

Spinoff

1988

NASA



Spinoff

1988

National Aeronautics and
Space Administration
Office of Commercial Programs
Technology Utilization Division
by James J. Haggerty
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Foreword

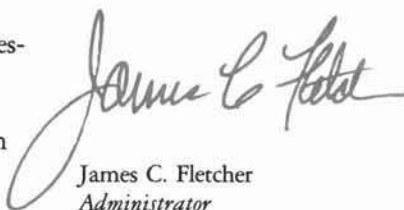
The year 1988, the 30th anniversary of the National Aeronautics and Space Administration, marks the start of a new era of space development and exploration. In the flight hiatus since the *Challenger* accident, the Nation has undeniably lost ground in global space competition. However, we have never lost sight of the goal of space leadership, nor have we lost the capability to attain that goal.

NASA's employees and contractors retain the imagination that opens up new horizons, the management expertise to organize and guide challenging programs, and the technical skills to translate vision into reality. Thirty years of working to advance technology have given us a great bank of know-how to draw upon. NASA also has the tools, facilities and human assets required to seek and demonstrate excellence in space.

We have established a broad and progressive space program that will expand space infrastructure and thus enable pursuit of a wider range of opportunities. Our program also will improve our space transportation system, bring about far-reaching advancements in space science, pursue the many practical benefits space offers, and build a technological foundation for the new NASA goal of extending the human presence beyond Earth orbit.

We have a renewed mandate from the President, whose National Space Policy, issued in 1988, reaffirmed the basic goal of United States leadership in space. What NASA and the Nation need now is a new national commitment of will and resources to attain that goal. That commitment must be based on the realization that our economic growth and prosperity, our industrial innovation and productivity, our national security, and our prestige and national pride are all closely linked to our future in space.

Given the full support of the American people and resources we need to complete the task, I am confident that the U.S. can and will lead spacefaring nations into a new era of progress and prosperity in the 21st century.



James C. Fletcher
Administrator

National Aeronautics and Space Administration

Introduction

U.S. competitiveness is a subject that is getting a great deal of attention from our national leadership. America's ability to compete effectively in the international marketplace is central to our current and future national economy. The key to competitiveness is technology, which—by one definition—is "that body of knowledge and capability required to bring a product to the marketplace."

The U.S. long dominated world technology but in recent years we have been strongly challenged by foreign nations, who have invested in years of intense research and development to upgrade their own technological capabilities. Our response, if we are to maintain competitiveness, must be to continue development and application of advanced technology to create superior products and services for the world market.

NASA research programs, therefore, are doubly important.

First, they represent a leading source of new technology, because aerospace programs are, by their challenging nature, extraordinarily demanding of technological input and the innovations they generate are exceptionally diverse. Because it is readily transferable, the technology being developed today provides a wellspring of know-how for new applications tomorrow.

Secondly, NASA programs of the past three decades have created a vast storehouse of already-developed technology that is available *now* for use by industry in creating new products and processes. It is a natural resource that can be put to work to enhance national productivity and competitiveness. Its importance is underlined by the fact that more than 30,000 secondary applications of this technology—spinoffs—have emerged to the benefit of the nation's lifestyle and economy.

The Congress has charged NASA with the task of stimulating the widest possible use of this valuable resource in the national interest. NASA seeks to meet that responsibility through its Technology Utilization Program, whose aim is to broaden and accelerate the technology transfer process and to gain thereby a substantial dividend on the national investment in aerospace research in the form of new products, new businesses and new jobs. The program is designed to serve as a channel linking NASA technology with those who might be able to apply it productively.

This publication is intended to heighten awareness among potential users of the technology available for transfer and the economic and social benefit that might be realized by secondary applications.

Spinoff 1988 is organized in three sections:

Section 1 outlines NASA's mainline effort, the major programs that generate new technology and therefore replenish and expand the bank of knowledge available for transfer.

Section 2, the main feature of this volume, contains a representative sampling of spinoff products that resulted from secondary application of technology originally developed to meet mainline goals.

Section 3 describes the various mechanisms NASA employs to stimulate technology transfer and lists, in an appendix, contact sources for further information about the Technology Utilization Program.



James T. Rose

*Assistant Administrator for Commercial Programs
National Aeronautics and Space Administration*

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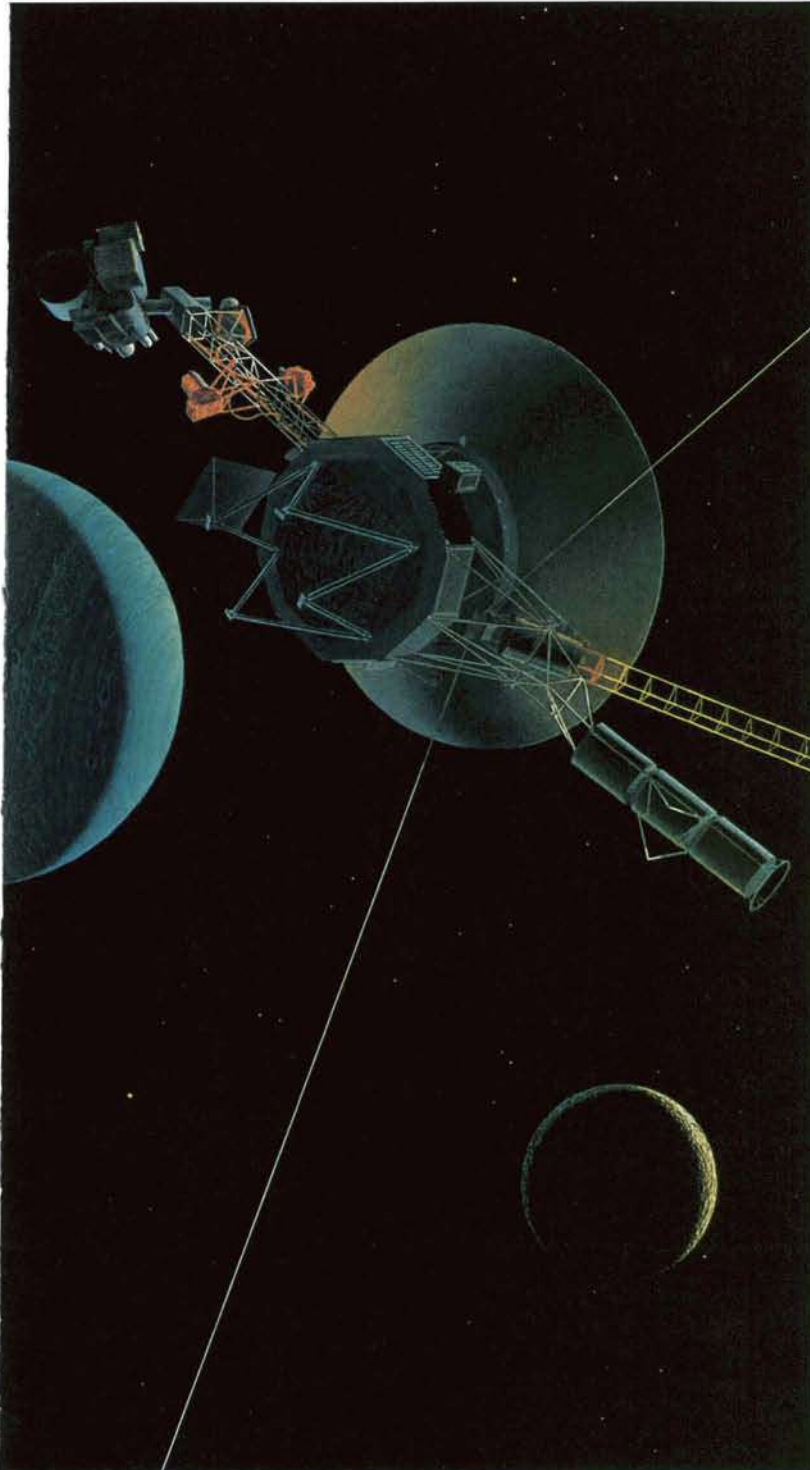
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A Universal Antidote

Among technology transfer examples in the field of transportation is an exceptionally versatile disinfecting compound for automotive and many other uses

For years, auto manufacturers have had a problem: customers, especially those in hot, humid climates, complained about the mold that forms in car air conditioners or, more specifically, about the obnoxious musty odor the mold causes. It was a problem because potential mold-killing substances could also leave lingering toxicity, and the alternative—removing the air conditioner from the vehicle for cleaning and disinfecting—was costly.

Last fall, two of the Big Three U.S. automakers concluded arrangements with Alcide Corporation, Norwalk, Connecticut for distribution of Alcide's patented Ren New Air Conditioning Disinfectant. The special properties of the Alcide® formulation, which has been approved by U.S. regulatory authorities, enable it to destroy mold and fungus, as well as bacteria and viruses, with minimal harm to humans, animals or plants. This allows use of the product to disinfect and deodorize auto air conditioners without removing them and without any lingering toxicity.

The disinfectant/deodorizer is one of a wide range of Alcide formulations engineered for a variety of purposes, spanning automotive, medical, agricultural, pharmaceutical and consumer markets. Alcide is not, strictly speaking, a spinoff from aerospace technology. But the products themselves and the company that makes them are beneficiaries of assistance provided by NERAC, Inc., Tolland, Connecticut, one of NASA's nine

An Alcide Corporation chemist performs a quality control check on a sample of Alcide, a multipurpose compound that destroys mold, fungus, bacteria and viruses without harming human, animals or plants.



NASA's Technology Transfer System

The NASA system of technology transfer personnel and facilities extends from coast to coast and provides geographical coverage of the nation's primary industrial concentrations, together with regional coverage of state and local governments engaged in transfer activities. For specific information concerning the activities described below, contact the appropriate technology utilization personnel at the addresses listed.

For information of a general nature about the Technology Utilization program, address inquiries to the Director, Technology Utilization Division, NASA Scientific and Technical Information Facility, Post Office Box 8757, Baltimore, Maryland 21240.



△ *Field Center Technology Utilization Officers:* manage center participation in regional technology utilization activities.

● *Industrial Applications Centers:* information retrieval services and assistance in applying technical information relevant to user needs.

○ *Industrial Applications Center Affiliates:* state-sponsored business or technical assistance centers that provide access to NASA's technology transfer network.

■ *The Computer Software Management and Information Center (COSMIC):* offers government-developed computer programs adaptable to secondary use.

▲ *Application Team:* agencies and private institutions in applying aerospace technology to solution of public problems.

△ Field Centers

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, California 94035
Technology Utilization Officer:
Laurence A. Milov
Phone: (415) 694-6471

Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, Maryland 20771
Technology Utilization Officer:
Donald S. Friedman
Phone: (301) 286-6242

Lyndon B. Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas 77058
Technology Utilization Officer:
Dean C. Glenn
Phone: (713) 483-3809

John F. Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, Florida 32899
Technology Utilization Officer:
Thomas Hammond
Phone: (305) 867-3017

Langley Research Center
National Aeronautics and Space Administration
Hampton, Virginia 23665
Technology Utilization Officer:
John Samos
Phone: (804) 865-3281

Lewis Research Center
National Aeronautics and Space Administration
21000 Brookpark Road
Cleveland, Ohio 44135
Technology Utilization Officer:
Daniel G. Soltis
Phone: (216) 433-5567

George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Marshall Space Flight Center,
Alabama 35812
Director, Technology Utilization Officer:
Ismail Akbay
Phone: (205) 544-2223

Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91109
Technology Utilization Manager:
Norman L. Chalfin
Phone: (818) 354-2240

NASA Resident Office—JPL
4800 Oak Grove Drive
Pasadena, California 91109
Technology Utilization Officer:
Gordon S. Chapman
Phone: (818) 354-4849

John C. Stennis Space Center
Mississippi 39529
Technology Utilization Officer:
Robert M. Barlow
Phone: (601) 688-1929

● Industrial Application Centers

Aerospace Research Applications Center
611 N. Capitol Avenue
Indianapolis, Indiana 46204
F. T. Janis, Ph.D., director
Phone: (317) 262-5036

Central Industrial Applications Center
Southeastern Oklahoma State University
Durant, Oklahoma 74701
Dickie Deel, Ph.D., director
Phone: (405) 924-6822

NASA Industrial Applications Center
823 William Pitt Union
Pittsburgh, Pennsylvania 15260
Paul A. McWilliams, Ph.D., executive director
Phone: (412) 648-7000

NASA Industrial Applications Center
Research Annex, Room 200
University of Southern California
3716 South Hope Street
Los Angeles, California 90007
Radford G. King, director
Phone: (213) 743-8988
(800) 642-2872 (CA only)
(800) 872-7477 (toll free, US)

NERAC, Inc.
One Technology Drive
Tolland, Connecticut 06084
Daniel Wilde, Ph.D., president
Phone: (203) 872-7000

North Carolina Science and Technology Research Center
P.O. Box 12235
Research Triangle Park,
North Carolina 27709
H. Lynn Reese, director
Phone: (919) 549-0671

Technology Applications Center
University of New Mexico
Albuquerque, New Mexico 87131
Stanley A. Morain, Ph.D., director
Phone: (505) 277-3622

Southern Technology Applications Center
Progress Center, P.O. Box 24
1 Progress Boulevard
Alachua, Florida 32615
J. Ronald Thornton, director
Phone: (904) 462-3913
(800) 354-4832 (FL only)
(800) 225-0308 (toll free, US)

NASA/UK Technology Applications Program
109 Kinlead Hall
University of Kentucky
Lexington, Kentucky 40506
William R. Strong, director
Phone: (606) 257-6322

NASA/SU Industrial Applications Center
Southern University
Department of Computer Science
Baton Rouge, Louisiana 70813-2065
John Hubbell, Ph.D., director
Phone: (504) 771-2060

○ Industrial Application Center Affiliates

Alabama
Johnson Research Center
University of Alabama-Huntsville
Huntsville, Alabama 35899
Phone: (205) 895-6257

Alaska
Director, Alaska Economic Development Center
University of Alaska—Juneau
1108 F Street, Juneau, Alaska 99801
Phone: (907) 789-4402

Arizona
Technology Transfer Network
3883 East Thomas Road
Phoenix, Arizona 85018
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SBDC/Technology Center
100 South Main Street, Suite 401
Little Rock, Arkansas 72201
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California
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University of Southern California

Colorado
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University of Colorado
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Boulder, Colorado 80301
Phone: (303) 444-5723

Florida
● See Southern Technology Applications Center,
University of Florida

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Georgia Institute of Technology
O'Keefe Building, Room 222
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Phone: (404) 894-4299

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Boise State University
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Indiana
● See Aerospace Research Applications Center,
Indianapolis Center for Advanced Research

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University of Kentucky

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Southern University

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Phone: (601) 960-3634

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Montana State University
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Nebraska
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University of Nebraska
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Lincoln, Nebraska 68588

Nevada
Desert Research Institute
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Reno, Nevada 89506
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New England

- See Industrial Applications Center, NERAC, Inc.

New Mexico

- See Industrial Application Center, TAC, University of New Mexico
Director, Business Assistance and Resource Center
University of New Mexico
Albuquerque, New Mexico 87131
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North Carolina

- See Industrial Applications Center
North Carolina Science and Technology Research Center

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North Carolina Department of
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Raleigh, North Carolina 27603-1337
Phone: (919) 733-7051

North Carolina Small Business and
Technology Development Center
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Raleigh, North Carolina 27605
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North Dakota

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University of North Dakota
Box 8103, University Station
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Phone: (701) 777-3796

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Applications Center
Southeastern Oklahoma State University

Oregon

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La Grande, Oregon 97850
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- See Industrial Applications Center
University of Pittsburgh

South Carolina

State Board for Technical and
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State of South Carolina
Room 103, 111 Executive Center Drive
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Phone: (803) 737-9367

Tennessee

Director, Tennessee Technology
Foundation
P.O. Box 23184
Knoxville, Tennessee 37933-1184
Phone: (615) 694-6772

Center for Industrial Services
University of Tennessee
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Nashville, Tennessee 37219
Phone: (615) 242-2456

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Technology Business Development
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Texas A&M University
310 Engineering Research Center
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Montpelier, Vermont 05607
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Herndon, Virginia 22071
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State Director, Small Business
Development Center
Washington State University
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Pullman, Washington 99164-4740
Phone: (509) 335-7876

West Virginia

Science and Technology Center
West Virginia Board of Regents
950 Kanawha Boulevard East
Charleston, West Virginia 25301
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