville Elementary School in Prince George's County, Maryland, and Alfred M. Kubota, acting principal of Chillum Elementary School, also in Prince George's County. Both men have an extensive background in aerospace education, and Kubota is advisor to the Cherokee Lane Elementary School Rocket Club. The 36-page 8½ x 5½ *Aerospace Education and Model Rocketry* booklet covers model rocketry, suggests further activities to explore our aerospace environment, and outlines continuing activities in the fields of aerodynamics, mathematics, space, and teamwork. Fully illustrated with photos and artwork, *Aerospace Education and Model Rocketry* is available separately (Cat. No. BK-18, price \$1.00) or as part of the Estes Educator's Information Packet (Cat. No. 711-EP-2, price \$2.50) designed specifically to show teachers how they can incorporate model rocketry into their curriculum.

A four-week unit designed to introduce and emphasize the current importance of technology of the space program, *Space Age Technology* is primarily directed at the junior high school. However, it is also suitable for many groups in high school. Science minded young men will find it interesting and informative for individual reading. *Space Age Technology* has 52 pages and is thoroughly illustrated. The 8½ x 5½ brochure has been divided into 11 chapters which cover such subjects as theory of flight, history of jets and rockets, power plants, rocket propulsion systems, guidance and controls, and model rockets. It is available from Estes Industries for \$1.00 a copy. (Cat. No. 711-BK-14.)

The third new Estes Brochure, *Guide for Aerospace Clubs*, was prepared by Dane M. Boles, Director of the Estes Rocketeer Communications Department, and is written for individuals and groups interested in becoming involved in the development of a model rocket club. A 29-page, 8½ x 11 booklet illustrated with many photographs and drawings, *Guide for Aerospace Clubs* covers such topics as launch site operations, workshop activities, club funding, special equipment, aerospace presentations, competition, demonstrations, exhibits, field trips research and developments projects, sponsorships, and club advisors. It can be ordered from Estes Industries for \$5.00 a copy. (Cat. No. BK-19).

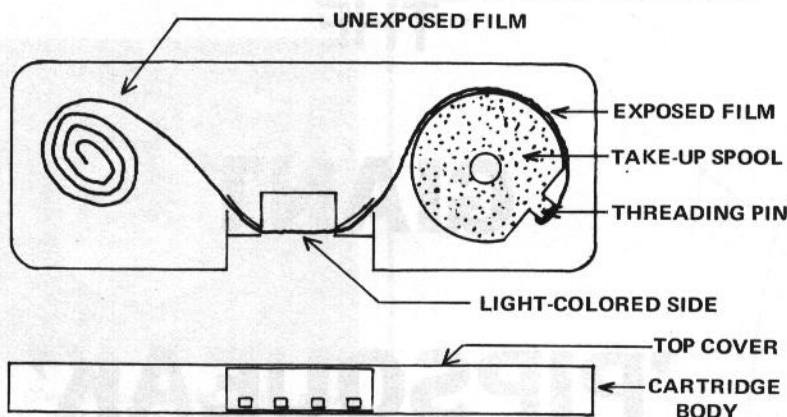


Figure 3. The film is wound into a coil and inserted into the left side of the cartridge. A hole is punched in the end of the film, and it is wound onto the take-up spool.

end of the film. The take-up spool, which should have been removed from the cartridge, has a pin on it. Place this pin through the hole in the film. The lighter colored side of the film should be flat against the spool.

Again in *total darkness* the film cartridge is opened, and the take-up spool should be seated in its grooves on the take-up side of the cartridge. Finally tape the cover back on the cartridge, and your Cineroc cartridge is ready to fly. Believe it or not, the whole loading procedure can be done in four or five minutes. In fact I've done it at the field inside an Estes changing bag.

Black & White Developing

Once you've shot the Cineroc film you must process it. No commercial processing is available for this non-standard film length, and Estes will not process it. You will need some special equipment to process movie film, but the initial investment of \$15 makes possible significant savings (over \$5.00 per flight) on your future Cineroc launchings.

The most inexpensive movie film processing kit available is the *Junior Home Processing Kit* (from ESOS Pictures, Dept. M-8,

(continued on page 39)

Table Two
Typical Color Processing Sequence

Solution	Time (first four steps in total darkness)	Total Minutes
Prehardener	3 min.	3
Neutralizer	1	4
First Developer	7	11
First Stop Bath	2	13
<i>(remaining steps may be carried out in dim light)</i>		
Wash	4	17
Color Developer	9	26
Second Stop Bath	3	29
Wash	3	32
Bleach	5	37
Fixer	6	43
Wash	6	49
Stabilizer	1	50
Dry		

MODEL ROCKETRY MAGAZINE TECHNICAL PUBLICATIONS

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(From the Editor, cont.)

teers who are attempting to legalize the hobby in states or localities where rocketry is presently prohibited.

What is needed, however is a *written copy* of the state, county, or local law on model rocketry. A letter by a rocketeer, detailing his impressions of what the law says will do other rocketeers no good should local authorities raise questions about the legality of their activity.

To put together such a "legal handbook," we ask the assistance of all **MRM** readers. Who knows where to find a copy of the law in your state, county, or town better than you do — especially after you have spent days searching it out. Thus, we ask that all **MRM** readers send in a copy of the rules and regulations in your area. For our part, we will make this information available to other rocketeers, and to groups attempting to legalize model rocketry in those areas where it remains prohibited.

Only with the cooperation of our readers in all areas can we put together a *complete* listing of state and local model rocket laws. Please send in copies of the rules in your vicinity to:

"Legal Handbook"
c/o Model Rocketry magazine
Box 214
Boston, MA 02123

(Cineroc Photography, cont.)

47th and Holly, Kansas City, Mo. 64112) which sells for \$10.95. It holds up to 32 feet of film, so you'll have no trouble with the 10½ foot Cineroc length.

Chemicals for processing black and white *reversal* processing are available at many large camera stores. A half-gallon kit, sufficient for about 30 rolls of Cineroc film, is available from ES0-S Pictures for \$3.45. Since each brand of chemicals will have slightly different processing times, follow the directions accompanying your kit. The entire black and white processing time will be about two hours.

Using black and white is advantageous because of its lower film and processing costs. Rocketeers planning R&D experiments should especially consider use of Tri-X film.

Color Processing

For spectacular Cineroc results, color is a must. The Estes film is a special Instrumentation Film made by Kodak. It can be processed in a Kodak E-4 Ektachrome Processing Kit (which sells for \$12.00 in ½ gallon size). The same chemicals can be used to process the Kodak Ektachrome High Speed film. The processing instructions given in the Kodak kit should be followed exactly. Note especially the warnings about contact with some of the chemicals. A list of the processing steps is given in Table 2.

Developing your own Cineroc films is a practical and money saving way of pursuing aerial photography. The major drawback is the initial investment in processing equipment. However once you have processed 10 or 12 rolls of film the cost per roll will be well below that of the Estes processing. The equipment and procedures described in this article will provide consistent and satisfactory results.

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