

Teen Astronauts In "Orbit"



NASA's Scott Carpenter praises Project SPARC

Story By
JOAN HEMENWAY
Associate Editor-YOUTH Magazine

Photography by
LEIF SKOOGFORES

Reprint by permission from YOUTH Magazine July, 1964 issue. YOUTH is a biweekly publication of the United Church of Christ for teenage readers.

"What does acceleration after blast-off feel like?" Lt. Commander M. Scott Carpenter nodded, recognizing a familiar question.

"It's kind of like lying on the floor and having eight people lie on top of you."

The high school audience buzzed with interest and another student stood to ask a question.

"What does it look like from up there?"

The tanned astronaut smiled. "It's the most fascinating sight I have ever seen." As he explained more fully, he added with a sly grin, "While I was up there, at one point

I thought--wouldn't it be fun if I came back and told everyone the earth was really flat!" Amidst laughter another question:

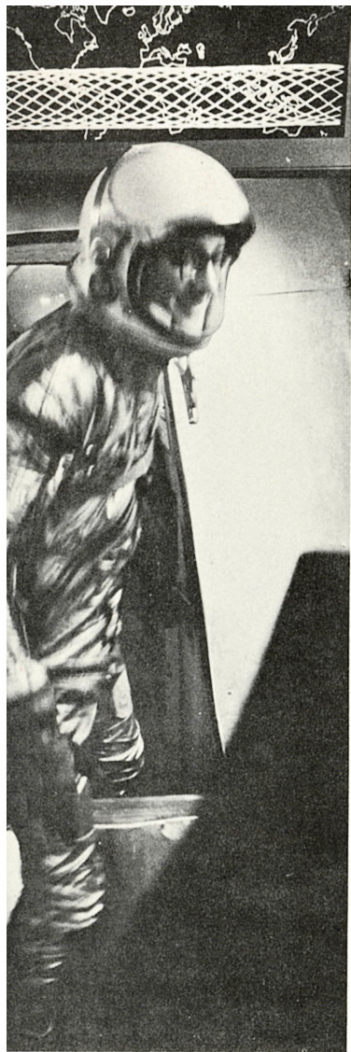
"Were you scared?" The celebrity turned more pensive.

"I don't know whether I can honestly answer that. We had three years of training and experience to get used to the idea. In the classic sense, no, I wasn't afraid."

Astronaut Carpenter's visit this spring to Philadelphia's Northeast High School will doubtless go down as one of the most exciting events in the school's history. And he came for a very special reason. On the day of his visit, Northeast High's Project SPARC (Space Research Capsule) launched three of its student astronauts into a 24-hour "orbit."

Behind the auditorium stage is a large wooden structure inside of which is the "ground control" for the "flight," and the capsule simulator itself. At 11 o'clock in the morning three carefully-trained students entered this capsule to live and eat, perform tests and sleep, in a simulated space flight. The boys had been painstakingly checked by a doctor, electrodes attached under their space suits, newsmen pushed out of the way, and live closed-circuit TV set up so that the student body could share in the excitement.

For the three astronauts and the ground control, this flight was not the first, but it was perhaps, the most important. They had been working steadily on the project for many weeks, building an air cooling system, connecting tape recorders and TV, installing a radio electrocardiogram machine, hooking up stray wires, going over information culled from previous flights,



We realize it's unusual, but that's not our purpose

preparing food, readying space suits, and making final adjustments to the interior of the three-man capsule.

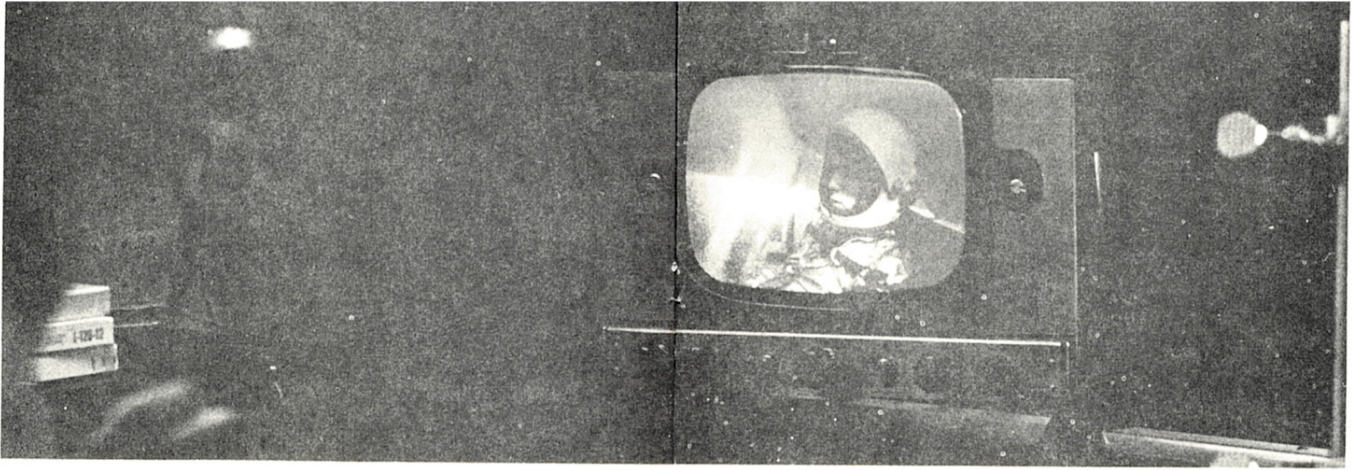
Although the capsule never moved from its resting place on the stage, the 24-hour flight was, indeed, a test in endurance and perseverance not only for the astronauts, but for everyone involved in Project SPARC. It was a victorious tribute to the brain-power and imagination of high school students today.

"In school we more or less get general knowledge and theoretical things in math and science," commented student astronaut Jeffrey Ball. "All of a sudden you enter Project SPARC and you find out how to use that little known formula in math. You're applying your knowledge and not just learning for the sake of learning." Another boy added, "This is the best year I've ever had in high school. The SPARC program puts meaning behind what you go to classes for."

The Project was begun in November of 1962 when a call went out for 50 students of superior capability who were interested in space science. Since then the club has received official recognition from the National Aeronautics and Space Administration, been given money from local and national foundations, built its own equipment and expanded to 91 full-time members and 123 part-time members. Last year 18 students took a trip at the invitation of NASA to the major space centers in the United States including Huntsville, Ala., Cape Kennedy, Fla., Greenbelt, Md., and Houston, Tex.

What are the feelings of the rest of the students toward the club? One astronaut commented: "It all depends who you talk to! Even among the teachers there isn't universal opinion. Some of them think it's a great thing and respect you for it and others don't





take it seriously. It's the same with the student body."

The guiding force behind Project SPARC is physics teacher Robert Montgomery. While his excellent leadership and imagination have been key to the club's growth, the Project is very proud of the fact that it is teacher-supervised but not teacher-dominated. Both Mr. Montgomery and the students in SPARC are equally willing to go without sleep at night once in a while, experiment with ideas which may fail, and continue to work closely together in spite of the tensions which crop up.

A lot of people wonder why there should be a Project SPARC. Isn't it too dangerous for high school students to handle? Should time and money and talent be used in this way? What place does it have in the over-all academic purpose of a high school education?

Mr. Montgomery answers: "We have three basic reasons for doing this. We realize it's different and unusual, but that's not our purpose. Our main reason is to discover how to handle the problems of real research on a high school level. Normally research is not attempted even on an undergraduate level in college. How do you approach such a thing in high school? With this kind of research you just can't go off somewhere to a magazine and pick out a science project and do it. This means that it really takes some thinking and some individual work.

"Also, I think it offers to the fellows and girls a tremendous opportunity to explore practically any field of science from astronomy to electronics, chemistry and medicine. It also gives them an understanding of the interrelationships within the sciences - how they all tie together. Over and above that, I think

If you know what you're doing it's not risky . . .

they get an experience of learning to work under pressure. Also being in front of people - having to sell the project, to convince people about it, being public relations people, learning how to manage the organization. Finally I think another reason for the project is the possibility of running across something that might contribute to the space program in the United States today.

"There are hazards, but these fellows are used to hazards. Its just like the Mercury astronauts. They realized that there were problems, but they were convinced that the machinery would operate and they would operate, and so they went on that basis. It takes the kind of person who recognizes the risk, won't take the risk unless he knows exactly what he's doing and that he has a good chance of coming out on top."

Not everyone in the Project is an astronaut. In fact, there are only eight who have been selected after prolonged physical and psychological testing. Membership is divided into work on seven different committees: medical, psychology, flight plan, astronics and communication, design engineering, life support, and advanced projects. Although no girls have been considered for the job of astronaut, there are plenty around on the committees. One member explains, "After all, where you find boys, you find girls, don't you?"

One of the most notable achievements of the Project this year is that the students have designed an air-flow system in the capsule which purifies the same air which the astronauts breathe. This is called a closed oxygen-replenishment system. It includes removal of moisture, carbon dioxide, and toxic gases by chemical reaction; control of temperature, bacteria, odor, and

dust; addition of oxygen, purification, and re-circulation of the fresh air back into the capsule.

A big break came when the Navy loaned Project SPARC some space suits. The suits contain their own air-ventilation system, but the SPARC astronauts have redesigned them for their own needs. They now wear the space suits for the simulated launching and landing sequences of the capsule. Next year the students plan to try water cooling the suits. NASA is now considering this same method of cooling the suits for the Apollo flights. The present use of space suits by NASA is mainly that of providing a back-up system to the conditions in the capsule, a kind of second environment. During the three-man Apollo flight the suits will be removed

(top) Physics teacher Robert Montgomery explains the progress of the test flight at an impromptu press meeting.
(bottom) Lt. Commander M. Scott Carpenter addresses the Northeast High School student body on May 27, 1964.



On one test, a cleaning lady

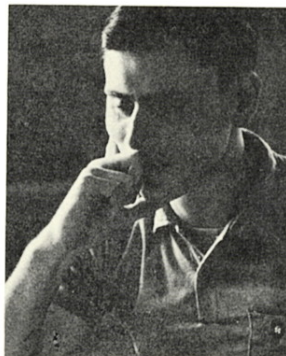
for part of the flight. Of course, space suits are also vital to plans for certain space experimentation and landing on the moon.

The arrival of Scott Carpenter at Northeast High involved something new for Project SPARC - lots of publicity all at once. How did the student astronauts react? "The Project has been hammered into us so much that we have really become indifferent to some of the most spectacular things, like all the publicity. It's come to where the newsmen are more excited than we are!"

The Project was well prepared for the crush of the press. "We knew something like this was going to happen, so we have our own security system, and the results were pretty funny. For instance, a newsman saw Scott Carpenter and started moving toward him. All of a sudden one of the students stuck out his hand and said, 'Sorry, you can't get near Commander Carpenter!'" But the system goes beyond special occasions. Each student must wear his Project identification badge and it tells how far each one can go, the files to which he has access and in which rooms he can work. The point of such a system is not to be secretive, but to be safe. There are chemicals and electrical materials which only certain students are qualified to handle.

There have been many humorous incidents along the way, too. One of the astronauts' duties is to weigh their food for two weeks. One of the boys had to go out to dinner for his grandparents' anniversary. Since he was very conscientious about this duty to weigh his food at every meal, he loaded his balance scale (like the ones used in physics or chemistry classes) into a paper bag and dragged it along. The restaurant turned out to be quite exclusive but the

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nearly fainted...

student went ahead and put his scale in the middle of the table, weighed the empty plate and then each portion of food while the waiters looked on in horror, wondering whether he was an inspector from the Food and Drug Administration or just some kind of nut. Finally one waiter mustered up enough courage to ask the boy what was going on. At that point, it was bad enough to be weighing his food, but when he had to tell the waiter he was an astronaut, they were about to send for the men in the white coats!

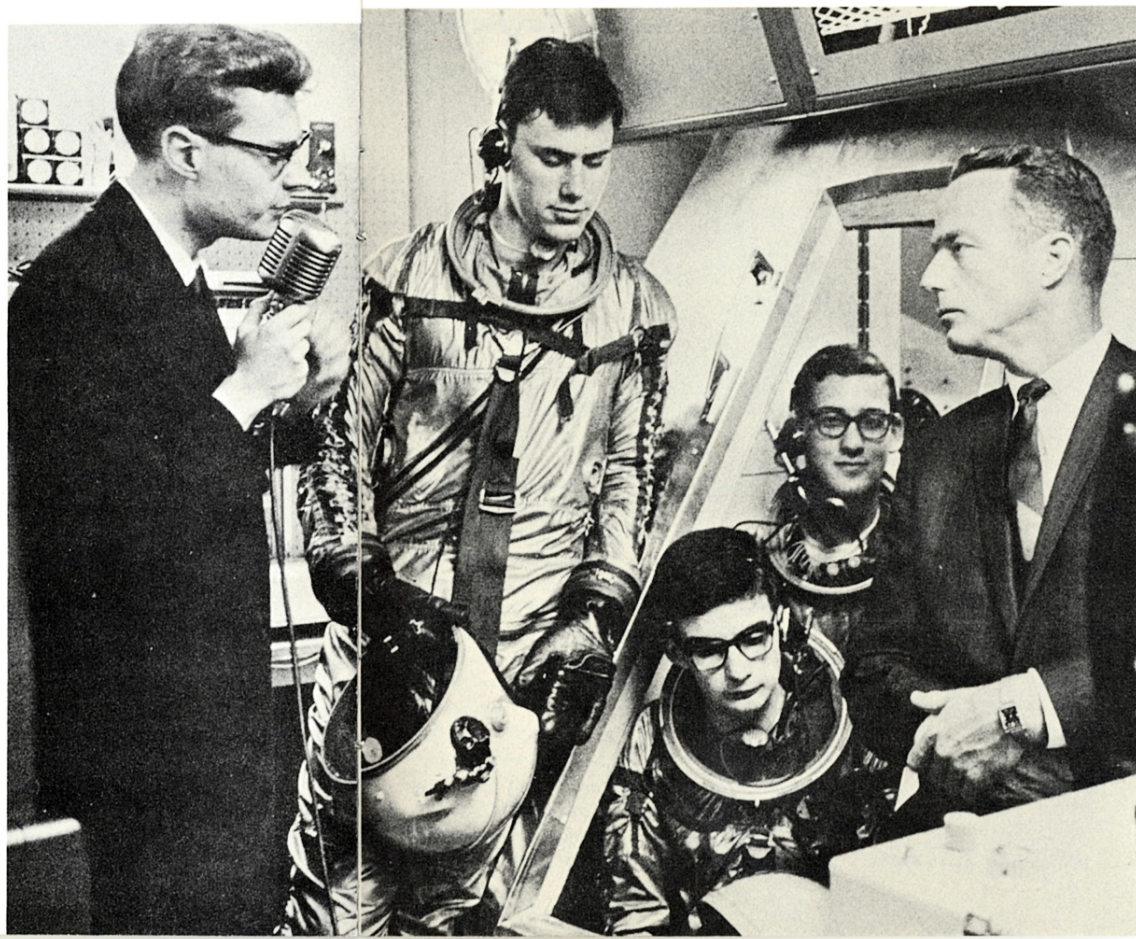
Another boy feels as if he has been made an honorary member of the custodial staff at Northeast. He relates the reason for this: "One day I was sitting in a closet in the dark minding my own business and testing one of our space capsule

Astronauts (top to bottom) A. Tyl Hewitt, Steven R. Yussen, and Jeffrey A. Ball relax after their simulated flight.

Applying our knowledge in SPARC gives meaning to our studies

seats when I heard these two cleaning ladies come up and they were talking. I could hear some keys jingling. One of the ladies went to put her key in the door but she found it was unlocked. She had her back turned, and she put her hand in, put the light on, then turned around, saw me, and nearly fainted. When she calmed down a bit she said, 'What are you doing in here?' I was not trying to be fresh or anything but I just said, 'I'm testing a chair!' She was very upset about this because it isn't everyday that you go into a storage closet and find someone sitting in the dark testing a chair!"

Many people ask about the possibility of other schools starting projects similar to SPARC. Eugene McClurken, student chairman of the Project this past year, says that "there aren't too many schools that could maintain a program like this. First of all, it has to be a large

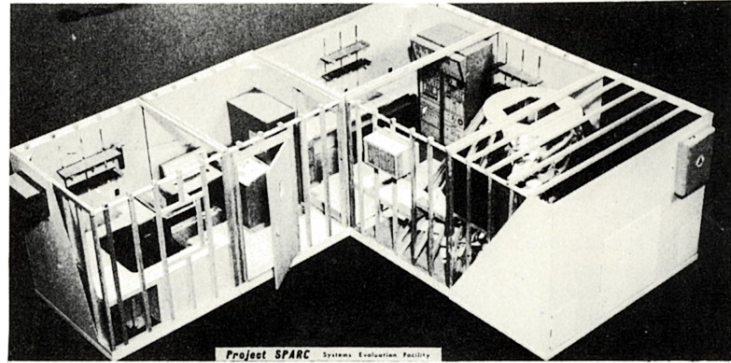


Dreams of more research leave plenty for the future

school, or at least a school where you can draw from the top of the student body, where you have enough good students who will work and whose grades won't drop. You also have to have industry around that can help out with technical and monetary assistance. The high school shop facilities have to be available to the students in the project. We built most of our equipment by ourselves. The educational facilities have to be top quality so that you can find out the latest information. You have to have a good basic education so that you can figure out just how all these things fit together."

Steve Yussen, one of the astronauts, adds: "I think any school or group of students who start out on a project like this have to have one quality - all of them have to be somewhat daring!" NASA has indicated that there are probably about 12 schools in the nation which would have the facilities and talent for such a project. However, many high schools could develop parts of a project and then work with other schools toward completion of a capsule or control center.

"For me the big experience of the Project is being able to get along with others." Astronaut Tyl Hewitt's opinion is echoed by all the members of SPARC. Gene comments further: "It has helped me to fill out all the fields of interest that I have. Also, the responsibility I've had is, I think, good for me. I couldn't speak in front of people before, so that is something I gained. I will probably end up teaching physics some day, but actually I enjoy research work, too. I'm also interested in religious aspects and how life fits into religion, or rather how religious life fits into our normal activities. For me, science is just man's systematized observation of God's works,



The Systems Evaluation Facility houses both the capsule simulator (right) and control unit. This nerve center of operation is a product of student design and construction. The left wing of this model shows a new proposed expansion unit.

and nature doesn't follow science's laws. It's just that science's laws happen to be the observation of nature's consistencies."

Although some of the present members of Project SPARC graduated in June, competition for membership among the other grades continues. And the dreams of the Advanced Projects Committee, which mainly include ideas on aspects of space life too complicated for the Project to simulate right now, leave plenty of work for the future. Specific plans for new achievements this year will be channeled into five areas: putting

full flight instrumentation into the flight control simulator, recruiting additional astronauts, expanding computer facilities which will work out last-minute flight control problems, increasing the time of simulated tests from three and then to five days, and adding to the psychological response equipment. This last area involves the isolation of the predominant characteristics in young people, which are especially conducive to space existence and is of special interest in space research.

When Lt. Commander M. Scott Carpenter came to Northeast High he stated his convictions about space travel and the future: "There is no limit to what we will accomplish someday, I have this faith. Help me to spread it." Project SPARC is an exciting response to this 20th century challenge. *****

Dr. Mabel Haller
Principal

Mr. Robert Montgomery, Jr.
Project Coordinator



Printed by the Pied Typer Press - Northeast High School

Project SPARC
Northeast High School
Cottman and Algon Avenues
Philadelphia, Pa. 19111