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**AMENDMENT TO SECTION 273 OF THE DEFENSE
AUTHORIZATION ACT OF 1988 RE SEMATECH ADVISORY COUNCIL**

(a) **SHORT TITLE.**--This section may be cited as the "Semiconductor Technology Council" (hereafter in this section referred to as the "Council").

(b) **FINDINGS WITH RESPECT TO THE COUNCIL.**--The Congress finds and declares:

(1) Semiconductors represent an area of technology critical to national economic and security interests as well as the competitiveness of the U.S. electronics industry;

(2) As a consequence of the advice and strategy developed by the National Advisory Committee on Semiconductors, a comprehensive outline of core technology challenges in the form of a Semiconductor Technology Roadmap has been compiled for semiconductors by leading technologists from industry, government and academia;

(3) A continuously updated Semiconductor Technology Roadmap which analyzes core technology challenges and identifies common knowledge and objectives across the full spectrum of semiconductor activity can be a useful tool in stimulating and facilitating research and development efforts by industry, government and academia; and

(4) As the mission of Sematech has changed in accordance with the Semiconductor Technology Roadmap, the Sematech Advisory Council should be eliminated and a new, ~~non-advisory~~ council created which is composed more broadly of representatives from industry, government and academia and can focus on the core technology challenges set forth in the Semiconductor Technology Roadmap.

(c) **ESTABLISHMENT OF COUNCIL.**--There is established the Semiconductor Technology Council.

(d) **PURPOSES OF COUNCIL.**--The Council shall:

(1) Seek ways to respond to the technology challenges for semiconductors by increasing efficiency, promoting creativity and entrepreneurship, and fostering precompetitive cooperation among industry, government, and academia; and

(2) Make available judgements, assessments, ~~and insights, and recommendations~~ that relate to the opportunities for new research and development efforts and the potential to better rationalize and align on a national basis semiconductor research and development.

(e) FUNCTIONS OF COUNCIL.--The Council shall:

(1) Review the technology developments and core technology challenges for semiconductors and explore opportunities for improved coordination among industry, government and academia;

(2) Exchange views regarding the competitiveness of the semiconductor technology base and new or emerging semiconductor technologies that could affect national economic and security interests;

(3) Exchange and update information and identify overlaps and gaps regarding the efforts of industry, government and academia in semiconductor research and development;

(4) Assess technology progress relative to the Semiconductor Technology Roadmap;

(5) ~~Make recommendations regarding the scope and content of semiconductor technology development within the U.S. government.~~

(6) Appoint sub-groups as necessary in connection with implementation of the Semiconductor Technology Roadmap; and

~~(6)~~ (7) Publish an annual report addressing the relationship of semiconductor technology challenges and developments among industry, government and academia.

(f) MEMBERSHIP.--The Council shall be composed of thirteen members as follows:

(1) Under Secretary of Defense for Acquisition, who shall serve as Co-Chairperson;

add N.E.C.

(2) Under Secretary of Energy;

(3) Under Secretary of Commerce for Technology;

(4) Director of the Office of Science and Technology Policy;

(5) Director of the National Science Foundation;

~~(6) An individual selected by the Semiconductor Industry Association, who shall serve as Co-Chairperson; and~~

~~(7) Seven~~ (6) Eight members appointed jointly by the Co-Chairpersons of the Council by the President, as follows:

(A) ~~Three~~ **Four** members who are eminent individuals in the semiconductor device industry, ~~one of whom shall serve as Co-Chairperson;~~

(B) Two members ~~nominated by Semiconductor Equipment and Materials International~~ who are eminent in the semiconductor equipment and materials industry;

(C) One member from the semiconductor user industry; and

(D) One member who is affiliated with an academic institution.

(g) **TERMS OF MEMBERSHIP.--**

(1) Each member of the Council appointed under subsection (f)(6) ~~and (f)(7)~~ shall be appointed for a term of three years, except that of the members first appointed, two shall be appointed for a term of one year, three shall be appointed for a term of two years, and three shall be appointed for a term of three years ~~as designated by the Co-Chairpersons at the time of appointment.~~ The term of the Co-Chairperson ~~nominated by the Semiconductor Industry Association appointed from the semiconductor device industry~~ shall be three years. A member of the Council may serve after the expiration of the member's term until a successor has taken office;

(2) A vacancy in the Council shall not affect its powers but, in the case of a member appointed under subsection (f)(6) ~~or (f)(7)~~, shall be filled in the same manner as the original appointment was made. Any member appointed to fill a vacancy for an unexpired term shall be appointed for the remainder of such term; and

(3) **Compensation:**

(A) Each member of the Council shall serve without compensation; and

(B) While away from their homes or regular places of business in the performance of duties for the Council, government members of the Council shall be allowed travel expenses, including per diem in lieu of subsistence, at rates authorized for employees of agencies under sections 5702 and 5703 of title 5, United States Code.

(h) **SUPPORT FOR COUNCIL.--**The Council shall utilize Sematech as needed for general and administrative support in accomplishing the Council's purposes.

(i) ~~FEDERAL ADVISORY COMMITTEE ACT. THE FEDERAL ADVISORY COMMITTEE ACT (5 U.S.C. APP. 2) SHALL NOT APPLY TO THE COUNCIL.~~

(j) **TERMINATION.--**The Council shall terminate in five (5) years unless both Co-Chairpersons recommend renewal for an additional five (5) year term or a majority of the Council members recommend such renewal.

NEWS BRIEFS

WHAT THE MEDIA ARE SAYING ABOUT THE CHIP INDUSTRY

Hope offered for key supply of epoxy resin

The Wall Street Journal, August 1993 -- Officials at Japan's Sumitomo Chemical Co. told a delegation of U.S. computer makers they hope to resume making epoxy resin for computer memory chips by January. Sumitomo's epoxy resin plant in Niihama, Japan, was destroyed in an explosion July 4. The plant supplied about half the market for epoxy resin used in the plastic packaging for most semiconductors.

AEA, CBEMA and SIA renew call for electronics tariff elimination

Press release, July 1993 -- The American Electronics Association (AEA), Computer and Business Equipment Manufacturers Association (CBEMA) and Semiconductor Industry Association (SIA) expressed disappointment ... with the failure of the world's leading industrialized countries to eliminate tariffs on electronics products. An initial

Uruguay Round zero tariff package, that excludes electronics products, was agreed to by the United States, Canada, the European Community and Japan [in July] for a limited number of industries.

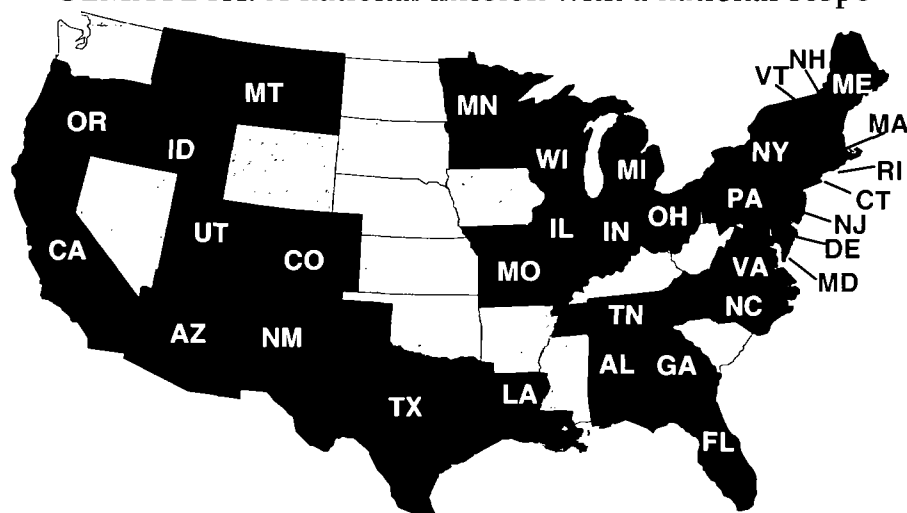
U.S. is not up to snuff in packaging

Electronic Engineering Times, August 1993 -- The Microelectronics and Computer Technology Corp. and Sandia National Laboratories will release a report later this year that recommends the government and industry form a partnership to establish a national center devoted to the development of a low-cost electronics manufacturing infrastructure. The report suggests a national goal be set to focus on a product area in which the United States can gain ground in cost-efficient technologies.

The Pentagon leads a charge for computer-display research

Business Week, August 1993 -- Flat panel displays are high on everyone's list of key technologies for the future. Trouble is, more than 95% of them are made in Japan. But the federal government hopes to change that. On July 20, the Pentagon's Advanced Research Projects Agency agreed to provide \$20 million to launch the U.S. Display Consortium. The group will consist of flat-panel startups, such as AT&T and Xerox, as well as display customers and suppliers of equipment for making flat screens.

SEMATECH: A national mission with a national scope



From manufacturing sites to research centers to suppliers' headquarters, SEMATECH's presence is felt in 34 states. The states identified above are home to manufacturing facilities of member companies and the Advanced Research Projects Agency; SEMATECH Centers of Excellence and national laboratories; locations of joint projects; and members of SEMI/SEMATECH, the U.S. suppliers' consortium working with SEMATECH.

SEMATECH

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SEMATECH UPDATE

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SEMATECH reduces its need for federal funds

With its original goals achieved and a broader mission before it, SEMATECH should begin 1994 under a budget that includes \$10 million less in requested federal funds than in prior years.

The consortium's \$180 million proposed budget for 1994 comprises \$90 million in member company contributions and a matching amount from the Department of Defense's Advanced Research Projects Agency, compared to \$100 million in annual federal dollars during the first six years of SEMATECH's existence. Reasons: Lower overhead, shared costs and an emphasis on cooperative research with other federally funded organizations.

"Basically, we've learned how to work smarter and become more cost-effective," said William J. Spencer, chief executive officer. "In 1993, for example, we asked our suppliers to pay a larger share of equipment improvement projects and joint development programs. This allowed us to begin doing more with fewer SEMATECH dollars."

Created in 1987 as a partnership between the federal government and U.S. chip manufacturers, SEMATECH's initial mission was "to provide the U.S. semiconductor

industry the domestic capability for world leadership in manufacturing.

According to Spencer, that mission was achieved in 1992 with a slate of results that included a 7 percent increase for U.S. firms in world semiconductor market share and the saving of an estimated 16,500 domestic manufacturing jobs since SEMATECH's inception.

Last year, responding to industry changes and new needs of its 11 members, SEMATECH adopted a new and broader mission: "Solve the technical challenges required to keep the U.S.

number one in the global semiconductor industry." This new mission includes the formation of several new focus areas for semiconductor research and development.

"The technical experts from SEMATECH and our member companies have determined that it will cost \$180 million per year to carry out our new mission," said Spencer. "Also, our plan to do more for less reflects today's economic realities: tough spending constraints for Congress and leaner times for SEMATECH's corporate members."

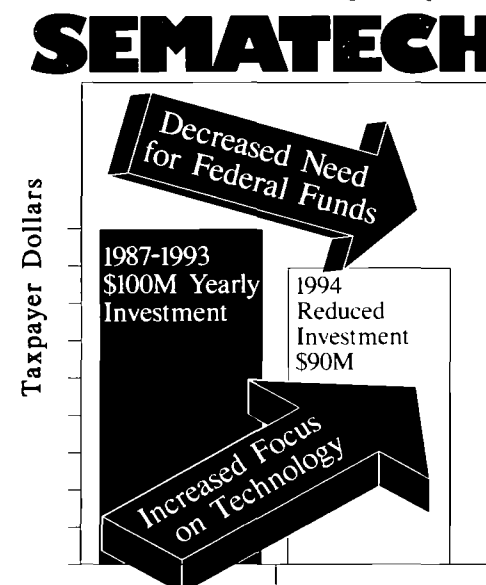
Spencer detailed the major ways SEMATECH has reduced its need for federal and private money:

- SEMATECH has learned how to test new equipment with fewer manufacturing process steps, chiefly by using computer "models" that simulate factory operations.

- The consortium is working more closely with national laboratories and federally funded university programs on mutually beneficial projects in semiconductor research.

- Administrative overhead -- such as clerical and support positions -- has been reduced from 18 percent to 13 percent of SEMATECH's budget.

- SEMATECH has transferred some of its former responsibilities to other related organizations.



House panel meets in Austin



Making the most of partnerships and collaborations to enhance America's competitive ability was the subject of a recent field hearing in Austin, Texas, by the House Committee on Science, Space, and Technology. Touring SEMATECH before the hearing are, from left, Bob Galvin, Chairman, SEMATECH Board of Directors; Rep. Eddie Bernice Johnson, D-Texas; Rep. Sam Johnson, R-Texas; Majority Leader Richard A. Gephardt, D-Mo.; Rep. J.J. Pickle, D-Texas; Rep. Robert Scott, D-Va.; and William J. Spencer, SEMATECH chief executive officer.

SEMATECH'S MODEL OF PUBLIC FUNDS STEWARDSHIP SHOULD BE PRESERVED

William J. Spencer President and Chief Executive Officer SEMATECH

Like a 90-yard pass completed in the end zone, SEMATECH has beaten the odds. When this organization began in 1987, many wondered aloud whether an unprecedented consortium of semiconductor manufacturers, government and academia could succeed in America. For a nation where fierce competition flourished and industry cooperation was minimal, it seemed a worrisome gamble.



Fortunately, we proceeded with a vision of the possibilities before us and a conviction which led our industry to work together in nontraditional ways in order to prevent further loss of U.S. semiconductor market share to foreign competition.

There has been another victory, also: SEMATECH has proven that a partnership such as ours can effectively manage public and private funds.

During our first six years, we have been budgeted at \$200 million per year -- half coming from SEMATECH member companies and half matched by the Advanced Research Projects Agency of the Department of Defense. For fiscal 1994, we have asked for \$90 million in federal funds to match an equivalent contribution from our members.

SEMATECH has repeatedly won praise for its ability to manage taxpayer dollars. The General Accounting Office, which has scrutinized our spending practices 10 times with positive results, declared in its September 1992 report: "SEMATECH has demonstrated that a government-industry consortium can help improve a U.S. industry's technological position while protecting the government's interest that the consortium be managed well and public funds spent appropriately."

I mention all this because the committee report accompanying the fiscal 1994 Defense Authorization Bill contains language that would alter the successful public-private financial partnership that SEMATECH represents.

Specifically, the bill makes the incorrect assertion that the electronics industry is the major source of chemicals that deplete the atmosphere's layer of protective ozone. The legislation also attempts to provide specific directions on how SEMATECH should manage the portion of its funding devoted to programs of environmental protection.

This is an unfortunate example of the sort of confusion that can occur when public policies are made on the basis of inaccurate information. In reality, the electronics industry generates only 12.8 percent of releases of ozone-depleting substances, according to the Environmental Protection Agency. Furthermore, the semiconductor industry, which SEMATECH serves, produces only 1 percent of ozone-depleting substance releases in the United States. This is based on 1991 data and it is widely known that great strides have been made to further reduce the use of ozone-depleting substances in the last two years. Therefore, an ESH program focused on further reductions of ozone-depleters would be "shooting behind the duck."

Throughout its existence, SEMATECH has been firmly committed to an aggressive environmental agenda, and we have worked extensively with community groups and scientific organizations to ensure our status as a good environmental neighbor. We also have taken a leading role in developing a 15-year strategic roadmap that directs U.S. semiconductor industry efforts in pollution prevention, worker health and safety, and environmental preservation.

It is a fundamental SEMATECH tenet that no job is so important that it may be performed without regard for safety, health and the environment. We believe this so strongly that we have devoted almost double the Congressionally directed \$10 million to environmental, safety and health R&D programs.

The cooperation between the federal government and the U.S. semiconductor industry via SEMATECH has been very productive. SEMATECH has repeatedly proven its ability to be a good steward of public and private resources. Ours is a workable model -- and it should be preserved.

SEMATECH Update is a bi-monthly news report designed to keep Congress informed about developments at SEMATECH.

SEMATECH is a quality-driven team of America's best, establishing a new model for national cooperation in high technology.

SEMATECH's mission is to solve the technical challenges required to keep the U.S. number one in the global semiconductor industry.

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HIGHLIGHTS OF THE SEMICONDUCTOR INDUSTRY

Chip industry's commitment to cut ozone-destroyers helps bring results

Science and industry are winning the fight to slow the buildup of ozone-depleting chemicals in the earth's atmosphere -- and the semiconductor industry is sharing in that success.

A recent study by the National Oceanic and Atmospheric Administration showed that industrial anti-pollution programs have slowed emissions of ozone-destroying substances into the atmosphere.

"These decreased growth rates are encouraging in light of voluntary, national and international efforts to limit emissions of ozone-depleting substances," the study noted.

The semiconductor industry, long environmentally conscious, can take pride both in the effectiveness of its own ozone-protective programs and the fact that the chip industry has never been a major producer of ozone depleting chemicals, observers say.

Environmental Protection Agency data shows the semiconductor industry generates only about 1 percent of ozone-depleting substances released in the United States. The chip industry generates releases from only two such compounds, CFC 113 and 1,1,1-Trichloroethane.

"The semiconductor industry has an aggressive program to phase out the use of these chemicals," said Frank Squires, SEMATECH's chief administrative officer. "Our SEMATECH members have made aggressive commitments and tremendous strides over the past four years."

Seven of SEMATECH's 11 members have halted the release of CFC 113 in their global operations, according to a 1993 Montreal Protocol report. These members include Advanced Micro Devices, AT&T, Hewlett-Packard, IBM, Motorola, National Semiconductor and NCR.

In addition, SEMATECH and four member companies independently reported these activities:

- Digital Equipment Corp. eliminated the use of ozone-depleting substances from its worldwide manufacturing operations in May, 18 months ahead of its schedule;

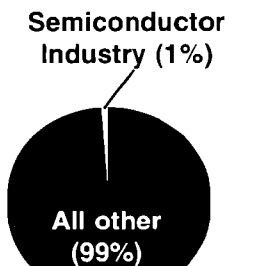
- Intel Corp. has phased out 98 percent of ozone-depleting substances at its facilities;

- Rockwell International has decreased its emissions of CFC 113 below reporting levels, and is working toward total phase-out;

- Texas Instruments eliminated CFC 113 from its semiconductor factories in August;

SEMATECH eliminated emissions of CFC 113 at its Austin facility in 1991, and remains firmly committed to an aggressive environmental agenda.

Ozone-depleting substances released by U.S. industries in 1991.



Source: EPA, TOXNET Database, 1991

SEMATECH names chief operating officer



Jim Owens

SEMATECH has named James B. Owens, Jr., a National Semiconductor executive vice president, to serve as its next chief operating officer. Owens will succeed William L.

(Bill) George of Motorola, whose three-year assignment ends in March.

Owens' three-year assignment to SEMATECH will begin in January. As chief operating officer, he will be responsible for research and development programs, including technical operations at SEMATECH's Austin facility and joint development and equipment improvement programs with U.S. suppliers.

Announcement of Owens' appointment was made early "because it is in keeping with our strategic plan to provide ample transition for key management positions at SEMATECH," said

William J. Spencer, president and chief executive officer.

"Jim brings a wealth of experience in various aspects of semiconductor manufacturing, as well as an in-depth knowledge of SEMATECH," Spencer added.

Owens has served on SEMATECH's executive technical advisory board and as an alternate board of directors member. He was selected in an extensive search by the consortium's top managers.

Currently, Owens is executive vice president for National Semiconductor's Analog Division in Santa Clara, Calif. He is responsible for Analog Operational Business Management; wafer fabs in Santa Clara and Greenock, Scotland; and assembly in Melaka, Malaysia.

Owens, 43, holds a bachelor's degree in physics from Stetson University; a master's degree in management from the University of Arkansas; and a master's degree in engineering from Georgia Tech.

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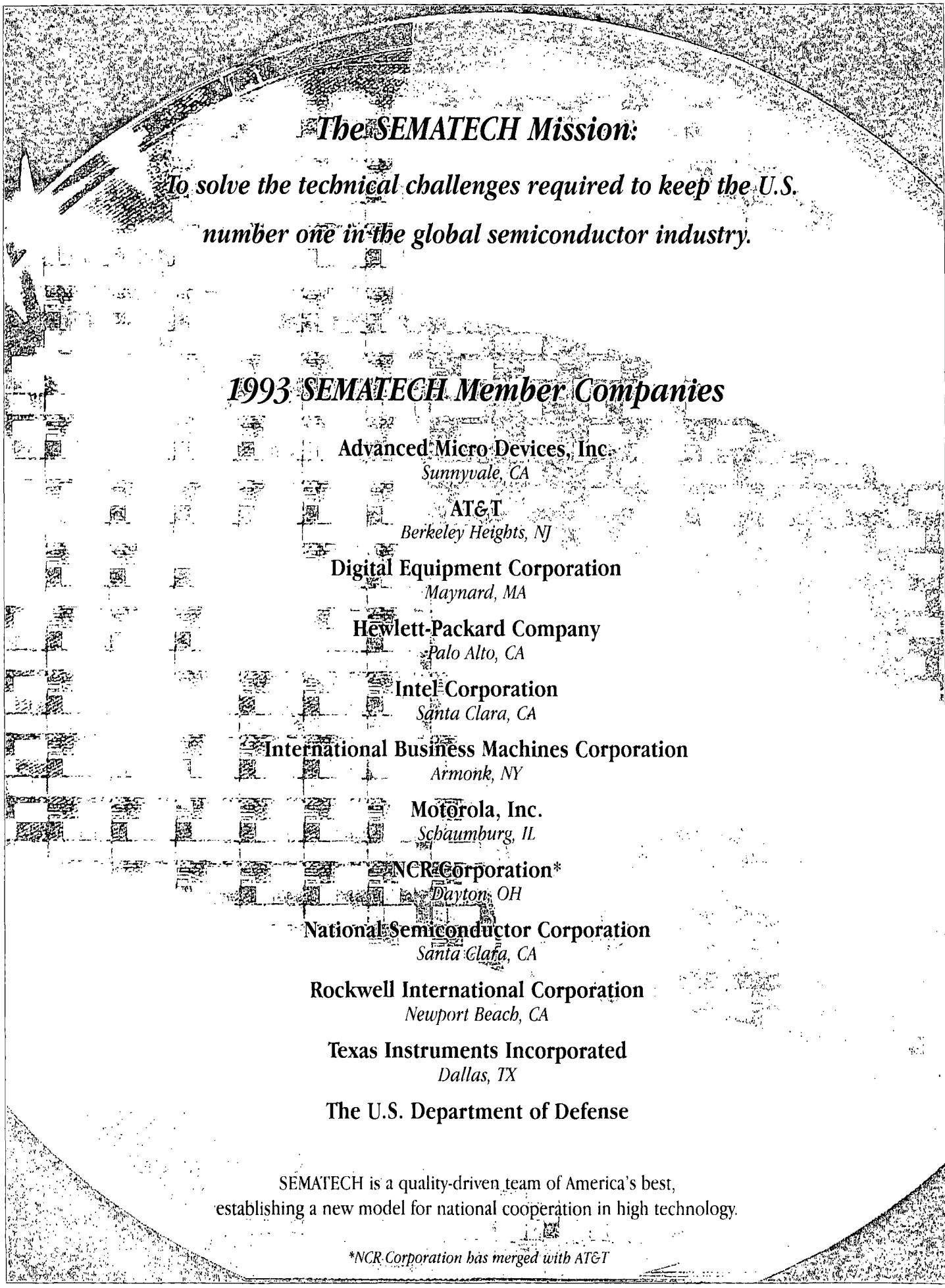
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A stylized, high-contrast black and white graphic of the American flag. The stars are represented by white, five-pointed stars of varying sizes on a black background. The stripes are represented by white, wavy, horizontal bands. The entire graphic is composed of a grid of small squares, giving it a pixelated or mosaic-like appearance.

An American
Partnership
That Works

Annual
Report
1993



The SEMATECH Mission:

***To solve the technical challenges required to keep the U.S.
number one in the global semiconductor industry.***

1993 SEMATECH Member Companies

Advanced Micro Devices, Inc.
Sunnyvale, CA

AT&T
Berkeley Heights, NJ

Digital Equipment Corporation
Maynard, MA

Hewlett-Packard Company
Palo Alto, CA

Intel Corporation
Santa Clara, CA

International Business Machines Corporation
Armonk, NY

Motorola, Inc.
Schaumburg, IL

NCR Corporation*
Dayton, OH

National Semiconductor Corporation
Santa Clara, CA

Rockwell International Corporation
Newport Beach, CA

Texas Instruments Incorporated
Dallas, TX

The U.S. Department of Defense

SEMATECH is a quality-driven team of America's best,
establishing a new model for national cooperation in high technology.

**NCR Corporation has merged with AT&T*

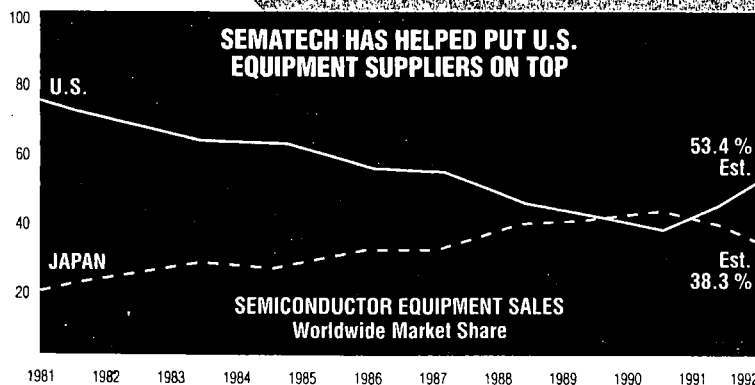
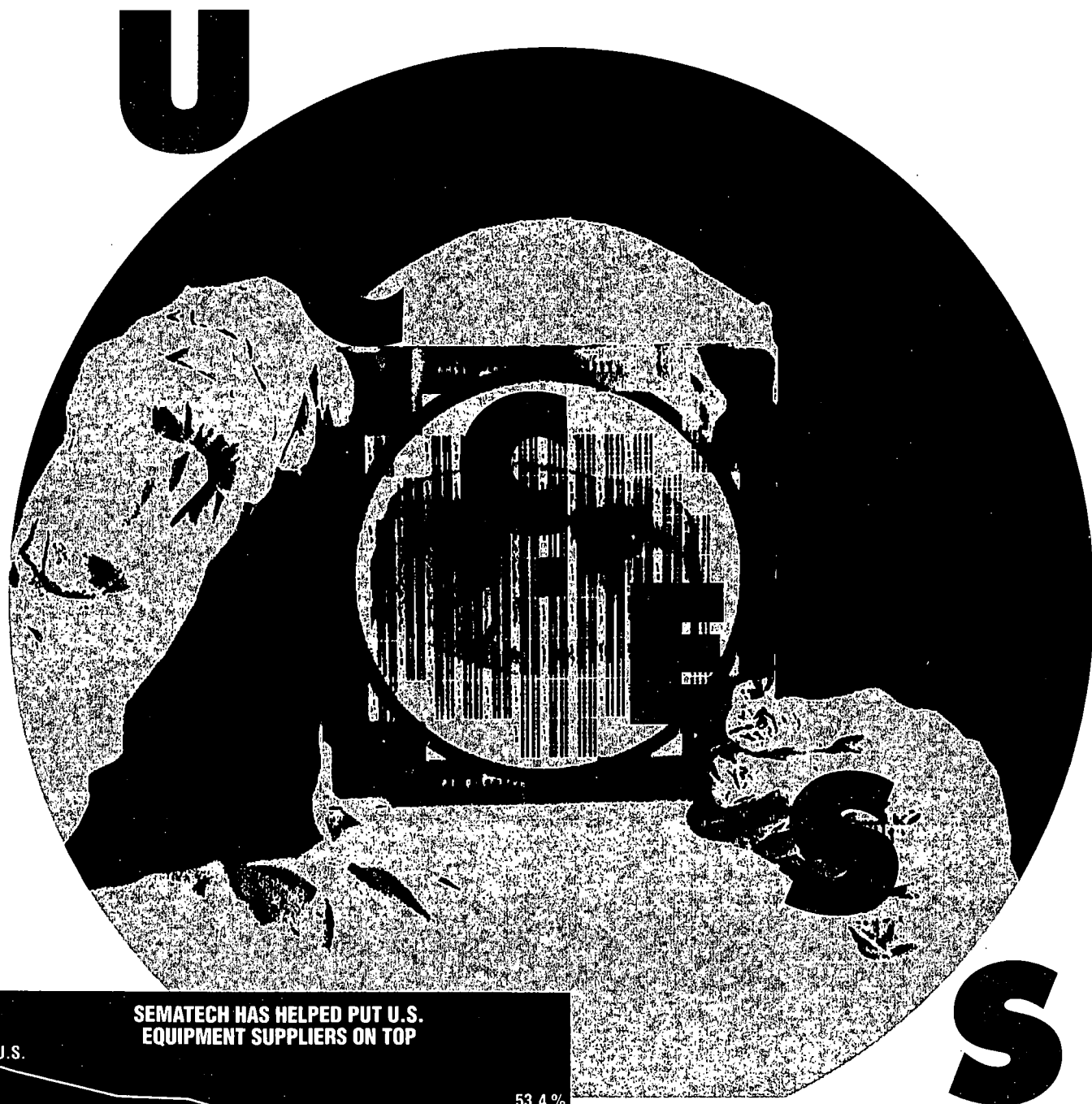
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SEMATECH



SEMATECH, as a technological catalyst, has brought U.S. semiconductor suppliers and manufacturers together to improve the basic tools and processes necessary in restoring U.S. competitiveness in an industry critical to our national economy and national security.

NEWS BRIEFS

WHAT THE MEDIA ARE SAYING ABOUT THE CHIP INDUSTRY

Good '94 Predicted

Electronic Engineering Times, Jan. 17 -- The economic recovery in the U.S., in general, and the semiconductor industry, in particular, will be more robust than normal, thanks to improvements in technology and management techniques, a top economist said. Vladi Catto, chief economist with Texas Instruments Inc., said the nation's gross domestic product should grow by at least 3 percent this year, compared with 2.8 in 1993 and 2.6 in 1992.

IBM Reclaims Patent Lead

Washington Post, Jan. 13 -- It is one of the many scorecards used to rate the technological prowess of nations: Whose company won the most U.S. patents last year? To the chagrin of the home team, Japanese names have taken the top spot every year since 1985. Now a much-sullied American player -- IBM -- has sprung into the lead, with 1,088 of the certificates in 1993. Japanese firms were still strong: Toshiba Corp. was second and Canon Inc. was third.

New AMD Chip Plant

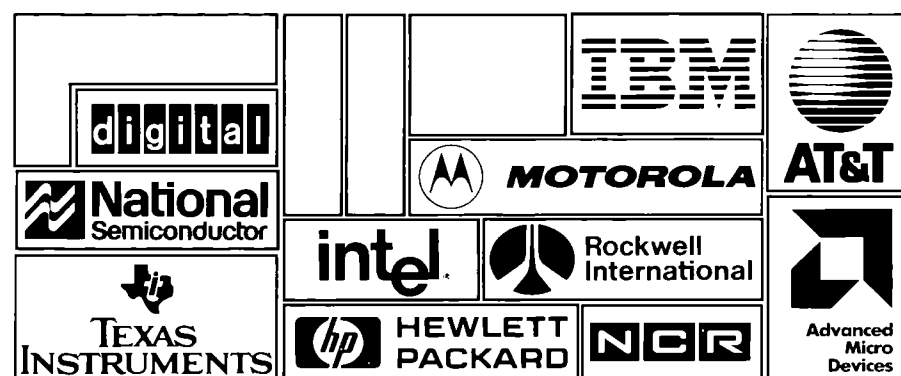
Solid State Technology, December 1993 -- Advanced Micro Devices is constructing a 700,000 sq. ft. submicron semiconductor manufacturing and office complex in Austin, TX. Known as Fab 25, the new facility will cost between \$750 million and \$1 billion when fully equipped. It will incorporate the latest advances in wafer fab technology processes from AMD's Submicron Development Center in Sunnyvale, CA, its existing Austin operations, and SEMATECH.

From laggards to leadership in chip manufacturing technology

Austin American-Statesman, November 1993 -- The consortium (SEMATECH) supported work at Micron Corp. of Peabody, Mass., for an advanced tool to repair "masks," which are used in the lithography process in which detailed patterns are traced into silicon wafers. SEMATECH's help, said Micron

President Nick Economou, enabled it to develop a leading-edge device that will be needed to make the next generation of advanced chips. Advanced tools and processes have enabled U.S. companies to move from laggards to leadership in chip manufacturing technology. SEMATECH also gets credit in the industry for improving communication between equipment manufacturers and chip makers.

SEMATECH member companies make up more than 75 percent of the semiconductor manufacturing base in the United States.



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SEMATECH UPDATE

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SEMATECH launches R&D 'thrust' programs that align with national technology roadmaps

SEMATECH has taken decisive steps to align its efforts with the national semiconductor technology roadmaps with the formation of several new research and development areas, or "thrusts."

The national roadmaps - an unprecedented cooperative endeavor by the U.S. semiconductor industry, federal laboratories and academia - has defined technological requirements for the next 15 years. The roadmaps are integral to ensuring the U.S. remains competitive in the worldwide chip industry.

SEMATECH has championed the effort since last year, acting as a key facilitator to bring together members of the semiconductor community. In the long run, this technology influence activity is expected to bring far more resources to bear on American competitiveness than SEMATECH could ever expend.

Additionally, SEMATECH intends to be fully involved to ensure that the roadmaps are diligently reviewed and updated.

The new R&D thrust areas at SEMATECH uniquely position the consortium to solve technical problems that are well beyond its initial challenge of advancing core wafer fabrication processes. They encompass both the front-end and back-end processes of chip making, and focus specifically on materials, technical computer-aided design, electronic packaging and testing.

"The wafer fabrication process will remain SEMATECH's primary focus through the end of the century," said Sam Harrell, SEMATECH executive vice president and chief strategy officer. "However, in 1994 these new thrusts will account for approximately 30 percent of our work and contribute significantly to our ultimate goal of helping the domestic semiconductor industry achieve a wide and lengthening lead in the global marketplace."

Other key strategic elements of SEMATECH's plan to align with the roadmaps and meet its members' needs over the next five years include:

- Finish the .25 micron technology program, often referred to as SEMATECH's Phase 4, on schedule, within budget and with quality by the end of 1994;
- Integrate environmental, safety and health objectives into all technical programs;
- Continue to develop a national lithography strategy;
- Provide and execute an operational plan that balances short-range and long-range efforts. (The guideline focuses 80 percent of resources on the current technology phase and 20 percent on even more advanced phases;)
- Integrate and leverage all the programs, in particular the long-range programs, with universities and federal laboratories.

SEMATECH is widely considered to be a successful national experiment. It has played a key role in mobilizing national efforts to not only survive foreign competitive advances in semiconductor wafer manufacturing technology, but to regain parity. □

Chemical safety symposium addresses environmental issues

Representatives from the semiconductor industry, the government, academia and medical communities, as well as environmental and labor organizations recently participated in a chemical safety workshop in Austin.

Approximately 100 people from across the country attended the workshop to discuss safe substitutes for chemicals currently used in the lithography process in semiconductor manufacturing.

"This symposium is a good example of how industry is working with various communities on technical issues identified in the semiconductor environmental roadmap," said H. Ray Kerby, SEMATECH's director of environment, safety and health programs.

"The section of the roadmap focusing on people issues emphasizes the importance of continuing to reduce employee and contractor exposure to process chemicals," Kerby explained. "Bringing together

representatives from the health and medical fields, with industry and chemical suppliers is one of the ways in which the industry is working to solve potential problems." □

Peter Freeman, (left) a SEMATECH lithography manager, discusses safe chemical substitutes with Claudia O'Brien and John D. Cox. O'Brien is with the U.S. Environmental Protection Agency's Design for the Environment Program in Washington. Cox is president of the Semiconductor Safety Association.



INDUSTRY ISSUES

SEMATECH: A MODEL OF CONTINUOUS IMPROVEMENT

William J. Spencer
President and Chief Executive Officer
SEMATECH

When SEMATECH was given birth in 1987, many onlookers felt it could not succeed because American competitors would not work effectively together, and American industry and American government simply could not put age-old differences aside and cooperate.



Thanks to the pioneering efforts of industry giants like Charlie Sporck of National

Semiconductor and the late Bob Noyce of Intel, and the bipartisan support from Congress and the Reagan, Bush and Clinton Administrations, SEMATECH stands today as a viable model of American industry-government collaboration. In fact, SEMATECH membership has surfaced in trade talks with the Japanese and Europeans recently which we read as a clear indicator that we must be doing something right.

We are increasingly asked how SEMATECH beat the odds and became a success. Our answer often surprises: We keep learning from the mistakes of history and by our own missteps. Creating such a continuous improvement culture is a natural for semiconductor companies due to the fast-paced technological change and the global competitors drawn to such a strategic industry. If SEMATECH had tried to stand still, it would have been run over very quickly. By using change as an ally rather than an enemy, SEMATECH has been able to maintain its flexibility and avoid a rigid "not-invented-here" mentality.

Lesson Learned #1 -- Start with a clear and focused mission: SEMATECH is focused on precompetitive semiconductor manufacturing technology. Period. Our job is to get the U.S. number one in that area and keep us there. Such a focus makes the tough budget decisions easier. We know we can't afford to be all things to all people. We have to drive for consensus among our members and the government, and then we have to deliver. On-time. On-target. On-budget. It all starts with a focused mission.

Lesson Learned #2 -- Establish clear measures of success: Our mission says we want the U.S. number one. The role that SEMATECH has played in regaining the marketshare lead in both semiconductor equipment and semiconductor sales is certainly in the eye of the beholder. The American firms that fought the economic battles on a global front and won certainly deserve the lion's share of credit. But SEMATECH played an important supporting role. Even more telling is the return-on-investment calculations reported to SEMATECH by our member companies. Last year, our member companies received, by their own accounting, about \$2 for every \$1 invested in SEMATECH. If SEMATECH were not a good investment, the member companies would have ordered the doors closed years ago. And without member companies willing to invest in SEMATECH, the government investment in SEMATECH would be questionable at best.

Lesson Learned #3 -- Learn from your mistakes and move on: When SEMATECH first started, we would not allow the American equipment and materials supplier companies to sell tools containing SEMATECH-developed technology to non-member companies for set periods of time. We learned that was a mistake and we changed it because we realized that those American firms had to become world-class suppliers in order to succeed. They had to be able to sell and service their products to Europe and Asia in order to meet the needs of their customers.

Lesson Learned #4 -- Collaborative ventures like SEMATECH should attack high-risk, high-return projects: If a manufacturing technology project is too risky for a single company to undertake, then that project may find a home at SEMATECH. Three SEMATECH programs -- phase shift mask, chemical mechanical planarization, and acid reprocessing/recycling -- are prime examples of high-risk, high-return projects tackled by SEMATECH. In each case, the collaborative pooling of resources by industry and government

(see Continuous Improvement on page 3)

ACCOMPLISHMENTS

HIGHLIGHTS OF SEMATECH PROGRAMS AND PEOPLE

Bob Galvin receives Noyce Award



Robert Galvin, left, long-time Motorola executive and chairman of SEMATECH's board of directors, receives the 1993 Robert Noyce Award from Gil Amelio, CEO of National Semiconductor and chairman of the Semiconductor Industry Association.

Galvin began his career at Motorola in 1940, and was named chief executive officer in 1959. He stepped down as Motorola's chairman in 1990, but continues to serve as a full-time officer of the company as head of the board's executive committee.

The Robert N. Noyce Award was created by the SIA board of directors in 1990 to honor the memory and achievements of the co-inventor of the integrated circuit. Noyce, a co-founder of Intel, was a leader in the semiconductor industry's efforts to affect public policy and promote actions aimed at improving

American semiconductor competitiveness. □

Robert W. Galvin, chairman of Motorola's executive committee and chairman of SEMATECH's board of directors, has received the 1993 Robert N. Noyce Award from the Semiconductor Industry Association.

The prestigious award - created to honor the late industry pioneer who became SEMATECH's first chief executive officer - was bestowed upon Galvin for his leadership in making Motorola a premier provider of communications equipment, semiconductors and automotive electronics.

Galvin was also recognized for his leadership over the past three years as chairman of the board of SEMATECH.

"At SEMATECH, Bob's years of experience as a highly regarded and successful businessman have provided visionary leadership to the board," said CEO William J. Spencer. "He has made his time available to SEMATECH in an unselfish way, and he is a strong voice for continued cooperation between government and industry."

According to Andrew A. Procassini, SIA president, "Bob Galvin is one of the true pioneers of the U.S. semiconductor industry. Throughout his more than 50 years at Motorola, and his service as chairman of SEMATECH, Bob Galvin's leadership and commitment to the industry are unparalleled."

Continuous Improvement

(continued from page 2)

helped make the risk much more affordable. If SEMATECH takes, for example, a \$4 million project and discovers the technology is not feasible, that saves our member companies and many government researchers the time and cost of discovering the "dead end." When I joined SEMATECH, I told the news media that if they were looking for mistakes to come to SEMATECH. We would make them, and we would learn from them. You cannot lead a group of world-class researchers by allowing them to only pursue "safe" projects. You must take risks to extend the frontier of any technology.

Lesson Learned #5 -- Continuous improvement is vital to success: SEMATECH has been, and will continue to be, on a life-long journey of continuous improvement. SEMATECH began as a collection of American competitors who did not trust each other or the supplier companies they had to rely on for success. We not only didn't trust

each other, we also didn't trust the government. Today, we have emerged as a group of precompetitive collaborators who understand the value of true teamwork. The National Semiconductor Technology Roadmap is a testimony to the power of collaboration. American manufacturers and suppliers joined with the leading researchers/technologists from the departments of energy, commerce, defense, the Administration and universities to craft a sensible, workable blueprint into the 21st Century.

With the help of Congress and the Administration, SEMATECH will continue on its continuous improvement journey. If history has taught us any lesson it is simply that you do not set the pace by standing still. We must keep challenging ourselves in order to maintain the momentum of American collaboration and cooperation. □

SEMATECH Update is a bi-monthly news report designed to keep Congress informed about developments at SEMATECH.

SEMATECH is a quality-driven team of America's best, establishing a new model for national cooperation in high technology.

SEMATECH's mission is to solve the technical challenges required to keep the U.S. number one in the global semiconductor industry.

Editor: Miller Bonner

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This newsletter is printed on recycled paper.

Author: Kerry A. Hanson at ostp
Date: 1/27/94 10:07 AM
Priority: Normal
TO: Barbara A. Ferguson
TO: Katherine B. Gillman
TO: Kerry A. Hanson
TO: Lionel S. Johns
TO: Henry C. Kelly
TO: JAMES C. TSANG
Subject: SEMATECH and Japan

----- Message Contents -----

FYI, I just received a heads-up from SEMATECH that in the next day or two the Wall Street Journal is going to run a story about Japanese interest in joining SEMATECH. This is evidently a result of the ongoing semiconductor negotiations between the Japanese government and the USTR. SEMATECH has not commented yet since they haven't received any guidance from the government.

Any action?

Kerry Hanson

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

April 13, 1993

MEMORANDUM FOR: SKIP JOHNS
SUBJECT: SEMATECH MEETING
FROM: MARK HARTNEY *ml*

The items that Bill Spencer would like to discuss include:

- Future directions for SEMATECH
- Extending government-industry cooperation to other areas of semiconductor R&D, particularly as identified by the Semiconductor Industry Association (SIA) in their 15-year roadmap
- The SIA's proposal to establish two levels of interaction:
 - a high level policy group
 - a working level group to update the SIA roadmap as needed

The SIA Technology Committee held a meeting on Monday to develop their ideas about the best way to implement these activities. Bill Spencer will provide us with the output from that meeting.

The other attendees will be Mark Nelson, the government affairs officer for SEMATECH, and Clark McFadden from Dewey, Ballantine, which represents SIA.

They also plan to visit Dwayne Adams at ARPA and Bill Perry and John Deutsch at DOD on Thursday, in addition to a visit to the International Trade Commission.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

April 7, 1993

MEMORANDUM FOR: JOHN H. GIBBONS, SKIP JOHNS ✓
SUBJECT: MEETING WITH BILL SPENCER, SEMATECH CEO
FROM: MARK HARTNEY MH

Bill Spencer will be in town next week, and has written in the past about setting up a meeting. Since the Semiconductor Industry Association will meet next Monday to approve the implementation plans for their "roadmap", it would be a useful opportunity to discuss their plans and mechanisms for an interface between government and industry on this topic. Since Bill has the experience of the government-industry interaction of SEMATECH, he would be a good person to discuss the best ways to achieve this.

He is available after 9:30 am on Wednesday the 14th, and I have tentatively scheduled the conference room for 11:00 am. That time was open on your respective calendars as well.

Topics for the meeting would include:

- 1) Letting him know about the formation of the Interagency Working Group on Electronics, as part of the FCCSET PMES Committee.
- 2) Discussion about expanding the scope of the Advisory Council on Federal Participation in SEMATECH to include other activities of the Interagency Working Group and the SIA's roadmap.
- 3) General issues related to government-industry interaction and his experiences.

Please let me know if you are able to attend this meeting, and if there are other people, particularly outside OSTP who should also be invited.

- This put the in your calendar
+ calendar and summary

4/14/93
11:00am

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

SHG

Bill Spencer sent this to me altho clearly this is of special importance to the broad OSTP strategy.

I'm sure you know Bill Spencer. I personally have been immensely impressed by Sonotech's progress but even more impressed by Bill's broader insights as to what principles are important in the tech transfer - generic technologies initiatives.

He has much wisdom to offer and he presents lucidly and insightfully.

I would strongly encourage that he be invited to meet with you and other senior staff at an early stage.

SHG

SEMATECH2706 MONTROVIA DRIVE
AUSTIN, TEXAS 78741-6499
(512) 356-3500

March 22, 1993

D. A. Henderson
Associate Director for Life Sciences
Office of Science & Technology Policy
Executive Office of the President
Old Executive Office Building, Room 494
Washington, DC 20506

Dear D.A.:

I'd like very much to spend some time with you, Jack Gibbons, and others at OSTP on the direction for SEMATECH in the future. The talk that I gave to PCAST last fall has been extended to include the SIA roadmap for semiconductor technology as well as new directions for SEMATECH resulting from a SEMATECH Board of Directors strategy meeting in February. We'd like to extend the kind of cooperation that has existed between government and industry in SEMATECH to all of the semiconductor R&D activities, both public and private. We feel the nation is spending about five billion dollars in semiconductor R&D. Roughly 80% of it comes from the private sector. It is my belief that the coordination of the spending should be done through OSTP. It probably should involve Bill Perry, John Rollwagen, Laura Tyson, and others.

I've attached a copy of a letter that the SIA sent to Mr. Gore, outlining the SIA's proposal for future interaction. We would certainly appreciate your input on how to proceed with our future plans.

Let's try to get together at the earliest possible date to do this. I would be willing to make a trip back to Washington any time to discuss our plans with you, Mr. Gibbons, and others, and get your input.

With best regards,



William J. Spencer
President and Chief Executive Officer

WJS/ahe
Enclosure



SEMICONDUCTOR INDUSTRY ASSOCIATION

4300 Stevens Creek Boulevard - Suite 271
San Jose - CA 95129 - (408) 246-2711

FAX (408) 246-2800

March 10, 1993

The Honorable Albert Gore
Office of the Vice President
Old Executive Office Building
Washington, D.C. 20501

Dear Mr. Vice President:

You have long advocated that effective coordination between the public and private sectors can advance U.S. interests for national prosperity and security, improve the government output of technology and enhance the competitiveness of U.S. industry. This is particularly true in an area as fundamental and critical to America's future as semiconductors.

The U.S. semiconductor industry is prepared to work with the Administration, industry and the academic community to coordinate efforts in pre-competitive semiconductor technology development to facilitate continued leadership in this vital field. Our industry has become the first U.S. industry to recapture leadership from the Japanese by working in cooperation with the U.S. government over the last decade. Advanced semiconductor technology is today, and will be in the future, the driving force behind the electronics industry. The electronics industry is America's largest employer. Strengthening semiconductor technology can make a major contribution to creating jobs and enhancing competitiveness in the equipment segment of this industry.

Based on months of joint analysis, industry, government and academic representatives working together have devised a 15-year vision for technology development in semiconductors. In the form of a national roadmap, this document can serve as a guideline and stimulus for research and development activities.

In order to seek the broadest understanding of the roadmap and facilitate constructive, positive action, a mechanism is needed to promote interaction among the various groups in the United States engaged in semiconductor technology development and to move beyond the traditional advisory process. This should involve two levels of activity. First, a senior level group comprised of government technology policy makers with industry and academia representatives should assess progress, identify common

03/11/93 11:20

408 793 8888

NSC CORP.

003/003

The Honorable Albert Gore
March 10, 1993
Page Two

objectives and resolve policy issues. Second, a working group should develop a workshop process that will review and update the technology roadmap at appropriate intervals.

The U.S. semiconductor industry is prepared to move forward immediately with the creation of such an infrastructure. To be effective, it will require an interagency perspective from the government as well as a capability to act on cross-cutting initiatives that go beyond the mission of individual agencies or departments.

The U.S. government and the semiconductor industry have already formed one of the most effective partnerships in high technology through the creation of SEMATECH. A partnership is now needed to mobilize our nation-wide talent and to address the entire range of semiconductor technology complexities that will confront us as we face the challenges of leadership in the information age.

The Semiconductor Industry Association would like to meet with you, Science Advisor Gibbons and others as soon as reasonably possible to pursue this common endeavor that we believe holds so much promise.

Sincerely,



Dr. Gilbert F. Amelio
Chairman, SIA Technology Strategy Committee
President and CEO,
National Semiconductor Corporation

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

April 13, 1993

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They also plan to visit Dwayne Adams at ARPA and Bill Perry and John Deutsch at DOD on Thursday, in addition to a visit to the International Trade Commission.

What do you do if U.S. has no wafer supply -

5B. R&D on 20-25B sales

80% private

1 BB DOE, DoD, DOE, NSF

High level group Small 10-15 people
once a year

Commercialization not a part

Lithography

1.2B U.S., 100 MM

Rebecca Henderson] Harvard

Design & Manuf.

600 Comp. \$10 < AAA

market intro
U.S. weakest

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

April 19, 1993

MEMORANDUM FOR: SKIP JOHNS, TIM NEWELL

SUBJECT: MEETING WITH ED MCGAFFIGAN

FROM: MARK HARTNEY *ml*

I met with Ed last Friday (April 16) to discuss semiconductor industry issues, including the SIA roadmap, the Interagency Working Group and ways to build a closer tie between government and industry.

He emphasized that in the letter from Sen. Bingaman to Dr. Gibbons they would like to see activity beyond the review of Federal activity in semiconductors. The letter states that OSTP and the committee should go beyond the 'cross-cut' to:

"eliminate duplicative programs, assign the agencies responsibilities consistent with their core competencies or comparative advantages, identify the opportunities for partnerships with the private sector's annual \$4 billion plus semiconductor research effort and devote an increased fraction of the federal research enterprise to ensuring the seven critical competencies [identified by SIA] are addressed and to partnership activities."

Ed was encouraged with the choice of Lance Glasser from ARPA to head the Interagency Working Group, and was interested in keeping up with their progress, particularly in regards to the assessment of activity as described above.

The second key issue was the proposals which SIA has made to establish a high-level policy framework for dialogue between industry and government. The emerging consensus has been to re-configure the Advisory Committee on Federal Participation in SEMATECH. This could be done through the Defense Authorization Act, and Ed is willing to do this. SIA will be preparing a proposal of what they would like to see in terms of membership and charter for the "new" group, and should have this ready in a few weeks. The current group has an exemption from the FACA sunset provision - they will remain in place as long as there is government funding for SEMATECH, but they would probably like to be able to hold closed meetings. Ed felt that some additional FACA exemption might be possible. Currently OSTP is not represented on this committee, but could be added with the new charter. He also noted that the committee chair should remain with DOD, or possibly be at OSTP, but did not think there would be support for a shift to Commerce.

His alternative suggestion was to use the Technology Advisory Committee's which are serve for Commerce and the USTR. There was a semiconductor advisory committee, but this has been absorbed into a larger group. The SIA was informed of this option, but hasn't pursued it - they would like a forum just for microelectronics without the distraction of additional activities.

As an aside, Ed inquired about any effort to coordinate foreign technology assessment between different agencies, and to disseminate this to industry. This topic had come up during the Critical Technology Panel, but little was done with it. Tom Kalil has some experience in this area, but it is presumably not high on anyone's list currently.

TO: Tom Ratchford
FROM: Bill Spencer
DATE: March 30, 1993
SUBJECT: SIA/SEMATECH Issues

Enclosed are two copies of:

- the SIA (National) Workshop Conclusions
- SEMATECH's 1992 Annual Report
- a letter from the SIA to Vice President Gore

George Scalise and Gil Amelio may have left the Gore letter with Skip Johns a week ago. The executive summary of the Workshop results gives you an idea of the scope of the document. The annual report can be skimmed for key ideas. George Scalise will be in Washington DC next week. I will be there on April 15th and 16th. We would be interested in discussing implementation of a national effort to fund the Workshop Conclusions, building on the SEMATECH model.

I hope we can arrange a time to get together.

cc: George Scalise
Eugene Wong



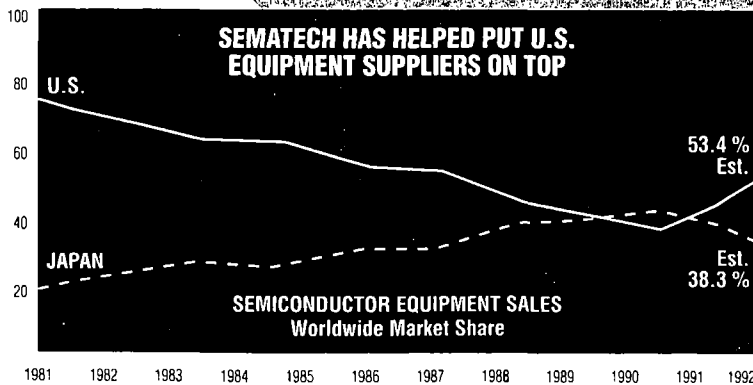
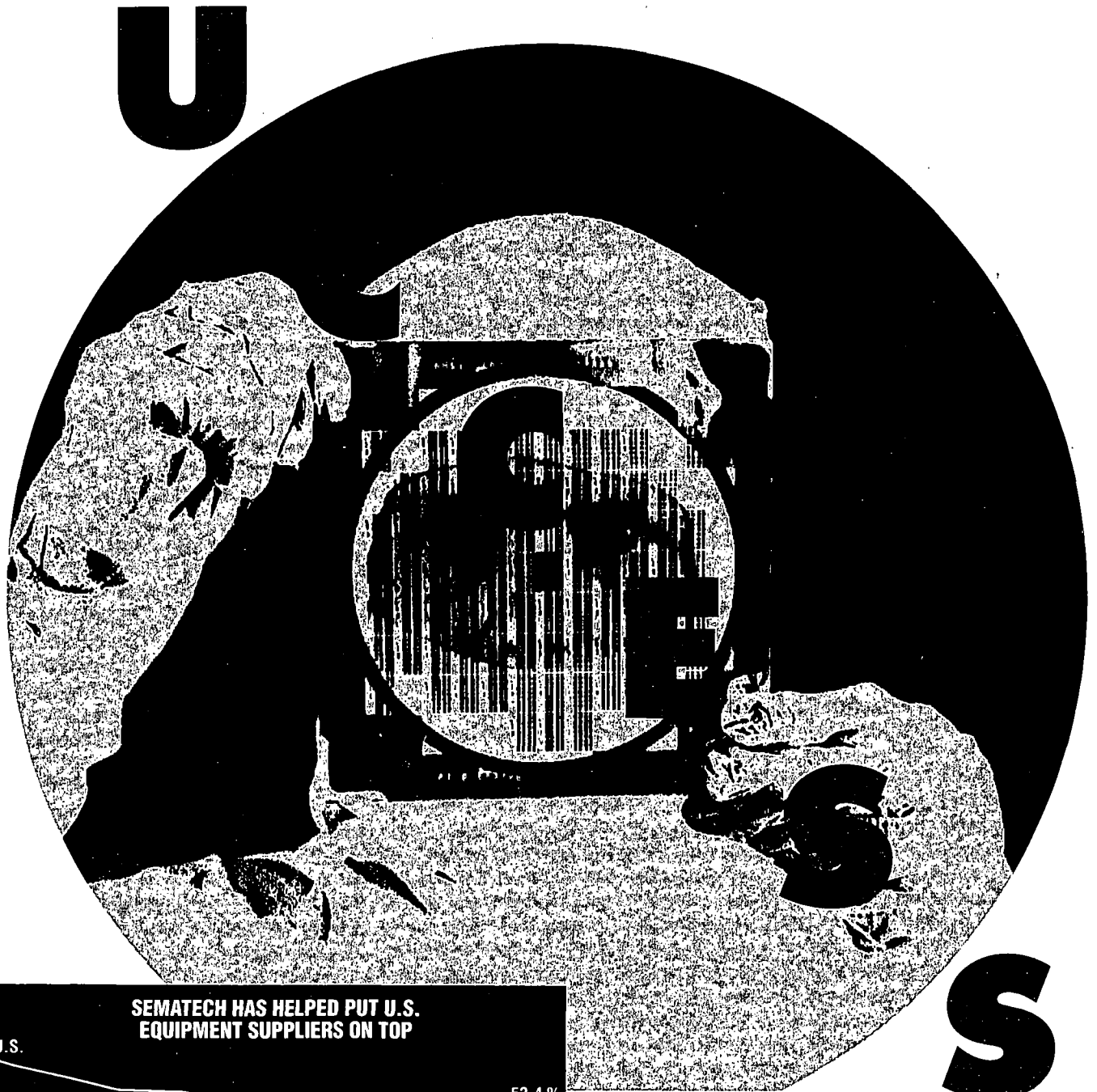
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SEMATECH



SEMATECH, as a technological catalyst, has brought U.S. semiconductor suppliers and manufacturers together to improve the basic tools and processes necessary in restoring U.S. competitiveness in an industry critical to our national economy and national security.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

April 7, 1993

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Please let me know if you are able to attend this meeting, and if there are other people, particularly outside OSTP who should also be invited.

*The put this on your calendar
+ schedule at meeting*

SEMATECH2706 MONTOPOLIS DRIVE
AUSTIN, TEXAS 78741-6499
(512) 356-3500

March 22, 1993

D. A. Henderson
Associate Director for Life Sciences
Office of Science & Technology Policy
Executive Office of the President
Old Executive Office Building, Room 494
Washington, DC 20506

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With best regards,



William J. Spencer
President and Chief Executive Officer

WJS/ahe
Enclosure

**SEMICONDUCTOR INDUSTRY ASSOCIATION**4300 Stevens Creek Boulevard - Suite 271
San Jose - CA 95129 - (408) 246-2711

FAX (408) 246-2830

March 10, 1993

The Honorable Albert Gore
Office of the Vice President
Old Executive Office Building
Washington, D.C. 20501

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The Honorable Albert Gore
March 10, 1993
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The Semiconductor Industry Association would like to meet with you, Science Advisor Gibbons and others as soon as reasonably possible to pursue this common endeavor that we believe holds so much promise.

Sincerely,

A handwritten signature in black ink, appearing to read "Gilbert F. Amelio". The signature is stylized and slanted to the right. To the right of the signature, the date "14/93" is handwritten.

Dr. Gilbert F. Amelio
Chairman, SIA Technology Strategy Committee
President and CEO,
National Semiconductor Corporation