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Model Rocket Contest Guide

Planning Model Rocket Contests for School-sponsored Clubs and Other Youth Groups

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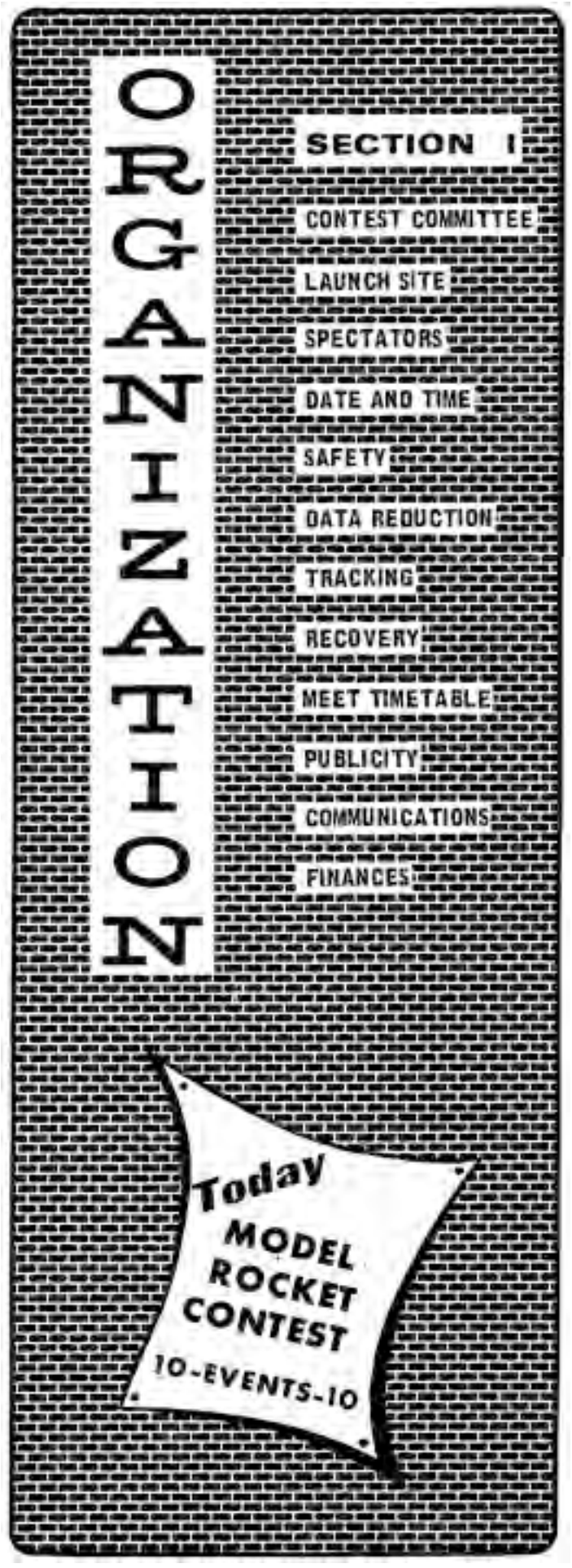
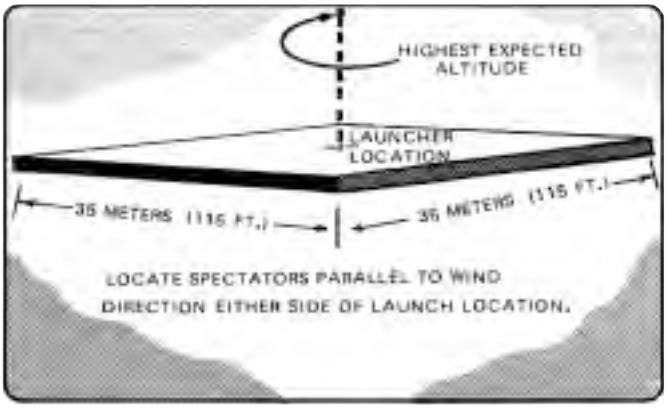


CONTEST COMMITTEE

A contest committee should be organized to plan all phases of the model rocket contest and to supervise all details of the contest. The committee should designate judges to settle any questions of eligibility for contestants, supervise safety inspections of all models before flight, make certain that no tracking team member or scale model contest judge or research and development contest judge tracks or judges his own entry, and settle any disagreements between contestants. It is recommended that the captain of each service team be included on the Contest Committee. (Service teams are teams which are in charge of different aspects of running the contest.)

L AUNCH SITE

The location at which the contest will be held should be selected long before the actual contest. The location should be large enough to provide ample space for the models to return safely using the various recovery systems. Ample space should be provided so that the tracking teams can measure off baselines equal to the highest anticipated altitudes. If this cannot be done, baselines as long as possible should be provided for the maximum possible accuracy in altitude determinations. The area selected should provide a relatively flat launching area with unobstructed visibility to the launching site from the tracking stations.



The launch site for the contest should be at least 35 meters (115 feet) on a side. The launch area's smallest dimension should be no less than one-fourth of the highest anticipated altitude. No launches should take place from less than 10 meters (33 feet) from any edge of the area being used.

Two facilities most often overlooked but important to the comfort of spectators and contestants alike…if the meet is to be an all-day affair.

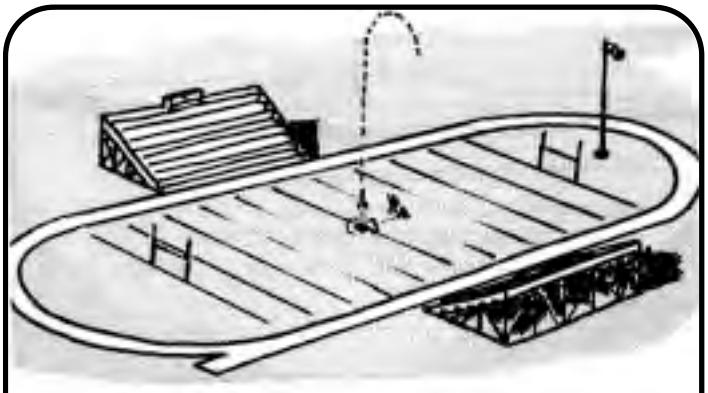
Any potential fire hazards such as dry grass should be taken into consideration in selecting the launching site. If the launching site is on school property, the proper school administrators should be notified well in advance of the planned contest. If school property is not used, permission to use the proposed launch site should be obtained before any publicity about the proposed contest is released.

LAUNCH SITE SELECTION CHECK LIST

SITE	SIZE	LANDSCAPE			FACILITIES		

For those fortunate enough in having more than one launch site available, a check-chart similar to the one shown may be of help in choosing the best possible site for your contests.

It is strongly recommended that the start of the contest be delayed or the contest postponed in the event of winds of over 20 miles per hour or other poor weather conditions occurring at the time the contest is scheduled to start.



School stadiums, football fields, or soccer fields are great places for model rocket contests.

SPECTATORS

Provisions should be made to direct the spectators if many are expected. This includes roping off or in some way controlling access to the actual launching area. Only one entrance into the launch area should be provided. Someone should be at this entrance at all times to permit only authorized contestants and officials to enter.

A designated place should be provided for parking, and traffic controllers should be stationed if the meet is to be a large one.

COMMITTEE ASSIGNMENT

Team _____

Capt. _____

Crew	Duties
1	
2	
3	
4	
5	
6	
7	
8	

Relief Crew	Duties
1	
2	
3	
4	
5	
6	
7	
8	

(A form similar to the one above will serve the committee well in setting up the many functions, which make a contest progress smoothly. It is suggested that the basic form be drawn up with space for inserting the name of the team, then be printed or duplicated. The specific team name may be hand lettered onto as many sheets as needed.)

Trained students, possibly with adult assistance, should be in charge of crowd control and parking (if necessary). Persons appointed by the Contest Committee should perform these functions.

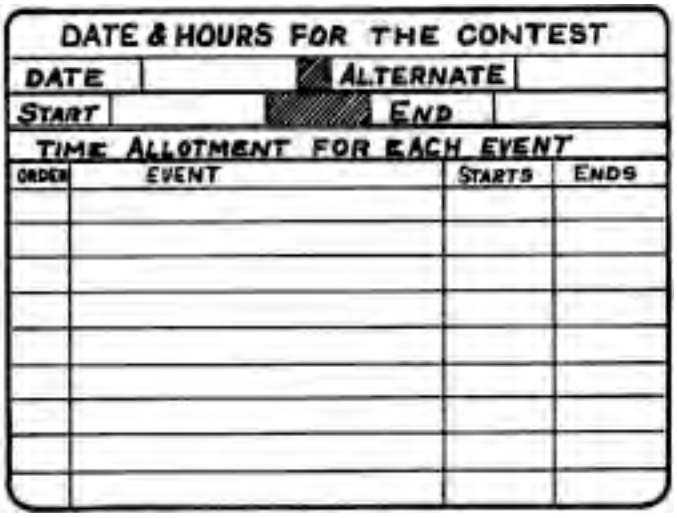
DATE & TIME

The date and time of the model rocket meet should be carefully selected. If necessary a time may be selected outside of school hours. If more than one school is involved, it is possible that the schools represented by the contestants might excuse the contestants to attend the contest if the school officials are properly contacted in advance. Often a school will allow the students in all interested classes to attend the meet.

Contests between clubs which are not school-sponsored should probably be held on weekends. The date and time selected should not be in conflict with a previously scheduled activity which many of the prospective contestants would like to attend.

Announcements about the contest should indicate that the contest would be postponed in the event of bad weather. It is strongly recommended that the start of the contest be delayed or the contest postponed in the event of winds of over 20 miles per hour or other poor weather conditions occurring at the time the contest is scheduled to start.

A timetable for the events in the model rocket meet should be carefully worked out before details of the contest are announced to the public. It is better to schedule too few events and allow each contestant two flights than to try to hold far too may events resulting in haste, confusion, and frustration.



DATE & HOURS FOR THE CONTEST

DATE		ALTERNATE	
START		END	

TIME ALLOTMENT FOR EACH EVENT

ORDER	EVENT	STARTS	ENDS

SAFETY

Model rocket contests are no more hazardous than other sport activities customarily engaged in by school students. The safety record achieved by model rocketeers is outstanding. However, adequate accident insurance for property damage and personal liability should be considered for the school and/or members of the sponsor group. Currently, over 300 million model rockets have been launched. No serious model rocket-caused accidents have been reported. Sponsoring groups not having suitable personal liability and property damage insurance should investigate securing coverage through a local agent or through the National Association of Rocketry.*

Every contestant and every official, whether adult or youth, should be provided with a copy of the Model Rocket Safety Code and should faithfully follow the safety rules outlined in this code.

Trained members should perform a safety check on *each* model rocket for correct engine selection, secure engine mounting, proper igniter and plug installation, good parachute and wadding packing, aerodynamic stability, structural strength, and make certain that the nose cone is sufficiently loose for easy parachute ejection on a parachute model before it is allowed onto the launch equipment.

Only standard model rocket engines will be allowed. Limitations may be placed on the engine types allowed if done before the contest and if the limitations are clearly specified in the announcements about the meet. All launchings shall be made using electrically operated igniters.

** The national model rocket contest organization is the National Association of Rocketry, PO Box 177, Altoona, WI 54720. Persons or groups interested in competition of a regional basis should investigate membership in this organization.*

MODEL ROCKET SAFETY CODE

1. Materials - My model rocket will be made of lightweight materials such as paper, wood, rubber, and plastic suitable for the power used and the performance of my model rocket. I will not use any metal for the nose cone, body, or fins of a model rocket.
2. Motors/Engines - I will use only commercially-made NAR certified model rocket engines in the manner recommended by the manufacturer. I will not alter the model rocket engine, its parts, or its ingredients in any way.
3. Recovery - I will always use a recovery system in my model rocket that will return it safely to the ground so it may be flown again. I will use only flame resistant recovery wadding if required.
4. Weight and Power Limits - My model rocket will weigh no more than 1,500 grams (53 ounces) at liftoff, and its rocket engines will produce no more than 320 Newton-seconds (4.45 Newtons equal 1.0 pound) of total impulse. My model rocket will weigh no more than the engine manufacturer's recommended maximum liftoff weight for the engines used, or I will use engines recommended by the manufacturer for my model rocket.
5. Stability - I will check the stability of my model rocket before its first flight, except when launching a model rocket of already proven stability.
6. Payloads - Except for insects, my model rocket will never carry live animals or a payload that is intended to be flammable, explosive, or harmful.
7. Launch Site - I will launch my model rocket outdoors in a cleared area, free of tall trees, power lines, buildings, and dry brush and grass. My launch site will be at least as large as that recommended in the following table.

LAUNCH SITE DIMENSIONS

Installed Total Impulse (Newton-Seconds)	Equivalent Engine Type	Minimum Site Dimension Feet	Meters
0.00 - 1.25	1/4 A & 1/2 A	50	15
1.26 - 2.50	A	100	30
2.51 - 5.00	B	200	60
5.01 - 10.00	C	400	120
10.01 - 20.00	D	500	150
20.01 - 40.00	E	1000	300
40.01 - 80.00	F	1000	300
80.01 - 160.00	G	1000	300
160.01 - 320.00	2Gs	1500	450

8. Launcher - I will launch my model rocket from a stable launch device that provides rigid guidance until the model
rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so the end of the rod is above eye level or I will cap the end of the rod when approaching it. I will cap or disassemble my launch rod when not in use, and I will never store it in an upright position. My launcher will have a jet deflector device to prevent the engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, or other easy-to-burn materials.
9. Ignition System - The system I use to launch my model rocket will be remotely controlled and electrically operated. It will contain a launching switch that will return to "Off"" when released. The system will contain a removable safety interlock in series with the launch switch. All persons will remain at least 15 feet (5 meters) from the model rocket when I am igniting model rocket engines totaling more than 30 Newton-seconds of total impulse. I will use only electrical igniters recommended by the engine manufacturer that will ignite model rocket engines(s) within one second of actuation of the launching switch.
10. Launch Safety - I will ensure that people in the launch area are aware of the pending model rocket launch and can see the model rocket's liftoff before I begin my audible five-second countdown. I will not launch a model rocket using it as a weapon. If my model rocket suffers a misfire, I will not allow anyone to approach it or the launcher until I have made certain that the safety interlock has been removed or that the battery has been disconnected from the ignition system. I will wait one minute after a misfire 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 (30 kilometers) an hour. I will not launch my model rocket so it flies into clouds, near aircraft in flight, or in a manner that is hazardous to people or property.
12. Pre-Launch Test - When conducting research activities with unproven model rocket designs or methods, I will, when possible, determine the reliability of my model rocket by pre-launch tests. I will conduct the launching of an unproven design in complete isolation from persons not participating in the actual launching.
13. Launch Angle - 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 powerline or other dangerous place, I will not attempt to retrieve it.

RANGE SAFETY OFFICER

The Range Safety Officer is a well-qualified youth or adult who keeps constant check on the launch sites, the spectators, the weather, the recovery area, the tracking teams and all other areas which are involved in the launch to be certain that no unsafe activity is permitted. He makes certain that all rockets placed on the launcher have passed inspection by the Safety Inspection Team. He calls an immediate halt to launch operations if any unsafe conditions develop and does not permit launching to resume until the problem is solved.

LAUNCH CONTROL OFFICER

The Launch Control Officer is in complete charge of all operations. Everyone operates under his directions. He always checks with the Range Safety Officer before permitting launches. He may personally press the launch switch for each launch, may supervise the contestant pushing the launch switch, or may designate a Firing Officer to do the actual launching.

TRACKING - DATA REDUCTION

If altitude events are to be flown, one of the most important things to consider is the provision of an adequate number of competent, trained trackers and data-reducers to staff the tracking teams and to run the data-reduction tables. Enough personnel should be provided to allow rotation of staff so no one has to remain on duty all morning or all afternoon. Data-reduction consists of computing the altitudes reached from the information provided by the trackers and accurately recording this and other data for each flight by a member of the Data -Reduction Team. It is recommended that an adult supervise the data reduction.

RECOVERY

To return the model rockets to the launch area, the recovery team should have plenty of members available who are well scattered throughout the recovery area.

RECOVERY TEAMS	
CAPTAIN	
STARTING CREWS	RELIEF

TIMETABLE

After selection of the different types of contests to be held during the meet, the timetable for the meet should be *carefully* worked out. Refer to the CONTEST EVENTS part of this publication for a list of possible contest events.

PUBLICITY

After *all* details for the contest have been arranged, publicity should be released giving exact time and

TIMETABLE OF EVENTS		
EVENT	STARTS	ENDS

place of the model rocket meet and information about the events and qualifications for entrants and model rockets. Entry forms, a list giving qualifications for contestants and model rockets, and an information sheet giving pertinent information need by prospective contestants should be duplicated for distribution to all interested persons. A note on the information sheet about postponement in case of bad weather is a good idea. If decided upon in advance, a new date for the contest in case of postponement might be given. The instructions and rules for the model rocket meet should specify that safety inspections will be performed by qualified persons on *each* model rocket before it is allowed to launch in any contest event.

PUBLICITY TEAM	
TELEVISION	
CREW	
RADIO	
CREW	
NEWSPAPERS	
CREW	
SCHOOLS	
CREW	

The publicity releases should be given to newspapers, radio and television stations, and exhibited on school bulletin boards and neighborhood bulletin boards (where available). Publicity releases should be distributed weeks before the actual contest is held. A list of available publicity channels should be prepared and used.

PUBLICITY RELEASES TO GO TO:

TV STATIONS

RADIO STATIONS

NEWSPAPERS

SCHOOLS - BULLETIN BOARDS

LAUNCHERS

A number of qualified students should be selected and trained long before the day of the contest to test all of the launchers used and to rig new ones if necessary. (The ESTES publication Model Rocket Launch Systems is an excellent training aid for those handling the launching.) It is recommended that only a12-volt system be used. A fully -charged car battery is excellent.

A special launcher may be constructed using a number of launching rods on one base, and utilizing a switching mechanism to allow a single power supply to operate each of a row of launchers in sequence. If a drag race is held, a pair of launchers can be wired to the same switch for simultaneous ignition.

The students caring for the equipment should check to make certain that adequate equipment is available for all needs, that all equipment is in proper working condition, and the power supplies are all fully-charged. This team sets up and tests all equipment well before the official time for the contest to start.
The equipment testing should include a test of the power supply to be certain adequate electrical current is available, and test of each circuit to be certain the launch control equipment is wired properly to supply adequate current to each launcher when the launch button for that launcher is pressed. Make sure that no current reaches the clips when the safety key is off. In addition, all launchers should be checked to be certain that they are firmly placed so they will not slip or move about accidentally. The tips of all launch rods should be above eye level. All connecting cables should be placed where they are not likely to be stepped on or tripped over.

COMMUNICATIONS

A two-way communication system between the data-reduction team and the tracking stations is very helpful. This system is especially advantageous in permitting more accurate synchronization of maximum altitude readings. If possible, the launch control site should be on the communication system; if not, possibly the tracking teams can hear the countdown procedure before each launch. Hopefully, the countdown and other pertinent information will be given over a public address system. If neither the two-way system nor the PA is available, a system of hand or flag signals can be used to alert trackers just before each launch.

FINANCES

An entry fee may be charged for each contestant. Entry fees can be charged for each entry of a model rocket in the contest, rather than for a contestant. No entry fee of any kind need be charged if the funds available to the sponsoring group are adequate to pay for all expenses, including prizes. If an entry fee is charged it might pay for a specified number of rocket engines and igniters.

One of the planning committee members can be placed in charge of issuing the engines and keeping track of whom has received the engines.

Do not be discouraged if you find it difficult to secure sponsors and finances for your first model rocket contest. The first time is the hardest. Once others have seen that you can put on a safe, successful contest, they will be more willing to support your efforts for future contest with their time, energy, money, and public endorsement.

Such school or school-oriented organizations as Student Councils, Science Clubs, Quarterback Clubs, Parent-Teacher Associations, and other similar groups will sometimes provide money and other assistance for model rocket contests.

Occasionally, when a model rocket contest involves a great many youngsters and parents, a printed program can be provided. Advertisements on this printed program can be sold as a source of additional income.

Please do not expect Estes Industries to donate prizes. Much as we would like to do this, the number of contests worthy of this support makes it impossible for us to donate suitable prizes.

MAXIMUM ALTITUDE

In the Maximum Altitude Contest, the contestants attempt to send their model to the highest altitude possible.

Normal countdown and launch procedures are followed for events of this type. To make the contest fair, the single stage model rockets should use the same type of model rocket engines (engines of the same total impulse classification).

If a sufficient number of model rockets are entered, a heat (one set of rockets placed on the launching pads at one time) of similar model rockets might be launched in series.

If desired and if time permits, a series of altitude contests may be conducted, each using a different class of total impulse rocket engines.

All model rockets in a particular contest are required to use rocket engines of the same total impulse classification. Each contestant, however, is permitted to choose a rocket engine with his choice of time delay to ejection.

A standard payload (usually a standard one-ounce weight) might be required for all models in one altitude event. This event would be open only to rockets with a payload compartment. The one-ounce weight or a similar standard payload could be carried by each rocket. Payload events are usually conducted as a separate contest event.

For events using two-stage rockets, similar rocket engines should be used for each model rocket entered. The lower stage engines would be ones using no delay. The same rules apply to three-stage rockets.

Rockets containing cluster of rocket engines should be limited to the same total impulse when in competition with other models for maximum altitude.

PARACHUTE DURATION

The most common type of duration contest is the event using model rockets employing parachute recovery systems. In this contest the entrants try to construct model rocket and parachute combinations which will remain in the air for long periods of time. The winner of this contest is the rocket which remains in the air the longest time after the instant of engine ignition.

Should a model rocket drift out of sight, the official time ends at the time the rocket drifts out of sight. At least one timer using a stopwatch or a watch with a sweep second hand is necessary. Having several official timers is desirable as the results from each (timer) can be averaged to provide a more accurate time for each flight, from the moment of ignition to the moment the rocket touches the ground. Having several qualified timers will allow several model rockets to be in the process of descent at the same time if each timer observes a different model rocket. Use of engines of a too high total impulse classification may result in many model rockets being lost because they drift out of sight before returning to the ground. Another hazard to be avoided whenever possible is loss of model rockets to one of the famous RETs ("Rocket Eating Trees").

The requirement that all rocket engines be of the same total impulse classification is suitable. All rockets may be required to be of the same type, but this is not essential and often is not practical.

Contests using two or three stage rockets or even cluster model are possible. Any time more than one engine is permitted in a model, a limit should be set on total impulse allowed. The contestants can use any set of engines as long as the sum of the total impulses of the engines does not exceed the limit.

GLIDE DURATION

The goal in this contest is to make model rockets using a glide recovery system which will stay in the air as long as possible. Design improvements and finishing skills are constantly sought to make gliders which will stay in the air longer than the other entries.

The model rockets entered in glide duration contests are called boost-gliders. They take off vertically or nearly so in the normal manner for model rockets (the boost phase of the flight). However, these model rockets return to the ground by gliding through the air (the glide phase of the flight). Skill in building model airplanes or model gliders helps a model rocketeer build better entries.

Three main types of boost-gliders exist. These are the front-engine boot glider, the rear engine boost glider and the pop-pod boost glider. As the name suggests, the front engine boost glider has the model rocket engine mounted near the front. The rear engine type has the model rocket engine mounted near the rear, and the pop-pod type has the engine mounted in a fairly typical model rocket (the pop-pod) which drops off at the top of the flight when the glider is detached. The parachute contained in the pop-pod returns the rocket portion of the vehicle gently to the ground.

All model rocket gliders entered in the contest should use engines of the same total impulse classification. However, open contests are possible in which the more powerful rocket engines may be used. The possibility exists, however, that a model rocket boost glider might not take the stress of the powered flight with larger engines. Also, the higher the glider is when it starts its descent, the greater the chance of losing it, because it glides out of sight.

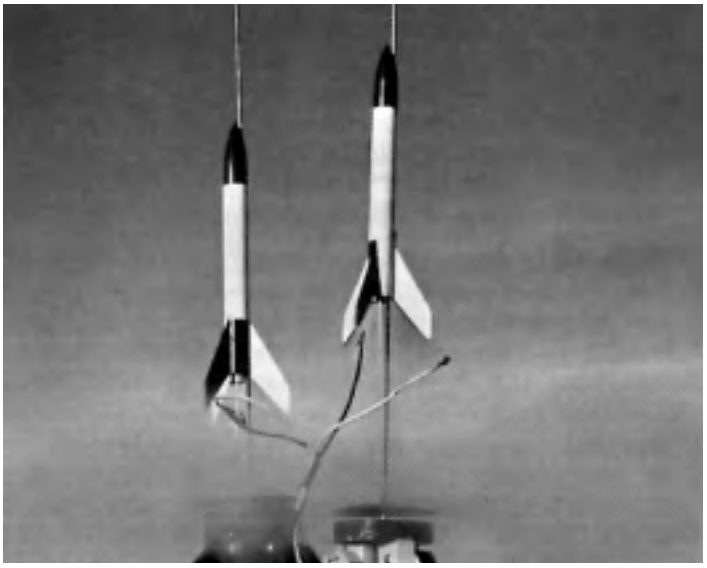
DRAG RACE

In this event, two model rockets are launched simultaneously. One point is awarded for the rocket first achieving motion at launch. One point is awarded for the rocket reaching the lowest altitude. One point is awarded to the rocket reaching the ground last. Each rocket must return by a safe recovery system which deploys at an altitude of at least 50 feet.

A countdown is used before launching and both launch buttons are pushed simultaneously on the launch command. Pushing the launch button prematurely disqualifies the rocket. To insure greater accuracy of timing for the ignition, a device might be made which will make the electrical connections to both launchers simultaneously thus eliminating human error in timing when pushing the launch buttons. Several devices may be used. One of the easiest to make may be constructed by rewiring two Electro-Launches to a double-pole, single throw or a double-pole, double-throw switch.

The rockets should use the same type of rocket engine. Whether or not the rockets competing with each other are the same type of model is left to the judgement of the contestants and judges.

Each tracking team for this contest must be certain that it accurately tracks the rocket to which the team has been assigned.



SPOT LANDING

A selected landing point is marked (as with a flag), and the winner is the rocket which lands closest to the selected spot. Only rockets using a safe recovery system are permitted. The recovery system must become operational at an altitude of at least 50 feet. The launching rod may not be adjusted to an angle of more than 30 degrees from the vertical. This contest requires launching rods which can be adjusted for angle of launch. Adjustable rods are desirable for any event.

SET ALTITUDE

Contestants try to cause their rockets to reach a pre-selected altitude. Careful consideration must be given to selecting the right model rocket engines. Any rocket using a safe recovery system is permitted.

Previous experience is very helpful for rocketeers in selecting the proper rocket engines. The tracking teams and data-reduction team must be very careful when working on these contests. The difference between the set altitude and the altitude reached by the rocket is used to determine the winner. The winner is the model rocket whose achieved altitude is closest to the prediction selected and announced in advance by the Contest Committee. It makes no difference whether the altitude reached is above or below the set altitude.

A variation on this contest is an event wherein each contestant predicts and announces the altitude his rocket will reach before it is launched. Judging is based on whose rocket has the least percentage of error from its predicted altitude. This percentage error is found by dividing the actual error by the predicted altitude.

PAYLOAD HANDLING

This type of contest requires well-built model rockets, wise selection of engines, skill in properly packing the payload, careful handling of all steps in the rocket preparation, launching and recovery operations and careful balancing of the

rocket for proper placement of the center of gravity. Original designs and multi-stage rockets are permitted.

The purpose of this type of contest is to safely carry specific objects as high as possible as payloads on model rockets. This contest requires model rockets which can copy in miniature the launches of instrumented high-altitude sounding probes and of satellites.

A standard payload used is the one-ounce weight. Careful balancing of the model rocket is necessary for proper performance during the powered phase of the flight. The eight must be secured in place before balancing to insure that the weight will not shift, thus changing the rocket's center of gravity. The payload must be removable.

A more difficult payload sometimes used in a special event is a raw chicken egg. The eggs used in the different rockets should be of the same size and weight. Any egg which is found cracked or broken when the rocket is recovered disqualifies the flight. Great care is need in handling this payload to prevent damage to the egg. A medium size egg is commonly used.

Whatever point system is selected for judging should be determined and announced before the contest begins. The highest successful flight might be the winner. More elaborate contests are possible. For example, points might be awarded for altitude achieved, flight duration, closeness of model rocket's landing to a pre-determined spot and nearness of maximum altitude achieved to a previously announced altitude.

SCALE

Entries in this contest must be actual scale models of existing or historic full-sized rockets. Points are awarded for each category of craftsmanship - accuracy of scaling (each contestant is responsible for providing dimensions and detains of the original full-size rocket as well as detailed plans of his model), smoothness of finish, painting, etc. Points are also awarded for flight performance. Flight performance points are usually based upon altitude achieved. The points for altitude achieved MAY be "weighed" based upon the total impulse classification of the engine used to favor smaller engines. In other words, the altitude reached by a rocket using a 1/4A engine could be multiplied by 4; the altitude achieved by a rocket using a 1/2A engine could be multiplied by 2; the altitude achieved by a rocket using an A engine could be multiplied by 1; the altitude achieved by a rocket using a B engine by 0.5; etc. All of the scoring categories and the system for awarding points should be decided upon and announced in advance. Well-qualified judges are necessary for this contest.

To simplify judging, it is possible to require that each entrant build a model of the same rocket. In a case like this it is important to notify everyone well in advance to give all contestants a fair chance to obtain the model kit or parts and build it.

CRAFTSMANSHIP

This contest is open to all model rockets except those made from kits of pre-formed plastic parts. The judging is based upon the skill with which the rocket was made as evidenced by properly shaped and sized finds, strength and smoothness of joints, smoothness and attractiveness of painting and decoration, beauty of the finished model, etc. Each model must be flown after judging and before announcement of the judges' decision. Any rocket failing to perform safely and properly is disqualified from the contest before the judges' decisions are announced. Well-qualified judges with model rocketry experience and a good appreciation for artistic beauty are suggested for this contest.

RESEARCH & DEVELOPMENT

This is the most flexible of all the divisions as far as the types of entries accepted. Specified categories might be set up in advance to make judging less difficult.

New designs, new techniques, the results of data collecting experiments, well-constructed displays illustrating important scientific principles involved in model rocketry or relating a fact or theory pertinent to model rocketry or similar projects are acceptable material for entries.

The best-qualified judges available should be utilized for this event. No judge for this contest may have an entry in this contest.

Possibly a stipulation may be made in advance that no prizes need be awarded and/or multiple prizes may be awarded at the discretion of the judges.

CHAMPION ROCKETEER OF THE MEET

This prize, when awarded, will go to the contestant accumulating the most points during the meet. The number of events in which a contestant must compete to qualify for competition for this award must be announced in advance. Competition in an event is considered to be a successful flight (not disqualified for any reason) even though the flight may not have received a prize in that event. The point system for the first place, second place, third lace, etc., and for participation in each event should be announced in advance. Of the contestants successfully completing the required number of events, the contestant accumulating the most points is the winner. The award presented for this should be the nicest of the awards presented.

Use only those suggestions from this publication which you need. Many successful model rocket meets consist of only one or two of the contests mentioned.

Other types of contests may be held. The imagination of the organizing group is the major factor in determining which contest may be held. The Estes Guide for Aerospace Clubs contains additional ideas for contests.

The following pages provide suggestions for two of the forms which can be used by contest judges.

Model Rocket FLIGHT DATA SHEET

Published as a service to it's customers by Estes Industries.
1295 H Street, Penrose, CO 81240

NAME

ADDRESS

CITY STATE

ZIP

Use one flight data sheet for each model. Four flights may be recorded on each sheet

PREFLIGHT INFORMATION

Rocket Name	Nose Cone Type
Rocket Number	Fin Type
Date Completed	No. of Fins
Type of Rocket	Color Scheme
No. of Stages	Weight Empty

COUNTDOWN CHECKLIST

Feather-weight or Tumble

Flight #1 Flight #2 Flight #3 Flight #4

☐☐☐☐ **10)** Fit the engine in the body tube carefully so that the recovery system will function properly.

☐☐☐☐ **9)** Install an igniter in the engine.

☐☐☐☐ **8)** Place the rocket on the launcher. Clean and attach the micro-clips.

☐☐☐☐ **7)** Clear the area, check for low flying aircraft, alert recovery crew and trackers.

☐☐☐☐ **6)** Arm the launch panel.

☐☐☐☐ **5)**

☐☐☐☐ **4)**

☐☐☐☐ **3)**

☐☐☐☐ **2)**

☐☐☐☐ **1)**

☐☐☐☐ **LAUNCH!**

Boost-Glide

Flight #1 Flight #2 Flight #3 Flight #4

☐☐☐☐ **12)** Check payload section (if used) and slide it into position.

☐☐☐☐ **11)** Set trim adjustments for desired flight path and for existing weather conditions.

☐☐☐☐ **10)** Check engine for proper fit in body tube.

☐☐☐☐ **9)** Install an igniter in the engine.

☐☐☐☐ **8)** Place the rocket on the launcher. Clean and attach the micro-clips.

☐☐☐☐ **7)** Clear the area, check for low flying aircraft, alert recovery crew and trackers.

☐☐☐☐ **6)** Arm the launch panel.

☐☐☐☐ **5)**

☐☐☐☐ **4)**

☐☐☐☐ **3)**

☐☐☐☐ **2)**

☐☐☐☐ **1)**

☐☐☐☐ **LAUNCH!**

Parachute or Streamer

Flight #1 Flight #2 Flight #3 Flight #4

☐☐☐☐ **12)** Pack flameproof recovery wadding into the body tube. Insert the parachute or streamer.

☐☐☐☐ **11)** Install the nose cone or payload section. Check condition of the payload (if any).

☐☐☐☐ **10)** Apply enough masking tape to the engine(s) for a tight friction fit in the body tube(s). When launching a multi-stage rocket be sure that the engines are in their proper relative positions and that a layer of cellophane tape is wrapped tightly around each engine joint.

☐☐☐☐ **9)** Install an igniter in the engine.

☐☐☐☐ **8)** Place the rocket on the launcher. Clean and attach the micro-clips.

☐☐☐☐ **7)** Clear the area, check for low flying aircraft, alert recovery crew and trackers.

☐☐☐☐ **6)** Arm the launch panel.

☐☐☐☐ **5)**

☐☐☐☐ **4)**

☐☐☐☐ **3)**

☐☐☐☐ **2)**

☐☐☐☐ **1)**

☐☐☐☐ **LAUNCH!**

LAUNCH

Flight Number		Flight #1	Flight #2	Flight #3	Flight #4
Date of Launch					
Launch Location					
Payload	Description				
	Weight				
Recovery System	Type				
	Color				
Engines	1st Stage	/	/	/	/
No. of / Type	2nd Stage	/	/	/	/
	3rd Stage	/	/	/	/
Total Weight					
Method of Launch					
Launch Angle					
Predicted Altitude					

WEATHER

Wind Direction				
Wind Velocity				
Humidity				
Temperature				
Visibility				
Remarks				

FLIGHT DATA

Altitude	Estimated				
	Tracking Information				
	Computed Alt.				
Flight Duration					
Stability Information					
Flight Performance					

INDIVIDUAL EVENT SCORE SHEET

Contest Name _____

Place Held _____ **Date** _____ **Time** _____

Entries			Qualifiers		
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		

Judging Staff

1	6
2	7
3	8
4	9
5	10

CONTEST WINNERS

PLACE	NAME	ADDRESS	NO. OF POINTS	

Weighing Factor _____

For use in determining Champion Rocketeer of the meet