

San Marco Completes Pre-Launch Ground Tests

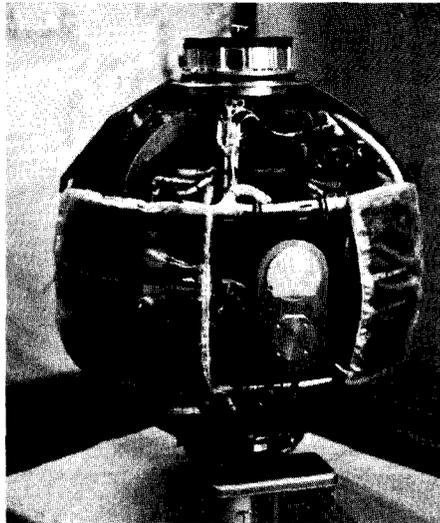
by Jim Elliott

The San Marco D/L spacecraft, an international satellite designed to make studies of the lower atmosphere, has completed its fabrication and pre-launch ground tests and is being prepared for shipment from Rome, Italy, to its launch site in Kenya, according to project officials at Goddard.

Inspection and Review

The announcement followed a two-day inspection of the 237-kilogram (522-pound) spacecraft and review of mission plans at the Centro Ricerche Aerospaziali (CRA) facility in Rome by a nine-man team of space specialists from Goddard, led by Alton E. Jones, Director of Flight Assurance.

Other team members were Carl L. Wagner, Jr. (Code 301); Robert C. Baumann (Code 400); Michael J. Coyle (Code



INTERNATIONAL SATELLITE—The San Marco D/L spacecraft will carry two Goddard instruments when it is launched from Kenya in late 1986.

302); Bill K. Gabbert (Code 728); David S. Kepler (Code 727); Henry C. Hoffman (Code 712); Joseph F. Stivaletti (Code 716), and Harry E. Wannemacher, Jr. (Code 711).

The spherical spacecraft, one meter (three feet) in diameter, will carry five scientific instruments when it is launched by an Italian Air Force crew from the Italian San Marco Equatorial Range in Kenya, expected to be next spring.

The launch vehicle will be a U.S.-built Scout rocket.

The spacecraft was designed and fabricated by CRA personnel in Rome.

Scientific Instruments

One of the five scientific instruments is from Italy, one from West Germany and

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NASA
National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

Vol. 32 No. 7

August 1986

New Balloon Material Successfully Tested at NSBF

by Joyce Milliner

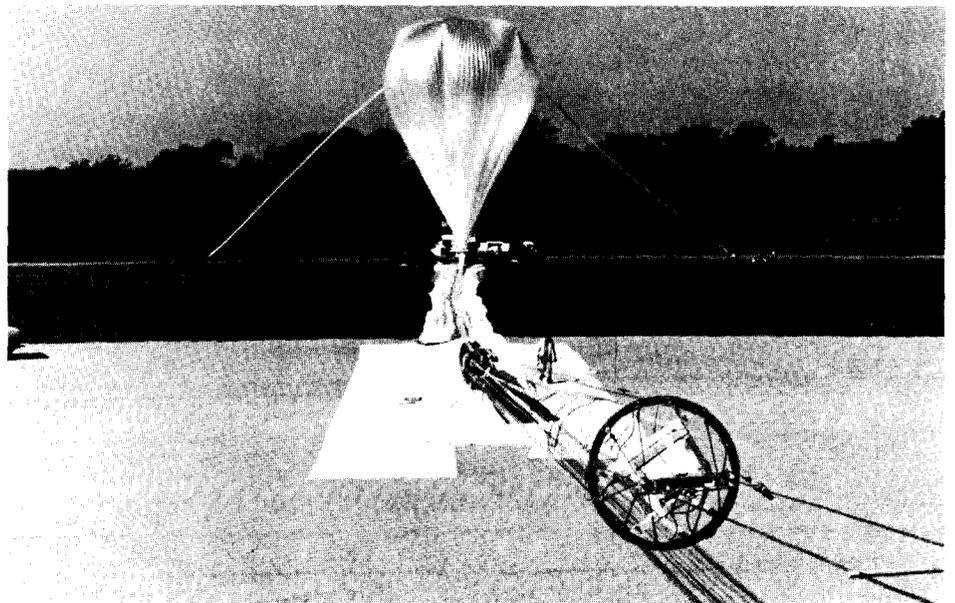
A flight test series of high altitude balloons, launched recently from the Goddard/Wallops National Scientific Balloon Facility (NSBF), Palestine, Texas, has utilized a newly developed material that is proving to be a most promising alternative to balloon film used for many years.

Acquisition of the new material and improved manufacturing processes followed a series of balloon failures occurring over the past 3 years. The failures were investigated by a Balloon Program Special Study Team and other groups appointed by the Wallops Flight Facility.

Astrofilm-E

The new balloon material, designated Astrofilm-E and developed by Raven Industries, Sioux Falls, S.D., has been used in two recently successful flights. One carried a 3,000-pound payload to an altitude of 130,000 feet, while the other carried a 4,300-pound payload to 120,000 feet. These flights were the fifth and sixth successful launches of heavy-lift balloons in seven attempts since the start of the recov-

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"ASTROFILM 'E'"—Shown is the newly-developed balloon grade film used at the Goddard/Wallops' National Scientific Balloon Facility (NSBF), located near Palestine, Texas. Pictured: The balloon partially filled with helium gas is held to the ground by the spool-release vehicle. On the ground, the helium occupies only a small fraction of the balloon volume. After release from the spool, the balloon will rise, lifting the scientific payload. As the altitude increases, the helium gas will expand until it reaches the "float" altitude above 100,000 feet. The fully inflated balloon will be many times the volume shown in this photo.

San Marco

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three from the United States, according to Ronald E. Adkins, Head, San Marco Office at Goddard.

The Italian instrument, for which the principal investigator is Professor Luigi Broglio, Director of CRA, is the Neutral Atmosphere Density (Drag Balance) experiment. It is designed to measure drag forces on the satellite in orbit.

The West German instrument is the Airglow Solar Spectrometer, sponsored by the Institut für Physikalische Weltraumforschung (IPW) in Freiburg. Principal investigator is G. Schmidtke. It is designed



RONALD E. ADKINS
Head, San Marco Office

to measure equatorial day and night air-flow, solar radiation from the Earth's surface and from clouds and the radiation of interplanetary and intergalactic origin reaching the satellite.

Two Goddard Instruments

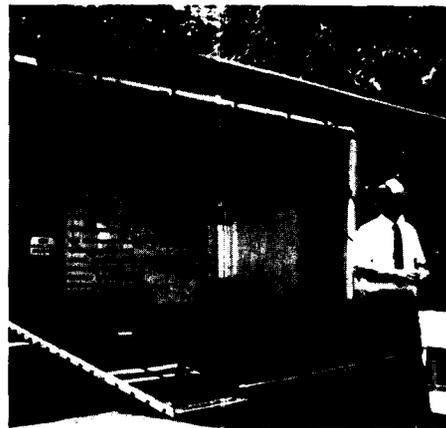
Two of the U.S. instruments are from Goddard. They are the Wind and Temperature Spectrometer to measure neutral winds, neutral particle temperatures and the concentration of selected gases in the atmosphere; and the three-axis Electric Field Instrument, which will measure the

(Continued on page 6)

COSPAS/SARSAT Van Is Part of "21st Century Aviation" Exhibit

The NASA managed SARSAT van, and driver, Bert Jones (pictured), made an appearance at this year's 34th Annual Experimental Aircraft Association's Convention and Sports Aviation Exhibition in Oshkosh, Wisconsin.

The walk-through mobile van represents the COSPAS/SARSAT program (acronyms basically for Search and Rescue Satellite Aided Tracking in English and Space System for Search of Vessels in Distress in Russian) and features six exhibits which tell the story of the effectiveness of satellites in saving lives. The van also presents the message that proper care of



one's Emergency Locator Transmitter (ELT) can help prevent costly false alarms.

NASA's exhibit this year, "21st Century Aviation," also included the National Aerospace Plane, an air-breathing space plane capable of flying at speeds up to Mach 25 in the upper atmosphere. The new, permanent NASA exhibit facility which is 6,000 square feet also housed examples of NASA research tools and exploratory techniques necessary for 21st century aircraft, four of the Agency's test pilots and their aircraft, and an exhibit of aeronautical art featuring works from the Nation's foremost artists.

NASA Plans To Buy Replacement Tracking and Data Relay Spacecraft

NASA announced plans to procure a Tracking and Data Relay Satellite (TDRS) to replace TDRS-B, the advanced communications satellite lost in the Challenger accident in January.

The plans call for a replacement spacecraft and follow-on satellites to keep the TDRS system operational through the end of the century. NASA will purchase the replacement spacecraft with parts for a second spacecraft from TRW, Electronics and Defense Sector, Redondo Beach, California. Delivery is scheduled for September 1991.

A TDRS follow-on study will be initiated in late 1986 leading to a decision to procure competitively advanced, follow-on spacecraft with deliveries planned to begin in 1996.

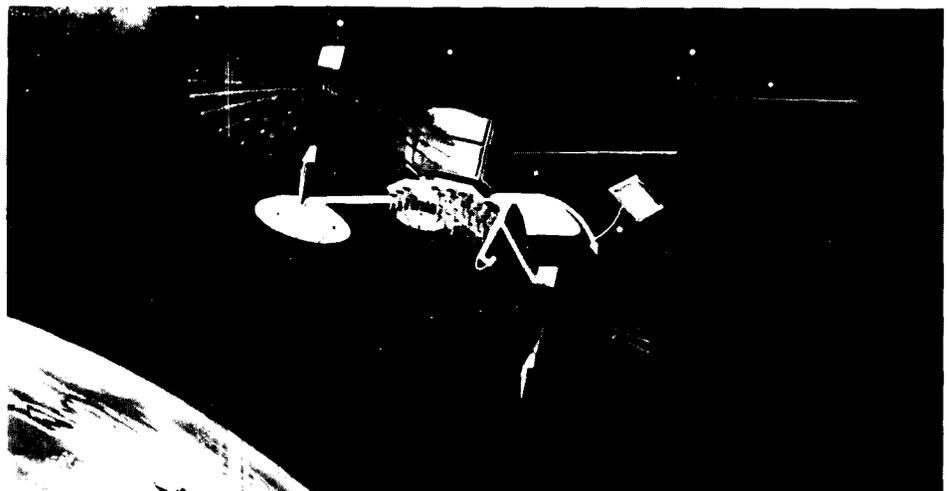
The currently operational TDRS-1 is in geosynchronous orbit over the Atlantic just off the coast of Brazil. TDRS-B would have been stationed over the Pacific south of Hawaii had it been launched in January. A third TDRS satellite, originally scheduled to be launched this summer, will serve as a spare and will be located between the other two spacecraft.

Primary users of the TDRSS system have been the Space Shuttle, Landsat Earth resources satellites, the Solar Mesosphere Explorer, the Earth Radiation Budget Satellite, the Solar Maximum Mission satellite and Spacelab.

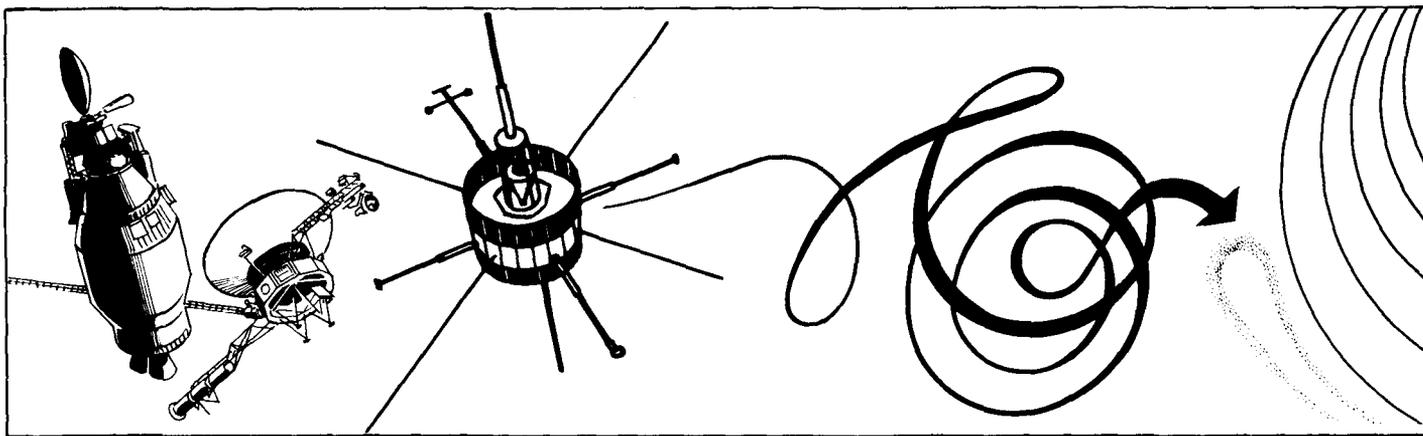
Future users include the Hubble Space Telescope, the Gamma Ray Observatory

and the Upper Atmosphere Research satellite.

Spacecraft and mission integration responsibilities are under the direction of Dale W. Harris, Chief, TDRS Project Office, while ground facilities and communications responsibilities are held by Robert E. Spearing, Chief, Networks Division, both at Goddard.



TRACKING AND DATA RELAY SATELLITE (TDRS)—NASA plans to replace TDRS-B which was lost in the Challenger accident. The TDRS project is managed by Goddard.



Symposium Marks Comet Intercept Anniversary

by Carter Dove

The first anniversary of the world's first spacecraft intercept of a comet will be spotlighted at the National Air and Space Museum on September 11 in a six-part symposium on deep space gymnastics.

The Goddard-sponsored symposium will feature six presentations by university, industry and government scientists and engineers which will explain in lay terms the physics and techniques for maneuvering spacecraft to gather valuable scientific data through planetary swingbys and interplanetary coasting.

Among the symposium participants will be Dr. Robert W. Farquhar, Code 550, who will describe his role in the historic intercept of Comet Giacobini-Zinner by the International Cometary Explorer (ICE) spacecraft on September 11, 1985.

In that unprecedented encounter, Farquhar "threaded" the ICE spacecraft—travelling at a speed of 46,000 miles (74,000 km) an hour—through the tail of the comet while it was 44 million miles from Earth.

The data from that mission both added significantly to and confirmed many predicted features of a comet.

The encounter was the zenith of a seven-year odyssey through space for the ICE—launched in 1978 as the International Sun-Earth Explorer (ISEE)—which Farquhar maneuvered past the Moon five times in 1983, using lunar gravitational assists to "slingshot" the spacecraft toward its rendezvous.

The September 11 event in the Museum's Albert Einstein Planetarium will be

open to the public free of charge. For additional information, call the Office of Public Affairs on x68955.

Joining with Farquhar will be Dr. Kathleen C. Howell, Assistant Professor, School of Aeronautics and Astronautics, Purdue University, W. Lafayette, IN: "Gymnastic Basics: Understanding Spacecraft Acrobatics"; Dr. William I. McLaughlin, Manager, Mission Profile and Sequencing Section, Jet Propulsion Laboratory, Pasadena, CA: "Voyager and the 'Grand Tour'"; Dr. Roger E. Diehl, Mission Design Section, Jet Propulsion Laboratory: "Galileo Mission to Jupiter"; and Chauncey W. Uphoff, private consultant, on "Solar Sailing".

Retirees

Farewell and best of luck to the following retirees who left Goddard in July!

	Code	Years
Bickers, David	731	20
Carolla, Anthony	750	30
Fuller, Ida	562	30
Howell, Barton	717.4	15
King, Richard A.	303	27
Miller, Doris J.	231	23
Shapiro, Ralph B.	400.6	27
Stitz, William B.	271.1	32
Tereniak, William	754.1	32
Tinari, Donald F.	562.2	24



ICE EXHIBIT—"The Three Lives of ICE," a NASA exhibit about the International Cometary Explorer (ICE) is currently on display at the National Air and Space Museum (NASM) and will run through mid-November. It is located adjacent to the Albert Einstein Planetarium on the second floor of the NASM. Pictured: ICE Flight Director Dr. Robert Farquhar, Code 500 (left) and Guest Exhibit Curator Dr. Stephan Maran, Code 680 (right) in front of three of the exhibit's five panels.

NASA Tests Advanced Weather Observing Systems

by Joyce Milliner

A team of scientists from two NASA centers, two federal agencies and several universities are cooperating this summer at the Wallops Flight Facility to test new sensors for observing weather and clouds.

The experiment, called the Satellite Precipitation and Cloud Experiment (SPACE), will use high altitude aircraft as a platform for new instruments that will provide a better understanding of the atmospheric processes leading to precipitation and severe storms.

Atmospheric Projects

The SPACE project is part of a large meteorological field experiment called COHMEX—the Cooperative Huntsville Meteorological Experiment, being conducted by the Marshall Space Flight Center; the University of Chicago; and the Federal Aviation Administration in the Tennessee Valley. COHMEX is the combination of three independent atmospheric projects—SPACE, Microburst and Severe Thunderstorms (MIST) experiment, and

the FAA Lincoln Laboratory Operational Weather Studies (FLOWS).

Crucial observations for SPACE are being obtained from three high-altitude aircraft with nine experimental remote sensing systems measuring visible, infrared and microwave radiation.

Goddard Instruments

This is the first time that such a complete complement of atmospheric instruments has been operated together. Four of the instruments have been developed at Goddard for cloud and precipitation observations. They include two microwave radiometers, a microwave precipitation radiometer and advanced microwave moisture sensor, and a unique laser radar system.

The Marshall Space Flight Center is operating two lightning sensor packages for studying the relationship between lightning and storm intensity, and both Goddard and Marshall are employing mapping radiometers for cloud and moisture distribution.

Two university research groups, the University of Wisconsin and the Massachusetts Institute of Technology, have provided advanced temperature sounding systems for studying pre-storm and storm weather conditions.

Data received from the SPACE project will be correlated with data received from the GOES and NOAA weather satellites.

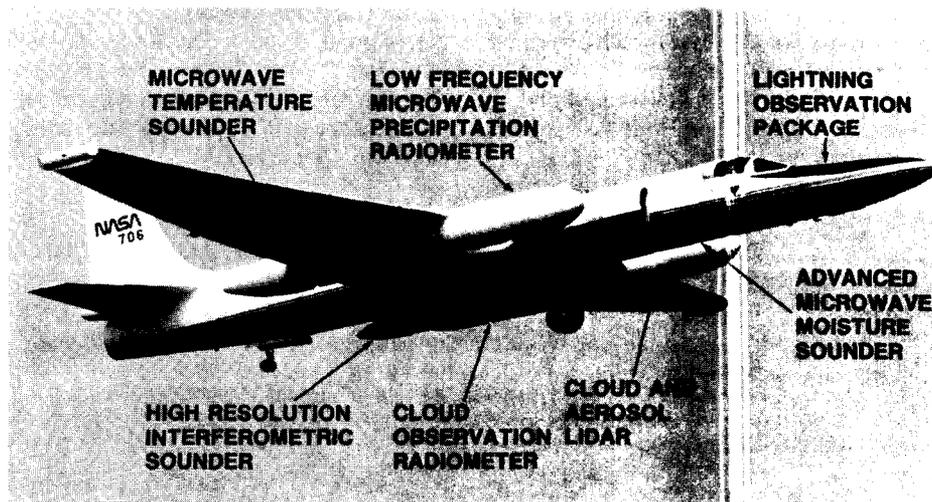
Principal scientists for the SPACE project are Dr. James Spinhirne, Code 615.2 and Dr. Richard Blakesly of Marshall.

Two Different Aircraft

The three Ames Research Center's aircraft—two U-2s and one ER-2—will operate from Wallops. The aircraft will fly in the Huntsville and Wallops areas, selected because of the facilities available and the weather—violent microbursts and summer thunderstorms. Other advantages include the lack of heavy aircraft traffic which might restrict research aircraft operations and the rolling farmland which reduces the clutter seen by radar.

The high altitude flights at Wallops also are being correlated with two sounding rocket launches scheduled during a night thunderstorm. In addition, numerous ground stations will be used for correlative measurements.

The National Science Foundation (NSF) is sponsoring the University of Chicago component of the COHMEX experiment, MIST, which is concerned with the structure of microbursts from thunderstorms. The FAA experiment, FLOWS, is concerned with the development and testing of automatic algorithms for wind shear detection using pulse Doppler weather radars. The results from FLOWS will be used to develop the next generation of weather radars for the FAA Terminal Doppler Radar (TDR). The NASA experiment will provide correlative data for the MIST and FLOWS program but also will make use of results from the NSF and FAA experiments.



AIRCRAFT CONFIGURATION—Two “super pods” on the wings and a “drop tank” beneath NASA's ER-2 aircraft have been added to carry experimental remote sensing systems for a meteorological field experiment called the Satellite Precipitation and Cloud Experiment (SPACE). A team of scientists from two NASA centers, and several universities are cooperating this summer at Wallops to test seven sensors in conjunction with observing weather and clouds. The overall goal of SPACE is to provide a better understanding of the atmospheric processes leading to precipitation and severe storms.

New Balloon

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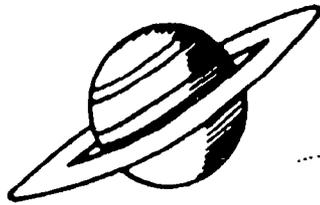
ery program. Five flights carried scientific instrument packages. One of four flights in this effort, using existing film, was unsuccessful.

Winzen International, Inc., Sulphur Springs, Texas, producer of Stratofilm balloon material used for the past 20 years,

also is studying a new material as part of the effort to improve balloon reliability. Two Winzen-made balloons employing film provided by the Centre National d'Etudes Spatiales, the French space agency, recently were flown successfully with a 4,800-pound payload.

The NASA balloon program provides support for approximately 50 flights per year for studies primarily in high energy astrophysics, astronomy and upper atmospheric research.

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Celebration of Spirit: A Tribute to the Challenger Seven

The students and faculty of the Marlboro Middle School, Marlboro, New Jersey paid tribute to the spirit and memory of the Challenger crew with a special day called "Celebration of Spirit: A Tribute to the Challenger Seven."

Each of the 1,475 students in the school wrote either a poem or an essay reflecting his or her personal feelings and memories about the astronauts.

Personnel in the Office of Public Affairs were so impressed by the quality and spirit of the work that they wanted to share selected writings with our readers. The following are examples which represent the hundreds of poems and essays written by the students:

Rise to the Challenge

Life is not simple,
not easy to live.
We face many choices,
we take and we give.
But always remember how high we can go.
Let us rise to the challenge!

Disappointments are needed,
so that we may see,
that though the doors may be locked,
we must search for the key.
And always remember how high we can go.
Let us rise to the challenge!

When things go wrong and we don't want to try,
when obstacles face us,
we must look to the sky.
And always remember how high we can go.
Let us rise to the challenge!

Ethan Barshay
Grade 8

If You Seek Their Monument...

The Challenger Seven
were brave and without fear
when their journey ended in sorrow.

If you seek their monument,
remember them as pioneers of the future.
Their lives may have passed like a shooting star,
but their quest is what we can be proud of.

We salute these astronauts
and their memory, a sign of America's glory.
Let them live in our hearts,

not as a dark cloud which rains tears,
but as a shining star that rises above the clouds.

If you seek their monument,
look up in the sky.
See their dream!

Rhoda Silva
Grade 8

Exploration in Space

For Christa and Judith,
and five others more,
the day had come,
for them to explore.

They got in their uniforms,
all ready and set.
For all of the seven,
success was a bet.

They got in the shuttle,
as the crowd watched in awe,
Then it blew up,
as everyone saw.

All of their relatives,
cried out with tears,
because they had loved them,
for so many years.

Now it is finished,
and everyone is sad.
But the space program will never,
be considered a fad.

Jennifer Roth
Grade 6

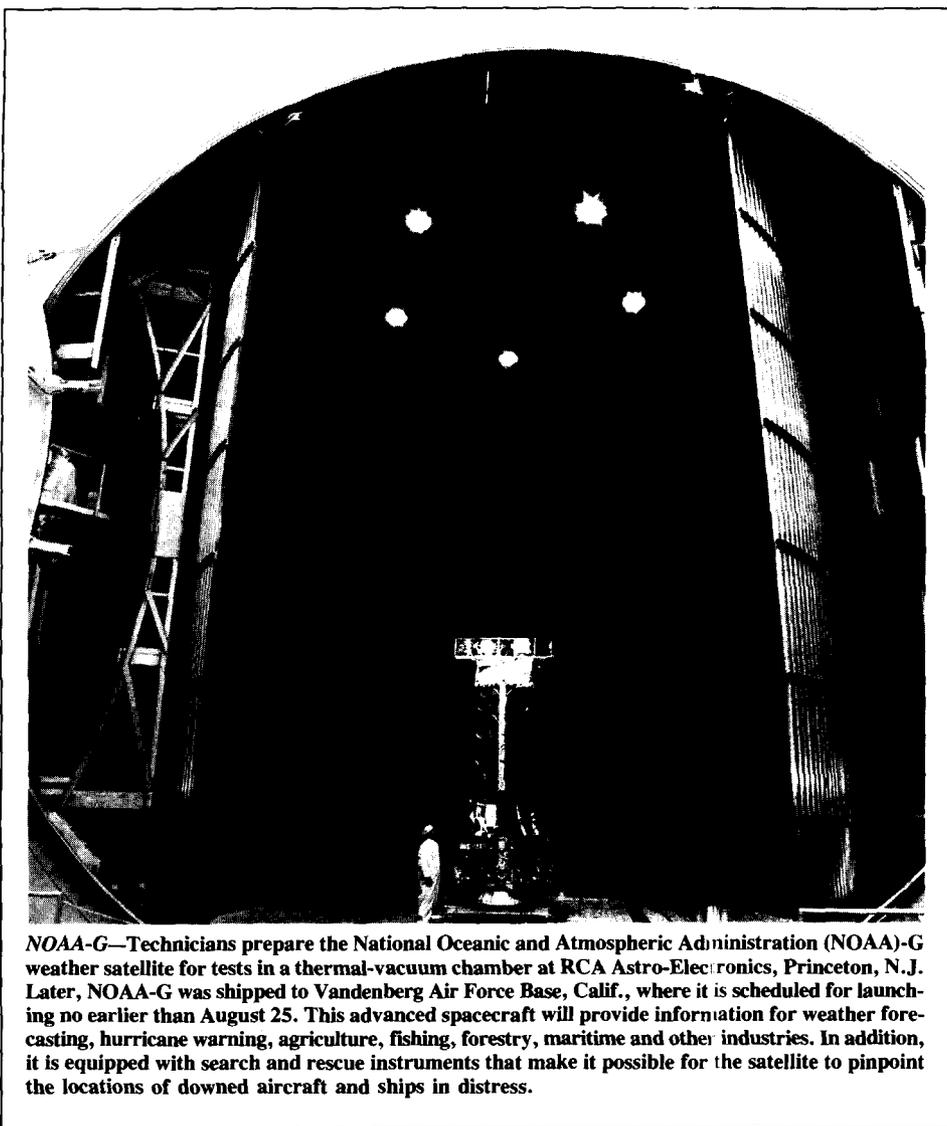
Challenger: My Reactions

It was eighth period one sunny day,
when a tone was heard over the school P.A.
Something was wrong in the Principal's voice,
as she made the announcement, she had no choice.
She wanted attention, that's what she said,
when feelings of worry danced in my head.
Could someone have died, could someone have lost?
"What was it?" I said to myself, of course.
Then as she stuttered in saying it's true,
that just after lift-off, the space shuttle blew.
How could this happen—I thought hard and good,
the shuttle explosion, I never understood.
Why happen this time, why happen now?
So many questions, where, when, and how.

After dismissal, I watched the TV.
I had to see it happen; I just had to see.
Just after lift-off, to my surprise,
I could not watch, I just shut my eyes.
But bravely they opened for a reason unknown,
to see the shuttle after it had blown.
Of course I saw the entire thing,
it catching on fire, the rocket, the wing.
A teacher in space was on the ship;
I saw her daughter waving on another clip.
It's a big mystery, one will never know,
Why her daughter pleaded, "Mommy, don't go."

Billy Grainer
Grade 8





NOAA-G—Technicians prepare the National Oceanic and Atmospheric Administration (NOAA)-G weather satellite for tests in a thermal-vacuum chamber at RCA Astro-Electronics, Princeton, N.J. Later, NOAA-G was shipped to Vandenberg Air Force Base, Calif., where it is scheduled for launching no earlier than August 25. This advanced spacecraft will provide information for weather forecasting, hurricane warning, agriculture, fishing, forestry, maritime and other industries. In addition, it is equipped with search and rescue instruments that make it possible for the satellite to pinpoint the locations of downed aircraft and ships in distress.

GSFC Explorer Scout Wins National Award

John Wolfgang, Head of the Systems Integration and Test Section, Code 725.5, was recently awarded the William Spurgeon Award for outstanding service to exploring on a national level. Wolfgang received the award, usually made to an organization or a corporation, for his work as Chairperson of the Leadership Development Committee, in addition to work on numerous national training committees and programs.

Wolfgang spends his free time advising Explorer Post 1275—a Science & Technology Post here at Goddard—which Wolfgang founded in 1975.

Wolfgang was one of the chief advisors for Project POSTAR, a project which entailed competition among US Explorer Posts for an experiment to be sent into space on a Get Away Special (GAS) payload. Post 1275 was responsible for coordination and integration of the experiment into the GAS can.

An Eagle Scout for 35 years, Wolfgang also has been the local council chairman for Adult Explorer Training for many years.

The Explorer Program is sponsored by the Boy Scouts of America and is open to both Boy and Girl Scouts, ages 14–20. The scouts form posts around a central special interest, such as the Science & Technology Post advised by John Wolfgang.

New Balloon

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Unique Flight Tool

Scientific payloads ranging from 100 to 6,000 pounds are carried aloft to altitudes between 15 to 30 miles. The balloons vary in volume from less than 1 million cubic feet to 50 million cubic feet and can provide flight durations as long as 2 days, although 12 hours is typical. The balloon material is 0.0008 inch thick. Large balloons can measure over 400 feet in diameter.

The balloon is a unique flight tool providing an in-situ platform between aircraft and satellite flight altitudes. This makes balloons particularly attractive for atmospheric research. Because of its weight-carrying capacity and flight duration, the balloon is an important element in infrared astronomy research and in cosmic and gamma ray investigations.

Most United States balloon flights originate at the Palestine site, but alternate sites for NSBF launches have included Ainsworth, NE; Greenville, SC; Malden, MO; Kauai, HI and international sites in Canada, Australia, Italy and Brazil.

San Marco

(Continued from page 2)

electric field surrounding the spacecraft in orbit. Principal investigators are Nelson W. Spencer, Code 600 and N.C. Maynard, Code 696, respectively.

The third U.S. instrument is the Ion Velocity Instrument from the University of Texas at Dallas. It is designed to measure the plasma concentration and the ion temperatures surrounding the spacecraft. Principal investigator is W.B. Hanson.

Fifth San Marco Launch

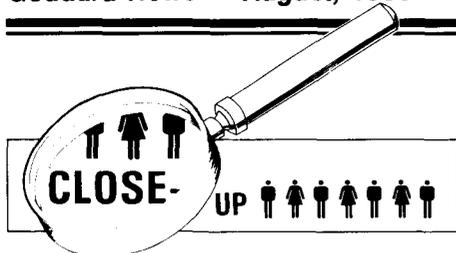
This launch will mark the fifth time a San Marco spacecraft has been sent into space. The first one, San Marco A, was launched from the Wallops Flight Facility on December 15, 1964. The second, San Marco B, was launched from the San Marco Equatorial Range on April 26, 1967; the third, San Marco C1, on April

24, 1971; and the fourth, San Marco C2, on February 18, 1974.

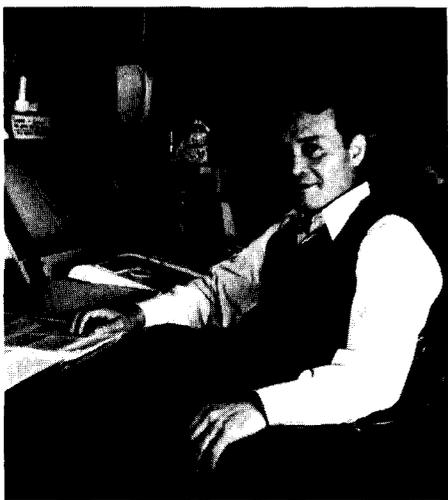
The third and fourth launches also were made in Kenya, where the San Marco Range uses a pair of ocean platforms for its unique launch facility. The San Marco platform—named for the patron saint of navigators—and the sister platform, Santa Rita—named for the patron saint of things impossible—were refurbished in Italy, towed to Kenya and erected approximately three miles offshore in 1966.

The Santa Rita platform is located about 500 meters (one-third of a mile) from the San Marco platform. San Marco serves as the launch platform, while Santa Rita is used as a blockhouse.

San Marco D/L (the L stands for low orbit) will be placed in an orbit of 277 by 685 kilometers (180 by 625 statute miles). Its inclination will be 2.9 degrees, and it will circle the Earth every 100 minutes.



Goddard's International Ultraviolet Explorer (IUE) Project Scientist **DR. YOJI KONDO** (below) attended three meetings in Europe over the past few weeks. Kondo led the NASA delegation at the IUE three-Agency Meeting in Noordwijk, Netherlands. At the meeting, representatives from ESA and the British Science Research Council (SERC) made a strong plea for NASA to complete its development of a one-gyro control system for the IUE so that it would be on hand in case of an emergency. The IUE has operated in a two-gyro mode since September 1985. Kondo served as co-chairman of the scientific organizing committee for an international symposium sponsored by NASA, ESA and SERC at University College in London. This conference reviewed the scientific achievements of the IUE after eight successful years of operation during which over 50,000 images have been ob-



KONDO

tained and more than 1,200 refereed papers have been published. Kondo also chaired an International Astronomical Union Colloquium in Bamberg, Federal Republic of Germany which was attended by 157 astronomers representing 27 countries. The topic of the conference was novae, binary stars which suddenly become thousands of times brighter and then gradually fade. Results from the IUE are proving crucial in unravelling the mysteries of novae. The IUE, which is operated jointly by NASA and the European Space Agency (ESA), is the only ongoing astronomical satellite in operation today.

JOSEPH A. DEZIO has been appointed as Platforms Project Manager on the Space Station Project, Code 400.6. He was formerly the Attached Payload Equipment Manager on the Space Station Project. The Space Station Platforms will provide the required services to support the investigation of Earth, solar, and stellar phenomena.



DEZIO

Equal Opportunity Program Manager **DILLARD MENCHAN** was the master of ceremonies for the National Technical Association's (NTA) Student Technical Symposium Session held at Goddard. The NTA's major objective is to serve as a medium for minority participation in modern technology. Fifty three students with scientific and technical disciplines attended the event.

DR. FRANK MARTIN, Director of Space and Earth Sciences, delivered opening remarks. **DALE FAHNESTOCK**, Deputy Director of Mission Operations and Data Systems, and **ROBERT KRAEMER**, Assistant Director for Technical Resources for the Engineering directorate, briefed the students. The students also were given a tour of the Goddard facilities.

"It was a worthwhile effort," said Menchan. "We got to meet some good students and they got to see Goddard as a career choice."

DR. ERIK MOLLO-CHRISTENSEN has been appointed to the Senior Executive Service position of Chief, Laboratory for Oceans, Code 670. Dr. Mollo-Christensen began his federal career as Head, Oceans and Ice Branch, Code 671 in 1983. He became Associate Chief, Laboratory for Oceans in August 1984. Prior to his appointment in the Federal Government, he served at the Massachusetts Institute of Technology (MIT) for 30 years, 21 years as a full professor in the fields of oceanography and meteorology. He brings to this position his technical expertise in oceanographic research using remote sensing technology and his managerial background in the areas of program planning and research leadership. Dr. Mollo-Christensen has a world-wide reputation in the fields of oceanography and meteorology which is evidenced by his extensive record of publishing and invitations to lecture.

GSFC Associate Director **DR. GEORGE F. PIEPER** (below) is leaving the Center this month after twenty-two years of service. Pieper has accepted a position with the Naval Academy in Annapolis where he will be Professor of Aerospace Engineering.

Dr. Pieper has been Associate Director of GSFC since 1984. Earlier he was the center's first Director of Space and Earth Sciences, a position he held from 1965 to 1983, a period of nearly eighteen years. "The major part of my professional career was spent as Director of Code 600," he said. "I am very proud of the many scientific accomplishments of the directorate during my tenure and since. My goal was always to create an environment in which first class people could do first class work. The fact that two of my lab chiefs have been elected to the National Academy of Sciences is some measure of my success... I suppose it isn't too bad to achieve some small measure of local immortality by having a building and a pond named after me, even if it is informally."



PIEPER

Mail your story to the Goddard News (Code 130), or call the Editor at 286-7277.

NASA Technology Studied for Use Against Brain Disorder

NASA technology is being studied for use in controlling hydrocephalus, an impairment characterized by an accumulation of fluids in the brain and accompanying enlargement of the head which can lead to mental disorders.

Goddard has awarded a \$696,000 contract to Case Western Reserve University, Cleveland, to perform an engineering feasibility study leading to development of a medical device to improve control of hydrocephalus. Hydrocephalus is caused by excess fluid in the brain and spinal column which increases pressure on the brain and can lead to mental retardation.

Case Western Reserve University has teamed with Johns Hopkins University's Applied Physics Laboratory, Laurel, Md.; Cordis Corporation, Miami, Fla.; and Borrow Neurological Institute, Phoenix, Ariz., to perform the feasibility study.

According to Don Friedman of Goddard's Commercial Programs Office, the device could be ready for application by 1990. The device would keep cerebrospinal fluid compartments at normal capacity by use of a microprocessor-controlled cerebrospinal fluid outflow regulating system which employs the aerospace technology. Friedman said NASA's expertise in microelectronics and other miniaturized instruments is directly applicable to the design of this system, called a Cerebrospinal Fluid (CSF) Control System.

Friedman said NASA technology has been used in other miniaturized medical devices. One example is the Programmable Implantable Medication System which dispenses medication within the body, on command.

Hydrocephalus is not a disease in itself but results from serious impairment of nor-

mal circulation or reabsorption of the cerebrospinal fluid. The disorder can result from birth defects, infection or injury to the brain.

Current treatment primarily consists of surgical insertion of a shunt to divert fluid from the brain to other parts of the body. While this treatment has helped many people, problems still exist and improved systems are needed. Medical reports indicate that about 50 percent of hydrocephalus patients require repeat surgery to replace or repair the implanted shunt.

The system being developed can be programmed and reprogrammed to meet the changing needs of a growing child and can be used later to wean the patient from shunt dependence. Friedman said the system also would improve management of hydrocephalus and could reduce health care costs by decreasing the number of operations and by eventually weaning the patient from the shunt.



MELWOOD CONTRACT—Goddard recently signed a one year contract for landscaping services with the Melwood Horticultural Training Center, Inc., a private non-profit organization which develops job responsibility, marketable vocational training, and social skills in mentally handicapped adults. Under the terms of the contract Melwood will provide five laborers, one tractor operator/supervisor, one supervisor, and landscape design services. A contract signing ceremony was held on August 1. Pictured: (back row) Keith Swan, Melwood Lead Handicapped Worker; Skip Kemerer, Contract Specialist, Code 246; Richard Stewart, Technical Officer, Code 290.1; Rolie Williams, Melwood Foreman; (front row) Richard Barnard, Melwood Executive Director; Marlene V. Forster, Contracting Officer, Code 246.

Blood Donors

Following is a list of Goddard donors who were cited by the American Red Cross with gallon pins at the bloodmobile of August 6, 1986.

Name	No. of Gallons
Michael Blizzard	4
Robert Boyle	2
Steven S. Brodd	2
Howard C. Dew	3
Raymond W. DiSilvestre, Jr.	3
Ida Hakkarinen	4
Tom Heslin	1
Ned Horning	1
Edward J. Hulbert, Sr.	1
Wayne Kasprzak	1
Deborah Knapp	2
Laurie Levinson	1
Patricia Lewey	2
Michael Mandelberg	1
Nancy Mingkim	1
Wyatt Rinker	3
Christopher Scherer	4
Wendy Shoan	3
Claudia Tom	1

This was the best bloodmobile by far! We went way over our goal! Let's do it again at the next bloodmobile scheduled for Wednesday, October 1, 1986, in bldg. 8 auditorium from 8:30 to 2:30.

THANK YOU GODDARD!

NASA
National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

The GODDARD NEWS is published monthly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771. Deadline for submitted material is the first of each month. For additional information, contact Randee Exler, 286-7277. The GODDARD NEWS staff is:

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