GENERAL SCIENCE

Space Industries Expand

➤ AS THE SPACE FRONTIER expands due to projects like Ranger, Mariner and Gemini, the country's giant aerospace corporations are being inspired to invest hundreds of millions of dollars of their own money in vast research installations that are often only loosely connected with Federal Government spending.

Government and industry have not always been so cordial, with the Government regulating and the captains of industries speaking out against regulation and for free enterprise. But in the field of research and development especially, the public and private sectors have become "kissin' cousins."

Actually, the role of private industry tends to be overlooked, primarily because the Government takes over as the official sponsor for the dramatic and mind-catching spectaculars resulting from the cooperative effort, thereby receiving all the credit (or the blame).

Notable in the growth of the partnership has been the space industry. Private research and development budgets and facilities have multiplied substantially in the last decade. According to a National Science Foundation report, the Federal Government provided 65% of the money for basic and applied research and for development. The total for these activities was $17.4 billion in 1963, the last year for which figures are available.

The growing importance of private industry's participation can be seen by a look at the number and scope of the new research and development centers being built by individual companies.

The Martin Company in Baltimore has just dedicated a new center for its Research Institute for Advanced Studies (RIAS), at a cost of almost $2 million. The building provides a staff of about 100 scientists with modern facilities for basic research in physics, metallurgy, bio-science and control theory. When RIAS was established 10 years ago, its operations were entirely company supported. Now it is involved in a number of contract studies funded by Government agencies.

The Lockheed Aircraft Corporation announced that in 1964 its research and development expenditures totaled $27.2 million, a 20% increase over the previous year.

Lockheed, for example, spent $10 million last year to meet the demands of aerospace progress. This year the company announced improvements to its Rye Canyon, Calif., research center, a new space age wind tunnel to test 10,000-mile-per-hour aircraft, and a new ocean science research facility.

The Douglas Aircraft Company recently broke ground on a new $2 million Advanced Research Laboratory at Huntington Beach, Calif. Basic research at the new laboratory will be conducted in mathematical sciences, environmental sciences, life sciences, material sciences and energy conversion. It will be adjacent to the $25 million Space Systems Center, a master facility for research, engineering, testing and production of systems and vehicles for space exploration.

North American, Aerojet General, General Dynamics and many others have similar top level research facilities recently completed or nearly finished. While space is the biggest of big business in the technical research field, oceanography runs a close second.

Regardless of the field, however, private research and development has come into its own as a great and increasingly important component of American business. The partnership is producing science leadership for the breakthroughs of today that mean accomplishments of tomorrow.

• Science News Letter, 88:100 August 14, 1965

AERONAUTICS

Present Radar Systems Insufficient for SST

➤ ALTHOUGH the nation's first supersonic transport plane (SST) is still years from getting off the ground, the airlines are already developing standards for the radar system it will need.

Since the SST will fly much faster and higher than today's subsonic jets, a whole new and different airborne weather radar set will be necessary. The speedy SST will first need radar with great range (roughly 300 miles according to current thinking). Airborne radars now have a range of about 180 miles.

Speed means heat—another important design consideration in the SST. The radome, which houses the antenna assembly of the radar set, is located in the plane's nose and will have to operate in three temperature regimes: the coolest when speed in flight is less than the speed of sound, moderately warm when cruising speed is faster than sound, and hottest when the plane is accelerating.

Pilots use weather radar to detect areas in clouds where severe turbulence is likely to be found. The radar sends out electrical pulses which are bounced back by water droplets, ice crystals, snow or hail in the clouds. This "bounce" shows up as illuminated areas or "echoes" on the pilot's radar scope. At SST altitudes of 60,000 to 70,000 feet, water in clouds is likely to be frozen. This means that a lower signal will be sent back than if the water were in liquid form—as it is at lower altitudes. Ways must be found, therefore, to increase the signal received by radar on an SST at those extreme heights.

To help answer such questions the Air Transport Association of America sponsored a recent study to help provide technical data that will be used in developing standards for a radar to be installed in the SST. The study, called "Parameters for Airborne Weather Radar," was prepared by Prof. John S. Marshall and associates of McGill University, Montreal, Canada.

• Science News Letter, 88:100 August 14, 1965

Questions

AERONAUTICS—What is the estimated range of the radar to be developed for the supersonic transport plane? p. 100.

AGRICULTURE—What flower has been found best in ridding farm soil and crops of nematodes? p. 110.

MEDICINE—What harm can the antibiotic streptomycin do to the unborn babies of pregnant women? p. 98.

OCEANOGRAPHY—What technique has been used to permit experimental animals to rebreathe the air they have exhaled? p. 101.

PALEONTOLOGY—How much did the dinosaur discovered in Szechwan Province in southwest China probably weigh? p. 101.

TECHNOLOGY—How is the new spacecraft cooling system, called transpiration cooling, similar to human sweating? p. 103.

SCIENCE NEWS LETTER
VOL. 88 AUGUST 14, 1965 NO. 7

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington, D. C. 20036. NOrth 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr. $5.50; 2 yrs., $10.00; 3 yrs., $14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage. Change of address: Three weeks notice is required. Please state exactly how magazine is addressed. Include zip code.

Copyright © 1965 by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also produces and distributes THINGS of science (monthly), produces and publishes books, and conducts the National Science Youth Program.

Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member of Audit Bureau of Circulation.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Wallace R. Brode,*** Washington, D.C.; Bowen C. Dees, National Science Foundation; Athelstan F. Spilhaus, University of Minnesota. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; Detlev W. Bronk, Rockefeller Institute; Henry Allen Moe, The Clark Foundation. Nominated by the National Research Council: Leonard Carmichael,* National Geographic Society; Eric A. Walker, Pennsylvania State University; Glenn T. Seaborg, U.S. Atomic Energy Commission. Nominated by the Journalistic Profession: Gordon B. Fister, Allentown (Pa.) Call-Chronicle; Ralph B. Curry, Flint Journal; O. W. Riegel, Washington and Lee University. Nominated by the Scripps Estate: Ludwell Denny, Scripps Howard Newspapers: Edward W Scripps II,** Edward W. Scripps Trust; Edward J. Meeman, Memphis Press-Scimitar. *President, **Vice President, ***Treasurer.

Staff—Director: Watson Davis. Assistant Director: Dorothy Schriver. Writers: Elinor Clark, Jonathan Eberhart, Ann Ewing, Faye Marley, William McCann, Barbara Tufty, Judith Viorst, Ruby Yoshioka. Science Youth Division: Joseph H. Kraus, Lloyd Ulmer. Photography: Fremont Davis. Production: Marcia Nelson. Syndicate Sales: Forrest L. Snakenberg. Librarian: Margit Friedrich. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410. Advertising Manager: Fred A. Moulton, MEtropolitan 8-2562, Washington, D. C.

Science Service, Inc. is collaborating with JSTOR to digitize, preserve, and extend access to The Science News-Letter. www.jstor.org