Upstate Rocketeer Supplement

From the editor,

This supplement to the October, 1992 *UR* is being sent to MARS club members only. Inside you will find several items of interest that for a variety of reasons, did not need to be sent out to newsletter subscribers or to exchange newsletters. Specifically, this supplement includes the following items:

1. The FAA NPRM issued in response to the NAR's proposal to change the FARS Part 101 to allow rockets up to 1500 grams to be flown without a waiver.

2. A proposal and petition from Chuck Weiss for the NAR to not discontinue it's involvement with FAI competition.

3. Two "B" engine Helicopter Plans for those planning for NARAM-35.

Until next time,

Dan

Dan

This file includes the text of the FAA NPRM issued in response to the NARUs proposal of 1985. This file was prepared by optical character recognition; and although an effort was made to correct errors introduced in the OCR process, there is no guarantee that no other errors remain.

This document has been uploaded for information only. The uploader prefers that you DO NOT issue an independent, personal response to the FAA on the subject of this NPRM until NARUs legal experts have finished their analysis and composed an informed response. Information about the progress of this effort will be posted in the Sport Rocketry section.

Printed copies of this document may be obtained by calling the toll-free number 1-800-FAA-SURE and asking for a copy of Docket #26965.

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
14 CFR Part 101
[Docket No. 26965 ; Notice No. 92-12]
RIN: 2120-AB75

Model Rocket Operations

AGENCY: Federal Aviation Administration (FAA) DOT.

ACTION: Notice of proposed Rulemaklng (NPRM)

SUMMARY: This notice proposes to reduce the restrictions on the operation of model rockets that use not more than 125 grams (4.4 ounces) of propellant; that are made of paper, wood, or breakable plastic; that contain no substantial metal parts; and that weigh not more than 1,500 grams (53 ounces). The FAA believes that this amendment will foster an important aeronautical education activity while retaining appropriate safety precautions.
DATES: Comments must be received on or before [90 days after publication]. {Actual date is December 9, 1992}

ADDRESSES: Comments on the proposal may be mailed or delivered in duplicate to: Federal Aviation Administration, Office of Chief Counsel, Attention: Rules Docket (AGC-10), Docket No. [26965], 800 Independence Avenue, SW., Washington, DC 20591. Comments may be examined in the Rules Docket weekdays, except Federal holidays, between 8:30 a.m. and 5:00 p.m.

FOR FURTHER INFORMATION CONTACT: Mr. Joseph C. White, Air Traffic Rules Branch, ATP-230, Federal Aviation Administration 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-8783.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested parties are invited to participate in this proposed rulemaking by submitting necessary written data, views, or arguments. Comments that provide the factual basis supporting the views and suggestions presented are particularly helpful in developing reasoned regulatory decisions on the proposal. Communications should identify the regulatory docket or notice number and be submitted in duplicate to the address listed above. Commenters wishing the FAA to acknowledge receipt of their comments on the notice must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. [26965]." The postcard will be date/time stamped and returned to the commenter. All communications received on or before the specified closing date for comments will be considered by the Administrator before taking further rulemaking action. The proposals contained in this notice may be changed in light of comments received. All comments submitted will be available, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket.

Availability of NPRM's

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Information Center, APA-430, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Communications must identify the notice number of this NPRM. Persons interested in being placed on a mailing list for future notices should also request a copy of Advisory Circular No. 11-2A "Notice of Proposed Rulemaking Distribution System," which describes the application procedures.

Background

On September 12, 1984, the FAA announced in the Federal Register (49 FR 35789) a Regulatory Review Program for Part 101 of the Federal Aviation Regulations (FAR) and invited comments and recommendations as part of this review. Comments received during the Regulatory Review addressed the following areas of concern: (1) balloon operations, including moored vs. tethered balloon requirements, lighting requirements and operations in the proximity of airports; and (2) model rocket operations. Comments on model rockets concerned proximity of operators to airports, increased gross weight, and propellant standards. Response to the announcement of the review program was very limited, except for those issues regarding the operation of model rockets. This notice addresses only those issues related to the operation of unmanned (model) rockets.

National Association of Rocketry

On May 24, 1985, the National Association of Rocketry (NAR), an affiliate of the National Aeronautic Association, representing thousands of model rocket consumers, and the Hobby Industry Association (HIA), representing the manufacturers of model rocket kits, motors, and accessories, petitioned the FAA to consider rulemaking action to amend FAR Ss 101.1, Applicability. The petitioners seek to raise the upper weight limit on excepted model rockets from 16 ounces to 1,500 grams (approximately 53 ounces) and the allowable propellant mass from 4 ounces to 125 grams (approximately 4.4 ounces). According to the petitioners, these changes are based on studies conducted by the NAR and are recommended to help keep model rocketry in the U.S. abreast of advancements made in this educational aerospace hobby/sport.

Section of the FAR Affected

Section 101.1, in pertinent part, establishes the applicability of Part 101 to the operation of any unmanned rockets using more than 4 ounces of propellant or having a total weight of more than 16 ounces, including the propellant.

A summary of the petitioners' request was published in the Federal Register on March 19, 1986 (51 FR 9458) for public comment. The only comment received was from one of the petitioners, who supported the petition.

Supporting Information

The petitioner stated that from 1959 to 1962, when the current Part 101 was being drafted, the NAR played a major role in suggesting the present limits on propellant and gross weight for exclusion from Part 101, Applicability. At that time, model rocketry was strictly an American hobby/sport. The Federation Aeronautical International first established its "Sporting Code for Space Models" in 1964. Considering the construction techniques, materials, and design principles of model rockets that existed in the 1959-1962 time period, the NAR considered 4 ounces of propellant and 16 ounces of gross weight to be the maximum values likely to be achieved in the model rocketry hobby in the foreseeable future. The FAA accepted these limits which formed the basis for the current FAR Ss 101.1.

The petitioner further stated that the state of the art in model rocketry has progressed to the point where larger, heavier, and more powerful model rockets are both feasible and safe due to improved propellants, materials, and safety procedures. NAR stated that it had conducted an intensive and inclusive study of potential safety hazards of model rockets having increased gross weights. The study was undertaken by a special committee of the NAR that was established in 1983 and staffed by model rocketeers, aeronautical engineers, National Aeronautics and Space Administration sounding rocket experts, rocket propellant

specialists, doctors of medicine, licensed pilots, and computer engineers. The study purports to validate the conclusion that no degradation of aviation safety will result from the proposed increase in propellant and rocket weights.

The study included an evaluation of the effects of crosswinds on the launching of model rockets. It concluded that heavier rockets would be less susceptible to tip-over or course derogation from wind than the lighter rockets.

The study also included an investigation regarding the potential of an incident between a 1,500-gram model rocket and an aircraft in flight. NAR's researchers assumed that any probable hazards to aircraft would fall in the following two areas: (1) airframe penetration during high-speed powered flight of models; and (2) foreign object damage, similar to that posed by a bird, during the model's low-speed drifting return to the ground under a miniature parachute or other recovery device.

Potential for damaging an aircraft in flight

The study concluded that the probability of a model rocket causing foreign object damage to an aircraft in flight during the model's slow descent to the ground, via a recovery device, depends on how much the model weighs, how high it flies, and how long it takes to return to the ground. The increase of allowable propellant, coupled with more powerful, modern model rocket motors when used with a very light rocket (less than one pound) could cause an increase in the maximum achievable altitude of only 20 percent (to 7,200 feet for a single-stage rocket and to 10,000 feet for a two-stage rocket). This could allow a model rocket to stay aloft under its recovery device for up to 10 minutes. The probability of an aircraft encountering such a rocket was estimated (by the NAR special committee) to be 1 in 48 million flights of these high performance model rockets. When a maximum of 125 grams of propellant is used with a 1,500-gram model rocket, the maximum achievable altitude is much less -- approximately 2,400 feet. In addition, impact with an aircraft during the upward powered flight of a 1,500-gram model rocket might cause airframe damage comparable to the impact of large hailstones.

The worst possible collision scenario that could occur would be during the model's slow descent phase, if it were to be ingested by a turbine engine. NAR noted that, since current regulations require aircraft turbine engines to remain controllable following ingestion of tire treads and 4-pound birds, turbine engines also should be able to continue operating after ingesting gravel or 1.5-pound birds. According to the petitioner, low density, non-metallic, high performance model rockets weighing up to 1,500 grams would not pose greater damage potential than these.

To confirm the results obtained by computer analyses, literature searches, statistical analyses, and historical data, the petitioner conducted actual flight tests at a site 5 miles north of an airport. Sixteen high-powered, high-weight model rockets were launched. All models were tracked using the FAA-approved two station altitude/azimuth theodolite system. Comparisons were made between high-powered model rockets weighing up to 1,500 grams with 125 grams of propellant, and those currently excluded from regulation by the FAR. These flight tests confirmed the other analyses and data; however, these tests did not include verification of the potential for the occurrence of an impact with an aircraft in flight or the resulting consequences of such an occurrence.

The final report of the NAR Committee was presented to the NAR Board of Trustees in February 1985. The board accepted the committee's report and the recommendation that NAR-permissible model rocket gross weights be increased to 1,500 grams and propellant weights to 125 grams. The report also was accepted by the Model Rocket Division of the HIA. The recommendations were forwarded to the National Fire Protection Association's (NFPA) committee on pyrotechnics, for their consideration in revising NFPA 1122 Code for Unmanned Rockets. This is a voluntary standard that is widely accepted by state legislatures and public safety officials having rulemaking powers.

FAA Analysis

The FAA has reviewed the NAR study as well as other pertinent data. The FAA also notes that the NAR estimates that there have been approximately 250,000 launches of model rockets since the inception of the sport and that the National Transportation Safety Board (NTSB) reports that there have been no midair collisions between model rockets and aircraft in flight. The FAA considers that it is to the public's benefit to foster interest in aeronautics and that model rocketry provides a valuable means for hobbyists to pursue that interest. The FAA further believes that the educational value of this activity is enhanced by remaining abreast of the state of the art technology.

The FAA commissioned a study of its own to evaluate the potential for a hazard to aviation safety resulting from the operations of model rockets.

The March 1991 final report included an analysis of the likelihood for damage to an aircraft in flight if impacted by a model rocket, as well as a conclusion of the probability of such an occurrence. The researchers, the Galaxy Scientific Corporation, of Mays Landing, NJ, made the following conclusions:

Model rockets have the capability to reach the theoretical speed of 600 knots and the altitude of 4,000 feet based on the calculations performed in the report.

Searches of FAA and NTSB data bases from 1984 to 1989 indicate that the probability of collision between model rockets and aircraft is remote.

The two most vulnerable types of aircraft are general aviation aircraft and rotorcraft, due to lower operational altitude and velocity and different structural design conditions.

The results of structural analysis show that model rockets under present and proposed rules have the capability to damage aircraft, assuming that a collision occurs.

Some operational limits for model rockets should be specified, (i.e., do not operate model rockets in controlled airspace or within 5 miles of the boundary of any airport). This notice would limit the operations of model rockets at least 5 nautical miles from the airports and further reduce the chance of collision between a model rocket and an aircraft.

The study, in its entirety, has been placed in the docket for public inspection.

Conclusions

The FAA must balance considerations of advancing the study of and interest in aeronautics resulting from model rocket activities with concern for the protection of aircraft in flight. The Agency also must balance the remote likelihood of a collision between a model rocket and an aircraft and the consequences of such an occurrence. The FAA has concluded that the outstanding safety record of model rocketry to date is due, in part, to the establishment and compliance with voluntary standards such as the NAR's Model Rocket Safety Code. That code provides, in part for a launch safety officer to terminate activity when aircraft are observed entering the area where model rockets are being launched. The FAA also believes that if the size and mass of model rockets are increased, there is an increase in the potential for harm to an aircraft in flight should a collision occur. It is therefore essential to ensure that persons operating larger model rockets observe such safety precautions. The FAA has determined that it is in the public interest to accommodate the advancement of model rocketry with regulations that also will provide an adequate level of assurance that such rockets will not jeopardize the safety of aircraft in flight.

The Proposal

The FAA proposes to add Ss 101.22 to Part 101 of the FAR to allow the operation of model rockets with up to 125 grams (approximately 4.4 ounces) of propellant and a maximum gross weight of 1,500 grams (approximately 53 ounces), including propellant, as long as certain precautions are taken. As is now the case, model rocketeers still would be prohibited from launching rockets into, or through, clouds, from flying near aircraft in flight, or from being hazardous to people or property. The prohibition against operating such model rockets in controlled airspace, within 5 miles of an airport, within 1,500 feet of any non-participant, or between sunset and sunrise, however, will not apply provided the person operating the model rocket complies with the provisions of Ss 101-25, which the FAA is proposing to modify in this NPRM, requiring that model rocketeers provide pertinent information about the operation to the nearest FAA Air Traffic Control (ATC) facility. The FAA has determined that organizations that previously were excluded from the requirements regarding spectator proximity or night operations have demonstrated a very effective safety record. The FAA believes that reestablishing the threshold at not more than 125 grams (approximately 4.4 ounces) of propellant and not more than 1500 grams (approximately 53 ounces) of total rocket weight, does not warrant spectator restraint or operational time prohibitions.

The FAA is proposing to make an editorial change to Ss 101-25 to clarify the intent of the existing language dealing with .. notification of an intended operation. The current language requires FAA notification "within 24 to 48 hours" of an intended operation. A literal interpretation of the requirement would allow a proponent to notify the FAA anytime preceding the actual time of the operation and up to 48 hours prior to the operation. Such interpretation is not the original intent of the requirement. The intent is for the FAA to receive notification at least 24 hours prior to the operation but no more than 48 hours prior to the operation. The 24-hour prior notification is the minimum necessary for the FAA and airport management, as appropriate, to advise pilots planning to operate in the area where unmanned rocket operations are planned. The maximum 48-hour notification is the optimum amount of time that a proponent would have finalized his/her intended operation. Therefore, the FAA believes it minimizes the revisions to advisories given to pilots concerning a planned unmanned rocket operation. Accordingly, the language in the rule would be changed to reflect the original intent of the rule.

Regulatory Evaluation Summary

Introduction

This section summarizes the full regulatory evaluation that provides more detailed estimates of the economic consequences of this regulatory action. This summary and the full evaluation quantify, to the extent practicable, anticipated benefits and estimated costs to the private sector, consumers, and Federal, State, and local governments.

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society outweigh potential costs for each regulatory change. The order also requires the preparation of a Regulatory Impact Analysis of all Rmajor" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is controversial or likely to result in an annual effect on the economy of $100 million or more, a major increase in consumer costs, or a significant adverse effect on competition.

The FAA has determined that this rule is not "major" as defined in the Executive Order; therefore, a full regulatory analysis, which includes the identification and evaluation of cost-reducing alternatives to this rule, has not been prepared. Instead, the agency has prepared a more concise document, termed a regulatory evaluation, that analyzes only this rule without identifying alternatives. In addition to a summary of the regulatory evaluation, this section also contains a summary of the regulatory flexibility determination required by the 1980 Regulatory Flexibility Act (P.L. 96-354) and an international trade impact assessment. If more economic information is desired than is contained in this summary, the reader is referred to the full regulatory evaluation contained in the docket.

Benefits

The proposed rule likely would provide benefits. The FAA has determined that the proposed regulations will accommodate the advancement of model rocketry and simultaneously provide an adequate level of assurance that such rockets will not jeopardize the safety of aircraft in flight.

Costs

The proposed rule for unmanned rockets consists of provisions that specify the requirements for operating certain model rockets (rockets using not more that 125 grams of propellant; made of paper, wood, or breakable plastic; containing no substantial metal parts, and weighing not more than 1,500 grams including propellant). The proposed rule is designed to accommodate the advancement of model rocketry with regulations that also will provide an adequate level of assurance so that such rockets will not jeopardize the safety of aircraft in flight.

The FAA estimates that the proposed changes in the NPRM would have no cost impact to users of model rockets. In fact, the proposed changes might produce a cost savings. The savings associated with these changes, however, are considered negligible and unquantifiable.

This provision may impose minor costs on the FAA. Persons operating model rockets would have to provide the information required in existing Ss 101.25 to the airport manager and to the FAA ATC facility that is nearest the place of the intended operation. The FAA would incur costs associated with receiving, recording, and evaluating the material that has been received. The FAA believes that these costs would be minor.

Conclusions

Based on the fact that there are little or no compliance costs coupled with the potential benefits, the FAA concludes that the proposed rule would be cost-beneficial.

International Trade Impact Analysis

The proposed amendments would apply to users of model rockets in the United States only. There would be no economic impact resulting from any of the proposed amendments and the FAA has determined that these regulations would not have an impact on international trade, if promulgated.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules that may have "a significant cost impact on a substantial number of small entities."

With regard to this regulatory evaluation, there would be no cost associated with any of the proposed amendments. The FAA has determined that the proposed amendments contained in this NPRM would not have a significant economic impact on a substantial number of small entities.

Federalism Implications

The regulations proposed herein would not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that such a regulation does not have federalism implications warranting the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this proposed regulation is not major under Executive Order 12291. In addition, the FAA certifies that this proposal, if adopted, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This proposal is not considered significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). An initial regulatory evaluation of the proposal, including a Regulatory Flexibility Determination and Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT. "

List of Subjects In 14 CPR 101

Moored balloons; Kites; Unmanned free balloons; Unmanned rockets.

THE PROPOSED AMENDMENT

In consideration of the foregoing, the FAA proposes to amend Part 101 of the Federal Aviation Regulations, as follows:

1. The authority citation for Part 101 continues to read as follows:

Authority: 49 U.S.C. App. 1348, 1354, 1372, 1421, 1442, 1443, 1472, 1510, and 1522.; E.O. 11514; 49 U.S.C. 106(g).

SUBPART C - UNMANNED ROCKETS

2. Section 101.22 is added to read as follows:

Ss 101.22 Special provisions for large model rockets.

Persons operating model rockets that use not more than 125 grams of propellant; that are made of paper, wood. or breakable plastic; that contain no substantial metal parts, and that weigh not more than 1,500 grams, including the propellant, need not comply with subparagraphs 101-23 (b), (c), (g), and (h) provided:

(a) that person complies with all provisions of Ss 101-25; and

(b) the operation is not conducted within 5 nautical miles of an airport runway or other landing area unless the information required in Ss 101.25 is also provided to the manager of that airport.

3. Section 101.25 is amended by revising the introductory text and paragraphs (a), (b), (c), and (d) to read as follows:

Section 101.25 Notice requirements

No person may operate an unmanned rocket unless that person gives the following information to the FAA ATC facility nearest to the place of intended operation no less than 24 hours prior to and no more than 48 hours prior to beginning the operation:

(a) The names and addresses of the operators, except when there are multiple participants at a single event, a single name may be designated for all operations in the event;

(b) The estimated number of rockets to be operated;

(c) The estimated size and the estimated weight of each rocket; and

(d) The estimated highest altitude or flight level to which each rocket will be operated.

Issued in Washington, DC, on September 2, 1992

L. Lane Speck
Director, Air Traffic
Rules and Procedures Service

49 North Street
Broadalbin, NY 12025

October 14, 1992

Dear Editor:

Please find attached a copy of a letter and petition sent to all NAR Senior Advisors and/or Section Presidents requesting support for the continuance of international spacemodeling activities. The letter also outlines a plan for improving the international spacemodeling service program.

I would appreciate your running the letter and petition in your newsletter in order to provide as many NAR members as possible with the information they contain. Because time is critical, it would be most useful if your newsletter will be published within the next thirty days.

If you choose to publish the information, please ask your subscribers to return the petition even if the October 20th target date is surpassed. All support will have a long term impact and be appreciated. Comments on this issue are welcome. If you have any questions, please call me at [518] 883-8805.

Thank you for your assistance.

Sincerely,

Charles Weiss

W/b
Enclosures

49 North Street
Broadalbin, NY 12025

Dear Spacemodeler:

I am writing to seek your support in reversing the recent decision by the NAR board of trustees to terminate support of international spacemodeling activities and to disengage from FAI affiliated international competition. Support of these activities provide NAR members the opportunity to represent the United States in world championship competition and to partake in the technological and cultural exchanges associated with these activities.

The board's decision is based on the premise that under existing circumstances, only a small percentage of NAR members experience the benefits of international programs. It is difficult to justify the expense of international activities on this basis. The activity also has been perceived as a closed arena, difficult to influence or access. It has been argued that, despite the countless efforts provided by dedicated international spacemodeling volunteers, the program has failed to inspire involvement, reach out to, or satisfy the concerns of many NAR members. Hence, the board views international spacemodeling as a program that fails to provide an adequate or justifiable service. The board's solution to the problem is to eliminate the program. This action is an even greater disservice to the NAR membership.

I ask the NAR membership and its board of trustees to consider an alternative solution. As International Affairs Committee Chairman and involvement with five United States teams, I have had firsthand experience and heard the concerns of both active international spacemodelers and the general NAR membership. From this input, I have deduced that the success of an international spacemodeling program is achievable by uniting the international spacemodeling community through an open and impartial organization available to all NAR members. The organization must provide a democratic mechanism for participants to choose their leadership, plan activities and play an active role in determining the rules governing the organization. The organization must be "member-driven!" The organization must become more financially self-sufficient to establish financial justification. It must inspire involvement by actively promoting international spacemodeling activities and the open and impartial exchange of information for all those interested. Finally, it should minimize the management frustrations that have lead to board of trustees' decision.

The following plan is offered to accomplish these objectives:

I. Establish an NAR affiliated special interest group or section dedicated to the promotion of international spacemodeling activities under the principles described above. The organization is hereby referred to as the NAR International Spacemodeling Society (ISS).

II. The ISS will:

A. Offer and encourage membership on an open and impartial basis to all members of the NAR.

B. Establish by-laws that provide for the fair and democratic election of leadership and membership participation in the policies, decisions, and management of the Society.

C. Establish impartial rules and regulations regarding the management and selection of U.S. teams. This function assumes that the NAR pursues and successfully obtains the authority to act in this behalf.

D. Establish a treasury and obtain funding to support international spacemodeling activities. Funds will be obtained through membership dues, subscriptions, publications, fund-raising activities and donations. Rules governing the collection and dispersement of funds will be determined by members of the ISS in accordance with the by-laws of the NAR.

E. Establish an ISS newsletter. The newsletter will disseminate organizational and technical information and provide an open forum for expressing opinions and sharing information related to international spacemodeling. The newsletter will be dedicated to the promotion of international spacemodeling activity, the advancement of international spacemodeling technology and available to any member of the NAR.

F. Sponsor and conduct FAI style competition events within the United States. These meets would be open to any competitor seeking involvement in international spacemodeling competition.

The ninth World Spacemodeling Championships and largest ever were held during September 1992 in Melbourne, Florida. Competition among the world's best rocket modelers, social festivities and technological and cultural exchanges were shared and enjoyed by participants from fourteen countries around the world. As many participants realized, one need not be a team member to share in this experience. The success of this event was made possible by the many participants and dedicated efforts of international spacemodeling volunteers. I left the World Championships bewildered that such an event is no longer considered worthy of NAR support.

The NAR represents many facets of model rocketry. Some areas of interest are pursued by fewer modelers than others. Yet, each interest area makes valuable contributions to the success of the hobby as a whole. The NAR is making a serious mistake eliminating smaller interests in favor of majority trends. What will be the next to go? As the primary model rocketry organization in the United States, active in and supportive of competitive model rocketry and in consistency with the principles of its

foundation, the NAR is the organization most suited to provide international spacemodeling opportunities to American spacemodelers. The NAR will fail all spacemodelers as an organization if it chooses otherwise.

The plan stated above received much support from spacemodelers attending the Ninth World Championships. A grassroots contingency provided preliminary funding to establish the ISS and to provide the NAR membership with the information contained herein. The future of international spacemodeling in the United States is in your hands. Please support the continuance of international spacemodeling activities and FAI affiliation as a NAR service program by signing the enclosed petition. Share the information with as many NAR members as possible and mail the petition to J. Patrick Miller, President of NAR. As time is crucial to the success of this campaign, please mail by October 20th. I would appreciate a duplicate copy of your petition.

If you are interested in becoming involved with the ISS or have any questions regarding this issue, please contact me at the above address or via telephone at [518] 883-8805. Thank you for your consideration and support.

Sincerely,

Charles Weiss
Past International Affairs Committee Chairman and Preliminary Organizer of the International Spacemodeling Society

J. Patrick Miller, President
National Association of Rocketry
2518 Ridgecrest
Garland, TX 75041

Dear President:

I (we) the undersigned, ask that the NAR board of trustees reverse its decision to terminate support of international spacemodeling activities and to disengage from FAI affiliated international competition.

I (we) support in principle the plan submitted by Charles Weiss which describes the formation of an NAR special interest group or section dedicated to the promotion of international spacemodeling activities on a fair and impartial basis for all NAR members.

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The Rose-a-Roc 12

Art Rose's Helicopter Duration Model

by Craig Beyers

Art Rose is well known indeed— especially on the East Coast— for his well-designed (if somewhat different) rockets. He is one of the few individuals who examines the rules, considers the physics, and then *engineers* his models in the strictest sense of the word. The *Rose-a-Roc 12* is one of Art's latest designs. Art did something no one has done before: he sent the model instead of a plan! Having the model to draft from was a novel experience and had its positive moments.

Members of the PULSAR Section have scaled *Rose-a-Rocs* up and down, using rotors of every size from 6″ (152.4mm) to 24″ (610mm). Typical times for various models have ranged between one and two minutes with A8-3's, and four to five minutes with C6-3's.

Two factors make the *Rose-a-Roc 12* a significant departure from the legendary *Rotaroc*, George Gassaway's well-known and well-copied helicopter design [3/80 *Rocketeer*]. First, the rotors fold span-wise, reducing the chord and presenting a smaller surface to the boost airflow. Second, the rotors are hinged below and within the "drag shadow" of the nose cone, keeping them out of the direct air path. These factors combine to reduce drag and to let the *Rose-a-Roc* boost higher than other designs. Of course, the higher you go, the farther you have to fall— and that's the competitive edge in this duration event.

The plans show a model suitable for A through C engines, according to Art. Since this model is stable with C's, smaller fins are practical for A and B classes. Make three identical fins from either 3/32″ hard balsa or 1/32″ plywood. (The plywood is neat— it buzzes happily on the way up!) Make sure you attach them well.

Punch holes in the upper end of the BT-20 with a hole punch before you install the balsa block and main shaft, because you won't be able to do so later! Coat the inside of the body tube with epoxy near the exhaust holes to reduce damage during ejection and improve durability. Put the engine block in, allowing the engine to stick out just about 1/4″. An engine clip adds weight— don't install one. Just be sure the engine is *tight* before you fly.

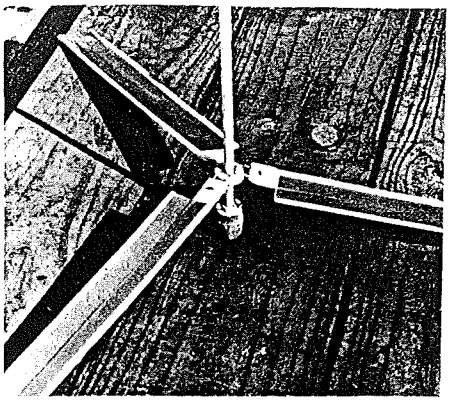
The rotors are made from three pieces of 1/16″ or 3/32″ balsa. Two form the lifting portion and a small piece reinforces the rotors at the rotor head. This small piece is attached when the hinges are attached, so don't bother with it now. Note the grain direction of the rotor blades, as it is very important. Sand the airfoil into each rotor before you cut the rotors in half. Wax the inside edges so that when you attach the rubber bands in the next step you don't glue the halves back together! Put *Trim Monokote* on the bottom of each rotor before attaching the 3/16″ *Sig* rubber pieces to the tops with *Hot Stuff*. Art used red *Trim Monokote* for visibility, and colored the top of each rotor with orange marker to make the model easier to find on the ground.

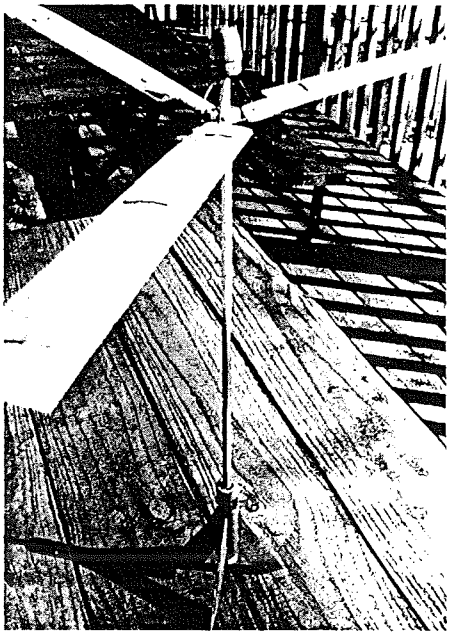
Instead of the heavy plastic *Klett* hinges, Art uses two sizes of galvanized iron wire available at his hardware store. The rotor-mounted, "U-shaped" hinges are 22-gauge wire, epoxied or *Hot Stuff*'ed to each rotor. The small piece of balsa is mounted, cross-grained to the rotor, at the end of each rotor blade. The plan is your best reference for this assembly. With a jeweler's drill set or pin vise, drill small holes into the hardwood hinge disk and thread the 28-gauge wire through the holes to "sew" the hinges on. Put two loops around each hinge, as shown in the plan. This is obviously the most difficult assembly on the model, so take your time and do it correctly. When all the rotors and hinges are attached to the hinge disk, set the whole assembly aside.

You can use either a 3/16″ dowel or 3/16″ square stock for the shaft. If you use the square stock, you must round down the upper end to fit the hinge disk and nose cone. Art used a drill gauge to round the square stock, pushing the wood through successively smaller holes until it fit the hinge disk. Glue the entire rotor assembly into place with the hinges on the *bottom*. Carefully drill a hole into the base of the nose cone and glue the shaft into it. Glue the balsa block to the bottom of the main shaft at this time.

(The plan shows a "freewheeling" option, published by "Captain Video" in NIRA's Section newsletter, *The Leading Edge*. Art has never built this himself, but thinks that one of his club members may have. It works this way: rather than gluing the hinge disk and nose cone to the main shaft, the modeler attaches them to a long piece of 3/16″ launch lug. This allows the assembly, which is held in place by additional 3/16″ lugs above and below, to rotate around the main shaft. Everything else is essentially the same.)

Slits in the bottom of the nose cone and in the rotors are used to attach the actuating rubber bands. Put the 1/8″ *Sig* rubber about 3/16″ deep into the nose cone and glue each piece in place. Pull the rubber through the holes in the rotors and adjust the rubber for equal tension in each blade *before* gluing it in place. (According to Art, he adjusts the rubber "to about E-flat above high C." Got that?) Adjust the dihedral of the rotor blades so that the tips are even with the top of the nose cone. Make sure you hold the rotor tightly between your fingers at the place where the rubber goes through. Adjust the rotor for a slight forward pitch at the same time as you are setting the dihedral.





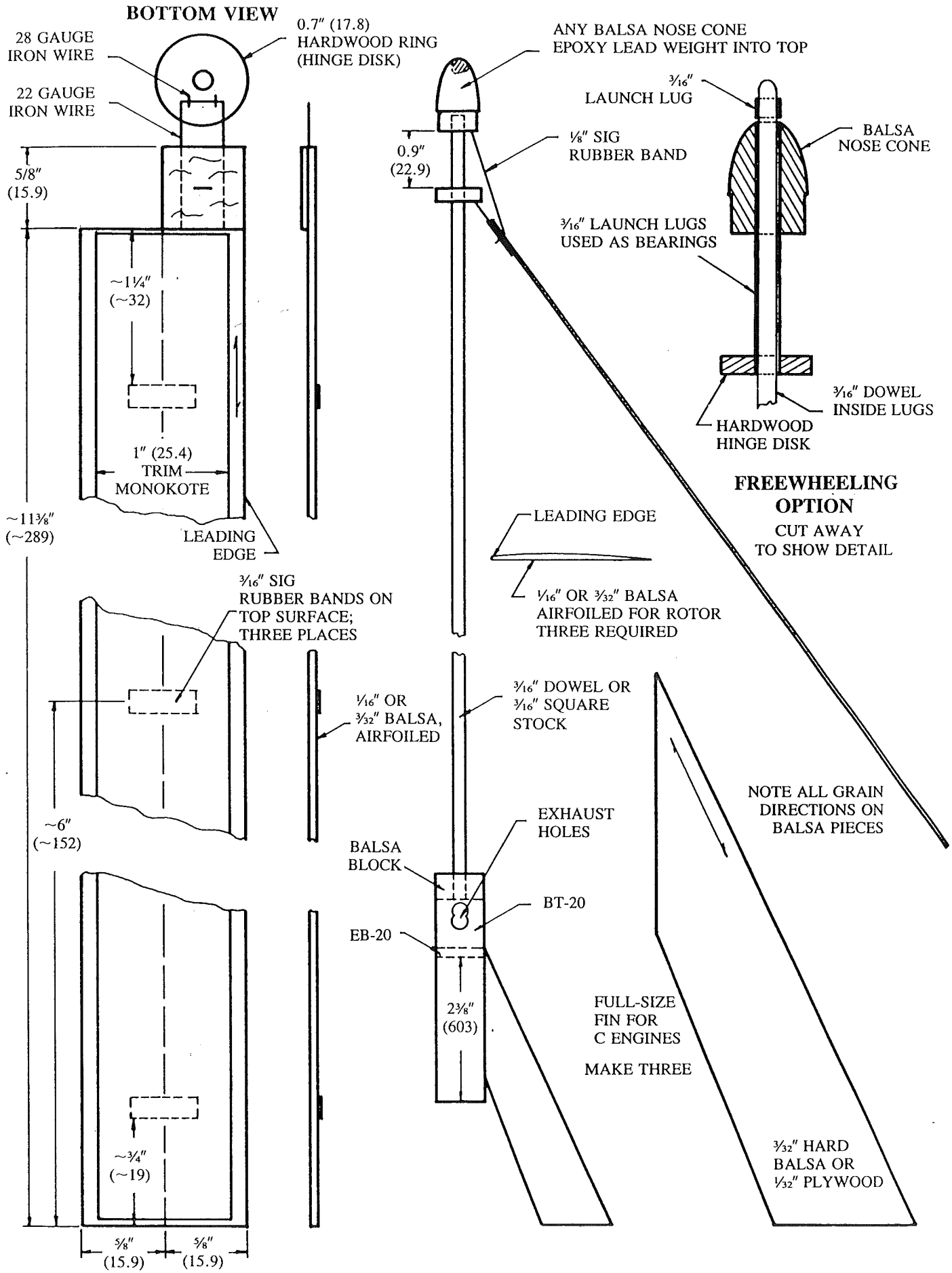
These photos show good detail of both sides of the rotors, as well as an overall view of the finished bird. (Photos by Craig Beyers)

When you attach the body/fin assembly to the shaft/rotor assembly, align the fins with the rotors. Glue the balsa block at the end of the main shaft into the body tube with epoxy or *Titebond* to ensure that it stays attached. Paint the lower section a bright color for visibility.

There is no launch lug, and, unlike the *Rotaroc*, the *Rose-a-Roc 12* cannot be flown from a standard launch rod. Art uses a tower instead.

To prep the model, fold each rotor in half and pull it down against the shaft. Wrap 2½ to three turns of nylon thread (CMR shroud line is perfect) around the rotors and through the exhaust holes. Tape the thread to the body tube— *don't* tie knots! Insert your engine with plenty of tape around the bottom to prevent ejection. Set it in the tower and you're ready to fly.

Whichever version of this model you attempt, build it slowly and carefully. The *Rose-a-Roc 12* is a difficult model to build, but its performance justifies all of your effort. Try one and you'll see!


BOTTOM VIEW
28 GAUGE IRON WIRE
22 GAUGE IRON WIRE
0.7" (17.8) HARDWOOD RING (HINGE DISK)
5/8" (15.9)
~1¼" (~32)
1" (25.4) TRIM MONOKOTE
~11⅜" (~289)
LEADING EDGE
3/16" SIG RUBBER BANDS ON TOP SURFACE; THREE PLACES
~6" (~152)
~¾" (~19)
5/8" (15.9)
5/8" (15.9)
1/16" OR 3/32" BALSA, AIRFOILED
ANY BALSA NOSE CONE EPOXY LEAD WEIGHT INTO TOP
0.9" (22.9)
1/8" SIG RUBBER BAND
3/16" DOWEL OR 3/16" SQUARE STOCK
EXHAUST HOLES
BALSA BLOCK
BT-20
EB-20
2⅜" (603)
3/16" LAUNCH LUG
BALSA NOSE CONE
3/16" LAUNCH LUGS USED AS BEARINGS
3/16" DOWEL INSIDE LUGS
HARDWOOD HINGE DISK
FREEWHEELING OPTION
CUT AWAY TO SHOW DETAIL
LEADING EDGE
1/16" OR 3/32" BALSA AIRFOILED FOR ROTOR THREE REQUIRED
NOTE ALL GRAIN DIRECTIONS ON BALSA PIECES
FULL-SIZE FIN FOR C ENGINES
MAKE THREE
3/32" HARD BALSA OR 1/32" PLYWOOD

Build the Rotaroc 7

by George Gassaway

The Rotaroc-7 was designed by George Gassaway of NARCS for the Helicopter Duration event, in which the rocket must deploy some form of rotors or blades that rotate and slow the rocket's descent. In this event the rocket that achieves the longest flight time from lift-off to touchdown is the event winner. As you can see from the plans, the Rotaroc-7 is a complicated rocket. Hence, some comments are necessary to explain its operation, construction, and flight preparation.

Although the Rotaroc-7 is a complicated design, its operation is relatively simple. After a vertical boost, the hot ejection charge gases burn through the elastic thread, releasing the rotors. The stretched rubber bands pull the rotors out against the rotor supports. Aerodynamic forces then cause the rotors to spin the entire rocket and generate enough drag and lift to slow the rocket and keep it up in the air.

Construction of the Rotaroc-7 requires some patience and care to ensure good flight performance. When cutting the fins, rotors, and rotor supports, make sure the balsa grain runs in the direction shown in the plans. Because of the loading of these parts, they *must* have the grain in the right direction or they will snap off! Use either fast-setting (5-minute) epoxy or a cyanoacrylate glue (such as Krazy Glue, Hot Stuff, or Eastman 910) to attach the Klett plastic hinges to the body and the rotors (Klett hinges can usually by found in the R/C aircraft section of your local hobby shop). Then wrap thread around the hinges and body tube and coat with white glue. Make sure that the hinges *aren't* directly in line with the exhaust ports, or the rubber bands that pull the rotors out will be burned off at ejection!

To fly the Rotaroc-7, prepare the engine and wrap enough masking tape around the end of the engine so that it fits tightly in the body tube. Put the elastic thread through the holes in the body tube, wrap the thread down against the body, wrap the thread once around the rotors and tie it. Then hook the rubber bands to the pins, making sure they fit into the half launch lugs that are glued to the rotor supports. Finally, slide the rocket over the launch rod—since the model has no launch lug, simply slip the rod up between the body tube and one rotor—attach the micro-clips, count down, and watch a most unusual rocket fly!