

NASA-TM-109898

NASA
Commercial
Technology
Team



NASA Commercial Technology Agenda for Change

July 1994

(NASA-TM-109898) NASA COMMERCIAL
TECHNOLOGY. AGENDA FOR CHANGE
(NASA) 18 p

N94-37765

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G3/85 0022373

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Administrator's Introduction

To All NASA Employees, Contractors and Grantees:

All of us have been challenged by the Administration to make significant changes in the way we do business — to be more efficient and deliver more benefits to the American people for less. The post Cold War era witnesses sharply increased global economic competition. The winners in this competition will be those who have most effectively used the resources accessible to them. To effectively use the technological, human, financial and other assets of NASA and the U.S. industrial base and to capitalize on the opportunities offered by an ever expanding technology base, we must carefully consider the marketplace and form partnerships with the private sector. The quality of life for all Americans stands to improve if we, the people of the largest U.S. civilian research and development agency, make smart decisions about technological investments and work effectively with private sector partners.

We formed the NASA Commercial Technology Management Team to develop and implement an agency-wide plan for the commercial technology focus outlined in the National Performance Review and other Administration policy decisions. This team is comprised of representatives from each of our field centers and headquarters program offices thus ensuring broad agency participation. Together, they have built on earlier NASA efforts to formulate the strategy and tactics needed to move NASA technology into the private sector where it can boost American competitiveness, create jobs and strengthen our economic base.

This document briefly outlines the national technology policy, agency decisions made to implement the national policy, and our agenda for the future. The Commercial Technology Mission is a primary NASA mission, comparable in importance to those in aeronautics and space. I am charging the headquarters' and field centers' leaders to work aggressively with the Commercial Technology Management Team to put the tools outlined here and elsewhere to work to put NASA's technological expertise into the hands of the American people.

This is an important first step in what promises to be an exciting but challenging journey. Collaborations between NASA and its private sector partners can be one more reason for America to stride into the 21st century with confidence.



Daniel S. Goldin, Administrator
National Aeronautics and Space Administration



Preface

This document describes the essence of NASA's new way of doing business to support the Agency's commercial technology mission objectives. It is meant to provide a summary description of the various changes needed to successfully perform this mission.

Acknowledgements

This report could not have been completed without the dedication and hard work of many people across all NASA facilities. From their leadership, NASA will remain an important national institution in our rapidly changing world. Those who deserve thanks include: Team Chairman, Greg Reck, Deputy Chairmen, Syed Shariq and Curt Shoffner, John McCarthy, George Alcorn, Bill Bierbower, Charlie Blankenship, Harry Craft, Hank Davis, Joe Heyman, Philip Hodge, Jerry Johnson, Yvonne Kellogg, Jack Mannix, Bob Norwood, Granville Paules, John Roth, Harvey Schwartz, William Sheehan, William Smith, William Spuck, Tyrone Taylor, Gabriel Wallace, Kelli Willshire, Kevin Barquinero, Doug Cannon, Robert Cone, Kyle Fairchild, Steve Hartman, Mark Kilkenney, Candace Livingston, John Mankins, Charles Redmond, Jonathan Root, Janelle Turner, Michael Weingarten, Anthony Villasenor, John Yin, Anjeanette Agro, Murray Altheim, James Chi, Julie L. Holdsworth, Tobin McGregor and Leslie Wilder.

I The National Commercial Technology Agenda

The advancement and application of new technologies in government and commercial products and services have always been important to the well-being of the United States. Since its inception in 1958, NASA has been an important source of much of the Nation's new technology. In today's increasingly competitive global economic climate, the U.S. must ensure that its technological resources are fully utilized throughout the economy. This portends a new, broader role for NASA.

One element of this new role is clear: While meeting its unique mission goals, NASA Research and Development (R&D) must also enhance overall U.S. economic security. To ensure that NASA's technology assets and know-how contribute to U.S. economic growth, it is critical that they are quickly and effectively translated into improved production processes and marketable, innovative products. Accomplishing these objectives requires the agency to develop new ways of doing business and new ways of measuring its progress.

NASA has traditionally measured its progress in terms of technical performance, cost and schedule. Now, in the post Cold War era there is another measure, contribution of technology to national economic security. In response, a strong emphasis on forming R&D partnerships with the private sector is the foundation of a new way of doing business for NASA. To realize NASA's goal, the agency will strive to conduct business like any other industrial partner when working with U.S. industry. NASA will set new standards for government commercial practices in terms of effectiveness, efficiency and timely customer responsiveness.

Overall, there are three national currents which drive NASA's evolution. They are the President's technology policy, the Vice-President's National Performance Review recommendations for NASA and the rapidly approaching realm of the Information Superhighway. A summary of each of these follows.

U.S. Commercial Technology Policy

Greater economic competitiveness as a result of NASA R&D investments is a new measure of effectiveness for NASA programs. This is a significant challenge to NASA — as it will be to other federal agencies. However, the significance of the direction announced in the President's 1993 U.S. technology policy¹ is clear:

- Investing in technology is investing in America's future
- American technology must move in a new direction to build economic strength and spur economic growth
- NASA must modify the ways it does business to encourage cooperative work with industry in areas of mutual interest
- At the level of technology application, a fundamental mechanism for carrying out this new approach is the cost-shared R&D partnership between government and industry

¹Technology for America's Economic Growth, A New Direction to Build Economic Strength, President Clinton and Vice President Gore, February 22, 1993

The National Performance Review

An instrument of change for U.S. technology policy, the recently released NASA Accompanying Report of the National Performance Review² from the Office of the Vice President of the United States, has recommended that NASA make improvements in technology transfer (and four other areas). Regarding technology transfer, the National Performance Review's recommendations are:

- NASA field centers should provide technology transfer training for all employees
- NASA should devote 10 percent to 20 percent of its budget to R&D partnerships with industry
- NASA's Research and Technology Objectives and Plans (better known as RTOPS) should be modified to give strong consideration to partnerships with the commercial sector in conducting NASA R&D
- NASA should grant its field centers and field center directors and/or project managers more flexibility in funding technology transfer opportunities
- NASA should establish clear and sensible metrics to measure technology transfer performance
- NASA contracts should require clearly defined technology transfer plans for the commercial application of technologies developed for NASA missions
- NASA Announcements of Opportunity should specify that technology advancement and infusion into the private sector are among the project selection evaluation criteria
- NASA should significantly increase its efforts to secure alliances with state and local governments and provide small businesses with opportunities to spur technology transfer
- NASA's Vision-Mission-Values document should be amended to state that technology transfer is a major mission objective of the agency

² From *Red Tape to Results: Creating Government that Works Better and Costs Less*: NASA Section

National Information Infrastructure

The Administration supports an agenda for a public-private partnership to construct an advanced National Information Infrastructure³ to benefit all Americans. The basic tenets of Administration policy include encouraging private investment, ensuring universal access, promoting competition, providing open access to consumers and providers and providing access to government information among others. NASA, in conjunction with industry partners, other federal agencies, state government organizations and universities is proceeding to address six focus applications. They are:

- Digital Library: Exploit the network as a platform for document storage and access
- Education: Exploit the network as a tool for education
- Medical Documentation: Exploit the network as a tool for dissemination of medical data
- Video Services: Exploit the emerging multi-media telecommunications markets
- Security Technology: Improve network security technology
- Consumer Information: Enable increased public access to information resources, such as scientific databases

Moving Forward

In light of these global changes and national policy declarations, NASA has strengthened its commercial technology policy and established an agenda for change to ensure that the agency effectively contributes to the economic security of the Nation.

³Administration White Paper on Communications Acts Reforms

II NASA Commercial Technology Policy

Today, it is critical that NASA supported R&D provide maximum value to U.S. economic security. NASA's aeronautics program exemplifies this policy and is built upon government-industry partnerships that have fostered technology development and commercialization for more than seventy-five years. In order for NASA to foster the commercialization of all of its technology with the same vigor and success that has characterized its aeronautics and space missions, a strong, clear and consistent NASA commercial technology policy is required which: (1) states NASA's position on commercial and technology transfer issues and (2) serves as a single source of guidance for the ways NASA can engage in technology development, transfer and commercialization. To meet these obligations, NASA's commercial technology mission is:

In order to ensure national economic security impacts of NASA programs, NASA will pursue a commercial technology mission concurrent to its aerospace mission. The commercial technology mission will require that each NASA program be carried out in a way that proactively involves the private sector from the onset, through a new way of doing business, to ensure that the technology developed will have maximum commercial potential.

This new mission requires NASA to impart, to the maximum extent possible, the benefits of its technological assets to the national economy and to use, to the maximum extent possible, the strengths of the U.S. industrial base. In accomplishing this mission, NASA supports the development and transfer of technology which leads to commercial products and services. However, the agency does not support nor endorse any individual company or product.

A separate policy document details the specifics of how NASA will conduct its business in the future in order to succeed in our commercial technology mission. The basic cornerstones of this policy are outlined below.

Cornerstones of NASA Commercial Technology Policy:

- **Technology Investment:** In support of national technology policy, NASA will devote 10 percent to 20 percent of its budget to R&D partnerships with the private sector.
- **Partnerships:** A major new emphasis will be placed on the formation of partnerships between NASA, industry, other government agencies and academia. These business arrangements will allow technology to flow toward all partners and simultaneously achieve the objectives of each of them. These partnerships include dual use development partnerships, industry-led partnerships, commercial technology acquisition and others
- **Minority, Small and Disadvantaged Business/Equal Opportunity:** NASA will strengthen its long-standing commitment to expand participation by minority, small and disadvantaged businesses in its programs. Our commitment to equal employment opportunity will be emphasized and actively pursued
- **State/Local/Federal Alliances:** NASA will actively pursue partnerships and regional alliances with state, local and regional governments for commercial development and transfer of technology. Not only do the States have significant infrastructure, capability and capacity to offer, but have long been known as sources of vigor and innovation. Building upon these assets will allow NASA to achieve a more effective response to commercial opportunities that arise

- **Field Center Led Implementation:** The commercial technology program will be implemented through the agency's field centers. The field centers and program offices will jointly develop policy and guide overall program direction. NASA headquarters will manage the implementation of only those activities that are impractical to delegate to the field centers. Field center directors will be granted the authority, flexibility and discretion they need to proactively foster technology commercialization at their installation
- **R&D Procurement Commercialization Objectives:** In the authorization of work on projects at the agency's field centers, NASA will require incorporation of technology transfer, partnership and commercial technology acquisition objectives, wherever appropriate. All applicable NASA R&D procurements, cooperative agreements, grants, announcements of opportunity, etc. will require clearly defined plans for the commercialization of technologies developed. Proposals will be evaluated and selected on the strength of their commercial plans along with other criteria. Award fee determinations will, in part, be based on the extent to which these plans have been realized
- **Metrics:** To ensure measurable progress toward agreed upon goals, each NASA field center and program manager will use a uniform set of standardized metrics. These metrics will be used across the agency as the basis for program evaluation, resource allocation and management decision making
- **Electronic Commerce:** NASA commercial technology efforts will use "electronic commerce" as a standard practice. In particular, the application of electronic media and communications technology will be given priority and efforts will be made to move quickly to eliminate paper documentation, storage, transmission, and authentication
- **Marketing:** In addition to its existing partnership with the aerospace industry, NASA will proactively seek non-aerospace partners for R&D collaborations where such collaborations offer significant synergy or benefits from sharing technology. In particular, arrangements with industries that can benefit significantly from introduction of NASA technology for new products, improved products or increased efficiency will be emphasized
- **Training and Education:** NASA will provide necessary commercial technology training to employees to enable them to fulfill new job requirements and to enable the agency to achieve its goals. NASA recognizes that little real progress can be achieved in adapting to new mission requirements without providing people with the necessary skills
- **Employee Accountability:** NASA will require field center managers to include in each research professional's position description a statement concerning their responsibilities supporting the commercialization of technology. These professionals will then be evaluated on their performance in this regard. This requirement is in accordance with the Federal Technology Transfer Act of 1986

III Agenda For Change

NASA is implementing a new way of doing business. To succeed, the commercial technology mission must become a responsibility of every NASA employee, contractor and grantee. This agenda marks the beginning of NASA's new focus, management commitment, and employee empowerment to improve our contributions to America's economic security through the pursuit of our aeronautics and space missions.

The national and NASA policy changes elevate the commercial technology mission to a fundamental NASA mission as important as any in the agency. NASA's Agenda for Change is the agency's blueprint for achieving this mission. The Agenda is organized into six sections. They are Commercial Technology Policy, Commercial Technology Business Practices, Marketing NASA's Capabilities, Commercial Technology Metrics, Culture Change Through Training and Education, and the Commercial Technology Electronic Network. Each section implements components of the national and agency policies which effectively reinvent the way that NASA imparts the benefits of its knowledge, capabilities and research efforts into the national economy and the way that NASA derives benefits from the technological strength of American industry. Each section also has specific goals and implementation schedules which are documented in Appendices A and B, respectively.

Commercial Technology Policy Preview

To obtain feedback from the private sector concerning NASA commercial technology policy, NASA will conduct periodic workshops with industry participants to discuss the issues and implications of this policy for business with the government. To assure NASA's quick and continued response, the NASA Commercial Technology Management Team and its policy sub team will continue as a standing body to handle fast track resolution of commercial technology issues and questions. The aforementioned policy document will be reviewed and revised on intervals of six months to assure its relevancy to agency needs.

Commercial Technology Business Practices

NASA will implement its new way of doing business through the execution of new commercial technology business practices. These practices, which are described below, are tools for NASA managers to use to achieve their commercial technology mission. A variety of standard commercial technology practices are necessary to ensure that commercialization is a goal of every project at all appropriate stages of development. Their use will provide the flexibility for NASA to achieve one of its goals — to adopt commonly used private sector business practices. The results of these practices will enable the agency to measure its progress in contributing to the nation's economic competitiveness. Each NASA program office and field center will be responsible for incorporating these practices into their program management system and ensuring that their use is understood.

Contractor-Developed Technology Commercialization

Since roughly 80 percent of NASA's R&D resources go to contractors, NASA will now require commercialization of technology developed under contract, as appropriate. NASA presently only requires reporting of commercialization.

Industry-led Technology Development Partnerships

NASA will invite industry to define and lead joint R&D projects (with possible university and other not-for-profit organization participation) that are relevant to the NASA mission but not driven by specific project requirements. The industry partners will share the costs for, and direct implementation of, each project and will be granted intellectual property rights, consistent with federal statutes.

Dual-Use Technology Development

NASA will pursue dual-use technology development programs. These can be R&D projects jointly pursued by NASA and/or industry, where the products of the efforts can be separately applied to NASA mission objectives and industry commercial objectives. These programs are characterized by resource and risk sharing, flexibility in the requirements of both parties, agreement in advance to the R&D effort and plan, and avoidance of typical buyer-seller relationships.

Commercial Technology Acquisition

Whenever possible, NASA will acquire commercial off the shelf technology to meet program or mission requirements. When off the shelf technology is not available, program requests for proposals will be written such that only price-performance requirements are defined, not preconceived hardware or software designs.

Small Business Technology Development and Commercialization

NASA will target its out-reach and information exchange activities toward small businesses to increase awareness of NASA technologies, programs and collaborative R&D opportunities. This policy recognizes that U.S. small businesses have unique capabilities to offer.

Regional Alliances

NASA will establish alliances with local, state and regional organizations to leverage resources and support regional "economic clusters." The field centers will assess their technology strengths and build individual technology networks in their regions.

Post Technology Development Diffusion

NASA will continue to identify existing technologies with commercial applications and aggressively introduce them into the marketplace. This technology diffusion can take the form of technology licensing or other forms of collaborations when licenses are not appropriate.

Marketing NASA Capabilities

NASA will intensify its commercial technology efforts by implementing an integrated industry-focused marketing plan emphasizing the commercial potential of NASA supported technology. By doing so, NASA will expand its potential impact beyond individual companies to reach entire industry sectors. NASA will augment its traditional technology transfer methods with a more active and strategic approach to more effectively bridge the gap between NASA's and U.S. industry's R&D requirements. In the past, the private sector's view of NASA was often limited to the perspective of a single field center. This new strategy will highlight the capabilities of the entire agency in specific technology areas of interest to the private sector.

While technology commercialization activities with aerospace industry customers will be strengthened, a major emphasis will be placed on developing cooperative relationships with non-aerospace segments of the economy. Recognizing that non-aerospace companies do not customarily equate their business interests to NASA's, added emphasis will be placed on demonstrating the relationships between NASA's capabilities and their needs. Industry associations and state and local organizations will be used to reach a broad spectrum of the private sector.

Marketing Strategy

First, NASA will conduct a center by center inventory of unique and commercially applicable assets, including technical expertise, facilities, technology products and services. This inventory will become a foundational tool for coordinating responses to industry needs and for targeting industries for collaborative efforts.

Second, in order to correlate the advanced technology needs of NASA and those of industry, NASA will establish a reliable outreach mechanism to inform the private sector of technology commercialization opportunities. Among other things, NASA will use electronic media to showcase the opportunities, to provide information for gaining access to them and to solicit private sector participation.

Third, NASA will develop and carry out a plan for targeted marketing of the agency's capabilities to a pilot set of three or four non-aerospace industry segments. This approach will enable NASA to channel significant support toward industry segments where the synergies of multi-center and industry technology collaborations can be most beneficial. The agency will target those industry segments that meet specific criteria, including the potential for significant U.S. economic impact and a strong industry commitment to participate and share costs.

Commercial Technology Metrics

NASA will establish metrics to manage all of its collaborations with industry. The metrics will address the efficiency of the day-to-day management process as well as bottom line results like jobs, product or industry market share, productivity gains and the like. Metrics will be designed to quantify the benefits that result from commercial applications of NASA technology as well as direct mission benefits such as lower life-cycle costs. As a long term

goal, we will strive to develop measurements of social benefits like improved health care and a better environment. In total, these measurements will enable a quantified assessment of the return on taxpayer investment.

Initial implementation of these metrics will rely on existing collection tools but will evolve into an integrated set of tools to efficiently collect data, process it and use it in the management process. A portion of the essential data will come from industry partners and will therefore require dealing with proprietary and other issues. Structuring agreements properly will help data collection, however, the proprietary and security issues of maintaining and displaying data, resource issues involved in the collection and subsequent analysis of the data all must be resolved.

Establishing Initial Metrics

The 1992 NASA Technology Transfer Report⁴ defined a minimum set of activity, efficiency and effectiveness metrics but stopped short of suggesting return on taxpayer investment measures. Database material and data collection tools already exist within NASA, and they are being used to begin the process of establishing an initial single, integrated set of metrics to support management's decision-making.

The effectiveness measures we plan to use include:

- Number of acknowledged uses: Written statements from NASA's partners that they used a NASA technology in their commercial products, services or internal processes or technology from a NASA program that they used or adapted to commercial technologies
- Number of NASA literature citations: The frequency of references to works of authors supported by NASA
- Number of NASA patents generating license royalty
- Size of the portfolio (total dollars spent on research partnerships by NASA and its partners)
- Types of products and services being produced
- When products and services would enter the marketplace
- Effectiveness of the portfolio (ratio of activity generated per dollar spent)
- Frequency of use of various NASA business practices

Implementing Long-term Metrics

The above metrics are critical during the initial implementation period of NASA's new business practices when most bottom-line measures still have a high degree of uncertainty. However, NASA will develop and implement additional metrics to measure the bottom-line results to support management decision making. The difficulties in this endeavor arise from the fact that commercial benefits of technology investments typically do not accrue for several years after R&D is completed and the diffusion of benefits are spread across a broad spectrum of the national economy. While the methodologies needed for measuring the economic impact of government investment are still evolving, NASA will advance the discipline and speed full implementation for NASA management oversight.

Notwithstanding these issues, NASA will develop the capability necessary to model the long-term economic impact of its commercial technology decisions. NASA has developed an initial top-level return on taxpayer investment model and identified a preliminary set of financial and economic indicators that will be needed from partners as model inputs. We have defined

⁴Commonly Referred to as the "Creedon Report," December, 1992.

a methodology for evaluating risk. This is extremely important because NASA's commercial technology partnerships are likely to be more risky than those found in the private market. We plan to apply the model to selected case studies based on an evaluation of our initial metrics collection. As actual results are reported we will validate our methodology and make adjustments where needed.

Culture Change Through Training and Education

Training and education of NASA employees is recommended in the National Performance Review and is a necessary investment to achieve agency-wide acceptance of technology commercialization as a NASA mission and to achieve high levels of performance in that mission. To create the needed change, NASA will provide appropriate training to employees, contractors and grantees. This training and education will enhance their understanding of the national context of technology commercialization and equip them with the skills needed to support the mission. To encourage joint problem solving and to precipitate an end to NASA's seclusion from its customers, much of this training will be open to NASA customers and contractor employees. The main elements of the program follow.

Awareness Education

Awareness education will be provided for employees to teach why technology commercialization is a high priority mission for NASA and where to go for more information. This training will define technology commercialization, explain its importance to NASA, the country and the individual employee, and illustrate how the process works at that particular field center. Additionally, the NASA Technology Commercialization Guidebook will be distributed to all participants in this awareness education.

Individual Training

Individual training courses will provide specific commercial technology skills and knowledge needed by NASA and contractor employees. Courses such as marketing, partnership agreement options, business practices, economics, ethics, information networks and others will be developed and provided to employees at all field centers. The NASA headquarters and each field center training office will play an integral role in developing and delivering these courses with help from subject content experts at the field centers and the private sector. Employee exchange programs or detailee assignments through such programs as the Intergovernmental Personnel Act will be encouraged to share highly valuable experience between civil servants and private sector employees.

Cooperation and Support

Headquarters and field center management will ensure cooperation and support to effectively plan and implement all training. They must coordinate policy and provide direction and enthusiasm to subordinates as well as make available the required

resources for training. Additionally, assistance from the field center training offices is important for course development, vendor selection and delivery. The training tools and programs of other federal agencies will be evaluated and used when appropriate in order to save time and money for NASA.

Electronic Commercial Network

This agenda for change will be implemented through the NASA field centers which will coordinate and manage their activities through an electronic network. Designed to create and foster a "virtual organization," the electronic network uses the Internet to connect all field center and headquarters technology commercialization professionals with each other and the rest of the country. The electronic network pulls all components of the NASA Commercial Technology Agenda For Change together to enable the agency to efficiently service internal NASA and customer needs.

NASA will use the electronic network for two purposes:

- To establish broad, interactive communications between NASA and industry regarding partnering opportunities; and
- As an effective management tool for both NASA and industry through the transmission of programmatic information such as metrics

The NASA electronic network will be designed and implemented to demonstrate the benefits of "electronic commerce." In particular, electronic media and communications technology will be preferred and efforts made to move quickly to eliminate paper documentation, storage, transmission, and authentication.

Technically, the network will evolve with industry standards thus avoiding obsolescence. This is an additive process and implements a structural change in the manner by which NASA conducts business without having to change existing procedures or establish new lines of communication. Using its considerable expertise in this technical field, NASA will develop new electronic tools and Internet-based access capabilities that are sophisticated in application, yet simple to use.

The commercial technology electronic network will forge a new NASA-industry relationship for R&D collaboration and partnership. This new relationship will cultivate a new NASA culture focused on contributing to the nation's economic security through its aeronautics and space missions.

IV NASA Commitment

NASA is committed to leading the commercial technology mission and its successful and expeditious implementation across all NASA field centers and program offices. NASA is dedicated to ensuring that each employee does his or her utmost to maximize the commercial value of NASA assets: knowledge and expertise, facilities and equipment, programs and technology. This effort will require full participation of all elements of the NASA technology transfer network. Program offices and field centers will give the highest priority to ensuring the availability of resources necessary to support strong organizations and initiatives dedicated to the transfer and commercialization of NASA supported technology.

NASA is committed to seeing that the agency's commercial technology policy is current, effective, and serves the economic needs of the Nation. With this document, NASA has outlined several business practices which will enable close coordination with the private sector. The agency is committed to actively seeking partnerships with both aerospace and non-aerospace companies. Additionally, NASA will manage all its new commercial partnerships with data from established metrics. The agency will tie these elements together through an the electronic network which will support close customer communications and management oversight.

Furthermore, the agency will dedicate resources to train and educate its staff in the principles of business and the commercial application of technology. NASA will also provide rewards and career paths similar to those traditionally available in the mission program areas.

NASA will ensure that the NASA Commercial Technology Management Team continues to lead the overall implementation of this Agenda for Change. A regular report will be produced to communicate agency progress and accomplishments.

Appendix A

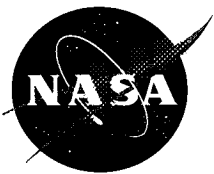
NASA Agency Level Goals

Subteam	Phase 0 March 31, 1994	Phase 1 September 30, 1994	Phase 2 Fiscal Year 1995
Training, Education & Culture Change	<ul style="list-style-type: none"> • Develop Training and Education Plan that defines policies and methods to stimulate change • Draft NASA Commercial Technology Guidebook • Draft NASA Commercial Team Directory 	<ul style="list-style-type: none"> • Conduct cooperative workshop with industry on NASA training needs and concepts • Develop core training curriculum • Implement training and education plan • Print NASA Commercial Technology Guidebook • Implement internal NASA awareness plan • Develop & print training module directory (4/30) 	<ul style="list-style-type: none"> • Deliver training in key skill areas • Train contractors/grantees • Establish recognition and award system • Assess impact, use and cost effectiveness of education and training regularly
Metrics	<ul style="list-style-type: none"> • Define initial set of commercialization metrics • Develop initial data collection and reporting mechanism • Prepare preliminary definition of a system to explain the concept of return on taxpayer investment • Begin integrating metrics with other teams 	<ul style="list-style-type: none"> • Initial metrics report • System concept definition for Return on Taxpayer Investment • Initial metrics database • Quarterly metrics report 	<ul style="list-style-type: none"> • Initial Return on Taxpayer Investment analysis • On-line metrics database • Real time update
Marketing	<ul style="list-style-type: none"> • Develop dual foci marketing plan: general awareness and targeted initiatives 	<ul style="list-style-type: none"> • Negotiate cooperative projects w/HOST (Healthcare Open Systems and Trials) • Define NASA commercialization customer base • Continue to develop significant technology commercialization partnerships with industry • Develop specific marketing plan for selected targeted industry groups 	<ul style="list-style-type: none"> • Implement mktg plans to targeted industries • Implement cooperative projects with HOST • Refine marketing plan to include mechanisms for identifying technology commercialization opportunities and assessing customer needs • Evaluate feasibility of targeting small business for cooperative R&D ventures • Assess collaborations with selected industry segments and adjust marketing plan
Practices	<ul style="list-style-type: none"> • Define and develop seven commercial practices 	<ul style="list-style-type: none"> • Fully document qualities & process of each practice, including assessments of required resources, professional skills & performance metrics • Coordinate with other subteams to develop course materials, metrics, address relevant policy issues, and establish methods to use the network as a mgmt. tool for implementing practices 	<ul style="list-style-type: none"> • Use one or more practices to collaborate with industry in commercializing NASA technologies
Policy	<ul style="list-style-type: none"> • Develop policy document to be signed by the Administrator • Obtain feedback on policies from interested groups 	<ul style="list-style-type: none"> • Policy document distributed to NASA employees and available to general public (4/15) • Conference with private sector to solicit feedback (June/July) 	<ul style="list-style-type: none"> • First six month review of policy
Commercial Technology Network	<ul style="list-style-type: none"> • Develop prototype of Internet capabilities and demonstrate to team members 	<ul style="list-style-type: none"> • Design, develop and implement Internet access capabilities for SBIR, AITP programs and Innovations newsletter. Finish installation of TechTracs at all NASA centers and begin initial development of Internet access 	<ul style="list-style-type: none"> • Continue addition of NASA databases to Internet access system

Appendix B

NASA Commercial Technology Management Team Top-Level Implementation Schedule

FY 1994-1995	3 RD Quarter	4 TH Quarter	1 ST Quarter	2 ND Quarter	3 RD Quarter
Policy					
		▲ 7/1 — Policy Signed By Administrator			
Commercial Practices					
		▲ 8/8 — Initial Practices Draft			
			▲ 10/1 — Practices Development Complete		
Metrics					
	▲ 4/28 — Initial Metric Report				
		▲ 8/1 — Metric Report Update		▲ 11/21 — Initial ROTI Results	
				▲ 12/8 — FY 94 QMR/4 th Qtr. Complete	
Marketing					
		▲ 7/30 — Initial Market Segment Analyses Available			
			▲ 9/30 — Center Technology Inventory Databases Complete		
			▲ 10/1 — Quick Wins Identified		
				▲ 1/30 — Quick Wins Completed	
Training and Education					
		▲ 8/15 — Training Resource Guide Completed			
			▲ 9/29 — SSC Training Pilot Completed		
Electronic Network					
				▲ 2/1 — People/Facilities Information	
	▲ 6/15 — Block 1 Program Information		▲ 10/1 — Block 2 Program Information		
					▲ 4/1 — Collaboration Process Management



National Aeronautics and
Space Administration

CU 28159 07/18/94