TECHNOLOGY TRANSFER

FRANK E. PENARANDA
NASA HEADQUARTERS
"If America is to maintain and strengthen our competitive position, we must continue not only to create new technologies but learn to more effectively translate those technologies into commercial products."

President George Bush
November 13, 1990

International Comparison of R & D Expenditures in 1989

United States
$111.1

West Germany
$21.9

Japan
$45.9

Note: $ in Billions of Constant 1982 Dollars
Source: National Science Foundation
### International Comparison of R & D Expenditures in 1989

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#### Source of Funds

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Government</td>
<td>45</td>
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<tr>
<td>Industry</td>
<td>51</td>
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<td>Other</td>
<td>4</td>
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#### Source:
National Science Foundation

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#### Technology Transfer

**Research & Development**
- Federal R&D Agencies
  - Laboratories
  - Contractors
  - Universities

**Producers**
- Federal Agency/TT Programs
- Federal Lab ORTAs
- NTTC/RTTCs
- State-Level Activities
  - Business/Technology Assistance
  - Incubators, Seed-Capital Funds, Research Parks

**Intermediary Programs/Organizations**

**End-Users**
- U.S. Private Sector
  - Individual Firms
  - Industry/Business Groups

**Stakeholders**
- Federal/State Agencies
- Federal/State Legislatures
- U.S. Industry/Business Communities
- U.S. taxpayers

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Two Basic Roles

- **Traditional Role:** Transfer NASA technology for secondary use throughout the U.S. private and public sectors

- **Emerging Role:** Develop the National Technology Transfer Network in cooperation with all Federal R&D agencies

### NASA Technology Utilization Program

**Thrusts for FY 1992 and FY 1993**

- Establish and operate a National Technology Transfer Network
  - Facilitate the transfer of all Federal technology to the private sector
  - Assist the Nation’s industrial competitiveness objectives

- Streamline and expedite the identification, documentation and dissemination of NASA’s emerging technologies

- Shorten the time between technology development and commercial applications

- Increase number of “cooperative agreements” and/or technology applications projects

- Emphasize and maximize economic benefits potential for NASA’s technology applications projects
National Technology Transfer Network

- Core Structure
  - National Technology Transfer Center (NTTC)
  - Six Regional Technology Transfer Centers (RTTCs)
- Other Key Elements
  - Federal R&D Agencies
  - Federal R&D Labs and Centers
  - Federal Laboratory Consortium for Technology Transfer
  - State/Local Agencies and Programs
  - Business/Industry Groups and Associations

NTTC Roles

- Research/Analysis
  - Technology transfer issues
  - Industry technology needs
- Clearinghouse/Network "Hub"
  - Outreach to Industry

- Training and education
- Network development

National Niches
RTTC Roles

- Link together Federal labs, state/local programs and the national network to serve the technology needs of each region's business and industry
- Provide value-added service to business and industrial clients:
  - Information Services involving computerized searches of Federal technology databases
  - Technical Services, including the assessment of technology requirements and potential solutions
  - Commercialization Services assisting the commercial application of Federal technologies
- Promote regional awareness of technology transfer resources and opportunities

[Diagram showing interactions between Federal R & D Agencies, Federal R & D Laboratories, NTTCs, RTTCs, Firms, State-Level Agencies, and Industry Groups]

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NATIONAL TECHNOLOGY TRANSFER NETWORK

"Technology . . . from the lab to the marketplace."

REGIONAL TECHNOLOGY TRANSFER CENTERS

The RTTCs, established in six regions spanning the United States, began operations in January 1992. The new centers, which replaced NASA's longstanding network of Industrial Applications Centers, reflect NASA's initiative to upgrade and restructure its technology transfer program in order to better serve U.S. business and industry in the 1990s and beyond.

The regional deployment, aligned with the six Federal Laboratory Consortium regions and covering all 50 states, allows the centers to work closely with a wide range of Federal, state and local programs in serving the technology and related business needs of the firms and industry in each region.

The RTTCs also utilize the NTTC and the national network to access technologies from throughout the Federal R&D base and link together additional capabilities and services from the NTTC and others across the United States to best meet their client's technology and related needs.

The RTTCs provide value-added services to meet the technology needs of individual business and industrial clients. These include:

- **Information Services**: computerized searches of Federal technology databases and other technology sources.

- **Technical Services**: assessment of technology requirements, analysis of technology applications, and engineering reports.

- **Commercialization Services**: technology brokering, business analyses and venture capital sourcing.

In addition to these core services, the RTTCs also conduct industry or technology based initiatives and activities addressing the particular needs and conditions of each region's industrial base and overall economy.

The surgeon is using a self-contained instrument, derived from NASA technology, thus offering greater freedom in the operating room (below).

"Working together to strengthen U.S. competitiveness . . . "

For further information, contact the National Technology Transfer Network.
NATIONAL TECHNOLOGY TRANSFER NETWORK

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PURPOSE AND OBJECTIVES

• The Federal R&D base - Involving over 600 laboratories and centers - produces a robust supply of proven and promising technologies that have secondary applications throughout the commercial and industrial sectors.

• The purpose of the National Technology Transfer Network is to provide an effective, market-oriented means of deploying technologies from the Federal R&D base to meet the technology needs of the U.S. private sector.

Objectives of the network include:

• Facilitate rapid access by U.S. firms and industry to the Federal R&D base and to the full range of technology transfer capabilities and services available throughout the United States; and,

• Foster cooperation and partnerships with Federal, state and local organizations and programs working to advance the technological competitiveness of U.S. firms and Industry.

NETWORK ELEMENTS

The National Technology Transfer Center (NTTC) and the six Regional Technology Transfer Centers (RTTCs) form the core structure of the overall network. Other key elements are:

• Federal agency technology transfer programs and activities;

• Federal laboratories and centers;

• Federal Laboratory Consortium for Technology Transfer;

• State and local agencies and programs, including technology centers and business/technical assistance services; and,

• Business and industry consortia, associations, and communities.

Overall, the network provides a national framework for the public and private sectors to work together productively to enhance the economic competitiveness of the United States.

A researcher from Sandia National Laboratories demonstrates a robot using a new software program that enables a robot to "program itself."

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* Alaska and Hawaii included in Far West Region