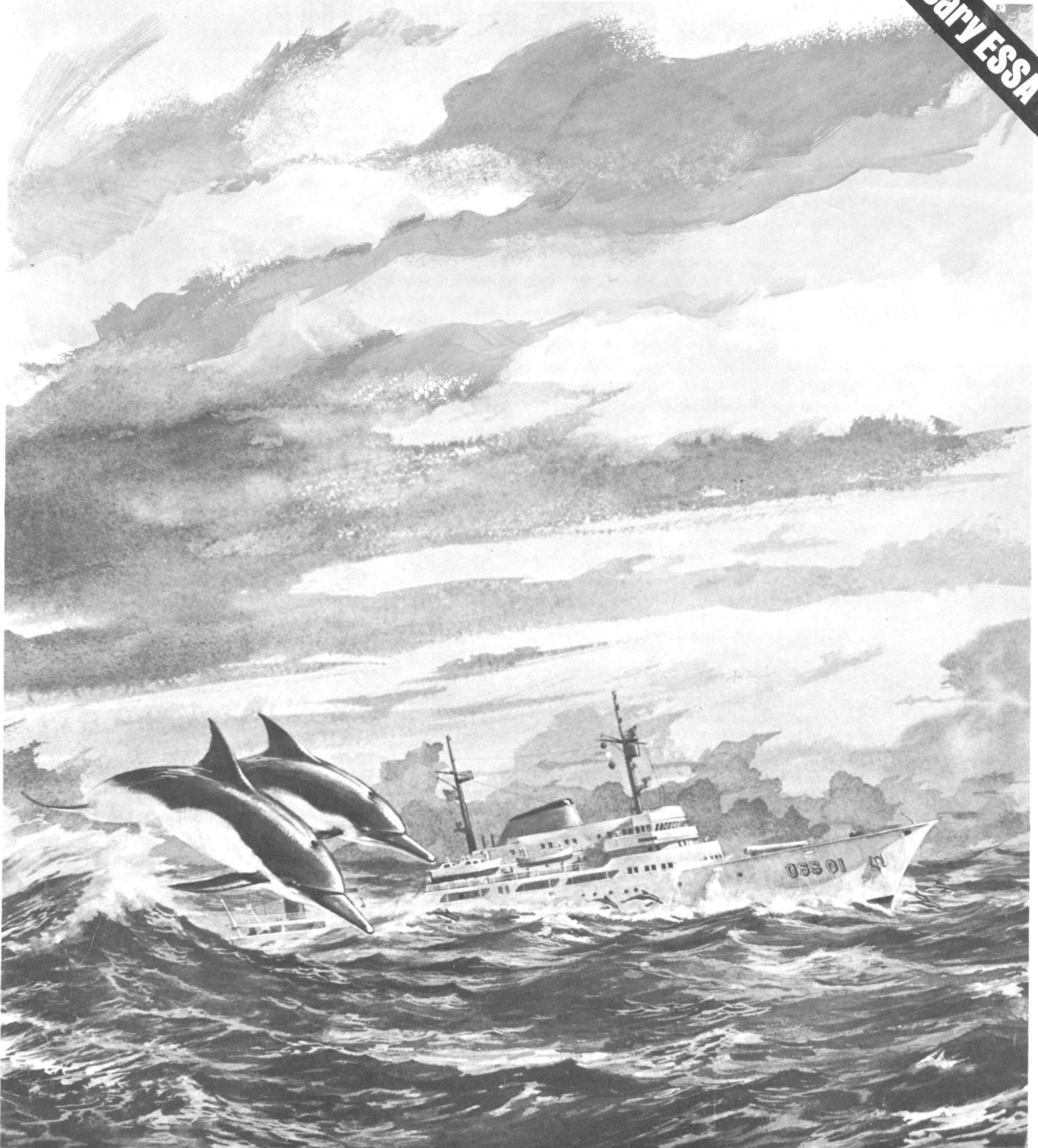


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First Anniversary ESSA



National Oceanic and Atmospheric Administration

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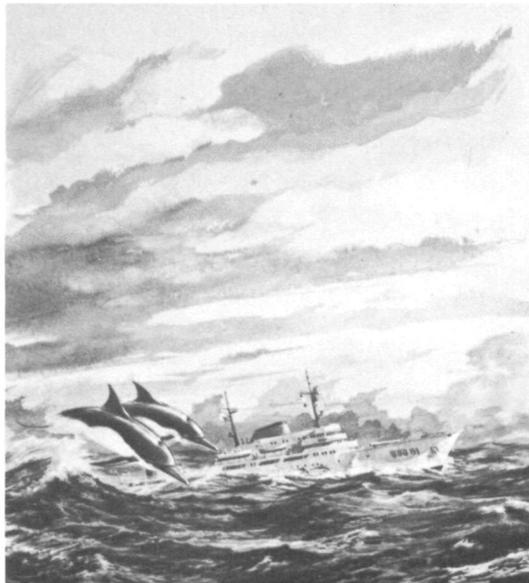
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U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

page

- 4. A Begining . . . Dr. Robert M. White
- 6. USSC&GS **Oceanographer**
- 9. ESSA Team in New England
- 11. ESSA News Briefs
- 15. A Spot in the Sun

Back cover. WALLOPS . . . Where the Action Is



COVER

USC&GS **Oceanographer** in heavy seas is conception of artist Jack Boilard. He was commissioned by Bissett Berman Corporation, San Diego, Calif., manufacturers of oceanographic instrumentation and systems, some of which are installed in **Oceanographer**.

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"a single national focus to describe, understand, and predict the state of the oceans, the state of the upper and lower atmosphere, and the size and shape of the earth"

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I AM happy to extend my congratulations to the Environmental Science Services Administration, and to the thousands of men and women who comprise its family, on the occasion of ESSA's first anniversary.

I recall saying at this time in 1965 that the new organization would offer each of you a fresh and important challenge.

In this first year, you have moved ahead to develop a better framework for the environmental science services of the Department of Commerce, to extend the range of those services, and to seek higher levels of excellence.

Day by day, you are meeting the challenge posed by the ESSA mission—to serve as a single national focus for observation, description, understanding and prediction of the natural environment.

The creation of ESSA has given the Department a new capacity for the pursuit of knowledge and the conquest of environmental problems which plague mankind. Through the joining of ESSA's major elements, it is possible to plan and execute programs previously beyond reach. The benefits to the Nation are real and visible; in the years to come they will multiply.

We have made an excellent beginning, through the spirit of cooperation and the sense of mission shown by the ESSA family.

As ESSA moves into its second year, and the responsibilities which accompany it, I take pride in saluting the organization and its employees. I have every confidence you will even redouble your dedicated efforts to serve America in this vital area of human endeavor.


JOHN T. CONNOR
Secretary of Commerce

During its first year of life, a baby devotes most of its efforts to adapting to its physical environment. In fact, throughout life the individual, to one degree or another, adapts to his environment instinctively because historically man has never known any other way.

ESSA, interestingly enough, has spent most of its first year looking towards man's eventually adapting the physical environment to his own needs. What is new and different in this approach, for a technical organization, is the very recognition that we can think in such terms.

This first birthday, then, is a proper occasion for a small amount of retrospection to prepare us for the future. It has now been over two years since I appointed a committee to investigate ways of improving the environmental science programs of the Department of Commerce. That committee was composed of Drs. White and Astin and Admiral Karo. After about a year's study, including consultation with eminent non-Government scientists, it unanimously recommended the establishment of ESSA. The rest is history.

Please accept my congratulations for your part in the results to date, whatever your job or station. A concept as big as ESSA's could never have been translated into reality without a tremendous amount of teamwork. My sincere wish for each of you is that your job satisfactions meet your expectations, for only through continuing self-challenge can the individual be motivated to undertake tasks as great as those facing ESSA.

The central core of that task is adapting the environment to man's needs rather than forevermore adapting man to the requirements of the environment. I shall be watching your progress with keen interest.

J. Herbert Hollomon
Assistant Secretary of
Commerce for
Science and Technology

A BEGINNING



BY DR. ROBERT M. WHITE
Administrator

THE ENVIRONMENT which envelopes us extends from beneath the ocean floor to upper space. Its manifestations anywhere in that immense range can affect our lives dramatically and enduringly.

The Environmental Science Services Administration is the fruit of a grand concept—the realization that if we are to live in harmony with this life-sustaining, yet often cruel envelope, we must deal with it in its own terms—on the grand scale. On July 13, 1965, the President launched this effort by joining the Weather Bureau and the Coast and Geodetic Survey under the banner of this new organization. In October, the Central Radio Propagation Laboratory of the National Bureau of Standards became a part of ESSA. The three organizations contributed to ESSA the basic disciplines with which it has attacked its task—to describe, understand and predict the state of the oceans, the state of the upper and lower atmosphere, and the size and shape of the earth.

Now ESSA is one year old and it is my pleasure, in this, the first issue of *ESSA World*, to review briefly the twelve months just past, and to express my personal gratitude to the more than 10,000 men and women who have brought our new agency so great a distance in so short a time.

When the dream of ESSA became a fact, and brought with it all the opportunity and challenge implicit in its mission, it became necessary to move forward as vigorously as possible on two fronts: operational and organizational. It has been a year of outstanding scientific and technical achievement and the formulation of new plans for expanded scientific and service endeavors.

We have brought into being the world's first operational weather satellite system with the launching of ESSA 1 and ESSA 2, and have established plans to modify and expand our satellite systems to incorporate other geophysical sensing devices.

In the field of oceanography, we have seen the launching of several new vessels for ESSA's Coast and Geodetic Survey hydrographic and oceanographic fleet; and the commissioning of what may be the world's foremost oceanographic research vessel, the *Oceanographer*. Our oceanographic vessels will be used for a wide range of geophysical purposes; this November, for example, the *Oceanographer* will participate in a solar eclipse expedition in conjunction with our Institutes for Environmental Research.

Vigorous action has been taken to execute our plans in global satellite triangulation, in cooperation with NASA, and the Department of Defense under the leadership of the Coast

and Geodetic Survey.

Our weather and river warning services have performed remarkably over the past year, demonstrating the public value of the critical services they give. ESSA, in a bold and imaginative approach to the problems of natural disaster which afflict our Nation, has conceived a Nationwide Natural Disaster Warning Plan which, given the approval of the Congress, will enable us to improve significantly in our task of warning of all geophysical phenomena within the coming year. We have recently advanced our capability in this area through the addition of a new geophysical laboratory, recently dedicated at Newport, Washington.

Our planning for new and exciting scientific programs has quickened. Broad-scale plans in the areas of weather modification, support for exploration of the Continental Shelf, the World Weather Watch, earthquake prediction, and environmental pollution—each and every one of vital interest to all Americans—are under review. Determinations are being made on the extent to which we shall be able to request Congressional support for them. It would be possible to mention numerous other accomplishments.

While this large and lively series of science-service programs has been progressing under the aegis of our new organization, we have been reshaping the agency's structure to accommodate its growing responsibilities. We have organized to include the Environmental Data Service, the National Environmental Satellite Center, and the Institutes for Environmental Research—embracing earth sciences, oceanography, atmospheric sciences, aeronomy, and the telecommunication sciences. Much effort has been devoted to planning and implementing the new structure, and laying the groundwork for extensive scientific participation in broad new programs in the environmental and telecommunication sciences.

It has been a year of integration of activities. We have a long way to go, but we have essentially completed the consolidation of our administrative and financial operations. We have been able to present a single budget to the Congress.

We are also implementing, after thorough discussion with all of ESSA's major elements, a new, consolidated accounting system and a management information system, both designed to bring further cohesion to the agency's operations.

We have taken the first steps to establish at Boulder, Colorado, the headquarters of the Institutes for Environmental Research and to initiate the increase of staff and programs there. Our Atmospheric Physics and Chemistry Laboratory has been established at Boulder; we have moved to establish components

1. ESSA 2 blast-off at Cape Kennedy last February. Vehicle was NASA's three-stage, thrust-augmented, improved Delta rocket. 2. ESSAites of the C&GS reduce seismographic charts to 35 mm film. 3. Work being done on one of the first two satellites in the Tiros Operational System. 4. Cloud-cover photographs in the form of radio signals from weather satellites are received by this heliz antenna. 5. These 60-foot antennas near Boulder, Colo., are used by the Institute for Telecommunication Sciences and Aeronomy. 6. A Coast and Geodetic Survey triangulation tower. 7. ESSA headquarters, Building 5, Washington Science Center in Rockville, Md.

of the Institute for Earth Sciences there; and, perhaps most importantly, we have taken the vital step of providing leadership for our Institutes with the appointment of Dr. George S. Benton as their director.

We have sought to improve and consolidate our Washington-area operations by the rental of a new building in Silver Spring, Maryland, to house the Weather Bureau and those elements of the Institutes which will remain here, as well as the headquarters for the Environmental Data Service and components of the Coast and Geodetic Survey.

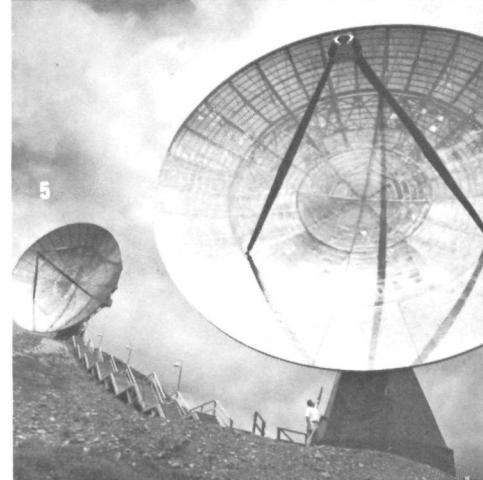
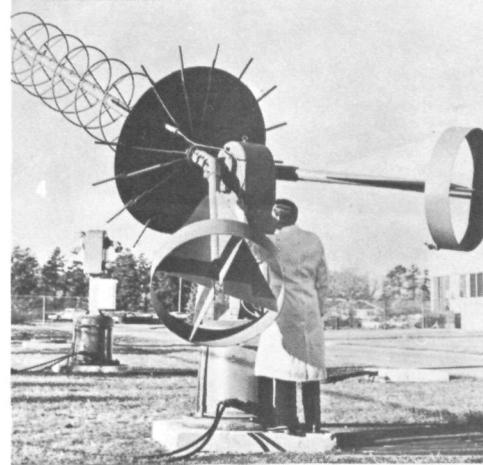
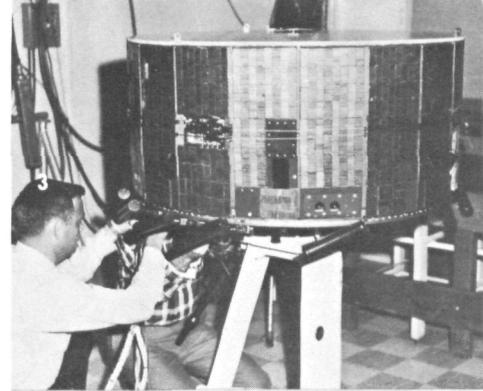
We have started to move to assemble a comprehensive Environmental Data Center complex in Asheville, North Carolina, with the transfer of the Geodetic and Seismology Data Centers to that location. Our ESSA headquarters staff has been consolidated, and staffing of the Office of Science and Engineering has been completed with the appointment of Dr. William V. Wright, to provide for effective coordination of our research and development programs.

Our talents and resources are extremely diverse; our mission is global in nature and scope. We face a formidable challenge: to use these talents and resources on land, at sea, in the air and upper atmosphere; to help man live in safety and harmony with his geophysical environment, and to use it effectively for the purposes of our existence on this planet.

As the geophysical environment itself is indivisible and interacting, so must our efforts be directed toward a single end, through many approaches. ESSA is composed, to a great extent, of men and women who first served in its line organizations, who served them with distinction, and who feel tremendous loyalty to them. It is a tribute to their comprehension of the overall ESSA purpose that they have achieved so much in so brief a time in our new framework.

The year just past has been an exciting, productive year, one in which we can take pride. But it is a beginning; the larger task lies ahead. A mission as complex and demanding as ours calls for the best efforts of which we are capable; we cannot afford a moment's complacency. The degree of our diligence and dedication is reflected in the daily lives of millions of persons. We have established the mechanics for forward motion; we must now move forward.

I know our ESSA family—to which this new magazine is dedicated—will continue to work together with determination to bring to our Nation the benefits which the Environmental Science Services Administration was created to provide. □





Captain Arthur L. Wardwell, USSEA, at the wheel of Oceanographer during run from Jacksonville, Fla., to Baltimore.

TO FATHOM THE SECRETS OF THE SEAS USC&GSS

OCEANOGRAPHER

EVEN BEFORE the Pythagorean school of philosophy, which upheld the spherical as against the disk-shaped world, men have tried to probe and understand the secrets of the sea. Today, man continues the vital study of the oceans and, in the United States, ESSA's Institute for Oceanography is responsible for oceanographic research programs while the Coast and Geodetic Survey operates and maintains ESSA's 15 ship research fleet and survey facilities.

While sailors' logs supplied the first scientific evidence, the most valuable early oceanographic observations were made during the expeditions of Captain James Cook and polar explorers Sir John Ross in the north and Sir James Ross in the south.

In the United States, hydrographic surveys began by the Coast Survey in late 1834 and early 1835, using the schooner *Jersey* under the command of Lieutenant Gedney and the schooner *Experiment* under Lieutenant George Blake. Their work progressed along the south shore of Long Island, in New York harbor, and in Great South Bay. The brig *Washington*, built in 1837 as a revenue cutter, was used by the Coast Survey during summers until she was permanently transferred to the Survey in 1840.

Just as the *Washington* contributed to early hydrography, the United States' oceanographic efforts entered a modern new phase with the commissioning of the USC&GSS *Oceanographer* (OSS-01), an ultra-sophisticated ocean survey ship, at ceremonies in Washington, D.C., July 13.

"We at ESSA are proud of *Oceanographer*," said Dr. Robert M. White, ESSA Administrator, "both for what she is and what she represents. The knowledge she seeks is elusive, the search as difficult as it is rewarding. But those who man this ship understand the difficulties, and the immensity of the undertaking. They also understand their efforts will help improve man's lot and prospects upon this little-known and restless planet."

The all-white ship—costing some \$10 million including scientific instrumentation—was completed by Jacksonville (Fla.) Shipyards April 20, under sub-contract to Aerojet-General Shipyards. She is the largest, most modern and most completely automated ship built in the United States for oceanographic investigation. She will be used principally by the Institute for Oceanography, one of ESSA's Institutes for Environmental Research. *Oceanographer's* operations will be characterized by close cooperation with university marine researchers. On each research or survey expedition, guest scientists will carry out their work in conjunction with scientists from the Institute for Oceanography.

On May 3, under the command of Captain Arthur L.

Wardwell (USSEA), *Oceanographer* sailed from Jacksonville to Baltimore for installation and check-out of additional data acquisition equipment. Returning again to Jacksonville, she is now scheduled for some six months of Atlantic ocean survey work before proceeding to her permanent base at Seattle.

Though no pleasure-cruise ship, much attention has been given to developing a living and working environment conducive to good morale and productive operations. Generous accommodations with adjoining individual dayrooms and facilities are provided for the captain, chief engineer, chief scientist and any distinguished guest.

There are individual quarters for senior officers and eight chief petty officers; remaining accommodations are double. Individual lounges are provided for officers and scientists,

chief petty officers, petty officers and crew. Austerity and lack of privacy, characteristic of some scientific working vessels, are noticeably absent on the *Oceanographer*.

"Because she investigates a global oceanic system," said Commander John R. Plaggmier (USSEA), Executive Officer, "*Oceanographer* has a global capability. Her nominal maximum cruising range, at a sustained speed of 16 knots, is 13,000 nautical miles—that's just about twice the great-circle distance from San Francisco to Bombay."

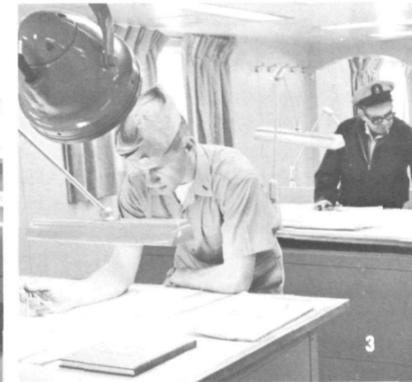
Plaggmier further said that the ship can be provisioned for 150 days at sea and that average fresh water consumption is approximately 5,000 gallons a day. "Storage is available," he said, "for some 25,000 gallons, and our distiller capability is 8,000 gallons a day."

Oceanographer has a complement of 13 officers/scientists,

Ships under construction at Jacksonville, Fla. Oceanographer was completed April 20, 1966 by Jacksonville Shipyards under sub-contract to Aerojet-General Shipyards.



1. Leland Wiggins, 2nd assistant engineer, adjusts TV camera in engine room. 2. A magnetometer sensor is lowered by Chief Boatswain Ivan H. Olsen (left) and Seaman Ludwig Blaha. 3. Busy in plotting room are Lieutenant Joseph W. Dropp and Chief Quartermaster Albert Greenberg. 4. Crewman prepares to board Oceanographer. 5. Scuba divers Lieutenant Paul Larson, master diver (left), and Stanley Otsubo, chief survey technician, return from dive. 6. The "long and short of it" aboard are seaman Doyle W. Popwell (left) and steward Leonard Aliwanag. 7. Baker Ireneo A. Bartoleme and cook Santiago T. Peralta at work preparing chow in Oceanographer's modern main galley.



a crew of 39, and 45 technical and scientific personnel. Quarters also are available for eight visiting scientists, a distinguished guest and eight unassigned crew. The ship can accommodate as many as 116 persons.

"Air conditioning," said *Oceanographer's* skipper, Captain Wardwell, "fine illumination, minimal vibration, and the arrangements and furnishing of quarters have taken much of the traditional discomfort out of long oceanographic voyages—she is indeed a grand ship."

Oceanographer is of welded steel construction, with structural reinforcing for operations in floating ice. All enclosed quarters and work areas are air-conditioned for maximum efficiency during tropical investigations.

A passive rolling tank permits operations to continue up to sea state 7—that is, fresh gale conditions with winds above 34 knots and waves 19 feet high.

"Propulsion is provided by two fixed-pitch screws," said Jose Velasquez, Chief Marine Engineer, "driven by two 2,500-shp—that's shaft horsepower—electric motors. A 400-hp bow thruster, which develops about 10,000 pounds of thrust, is located in a tunnel through the ship's hull and permits her to keep a steady heading at slow speeds despite wind and wave conditions."

"Her design was unique," continued Velasquez, "since she has a single computer to serve both ship operation and the collection and processing of environmental data."

Using this computer, a high degree of machinery automation is made possible by the Centralized Engine Room

Control (CERC) system, a development of the Westinghouse Corporation. CERC also permits remote control of main propulsion units and principal auxiliary machinery from a master control station in the engine room, from a conning station aloft and from the bridge.

The oceanographic laboratory is a rectangular area occupying the entire aft end of the main deck superstructure. Modular laboratory furniture permits flexible arrangement of the central work area to suit individual projects.

"There's a 6 by 8 foot vertical center well," explained Velasquez, "that extends from the laboratory through the ship's hull that can be used by suba divers and for casts of special equipment."

Oceanographer's meteorological office is forward and above the oceanographic laboratory. It is equipped with radiosonde receiver and balloon-tracking radar, and repeaters for seawater temperature, wind velocity and ship's course and speed. The ship can receive ESSA satellite photographs through an APT (Automatic Picture Transmission) receiver system.

The list of *Oceanographer's* equipment and capabilities is long and impressive. In the words of Dr. White, "Her pre-eminence in size was matched by the imagination with which her design employs automated systems and by her superb oceanographic capability."

The more mundane may ask, what about eating facilities? According to Quartermaster Lindell Simms who put in 20 years with the U.S. Navy: "I've never had it so good. *Oceanographer's* chow and bunks are the best." □



Marvin Harris (left) survey technician, and C. Nickerson, boatswain mate, operate deep sea anchoring winch.



At dock in Jacksonville, *Oceanographer* will soon be under way. Union Jack on bow is lowered when ship is in motion.

An ESSA team in New England

... how the C&GS and WB
support down easters

“WE PLAN TO GO CAMPING at Lake Winnepesaukee next week—could you give me a five-day forecast?”

“When is low tide?”

“Can I plan to have a garden party or do you think it'll rain tomorrow?”

“Where can I get aeronautical charts for the Boston area?”

These are but a few of hundreds of questions the public ask of the New England Coast and Geodetic Survey Office in Boston's Custom House and the Weather Bureau's Airport Station at Logan International Airport.

The country's oldest chart and map-making agency, the U.S. Coast and Geodetic Survey, is of vital importance to New England's mariners, aviation industry, engineers and many others.

“Even in this space age,” said George E. Moore, chief of C&GS's Boston Field Office, “cargo vessels are the cheapest and most economical method of moving the vast bulk of world commerce. Shipping safety directly affects the pocket-book of every householder, even though he lives in the most remote corner of New England.”

Moore explained that to insure its nautical charts are kept as up-to-date as possible, C&GS's regional headquarters searches out navigational dangers, waterfront construction changes and other hazards which jeopardize mariners' safety.

“We're always on the go,” continued Moore. “I confer with union and cooperative officials at Boston, Gloucester, and Rockland, Me., to get information of great concern to the New England fishing industry. Wrecks, pinnacle rocks, ledges and the like, not only are important feeding grounds but can destroy nets and trawls costing thousands of dollars.”

Teaming up with C&GS to assist New England's economy is the Weather Bureau. In addition to the safety of people and the security of their property, weather affects commerce, industry, communi-



Record American Photo, Paul Queenan

Plow clears new snow from sidewalk along Boston's Tremont Street. Weather Bureau's forecast of afternoon's mild temperatures completed the job.

Aviation weather forecasts of favorable ceilings and winds permit helicopter to spray cranberry bog at East Wareham, Mass.





Behavior of tides and currents of New England's 6,130 miles of coastline is of major concern of the Coast and Geodetic Survey. Safety of thousands of boating enthusiasts depends upon C&GS's accurate forecasting and reporting.

Photo by Sam Chambliss

cations, transportation, agriculture and recreation, to name a few.

Many Weather Bureau service and observational offices are located throughout New England. The largest of these is the Forecast and Warning Coordination Center at Boston which is headed by Dr. Oscar Tenenbaum, Meteorologist in Charge of WB's Boston Airport Station.

"There are some 500 cooperative-observer stations too," said Tenenbaum, "supervised by the Bureau and operated by individuals or employees of utilities, airlines, U.S. Coast Guard and the FAA."

In an area which enjoys such a variety of weather, every form of transportation is affected, particularly in winter. Scheduled and non-scheduled airlines require accurate observations of ceilings, visibilities and winds for take-offs and landings.

Similarly, C&GS's aeronautical charts, used by business aircraft, general aviation and the aviation industry, are undergoing changes due to airport construction, changing landmarks, revision of airways and changes in radio aids.

As one of the major industrial areas of the United States, New England has long appreciated the importance of weather forecasts, warnings, current observations and climatological data throughout the

year. Retailers are guided in building up their inventories, in featuring special sales items, in scheduling newspaper and radio advertising by climatological statistics and extended-range forecasts.

Likewise, the C&GS's Field Office must check over 100 private firms and concerns which are authorized to sell nautical and aeronautical charts. Periodically the sales stock of these agents is inspected to insure that obsolete charts have been removed and only current material is available to the public.

On file at the Custom House headquarters is a wealth of technical information which includes tidal records for the past half-century, nautical and aeronautical charts, technical publications on C&GS's specializations, all of which are available to the public. Typical of the Field Office's visitors are: lawyers engaged in boundary disputes, storm damage cases, admiralty law suits; engineers; builders; shipping lines; and representatives of the aviation industry.

The behavior of the tides and currents washing the 6,130 miles of New England shore is of major concern and 13 tide gages have been set up to continuously record the mighty rise and fall of the sea.

Both Moore and Tenenbaum agree

that recreation is one of the larger contributors to New England's economy. A diverse and interesting terrain combined with proximity to the ocean make it an important playground of the United States and Canada.

"As an example of WB's service regarding recreation," said Tenenbaum, "we give a winter sports service for skiers in cooperation with the New England Council."

The service includes a twice-daily bulletin which summarizes skiing conditions at some 100 winter sports areas—also included are forecasts of expected weather conditions affecting other winter sports activities in those areas.

"And in the summertime," added Moore, "thousands of sailing and power boats take advantage of the ocean coast and inland lake waters. Naturally it follows that C&GS's maps and charts contribute extensively to the excellent water safety record New England enjoys."

ESSA is proud of its record in New England—proud of its many services extended to the down easters—and takes satisfaction in the fact that millions of vacationing Americans and Canadians are protected by accurate environmental reporting. □



World's Coldest Spot Has New Antarctic Station

The United States has set up a new Antarctic station at what is believed to be the coldest spot on earth, where the temperature may fall to 130 degrees Fahrenheit or more below zero.

Coast and Geodetic Survey's geophysicist Douglas Elvers recently returned from the Antarctic, where he was a member of an 11-man traverse party, said the lowest temperature will be recorded during the forthcoming Antarctic winter early this month.

The party traveled through previously unexplored territory on a route which took it from the Pole of Inaccessibility to Plateau Station, the new camp, where Elvers participated in setting up a geomagnetic facility.

Plateau Station is some 600 miles northeast of the South Pole. It was erected by the U.S. Navy on one of the Antarctic's highest plateaus. Elvers disclosed that last fall the temperature dropped below minus 100 degrees F.

The station sits atop almost two miles of snow and ice at what may be the center of the Antarctic storms. Making a winter stay there are four Navy personnel and four scientists, one each from the C&GS and the WB and two from Stanford University, Stanford, Calif.

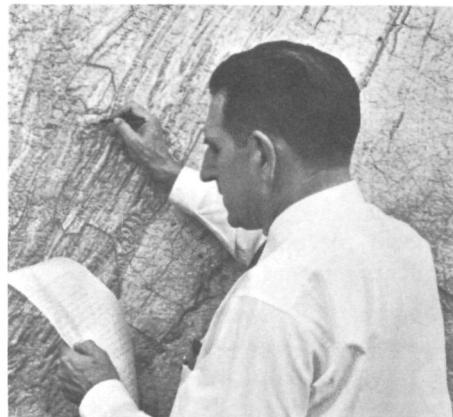
Benton Appointed Director of IER

Dr. George S. Benton, chairman of Johns Hopkins University's Department of Mechanics, has been appointed to lead



the research activities of ESSA. Dr. Benton will become Director of the Institutes for Environmental Research this month.

Administrator Dr. Robert M. White said: "His appointment follows a search of many months for a director combining the unique qualifications necessary to this position of significant leadership . . ."



'Flood Detectors' Guard Potomac River Basin

The Weather Bureau is testing a 20-station network of electronic "flood detectors" in the Potomac River basin.

The Automatic Hydrologic Observing System (AHOS) should provide WB hydrologists with up-to-the-minute river level and precipitation data from strategic sites within the 14,000 square mile river basin which includes sections of Virginia, West Virginia, Pennsylvania and Maryland. If the tests prove successful, AHOS could be extended to flood-prone areas in other sections of the United States.

Aided by the information received from AHOS, hydrologists are able to keep a constant watch on the rain and snowfall accumulations and fluctuations in the river and stream levels which are of great importance in flood forecasting and warning.

Basic equipment for the system includes a data "concentrator" and special teletypewriters housed in the Weather Bureau District Office at Washington National Airport, plus the 20 measuring and transmitting stations.

Information from the automatic network also is received at the River Forecast Facility of WB's Office of Hydrology where river forecasts for the Potomac are prepared. The River District Office at the airport is responsible for the operation of the river district and for sending out forecasts and warnings.



Volunteer Weatherman Receives Holm Award

R. J. Hoge, in charge of Watertown, Wis., weather records, received the Holm Award last April for nearly 30 years of superior service as a volunteer weather observer, for continuity of observations and for accuracy, reliance and cooperation.

The award was presented by Hans Rosendal, ESSA state climatologist of the Madison Weather Bureau.

Shown are (left to right): Hoge, Rosendal and Congressman Robert W. Kastemeier of Watertown.

The Holm Award was named for a Lutheran minister who was the first person known to have taken systematic weather observations in this country. The Rev. John Campanius Holm took daily observations near what is now Wilmington, Del., in the years 1644 and 1645.

In making the presentation, Rosendal complimented Hoge on his outstanding record of service in the collection and preservation of weather data in this area.

Storm Over Irish Sea



ESSA 1 photo of storm over the Irish Sea is seen in the big enlargement behind Lara Walters, secretary at the National Environmental Satellite Center, Suitland, Md. She examines film of satellite's TV pictures from which the enlargement was made. (Photo by Western Electric)

Blast Off



Members of the C&G's 20th graduation class of ESSA commissioned officers and spaceflight meteorologists at WB's National Meteorological Center, Suitland, Md., watch TV blast-off of Gemini 9.

The graduates, who hold college degrees, had completed an intensive 13-week course in the scientific disciplines of ESSA which included, for the first time, meteorology and aeronomy to prepare them for possible future Weather Bureau assignments.

Wright Appointed Director of the Office of Science and Engineering



Dr. William V. Wright, Jr., was appointed to the position of Director of ESSA's Office of Science and Engineering last May by Administrator Dr. Robert M. White.

Dr. Wright attended the California Institute of Technology receiving his bachelor's degree in 1951 and his doctorate in physical metallurgy in 1955.

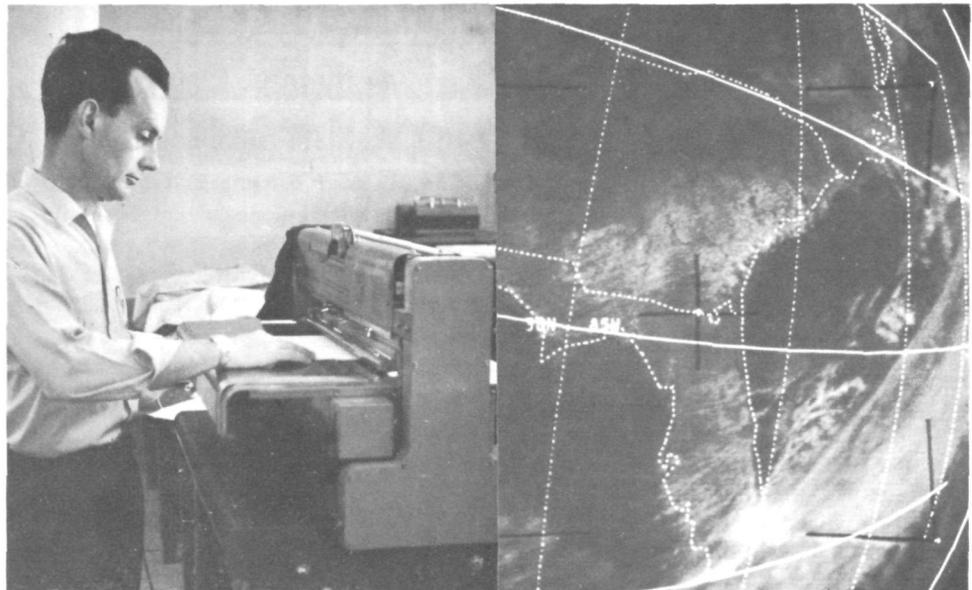
Formerly Dr. Wright was vice president of Electo Optical Systems, Inc., at Pasadena, Calif.



Administrator Eyes First APT Picture by ESSA 2

Administrator Dr. Robert M. White (left) and David S. Johnson, Director, National Environmental Satellite Center, examine the first Automatic Picture Transmission (APT) picture sent by ESSA 2, February 28.

The picture covered a 4-million square mile area from the Dakotas to the East Coast and from northern Hudson Bay to Tennessee.



WEATHER BUREAU ASSISTS GEMINI 9 MISSION

Assistant chief of the Communications Branch, Don Ayers, National Meteorological Center, Suitland, Md., transmits a weather chart to the Gemini 9 broadcast pool. Photo from ESSA 1 prior to Gemini 9 launch clearly shows Florida weather.

Mauna Loa Gets New Director



Left to right: Lothar H. Ruhnke, Director, MLO, John G. Norris, Personnel Officer, and James W. Osmun, Director of the Pacific Region.

Lothar H. Ruhnke was sworn in April 6 as Director of the Weather Bureau's Mauna Loa Observatory, Hawaii.

At the observatory, Ruhnke will direct projects designed to get basic information needed to improve weather forecasting.

Mauna Loa Observatory is a branch of ESSA's Institute for Atmospheric Sciences.

New Physical Science Administrator



The new Physical Science Administrator (Senior Scientist) in ESSA's Office of Science and Engineering is Dr. William O. Davis of Stamford, Conn. Dr. Davis was appointed to the post last May by Administrator White.

Dr. Davis comes to ESSA from the Huyck Corporation, Stamford, where he was Director of Research with responsibility for developing new industrial and military products to meet market needs.

Admiral Karo Receives Gold Medal



The Gold Medal of the Society of American Military Engineers was presented to ESSA Deputy Administrator Vice Admiral H. Arnold Karo for exceptionally meritorious service to the Society.

The medal was presented by Rear Admiral John B. Oren in ceremonies on May 23 at the Annual Military Engineer dinner held at the Fort McNair Officers Club in Washington, D. C.

Admiral Karo (left) was selected for the award in recognition of his national and international leadership in military engineering, science and technology, as well as for his "wise counsel and leadership" in the Society.

New Observatory Dedicated

The Newport Geophysical Observatory, one of the most modern facilities of its kind in the world was dedicated last month.

Located eight miles north of Newport, Wash., it is the first of its kind in the Northwest United States and one more in the network of 14 similar observatories maintained by the Coast and Geodetic Survey.

Principal speaker at the dedication was Sen. Henry M. Jackson, (Wash.). Others participating were Vice Admiral H. Arnold Karo, Deputy Administrator of ESSA; Rear Admiral James C. Tison Jr., Director of ESSA's Coast and Geodetic Survey and Captain Harold J. Seaborg, Director of ESSA's Pacific Marine Center in Seattle.

San Juan Forecaster Is Renowned Shutterbug

When not engaged in his normal duties as aviation forecaster at San Juan, Puerto Rico, Edward R. Miller is likely to be found traveling around the world camera in hand.

Photography is his main interest and children are his favorite subjects. Miller's work has received enthusiastic response in several exhibitions in the United States during the last two years. This year he has had exhibitions in the United Nations Secretariat and at the International Photography Fair in New York Coliseum. Both were sponsored by the United Nations Children's Fund. Another collection was on exhibition during May at the Witte Memorial Museum, San Antonio.

His training in photography began with a three-month stay at the Antonelli School in Philadelphia and a year at the Art Center School in Los Angeles.

Trained as an engineer at the University of Minnesota, Miller also studied languages and the humanities at the universities of Kansas City, Mo., Havana, Hawaii, the Philippines, Puerto Rico and Santo Domingo.

Concerning his work, the reviewer at the Minneapolis Institute of Art said: "Miller deftly escapes a sentimental concern with people, and in particular, with children. He succeeds in bringing to these subjects a warm and genuine response and insight with sound photographic grasp. He has managed to do photographically what other photographers have found it difficult to do . . ."

One of his favorite photos (below) was taken in Seoul, Korea.



personnel briefs



RETIREMENTS

William Dennis, 18 years, Office of Oceanography, Rockville, Md. **Henry Petersen**, 23 years, Pacific Marine Center, Seattle. **Jeanne Wilson**, 5 years, Aeronautical Charting and Cartography, Washington. **Joseph Nelson**, 19 years, Geodesy and Photogrammetry, Rockville, Md. **Joseph King**, 13 years, Administrative Operations, Rockville.

HEADQUARTERS INCENTIVE AWARDS COMMITTEE

An ESSA Headquarters Incentive Awards Committee was appointed by Dr. White consisting of the following members:

Guy Dorsey, chm.	Alternates
John Eberly	Richard Quill
Morton Rubin	Robert Culnan
Albert Stanley	Robert Rollins
Robert Schloemer	Harold Harshbarger
Gordon Vaeth	Carl Frey
Russell Grubb	George Allen

This committee is responsible for establishing an ESSA-wide program policy, actively promoting the program, evaluating and recommending for approval the larger cash awards, special awards and Gold, Silver, and Bronze Medal Awards.

Marion Talcott, Employee Relations Branch, Personnel Division was appointed by Dr. White to serve as Incentive Awards Program Officer and will be responsible for general administration of the program.

health

HEALTH BENEFITS OPEN SEASON

The Civil Service Commission said that it has tentatively scheduled November 14 through November 30 as open season for the Federal Employees Health Benefits program. Final decision will be made after interested parties have had an opportunity to comment on this proposal.

During this open season, employees who are not enrolled under the program will be permitted to enroll, and both annuitants and employees who are covered under a participating health benefits plan will be able to change from one plan, option or type of coverage (self-only or family) to another. Changes made during the open season will be effective beginning with the first full pay period in January 1967.

The Federal Employees Health Benefits program covers about 6,800,000 employees, retirees, and their dependents. It is the largest employer-sponsored voluntary contributory health benefits program in the world.



One of the hazards of sun tanning, according to dermatologists, is premature aging of the skin. About the only beneficial effect of sunlight, other than the psychological lift of a good tan, says the American Medical Association (AMA), is the formation of vitamin D, already amply provided by the American diet.

But if you want a tan, the AMA says, do it without burning. Get it by beginning with about 15 minutes' exposure the first day and increasing the time by a few minutes a day.

safety

This is a slow-motion, split second reconstruction of what happens to a driver and a car when, traveling at 55 miles an hour, it crashes into a solid tree.

1/10 of a second:—the front bumper and chrome "frosting" of the grill-work collapse;—slivers of steel penetrate the tree to a depth of one and a half inches or more.

2/10 of a second:—the hood crumples as it rises, smashing into the windshield;—spinning rear wheels leave the ground;—the grill work disintegrates;—the fenders come into contact with the tree, forcing the rear parts to spray out over the front doors. In the same second

tenth of a second, the heavy structural members of the car begin to act as a brake on the terrific forward momentum of the 2½ ton body;—but the driver's body continues to move forward at the vehicle's original speed of 55 mph. (This means a force of 20 times gravity; his body weighs 3200 pounds.) His legs, ramrod straight, snap at the knee joints.

3/10 of a second:—the driver's body is now off the seat, torso upright, broken knees pressing against the dashboard;—the plastic and steel frame of the steering wheel begins to bend under his death grip;—his head is now near the sun visor, his chest above the steering column.

4/10 of a second:—the car's front 24 inches have been completely demolished, but the rear end is still traveling at an estimated speed of 35 mph;—the driver's body is still moving at 55;—the half-ton motor block crunches into the tree;—the rear of the car rises high enough to scrape bark off low branches.



5/10 of a second:—the driver's fear-frozen hands bend the steering column into an almost vertical position;—the force of gravity impales him on the steering wheel shaft;—blood spurts into his lungs.

6/10 of a second:—so great is the force of the impact that the driver's feet are ripped from his tightly laced shoes;—the brake pedal shears off at the floor boards;—the chassis bends in the middle, shearing body bolts;—the driver's head smashes into the windshield;—the rear of the car begins its downward fall, spinning wheels digging into the ground.

7/10 of a second:—the entire writhing body of the car is forced out of shape;—hinges tear;—doors spring open;—in one last convulsion the seat rams forward pinning the driver against the cruel steel of the steering shaft;—destruction of driver and vehicle is final. . . .

Time elapsed — **Seven Tenths of a Second.**

A SPOT IN THE SUN

ITSA's activities at Fort Belvoir, Va.

UNIQUE IN THE ACTIVITIES of ESSA's Institute for Telecommunication Sciences and Aeronomy, Boulder, Colo., is the Telecommunications and Space Disturbance Services Center, Fort Belvoir, Va., of ITSA's Space Disturbances Laboratory.

The Center, manned 24 hours a day, seven days a week, provides many inter-related services which are made available to scientists, researchers, and operational communications personnel both in and out of Government. Some of these services are on a world-wide basis.

Divided into three basic activities, these services are: issuance of high frequency radio propagation forecasts; collection and dissemination of solar and geophysical data and the dissemination of satellite data.

High frequency radio communications are frequently disrupted by disturbed ionospheric conditions. Typical effects include severe fading, multipath propagation, and, in some cases, complete loss of the wanted signal.

Usually at high altitudes these conditions occur in time-association with disturbances in the earth's magnetic field. Since geomagnetic disturbances can frequently be anticipated by proper application of known sun-earth relationships, it follows that a significant fraction of ionospheric disturbances also can be predicted. Being forewarned of impending disturbances, operators of high frequency radio circuits often are able to maintain satisfactory communications by making suitable changes in operating frequencies, schedules, or radio paths.

The space age has fostered a dramatic increase in interest in the earth's upper atmosphere and solar-terrestrial relationships. Many new activities require a detailed knowledge of current ionospheric, geomagnetic and solar conditions.

The Center collects certain solar and geophysical observations taken in its region and disseminates summaries of these observations to other regional centers and to laboratories, observatories and agencies within its own region which have requested the service. It assists the World Warning Agency in the designation of geophysical alerts (GEOALERTS) signaling the onset of geophysical events of unusual importance or interest.

The Center, as a Satellite Regional Warning Center (SRWC), is one of the terminal facilities in the international SPACEWARN network operated for the Committee on Space Research (COSPAR). This network is operated on a regional



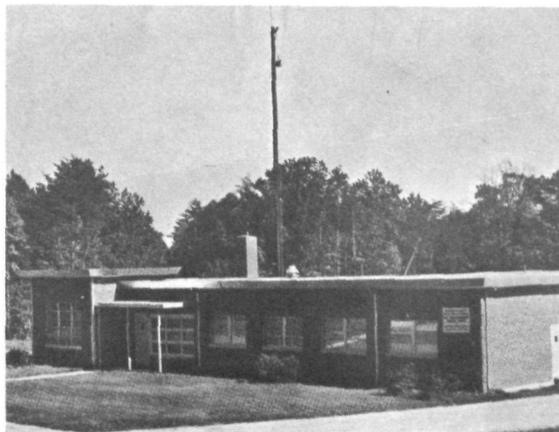
Headquarters of ESSA's Institute for Telecommunication Sciences and Aeronomy, Boulder, Colo.

concept. Prime function of SPACEWARN is to make available to scientists announcements of successful scientific satellite and probe launchings and current orbital elements of scientific satellites in order to secure maximum international participation in the research programs. Launching announcements are inserted into the SPACEWARN network by the Academy of Science of the nation conducting the launch. Orbital elements are inserted in the network on an irregular basis by the national computing centers.

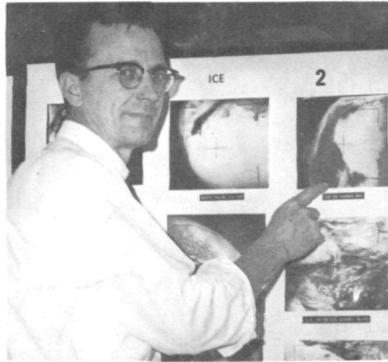
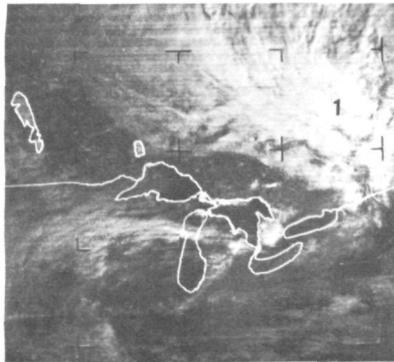
Especially significant is that the Center also issues a series of special radio propagation forecasts for circuits in the NASA ground communications network (NASCOM), at the times of manned spacecraft, scientific satellite, or scientific space probe launchings.

To sum up, the Center at Fort Belvoir helps to fulfill ITSA's mission by providing environmental services to the scientific and technical community relating to many phases of solar-geophysical research, space activities and telecommunications. □

Some of the complex equipment used by the Center for local monitoring.



Home of the Telecommunications and Space Disturbance Services Center at Ft. Belvoir, Va.



WALLOPS

where the action is . . .

The 12-acre sandy and windswept terrain that surrounds Wallops Station (Va.) houses some of the most modern and sophisticated electronic equipment of the space age. Home of ESSA's National Environmental Satellite Command and Data Station, the large \$4.5 million complex tracks, takes data, and transmits commands to the 180 different instruments on weather satellites ESSA 1 and 2. What ESSAites do amidst the winking, blinking lights and humming computers is pictured here.

1. First APT (Automatic Picture Transmission) by ESSA 2 over Canada and central United States. 2. Marvin S. Black points to a disturbed weather area. 3. Lou Kragler sits at master control which commands satellite instrumentation. 4. William E. Hudson (left) and Harold W. Tarr teletype outgoing information to the National Environmental Satellite Center at Suitland, Md. 5. Manager of Wallops Station, H. Q. Van Dyke, talks with NESCC operations. 6. Giant antenna is 138 feet tall, weighs 350 tons and works 24 hours a day sending commands to the two ESSA satellites. 7. Gerry Mott, telemetry specialist, confirms that a command has been transmitted to and received by the satellite.