I. Introduction

It is a pleasure to be here today to discuss the great importance of cooperative research ventures to the future of U.S. industry.

Through technological cooperation we can begin to restore U.S. technological leadership across the industrial spectrum. I firmly believe that such intra-industry and inter-industry cooperation is a policy imperative for our country, for U.S. business, and for the millions of people whose livelihoods depend on a globally competitive America.

My message today is simple and straightforward: Time is running out for us to take action to encourage both basic industries and high technology industries to develop needed technologies by pooling scarce scientific and engineering talent and other resources -- not only for their private gain, but also in the national interest.
II. Background

Over the last dozen years, there has been growing concern among thoughtful Americans about the decline of the U.S. position in a number of important and visible world markets. This concern has not been misplaced. The U.S. position of leadership in many fields and markets has increasingly been challenged, often successfully, by other nations. Japan is but the most obvious case in point and its challenges have covered a wide range of technological sophistication from automobiles to the most advanced electronic and computing devices.

To some degree, the decline of U.S. post-World War II market dominance in many industrial areas was probably inevitable. First, the rapid rise of the international enterprise catalyzed the process. Second, the unprecedented open attitude of the U.S. government and the U.S. science establishment with regard to the international diffusion of scientific achievements provided additional fuel. Third, U.S. institutions of higher learning welcomed, even sought, students from around the world. Finally, given the U.S.' openness with regard to its research programs and results, certain nations, most notably Japan, concentrated disproportionate resources on exploiting scientific outcomes by way of market-oriented innovation. This because they were significantly relieved of the necessity to "do" their own science.
All this was perhaps as it should have been — up to a point. That is, on balance the U.S. benefited dramatically from its science and technology transfer activities for perhaps 20 or 25 years following the end of World War II. It could probably have continued to enjoy this situation but for two policy "failures" — public and private. First, the U.S. was increasingly wasting the resources necessary for research and development through continued duplication of effort with regard particularly to basic and applied research. Both public and private attitude and policy contributed to this waste — as it still does. Second, U.S. firms failed to acquire the rights to the technologies and techniques developed overseas on the basis of U.S. science.

These failures have been compounded by the fact that overseas competitors profit from massive government, legal, and financial support, and from government-encouraged intercompany cooperation. The deep pockets of these firms and their governments can buy both new technology and market share. American firms are at best ill-equipped to counter such efforts individually.

But past need not be prologue. At last the U.S. is coming alive to at least some of the problems it faces with regard to international competitiveness. One of the principal manifestations of this awareness is increased interest within both U.S. industry and government in cooperative research ventures. That's good but a deeper understanding is required.
The need for cooperative research, however, is not simply rooted in the existence of increasing international competition. It is crucially important to understand that the need for technological cooperation would have arisen whether the Japanese threat existed or not.

The long-term vitality of any industry -- and certainly of high tech industries -- rests squarely on the *existence of a large number of competitors* -- individually innovating and creating new products and services. Yet, The history of most industries indicates a natural tendency toward consolidation into fewer and fewer firms as the need for efficiency and scale economies in production gains ascendency. Indeed, the Japanese based their semiconductor industry strategy on this phenomenon.

[quote from *Inc.* on semiconductor industry and smaller "niche-oriented" companies]

That's good news. But the trend of consolidation into ever bigger, less innovative organizations is a fundamental fact that can't be wished away. And it is reinforced and accelerated by the increasing capital intensity of industrial growth. Each new wave of technology has required a greater commitment of capital as well as intellectual resources.
Most U.S. electronics firms suffer from scarce capital resources, high capital costs relative to international competitors, and a rapidly growing need for more capital to develop the new technologies needed for competitive survival.

As to intellectual resources -- one example -- a 1981 study reported 54,000 job openings for graduates with degrees in computer science. Buy only 13,000 graduates with the necessary skills to fill those positions. This 75 percent shortfall will no doubt continue for the foreseeable future.

Paradoxically, at the same time we suffer from the scarcity of capital and intellectual resources, we also suffer from this continuing, enormous, needless duplication of technology efforts. For every corporation to labor away at basics is a terrible waste to society. A base technology can be exploited in the form of many different applications to promote effective competition across a broad spectrum of final products and services and markets. That's productive. That's pro-competitive.

What is required is a national policy which fosters pro-competitive cooperation in technology development. Such a policy is, as I have noted, necessary to match the competitive forces from overseas, but more fundamentally, it is absolutely necessary to assure a highly competitive and innovative industry structure far into our country's future.
II. The Nature and Benefits of Cooperative Research Ventures

Let me briefly review the nature and benefits of cooperative research. Properly constituted, a cooperative research venture is a joint activity which allows firms to share advancements in basic technology which they can then individually apply to new products, processes, and services. While a cooperative research venture can obviously cut the costs of certain types of research and thereby free resources for other development activities, it can also expand the technological possibilities available to the participating firms. The benefits to participants, then, are:

A better definition of R&D needs and pitfalls;

A reduction in the needless duplication of R&D;

A more efficient utilization of scientific and technical talent.

And an expanded scope of technological possibilities.

It is this last result which has a dramatic effect on both productivity and international competitiveness. Not only the participants, but the whole economy benefits. And the economic benefit can be even greater if there are mechanisms and
incentives to further leverage the technology produced by the venture. For example, although participating companies should have initial rights to the technology and receive preferential treatment, if the technology is ultimately also made available to other companies -- in particular to small companies -- the fallout throughout the economy, in terms of additional innovation and jobs -- and indeed in terms of such global concerns as public deficits and the balance of payments -- would be striking.

It is worth noting at this point that the fundamental idea of cooperative research ventures is by no means new in the United States. Examples of cooperative research ventures can be cited going back, in some cases, 50 or more years. There is the Research and Test Department of the Association of American Railroads (which may well be the oldest cooperative research venture), the Institute for Textile Technology, and the Electric Power Research Institute. More recently, my company joined with several other firms to form the Microelectronics and Computer Technology Corporation (MCC).

III. Barriers

That is a modest list, however, in view of the potential national and individual benefits just presented. So why isn't technological cooperation a way of life for us?
There are at least two very important reasons:

The first is our business culture, which evolved in an environment of a huge and expanding domestic market, in which competition for most U.S. corporations was mainly with other U.S. companies. Other inhibiting aspects of this business culture are an emphasis on short-term investment horizons -- in itself a complex subject -- and a misplaced view of what is involved in maintaining a proprietary position as an industry matures. But our attitudes have become anachronistic as the world we compete in has changed fundamentally in the last decade. The changes will accelerate even more over the next 20 years.

The second reason for the lack of cooperation, however, is the fear of inadvertently violating our century-old antitrust laws.

Even though research cooperation is typically lawful, the uncertainties in the interpretation and application of U.S. antitrust laws are a major obstacle to pooling adequate resources in today's environment. Very little official guidance exists as to either what constitutes a lawfully-structured cooperative research venture or what conduct will ultimately be considered lawful by the courts. Thus, participants in such ventures must proceed at their peril.
IV. The Need for Anti-Trust Clarification

Both the historical absence of significant numbers of cooperative research ventures and my own company's experiences over the last 20 years demonstrate the over-deterrence of an ambiguous antitrust environment. In short, the change that is needed is from laws that might permit technological cooperation -- to legislation that encourages it.

The Congress appears ready to respond -- especially the House which took still another step this morning. The large number of bills that have been introduced in this regard over the past year or so is encouraging. There is no need to go over here the many differences, subtleties and in some instances misguided rationale of the various approaches taken in these legislative initiatives. But I do want to elaborate for a moment on the rationale and importance of one particular approach -- one which Control Data firmly supports based on experience.

This is the approach of having legislatively prescribed standards within which a cooperative venture is assured of being in compliance with the antitrust laws.
This is the only approach which addresses the root causes of the current problem and the basic public policy objective of widespread technological cooperation. The most important point in this whole matter, it seems to me, is to encourage cooperative R&D without dismantling the basic body of antitrust law which has served this country so well. The approach of having legislatively prescribed standards does precisely that. Such an approach doesn't seek to change our antitrust laws -- it doesn't even seek special exceptions; rather, it clarifies -- or specifies in advance, if you will -- the "rule of reason" as it relates to cooperative research. Under this approach, Congress would prescribe statutory criteria for lawfully organizing and conducting joint R&D ventures which, if met, would mean rule of reason, and thus would shield a venture from antitrust attack. This would remove existing uncertainty because, unlike other proposals, companies would know in advance how to organize and conduct such ventures.

I hasten to add that the "standards" approach is not uniformly endorsed. For example, from what I've seen, the broad-based generic trade associations appear to be more interested in a general detrebling of damages in antitrust cases than in encouraging cooperative research. However that may be, the actual criticisms of the "standards" approach vary -- the kindest characterization being that the concept is naive and
unworkable. This simply isn't so. Fair, simple standards can be spelled out. They cannot cover every conceivable circumstance and they have no need to do so for there is always the fallback to the basic body of anti-trust law. Standards are simply a workable way of encouraging more research cooperative ventures than we will otherwise have. I strongly believe that Congress should place the priority of antitrust clarification ahead of the priority of damage relief. Tinkering with remedies -- and the controversy that involves -- is unnecessary. Clarifying what constitutes lawful cooperative research may seem like hard work but in the long run it is both simpler and more effective.

One such set of standards -- only four, I might add -- could be the following:

- First, the protected activities of a venture would be limited to research and development, as precisely defined -- no joint development of a common product would be included nor, obviously, would joint production or marketing activities.

- Second, all participants in a project that led to the development of a useable technology would be entitled to independently use it, on an equal basis to other participants.
Third, the participants in a project could not use the venture as a device to adversely impact competition in either existing or future product or service markets. For example, they could not agree to restrict their independent research and development or their use of either pre-existing technology or technology developed by the venture; they could not agree to any restrictions on the manufacturing or marketing of any products or services, whether unrelated to or resulting from the venture; they could not exchange information relating to their sales of existing products or services.

Fourth -- and finally -- following a specified time period of exclusivity, the technology resulting from the venture would be made available to small businesses on the payment of reasonable royalties.

A venture that was in compliance with these four simple standards could not, under any reasonable hypothesis, cause injury to either the competitive process or to consumers. In fact, the fourth, licensing, renders irrelevant any concerns about potential market abuse because of technological advantage.

However, as it happens, enormous and unnecessary controversy has arisen over the concept of licensing to non-participants. It has even had the honor of being labeled "egregious" by the former Assistant Attorney General for anti-trust. Others have been less kind.
Some of the criticism arises out of fear, some out of a simple desire not to be any more constrained than necessary, but much more out of a failure to understand the kind of research involved. One must start with the understanding that cooperative research ventures to be workable depend utterly and inescapably on this premise:

Cooperation in research and development only makes sense where firms will add further value to a jointly developed technology and in this fashion achieve marketplace distinctiveness. And I do not mean cosmetic distinctiveness. It means incorporation of the technology in a new and totally different process or product. Otherwise, you simply have joint product development -- and I see no reason at this time to address the antitrust laws as they relate to that kind of activity. Once this precept is understood, fear of licensing (under reasonable terms) simply disappears.

With that as a context, let me go back to why, from a national policy point of view, encouraging licensing of such jointly developed technology is desirable.

Our broad policy goal is not simply to encourage R&D cooperation, however necessary that may be. Rather, the broader goal is to increase the competitiveness of U.S. industries in world markets, to promote economic growth, and thereby to create jobs. Development of the technology solves only half of the problem. The other half -- perhaps the more important half -- is its diffusion and use.
Consider the position of small or start-up businesses. By and large, many of these lack the resources to even consider joining a cooperative research venture; even working together, several such firms could probably not make (or justify) the large commitments that today's environment demands for certain technologies. But there is considerable "fall out" technology that inevitably arises from any major research project. Small companies are particularly adept at picking up on this "fallout" of advanced technology and rapidly applying it in the creation of new products and services. In so doing, they greatly expand our nation's competitive base. Thus, it would be a highly desirable national policy to make technology created by R&D joint ventures readily available to others -- with reasonable rewards to the creators.

So, allegations that a licensing standard "will destroy the innovation incentives of the patent system" are simply untrue, ivory-tower economic posturing. The only "real world" economic evidence as to the impact of increased cooperation is Japan's experience -- hardly a casebook example of a slowed rate of innovation! A licensing requirement is more accurately viewed as an aid in assuring that cooperation is particularly encouraged with regard to the right kinds of activities rather than as some threat to the process of innovation.
Conclusion

Well, rather than engage in a lengthy summary let me conclude with some slightly paraphrased questions from the beloved soap operas of radio and TV.

- Are the desires of Uncle Sam and Auntie Trust incompatible?

- Can a small-town company find happiness with a big-time partner?

- Will cooperation rekindle the passions of Innovation?

- Will Clarity be fathered along the Potomac?

- What will happen when all the chips are down? Will we be here to tune in tomorrow?

I believe we will. What the Congress does may not be precisely what any one of us thinks is the best, but there is an opportunity to improve the basic functioning of U.S. industry -- we must believe it won't be lost.