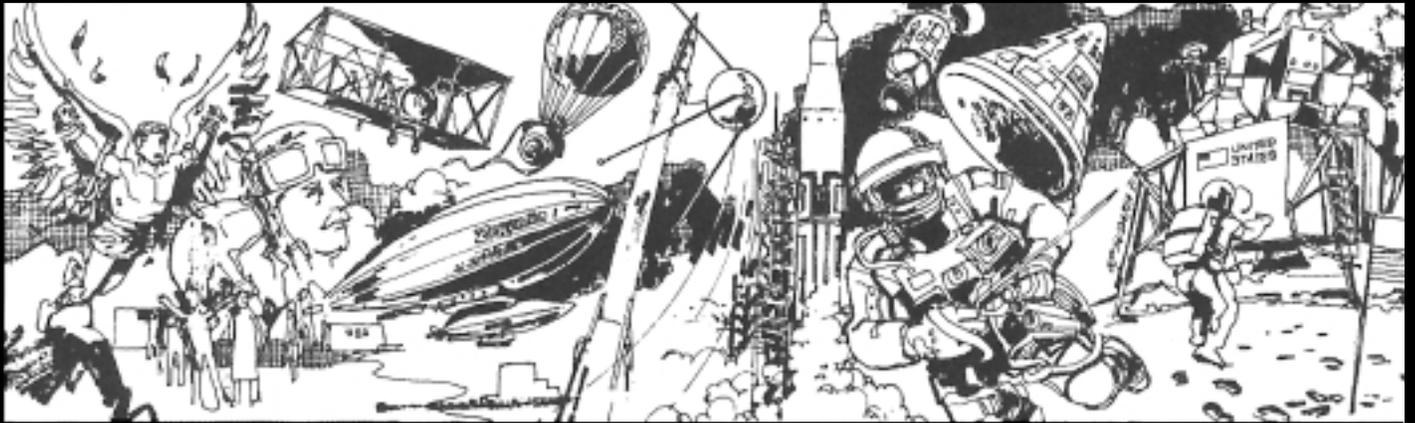
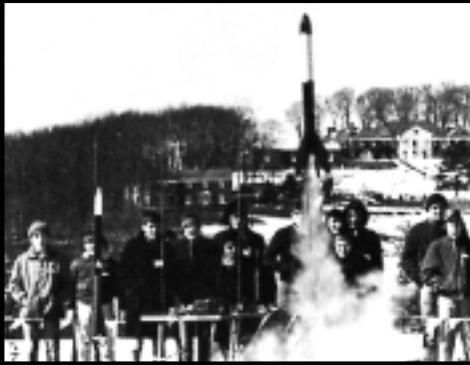


GUIDE FOR AEROSPACE CLUBS



ESTES INDUSTRIES
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ESTES INDUSTRIES
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By Dane Boles
Edited by Ann Grimm

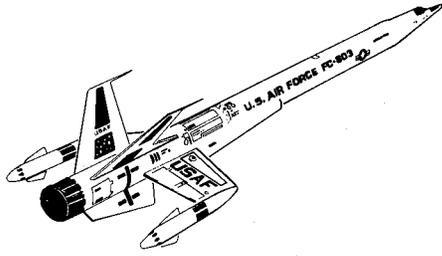
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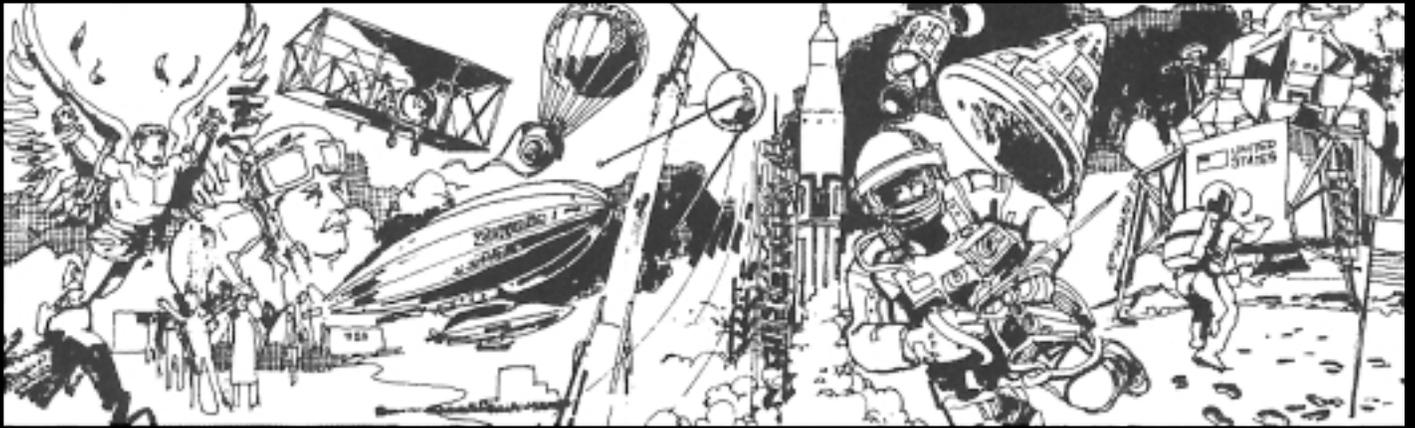
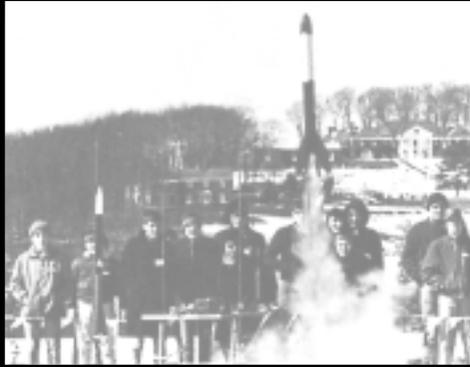
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SECTION I

Why Form A Club?



Model Rocketry is the world's fastest growing educational-scientific hobby and sport. The tremendous public interest in our nation's Space Program has created a wave of enthusiasm in model astronautics resulting in the formation of thousands of model rocket clubs across the nation.

Model rocket clubs offer many opportunities normally not available to individual rocketeers. Unlimited educational and recreational activities are available to club members who work together in an atmosphere of team cooperation. A club environment permits the sharing of ideas and the opportunity to engage in projects beyond the resources or abilities of a single person.

The skills and expertise of individuals in such varied areas as model construction and finishing, electronics, mathematics, aerodynamics, physics, drafting, woodworking, writing and leadership can be available to all club members for the carrying out of the highest quality research and development projects. The club situation tends to promote individual creativity and competitive sportsmanship. In addition to sharing their knowledge, club members are able to pool their resources to develop a fully equipped

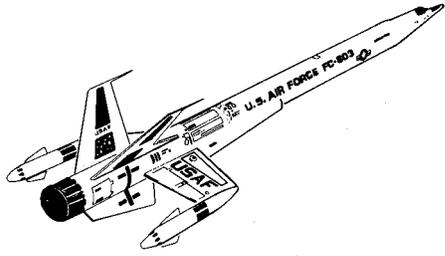
launch site to outfit a club laboratory or workshop.

POTENTIAL ACTIVITIES

The organization of a club provides an unparalleled opportunity to participate in a variety of events. Potential club activities include sport-flying launches, various types of contests, research and development projects and workshops. Field trips, conferences, aerospace films, guest speakers, educational activities, special presentations, demonstrations and exhibits are also available to organized clubs.

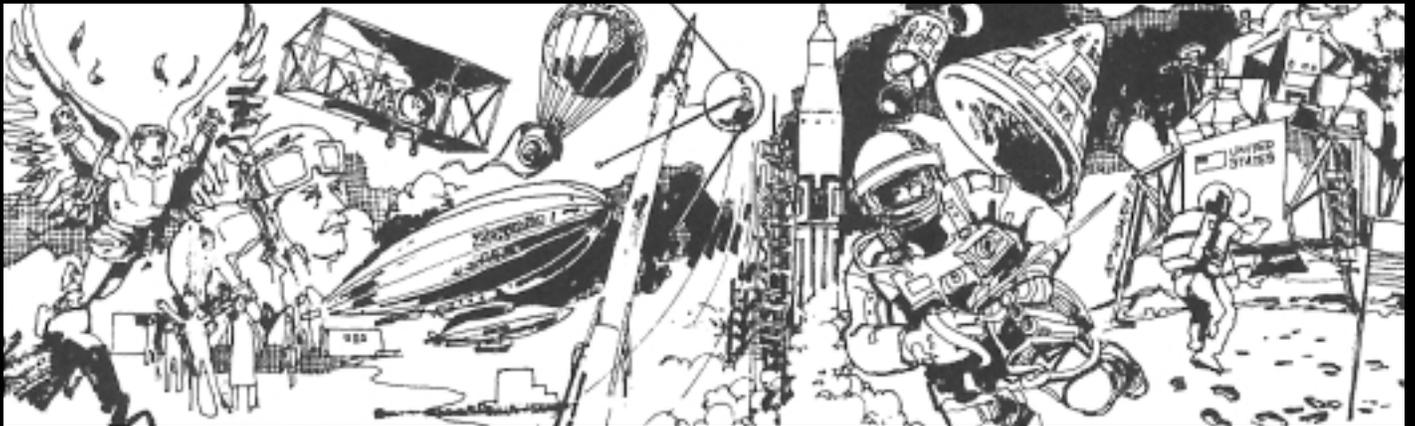
A model rocket club is where the action is! An organized model rocketry program will involve you and your community in exciting Space Age experiences. Organize your friends now, and begin participating in the original out-of-sight hobby.....Model Rocketry.





SECTION II

Organizing A Club?



The first step in organizing a club is to bring together as many rocketeers and potential rocketeers as possible. The activities of an individual, several rocketeers or a group interested in starting a club will serve as a basis for getting people involved in model rocketry. The larger the membership, the more resources for equipment, the more knowledge for projects and the more activities that can be held.



Young spectators watch in amazement as rocketeers interested in starting a club give an exciting launch demonstration.

A public model rocket demonstration or exhibit followed by an organizational meeting is an excellent combination for pulling the rocketeers and interested individuals of a community together. If possible, the local recreation department, area schools, hobby shops, merchants, youth groups, service organizations, newspapers and radio and television stations should all be contacted and given the dates, times and places for the public demonstration and the organizational meeting. In addition, recreation buildings, schools and hobby shops are excellent places to display informational posters and club sign-up sheets.

PUBLIC DEMONSTRATION

A local park, school playground, playing field or a large vacant lot is an excellent area for a public demonstration. Remember that the location for a public demonstration must be easily accessible. Be

sure to obtain proper permission to use the land and for holding a public demonstration before announcing the launch. A good demonstration should feature the launching of a number of model rockets using different types of model rocket engines. An exhibit of the various kinds of model rockets should also be set up for spectator viewing. All launchings should include a countdown and a launch narration of the lift-off and various phases of flight. An entertaining, informative narration can contribute greatly to the success of a demonstration launch. To provide convenient spectator participation, the launch area should have boundaries outlined with rope, pylons or chalk markings. One side of the area should be designated for spectators with exhibit tables set up just inside the boundary. The layout for a typical demonstration launch is shown in figure 1 on page 7.

Designing a spectator area increases range safety and permits the launch narration to be heard without a public address system. On or between the exhibit tables there should be a large poster announcing the date, time and place of the organizational meeting and inviting interested individuals to attend. In addition to the posters, a sign-up sheet should be available to all persons planning on attending the meeting. An impressive and well-organized demonstration can be extremely effective in gaining new members and much civic support for a community model rocket club.

ORGANIZATIONAL MEETING

A library, recreation building, meeting room or school classroom makes an excellent location for an organizational meeting. In order to have a really active club there should be at least eight participating mem-

bers and one or more adult advisors. An organization with fewer persons is possible, although its activities will be limited. All clubs should have at least one adult advisor. A club advisor can be extremely valuable in the supervision of range safety, workshops and research projects. His leadership can lend assistance with community relations, special events, arranging aerospace presentations and field trips. His interest will aid in stimulating participation of other parents and the support of a sponsoring organization. An advisor can be a parent, recreation leader, teacher, coach, scientist, scout leader, merchant or any adult who is willing to assume the responsibility of club advisor and who is acceptable to the members. He does not need to be an expert on rocketry. Your teacher can be an excellent club advisor. Even if your teacher is not willing to become the club's regular advisor, perhaps he or she can be a part time leader.

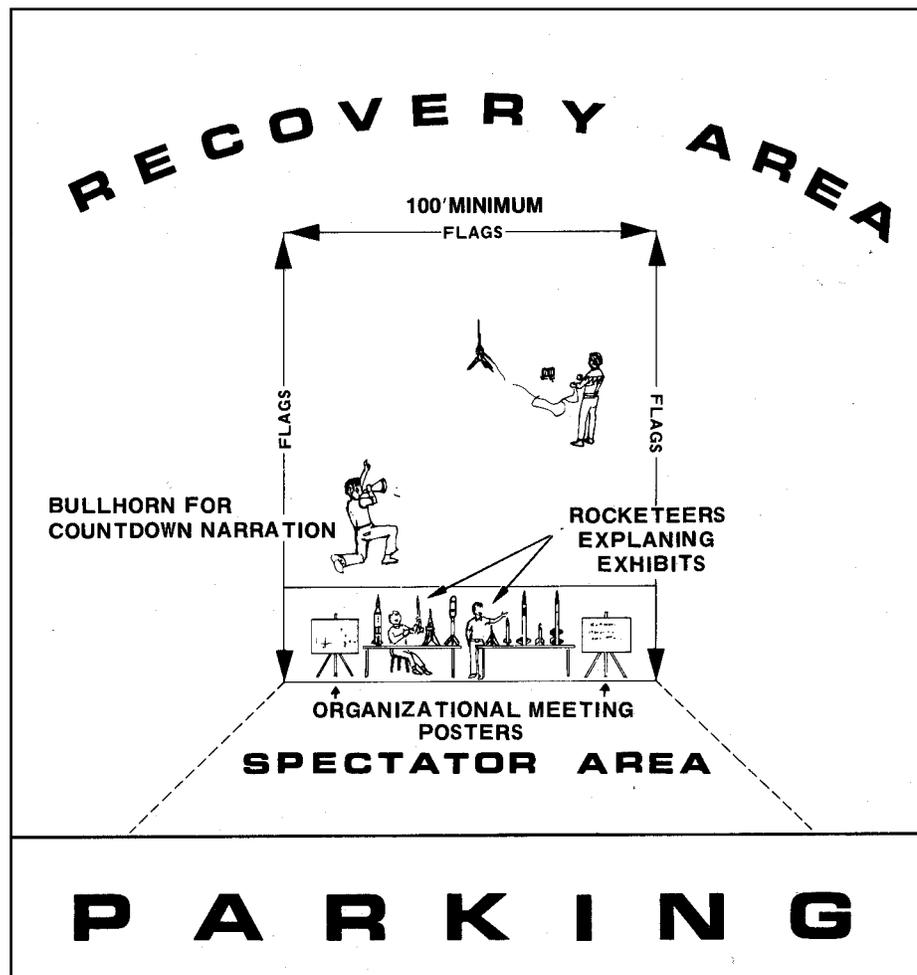


Fig. 1 Suggested layout or typical demonstration launch.

This first organizational meeting should be presided over by the individual or spokesman for the group who sponsored the public demonstration. Topics for discussion should include the purpose for starting a club, a basic explanation of model rocketry with an emphasis on safety and whether or not a second demonstration launch is needed to gain additional members. Several temporary committees should be appointed to get people involved and to assist with the organization and development of the club. Appointed committees should include Activities and Publicity, By-Laws and Constitution, Advisor and Sponsorship and Facilities and Equipment. It is best to save the election of officers, determination and collection of dues and acceptance of a constitution or by-laws until the third or fourth meeting. This will allow time for all committees to create a sound foundation for club development. When their initial duties are completed, the temporary committees can be made permanent standing committees or can be dissolved and their members placed in whatever committees are established by the club's constitution.

ACTIVITIES AND PUBLICITY COMMITTEE

This committee is responsible for the planning and scheduling of the club's first series of activities including launchings and workshops. If deemed necessary, it will handle all arrangements for additional public demonstrations. Club publicity and communications to club members are also the responsibility of this committee. During the first organizational meeting, this committee will set and announce the date, time and place for the second club meeting.

BY-LAWS AND CONSTITUTION COMMITTEE

This committee is responsible for the formulation of a club constitution or by-laws. The following is a suggested outline for a club constitution:

ARTICLE I: Name of Club

ARTICLE II: Purpose

ARTICLE III: Duties of Advisor

ARTICLE IV: Sponsoring Organization

ARTICLE V: Membership

ARTICLE VI: Officers

ARTICLE VII: Elections

ARTICLE VIII: Duties of Officers

1. President

2. Vice President

3. Secretary

4. Treasurer

ARTICLE IX: Club Funding

ARTICLE X: Committees

1. Special Activities Committees

2. Publicity and Community Relations
Committee

3. Finance Committee

4. Contest Committee

5. Library Committee

6. Workshop Committee

ARTICLE XI: Teams

1. Range Operations Team

2. Range Safety Team

3. Data Reduction Team

4. Tracking Team

5. Special Projects Team

6. Research and Development Team

ARTICLE XII: Identification Symbols

1. Club Motto or Slogan

2. Club Insignia

3. Club Flag

ARTICLE XIII: Honorary Membership

ARTICLE XIV: Amendments

ADVISOR AND SPONSORSHIP COMMITTEE

If the club does not have an adult advisor by the end of the first meeting, it will be the responsibility of this committee to find one. In addition, this committee is responsible for gaining the support of a local organization as the sponsor. A sponsor can be of great value in the development of a model rocket club. A club sponsor can be of assistance in areas where special resources or supplementary funds are needed and in situations where increased community support or additional manpower is necessary. With the leadership of an adult advisor and the recognition of a sponsoring organization, a model rocket club will quickly receive its community's approval and support. This is especially valuable when publicity is needed for

a special event or where model rocketry is still new to the greater part of the community. The following is a brief list of potential sponsors

Civic Organizations

Recreation Department
School
College
University
Chamber of Commerce
Jr. Chamber of Commerce
Fire Department
Police Department
P.T.A.
Social Service
Forestry Department

Service Clubs

Lions
Optimists

Rotary
Kiwanis
Elks
Masons
Eagles
Order of the Moose
American Legion
Salvation Army
Sertoma

Youth Groups

Y.M.C.A.
Indian Guides
Explorer Scouts
Boy Scouts
Cub Scouts

Big Brothers-Boys Clubs
4-H
Church Groups
Girl Scouts
Camp Fire Girls
Boy Scouts of Canada

Commercial Firms

Hobby Shops
Merchants
Aerospace Companies
Corporations

Military Affiliation

Civil Air Patrol
Special Services
Royal Canadian Air Cadets



Scouting organizations can provide excellent advisors and sponsorship for model rocket clubs.

When approaching a particular group for sponsorship support, it is best to explain what model rocketry is, the reasons for forming a model rocket club and why sponsorship and support are desired. It is very important to stress model rocketry's excellent safety record, to point out the difference between the model rocketeer and the "basement bomber" and to emphasize the educational and recreational activities available in model rocketry. If the club has made an honest and diplomatic approach, the club will probably receive the enthusiastic support of a sponsor. If for some reason, the first group approached cannot assist

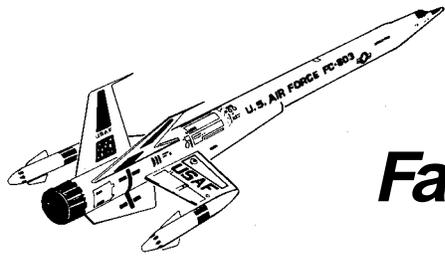
the club, then approach a second group-but don't give up!

FACILITIES AND EQUIPMENT COMMITTEE

This committee is responsible for the design, materials procurement and construction of equipment needed to carry out the club's first series of activities. Its members will make proper arrangements with local officials to secure locations for a launch site and a club workshop. The activities of this committee should be closely coordinated with the club officers, advisor, sponsor and Activities and Publicity Committee.

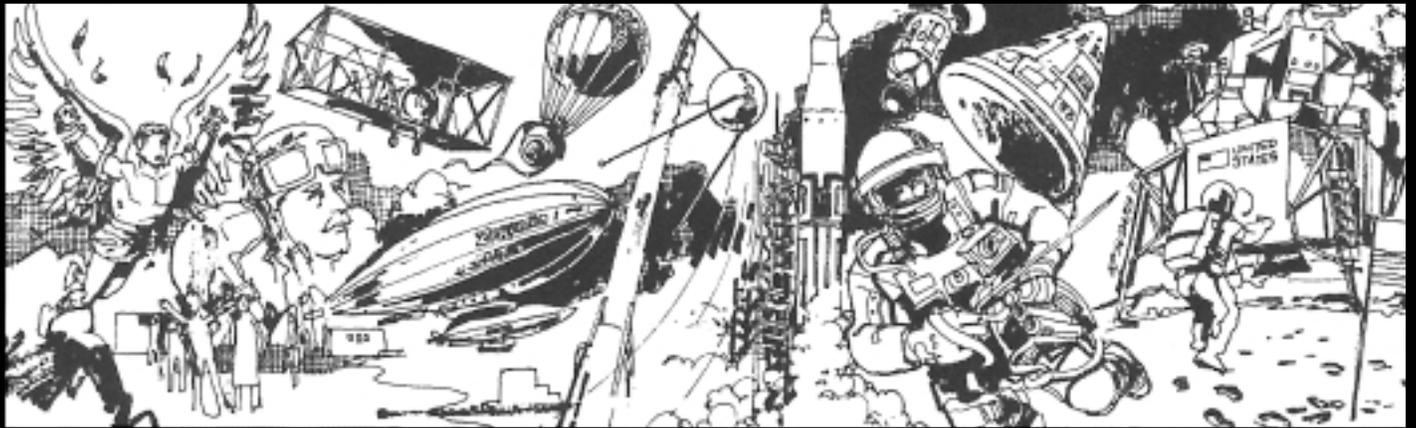
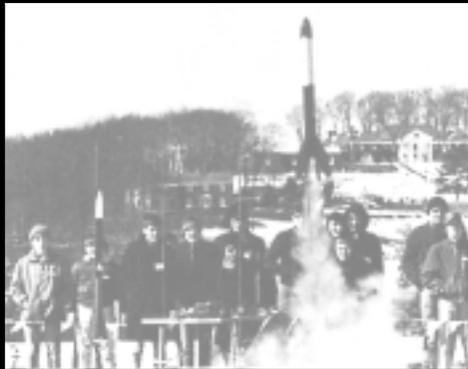


Teacher generates interest in the formation of a club during his classroom presentation on "model rocketry".



SECTION III

Facilities and Equipment



All clubs need a launch site, a workshop and certain equipment in order to function properly. The club's officers, advisor and sponsor should assist the Facilities and Equipment Committee in securing land and equipment for launchings and an adequate meeting place for club members.



Ideal launch site complete with flags, signs and multiple pad launcher

The parents of rocketeers can be extremely helpful in making the proper contacts with local landowners, school authorities and civic officials for a launch site and club workshop. Additionally, a local merchant, machine shop, electric company, lumber yard, building contractor, aerospace corporation or military reservation may be of assistance in supplying scrap or surplus material for the club's launch system and workshop tools. Club members can collect for unwanted items which might be of assistance to the club.

LAUNCH SITE

Generally, the physical requirements for a club launch site are about the same as those needed for a demonstration. A good launch site should be a cleared area, free of any easy-to-burn materials, and away from large buildings, power lines, tall trees and low flying aircraft. A club launch site must be easily accessible, have ample room for parking and be large enough for the recovery of all rockets launched. A general rule for the launch site size is to have the shortest side equal to one-fourth the maximum altitude which the rockets will reach.

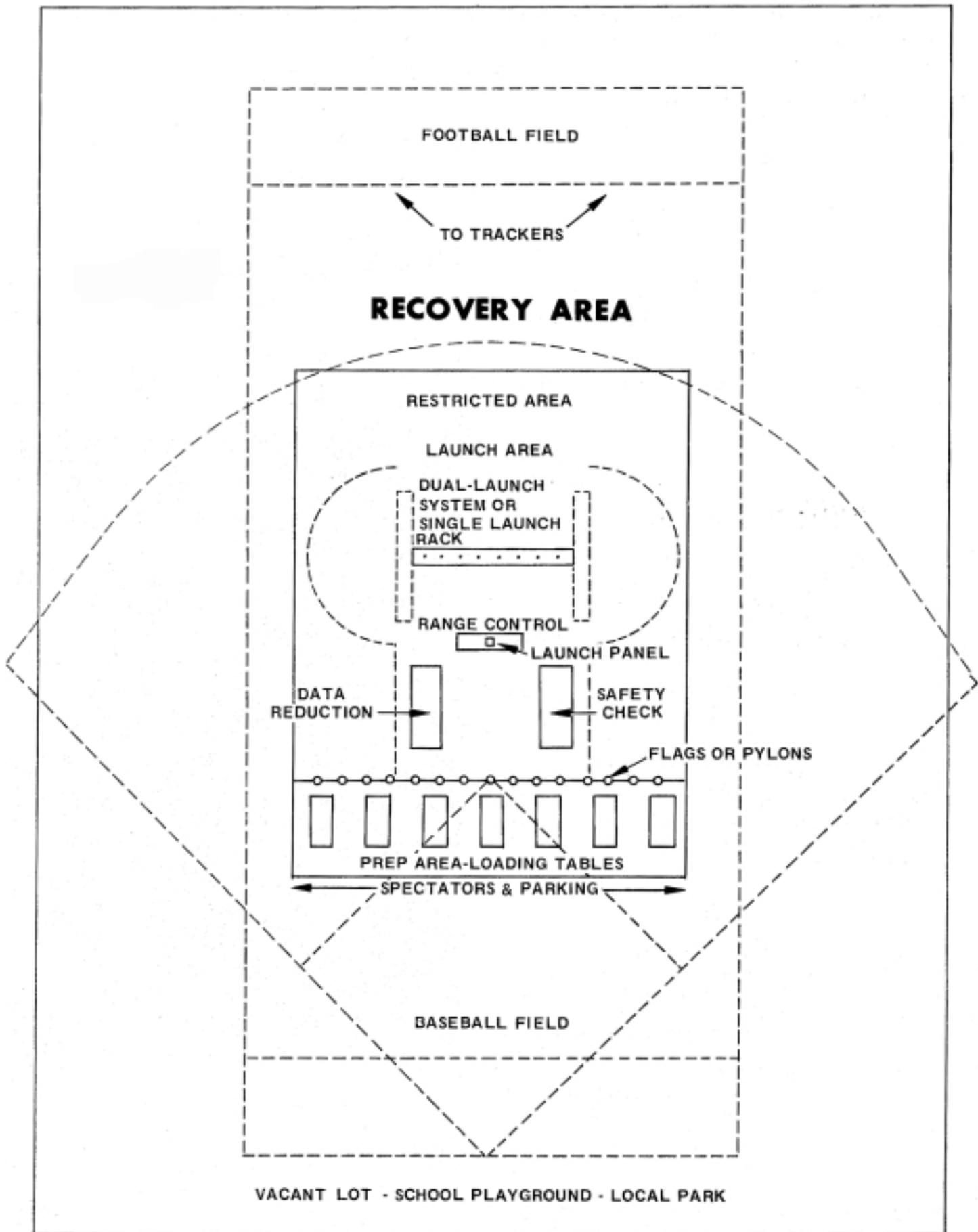
With these requirements in mind, it is important to launch to realize that a huge expanse of land is not

necessarily required for a launch site. A local park, school playground, playing field or large vacant lot can make an excellent club launch site, in addition to being great for demonstrations. See figure 2 page 13.

Clubs in highly populated areas, large cities or mountainous regions may find it almost impossible to secure a large piece of relatively flat land for launching. Groups facing this type of situation should consider the possibility of a "scaled down" launch area which requires only a little land. A "scaled down" launch site places limits on the types of engines used and /or requires streamer or tumble recovery for high performance rockets, thus assuring most recoveries within the limited boundaries of the range.

Remember: A large launch area is not a necessity, and a "scaled down" launch site is better than no site at all.

Sometimes a group will find a suitable site and then be delayed from launching by the site owner until they can show proof of liability insurance coverage. This is a common occurrence if the community is not yet aware of the true nature and safety of model rocketry. Groups facing this situation should contact the National Association Of Rocketry (N.A.R.), P.O. Box 177, Altoona, WI. 54720, for membership and liability insurance information. Sizable liability coverage for model rocketry is available through the N.A.R. at a nominal cost to rocketeers.



The following is a list of range equipment normally required for the operation of a club launch site:

Multiple-pad or several single pad launch systems refer to Estes Industries booklet Model Rocket Launch Systems

Car battery (preferably 12 volt)

Pylons, flags, chalk or tape to mark off launch area

Tables and chairs for data reduction and the prepping of rockets. Note: Large pieces of plywood laid across saw horses make excellent prepping tables.

Public address system (preferably portable; a bull horn works great.)

Data reduction equipment:

- (1) Tracking scopes
- (1) Estes AltiTrak™
- (1) Stopwatches
- (1) 100' tape measure
- (1) Walkie talkies

Small flagpole for club range flag and American Flag.

Storage area for range equipment located at the site, workshops or perhaps in one of the rocketeer's garages. Note: if the storage area is located away from the range be sure to have adequate transportation available to bring club equipment back and forth.

WORKSHOP

A workshop is extremely important to the success of a model rocket club as it allows club members an opportunity to meet together and discuss club business, plan special projects, present technical reports, build range equipment and schedule club activities. Without a club meeting area, these matters would have to be handled at the launch site and this could take time away from launching. Furthermore, a club workshop gives rocketeers a place to go and things to do after school, in the evening or on the weekend.

In searching for and selecting a club workshop, several points should be taken into consideration. Will it be large enough to handle most of the membership? When is it available and for how long? Is it available on a regular basis? Is there any charge for using it? Can it be decorated as a model rocket work-

shop? Does it have tables and chairs? Will the construction and painting of rockets be allowed? Does it have adequate lighting and a storage area? Is there a telephone nearby? Can it be locked?

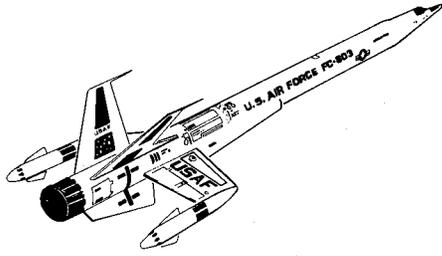
Potential places for a club workshop include:

- Park recreation building
- School room
- Community center
- Library meeting room
- Church classroom or basement
- Youth organization (YMCA, Boys Club, etc.)
- Service organization (Elks Club, VFW Hall, etc.)
- Military installation
- Science center
- Museum meeting room
- Hobby shop meeting or arts and crafts room
- Rocketeer's basement, playroom or garage



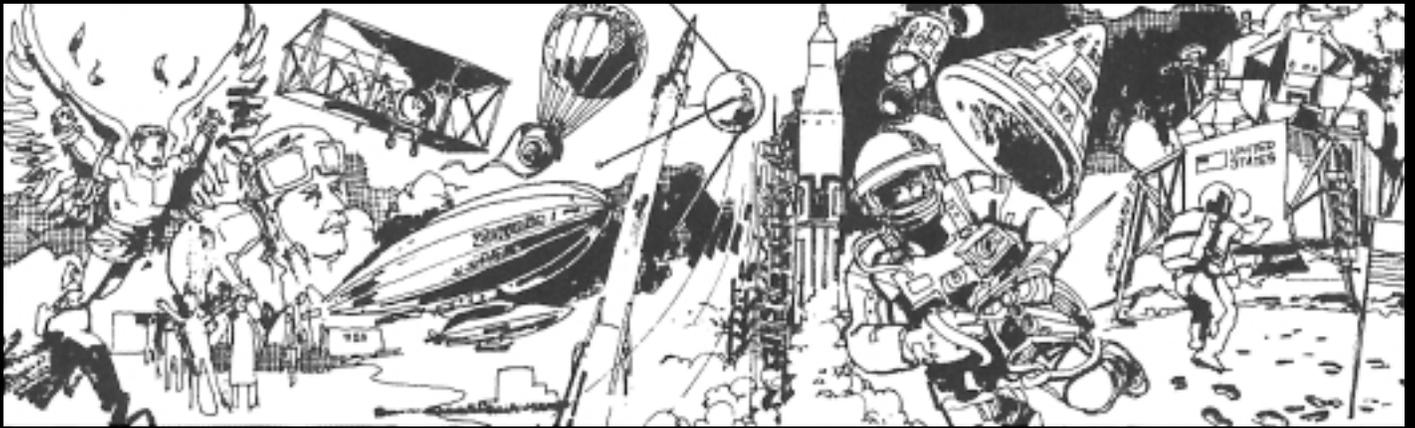
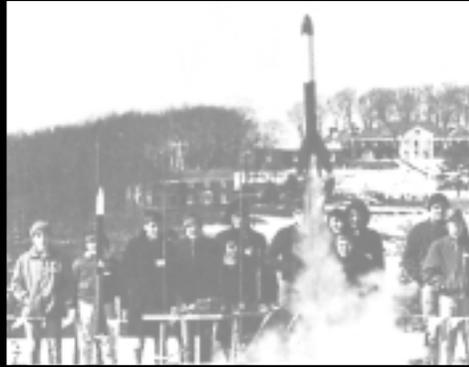
Bulletin boards decorated with aerospace posters add realism to the workshop.

When a proper meeting area has been secured, club members can turn it into an exciting model rocket workshop by placing NASA photos and aerospace posters on the walls, constructing work benches and painting booth, establishing a library, erecting a display area for members' rockets and installing a club wind tunnel for stability tests. These and other projects will enhance the appearance of a workshop and make activities of the club even more enjoyable and exciting.



SECTION IV

Club Activities



A great variety of educational and recreational activities are available to the members of a model rocket club. This section describes a number of these events. For successful activities, proper organization is always necessary. The check list on the following page suggests a number of points which should be taken into consideration when planning an event.



Range Safety Officer gives flight narration as Alpha® lifts-off from club launch rack.

EVENT CHECK LIST

1. Place the event on the club calendar
2. Make sure club officers and advisors are aware of the event.
3. Inform all teams and committees concerned with the event.
4. Give publicity to the news media for special events.
5. Give event information posters to the local recreation department, hobby shops, schools and youth organizations.
6. Send out special invitations if necessary.
7. Make the proper launch site or workshop arrangements, depending upon where the event will be held.
8. If awards will be given, make the proper arrangements.
9. If funding will be involved, appoint a person to be in charge.
10. If food concessions will be handled, make the necessary arrangements for supplies, electricity, water, cash box change and workers.
11. Arrange for trash containers.
12. Be sure a first aid kit is on hand.
13. Make sure a public address system is available.
14. Make arrangements for audiovisual equipment such as a projector, movie screen, etc. if these will be needed.
15. Have spectator areas appropriately designated.

16. [] Arrange for an adequate number of tables and chairs.
17. [] If necessary, print and distribute an event program or timetable.
18. [] Make sure telephone and restroom facilities are available.

If the event takes place at the launch site, include the following.

19. [] Be sure the launch site has been laid out correctly.
20. [] Pre-test range equipment for proper operation.
21. [] Be sure a back-up power source for the launch system is available.
22. [] Make sure the Range Safety Team has adequate personnel to run the event and provide launch narration.
23. [] Contact the appropriate teams for personnel and equipment to carry out data reduction, communications, tracking and recovery.
24. [] If competition is featured, require that the Contest Committee be in attendance.
25. [] Begin the event with a welcome address to the spectators and a short explanation of the day's events.
26. [] If awards are given, have a special person such as the mayor or a city councilman make the presentations.
27. [] End the event by thanking the spectators for their attendance.
28. [] When the event is over, be sure all equipment is properly stored and the launch site is cleared of all litter.
29. [] Send thank you letters to the people who helped make the event possible.
30. [] Evaluate the event and discuss how to make the next one even better.

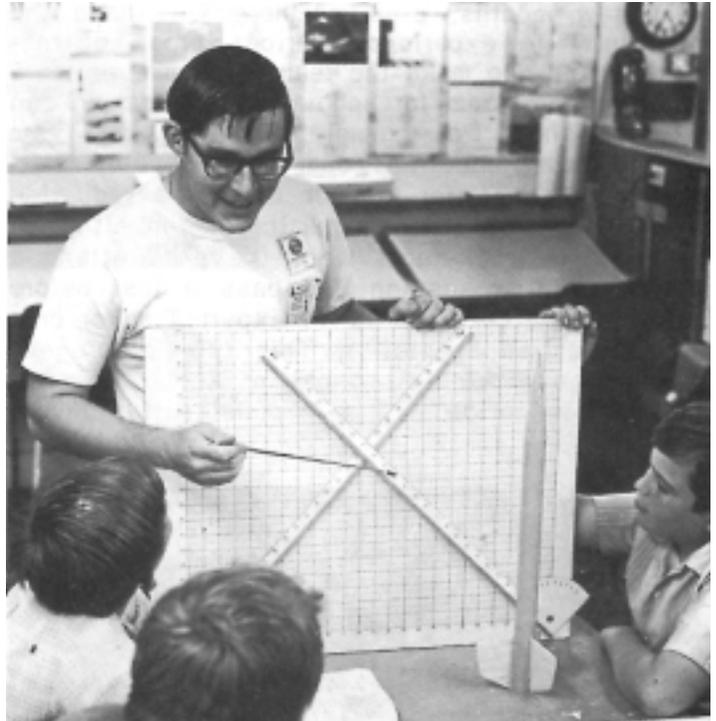
RANGE TEAMS AND COMMITTEES

Launch site activities begin with the Range Operations Team. As suggested in section Two, the team system gives each rocketeer a certain responsibility on the range or in the workshop. The Range

Operations Team is responsible for the upkeep and repair, the setting up and taking down and the transportation to and from the launch site.

The Range Safety Team is charged with the responsibility of running all range equipment, safety checking all rockets and giving the appropriate safety clearance, countdown and flight narration for each launch.

The Data Reduction Team and the Tracking Team are responsible for their own equipment such as stop-watches, computers, walkie-talkies and tracking scopes.



Club advisor gives data reduction presentation to rocketeers attending specialty certification program.

The Special Projects Team and the Research and Development Team do most of their work in the club workshop and cooperate closely in range activities. The R&D Team deals exclusively with research projects whereas the Special Projects Team is responsible for the construction of special club equipment, such as a wind tunnel.

Various committees also become involved in launch site activities. The Publicity and Community Relations Committee should be on the scene at all launchings to answer questions, make announcements, take pictures and give out club literature.

The Special Activities Committee is responsible for the planning and scheduling of all special activities and the publishing of a club calendar. Members of this committee should be in attendance

at all special events to make sure all goes smoothly and according to plan.

The Finance Committee is responsible for the collection and allocation of all club funds. Representatives of this committee should attend club launches whenever fund raising is taking place.

The Contest Committee must be in attendance at all model rocket meets as this committee is responsible for the scheduling and record-keeping for all competitions.

By changing the teams and committees once every few months, club members will have the opportunity to experience various types of club responsibilities. To make the team system even more rewarding, programs for specialty certification can be established. For example, the Tracking Team and Data Reduction Team could develop challenging programs for tracker and data reduction certifications. In order to participate on either of these teams, rocketeers would have to attend a special training session and pass a test before they could be certified as an Expert Tracker or a Data Reduction Specialist. This type of program increases a rocketeer's sense of accomplishment and promotes pride in his responsibilities to the club.



Members of the tracking team use various types of tracking devices to discover the altitude of club members' rockets.

LAUNCH SITE ACTIVITIES

The most common launch site activity is sport-flying. A sport-flying launch is non-competitive and features rocketeers flying any type of model rocket or boost-glider they wish to enter.

COMPETITION

Competitive launching is probably the most exciting of launch site activities as a great variety of com-

petitive events can be held. Competition can be held between club members or against members of other model rocket clubs. By inviting other clubs to participate the spirit of competition is increased. Potential events for a model rocket meet include:

- Maximum Altitude
- Parachute Duration
- Glide Duration
- Drag Race
- Spot Landing
- Set Altitude
- Payload Handling
- Scale Model
- Craftsmanship
- Research and Development

These events can be further categorized by the types of engines used. For more information on how to run a model rocket meet, refer to the Estes [Model Rocket Contest Guide](#).

Clubs interested in standardized model rocket competition should write to the National Association of Rocketry, P.O. Box 177, Altoona, WI 54720. Request information on membership and sanctioned competition.

All day "fun" competitions such as Drag Race Elimination and the Quadrathon are extremely popular with model rocket clubs. In Drag Race Elimination club members launch in pairs. One point is awarded to the rocket first achieving motion at launch, one point for the lowest altitude and one point for the last one down. The best two out of three points wins. Rocketeers are gradually eliminated until two club members are left for the final launch-off.

The quadrathon is a real test for the design and construction of competitors' rockets. Contestants are allowed to use only one rocket to participate in four events. Quadrathon rockets must be designed to fly in Parachute Duration, Spot Landing, Payload and Maximum Altitude. This is a real test of endurance for the craftsmanship of rocketeers.

Specialized competitions like Boost-Glider (B/G) Meet, Identical Kit Meet or Original Design Meet are also very interesting. In a Boost-Glider Meet all competition is exclusively for boost gliders. In the Identical Kit Meet various events can be flown, providing that all rockets in each event are built from the same type of kit. This event is a good test of the finishing abilities of rocketeers. The Original Design Meet measures the designing capabilities of individual rocketeers. Only scratch-built rockets are allowed to compete.



Recreation leader and club parents assist rocketeers with the prepping of their rockets.



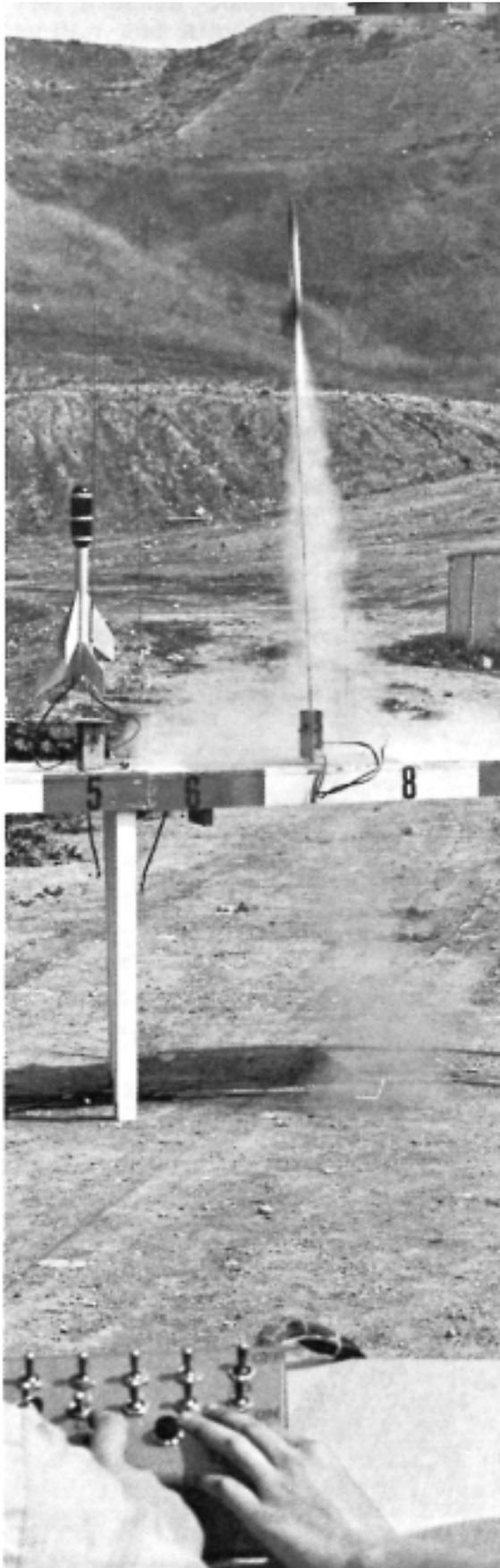
Range Safety Officer narrates as club advisors and members of the Data Reduction Team prepare to track and record rocketeers' flights.



Rocketeers and parents have their rockets examined by range officials at safety check-in station.



Rocketeers position their rockets on the pad and make final preparations for launch.



All systems go!

Ignition!

Lift-off!!!

SPECIAL EVENTS

One of the most enjoyable range activities is the Father-Son or Mother-Daughter launch. This is one event that will really get club parents involved.

For a hair-raising, hilarious afternoon try hosting a Backward Launch or a Funny Meet. In the Backward launch club members enter their rockets in the usual events, except that the names and rules for each event are reversed. Examples: Minimum Altitude, Non-spot Landing, Un-Parachute Duration, etc. In the Funny meet the names and rules for each event not only are reversed, but conventional rockets are not allowed. A competition vehicle can be anything as long as it is stable and made of balsa wood, paper or plastic. Example: Paper cup, toy plane, cardboard box, etc. This event should be attempted only by advanced rocketeers who have a good knowledge of the principles of model rocket stability.

An active model rocket club will be involved in many demonstrations for the public. A club demonstration can be carried out like the one described in the second section of this booklet. A larger number and a greater variety of rockets and engines will be required. Begin the demonstration with a low-powered, single-stage rocket and work up to a large scale model like the Saturn V. Be sure a public address system is available for the launch narration as this can mean the difference between failure and success. A rapid launch sequence combined with an entertaining launch narration will make the club demonstration an impressive success.

In addition to the demonstration, an All-Comers Competition Launch is extremely effective for gaining new club members. Non-club members from surrounding areas are invited to participate in one or two simple events and several hours of sport-flying with club members. At the end of the launch, those interested in joining are invited into the club. This activity is great for illustrating the benefits of club affiliation.

WORKSHOP ACTIVITIES

The club workshop can provide stimulating and exciting experiences for rocketeers. Potential workshop activities include technical discussions, construction lectures, aerospace films and the training sessions and tests for a range specialty certification program.

SPECIAL PROJECTS

A workshop can become the major area for the construction of club projects and is a great place for the maintenance and repair of range equipment. Normally, most of the work done by the Research and Development Team and the Special Projects Team takes place in the workshop. Potential special projects for club members include:

The design and construction of a multiple-pad launch system. Refer to Estes Industries' Model Rocket Launch Systems, by Robert L Cannon.

Studies in the mathematics of rocket flight, including investigations in acceleration, trajectory, drag, etc. Refer to Technical Reports TR-10, "Altitude Prediction Charts" and TR-11, "Aerodynamic Drag of Model Rockets", by Dr. Gerald M. Gregorek, Associate Professor, Aeronautical Engineering, Ohio State University.

Construction of a static test stand to secure time-thrust curve information for various types of model rocket engines.

Radio-telemetry and payload instrumentation are interesting R and D projects.

Construction of a wind tunnel for pre-flight stability test. Refer to Estes Technical Report TR-5, "Building Wind Tunnel".

Development of new types of recovery devices.

Photo interpretation using aerial model rocket camera.

Construction of a model gantry or launch tower.

Construction of an underwater launch facility.

Conducting weather and atmospheric tests.

Payload experimentation to determine the effects of rocket flight using insects.

Development of a two-station, three-dimensional tracking system and the construction of theodolite tracking devices.

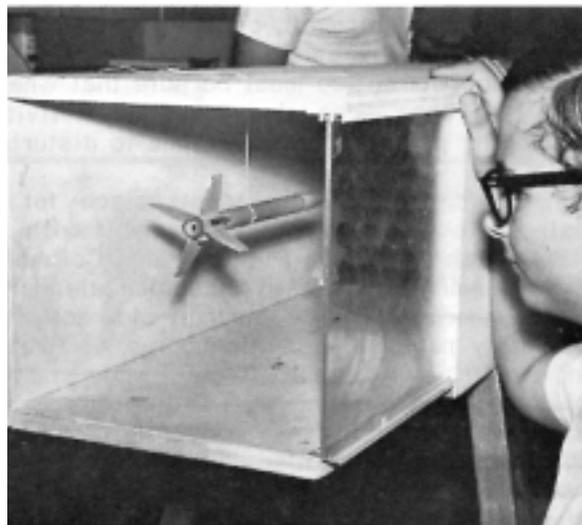
CLUB LIBRARY

A workshop library can be of great assistance to rocketeers involved with special projects. The Library Committee should attempt to secure copies of all available technical reports and other model rocket literature for the development of the club library.

Additionally, hobby magazines like American Spacemodeling and science publications such as Popular Science, Scientific American, Final Frontier, Space News and Air and Space will be especially valuable in a club library.



Rocketeer fine tunes his model rocket transmitter after placing it in his rocket's payload section.



Rocketeer tests the stability of his model rocket in the club wind tunnel.



Rocketeers and club advisor hurry to fill container which houses Polaris type rocket for underwater launch.

The club library can also be of value to members who are constructing school science fair projects which feature model rocketry.

WORKSHOP CONTESTS

Non-flying contests are extremely effective for maintaining interest in workshop activities. They are especially valuable to clubs who are faced with inclement weather which is bad for launchings. Competitions such as Research and Development, Craftsmanship and Original Design can be held by establishing special non-flying rules.

MEETINGS

The workshop provides an excellent place for important meetings. Officers, committees and advisor can meet together to discuss club business, financial matters and plans for future activities. The Workshop Committee is responsible for the supervision and scheduling of activities for the workshop. In addition, it is charged with taking care of workshop equipment, cleaning when needed and the setting up of tables and chairs for meetings. The Workshop Committee must be sure that when a meeting has been scheduled no other activities will be taking place at the same time to disturb it.

The workshop is also a great place for the Special Activities Committee to meet with the Contest Committee and the Publicity and Community Relations Committee to plan the club calendar. A printed calendar of club activities is absolutely necessary to inform club members of coming events. Calendars normally cover at least a month of activities and are either mailed to rocketeer's homes or given out at workshops and launchings. A sure way to get club members to read their calendars is to urge each member to post it on the door of his refrigerator.

A major activity for the club workshop, if it is large enough, can be the monthly or semi-monthly membership meeting. If the workshop isn't large enough to handle the crowd, then a larger building like a school cafeteria or recreation hall should be secured. This type of meeting brings rocketeers, their parents and advisor together to discuss club business, announce coming events and introduce new club members. Aerospace presentations, films and guest speakers are a few of the possibilities for meeting presentations. One of the most valuable benefits of the monthly meeting is that it can get rocketeers' parents really involved in club activities.

FIELD TRIPS

Field trips present some of the most interesting and exciting experiences for club members. Many aerospace firms, NASA facilities and military installations will provide tours for groups such as model rocket clubs. Be sure rocketeers' parents are involved in this type of activity as transportation will be needed. Permission slips should be turned in by all rocketeers to assure that their parents are aware of the field trip. The field trip is a valuable educational activity which will really stimulate club enthusiasm.

SPECIAL PRESENTATIONS & EXHIBITS

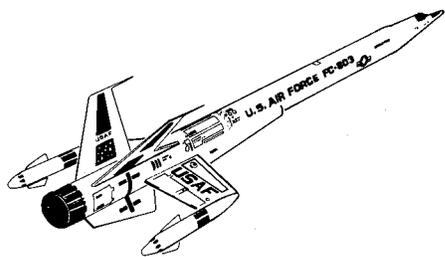
Model rocketry is an exciting hobby which can draw the interest of an entire community. Model rocket clubs may be called upon to give special presentations or exhibits. A club should always be prepared to furnish display rockets, background posters, films, handout literature and guest speakers for this type of occasion. Presentations and exhibits are very effective in gaining new members and are great for club public relations.

NATIONAL ASSOCIATION OF ROCKETRY

If five or more club members have become interested enough in model rocket competition to join the National Association of Rocketry, then they should consider the possibility of forming a section. As an N.A.R. section, club members who hold N.A.R. memberships are eligible to compete in local, state and regional model rocket competitions leading to the national model rocketry championship, NARAM, held each year. The N.A.R. offers an exciting and a rewarding challenge to serious rocketeers.

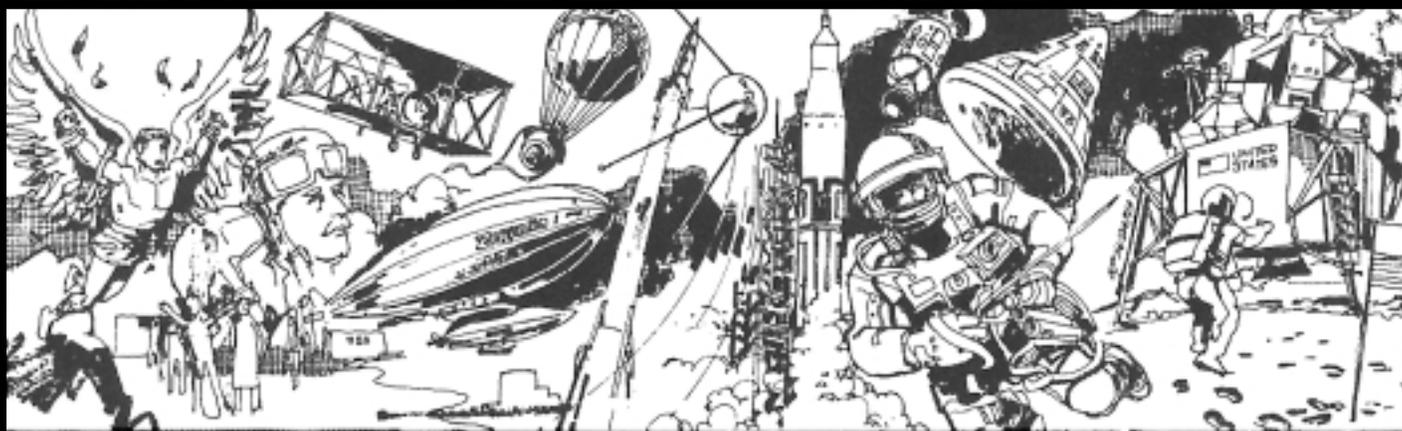
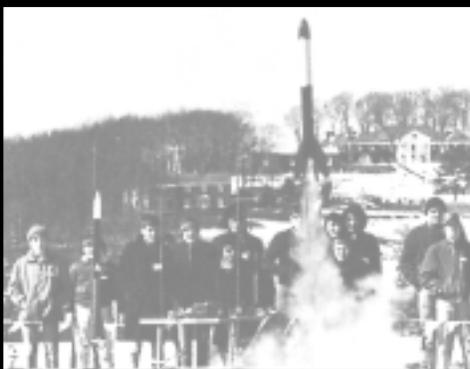
In addition to providing liability insurance and a framework for standardized competition, the N.A.R. is responsible for developing standards for model rocket engines and establishing safety codes for safe, non-professional, model rocketry. It has been established as the national, non-profit organization for the perpetuation of model aeronautics. With the aid of the N.A.R., model rocketry has won the endorsement of the United States Air Force, the National Aeronautic Association, the 51-nation Federation Aeronautique Internationale, the Academy of Model Aeronautics, the National Aeronautics and Space Administration, U.S. Space Camp and the United States Space Foundation.

For more information on the National Association of Rocketry write to:
N.A.R. Headquarters
P.O. Box 177
Altoona, WI 54720



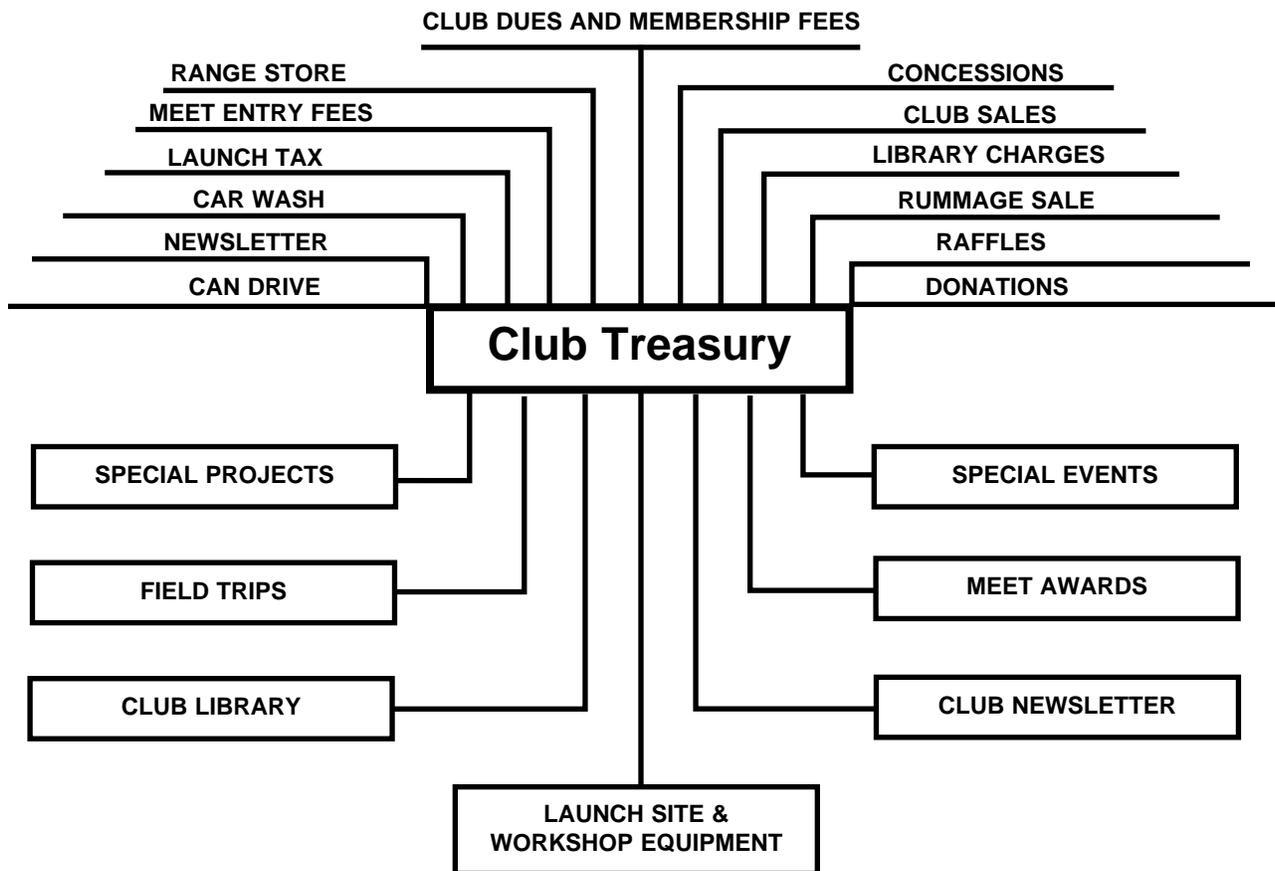
SECTION V

Club Funding



All model rocket clubs need a club treasury to finance activities, projects and the building and upkeep of workshop and range equipment. Even if a group is able to obtain a good deal of free materials and supplies, there are still things they will need to purchase.

Sources of Club Income



Club Expenditures

There are various ways for clubs to make money. A club should decide on the amount of money it needs to carry out its activities and then choose the methods it will use to make that amount. It is extremely important that a club not charge its members every time they turn around for this is one of the ways rocketeers lose interest in their club.

The club Treasurer, Finance Committee, officers and advisor should be involved in all fund raising activities and discussions concerning club financial affairs.

FUND RAISING

The charging of a club membership fee and the collection of dues are the two most common ways of raising funds. If these are not adequate to finance club projects and activities, then other methods of fund raising should be explored.

A club newsletter and membership materials are always very popular with club members. Newsletters are fairly inexpensive to publish and can be sold to club members for a small charge. In addition, space for ads can be sold to local merchants to increase the profit from the newsletter. Membership materials such as a club patch or membership certificate are extremely popular as all club members will buy them for identification. Since production costs for such materials will be higher than those for a newsletter, a club should always be sure that its members would like a particular item before it is produced.

Meet entry fees and a launch tax are two more ways a club can increase its treasury. Whenever the club hosts a large rocket meet between its own members or with other clubs, it can charge a nominal fee for entering the meet and for participation in each event. A launch tax is used at club launchings and should be approved by the entire membership before it is put into effect. An example of a launch tax would be to charge each club member a penny every time he experiences a misfire or recovery failure.

If a club has an active library, members can be charged for the loan of materials or fined for not returning them on time.

CONSESSIONS

Among the many ways of raising club funds are food concessions and the range store. Launch site food concessions are extremely popular and can be easily handled by rocketeers or parents. Major concerns include proper storage area for food goods and a responsible person in charge to be sure club profits don't get eaten up. Refreshments at large club meetings are also a good money-maker.

RANGE STORE

The range store can be an extremely effective activity for raising club funds. A local hobby shop can be of great assistance with its sponsorship. By cooperating together both the club and the hobby dealer will profit from the establishment of a range store.



Rocketeer purchases model rocket engine from club advisor at the range store.

If a local hobby dealer is not available, model rocket supplies can be purchased directly from Estes Industries. A good range store requires bookkeeping, inventory taking and several extremely reliable people in charge in order for it to be effective. We recommend the development of a range store in cooperation with a local hobby dealer as he can be of great help in assisting a club with its activities.

CLUB SALES

Various types of sales have become very substantial money makers for clubs. If rocketeers or family members are willing to make cakes and cookies, a "bake sale" always goes over great. By working in teams cleaning their own garages and storage areas of their neighbors, rocketeers can usually acquire enough "junk" to stage a launch site "auction", "rummage sale" or "garage sale". Club participation at a local swap meet or flea market may also create additional profit for the club. Finally, there are a number of commercial firms who will provide groups with such items as candy, cookies, light bulbs and greeting cards to be sold on a commission basis. Special consideration should be given in this type of fund raising to the number of workers needed and the amount of potential profit to be gained from the project.

MAJOR EVENTS

Major club-sponsored events such as dances, potluck dinners, picnics and raffles, where legal, are successful fund raisers, but require a great deal of preparation and planning by rocketeers, advisor, sponsor and parents. These types of events are best scheduled on an annual or semiannual basis considering the time and effort involved in their planning.

Rocketeers interested in ecology will find an aluminum can drive both rewarding and profitable for their clubs. Several aluminum can companies will pay up to 1cent per can to groups interested in cleaning up the countryside. A number of glass reclamation centers across the nation will also pay groups so much per bottle or jar for cleaning the land of waste glass.

One of the most effective activities for raising club funds is the sponsorship of a car wash. For a successful car wash there must be good publicity, plenty of workers and donations of soap, towels, and other washing materials by the rocketeers. One sunny Saturday of washing cars can bring a considerable profit into a club's treasury.

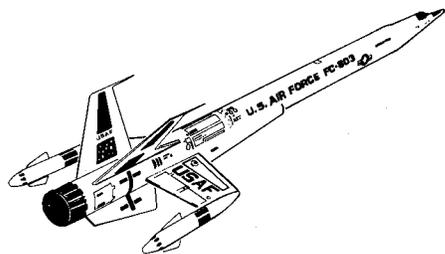
DONATIONS

Donations represent a final means to increase a club's treasury. The club sponsor, local merchants and industry may be of assistance when solicited for donations. A general rule is that donations are requested only for the most important of events or for the largest of projects, and a donor is not asked to contribute more than once a year. Realizing that donations can be extremely useful, clubs should be extra careful not to abuse their privilege of soliciting for funds.

If a club has ideas for making money other than those listed here, it should certainly try them out. Remember, if it is effective, ethical and fair, then try it!

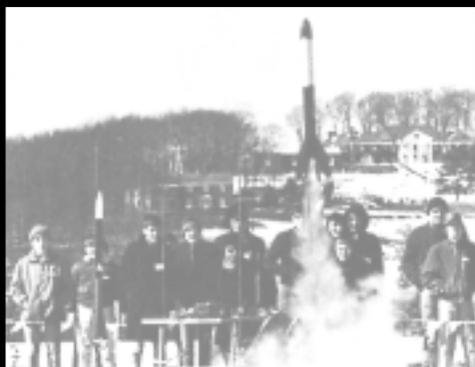
MAINTENANCE OF FUNDS

The club's Treasurer should keep an up-to-date financial record of all club transactions. A club checking account with a local bank will make this job easier and eliminate the need to carry around or keep large sums of money. It is good practice to have at least two signatures, such as the President's or Advisor's in addition to the Treasurer's, required for the signing of checks. This assures that more than one person knows that a check has been written. Members of the Finance Committee should be consulted on all matters concerning club spending. Their approval should be sought for all club expenditures as they share responsibility for the club's financial affairs. The effective maintenance of club funds is extremely important as it will always allow a club to know where it stands financially.



SECTION VI

Advanced Model Rocket Programs



A model rocket club that has had good organization and has received the strong support of its membership has the ability to pursue a variety of advanced model rocket activities and projects. An advanced model rocket program gives rocketeers the opportunity to take part in exciting endeavors which will greatly stimulate their interests in model rocket science and aerospace technology.

ADVANCED FACILITIES

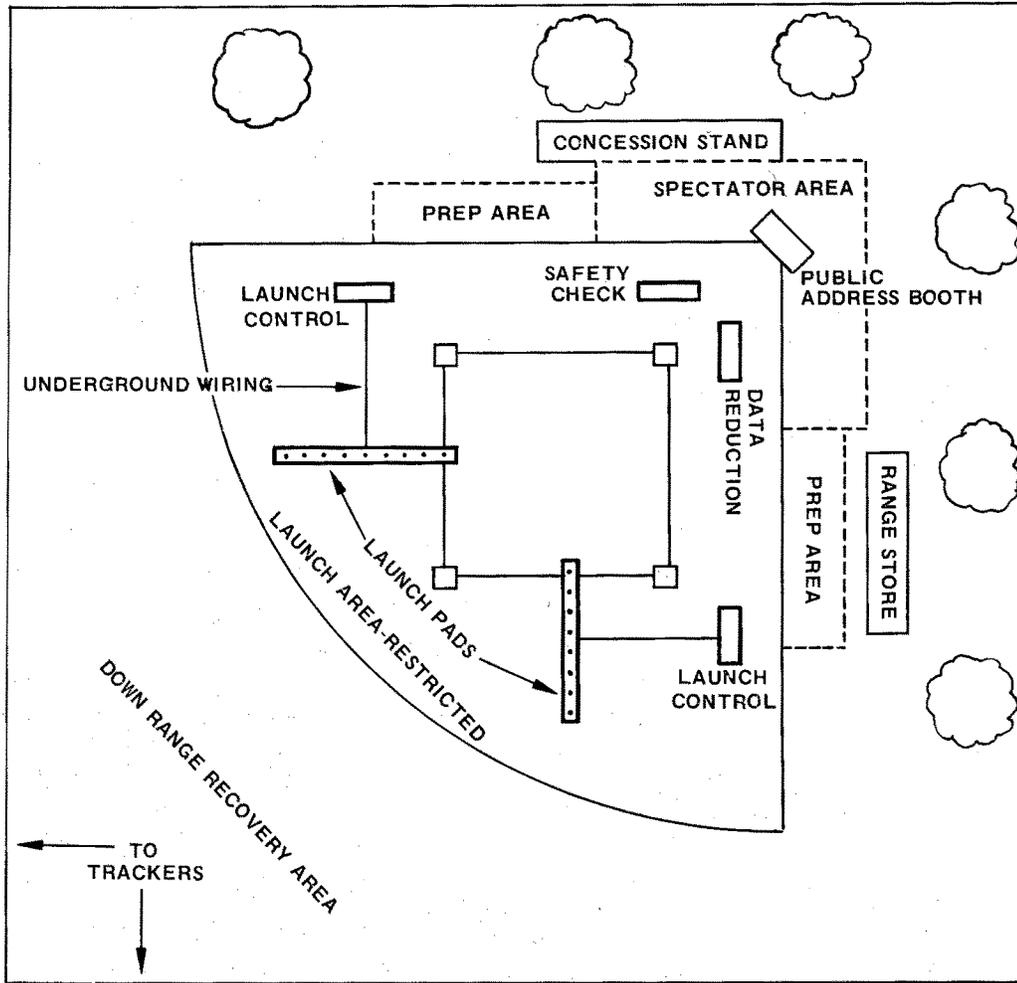


Fig. 3 Suggested layout for advanced launch site.

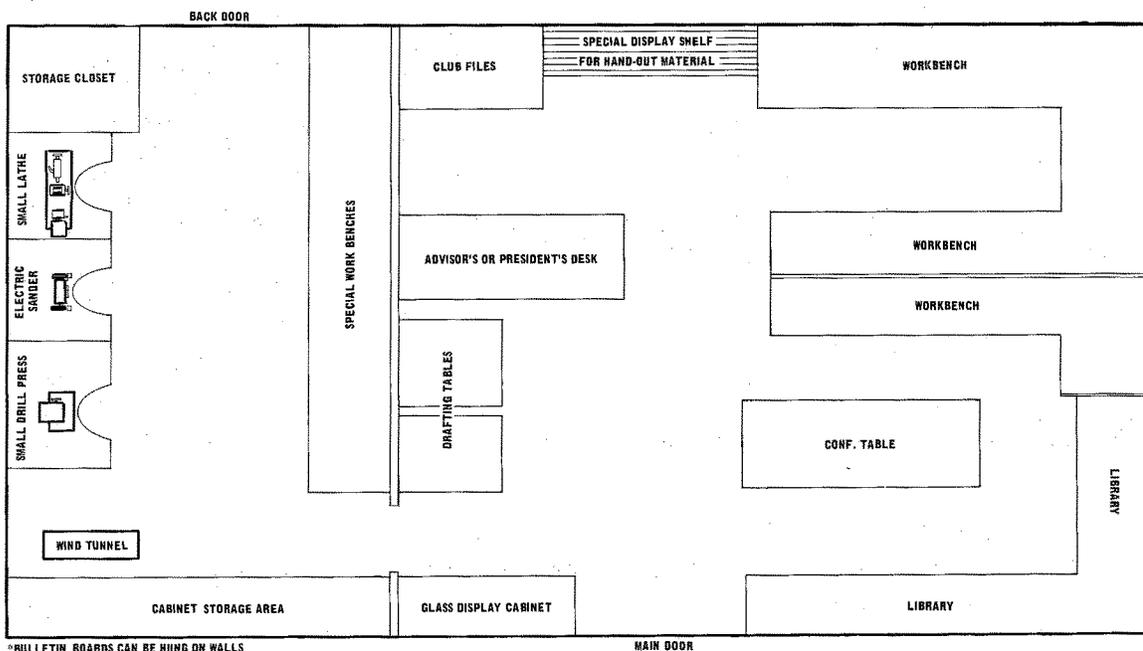


Fig. 4 Suggested layout for advanced workshop.

To carry out advanced club activities, adequate funds will be necessary. A parent or senior member council can be extremely effective in handling activities such as launch site concessions, range store, special sales and other fund raising events. The profits made by these activities can be used to outfit the launch site and workshop with special equipment to assist rocketeers.

LAUNCH SITE IMPROVEMENTS

Possible launch site improvements might include one or two multiple-pad launch systems complete with underground wiring. With two multiple-pad launch pad systems, launching can be almost continuous. While rocketeers are placing their rockets on one launch rack, the rockets on the other rack are being launched.

A high quality, built-in public address system for improved launch narration might also be considered. Improved data reduction, tracking and communications equipment will benefit the entire club by upgrading meet recording. Other launch site necessities such as appealing information signs, tables, chairs and boundary flags should also be taken into consideration.

To improve the quality of launch site facilities, a club might explore the possibilities of constructing a range storage area, concession stand, restrooms or bleachers for spectators.

ADVANCED RANGE ACTIVITIES

If launch site improvements are carried out to increase the general quality of the range and to make possible the handling of a greater number of rocketeers, then the club should consider the possibility of hosting a regional model rocket meet. With adequate equipment and facilities, the hosting of a regional meet can be an enjoyable and exciting experience for all concerned. This type of event promotes excellent competition and the sharing of ideas between rocketeers from various areas. It takes a good deal of planning and is usually scheduled over a two-day period, such as a weekend.

In addition to the regional meet, an advanced club should explore the possibility of sponsoring a model rocket conference or convention. This event requires large meeting facilities, guest speakers and possibly food and lodging arrangements. It features professional talks, rocketeer presentations and round table discussions on topics of current interest to model rocketry and aerospace science. Guest speakers can usually be obtained through NASA, the military, the aerospace community or the university community. As the sharing of ideas and information is the major

aim of this event, it represents one of the most educational of club activities.

Other launch site activities for an advanced model rocket program might include control-line or radio-controlled airplanes, free flight or towline gliders, Citizen's Band or ham radio communications or perhaps astronomy. Activities relating to flying, electronics, communications or space will usually be of interest to at least a portion of the club members. Participation in these types of activities will turn a model rocket club into a real Aerospace Club.

WORKSHOP IMPROVEMENTS

Improved workshop equipment might include a small wood lathe for turning custom nose cones, electric sander for airfoiling large fins or airbrush system for rocket finishing. Additional hand tools for workshop use plus free glue and sand paper for club members might also be considered. The construction of drafting tables and the development of an expanded library could help club members with the planning and execution of their special projects.



Advanced rocketeer airfoils special competition designed fin on workshop sander.

ADVANCED WORKSHOP ACTIVITIES

The special projects of an advanced model rocket program may involve static testing, wind tunnel observations or computer technology in the researching of such topics as engine performance, aerodynamics, drag, center of pressure calculations or altitude prediction. Special projects can be an individual endeavor, the continuation of a school assignment or a team research effort by several rocketeers.

Teachers interested in developing an educational model rocket program for their classroom should contact Estes Industries' Education Department for information on school materials. Model rocketry is a tremendous teaching aid and great fun for students.

The publishing of a club newsletter can really stimulate interest in club activities. The purpose of a newsletter is to provide personalized reading enjoyment for club members. Features can include articles on club activities, editorials, cartoons, free plans and club announcements. If a club has been publishing a successful newsletter, it should consider sending copies to other clubs. The exchanging of club newsletters has become an extremely popular activity, especially among sections of the National Association of Rocketry. The newsletter exchange keeps clubs informed of what is happening locally and communicates the activities of clubs all across the nation.

With an increase in membership and a greater variety of potential activities and projects, a model rocket club may discover a number of experience levels and age groups among its members. In order to maintain continuity, interest and enthusiasm, a system of club sections, flights or levels should be considered. Usually 3 or 4 club sections will be adequate to handle the various experience and age levels. Each section should have a number of requirements which must be completed before a rocketeer can move onto the next level. Section requirements might include the construction and launch of certain types of model rockets, the reading of technical literature, attendance at designated discussions and lectures, special projects and participation in particular club activities. Estes Industries' "Model Rocket Study Guide" (TR-8) is an excellent model for this type of program. TR-8 features a guide for three club sections with construction requirements, reading assignments, special projects and reviews. Club sections provide rocketeers with a framework for development and an incentive for advancement in model rocketry.

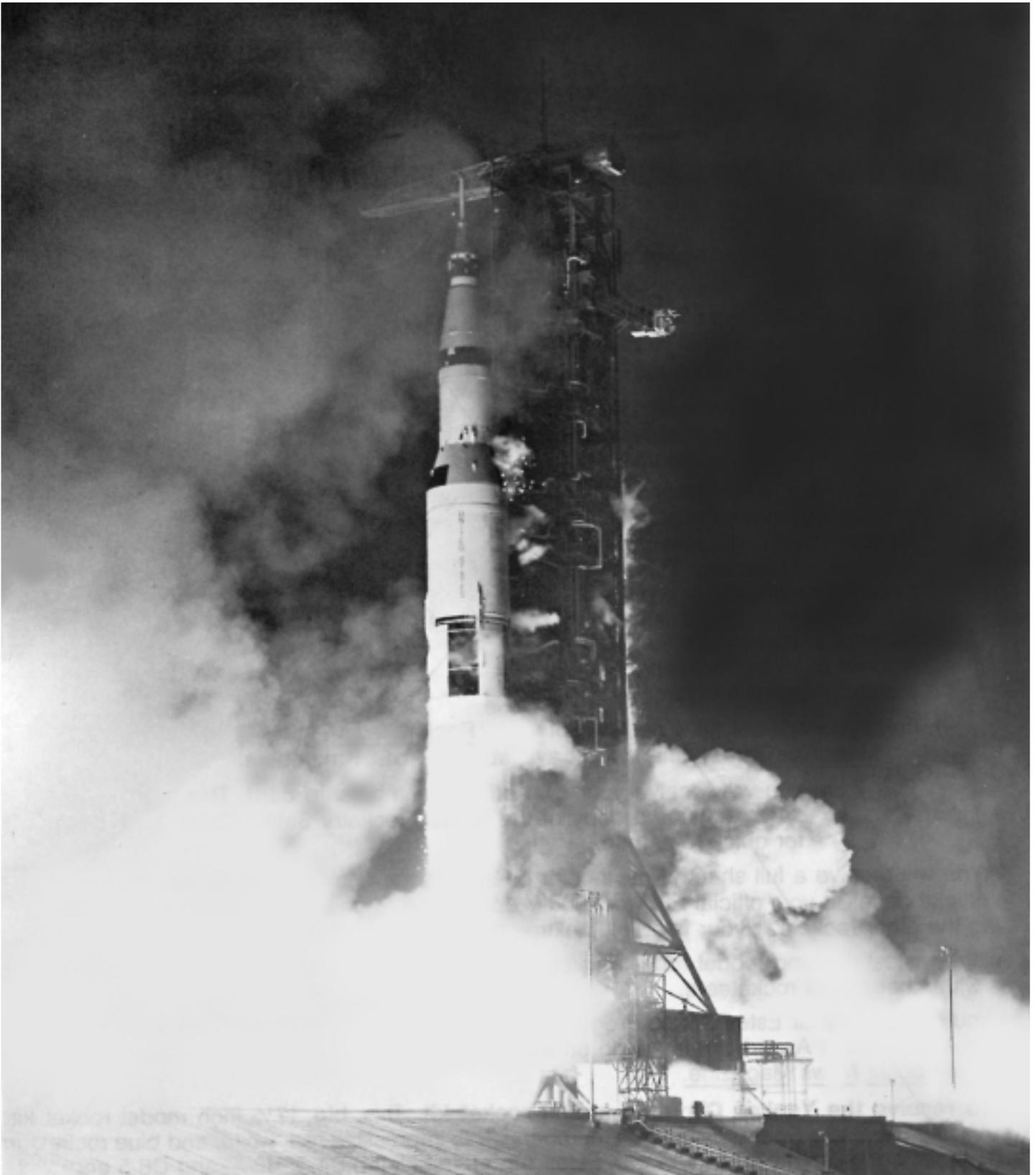
SUPER FIELD TRIPS

As was mentioned earlier, field trips can provide very exciting educational experiences for model rocket club members. Advanced clubs should explore the possibilities of watching an actual rocket launch at the nearest NASA, military or aerospace installation test facility. Viewing the launch of a sounding rocket, satellite carrier or military vehicle would be a great thrill for members of any rocket club.



Father and son make the final launch preparations for their unique research and development vehicle.

If a model rocket club has become an N.A.R. section, its members will be aware that the national model rocket championships, NARAM, sponsored by the N.A.R. are held each summer. Clubs wishing to attend this meet should begin planning early. A club will need good organization, strong parent support and adequate funds for its members or representatives to attend the five-day event. The meet features the nation's best model rocket competition plus a variety of exciting activities. NARAM participation provides a tremendous challenge and highly rewarding experiences for rocketeers.



Advanced activities represents the paramount experience for the members of a model rocket club. Sponsor the necessary fund raising events and make the proper arrangements for club members to witness the launch of a Space Shuttle from Cape Canaveral. What a thrill for club members to witness the beginning of a space mission! Although this sug-

gestion may seem out of reach for most model rocket clubs, it doesn't have to be! Remember, unlimited educational and recreational activities are available to clubs who have good organization, an interested membership, strong parent support, a capable advisor and sincere sponsorship. With these ingredients, the sky is the limit for club activities.



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