RRS NEWS

FOR THE ADVANCEMENT OF
ROCKETRY AND ASTRONAUTICS

PUBLISHED BY THE

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Reaction Research Society

POST OFFICE BOX 1101 — GLENDALE 5, CALIFORNIA

REACTION RESEARCH SOCIETY

NEWS

FOR THE ADVANCEMENT OF ROCKETRY AND ASTRONAUTICS

Published by the Executive Council
of the
REACTION RESEARCH SOCIETY, INCORPORATED
Box 1101 - Glendale 5, California

R.R.S. NEWS Number 95 SUMMER 1961

R.R.S. Meetings

5th R.R.S. Rocket Mail Flight, May 27, 1961

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September 9, rocket test program

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The R.R.S. NEWS is published quarterly by the Executive Council of the Reaction Research Society Incorporated.
Subscription rates are: Single copy 50¢, Yearly $2.00

REACTION RESEARCH SOCIETY MEETING NOTICE

HEADQUARTERS DISCUSSION MEETINGS: Monday, October 9, November 13, and December 13, 1961 at 7:30 p.m. at the Casa Verdugo Branch of the Glendale Public Library, 1151 North Brand Boulevard, Glendale. Movies and membership projects will be shown. Open to the public.

NOTICE

Due to difficulties in publishing the R.R.S. NEWS, the regular quarterly issues that were omitted will be made to apply on future issues of the NEWS. Those subscribing to the R.R.S. NEWS will automatically have their subscriptions extended for another year.

Flown Rocket Mail Covers

From the R.R.S. 5th Rocket Mail Flight, there are remaining less than 150 covers postmarked, Randsburg, May 27, 1961, and only 110 souvenir mint stamp sheets (2 stamps per sheet). The covers sell for $2.00 each, postpaid, and the souvenir stamp sheets are $1.00 per sheet of 2 stamps, postpaid.

This rocket mail flight being our most successful in the last few years will be followed by a special rocket mail flight sometime in January or June of next year. Advanced notices will be given when the date can be announced.

5th R.R.S. ROCKET MAIL FLIGHT

MAY 27, 1961

As the date for the important time of an Official Society Rocket Mail Flight nears, organized confusion in rampart. Excitement runs high as all of the rocket components are checked for readiness. Countless errands have to be run. Last minute checking of the Society Postoffice box must be made for orders received on the pre-flight date.

As we complete packing equipment and at last are on the way to the Townsite of Randsburg in the wee hours of the morning, there always remains that same old thought, has anything been forgotten. Then as you are traveling the 145 miles to the desert, anxiety increases about what type of weather we will have, will permit a successful launching of the mail rocket.

After entering the site of launching, all of these things are forgotten and there is nothing but hurried work details of preparing rockets, loading them and setting up the firing circuit in advance of having the completed rocket installed within the launcher. After all of these details have been completed, the prepare to launch signal is given. After all other crewman are behind protective cover, the firing crew prepares to arm the rocket. Then the red flag is raised on it's staff, designating that the rocket is armed and the count-down will begin from 30 seconds. Everyones pulse increases as the count-down goes from 9--------1 FIRE!

Because of the nature of the rapid burning solid fuel, the flight is over in less time than it takes for the count-down. The all clear sounded, the green flag replaces the red and the recovery crew is on it's way to pick up the compartment of rocket mail covers that have flown more than a mile down the flight range. After the removal of the protective wrapped packages of flown covers they are immediately loaded in the nearest vehicle-- and are on the way to the Postoffice of Randsburg.

No, its not over yet, now begins the hurried assembly of all personel present to apply regular AIRMAIL stamps to the Rocket Cache Covers. Finally as the 2000 covers are at last all completely stamped and are delivered--- in this case to a Post-mistress, everyone can make that sigh of relief. The rewarding feeling of success is felt by all. Consummating another Rocket Mail Flight of which the Reaction Research Society has been pioneering since June 27, 1947 with it's First flight across the Colorado River, from Winterhaven, California to Yuma, Arizona.

MOJAVE TEST AREA DEVELOPMENT

I would like to make a proposal that the Reaction Research Society take the initiative in developing the Mojave Test Area. As an interested party I have observed the excellent results of the work of a few members of the R.R.S. and the P.R.S. However, much more work needs to be done, and I will mention a few projects that seem to be in order.

But-what is really needed is for individual members-- You who are reading this article-- to pick on small project, which you know you can do and would like to do, and offer it as Your contribution to your Society. A project needn't be big: for example, if each member had contributed one concrete block and carried it out to the MTA each time they went out there, we could have some really solid facilities by now.

Besides a sign that has already been made to be posted at the entrance road to the MTA. There is need for guide posts along the dirt road leading to the area. Small arrows saying "MTA" mounted on a sign and anchored to a sturdy post 4" by 4" every half mile or so would be sufficientHere's a project you could build and install--maybe one, each time you took a trip out to the MTA and it would be there every time you passed, and you would have the feeling ' I did that', I know the R.R.S. News would be proud to give proper credit for good jobs, well done.

Another really important project: a permanently marked range. Right now, if you ask one of the rocket builders who have fired at MTA "which way did it go and how far?". The rocket 'scientist' could only answer, ' It went that-a-way' and, 'a far piece'. Without permanently fixed base line, measurements cannot be accurate. Every time the launching tower is lowered or raised, it is probably pointing in a different direction. The solution to these haphazard practices is not really difficult. There already exists a good fixed point; the solid concrete launching pad. All that is necessary for a base line is another accurately fixed point down range. A small concrete pad would do, but a visible tower or post would serve many valuable functions. A 30 foot pole, painted alternately red and white every 5 feet, at a distance of 500 or 1000 feet down range would aid immeasurably, in aligning the launching tower, in establishing a relative wind direction, and in providing a base for measureing to a downed rocket. It is a must for laying out accurate tracking, and photo-tracking stations. Most photographs would show such a tower and provide a relative yardstick.

So, the Society does need your help. Better yet, the bits of work of each member does is what really makes the Society.

George Dosa

R.R.S. ROCKET TEST FIRING SEPTEMBER 9

The weather conditions were ideal for firing rockets on the 9th of September at the Mojave Test Area. There was a very slight breeze and the temperature did not exceed 95' F.

Of the nine rockets fired, three were designed for static testing and the other six were flight rockets. The three static motors were fired for the purpose of testing fuel formula mixtures of potassium nitrate and powdered sugar. The largest of these motors, constructed of chrome-molybdenum tubing with ¼ inch wall, exploded violently just after ignition. One of the smaller motors also exploded. The third static motor, built by Jim Boland, had a successful firing, burning very smoothly for 26.75 seconds.

All of the flight rockets used micrograin as a propellant. Five of the six used a mixture ratio of 80% zinc and 20% sulphur, by weight. The rocket which did not use the above mixture ratio was designed for the purpose of testing a mixture ration of 67% zinc and 33% sulphur. This rocket, designed by Larry Teebken, was made of aluminum tubing of 1/8 inch wall thickness.*(This was another of the many illustrations that aluminum tubing is NOT the type of metal to be used with the mixture of zinc and sulphur.) Although the rocket had a flight altitude of 550 feet, there was a burn through of the motor casing just above the nozzle.

Two other rockets which were about 46 inches long were fired. One of these lost its bulkhead, but the other, built by Jim Boland, had such a good flight that it was lost from sight before it reached peak altitude and has notbeen recovered.

New nozzle designs were tested in two other rockets. These rocket and nozzles were designed by Jim Boland. One of the nozzles was made in two pieces as if it had been cut in half across the throat. When mounted in the rocket, there was a 1/8 inch space left between the two pieces of the nozzle. The presence of the space was to re reduce the erosion of the nozzle. This rocket reached an altitude of 4650 feet but has not yet been recovered at this time.

The second rocket used two nozzles, one above the other, with the upper nozzle having the smaller throat diameter. The use of the two nozzles was to allow more of the micrograin to burn within the combustion chamber. This rocket, which was 57 inches long and 1 3/4 inch in diameter, rose to an altitude of 6400 feet.

The final rocket of the day, built by Jack Preuss and Jim Boland, was 12 feet long and 2 ½ inch in diameter. The main stage of this rocket was surrounded by a cluster of three 40 inch long by 2½ inch diameter rockets which made up the booster stage. This booster stage was designed to fall away when it burned-out. Prior to ignition the four motors were fitted with squibs, but unfortunately, the squib used in the main stage was a different type than those used in the booster motors. Upon ignition all of the booster motors fired but the main-stage did not. The booster did carry the rocket to 1800 feet and after turn over, the main stage ignited from heat transfer and began a power dive into the desert below. When the rocket was recovered, it was 8 feet into the ground. A dye marker in the nose-cone had exploded upon impact as designed and spread blue dye over the area.

Everyone present considered the firing a success because of the new knowledge gained from the "mistakes" and the excellent flights of the other rockets.

by Maryann Butterfield.

*(Ed.)

STUDENT PROGRAM

There remains much more to be done in presenting amateur rocket construction and testing in a form to provide a complete student program. In many publications on the subject of amateur rocketry there is presented the general information in which to help. It is then up to the rocketeer to try to apply this information in an effort to construct or fly a rocket. As a result many a rocketeer never gets beyomd the stage of just flying a rocket. Such further experiments lead to the technical studies of measureing and checking the behavior of fuels by the use of static test stands and instruments. The technical challenge of rocketry can be overcome by a series of tried and tested formulas and graphs explaining how to go about it in detail. Actual workable plans of test stands and the use of easily available hardware and instruments will decrease the problems and expense of conducting valuable instructive experiments. Efforts are being made to gather project material from R.R.S. members to provide testing data and methods for studying each individual phase of amateur rocketry.

Through the publications of Jim Humphreys, the R.R.S. has just begun to make a showing at presenting such details of how a static test stand is constructed, tracking methods used on the R.R.S. Mojave Test Range, nose cone construction, checking the center of gravity and pressure of rockets to be flown and may other subjects. Emphasis in presenting the new material will be an actual test proceedure that may be conducted to provide conclusive results and characteristics. Shake tables and centrifuges will make it possible to test the ruggedness of electrical connections, firing devises and electronic component reliability.

When a second-stage rocket did not fire in proper order, or the recovery parachute did not open to recover the instrument package, there must not have been much pre-testing of the mechanical or electrical components. This pre-testing would assure to a degree better reliability for the success of the experiment. Along this line there has been experiments with rocket in-flight movie cameras to take pictures of instruments or of the terrain. Many of these experiments fail because either the 'G' forces of the rocket in flight prevent the mechanisms to function properly or there is a complete breakdown of some important part. These problems can be worked out if pr-flight testing of this equipment was made to prevent improper operation.

You are invited to participate in conducting this Student Program by assisting in gathering material, run tests and write up reports of each phase that may be selected. If there is a great show of enthusiasm in getting this program started, there may be added possibilities of producing some short film strips to supplement the printed material.

Very little can be accomplished by just one or two working on such a big program. If you may be interested in a certain phase of this or have ideas that may greatly benefit this Student Program, jot these down and send them in to the R.R.S., we will appreciate them.

E.B.P.

AMATEUR ROCKETEERS OF AMERICA CONVENTION

The First National Convention of the A.R.A. was conducted August 14 to 18, 1961, at Indianapolis Indiana. This being the greatest effort to assemble rocketeers Nation-wide, a good showing was made by the 135 rocketeers present.

On the opening day Dr. Willy Ley, noted author, lecturer and space scientist, presented a full coverage of the history of rocketry. During the week, morning and afternoon classes consisted of aerodynamics, instrumentation, designing rocket test facilities and the design of solid rocket motors. Adding to this was a lecture by Major Bertrand Brinley, author of "Rocket Manual for Amateurs". His technical classes were a great inspiration and help to the rocketeers in conducting proper experimentation with rockets. Other instructors were Dr. C.F. Warner, director of J.P.L. laboratories at Purdue University, John Carlson, Executive Secretary of the A.R.A. and Michael Tate, studying for a degree in Aerospace Medicine.

Industrial tours choosen by the rocketeers by preference on thursday, included the Naval Aviation Test Laboratory and the Allison Division of General Motors Corporation at Indianapolis.

The final evening program on August 18, was given by Dr. D.D. Wyatt, NASA director of space flight program. The lecture and movies of the Mercury space flight of Lt. Shepard was the climax of this important gathering of rocketeers.

The plans for next years convention are for even greater accomplishments. These are to provide a greater coverage of instruction and workshops, along with activities at the New National Rocket Flight Test Range. Address of the A.R.A. is Room 201, 14 North Illinois Str., Indianapolis 9, Indiana.

DEVELOPMENT AND TESTING OF A HYDROGEN PEROXIDE ROCKET.

The Reaction Research Society has recently re-printed a research paper on the Development and Testing of a Hydrogen Peroxide Rocket, by David Elliot and Lee Rosenthal. This is the First report on the Reaction Research Society's project for developing a liquid propellant sounding rocket.

The report was honored with an award by the American Rocket Society. It describes the design, construction, and testing of the first liquid propellant rocket to be fired by the R.R.S. The report which is twenty-three pages in lenght, contains four drawings and charts, and seven photographs, by Carroll L. Evans Jr. and Richard Schenz.

Since there has become wide use of this highly concentrated hydrogen peroxide in space vehicles, The R.R.S. believes that this report will be of exceptional interest to rocket researchers.

The price is $1.50 post paid, ordered from the Reaction Research Society, P.O. Box 1101, Glendale 5, California

REACTION RESEARCH SOCIETY INC.
BOX 1101
GLENDALE 5, CALIFORNIA

THE REACTION RESEARCH SOCIETY

The Reaction Research Society is a non-profit civilian organization whose purpose is to aid in the development of reaction propulsion and its applications, and to promote interest in this new science.

The Society was organized in January, 1943, and from that time to the present has static fired and flight tested several hundred rockets, using both liquid and solid propellants, They have held two rocket mail flights, carrying special philatelic mail in experiments designed to call attention to the use of rockets for practical, peaceful purposes, and have established several altitude and other records for non-professional rockets and missiles.

The Reaction Research Society publishes RRS NEWS & ROCKET DIGEST containing notices and information about both Society and national activities in the rocket field, which is sent to all members as a part of their membership.

There are opportunities for persons of widely diverse interests to take an active part in the Society's work. Technical skill is not necessary for participation in many projects.

Active membership in the Reaction Research Society is for the interested and qualified persons who by their membership indicate their willingness to engage in the activities of the Society. Active membership is $5.00 per year.

Associate membership is for persons who cannot devote sufficient time to Society work to warrent an active membership. Associate membership is $3.00 per year.

If you are interested in joining the Society, or desire more details, please write to:

Secretary
Reaction Research Society
Box 1101, Glendale 5, California