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FEDERAL TELECOMMUNICATIONS LAW:

A LEGISLATIVE HISTORY OF

THE TELECOMMUNICATIONS ACT OF 1996

PUB. L. NO. 104-104, 110 STAT. 56 (1996)

INCLUDING

THE COMMUNICATIONS DECENCY ACT

Volume 12
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SUMMARY TABLE OF CONTENTS

HeinOnline -- 12 Bernard D. Reams, Jr. & William H. Manz, Federal Telecommunications Law: A Legislative History of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) including the Communications Decency Act iii 1997

HeinOnline -- 12 Bernard D. Reams, Jr. & William H. Manz, Federal Telecommunications Law: A Legislative History of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) including the Communications Decency Act iv 1997

INTRODUCTION

AN OVERVIEW OF THE TELECOMMUNICATIONS ACT OF 1996

The "Telecommunications Act of 1996," signed into law on February 8, 1996, opens up competition between local telephone companies, long-distance providers, and cable companies; expands the reach of advanced telecommunications services to schools, libraries, and hospitals; and requires the use of the new V-chip technology to enable families to exercise greater control over the television programming that comes into their homes. This Act lays the foundation for the investment and development that will ultimately create a national information superhighway to serve both the private sector and the public interest.

President Clinton noted that the Act will continue the efforts of his administration in ensuring that the American public has access to many different sources of news and information in their communities. The Act increases, from 25 to 35 percent, the cap on the national audience that television stations owned by one person or entity can reach. This cap will prevent a single broadcast group owner from dominating the national media market.

Rates for cable programming services and equipment used solely to receive such services will, in general, be deregulated in about three years. Cable rates will be deregulated more quickly in communities where a phone company offers programming to a comparable number of households, providing effective competition to the cable operator. In such circumstances, consumers will be protected from price hikes because the cable system faces real competition.

This Act also makes it possible for the regional Bell companies to offer long-distance service, provided that, in the judgment of the Federal Communications Commission (FCC), they have opened up their local networks to competitors such as long-distance companies, cable operators, and others. In order to protect the public, the FCC must evaluate any application for entry into the long-distance business in light of its public interest test, which gives the FCC discretion to consider a broad range of issues, such as the adequacy of interconnection arrangements to permit vigorous competition. Furthermore, in deciding whether to grant the application of a regional Bell company to offer long-distance service, the FCC must accord "substantial

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weight" to the views of the Attorney General. This special legal standard ensures that the FCC and the courts will accord full weight to the special competition expertise of the Justice Department's Antitrust Division--especially its expertise in making predictive judgments about the effect that entry by a bell company into long-distance may have on competition in local and long-distance markets.

Title V of the Act is entitled the "Communications Decency Act of 1996." This section is specifically aimed at curtailing the communication of violent and indecent material. The Act requires new televisions to be outfitted with the V-chip, a measure which President Clinton said, "will empower families to choose the kind of programming suitable for their children." The V-chip provision relies on the broadcast networks to produce a rating system and to implement the system in a manner compatible with V-chip technology. By relying on the television industry to establish and implement the ratings, the Act serves the interest of the families without infringing upon the First Amendment rights of the television programmers and producers.

President Clinton signed this Act into law in an effort to strengthen the economy, society, families, and democracy. It promotes competition as the key to opening new markets and new opportunities. This Act will enable us to ride safely into the twenty-first century on the information superhighway.

We wish to acknowledge the contribution of Loris Zeppieri, a third year law student, who helped in gathering these materials.

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TABLE OF DOCUMENTS

VOLUME 12

Section X: Past Hearings (Continued from Volume 11)

For ***Master Table of Documents*** of this set, please refer to ***Volume 1.***

HeinOnline -- 12 Bernard D. Reams, Jr. & William H. Manz, Federal Telecommunications Law: A Legislative History of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) including the Communications Decency Act vii 1997

HeinOnline -- 12 Bernard D. Reams, Jr. & William H. Manz, Federal Telecommunications Law: A Legislative History of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) including the Communications Decency Act viii 1997

Document No. 176

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MODIFIED FINAL JUDGMENT

HEARINGS

BEFORE THE

SUBCOMMITTEE ON
TELECOMMUNICATIONS AND FINANCE

OF THE

COMMITTEE ON
ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDREDTH CONGRESS

FIRST SESSION

JULY 15, 30, AND OCTOBER 2, 1987

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CONTENTS

HeinOnline -- 12 Bernard D. Reams, Jr. & William H. Manz, Federal Telecommunications Law: A Legislative History of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) including the Communications Decency Act iii 1997

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MODIFIED FINAL JUDGMENT

WEDNESDAY, JULY 15, 1987

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS AND FINANCE,
Washington, DC.

The subcommittee met, pursuant to notice, at 11:20 a.m., in room 2123, Rayburn House Office Building, Hon. Edward J. Markey (chairman) presiding.

Mr. MARKEY. Good morning.

Today we will begin a series of hearings that will thrust this subcommittee into one of the most important debates that this Nation faces. The debate will help decide the future course of the entire telecommunications industry. These hearings will not be in the headlines of tomorrow's newspapers, but the final decision on the shape of the telecommunications industry will profoundly influence America's social and economic institutions for decades.

The telecommunications industry has already been the catalyst for burgeoning economic growth and is touted as the United States' best hope to continue its world economic leadership in the 21st century. In the same way that Henry Ford's invention of the assembly line and the U.S. Government's investment in the interstate highway system created the Mobile Society, communications technology will not only develop a more informed citizenry with access to information from an increasingly wide diversity of sources, it will transform the social fabric of our culture as well.

Over the last decade our telecommunications industry has undergone a radical technological and economic transformation. The once monolithic giant, AT&T, is a shadow of its former vertically integrated self. Seven powerful corporations now control the local networks, and thousands of fledgling competitors are lurking on the horizon.

Some contend that this proliferation of providers demonstrates that the telecommunications marketplace is now fully competitive. They assert that the AT&T divestiture has succeeded in spawning competition, and yet more deregulation and increased competition is needed. They claim that the time is now ripe for the entry of the seven regional operating companies into lines of businesses restricted in the modified final judgment, (MFJ), and that their vast technological and financial resources would stimulate growth and efficiencies in the domestic and international markets.

Others totally disagree. The BOC's, they argue, still control the bottleneck local network facilities that are the lifeblood of every competitor. They fear that pell mell deregulation or freedom for

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the BOC's would seal the fate of all competitors and signal the death knell of any opportunity for the creation of a truly competitive telecommunications marketplace.

The lines of debate are drawn. For the past decade, most of these questions have been before the courts, the Justice Department, the Federal Communications Commission, and the State Public Utility Commissions. While Congress stood on the sidelines unable to reach a consensus and pass major legislation, each of these parties promoted their own beliefs, and each prescribed their own magic elixir for a healthy telecommunications industry.

The result has been a disjointed public policy that has the industry jumping through hoops like trained seals. Critical interdependent decisions like the allocation of non-traffic-sensitive costs, intralata competition, appropriate regulation of AT&T, Computer Inquiry III, and the MFJ restrictions on BOC's are being decided in piecemeal fashion by parties in various, independent jurisdictions. Our telecommunications policy has been a string of stand-alone decisions which hold together as well as Ollie North's shredded documents.

It is time for the United States to develop a comprehensive and coherent telecommunications policy. The subcommittee will begin today to examine the telecommunications industry as it exists now and how it should appear in the future. I think I can speak for the members of this subcommittee when I state that we have no interest in micromanaging the telecommunications industry.

Further, this series of hearings is not an attempt to send a message to any Judge or State commissioner. And this is not a harbinger of ill-conceived, shoot-from-the-hip politics. The objective of these hearings is to prepare, to educate, and to inform members as we assume our elected responsibility to establish a domestic policy that draws a blueprint for the U.S. telecommunications industry's future.

With that, the time of the Chair has expired. The Chair recognizes the gentleman from Indiana, Mr. Coats.

Mr. COATS. Thank you, Mr. Chairman.

I don't have a formal opening statement. I do think, however, it is important that this committee is meeting to look at the issues as they currently stand, so that we are prepared to respond in the appropriate fashion to the judgment that will be rendered by Judge Greene, hopefully in August.

It is my understanding that August is the vacation period for judges, and I'm not sure if the Judge is going to render his opinion and get out of town, or get out of town and contemplate what he ought to do and then come back and render his opinion. But in any event, it will be important for this subcommittee and our members to be apprised of just what the situation is in the industry, and I think this series of three hearings will help us do that.

I was pleased to hear the Chair indicate in its opening statement that it is not the purpose of the committee to micromanage the telephone and telecommunications industry. I think that is wise, because even if we—if that were our purpose, I doubt very much if we would be able to successfully do that. This is an industry in a considerable state of change. New developments are coming onboard every day. We simply are not structured here in Congress to

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react quickly enough, in my opinion, to render sound policy decisions that would benefit the industry in the long run.

We do need to take an overview. We do need to review the Judge's decision to determine what effects it will have on the industry and on our constituents. I assume that we will do that, but I hope we don't fall in the trap of attempting to make decisions at levels that we don't have the expertise to do.

I look forward to the testimony of the witnesses. Again, I commend the Chair for calling the hearing and yield back whatever time I have left.

Mr. MARKEY. I thank the gentleman. The gentleman's time has expired.

The Chair recognizes the gentleman from Oklahoma, Mr. Synar, for an opening statement.

Mr. SYNAR. Thank you very much, and let me join with my colleagues in commending you, Mr. Chairman, for this important hearing.

In your opening statement, you said that the purpose of these hearings was to inform, prepare, and educate. Indeed, that is an important function that this committee must serve.

These are complex issues. The hearings are important, and they will provide us information about the communications marketplace and the many changes that are going on.

Last year, I requested a GAO report to look into the FCC's plan to monitor the finances of the BOC's as they enter these new lines of business. That report should be completed later this summer.

I am particularly interested in these hearings today, to hear from the witnesses about the FCC's Computer III Inquiry and the Open Network Architecture that we're looking at. I think these are important questions that we need to ask, and again I thank the chairman for his attention.

Mr. MARKEY. I thank the gentleman.

The Chair recognizes the ranking minority member, the gentleman from New Jersey, Mr. Rinaldo.

Mr. RINALDO. Thank you very much, Mr. Chairman.

I, too, want to thank you for convening this hearing on competition in the domestic telecommunications industry. The hearing follows, as we all know, on the heels of the public hearings held just 2 weeks ago by Judge Greene, as he reviews the first report of the Department of Justice on the effects of the modification of final judgment agreed to in 1982 and implemented in 1984.

I think everyone would agree that the first 3 years of divestiture have not been the smoothest. I think we will also agree that many of the problems that have been encountered have been expected. There has been confusion on the part of consumers, a tremendous amount of competition in the long-distance field, and a general sifting and resifting as the marketplace has taken account of these changes.

These developments are not necessarily bad, but I do think they underscore one point. We are still at the beginning of the process and not the end. I think the hearing this morning and the subsequent hearings that will follow this one will point that out.

The type of activities we have seen are natural, given the circumstances and the tremendous changes that have taken place in

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the domestic telecommunications industry. I know there are Members of Congress who feel that we haven't gone far enough, and who think we should consider legislation immediately that would alter the modification of final judgment or MFJ, so that the Bell Operating Companies could be freed up to enter lines of business from which they are now prohibited. In my own opinion, I think that the subcommittee is going to have ample opportunity to debate that question thoroughly in the near future.

Once Judge Greene issues his decision on the Justice Department report, I suspect that there will be no shortage of industry representatives sharing their reactions with us, and there will be many Members of Congress who will press at that time for some form of legislative action. And that may be entirely appropriate, and I would hope that we will use the hearing process to get comments that are needed on the record.

Although I have not cosponsored legislation such as that introduced by my colleagues on this subcommittee, Congressman Tauke and Congressman Swift, I don't have a closed mind on the question.

In my estimation, we are in a period of transition. I don't think the public good is hastened or is fostered, I should say, by speeding up that circumstance or by rushing things that necessarily shouldn't be rushed. If tomorrow Judge Greene decides to let the BOC's into information services or manufacturing or long-distance, I don't think the world is going to come to an end.

On the other hand, I don't think the world is going to come to an end if he decides the opposite way either. What is important, in my judgment, is to ensure an orderly transition to a newly competitive environment and to ensure that we maximize the benefits of divestiture and competition to the consumers. That is not a responsibility that ends with one court decision or can be easily solved with one piece of legislation. It is an ongoing obligation of this subcommittee; it's an ongoing obligation of the Congress.

Mr. Chairman, as I stated earlier, I think we're at the beginning of the transitional process. We are just learning how competition in the telephone industry works. We're just learning about the effects of divestiture. So we are nowhere near the end of the process. I anticipate further hearings and more legislative activity, and I intend to do everything possible to see that my constituents and the public generally benefit from divestiture and the telecommunications revolution.

I look forward to working with you, Mr. Chairman, in the future, as we oversee this industry and as we work on appropriate legislation at the propitious opportunity. I want to express my thanks to our witnesses this morning, and I yield back the balance of my time.

Mr. MARKEY. The gentleman's time has expired.

And now I think unfortunately, because of the conclusion of the Democratic Caucus on the floor, which had been discussing the issue of revenue enhancement and apparently took longer than they originally anticipated, that has now concluded. It has triggered, however, yet another event, which was to have been concluded by 10 this morning, which was the conclusion of yesterday's full committee Energy and Commerce markup of pending legislation. That committee must now reconvene here at this time for the

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next 30 minutes or so in an effort to expeditiously complete that legislation.

At the immediate conclusion of that hearing, it is our intention to reconvene this hearing, so that we can proceed.

I offer my apologies to the members who have not yet had a chance to render their opening statements. They have every right to reserve that opportunity, and I apologize to our witnesses and to our guests here for the inconvenience, and I would ask that the cameras which are here, if possible, could begin to clear out, because that is one of the obstacles that will stand between the convening of this hearing and the convening of the next one.

Mr. COATS. Mr. Chairman?

Mr. MARKEY. The gentleman from Indiana?

Mr. COATS. Mr. Chairman, you mentioned the Democratic Caucus met this morning on the subject of revenue enhancement. Is that the same as taxes?

Mr. MARKEY. I've got to get it. Where's my Ollie North dictionary here?

Mr. SWIFT. I think the answer, if the gentleman will permit, the answer is, not in the President's mind.

Mr. MARKEY. Can I say this, though? Can I say this right now?

Mr. COATS. You're the chairman. You can say anything you want.

Mr. MARKEY. All right. Right now, I want to make it clear. I'm willing to meet Abu Nidal anywhere, any time. There's a deal for you, if you want it, okay? And any time, anyplace, OK. Just keep my family out of it, all right?

The gentleman from Iowa.

Mr. TAUKE. Mr. Chairman, I don't have anything nearly so clever or humorous to request. I probably will be unable to be here when the hearing convenes, and I just simply want to commend you for calling the hearings and setting up an orderly process for considering this issue, and I ask unanimous consent to include a statement in the record.

[The prepared statement of Mr. Tauke follows:]

OPENING STATEMENT OF HON. THOMAS TAUKE

Thank you, Mr. Chairman. Mr. Chairman, I want to commend you for holding this series of informational hearings on competition in our telecommunications industry. I can see that after we complete the hearings, the subcommittee will be in a stronger position to move forward on this important issue.

I believe that the restrictions on the Bell Operating Companies (BOC's) that are contained in the Modified Final Judgment (MFJ) of the 1982 Consent Decree were necessary during the critical transition time following the AT&T divestiture. The MFJ restrictions provided stability to our telecommunications industry that was absolutely necessary at that time. The decision was a wise one as was the decision by Judge Greene to review the decree every 3 years.

However, some parts of our telecommunications industry have matured to the point where some of the major restrictions on the BOC's can be lifted to improve competition, to provide new services for consumers, and to enhance the U.S. trade position. I believe that lifting these restrictions will benefit consumers and the telecommunications industry.

The MFJ created a huge new market for telecommunications products while at the same time tying the hands of the newly-created Bell Operating Companies by prohibiting them from manufacturing equipment and providing information services.

If a consumer needs information services he must either purchase expensive customer-premises-equipment (CPE) or build his own network. Since much of the CPE

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is manufactured offshore, removing the information services restriction from the BOC's would enhance our trade balance.

The trade benefits of permitting the BOC's to manufacture telecommunications equipment are enormous. Joint ventures with foreign firms can facilitate the opening up of foreign markets that have heretofore been closed to U.S. firms. This would result in new plants being constructed by U.S. firms, and second new plants would be build by joint firms.

In addition, increased outlays in research and development would result from the removal of the manufacturing restriction, and this, it occurs to me, will permit the United States to retain its technological leadership.

Once again, Mr. Chairman, I commend you for holding this hearing, and I look forward to reading the testimony of our witnesses.

Mr. MARKEY. I thank the gentleman, and the gentleman, I know, has a lot to contribute on this issue, and I do apologize for the way in which this has developed.

Are there any other members seeking recognition?

[No response.]

Mr. MARKEY. The Chair seeing none, we will take a recess for approximately 30 to 45 minutes, which might give you a chance to get a bite to eat.

[Brief recess.]

[The opening statement of Hon. W.J. "Billy" Tauzin was received:]

OPENING STATEMENT OF HON. W.J. "BILLY" TAUZIN

Today, I would like to commend Chairman Markey for holding a series of educational hearings in our subcommittee on competition in the telecommunications industry. The Department of Justice's recommendations to change the MFJ are presently before Judge Greene. We're all waiting to see if the Judge decides there has been sufficient change in the industry since divestiture to warrant removal of the line-of-business restrictions now on the BOC's.

One thing is certain, my State has experienced changes in the last 3 years. Louisiana has gone from a State with a healthy economy to a State experiencing severe economic problems. We need, and the Nation needs, to look for opportunities that will benefit consumers and our economy. The ever-changing area of high-technology, of which telecommunications is an integral part, is critical to the economic vitality of our Nation as is energy policy. These hearings are structured to deal with this important subject.

The AT&T divestiture was supposed to bring us more choices in services and products. In Louisiana, we've seen some changes but divestiture has also brought us confusion and lost jobs. I'm anxious to see what services, job opportunities and economic advantages removing the restrictions on the BOC's will bring. The Chairman of the House Energy and Commerce Committee, John Dingell, in his news release on the Department of Justice's recommendations said, "the recommendations represent a welcome step toward enabling the Bell Operating Companies to bring the benefits of information-age technology to as many Americans as possible. Continued imposition of current restrictions would merely reward a few powerful, vested economic interests".

The MFJ line-of-business competitive restrictions are not only restricting the participants in the decree but are quite possibly restricting opportunities in Louisiana and our Nation. Changing technology is dictating changes in the way people and Nations live and work.

The potential exists for even more change. Today only the largest business and governmental organizations have the resources to use this technology. Millions of potential users do not have access to the technology and services due to their great cost and limited availability.

I'm not only talking about services people want, but services people need. For example, many sick or injured people especially the elderly, could be helped while being treated or recuperating at home, avoiding the great costs of extended hospital stays, by services provided over the local telephone network. Services like emergency assistance signaling; heart and blood pressure monitoring; and electrocardiograms could be transmitted from patient's own home to their doctor's office or to a specialist in a medical center. The line-of-business restrictions do not allow the com-

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panies with facilities in almost every neighborhood to be actively involved in providing these kinds of services.

The restrictions also limit their involvement in information services in many other areas, like education. In Louisiana, we have many excellent schools and teachers, but not enough of both. The linkage of the telecommunications network with computer technology could distribute excellent, innovating teaching tools and learning opportunities to every school in our State, not just those with the most resources. This linkage and distribution could be a critical step in equipping our school children for the new high technology jobs of the future and reducing the number of our children who either drop out of school or finish without the skills needed to compete for today's and tomorrow's jobs.

Many consumers and small businesses are concerned about the availability of video text services, security systems, voice storage capabilities and a host of other services that consumers in France and Japan are already enjoying. We can't let our Nation take a second or third place in new technologies available to citizens.

While these MFJ line-of-business restrictions limit the availability of information services they also create other major concerns. The restrictions on BOC manufacturing keep some of this countries' largest and best managed companies from engaging in manufacturing while we allow foreign companies to unfairly operate in our markets, reduce job opportunities for Americans, and undermine the Nation's high-tech economy.

These Bell Operating companies have no economic incentive to spend money in research and development since they are barred from manufacturing. Without that incentive it seems we will be destined to lose the technological leadership in telecommunications we enjoy today. If they are not able to develop and build new telecommunication products, they will not be producing any new jobs. There appears to be a clear link between these restrictions and the lack of jobs. We need more jobs in Louisiana and every other part of our country.

Removal of the information services and manufacturing line-of-business restrictions would surely lead to more jobs. As the telecommunications networks are modified to provide new information services, new equipment must be built and installed. This can only mean more jobs created by companies with strong ties to our local communities and the people there. Either though creation of jobs in their own companies or through joint ventures with other manufactures, removal of these restrictions will mean greater job opportunity.

It seems clear, removal of these two restrictions will have a significant positive impact in our economy. It is not so clear the long distance restrictions should be removed. I get concerned that we need more choices for consumers, especially in rural areas, but I think that we need to look at how competition develops in the long distance area. If consumers have choices at good prices we can wait, if consumers don't have choices in providers, then we need to look closer at that restriction.

Those of us in Congress need to make sure American technology and ingenuity are put to their highest and best use in strengthening this Nation's competitive posture and creating job opportunities for Americans. We also need to make sure our technology and ingenuity are available to all consumers, including residential and small business users.

I'm anxious to make sure the interests of consumers and the Nation's development of a competitive world-leading telecommunications and information services market will be maximized as restrictions are removed. As these and other hearings unfold, we must focus on what approach positions Americans and America for the brightest future.

Mr. MARKEY. We are going to reconvene the hearing. How many people would like to see a video tape of the members' opening statements which were made 1 hour ago? Hearing no support for that idea, we will recommence the hearing and turn to the gentleman from Pennsylvania, Mr. Ritter, who requests time to make an opening statement. He is recognized for that purpose.

Mr. RITTER. Thank you, Mr. Chairman. I want to commend you for your interest in this subject and for holding these hearings. These hearings play a key role in the subcommittee's ongoing responsibility to ensure universal telephone service at reasonable rates.

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The phrase itself contains the essence of telephone policy through this century. I believe that our goal of universal service should be more than just ensuring access to the minimal phone service.

We are in the information age, the evolution and communication of information is growing at explosive rates. It is our duty to see that everyone has the opportunity to benefit from this information growth explosion. One doesn't need extensive research to know that the telephone network plays a key role in bringing information to the people. Advances in technology show us there is potential for greatly enhanced information services carried over phone lines. In fact, many foreign countries already benefit from such advances.

However, restrictions remain from the break-up of AT&T which retard the use of the phone system for providing this incredible range of new information services. I believe some of these restrictions should be re-evaluated and modified.

When we discuss universal access, we are in a position to substitute information for telephone service. Our new goal should be universal access to information. If this is our goal, we must improve the availability of information services, restrictions which have flowed from previous legal decisions have limited opportunities for home banking, voice message retrieval, burglar and fire alarm services, directories, health, social and emergency services, education and training, video communications, the list goes on and on.

For example, the French Minitel system has over 4,000 services from a multitude of providers right now.

The issues before Judge Greene are complex. It is not my intent to try to influence him before he addresses the question in the near future.

However, I do want witnesses to be aware of my own efforts to understand this area. It seems to me that the benefits of providing enhanced services to the public are enormous. They are so enormous that they may justify allowing the Bell Operating Companies to provide information services to their customers and to allow equal access to that network for other service providers.

Just as the Government opened interstate commerce by building the Federal highway system, allowing for mass provisions of transportation services, allowing for mass provisions of information services would likewise facilitate building the interstate highway of the future, of the information age, as enhanced information services and an enhanced information services telephone network.

I welcome the witnesses today who will review the economics of the telecommunications industry and provide their views regarding the availability of information services.

Thank you, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The Chair observing no other members seeking to make opening statements, concludes the portion of the hearing dedicated to that purpose. We now turn to our panel of witnesses, which consists of two.

Dr. Lee Selwyn, who is president of Economics and Technology, Inc. located in Boston, MA, and Dr. Alfred E. Kahn, who is a Robert Julius Thorne Professor of Political Economy at Cornell University.

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Would the two witnesses be willing to come up and sit at the table? When you feel comfortable and ready to proceed, we would ask, beginning with Mr. Selwyn, that you present your testimony to the subcommittee in as concise a form as possible, with the foreknowledge that your entire written statement will be included in the record in its entirety. I would ask that you move the microphone a little closer to you so we can be assured everything you are saying will be heard by the audience.

We will begin with you, Mr. Selwyn. We welcome you. We look forward to hearing your testimony.

STATEMENTS OF LEE L. SELWYN, PRESIDENT, ECONOMICS AND TECHNOLOGY, INC., AND ALFRED E. KAHN, ROBERT JULIUS THORNE PROFESSOR OF POLITICAL ECONOMY, CORNELL UNIVERSITY

Mr. SELWYN. Thank you, Mr. Chairman, members of the subcommittee. I appreciate the opportunity to be here today and to discuss with you the important issues of competition, deregulation and the proliferation of information services and new technologies in the U.S. telecommunications industry.

In my opening remarks, I am going to try to cover a couple of areas. I have included in a handout that I believe you have before you, some diagrams that I will be referring to.

As a general proposition, a good deal of the discussion and debate that has gone on in this industry is rooted in a basic factual question of whether or not competition can exist at a level sufficient to justify the elimination of regulatory and MFJ protections that have been introduced structurally into this industry.

I submit that by any traditional standards, one could not conclude that competition has reached that level. Moreover, as I will discuss shortly, I believe there are certain structural elements in this industry which will permanently prevent effective competition from developing, at least with respect to the mainstream of mass market common carrier services.

As a consequence, in my view, some degree of continued economic regulation of basic telecommunications network services and basic structural protections against the leveraging of the dominant carrier's position in the provision of basic network services into other segments of the economy should be maintained and should be maintained for the foreseeable future.

There has been a good deal of discussion with respect to the question of whether or not direct involvement by the Bell Operating Companies in the provision of information services is somehow an essential factor in accomplishing the widespread dissemination of information services in this country and the situation in France is frequently cited as an example of how the involvement by the utility has somehow produced a more widespread dissemination of these services.

In fact, that assertion is precisely contrary to another claim that has been advanced in this same debate, and that is that basic network services of dominant carriers are themselves subject to effective competition. It simply can't be both of these alternatives.

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Either we are dealing with a structurally monopolistic industry in which case there may be merit in the argument that the dominant provider should somehow have an essential role in the provision of information services or at least in the provision of network facilities to support those information services, under regulation and as part of its basic network service franchise, or in the alternative, if we are in fact dealing with a competitive market as many of the BOC's' claims would have us believe, then there could not be substance to the argument that the BOC's and the BOC's alone are capable of bringing information services to the mass market.

Despite the fact that we are told repeatedly of the success of the French Minitel system, the fact is without any direct BOC involvement in the information services market in this country, there is a substantial dissemination of these services in this country today and in many respects, it is a broader dissemination of these services than exists in France.

There are some 15 million households in the United States with personal computers of which 3.5 million or so are believed to have some sort of modem which makes it possible for them to communicate with on-line information services. For an additional $50 to $100, each of those remaining 12 million households could be similarly equipped.

With that access, any one of these households could potentially obtain information services from literally thousands of individual database services offered by hundreds of providers.

The opportunities for entrepreneurial activity in this area seem limitless and without BOC involvement thus far, this industry has in fact placed more subscribers on-line than in all of France.

I might also point out that even with respect to geographic availability, in the United States, the network is structured in such a way that geographic availability of information services is generally universal whereas in France, it is limited to those parts of the country that the French utility deems to be worthy in its transition plan to obtain these services in whatever sequence it chooses.

I said I wanted to spend a few minutes and indicate why I believe that we are dealing with cases of an industry that is structurally monopolistic. I would like to ask you to refer to the series of diagrams in the handout and I will try to run through these very quickly.

The point that I wanted to discuss——

Mr. MARKEY. Would you indicate what page you are on?

Mr. SELWYN. There is a handout that begins with two pages of summary and that is followed immediately by a series of charts.

Mr. MARKEY. Figure 1 on the page immediately following page 23. [Diagrams begin on p. 35.]

Mr. SELWYN. Yes, in this larger book.

In this diagram, I have drawn a very simple network consisting of two user locations, in New York and Washington. The point of this simple network is under this case, this facility can be used solely for communication between these two users. That is its entire function and capability.

If we substitute as I show on Figure 2, a common carrier at each end of the network, with the common carrier offering connectivity to multiple users in each city, then that exact same facility can

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serve multiple users and carry more traffic as a consequence, since the cost of this facility tends to be relatively fixed, particularly with modern fiberoptic technology, irrespective of the volume of traffic that is carried, the unit cost of traffic tends to drop dramatically as more users are added to the network.

Even here, this network is capable only of handling traffic between New York and Washington. What if we have an even more complex network, as I show on Figure 3? In this case, that New York/Washington link is interconnected with a series of other links.

In addition to carrying the New York/Washington traffic, that very same link can also handle Boston to Washington traffic, the Hartford to Atlanta traffic, the New York to Richmond traffic, and any other combination of city pairs that happen to traverse that particular link in the network.

As we add more complexity and more connectivity to a network, its role as creating a barrier to entry by others becomes increased, because the economy of scale and scope in the network becomes increased.

We can see this is not just a theoretical discussion, because we see this happening in the airlines industry today, in a very dramatic fashion.

On Figure 4, I have drawn a network that characterizes most of the major airlines' operations that exist today. It is a concept known as hubbing, where individual routes are interconnected at a single hub point in the center.

Under the system of airline deregulation, when the airlines were permitted to enter individual route markets as they saw fit, they found it expedient to establish hub systems. Once established, airlines tend to monopolize these hubs simply because each of the individual links in the hub is now capable of carrying not just the local traffic from the outlying point to the hub, but also traffic that transits the hub.

To illustrate exactly how monopolistic some of these hub markets have become, on Figure 5 I show a diagram of the Minneapolis/St. Paul Airport in which the gate areas that are served by Northwest Airlines after its merger with Republic are shown in the shaded areas. Similar examples can be shown in two other Northwest hubs in Detroit and Memphis which appear on the next page.

Now what we have in the airline industry is a demonstration of a very fundamental principle, that in telecommunications would be even more pronounced, because unlike the airlines industry where at least the assets are portable—you can always move an airplane from one place to another—in telecommunications, the network assets are fixed and locked into the ground once constructed.

If we look at the next page, this presents some data showing the market shares of major airline hub markets that have been achieved through this process. Bear in mind that each and every one of these hub markets, such as, for example, St. Louis where TWA has 83 percent of the market or Minneapolis/St. Paul where Northwest has 79 percent, have no legal barriers to entry by other carriers at this point, yet it is virtually impossible for other carriers to effectively enter the market, because they cannot carry traffic across the hub due to the dominance of the single provider.

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This condition has affected pricing in the airlines industry. On Table 2 on the next page, I have shown some example fares of routes between airline hubs and points served directly on a nonstop basis by those hubs, and I've shown these, expressed these in terms of a unit standard of cents per mile or dollars per mile, and as you can see, we typically see fares for unrestricted—the lowest unrestricted coach fare in the market in the range of 40 cents, sometimes even as high as 80 cents or more.

But when we get to a more competitive route, as shown on the next page, where the route transits a hub, because after all, you can get from Washington to Los Angeles through any of a number of hubs in the middle of the country, we find much lower fares for unrestricted—and again, these are all unrestricted, no advance purchase, no penalty—we're not dealing with any of those—unrestricted fares, and we're seeing numbers as low as 7 cents, 8 cents, 9 cents, under 10 cents in many situations, even in cases where we have non-hub-related direct end-to-end connections for routes that have enough traffic in the market to sustain a flight without an interconnecting hub, such as Washington to New York, for example, or Los Angeles to Las Vegas. We find considerably lower fares where these markets can support competition. But where there is no competition in the market, we find much higher prices.

It is my view that the network, the existence of a network in telecommunications, which is more entrenched than the network in the airlines industry, today and for the foreseeable future—and in fact, the technological trend would suggest that the conditions are getting even stronger and not weaker—that we will be looking at a fundamentally monopolistic industry that must be seen as conferring substantial economic entry barriers that have to be recognized in order to assure the universal availability of telephone services to consumers, to information services providers and to users of information services.

That is the only way that we can assure the widespread access to telecommunications in this country, is to recognize that we are dealing with a monopoly market and to treat it accordingly. I think that before we dismantle the present regulatory regime and the present regulatory model that has been applied to this industry, those who would advocate change have a heavy burden to show that the changes they advocate will not create serious disruptions in the delivery of these services.

Thank you.

[Testimony resumes on p. 45.]

[Mr. Selwyn's prepared statement and diagrams referred to follow:]

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Statement of

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to the

United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Telecommunications and Finance

July 15, 1987

COMPETITION IN THE U. S. TELECOMMUNICATIONS INDUSTRY

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to appear before you today and to discuss the current conditions of market dominance and limited competition in the market for telecommunications services in the United States. Telecommunications policy is at a critical crossroad, with many of the key decisions on the future course and scope of regulation, restrictions on Bell Operating Company (BOC) lines of business, and universal access to telecommunications services turning heavily on the factual question of the extent to which a competitive marketplace can be expected to develop so as to introduce contraints on what might otherwise be monopolistic pricing and marketing practices by dominant carriers. The presence of effective competition is thus an essential factual predicate to policy changes that would reduce and/or remove regulatory constraints on dominant carriers and that would permit BOCs to enter adjacent lines of business.

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It is thus not surprising that proponents of reduced regulation and increased BOC line of business flexibility have devoted a great deal of attention to the development of theories and evidence that would establish the presence of effective competition in markets traditionally monopolized by dominant local exchange and interexchange carriers. That the dominant carriers continue to enjoy an overwhelming share of their respective markets is difficult to dispute. As a result, those seeking to posit the presence of a competitive market have introduced novel theories of market structure, such as the notion of "market contestability" and most recently a theory of competitive market entry that can probably best be described as "engineering contestability."

These efforts to conjure up a competitive marketplace out of one characterized by extreme concentration and dominance have caused many policymakers to lose sight of the underlying rationale for economic regulation of the telecommunications industry and for the underlying theory of the recent break-up of AT&T. Both of these hold that certain components of the larger telecommunications infrastructure exhibit properties of natural monopoly and thus constitute "bottlenecks" within the exclusive or near-exclusive control of the dominant carriers. As such, the dominant carriers are in a position to extend their market power to other segments of the economy - so-called "adjacent markets" - that are dependent upon a service or resource which these carriers exclusively control and through which each such adjacent market activity must pass (hence the narrow "bottleneck" analogy).

Economic regulation has long been used to assure - or at least try to assure - that in the aggregate the public utilities entrusted with the responsibility to develop and maintain local and interexchange

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telecommunications networks do not take unreasonable advantage of their monopoly or near-monopoly position so as to increase prices and restrict output. The AT&T break-up was designed to separate the bottleneck local network and service infrastructures - where conditions of natural monopoly are most pervasive - from other market segments in which competition in varying degrees may possibly exist. Such challenges to the fundamental soundness of these policies as have emerged within the past several months all rest on an assertion of the presence of competitive activity at a level sufficient to supplant the protective regulatory and MFJ mechanisms; these challenges cannot be sustained in the absence of this competitive condition.

So in the final analysis the policy questions confronted by Congress, by the FCC, by the Department of Justice and by the United States District Court rest heavily on the veracity of the factual assertions of competition that proponents of policy changes have put forth. In my discussion with you today, I shall address three areas where, contrary to the assertions of the BOCs and others who would dismantle the existing regulatory safeguards, such factual evidence as does exist affirmatively supports a finding that effective competition is not present in major segments of the telecommunications marketplace, nor is it likely that such effective competition will emerge in the foreseeable future. It is thus far too soon to discard the regulatory model that has served this market so well for so many years, producing the finest and most universally accessible telecommunications system in the world. Those who would abandon this proven industry model and subject our country to the vagaries and risks of novel economic and regulatory theories must carry a heavy burden of proof as to the soundness of their factual predicates. And none of the data and

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largely anecdotal evidence that has been advanced by proponents of a new industry model comes even remotely close to satisfying this burden.

I. The Network as a source of market power

In the past, efforts to identify and to quantify the presence of competition in telecommunications markets have tended to focus on the ability of individual suppliers or end users to acquire and to deploy transmission and switching facilities that were separate from those associated with public common carrier networks. Often relying on purely anecdotal evidence, the presence of competition would be asserted if, for example, it could be shown that an individual user was capable of constructing his own private microwave or fiber optic transmission facility. The matter of interconnectivity among these isolated facilities was generally ignored. But Peter Huber's study of the U. S. telecommunications industry, prepared for the Department of Justice as part of its triennial review of the aftermath of the U. S. v. AT&T antitrust settlement, helped to focus our attention on the vital role that a telecommunications network plays in permitting its owner to amass and to exercise market power.* Most telecommunications network resources, particularly those associated with transmission, involve large fixed capital investments that can be most efficiently recovered when the resource is shared among a number of individual users. Thus, the degree to which the owner of network resources is able to achieve an efficient scale and scope of operations

* Unfortunately, having advanced the correct analytical framework, the Huber Report reached a number of fundamentally incorrect factual conclusions about the connection between networks and market power, largely because of its failure to recognize the role of centralized control of network connectivity and the extreme economies of scale and scope that characterize large network structures.

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will materially affect its ability to achieve and maintain an advantageous market position vis-a-vis present and future rivals. As I shall show, this property is intrinsic to large, complex networks and to the entities that control them.

Several examples are useful in illustrating this phenomenon. Please refer to Figure 1, which shows a simple two-point network interconnecting an individual user in New York with another user in Washington. In fact, the only traffic that this simple network is capable of handling is that generated by each of these two users to each other; hence, the total cost of the facility must be borne by these two users (which are most likely two locations of the same company). In Figure 2, the same two cities are interconnected, but here the transmission facility is owned by a common carrier and is capable of carrying traffic between any of a number of users in New York and any of a number of users in Washington. Even in this simple situation, the common carrier facility has the potential for handling substantially more traffic than the private user-owned two-point transmission system, and thus enjoys the opportunity to produce and hence to provide service to each customer at a cost that, in general, will be less than that which would be required were that customer to acquire and operate his own private dedicated transmission system.*

* This by no means implies that user-owned resources are always less efficient than those maintained by common carriers. In certain special situations, the nature of an end-user's telecommunications requirements may be so specific and unique that the normal efficiencies associated with common carriage are more than offset by the uncommon nature of the user's needs. In these cases, the deployment of specialized networks and facilities may be more efficient than if the service is furnished by a common carrier. Although frequently included in the litany of anecdotes cited by those seeking to portray the presence of competitive activity, these special cases of user-owned systems as often as not exist because the dominant local or interexchange carrier was unwilling or unable to furnish the required service in an economical manner.

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Figure 3 illustrates a somewhat more complex common carrier network in which the New York-to-Washington link is interconnected to a number of other transmission links. In this case, in addition to carrying the New York-to-Washington traffic, the same New York-Washington link also carries traffic between Boston and Washington, Boston and Atlanta, New York and Richmond, and literally dozens of other combinations. As a general principle, the more segments in a communications network, the more traffic that will be handled by any individual segment, all other things being equal. This property of networks engenders significant economic advantages to common carriers vis-a-vis individual users, and to large, ubiquitous common carriers vis-a-vis small, more specialized common carriers.

Learning from the airline experience. This property of networks and its role in conferring market power on its owner is more than mere theory. In fact, the phenomenon and its economic results can be readily demonstrated in the post-deregulation airline industry, where the legal barriers to entry and competition have been largely eliminated and have ostensibly been replaced by competitive market forces.

By viewing the airline industry in the context of network relationships, we can learn a great deal about the likely nature and extent of competition that can be expected to develop in the telecommunications field. And what we learn is that the very property of networks that promotes consolidations and cartelization in the airlines industry will also assure continued, indeed perpetual, market dominance by the incumbent local exchange and interexchange telecommunications carriers.

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In the pre-deregulation days, the CAB used to define a "market" as generally consisting of a specific route between two (or a relatively few) cities. Airlines would seek authority to enter and/or exit such "route" markets by making application to the CAB for each such route in question. Although airlines would each assemble collections of individual routes to form larger networks, the CAB's approach to regulation generally limited the actual economic benefits flowing from such networks to mainly operations and maintenance matters. The agency, for example, regulated fares such that all airlines were required to charge the same fare for travel between the same pair of cities, irrespective of the routing (direct or connecting) or even whether a single or more than one airline participated in carrying the passenger from the point of origin to the ultimate destination. Indeed, the CAB required interline ticketing and joint fare construction such that passengers would realize no direct benefit from travelling on a single carrier nor suffer any penalty if they switched carriers in the middle of their trip.

But airline deregulation has led to a fundamental redesign of airline route networks around "hubs" at which passengers may make connections to other flights usually operated by the same airline. Please refer to Figure 4. Under the "hub" system, the carrier fills its seats on each flight by combining local traffic (i.e., between the hub city and some other location) with through-traffic that transits the hub. Thus, flights into and out of the TWA St. Louis hub carry a certain amount of local traffic (where St. Louis is either an originating or terminating point for the trip) but predominantly carry traffic between points other than St. Louis that transits the hub for purposes of making a connection. At the same time, there is no longer any requirement

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that joint fares be constructed at rates no higher than on-line fares, such that passengers entering the hub via one carrier can be made to suffer a substantial fare penalty if they choose to switch carriers at the hub (if in fact that option is even available).

The consequence of this new network structure is that the presence of the network itself tends to confer market power and create substantial entry barriers which may be far more severe in limiting competition in these markets than the pre-deregulation route authority cases administered by the CAB. In fact, because of the enormous benefits that an airline may realize by filling more seats on existing flights, there is a substantial economy of scale and scope that arises from the creation of the largest possible hub-oriented interconnecting network. To see why this is so, suppose that a flight segment between, say, New York and Kansas City can support only 20 local passengers, but by providing connections at Kansas City to San Francisco, Los Angeles and Seattle, an additional 10 passengers destined from New York to each of these three cities will fly the same New York-Kansas City segment, bringing the total passenger volume to 50. Now suppose the airline adds an additional destination to its Kansas City hub (say Phoenix) and that as a result another 10 New York-to-Phoenix passengers will now take the New York-Kansas City flight, bringing the total number of passengers to 60. Clearly, even in this highly simplified example, it is apparent that the more network points that are served by the central hub, the higher will be the occupancy level for each flight segment into and out of the hub. In fact, once an airline has established a major hub and has achieved a certain "critical mass" insofar as connecting passenger volume is concerned, the presence of the hub and its associated route

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network creates an effective barrier to entry against other carriers who might seek to offer local two-point service, unless that demand in the specific two-point market is sufficient by itself to fill up the airplane (e.g., New York-Boston, New York-Washington).

Industry data, such as that shown in Table 1, confirms the existence of cases of overwhelming dominance of "fortress hub" markets. TWA enjoys an 83.5% share of the St. Louis hub market. Northwest, recently merged with Republic, controls fully 79.6% of the Minneapolis-St. Paul market, and USAir, which began evolving its Pittsburgh hub some years ago, controls 79.7% of that market. Figure 5 provides a graphic picture of precisely how dominant Northwest Airlines has become at each of its three major hubs - Minneapolis, Detroit and Memphis.

Not surprisingly, this pattern of extreme market dominance at certain hubs and of multiple carrier competition in other routes, such as between points that transit hubs, has produced a structure of airline fares that tend to vary inversely with the level of competition over any given route. In general, unrestricted, no-advance-purchase fares into and out of principal mid-continent hubs - where concentration tends to be greatest - are far higher, on a per-mile basis, than for routes of comparable distance in more competitive markets or even for the relatively competitive transcontinental market where any of a number of airlines and airline hubs may be used.

For example, the minimum unrestricted coach fare (one-way) between Boston (a non-hub airport) and Detroit (dominated by Northwest) during the week of June 12 was $272.50, or approximately $0.44 per mile for the 616 mile trip. By comparison, the minimum fare on Northwest Airlines between Boston and San

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Francisco via the Detroit or Minneapolis hubs was $174, or only $0.06 per mile for the 2705 mile trip. The USAir fare between Boston and Pittsburgh (its principal hub) was $199, or $0.40 per mile for the 496 mile flight, while the minimum unrestricted fare on the highly competitive Boston-Washington route, a 400 mile distance, was only $74.50, or about $0.19 per mile. Tables 2, 3 and 4 provide other illustrations of this pattern, which seems to be consistent throughout the airline industry.

Properties of telecommunications networks assure even greater concentration than in the airline industry. The fundamental networking characteristics, not to mention scale and scope economies, that are evidently so important in the airline industry are, of course, enormously more important in the case of telecommunications, where interconnectivity and ubiquity work together to assure the dominant local and interexchange carriers virtually unchallengeable control of their markets. Indeed, even the nominal fungibility and sunk cost conditions characteristic of the airline industry are even less conducive to competitive entry and exit in the case of common carrier telecommunications, because, unlike airplanes, physical switching and transmission resources cannot be easily redeployed from a site of relatively low demand to one of high demand. Thus, what we can learn from the experience of "deregulation" and "competition" in the airline industry is that the pattern of networking and market dominance will be significantly greater in the case of telecommunications carriers, because (a) they already have substantial ubiquitous networks in place, (b) these individual resources are characterized by far greater economies of scale than even the largest jumbo jets operated by the airline companies, (c) these resources are almost totally non-fungible and

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exhibit sunk costs of a magnitude that is comparable to their initial acquisition price, and (d) the confluence of these conditions creates an insurmountable barrier to entry except for the kind of minimal, miscellaneous "competition" that is described by proponents of the "contestability theory" and which receives grossly disproportionate emphasis in Peter Huber's study. Indeed, even in the airline industry, no one would seriously suggest that the isolated instance of a private or corporate airplane constitutes any consequential "competition" to the certificated common carriers, yet it is precisely this kind of activity in the case of telecommunications that Huber and others insist on characterizing as constituting "competition" for the dominant telecommunications network operators, ostensibly making these highly capital-intensive network-based markets "contestable."

II. Huber's "Geodesic Network"

By any traditional standard, the telecommunications common carrier industry cannot be seen as anything other than one characterized by extreme market dominance and monopoly on the part of AT&T in the interexchange market and the local exchange carriers (principally the BOCs) in each's respective franchise territory. AT&T's principal long distance "competitors" - MCI and U S Sprint - have between the two of them amassed something under 10% of the market (even less when adjusted for their resale of AT&T and BOC services) and both are known

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to be in serious financial difficulty.* According to data cited in the Huber Report, the BOCs provide facilities for approximately 340-billion annual minutes of switched and dedicated access connections between customers and interexchange carriers; access arrangements not involving the use of BOC facilities account for only one-half billion minutes annually [Huber Report, Table IX-4]. Even if an additional 10-billion minutes of direct customer-to-customer connection (not involving either local or interexchange common carriers) as postulated (without empirical data) by Huber are included in this calculus (and it is far from clear that such use either exists at the volume levels suggested by Huber or that it should in all cases be considered as being "competitive" with BOC common carrier network services), the BOCs' market share is still seen as exceeding 96%. And none of these figures include any of the local and other intraLATA services also furnished by the BOCs on what is undoubtedly an even less competitive basis than in the case of access. If factored into the analysis, the BOC market share of local, intraLATA and interexchange carrier access services (all of which utilize the same common BOC network infrastructure) would be found to be well in excess of 99%.

Thus, if one wants to make a case for the presence of a competitive marketplace in the face of these traditional indicators of market power and dominance, it seems to be necessary that either the market data be presented in a manner that will in effect conceal its traditional interpretation or, in the

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* US Sprint's first quarter results showed an operating loss of $242-million; MCI's first quarter earnings were $11-million on sales of $955-million, or 45% below its operating profits for the corresponding period last year. Both of these figures represent operations before AT&T's latest 4.8% interstate message toll service (MTS) rate reduction, which became effective on July 1, and which will undoubtedly engender even greater financial difficulties for these fringe carriers.

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alternative, that some new "theory" be advanced whose standards are not so rigorous and unforgiving as the previously accepted measures of market power and dominance. Peter Huber appears to have pursued both avenues. Attachment 1 contains a detailed examination of the Huber Report to the Department of Justice and discusses in considerable detail its various flaws, misinterpretations of data, misunderstandings of the underlying technology, and unsupported and domonstrably incorrect assumptions about the telecommunications industry. But it is Huber's theory of a "geodesic network" that provides the "engineering contestability" foundation that has been seized on as support for deregulation and MFJ modification efforts by the BOCs.

Dr. Huber's perception of industry structure, concentration and competition in the telecommunications market rests heavily upon the notion that the physical architecture of the U. S. telecommunications system is assuming a "geodesic" form. Huber sees the network as evolving from its hierarchical "pyramid" architecture toward a "geodesic" model, in which switching, intelligence, and transmission connections are moved from the core of the network out to its edges, from a few large, central office switches to numerous switching systems under the control of individual network users rather than monolithic common carriers. The geodesic model provides a foundation for the Huber Report's central thesis - that the telecommunications marketplace is becoming less monopolistic and more competitive - since, as he sees it, the decreased role of central office switches relative to systems owned by individual users limits the ability of the owners of these large network switching systems to exercise monopoly power in their provision of telecommunications services.

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The geodesic model thus provides a predicate for the Huber Report's support for the elimination of structural and line of business constraints on dominant carriers and for the ultimate removal of most regulatory constraints as well, since in his view these firms' monopoly control of the nation's telecommunications resources is already on the wane. To the extent that the geodesic model fails to accurately describe the current and developing shape of the U. S. telecommunications network, the very foundations of Dr. Huber's vision of the telecommunications market are destoyed, and his "bottom line" recommendation cannot survive. If the basic hierarchical structure that Dr. Huber believes is on its way out is indeed still in full control of the U. S. telecommunications infrastructure, then this vision of a competitive marketplace must be seen as illusory, based upon an incomplete understanding of the structure and function of the nation's telecommunications system and its individual components.

In fact, the geodesic model that Dr. Huber has envisioned does not now characterize the U. S. telecommunications system, nor will it do so for the foreseeable future. For that reason, the notion that we are on the verge of an explosion of competitive entry and activity - activity that will create the geodesic network - must be dismissed as a foundation for modifying the regulatory structure of the Regional Companies or of the industry generally. Contrary to the Huber Report's conclusion that technology is driving network elements out to the edge, that very same technology is actually contributing to an even more centralized network structure than that which has existed in the past. The economic size of long-haul transmission systems has increased by at least three full orders of magnitude since the late 1960s, and new "common

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channel" switching and network control systems have moved network intelligence away from the local central office and into a centralized network control facility. And the more complex and highly integrated these networks become, the barriers to entry confronted by would-be competitors become all the more formidable.

Interestingly, many of the "geodesic" properties that Huber envisions for the telecommunications industry can be seen, to at least the same theoretical extent, in the case of the airlines. Certainly any individual pair of cities can be served via a direct flight; unlike the case of telecommunications networks where transmission facilities are generally planted permanently in the ground, the airlines are able to redeploy their equipment and even their terminal facilities in response to changing demand and other market conditions. If Huber's notion of engineering contestability would automatically lead to market entry and competition, then we should not be seeing the kind of extreme entry barriers that have developed as a result of highly interconnected airline route systems. But as the airline experience underscores, one cannot simply look at an individual component of a larger network, posulate its contestability in the marketplace, and leap from that postulate to the notion that the totality of a network is similarly contestable. As our discussion in Attachment 1 amply demonstrates, the Huber Report's vision of a "geodesic network" cannot and should not be afforded a serious role in this policy debate because of its numerous factual flaws. But even if Huber were somehow correct at an individual network component level, it simply does not follow that the network properties that have produced high concentration in the case of the airlines would be less - rather than more - pronounced in the case of telecommunications. That Huber's

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work has helped us to focus on this point is clearly its most important contribution.

III. Information Services and the BOCs

While the BOCs clearly support the notion of a "contestable" network generally, they have at the same time advanced the view that their own entry into the enhanced and information services markets on an integrated basis with their basic network services is somehow essential for the widespread deployment and universal availability of these advanced capabilities. Incredibly, these two positions are mutually inconsistent.

Under the "geodesic" view, the BOCs do not exercise centralized control over the basic network infrastructure, and connection of a wide variety of specialized terminal devices, information systems, data bases, and user-owned networks at the outer perimeter of the geodesic structure limits the economic power of the BOCs' own resources while assuring unimpaired entry by others into the broader network community. The "competitive" nature of the network itself, we are assured, precludes the BOCs from taking undue advantage of their own network resources in a manner that would enable them to compete unfairly with non-BOC enhanced and information services providers. One would think that, under this model, widespread development and availability of non-BOC advanced services that utilize BOC network resources would be a virtual certainty.

But we are also told that that same widespread development of information services cannot be assured unless the BOCs are themselves permitted to enter and actively participate in this market, that the provision of enhanced and information services under a technical architecture that is integrated with the basic national telecommunications network is essential, and that it will simply fail to materialize without the direct participation of the BOCs. To bolster this view, the BOCs cite the French government's decision, as implemented by the government-owned PTT, to distribute 2.7 million "Minitel" terminals to telephone

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subscribers as the catalytic event that gave life and breath to the French information services industry.

The BOCs cannot at one and the same time claim to operate in "fully competitive markets" insofar as the provision of basic network services is concerned while also advancing the notion that they are the only organizations capable of using these same network services and resources to develop and to widely disseminate on-line information services on a broad national scale. You just can't have it both ways. The BOCs' schizophrenic policy agendas only serve to underscore the fundamental factual uncertainties that pervade the current telecommunications policy debate. Notwithstanding their citation of the French government's policies, the BOCs are clearly not asking the federal government to take over the U. S. telecommunications industry or even to finance the mass distribution of information services terminals.

But what are the BOCs actually seeking? Are they asking that we return to a bygone era, where the totality of the telephone network, from terminal equipment through local exchanges and on to the national interexchange infrastructure, was integrated and controlled by a single corporate entity? Or are they merely asking that this same structure be reestablished, except on a regional, as distinct from a national, basis? If the BOCs are even remotely correct in their claim that the U. S. will be left hopelessly behind if the BOCs are not allowed to develop an information services structure that is integrated with their basic local networks, then the present regulatory machinery must be expanded, not reduced, so that it embraces these adjacent markets as well. Thus, the BOCs cannot be correct both that their presence in the information services market is essential and that their basic network services markets have become fully competitive and capable of being deregulated. At most, only one of these two scenarios can be valid.

The BOCs have in effect asserted that dominance of the information services market is essential to its development, and moreover that they are the only entities capable of achieving the critical mass needed to accomplish such market dominance. Before accepting this BOC view, however, one must first identify the

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source of the economy of scope that would permit the BOCs to become the dominant information services providers. For it is entirely possible, and perhaps quite likely, that the actual economy of scope can be attributed not to any fundamental technical property of the basic network/information services interface,* but instead to the unique ability of the BOCs to leverage their monopoly control over their local exchange networks to achieve apparent savings that could be, but that will probably not be, made available to non-affiliated information service providers or other entities. And that, it would seem, is hardly a basis to even condone, let alone affirmatively support, BOC involvement in this field.

Putting aside the BOCs' leveraging opportunities arising out of their control of bottleneck facilities, can the deployment of widely-available information services be expected to occur without BOC presence in this market?

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* In the 1960s, during the era of the FCC's First Computer Inquiry, it was a common belief that, because computers were so expensive, there would be a considerable economic benefit from integrating multiple functions into the same physical processor. Thus, the computer that ran a telephone central office could also be called upon to provide on-line information services on an integrated basis. Today, of course, computers are cheap but the software necessary to permit the integration of multiple on-line applications with a real-time process control function, such as that provided by an electronic or digital central office, is highly complex and often prohibitively expensive, and it thus extremely unlikely that there would be any economic benefit from using the central office processor to provide information services as well. Thus, the only real "integration" that can realistically be expected to occur under today's cost and technology conditions would emanate from the BOCs' control over the real estate on which its network facilities are housed, taking the form of colocation of information services equipment and facilities with basic network switching and transmission systems in the same central office building. And if there are real economies arising from such colocation, then these could readily be made available to non-BOC entities as well through tariffed Open Network Architecture and colocation arrangements.

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But for a recently-announced FCC action* that could, if implemented, seriously threaten the economic viability of many non-BOC information services providers, there is growing evidence that it can and that it will. While the French government was busily handing out simple "dumb" computer terminals to its citizens, the microcomputer industry was taking shape in the U. S. along the finest traditions of the American free enterprise system. Firms that didn't even exist a decade ago now hold leadership positions in the microcomputer hardware and software markets. Firms like Apple Computer, Lotus Development Corporation, Microsoft, Hayes. Literally hundreds of specialized hardware producers and thousands of specialized software developers have entered the market, and large firms have not fared all that well against many of their smaller competitors.**

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* On June 10, the FCC issued a Public Notice [mimeo no. 3579] in which it indicated its intention to make enhanced and information services that involve interstate transport subject to carrier's carrier switched access charges. Up to now, these services, which involve no direct electrical connection between local business lines and interstate transport facilities, have not been included within the coverage of the FCC's Part 69 access charge rules. It has been estimated that if the proposed rule change is adopted, the cost - and hence the price - of communicating with enhanced information services could increase by as much as $5.00 per connect hour. Of even greater concern, it is not at all clear that the types of information services being proposed by the BOCs, were they permitted to enter this market, would themselves be provided in a manner that would fall within the scope of the FCC's access charge rules. It is thus entirely possible that the FCC's action may impact nearly every information services provider except the BOCs.

** AT&T, it could be said, traded away its local operating telephone companies for the right to enter the computer and information services field. Yet AT&T does not have very much to show for its efforts in this regard. Its entry into the personal computer market was little more than another "me too" IBM clone which has captured only a miniscule share of the PC market; moreover, that machine was not even produced by AT&T or by any other U. S. company. AT&T has enjoyed some success with one major software product - UNIX - but that was developed by Bell Labs before divestiture largely with ratepayer-supplied funds. And there's no sign of any major AT&T entry into the data base or information services marketplace.

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According to recent industry data, there are some 500 different on-line information services available to businesses and consumers in the U. S. provided by firms of all sizes. Many banks offer on-line home banking services; some airlines provide on-line flight reservations services; a number of different financial and general news and specialized "newsletter" type services are available; and home shopping via personal computer is beginning to become popular. There are any number of private "bulletin boards" maintained by individual groups and organizations, and several national public electronic mail networks are accessible from home computers. Packet networks like Telenet and Tymnet and the national Direct Distance Dial (DDD) voice telephone network have assured universal availability of practically all of these services. Some 15.2-million U. S. households currently own some sort of personal computer that would, with the attachment of a modem, be capable of accessing any of the available information services. And some 3.5-million of these households already own such modems.

The BOCs are, of course, in an essential and unique position to develop the means for facilitating access to information services and to make such access even more efficient than is possible with today's network structure. They can implement derived channel technologies (like Data Over Voice) to permit the home information services user to access a computer system while also using his home telephone for voice communication. They can deploy packet networks at the local central office level that will eliminate the need to occupy higher-capacity voice-grade transmission facilities for low-speed data applications, and in the process reduce the cost and hopefully the price of such access. The BOCs are correct that their role in establishing a new network infrastructure to support

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widespread use of on-line information services is essential for the development of this marketplace. But that is precisely because the BOCs continue to control and to dominate the nation's basic telecommunications network resources, not because that network has become "geodesic" or "contestable." And the BOCs' ability to provide the needed network resources does not in any sense turn on their own entry into the information services business, and indeed such entry could easily divert resources that should be used to enhance the basic network. The BOCs' networks and resources are critical to the widespread development of enhanced and information services by others; the BOCs' own involvement in these adjacent markets can only get in the way of what ought to be their primary mission.

Conclusion

It has frequently been suggested, in the course of this policy debate, that notwithstanding the lack of hard quantitative evidence of a viable and sustainable competitive telecommunications marketplace, we ought nevertheless to "give deregulation a chance," to learn from actual experience whether in the absence of legal barriers to entry it will not be possible to develop an effective and efficient market mechanism. But in fact most legal barriers to entry by non-dominant firms have been removed, yet the dominant positions of the incumbent local and interexchange carriers remain as entrenched as ever. The current financial plight of the OCCs could have been and was (at least by me) predicted even before the initiation of the present switched access charge system in May of 1984. We know a great deal about the underlying economic properties of telecommunications technologies and markets, and can continue to

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project, with considerable accuracy, the areas where sustainable competition can be expected to develop, and where it cannot.

There is simply no compelling reason why we should now abandon what has proven to be a reasonably (albeit not perfectly) effective mechanism for constraining the exercise of market power by the dominant firms, and in fact it is time that the known deficiencies in the present regulatory structure, such as the lack of detailed examination of the cost basis and other quantitative data underlying rate and tariff actions by dominant carriers, particularly at the federal level, be corrected. We have also learned that the elimination of legal barriers to entry in no material way threatens the financial well-being of the dominant local and interexchange carriers, so we can, in a way, "have our cake and eat it too" in terms of competition and regulation: We can permit entry and innovation by new firms without posing serious risk to the primary national telecommunications infrastructure, but for that very reason we cannot expect such limited, specialized competition as may materialize to constrain the market power of the dominant carriers. The responsibility for imposing and maintaining such constraints must clearly lie with an effective and efficient system of economic regulation of the dominant local and interexchange carriers.

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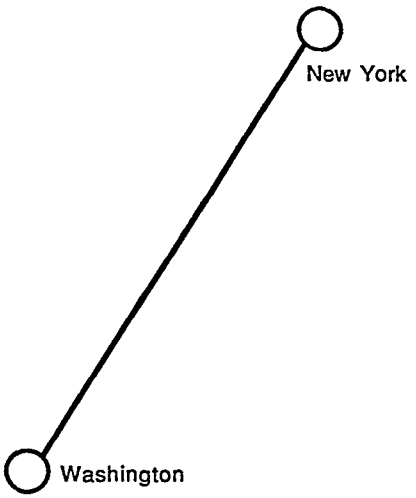

Figure 1

A direct connection between two end users can only be used to carry traffic between the two users.

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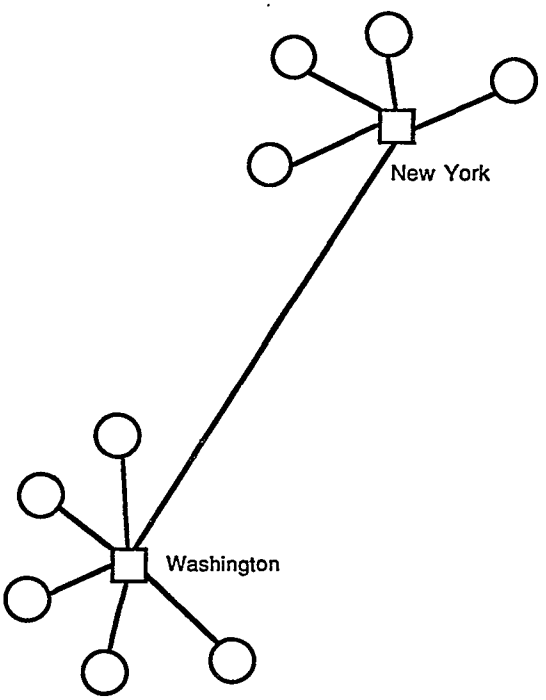

Figure 2

A two-point common carrier network
can carry traffic to/from
many users in the two cities

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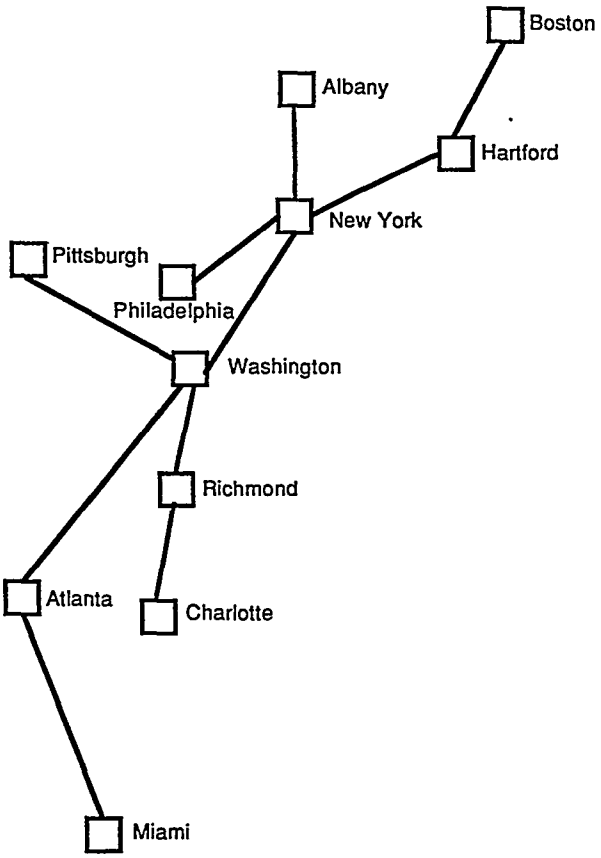

Figure 3

Each two-point link in a multipoint common carrier network is capable of carrying tarffic between many combinations of network nodes.

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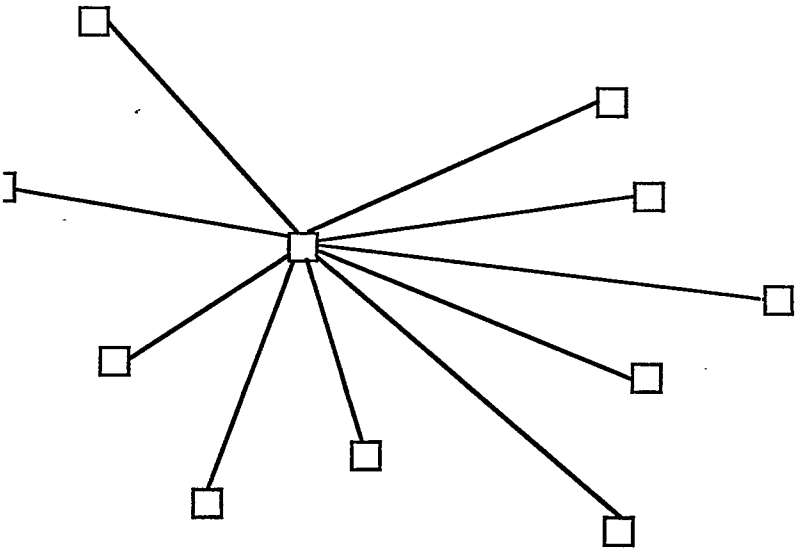

Figure 4

A "hub" network: All traffic either transits the hub or terminates at the hub. Each link is thus capable of carrying traffic to/from any point on the network

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Figure 5a

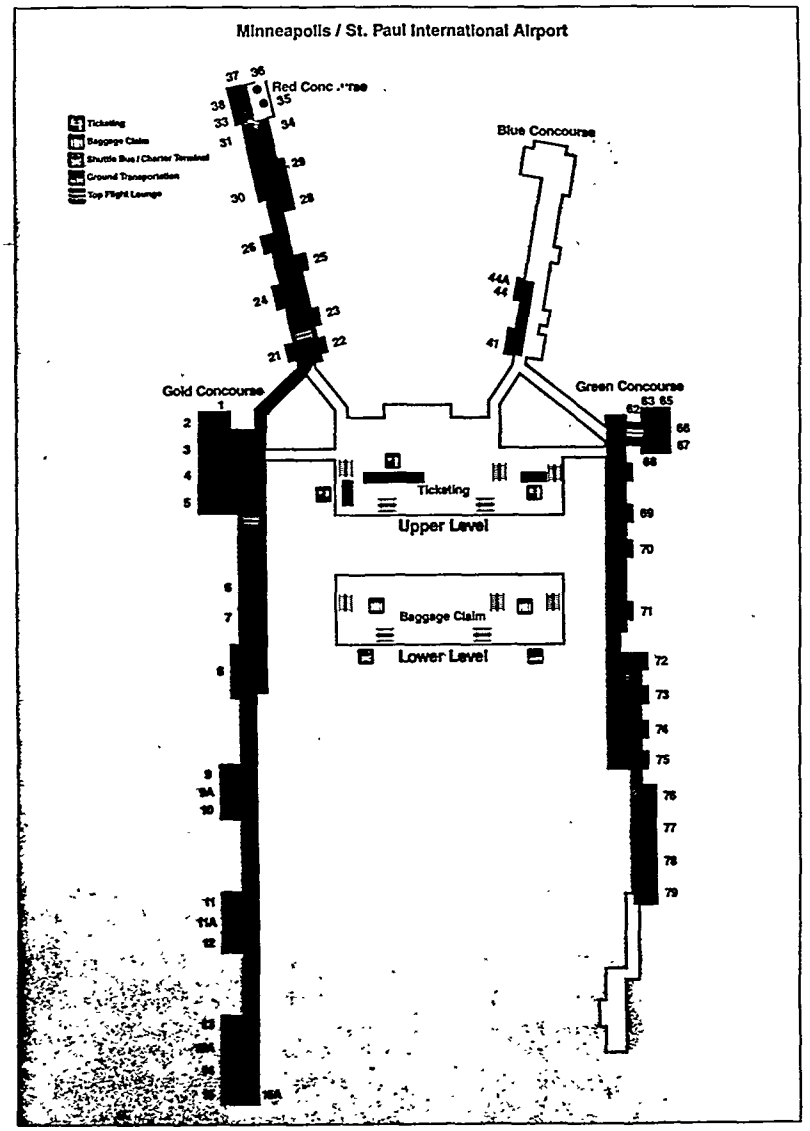

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Figure 5b

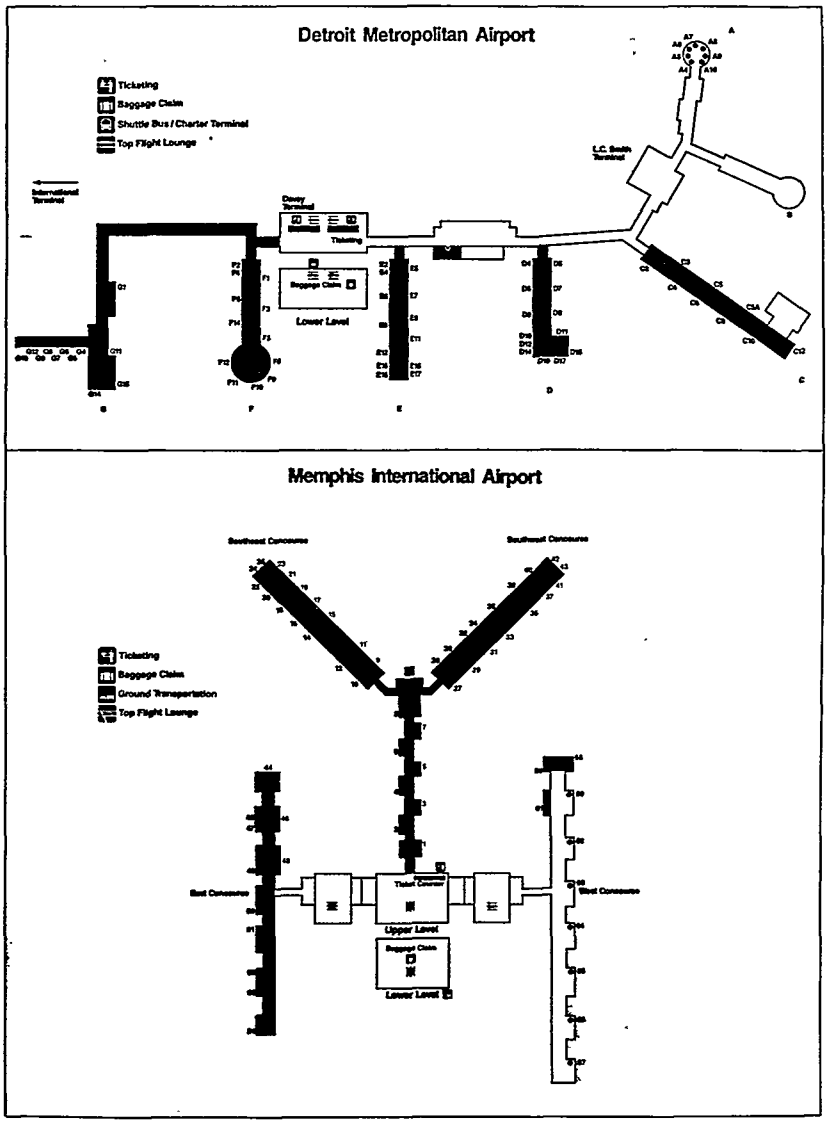

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Table 1

"FORTRESS" HUBS
BASED ON 1985 TRAFFIC

Hub Airport	Dominant Airline	Market Share of Dominant Airline (%)
1. St. Louis	TWA	83.5
2. Pittsburgh	USAir	79.7
3. Minneapolis/St. Paul	Northwest	79.6
4. Chicago-Midway	Midway	78.7
5. Charlotte	Piedmont	75.8
6. Salt Lake City	Delta	75.5
7. Houston-Intercontinental	Texas Air	71.1
8. Houston-Hobby	Southwest	69.6
9. Newark	Texas Air	68.6
10. Dayton	Piedmont	65.2
11. Memphis	Northwest	63.1
12. Dallas/Fort Worth	American	62.0
13. Miami	Texas Air	59.0
14. Detroit	Northwest	55.7
15. Atlanta	Delta	52.8

SOURCE: AVIATION DAILY

Based upon domestic passenger enplanements; figures combined to reflect recent mergers.

Source: January 1987 Frequent Flyer, page 73.

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Table 2

SAMPLE UNRESTRICTED AIRLINE FARES*

NON-STOP FLIGHTS INVOLVING A HUB THAT IS DOMINATED BY A SINGLE CARRIER

(non-competitive routes)

ROUTE	AIRLINE	FARE	DISTANCE	PRICE PER MILE
Boston-St. Louis	TW	$397	1045	$0.38
Atlanta-Minneapolis	NW	$311	907	$0.34
Minneapolis-Salt Lake City	NW	$305	990	$0.31
Salt Lake City-Dallas	AA	$325	993	$0.33
Boston-Chicago	NW	$320	858	$0.37
Wichita-Kansas City	EA	$163	186	$0.88
Detroit-Denver	UA	$347	1142	$0.30
Boston-Pittsburgh	AL	$199	490	$0.41
Chicago-Detroit	UA	$200	237	$0.84
Houston-Phoenix	CO	$326	1012	$0.32
San Diego-Pittsburgh	AL	$489	2110	$0.23
San Francisco-Kansas City	EA	$365	1495	$0.24

* Based on the lowest unrestricted one-way fare in effect as of July 13, 1987

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Table 3

SAMPLE UNRESTRICTED AIRLINE FARES*

CONNECTING FLIGHTS THAT TRANSIT A CENTRAL HUB

(competitive routes)

ROUTE	AIRLINE	FARE	DISTANCE	PRICE PER MILE
Boston-Minneapolis-San Francisco	NW	$181	2698	$0.07
Washington, DC-Kansas City-Wichita	EA	$180	1123	$0.16
Atlanta-Salt Lake City-Phoenix	DL	$287	2088	$0.14
Boston-Detroit-Denver	NW	$220	1764	$0.12
Minneapolis-Salt Lake City-Los Angeles	DL	$222	1572	$0.14
San Francisco-Kansas City-Minneapolis	BN	$166	1889	$0.09
Atlanta-Dallas-Los Angeles	AA	$312	1961	$0.16
Washington, DC-Pittsburgh-San Diego	AL	$216	2295	$0.09
Phoenix-Minneapolis-Washington, DC	NW	$166	1988	$0.08
Miami-Atlanta-Detroit	EA	$176	1200	$0.15

* Based on the lowest unrestricted one-way fare in effect as of July 13, 1987

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Table 4

SAMPLE UNRESTRICTED AIRLINE FARES*

POINT-TO-POINT NON-STOP FLIGHTS IN HIGH-TRAFFIC ROUTES
NOT INVOLVING A CENTRAL HUB

(competitive routes)

ROUTE	AIRLINE	FARE	DISTANCE	PRICE PER MILE
Boston-Washington, DC **	EA	$75	406	$0.18
Washington, DC-Atlanta	EA	$140	540	$0.26
San Francisco-Los Angeles	PS	$32	333	$0.10
Phoenix-Salt Lake City	DL	$69	502	$0.14
Dallas-New Orleans	DL	$114	447	$0.26
Denver-St. Louis	TW	$180	780	$0.23
Dallas-Houston	AA	$57	233	$0.24
Los Angeles-Las Vegas	DL	$32	231	$0.14
San Diego-San Francisco	AL	$39	449	$0.09
New York-Miami	PA	$186	1092	$0.17

* Based on the lowest unrestricted one-way fare in effect as of July 13, 1987

** One-half of unrestricted round-trip fare

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Mr. MARKEY. Thank you very much for a very, I think, enlightened testimony.

We now turn to Dr. Kahn. I might stipulate at this point that Dr. Kahn has some reputation in the airlines industry, and so as a result, some of the comments which Mr. Selwyn made, I'm sure will be not wanting for comment, and we thank you, Doctor, very much. Your expertise on a wide range of issues is greatly admired, and your comments in this area will be appreciated and, I'm sure, very much looked upon by the committee for guidance in the coming months.

So with that, whenever you feel comfortable, please begin.

STATEMENT OF ALFRED E. KAHN

Mr. KAHN. Thank you, Mr. Chairman.

Ten to 12 years ago when I was chairman of the New York Public Service Commission, I testified twice before this committee on the policy issues that have been generated by the recent increases in competition in telecommunications. What Congress confronted at that time was two contending views of the industry. Neither of them was ridiculous.

One was a view of a single entity, thoroughly regulated, protected from competition, with total 100 percent responsibility for service, in a position to take full advantage of the economies of scale, of the integrated planning and operation of the network, and, incidentally, to overcharge long-distance calling by many billions of dollars a year and use the proceeds to hold down the charges for local service.

The contending vision was one in which competition would assume the principal responsibility for protecting consumers and exploiting even then rather developing and converging telecommunications and computing technologies.

We have gone very far since then toward opening all of telecommunications to competition, largely inadvertently and without a very clear vision of where we were going. The most difficult issues today all revolve around the question of how far and in what ways the liberalization of entry should be accompanied by deregulation of the incumbent companies as well, especially AT&T and its successors.

I'm sorry that I can't give you specific and decisive guidance for that, but I do have a number of general principles that I urge you to keep in mind as you pursue these extremely important hearings.

Number one, the logic of opening the telephone industry or any other industry to free entry ultimately demands deregulation of the incumbent companies as well. Competition and public utility type regulation are ultimately incompatible. The present situation in which we permit free entry but continue to subject the telephone companies to severe regulatory constraints, which I describe at length in my written submission, could well be giving us the worst of both possible worlds. We simply have no way of knowing today to what extent the competition that we are witnessing, not just in long-distance service, but in shared tenant services, in bypassing of local telephone companies, we have no way of knowing to what extent that's competition on the basis of efficiency, to what

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extent instead it has been made possible only by the continued artificial restrictions on the regulated telephone companies.

We also have no way of knowing to what extent we may, because of the restrictions still imposed on the telephone companies, especially under the consent decree, be depriving ourselves of valuable service innovations. We have all the confusions of competition, compounded by the breakup of AT&T, the sharp increases in depreciation cost, likewise necessitated by the introduction of competition, but we may be depriving ourselves of a large number of the benefits of competition.

That's my first point.

Second, regulation in these circumstances runs the extreme risk of erring on the side of protecting competitors from competition in conflict with its major historical function, which is to protect consumers from being charged excessively high prices or being given poor service. All too often historically regulation has done exactly that, has been synonymous with cartelization and protectionism.

If we are uncertain—and despite Mr. Selwyn's eloquent testimony on the point—the fact is, we do not know, and economists have been studying this for years, and you can get the total spectrum of opinions on the subject—if we're uncertain whether some parts of the telephone business may really be natural monopolies, the only way to find out ultimately is to permit competition to take place and let the market tell us.

Third, there are clearly major markets in which customers still require regulatory protection, of course. The way to do that, while deregulating the competitive operations, is in one way or another to break the link between the prices to the monopoly customers and the revenues and costs that are ascribed to the competitive operations.

How? So far as I can see, there is no method that will not be essentially pragmatic. Some States, for example, are attempting thoroughly to separate the accounts of the two operations, but that's largely arbitrary. And as long as the two sets of services continue to be provided largely from common facilities, regulators will never get out of the business of making those arbitrary allocations on a continuing basis, the very process that makes partial deregulation so unsatisfactory.

I suspect, therefore, that we're going to see increasing recourse instead to simple indexation schemes for the monopoly prices, as in England where telephone rates are linked to their CPI, or freezes of one kind or another, such as has recently been introduced in States like Vermont and New York. These all automatically insulate the rates that we're most concerned about, namely primarily local service charges to residential and small commercial customers, insulating them from whatever the rates the telephone companies may be free to charge for competitive services, and it eliminates the danger of cross-subsidization.

The New York moratorium agreement also permits the telephone company's rate of return to vary within a rather wide range over the next several years. This has the very attractive property of giving the company a strong incentive to improve its efficiency, to innovate aggressively with both it and the ratepayers sharing in the benefits.

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How do we decide—this is No. 4—which markets or services can safely be deregulated wholly or partially? The answer, of course, is, the ones that are actually or potentially effectively competitive, but that advice really is not very helpful. There are no conclusive, objective tests. Markets in the real world are not neatly divided between identifiably competitive and identifiably monopolistic. Some market power is present in the overwhelming majority of America industries, industries that we nevertheless choose not to regulate directly.

Why don't we regulate them? The answer is that regulation, too, is a highly imperfect institution. And who should know better than I? As I never cease to point out, even I was myself a very aggressive regulator.

Obviously, what we have decided for almost all American industries is that however imperfect competition may be, it is likely to produce better results than very imperfect, cost-plus utility type regulation.

Point number five, in assessing the sufficiency of competition in telecommunications markets, we have to give especially heavy weight in this industry to potential competition. Existing concentration figures and shares merely reflect very heavily the effects of regulation itself. The point is that we have here very rapid technological change. These technologies are incredibly versatile. All of that casts doubt on the validity of any of the traditional definitions of services or markets or measures of concentration in those markets. Many services have a wide range of substitutes, ranging from some that are relatively close to others that are clearly highly imperfect.

Technology is the most powerful underminer and destroyer of monopoly power, because it is constantly developing new services, and in so doing, that compete directly with old or new methods of developing means of satisfying needs that compete directly with old methods, and in so doing, it typically opens the game to new players.

Everybody is in the telecommunications business today—banks, investment houses, industrials, public utilities, cable TV operators, real estate companies, electronics companies generally.

Now I don't mean to exaggerate. There is surely still a great deal of monopoly power in important markets served by telephone companies. My point is only that by far the most pertinent measure of competition is a measure of the firms, large users of telecommunications services and firms in other industries that have access to the pertinent technology and the ability and incentive to apply it, either for their own needs or for sale in the market.

Six, let's look at the issue before the FCC today about whether or not or in what ways to loosen the tight regulatory control it now exercises over AT&T's long-distance rates. Concentration rates in long-distance markets remain very high. Whether AT&T's share is 70 or 80 or even 90 percent depends a good deal on what measure you use.

But a simple layman's observation surely discloses that the market is in many ways highly competitive. There are at least 3 major companies that actively compete with one another. I have seen figures compiled by AT&T that seem to show that 95 percent

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of all interLATA traffic is generated in LATA's served by 3 or more facilities-based interexchange companies, not to mention resellers, and almost all of that is in exchanges that offer equal quality access.

Until very recently, the major uncertainty about deregulating AT&T was whether the smaller competitors could survive, whether because AT&T might employ predatory tactics or merely because of its very large asserted advantages over its rivals. But first, the only way to find out whether competition can survive is to permit AT&T to compete.

Second, AT&T, after all its exposures to antitrust liability over the last 10 to 15 years, would be insane to engage in predation.

Third, for reasons that I explain in my written statement, the comparative unprofitability of MCI and U.S. Sprint in recent years is not an accurate indicator of the likelihood of their survival now that they have largely completed their huge investments in a nationwide transmission network.

And fourth, the greater likelihood has always seemed to me not that they would be driven out of business, but that an unregulated AT&T would compete only very softly, holding a price umbrella over its rivals in order to ensure their survival, so as to avoid any possibility of antitrust attack or reregulation, and I'm glad to see that MCI has come around to my position. MCI is now an ardent advocate of deregulation, obviously because it expects that a deregulated AT&T would not compete with it as strenuously in price.

Here's where I think I come out. One, companies like MCI and Sprint, and even more the enormous capacity that they have already installed, have much better prospects of survival than the present profit rates of those companies suggest.

Two, their survival will continue to depend upon their offering subscribers some combination of assertedly superior service—witness U.S. Sprint's continued emphasis on its all fiber optic transmission—and lower rates, and that they can be counted on to continue to limit AT&T's ability to exploit the public.

Third, if, in fact, competition turns out to be inadequate—this is long-distance calling—we will always have the option of letting the Bell regional holding companies back into this business. AT&T is not likely to drive them out.

Fourth, higher profits for AT&T, particularly if they cannot be extracted from captive customers, would be a very small price to pay for the benefits of competition and the superior incentives of a company freed from cost-plus regulation to be efficient and aggressively innovative.

Finally, public utility type regulation is simply not a very good answer to the danger of possible inadequately competitive oligopoly. So long as we retain some reasonable protection of small residential and small commercial customers, it seems to me Congress' best course is to give the regulators and Judge Greene a good deal of leeway in their quest for solutions to these dilemmas. This is not a case of good guys and bad guys. This is not a Clint Eastwood movie. It is not about the good, the bad, and the ugly, to quote somebody else.

Telephone service is still a wonderfully good bargain, and hundreds, maybe thousands of actors are indeed actively engaged in

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probing and exploiting the almost miraculous promise of modern telecommunications technology, thanks in important measure to the deregulation that we've experienced so far.

Thank you.

[Testimony resumes on p. 63.]

[The prepared statement of Mr. Kahn follows:]

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STATEMENT OF ALFRED E. KAHN

Ten to twelve years ago, I had the privilege of testifying twice before this Committee, and once before the corresponding committee of the Senate, in my capacity as Chairman of the New York State Public Service Commission, on the policy issues generated by the recent increases in competition affecting the telecommunications industry, and specifically on the succession of bills then before Congress intended in one way or another to reverse that trend.

What Congress confronted at that time was two contending views of the best way of organizing the industry; neither of them was ridiculous. One was of a single entity, thoroughly regulated and protected from competition, with total responsibility for service, from end to end. Such a monopoly would be in a position to take full advantage of economies of scale and of integrated planning and operation of the entire telecommunications network, and to perform all sorts of quasi-governmental functions--most prominently, to overcharge long distance service by billions of dollars annually and use the proceeds to hold down the charges for local service; also to overcharge businesses generally in order to hold down basic residential rates.

The other vision was one in which competition would assume the principal responsibility for protecting consumers, on the one hand, and ensuring the full exploitation of the rapidly developing and converging telecommunications and computing technologies, on the other.

My own principal reason for opposing the various Bell bills was to defend the policy that we had already adopted in New York of opening to competition the provision of customer premises equipment--interior wiring, the telephone instruments themselves, answering machines, switchboards and the like, in increasing variety and complexity--although I must say we never dreamed of taking away from customers

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the option of continuing to obtain all these services from their single local telephone company, if that was what they wanted. As I contended at the time, this part of the business is obviously not a natural monopoly. And consumers have already clearly received enormous benefits from the greatly expanded range of equipment choices that competition has made available to them. I expressed much greater uncertainty in that testimony about the feasibility of competition in the long distance business; and of course there was no question at all at that time about deregulating the core local services--subscriber access, switching and transport.

In the intervening years, we have gone very far towards opening all of telecommunications to competition--largely inadvertently, and without a clear vision of where we were going and what we expected the industry to look like at the end. The most difficult issues today, which are the subject of this Committee's hearings, all revolve around the question of how far and in what ways the liberalizations of entry that have already occurred and are likely to occur should be accompanied by deregulation of the incumbent companies as well--especially AT&T and its successors.

I am aware that you are looking for quite specific and decisive answers to those questions; I regret that I am not able to provide them to you. There are, however, certain general principles that I urge you keep in mind as you approach this task, and, specifically, as you set about evaluating recent deregulatory policies and proposals of the Federal Communications Commission. I set them forth as a series of propositions.

1. The logic of opening the telephone--or any other--industry to free entry, whether by competing suppliers or by permitting large categories of customers to supply their own needs or both, ultimately demands deregulation of the

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incumbent companies as well: wherever we decide we can safely rely on competition, we must, logically, abandon public utility-type regulation.

I have become increasingly convinced that the present situation, in which we permit free entry but continue to subject the telephone companies to severe regulatory restraints, could well be giving us the worst of both possible worlds. The most troublesome of those restraints are the requirements that they

o set prices on the basis of average system-wide costs--which means in some markets above cost, and therefore subject to competitive invasion, and in others below cost, in a continuing effort to practice internal subsidization;

o sell only at posted tariffs, from which they are forbidden to depart except with permission of the regulatory agency, while their competitors are subject to no such constraints;

o price on the basis of embedded or book costs that typically far exceed the true economic costs of both the regulated companies themselves and their unregulated rivals, because they contain a very large component of capital carrying charges on investments grossly overvalued on their books: because the original investments have been inadequately depreciated in the past, their depreciated original cost evidently far exceeds the cost of duplicating the plants or services with current technology;

o price their competitive services on the basis of cost allocations that have nothing to do with their true economic costs, but instead represent little more than the desire of regulators to perpetuate internal subsidizations or to protect competitors; and, finally;

o in the case of the Bell and General Telephone Operating Companies, confine their operations more or less to the mere transmission of verbal messages--that is to say, remain subject to severe limitations on their ability to provide the

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sophisticated information services that their modern computer-switches are capable of providing.

In these circumstances, we cannot know to what extent the competition that we are witnessing is competition on the basis of efficiency, to what extent instead it has been made possible only by the continued artificial restrictions on the prices and activities of the regulated telephone companies, including AT&T itself. That uncertainty extends not just to long distance service but also to a good deal of the competitive bypassing of local telephone companies, and the competitive provision of the equivalent of local service by geographically concentrated business users, such as in shared tenant services. And we have no way of knowing to what extent we may, by virtue of the restrictions still imposed on the telephone companies, mainly under the AT&T Consent Decree, be depriving ourselves of valuable service innovations. We have the confusions of competition, compounded by the breakup of AT&T, and the sharp increases in depreciation cost, likewise necessitated by the introduction of competition--a monopolist can write equipment off over a 30-35 year period, because it can control the rate of innovation; a firm in a competitive industry has no such luxury. We have also had real benefits of competition; but subscribers to basic telephone service would, I suspect, take a great deal of convincing that they are better off because of it.

2. Regulation in these circumstances runs the extreme risk of erring on the side of protecting competitors from competition, in conflict with its major historical function, which is to protect consumers from being charged excessively high prices or provided poor service. Whatever the possible offsetting justifications, the setting of price floors is, at first blush, a restriction on competition; it clearly holds prices to some consumers higher than they otherwise would be. It also creates the possibility that business will go, inefficiently, to companies with higher

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incremental costs than the incumbent companies, because the latter are prevented from pricing down to their incremental costs.

It is not at all clear to me that public utility regulators ought to be in that business. Indeed, regulation has all too often, historically, been synonymous with cartelization, protecting industries from competition, rather than serving the interests of consumers. This unhappy tendency of regulation is directly related to our uncertainty about whether some parts of the telephone business may or may not still really be natural monopolies: as I have already pointed out, as long as we limit the competitive response of the incumbent companies, we simply have no way of knowing the answer to that question. The only way to find out where competition is feasible and where it is not, ultimately, is to permit the competition to take place and let the market tell us the answer; and the longer we postpone that determination the greater the cost to the public.

3. What about the markets in which we think customers still clearly require regulatory protection, and the associated danger of their being forced to cross-subsidize the telephone companies' competition in other markets? In my judgment, the essential solution to this dilemma is to find ways of breaking the link between the prices to the monopoly customers and the revenues and costs ascribed to the competitive operations. Only then can the latter be genuinely deregulated. As long, instead, as the regulated prices continue to be set, directly or indirectly, on the basis of total company costs and revenues, or on the basis of some continuing process of allocation of costs between regulated and unregulated operations, there will always be the danger, in principle, of subsidization of the latter by the former (however much the actual practice has, historically, run in the opposite direction). In those circumstances, conscientious regulators will not be able to refrain from setting floors under the competitive prices (as well as ceilings

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over the putatively monopolistic ones), and second guessing the companies' investment decisions.

The question is: how is that separation to be done? So far as I can see, there is no possible method that will not be essentially pragmatic, indeed arbitrary. Some states, for example, are attempting to effect a thorough separation of the accounts of the two operations. While I think that is probably better than the present situation, it does not seem to me it will suffice, not merely because it will inevitably involve all sorts of arbitrary allocations--that might be a small price to pay if it permitted the regulators thereafter to keep their hands entirely off the competitive pricing and investment decisions--but because, so long as the two sets of services continue to be provided for largely, from common facilities, regulators will never be able to get out of the business of making those arbitrary allocations on a continuing basis--the very process that makes partial deregulation so unsatisfactory.

I suspect, therefore, that we will see increasing recourse, instead, to simple indexation schemes for the monopoly prices, or freezes of one kind or another such as have recently been introduced in states like Vermont and New York. As an example of the former, the recently privatized British Telecom is constrained during its first five years to raise the average of its prices no more than the retail price index minus three points; and no subcategory of prices--for example, the basic residential charge--more than the RPI plus two points. The New York State moratorium, roughly similarly, retains definite ceilings on some or all of the telephone rates about which there is the most intense regulatory concern--notably among them, local service charges to residential customers. This automatically has the effect of insulating those charges from whatever rates the

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telephone company may be free to charge for competitive services, and eliminates the threat of cross-subsidization.

It appears that the New York moratorium agreement also will permit the New York Telephone Company's achieved rate of return to vary within a considerable range over the next several years. This has the extraordinarily attractive property of giving the Company a strong incentive to improve its efficiency and to innovate aggressively, with both it and its ratepayers sharing the benefits. So long, also, as the agreement preserves ceilings on the monopoly services, this arrangement further undermines any possible concern about the Company's taking losses on its competitive operations, in the expectation of recouping from the monopoly services: any such losses will simply reduce its profits.

4. How do we decide which markets or services can safely be deregulated, wholly or partially? The correct but totally insufficient answer is: the ones that are actually or potentially effectively competitive. The trouble is that there are no conclusive, objective tests of which markets can be so categorized. The markets of the real world are not neatly divided between identifiably competitive and identifiably monopolistic. Instead, the degrees of market power present in individual markets present a continuum, with infinitesimal gradations between none and very large. Some market power is present in the overwhelming majority of industries--industries that we nevertheless choose not to regulate directly. This is only another way of recognizing that almost all competition, in almost all industries, is imperfect.

Why, then, don't we regulate most of those markets? The answer is that regulation too is highly imperfect. Even when I was, I think, a very aggressive regulator of public utilities myself, I pointed out that:

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> "A regulator cannot....force a company to be progressive, to innovate, to be efficient. He cannot do what a good management can do, and there is very little he can do about what poor managements do. In short, he cannot supply the dynamic stimulus that in other industries is supplied by competition."[1]

Manifestly, what we have decided, with respect to almost all American industries, is that however imperfect competition in them may be, it is likely to produce better results than very imperfect utility-type regulation--regulation that is even more egregiously imperfect in industries, like telecommunications, where we have permitted free entry but continue to limit the response of the incumbents.

5. In assessing the sufficiency of potential competition in telecommunications markets, I think it unquestionable that we must give relatively greater weight than in industry generally to potential as contrasted with actual competition, for a number of reasons:

o Existing market concentration figures and shares are of far less significance here than in industries generally, because they reflect heavily and continue to reflect the effects of regulation itself.

o The rapidity of technological change and the versatility of telecommunications technologies casts into doubt the validity of any of the traditional definitions of services, and therefore of measures of concentration among their suppliers. Consider, for example, the use of a local exchange carrier's switched network to place calls. Potential substitutes include WATS, private line service (furnished by the carrier or a rival), local area networks (again, as furnished either by the carrier or a rival), private telecommunications systems (e.g., microwave), not to mention postal service, air couriers and so forth. For intra-office or intra-building calls, Centrex and PBXs (purchased privately or as part of a

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1 A. E. Kahn, "Between Theory and Practice: Reflections of a Neophyte Public Utility Regulator," Public Utilities Fortnightly, January 2, 1975, p. 3.

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shared tenant service) are clear alternatives. The extent to which each of these is a substitute, actual or potential, depends on the nature of the customer and the location of the traffic. But the general principle is clear: many services are likely to have a broad set of substitutes, ranging from some that are relatively close to others that are highly imperfect. The proliferation of technologies for satisfying telecommunications needs makes it impossible to draw clear market boundaries, and a boundary drawn today can become obsolete a month from now.

o Technological innovation itself is the most powerful underminer and destroyer of monopoly power, because it constantly develops new services and new methods of satisfying existing needs that compete directly with old ones; and in so doing typically opens the game to new players. The suppliers and potential suppliers of telecommunications services today include banks, investment houses, industrials, public utilities, cable TV operators, real estate companies and electronics companies generally. The constant creation of new and cheaper ways to supply existing telecommunications services and the equally vigorous creation of new services is constantly reshaping markets and, as a general proposition, seems to be making them more open to competition.

I do not mean to exaggerate: there is surely still a good deal of monopoly power in important markets served by telephone companies. My point is only that by far the most pertinent measure of competition in telecommunications today is a measure of the firms--large users of telecommunication services, firms in other industries such as computers and data processing--that have access to the pertinent technology, and the ability and incentive to apply it, either for their own needs or for sale in the market.

In short, the dynamic character and rapid growth of this industry should incline us to be less worried about high concentration ratios or even the possibility

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of short-run monopoly exploitation than in most industries, and more concerned about the obstructions of competition and distortions imposed by continuing regulation.

6. The issue now before the Federal Communications Commission about whether or not, or in what ways, to loosen the tight regulatory control it now exercises over AT&T's long distance rates illuminates many of these observations in very interesting ways. Concentration ratios remain very high--whether AT&T's share of the market is properly measured at 70 or 80 or even 90 percent depends a good deal on what measures one uses, and I am not in a position to recommend one or the other.

A simple layman's observation surely discloses, however, that the market is highly competitive. There are at least three major companies that actively vie with one another for the patronage of subscribers, not just in advertising but in the varying price and quality packages that they offer. I have seen figures compiled by AT&T that seem to show that 95 percent of all interLATA traffic is generated in LATAs served by three or more facilities-based interexchange companies, not to mention resellers; that while only some 70 percent of all subscribers now are served by exchanges offering access of quality equal to what is available to AT&T--a ratio scheduled to rise substantially in the next year or two--those exchanges account for a much larger percentage of the total business and serve virtually all business customers; and that its competitors already were actually serving at least 40 percent of its large business and 20 percent of its large residential customers at the end of 1986.

Until very recently, the overwhelming question about the desirability of deregulating AT&T's offerings in this market was whether its smaller competitors could survive--whether because AT&T might employ predatory tactics or merely

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because of its very large asserted advantages over those rivals. It was in this context that I came increasingly to the view that the only way to find out whether this industry is a natural monopoly would indeed be to permit AT&T to compete. Entirely apart from the very real question of whether predation would have made sense from AT&T's standpoint on purely economic grounds, I was convinced that, after its exposures to antitrust suits and liability over the last 10 to 15 years, the company would have been insane to engage in such practices. The far greater likelihood, it seemed to me, was that it would compete only very softly, holding a price umbrella over its rivals in order to ensure their survival in their comparatively limited share of the total market, in order to avoid any possibility of either antitrust attack or reregulation.

The comparative unprofitability of MCI and US Sprint in recent years, which seemed to support the earlier concerns about their ability to survive in competition with a deregulated AT&T, is, I believe, very misleading. One important reason for their low profitability has been the very heavy investments those companies have been making in expanding their transmission capacity, with the result that their share in national interexchange capacity is evidently much larger than their present share in the total business. In consequence, their large cash flows are preponderantly dedicated to covering depreciation and interest costs, leaving very little for the bottom line. This clearly means, however, that as their traffic grows, to make fuller use of their disproportionately expanded capacity,[2] the revenues will almost all flow right through to profits. Moreover, now that it has been constructed, that capacity is not going to disappear: even if MCI and/or US

[2]According to a study by a member of the FCC staff in December of last year, the investments in fiberoptic capacity by the other common carriers have been immense, fully double those by AT&T, and the technology already exists for multiplying their carrying capacity at a relatively small incremental cost. Jonathan M. Kraushaar, Fiber Deployment as of Yearend 1986, Common Carrier Bureau, December 1986.

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Sprint were to leave the business, it will be saleable, at some price, to companies who will, particularly if they buy it at bargain rates, be able to offer AT&T severe competition.

The dramatic turnaround in MCI's position on the continued regulation of AT&T from urgent advocacy, clearly for fear that a deregulated AT&T would be a more powerful competitor, to very vocal opposition has signaled a corresponding shift in the principal rationale of the opposition to deregulation. As I have observed, I am inclined to agree: the greater danger is that competition will be insufficiently keen, and that AT&T will therefore be able to earn returns higher than the FCC now permits it--an expectation that obviously explains AT&T's own advocacy of deregulation.

I do not have a firm recommendation to offer for resolving this dilemma. It does seem to me, however, that:

o As I have already observed, companies like MCI and Sprint, and even more the huge amounts of capacity that they have installed, have much better prospects of survival than the present profit ratios of those companies suggest.

o Their survival will continue to depend upon their offering subscribers some combination of assertedly superior service--observe US Sprint's continued emphasis on its all-fiberoptic transmission, further emphasized by its recent writing off of a large portion of its investment in wire transmission facilities--and lower rates, and that they can therefore be counted on to continue to limit AT&T's ability to exploit the public.

o That if in fact competition turns out to be inadequately strong, we will always have the option of letting the Bell Regional Holding Companies back into this business; it can hardly be doubted that they have the resources to compete effectively with AT&T.

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o Higher profits for AT&T--particularly if they cannot be extracted from captive customers--would be a very small price to pay for the benefits of competition, and the superior incentives of a company freed from traditional public utility-type regulation to be efficient and aggressively innovative.

o Finally, and most fundamentally, public utility-type regulation--in contrast with such pragmatic devices as freezes or indexed rates of putatively monopoly services--is simply not a very good answer to the danger of possibly inadequately competitive oligopoly.

o On the other hand, even though a political amateur, I cannot refrain from commenting on the political hazards of permitting the scheduled additional 60 cent and 30 cent increases in subscriber line charges--which I strongly support--to go into effect without regulatory insistence that every cent of the corresponding resulting decline in the access charges by the local telephone companies to AT&T be passed on in reduced long distance rates.

7. One final recommendation, which I trust you will not regard as presumptuous. I suggest that Congress should be very hesitant about interfering with the efforts of the FCC and the state regulatory commissions to work through the present, highly unsatisfactory regulatory situation, and to experiment with alternative ways of eliminating the distortions and reduced incentives for innovation and competition that it now involves. These issues cannot be understood as arraigning good guys against bad guys; my testimony would not be fairly characterized by the title of a Clint Eastwood movie. There are genuine uncertainties about what would be the best choice among inevitably imperfect institutions--uncertainties that, I fear, are all too evident in my testimony.

So long however as we retain some reasonable protection of small residential and small commercial customers, however pragmatic, it seems to me the proper course is to give the regulators a good deal of leeway in their quest for solutions. We can take comfort in the knowledge that, on the one side, telephone service is still a wonderfully good bargain, and, on the other, that thousands of actors are in fact intensely engaged in probing and exploiting the almost miraculous promise of modern telecommunications technology.

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Mr. MARKEY. Thank you. That concludes the testimony from our witnesses. The Chair now recognizes the gentleman from Pennsylvania, Mr. Ritter, for an opening round of questions.

Mr. RITTER. Mr. Selwyn, your testimony indicates that you do not feel it is appropriate to allow the Bell Operating Companies to participate in the enhanced information services.

What if the FCC had the technical capability and the funding to police the Bell Operating Companies to ensure that monopoly abuse did not occur, would you then withdraw some of your reservations about the Department of Justice recommendations?

Mr. SELWYN. Let me say I'm not sure that the predicate you have suggested could in fact be implemented. Even if it could be, I think if our objective in this country is to assure the most widespread availability of information services, then what we should be doing with the custodians of the national communications infrastructure is to get them to direct their primary attention at modifying their networks, to facilitate and to assure the widespread availability of information services rather than giving them the opportunity to utilize their networks to enhance their own position in information services.

What I mean is right now, today, the information services that exist in this country are utilizing for the most part the switched voice dial telephone network, which serves a useful purpose but is not the most efficient means under currently available technology for achieving the distribution and delivery of these services.

What the BOC's ought to be doing is to provide the network resources, provide that interstate highway system, so that the services can be delivered, and not to divert their attention to participating in a market where they have no particular expertise and where except for the leveraging opportunities, which are fundamentally anti-competitive, there is simply no reason to expect they would be more successful than other firms in providing effective services.

Mr. RITTER. Is there sufficient incentive in their system now to do all that, if they themselves are not permitted to utilize the changed network?

Mr. SELWYN. I think it is. They have an opportunity to enormously expand the utilization of their existing network resources by facilitating the development by others of information services. What they can be leveraging is the entrepreneurial capacity of the entire information services industry, to market those services utilizing BOC transport facilities. They will generate revenues every single time somebody uses an information service over those monopoly transport facilities.

If I were in their position, that is the direction I would be going. I think that is the direction that makes the most sense and will assure the objective that you stated in your opening statement, that will provide them the best possible assurance of it being achieved.

Mr. RITTER. Dr. Kahn, would you like to add your comments?

Mr. KAHN. Yes, I would. In the period of 1981 to 1984, when I talked to managements of a number of telephone companies, I preached the kind of message Dr. Selwyn is. I suggested they set themselves up as small business administrations, that they do ev-

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erything they could to encourage entrepreneurs to come forward and offer information services, because that would increase the use of the highways and mean more revenues for them as well.

I certainly urge this committee to devote a good deal of its attention to the question of whether that promise has been realized, the extent to which my impression is it has been grossly inadequately realized and why.

I'm sure you will receive arguments by some which I have no way of evaluating, that it is because the telephone companies have simply not really offered equal access, collocation and the like.

All I do know is that as far as I can see, the only enhanced service that is offered generally by telephone companies now in the information field is Dial-a-Porn.

I ask myself, why is it that big business users can get the most miraculous services from their switches, their PBX's, their switchboards, services that the telephone companies are obviously capable of offering with their switches.

Mr. RITTER. Dr. Selwyn has mentioned in talking about the United States versus France, that there are more enhanced information services users in the United States than in France. It sounds to me a little bit like comparing apples and oranges.

Could you comment on that?

Mr. KAHN. I understand you are going to have a presentation on the French system. I read about it in the press. The fact is I don't see why I still have to use $0.22 stamps to pay my bills. It is a technologically absurd way to do it. I don't see why businesses can program their PBX's, their switchboards, to give them least cost routing of long distance calls, minute by minute, call by call. Nobody is less competent than me to decide who the long distance preferred carrier should be. I have no way of knowing who to turn to, let alone call by call.

If businesses can do these things with their switches and big customers can have all these complicated services, I don't know why we are not having them offered to the general public.

Mr. RITTER. Then the question becomes is that why they are not being offered to the general public answered by opening up Bell Operating Companies to serve as the linchpin in such an enhanced service network.

Mr. KAHN. There are two plausible explanations. One, of course, is they have not really made their facilities available, the Operating Companies, to independent entrepreneurs who might offer the service. The other is, of course, they themselves are prevented from doing so by the terms of the Consent Decree. Fundamentally, I think we have to recognize those restrictions on the kind of intelligence that the telephone companies can build into their computers, which are their switches, are counter-technological. There may be good reason for it, but it is clearly limiting the uses they can make of their technology.

Therefore, my intuitive attitude is sooner or later that ought to go. Two things; one, of course, the danger of cross subsidization. That is why I want to get away from cost plus public utility type regulation. If we eliminate the dangers of cross subsidization, then you have to evaluate whether open network architecture and comparably efficient interconnections are real words or just words.

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Mr. MARKEY. The gentleman's time has expired. In the interest of fairness before we recognize the gentleman from Oklahoma, we will let Mr. Selwyn make a brief comment.

Mr. SELWYN. Thank you, Mr. Chairman.

I am incredulous with the notion that the kind of things Professor Kahn has suggested as not being available, that in fact he thinks they are not available. He doesn't have to pay his bills with a $0.22 stamp. There are any number of banks that he can deal with directly that offer that capability on an on-line basis. He can walk into an airport in Seattle with a bank ATM card issued by his home bank in Ithaca and get money out of that machine, using a network where the transport facilities are provided by the Bell Operating Companies, but where the application itself has been developed entirely outside of the Bell Operating Companies.

The issue of automatic route selection, that always intrigues me because as we get into a less competitive long distance environment where the rate structure is getting flatter, the need for that application goes away but most of the services that he has characterized as being available only to large business customers are today available virtually to any business of any size.

Most of the on-line services that he would like to avail himself of in fact do exist and he could very well have availed himself of them through any number of sources, either through a home computer or through some other means.

I think there is a misunderstanding and a very serious misunderstanding about what is available in this country. There is a lot more out there than you may think.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Oklahoma, Mr. Synar, for a round of questions.

Mr. SYNAR. Those who are in favor of lifting these restrictions keep pointing to the consumers and how they will benefit if we allow the BOC's lines of business and then using the profits from these new ventures they get into, to hold down the rate increases that the consumers could expect.

My question to you is that can work both ways, can't it? The fact is, if they invest in these ventures and there are no profits, they would have to come forward and ask the rates be raised in order to subsidize their losses.

I would like your comments on that.

Mr. KAHN. As long as we retain the present system of regulation, that danger is undeniable. That is why in my testimony I said that the only way in which we can permit the telephone companies to go into these non-basic service ventures—by the way, what is basic depends upon what you are used to—a lot of things that aren't basic maybe aren't basic because they haven't been offered to us. The only way to do that is to make certain that we separate the charges to the monopoly customers, the ones we are worried about, from the revenues or the losses or the costs that are ascribed to the competitive operations.

That is why I want to get away from rate base, rate of return regulation. That is why I am so attracted to the kind of thing they do in England with the indexation, the Consumer Price Index minus some points, or the freezes that we have in many States

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now, moratoriums, which simply say, look, we are worried about the basic service rates to small residential, small commercial users. They may not go up in the next several years more than the CPI or more than the CPI minus several points.

It is cut loose then. Now you want to go out and try these other ventures, yes, you are welcome to try those other ventures. I am setting aside the ONA and CEI fear, that competitors may not have equal access. There is no danger now that you may do that at the expense of the small residential customers.

Mr. SYNAR. Dr. Selwyn?

Mr. SELWYN. Why are we only worried about the small residential user? If we want to encourage the development and widespread availability of products and services that utilize telecommunications and if the telecommunications infrastructure is monopolistic, as I believe it is, then I think we have to worry about all users and not just small ones.

If in fact we allow the BOC's into ventures that end up costing them money in that they are not profitable and sustain losses and if we deregulate them and if my hypothesis is correct, that they are in fact structural monopolies, then they will simply have no other option and will have plenty of opportunity without regulation to raise prices.

Dr. Kahn suggested and I agree with him, MCI sees a great advantage in deregulating AT&T right now. That is not because they expect AT&T to reduce its prices as a result of deregulation. In fact, AT&T can be reasonably expected to increase its prices as soon as the regulatory constraints are removed.

If we are interested in protecting consumers, why would we want to deregulate AT&T if all that will do is yield a price increase?

Mr. SYNAR. Let's go to the second thing, the issue of the cross subsidization. I would be interested in hearing both of your comments with respect to whether or not you think the FCC's Computer III inquiry is sufficient to protect the taxpayers from the fear that many people have about cross subsidization.

Mr. SELWYN. Computer III contemplates that the provision of enhanced services on an unseparated basis with certain protections being built in, in two areas, cost accounting and so-called open network architecture.

The basic principles and objectives of the FCC's policy, I think, are valid. We are a long way off from implementation of either of these two policies. As long as we are dealing with a common network infrastructure that will be utilized for both basic and enhanced services, it is not at all apparent to me that cost accounting will be successful in providing the necessary protection.

With respect to the issue of open network architecture, that is simply something that we have to wait and see. We don't know what the cost of open network architecture will be. It could well be that the cost of achieving the technical standards and technical interfaces to accomplish ONA will exceed whatever costs we might be avoiding by eliminating structural separation of these functions.

The FCC has in effect embarked on a policy on the assumption that there are inefficiencies in structural separation, without actually making any serious attempt to quantify whether or not the

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cost of the remedy will not itself be greater than what it is the remedy is supposed to cure.

Mr. SYNAR. Dr. Kahn?

Mr. KAHN. There are two essential questions about the Computer III, both of which I have brought out in my testimony. I think the committee has simply got to look into those.

Is the provision of ONA, open network architecture, really feasible, and that clearly includes the economic question that Dr. Selwyn mentions. Is it real or is it just a word? Second, will there be adequate ceilings on the rates to the people we are worried about?

I've said residential and small business users. The determination of who needs protection and who not is another factual question that I think the committee will be well advised to look into. I see a great deal of competition for the patronage of big business users. Undoubtedly, that is much more true in Manhattan, but it is true in Oklahoma City as well, than it is likely to be in Norman, although there is one big user in Norman that probably can take care of itself as well.

That's another factual question to look into. Given those two, if in fact one could be satisfied there are areas where there is competition and that we have ceilings on the prices we are worried about, and equal competitive opportunities can be made a reality, then I think it is undeniable that the Computer III way to go is the way to go.

I don't care whether Dr. Selwyn feels that the advantages of doing it in an integrated way are small or whether my intuition is right that the same switches can do a lot of things and therefore, there are probably great economies.

I don't care. In a competitive system, it is counter competitive to say to certain people, you may not produce these products, even if you have the facilities to do so, and our preference should be to let that be tested in the market, provided we have these two protections from the outset.

That is what I meant when I said the restrictions are counter technological. They are really in a sense counter competitive. They say, there are things you cannot do, even though you may be very good at them. Good reasons. We need protections. Ultimately, I trust that is the way in which we will be able to go.

Mr. SYNAR. Dr. Selwyn?

Mr. SELWYN. There are two separate issues here. One issue is entry by firms other than the BOC's, other than the dominant carriers, into these markets. The second issue, which is an entirely separate issue, is entry by the dominant carriers and regulation of the dominant carriers.

We can have—I think the conditions probably in the most competitive market in the country, which is Manhattan, have amply demonstrated that we can have entry without engendering any serious risk to the financial well being of the dominant carrier. We simply cannot use, I think, simplistic rate capping techniques or indexing techniques, the kind of pricing pattern that I described earlier with respect to airlines is what we will see in markets that are characterized by spotty competition.

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We will find prices that vary by a factor of 6 or 8 to 1 for what is fundamentally the same service, simply on the basis of whether or not a particular isolated segment of that market may be competitive.

I don't think that any of the cost accounting techniques that are being discussed, any of the rate capping or indexing schemes that are being proposed, really are prepared to confront this kind of structural monopoly and miscellaneous competition. It simply is not amenable to that simple a solution.

Mr. SYNAR. Thank you both. Thank you, Mr. Chairman.

Mr. MARKEY. I thank the gentleman.

Could I ask both of you to just go back 3 or 4 years when the Consent Decree was entered into by all of the relevant parties and look over that period of time and give us some sense of your feelings with regard to whether or not there has been a creation of significant new competition in the local exchange marketplace.

Has it developed? Is it there? Does it need more nurturing? Can you give us your view of the state of the telephone industry pronouncement at this point in time?

Mr. KAHN. I must observe at the outset that I have not studied this subject with the kind of care and detail others have and therefore, I cannot really give you any decisive answer.

I do want to observe that you have set this up as a kind of adversary testimony, in which one of the adversaries has represented the parties specifically on this subject and his general argument is there isn't much competition, and I have not done that kind of factual inquiry.

It seems to me very clear that when you are talking about large business users in concentrated metropolitan areas and you are talking about special access, that is the ability to go directly to any long distance carrier, or you are talking about private line service in those markets, bypass of one kind or another, or shared tenant services, that is a lot of competition. It is very active. A very large percentage of the business users, the big business users patronize other long distance carriers or long distance, another area, even intraLATA but relatively a long distance service within the LATA and of course long distance interLATA and interstate.

I think there is a great deal of competition there. It is a question that I think the committee clearly ought to look into and get people who have studied it. If you have to have adversarial proceedings, get people who have studied it and argued it on both sides.

My impression is there is a great deal of it in those particular areas dealing with those particular customers.

Mr. MARKEY. Dr. Selwyn?

Mr. SELWYN. You can always point to cases where an individual customer has constructed its own facilities or has used a non-BOC carrier or other provider for some small fraction, and I emphasize "small fraction" of its total facilities.

The data that we have including data, for example, presented by Peter Huber, who is certainly one who believes that competition in general has developed in this marketplace, continues to show patterns of just enormously overwhelming documents. Huber cited data on minutes of use of access facilities as between the BOC's

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and other non-local exchange carrier providers. He identified on an annual basis, 340 billion minutes being provided by the BOC's for access to long distance carriers and only half a billion minutes being provided by users or other non-BOC sources. This is a market share in excess of 99 percent.

Clearly, we can point to individual situations, but that does not make a market competitive, any more than somebody who flies from Washington to New York in his own private one engine plane is competing with the airlines. That is the level of competition in the final analysis that we are looking at.

The large companies that Dr. Kahn has suggested have competitive opportunities are the same large companies that own their own private airplanes, and for a small fraction of their total communications needs, do find that on occasion they can get a better deal from some non-BOC provider, most of the time because the BOC is utilizing inefficient pricing in the way it charges for its services, failing to recognize the presence of economies of scale, for example, and forcing the large customer to look for alternatives.

If the BOC's were to adjust their prices to accurately reflect the kind of scale of economies I discussed earlier when we went through those diagrams, then for the most part, even some of these anecdotal instances of competition would evaporate.

You simply cannot use isolated cases of miscellaneous competition and from that leap to the conclusion that we are dealing with a competitive market.

Mr. MARKEY. Let's go back, and perhaps you can give us your feelings in these various areas, long distance, manufacturing, information services, where you believe that competition does exist and where perhaps we should be looking if at all to release the BOC's from some of the restrictions which are on them.

Could you give us your sense of which areas are riper than others, if at all, for that kind of attention?

Mr. KAHN. Number one, again, I won't repeat my qualification that I have not studied these and therefore are not prepared to give you any kind of judgments in which I feel strongly confident, but I must observe that Dr. Selwyn has made a career of using the word "anecdotal." There is testimony in the proceeding before the New York Commission right now that ⅔ of the 400 biggest users of telephone service of New York Tel, ⅔ of them, are located in buildings that are passed by right now by Teleport, which is one of the competing facilities.

There are surveys of the 500 biggest users which show very large percentages of them, not anecdotal, very large percentages, that either have their own services, and one shows that something like 30 percent of them have their own private systems, and another 15 to 20 percent use other methods for access to long distance carriers.

This leads me to trying to differentiate the ones you are talking about. Number one, I believe that in the long distance market, as I suggested, we are close enough now to be willing to have a substantial amount of deregulation of the kind I described, while retaining ceilings on rates to small commercial and residential users.

Number two, in special access, that is direct access by big users to the long distance companies, one or another, we have a variety

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of suppliers in the major cities and that seems to be increasingly competitive. Again, large users, urban areas.

Manufacturing is clearly becoming quite highly competitive. That doesn't answer the question of whether it is desirable to let the BOC's go back into manufacturing because there you have that same old problem that the divestiture was supposed to eliminate.

I think those are 3 of the areas in which we are the closest to having a fairly high degree of competition.

Mr. MARKEY. Dr. Selwyn?

Mr. SELWYN. Just because the bus passes my building, if the bus isn't going where I want to go, it doesn't do me very much good.

I think what we are losing sight of here is the importance of the network. The large bank in Manhattan that has a branch system and has affiliates all over the country needs to be constructing a network that is not limited to something that happens to pass its building.

We have very strong evidence that can be seen, which I have been predicting now for some years and those predictions have been quite accurate, that when you eliminate differentials in the underlying costs of long distance services that were being incurred by AT&T on the one hand and its competitors on the other, that are the result of access charge differentials, the start-up carriers would find themselves in a great deal of financial difficulty. That situation seems to be accurate.

I agree with Professor Kahn that we obviously need to see how well Sprint and MCI do now their networks are larger than they were a few years ago, but I would also remind everyone that AT&T hasn't been lying around doing nothing during this period. It has been expanding its own network by an amount that exceeds the combined total of the other two.

I don't think we are confronting right now enough competition in the local exchange market to suggest that any of the factual underpinnings that led to the MFJ in the first place should really be relaxed at this point. I think the relevant test is not competition in information services or in long distance or in manufacturing, but whether or not the basis upon which the businesses of the BOC's were delineated in the original anti-trust settlement in 1982 and implemented in 1984 have materially changed.

I think the evidence is they have not. On that basis, I think what we need to do is continue to have the BOC's focus on their primary mission and now allow them to interfere with these other markets.

Mr. MARKEY. What is your answer to the argument that has been made by the Bell Operating Companies that unless some of the court's restrictions are lifted, allowing them to offer certain services, that customers will bypass their facilities and as a result the Bell Operating Companies will be forced to raise their rates for local customers?

How do you respond to that?

Mr. SELWYN. I believe the Bell Operating Companies, if they seriously believed there was any truth to that assertion, would be availing themselves of opportunities that already exist, both at the State and Federal level, to adjust their rate structures to more accurately reflect the cost of their service and remove the pattern of over charging for services furnished to the very large customers,

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the very same large customers that they assert would be bypassing them.

If these concerns were as valid as the BOC's claim, one would like to see much more aggressive pricing in those areas. We would be looking at price reductions rather than price increases.

I think there has been study after study in this area and nobody has yet been able to demonstrate any consequential diversion of traffic, to the point where it has had any material impact. Certainly, if the BOC's are really concerned in this area, there are remedies that are available to them, that they will be permitted to implement. In fact, in some cases, encouraged to implement at both the State and Federal level.

Mr. MARKEY. Dr. Kahn?

Mr. KAHN. There is testimony in the New York case that New York Tel's sales of services to its 400 largest customers have grown in the last couple of years, 35 percent less rapidly than their sales to other customers. That's number one. These are not just a couple of anecdotes.

No. 2; I'm sure the Operating Companies would agree with Dr. Selwyn, and of course he and I have agreed on this for a long time, that the rate structures as they exist at present are an open invitation to inefficient competition.

I am sure the telephone companies have been testifying for years about trying to get them corrected.

It is interesting. It is said that one should be suspicious of sausages made by other people because you don't know what is in them. I am suspicious of sausages made by me because I know what is in them.

I practiced regulation. I have also been testifying on exactly this subject with testimony that I think Dr. Selwyn would agree with entirely, it is a very tough fight. One of the advantages of competition is that it begins to attack those irrationalities of rate structures.

Mr. MARKEY. Dr. Selwyn?

Mr. SELWYN. I would just observe one point on this, and that is that the New York Public Service Commission 3 years ago told New York Telephone to deaverage its rates, and New York Telephone—and that is to reflect costs—to reduce its rates in high-density markets where competition was greatest.

New York Telephone has resisted and challenged the Commission's attempts to move it in that direction. The Administrative Law Judge recommendation in that direction was fought vigorously by New York Telephone, and even when an order finally came out of the Commission, the telephone company has dragged its feet.

So I think that we have a situation here where if New York Telephone is losing business or at least not experiencing the growth that it had perhaps been experiencing before, it has only itself to blame, because the opportunity is there for it to make the rate adjustments.

Mr. MARKEY. You're saying that if deaveraging had taken place in a timely fashion, that it could have been used to mitigate a lot of the problems which have developed.

Mr. SELWYN. That's one possibility. Now the other alternative is that New York Telephone may have reached the conclusion that

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the underlying demand for its services is sufficiently price inelastic that it's better off charging the higher prices and sacrificing some market share, because it will make more money that way.

Mr. MARKEY. My time has about expired. Dr. Kahn, did you want to come back——

Mr. KAHN. Well, I would only say that one would never become poor underestimating the rationality of regulated public utility companies and their pricing, and that's one of the reasons that I am such an advocate of competition.

Mr. MARKEY. They definitely won't become poor.

The time of the gentleman from Massachusetts has expired.

The Chair recognizes the gentleman from Washington State, Mr. Swift.

Mr. SWIFT. Thank you, Mr. Chairman.

The on-again/off-again schedule made be gone-again Flannigan, and I'm sorry, having missed most of the testimony. I'm going to limit myself to one question.

Clearly, the deregulation of BOC's as it relates to manufacturing causes concern in some areas, and when you deal in this complex area, I think you've got to take all of these concerns seriously, because it's not that clearcut. So I'm not suggesting that I am totally at ease with that. I think there are concerns that have to be addressed.

But there is, in addition to the usual red flags raised about permitting them to do that, a concern that is also raised by the BOC's. If we don't permit them, and I'd just like you each to comment on this specific thing—the BOC's indicate that they are having a very difficult time in many instances in getting the R&D done on some concepts they have for equipment that could improve services, add services, reduce costs to consumers. Specifically, Ameritech proposed an improvement of the adjunct processor—I don't even know what that is, incidentally—but according to them, this would have had considerable benefits, and they took that to 52 different manufacturers, including AT&T, and nobody wanted to mess with it.

Could you comment a bit on that, the other side of the issue from where you usually get the red flags? Aren't we running a potential of not letting the people who have the direct economic interest in running the local loop—nobody else is thinking about those things—having no ability really to be able to design, underwrite, and get people to manufacture the kinds of equipment they need to improve the local loop?

Let's start with either of you. Dr. Kahn?

Mr. KAHN. I think the answer to that question—unfortunately, I'm a two-handed economist—on the one hand, it's going to be similar to my answer about the question of letting the operating companies get into information services. I don't think there's any question that in a sense it is counter-competitive to say to companies, "You may not make your own equipment." I don't think there's any doubt that there is something lost, something in the advantages of integration, something that comes from the knowledge that the companies have of their needs and the incentive they have to develop their own packages, which includes packages of services which may include manufacturing. There's something lost. I don't think there's any question about that.

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And therefore, although very suspicious about vertical integration, I have tended to be—to say, well, the telephone industry gives me more problems than any other. You know the other side historically, that as long as you're regulated on a cost-plus, rate-based rate of return basis, there is that danger on the other side.

That's why if we could move away from the cost-plus rate-based rate of return regulation and simply say to the companies, "All right, for the next 5 years—we may reconsider at the end of 5 years—your rates that we worry about will just be indexed"—the consumer price index, minus 3 points or whatever one wants to say—then the companies are no longer in the position of being able to cross-subsidize competitive services at the expense of monopoly services. They are no longer in a position of being able to make money by selling things to themselves at excessive prices.

So that again that's why I am so—negative is too strong—I mean, you have to regulate sometimes, but if there are ways of getting away from that kind of cost-plus regulation, then you can more freely permit that kind of integration to take place, because if they lose, they'll lose the money in that case. They won't be able to recover it from their captive customers.

Mr. SWIFT. Dr. Selwyn?

Mr. SELWYN. Let me focus on a specific manufacturing situation. Now if we presume that the manufacturing industry is reasonably competitive at the moment, and if the 52 manufacturers turned Ameritech down, maybe there's a signal there about what the competitive marketplace thinks of whatever it is that Ameritech's concept is.

Presumably Ameritech would be in a position, whether or not it is actually permitted to engage in a manufacturing operation, to incur the same risks in terms of product development and research and development under contract with an outside firm than it would be if, in fact, it had its own captive manufacturing plant. If Ameritech felt that this product was of sufficient value to it and to its customers that it was willing to take the same type of risk in funding the R&D from any of those 52 firms that might have, under a funded contract, agreed to undertake this work, as Ameritech would have had to come up with if it were, in fact, involved in the manufacturing business itself, then it seems to me that it could have solved its problem.

The real risk here is going back to where we were in the days of integration of the Bell System and Western Electric, and when Western Electric would go off on some venture—for example, the development of the picture phone, a product that had no particular commercial success—and simply recover the cost of that venture by raising prices of other Western Electric products—that's the real risk of having a captive manufacturing function, that R&D activity, even if we had indexed regulation, could easily be buried in the costs that would be paid by the Ameritech operating companies back to the Ameritech manufacturing company for other more vanilla products that are purchased on a routine basis.

Mr. SWIFT. And I understand that. Those are some of the obvious red flags I think you have to be concerned about.

I don't know the answer to this question. But under the current prohibitions, if Ameritech were to undergo the risk, would they be

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able to benefit financially if the risk paid off, or are you suggesting that they should assume all the risk with no opportunity, zero opportunity, of ever benefiting from the risk they take?

Mr. SELWYN. Oh, no, I would never suggest that. Some operating companies, including, for example, New York Telephone, have made proposals at the State level that would permit them to engage in certain new service development where there would be some degree of risktaking that would be shared between ratepayers and stockholders with the benefits also being shared between ratepayers and stockholders.

Mr. SWIFT. How would that work? How could they benefit if they can't manufacture? How would they benefit if their research paid off?

Mr. SELWYN. If their research—well, they could certainly benefit by licensing the results of that research to other manufacturers?

Mr. SWIFT. I see. I see. It does seem to me, however, that to suggest because 52 manufacturers didn't want it, that doesn't necessarily mean that the market was sending a signal, because none of those manufacturers would have had, it seems to me, as much to gain as Ameritech might have had. In other words, if Ameritech were permitted to do this, and you had an adequate accounting system so you took care of the red flags—that's a big if, but assuming for this sake—they might be willing to take—Ameritech might be willing to take a bigger risk to get this product from which they'd benefit than a manufacturer who has a limited amount of benefit. He's going to get the product from the manufacturing, the sale of it, but he's not improving his basic system and so forth.

So all I'm raising is that it seems to me that you are putting some kind of a limiting factor on innovation within the local loop if you don't permit the manufacturer who runs—if you don't permit the operator of the local loop, who is the only customer for that kind of stuff, you know, in the country to have some participation in it.

Mr. SELWYN. But there are a hundred some-odd million local loops out there. I mean, this is—if somebody has got a product that is going to be valuable, there's an enormous leveraging opportunity. This is not—you're not talking about an isolated, very specialized market. I mean, if there is something that can have a general benefit to Ameritech, it could benefit Bell South; it can benefit GTE; it can benefit small independent telephone companies in Northern Minnesota.

The point is that there are—the real concern about manufacturing, going back through the history of the antitrust case itself, was the broader integration, the ability to simply bury certain manufacturing ventures, the risks of certain manufacturing ventures, into products that would then become part of the regulatory rate base.

This is an industry that shuns risks, doesn't want to take risks, has been looking—and I've been studying this industry for 20 years, and I've seen every way possible to transfer risk away from stockholders and to ratepayers, either directly, indirectly, you name it, they've figured it out. And I am just very skeptical about the ability of anybody to come up with a system that simply prevents that from happening.

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Mr. KAHN. May I just say, first of all, I agree with you.

Second, I'll bet you 95 percent of the economists in the country would agree that there is something to the possible benefits of doing it yourself, whether because of particular incentives that you may have yourself, particular expertise, particular abilities to work, particular incentive to keep it to yourself.

And that third, to the extent that you have tight rate-based rate of return regulation, that that discourages that kind of innovation. And in my testimony, I referred to one attractive aspect of the moratorium in New York State, which permits wider variation in the rate of return earned by a company, because that improves the lack of incentive problem.

Now none of that is to disagree with Dr. Selwyn's point that regulation and monopoly tend to encourage bureaucratic risk avoidance. But, of course, that's the virtue of competition.

Mr. SELWYN. I should just add to that, lest there be any misunderstanding, I am not opposed to modification in the traditional regulatory scheme of rate of return on rate-based regulation, and, in fact, in a paper that I submitted to NTIA last fall, I discussed specific incentive-based alternatives that could be considered. So I think that there is certainly room for innovation in the regulatory process without destroying the regulatory process.

Mr. SWIFT. Well, I want to thank you both. I am sorry I got lost in the schedule somewhere, because I was, as you know, here when we tried to start up before and was looking forward to your testimony. I will read it. I thank you both. Your reputations proceed you and follow you, and your observations are extremely helpful to this committee as we wrestle with the problem, the policies connected to which are extremely complex. If they weren't, we would have solved them a long time ago.

I yield back the balance of my time.

Mr. MARKEY. I thank the gentlemen for his participation in the hearing today.

I'd like to note for the record, just so that it can be made clear, we did invite Peter Huber, the author of the Huber Report, to testify here today or at any other point, and he has refused to testify, just so that you will know that we did ask for another one-armed economist to come here to balance out Dr. Kahn and Mr. Selwyn.

Mr. KAHN. Did you offer him limited immunity?

Mr. MARKEY. We offered him protection from you, Doctor.

Which is really what he sought.

No, in all seriousness, we did invite him, and he has refused to testify, and we make that open invitation to him at any point to come along to testify, so that we can understand his report, the "Geodesic Network 1987 Report on Competition in the Network Industry," which he has developed for the Justice Department, and we will distribute Thesauruses to all members of the subcommittee so that they can decipher what this report, in fact, says in English, because I think it is the—a very important key debate which is going on right now, although I must note, Dr. Kahn, in the course of your testimony, one arm or another shrinks up and down depending upon the subject as it is raised.

Mr. RITTER. Would the gentleman yield?

Mr. MARKEY. I'd be glad to yield.

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Mr. RITTER. Isn't that the prerogative of a professor?

Mr. MARKEY. And a politician. But Dr. Kahn is, I think, underestimating his ability to speak with authority on many of the subjects which we're discussing here today.

The Chair once again recognizes the gentleman from Pennsylvania.

Mr. RITTER. I thank the chairman for yielding.

I would like to ask our witnesses why, if Japan, Canada, and in particular France have achieved greater integration in terms of the services, information services offered, why some larger players might not help to achieve some of that integration in the United States?

After all, the Japanese, Canadian, and French systems are national telephone systems. They seem to have progressed in a way to provide integrated information services to households further than we have.

Why wouldn't the involvement of some larger players in the American information service delivery network—not one national player like those countries—help us to achieve this greater degree of integration?

Mr. Selwyn?

Mr. SELWYN. I think it might well help but I think we have to identify what that involvement should be. It is my view that the BOC's should be involved as facilitators in the delivery and dissemination of information services. That is their role. That will achieve the distribution and the intensity and availability of these services.

Mr. RITTER. It seems to me intuitively that if you're providing the system to transmit these products and don't have a stake in producing some of them, you have no incentive to improve the transmittal system.

Isn't the integrative capability of a larger player here potentially useful to the total system.

Mr. SELWYN. I don't agree with that. I think we can cite some specific examples that would show that is not the case. Let's take, for example, the development of personal computers. We had a large player, IBM, enter that market to produce the basic structure, the basic piece of hardware, the frame of the system, as it were, who had a very minimal involvement in the development of software and to this day, has a very, very small share of the personal computer software market.

In fact, offering a product that from day one was designed with an open architecture that permitted any number of literally thousands of companies to make general and specialized products, that fit in that system, and yet we have achieved very widespread adoption and distribution of what became a de facto standard, without any one monolithic firm simply dictating all the pieces, or even going so far as to develop the underlying applications.

In fact, the things that really moved the personal computer industry off the ground and that got this equipment adopted in offices around the country, were software packages that were developed by some very small firms.

Mr. RITTER. Could you focus on the differences between the Japan/Canada/France experience where there is a far greater

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unity? There is one telephone company so they have achieved this kind of integration. We still have this enormous fragmentation.

Wouldn't the involvement of some larger players who have a greater geographic coverage and a national scope as opposed to simply a specific use better facilitate the development of a better information system?.

Mr. SELWYN. Where is AT&T in all this? AT&T, it has been said, gave away all of its local operating companies for the right to buy a small interest in Olivetti. AT&T certainly is the big player. AT&T has made a pitiful showing in the information services market. It has made an even more pitiful showing in the computer market, all of the areas that were supposed to be its great opportunities.

Why is there any real reason to believe that the BOC's have expertise that makes them better equipped to develop these markets than other companies that have been in the business a lot longer? I don't even understand where this fragmentation we keep talking about is.

Any one with a telephone in the United States today can get access to on-line information services. That is not true in France. In France, if you are not in the area that is within the Minitel distribution plan, you don't get access to Minitel.

I think there is less fragmentation here. What we have is a distinction that goes to the very core of our economic system relative to what we find in other countries. We have an entrepreneurial system that facilitates innovation and entry by a lot of small firms and we have a delivery structure that is fundamentally monopolistic that should be devoted to facilitate that entry and that innovation.

What the French Government decided to do was give away terminals. We could do that here if we wanted to.

Mr. RITTER. I would think we could give away all the terminals we want and I don't think we would have a system.

Dr. Kahn?

Mr. KAHN. I am fundamentally in agreement with Dr. Selwyn on this. Remember, before 1984, there was no system in the world more thoroughly integrated and large than AT&T itself. Yet, its record, perhaps because of the way it was regulated, but in any case, AT&T was slow on digitization. It took the threat of Datran for AT&T to react for high speed data transmission. It has been slow. Right now the companies are doing their best to catch up with fiberoptics and the like, under pressure of competition.

It seems to me the ideal market system is to leave it open to both. That is to have competition between forms of organization, and that is why I basically oppose preventing the integration which we are doing now, because I think in certain circumstances——

Mr. RITTER. Would you comment on Dr. Selwyn's comment that AT&T has the capabilities to do all this right now?

Mr. KAHN. I'm not sure AT&T has any longer, anything like the facilities it had before 1984. You had no more integrated dominant, single, large system in the world than AT&T at that time. I don't think its record, and maybe because of the unimaginative way in which it was regulated—innovation—I'm not talking about Bell

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Labs, I'm talking about the actual commercial innovation, was as attractive.

Mr. RITTER. Why hasn't this happened now? If you are saying we should allow the BOC's entry and he is saying we already have a major national player. Here is France, Japan and Canada who have done it. Why would we need the BOC entries at this point? Wouldn't it result in similar lack of success that Dr. Selwyn is pointing out that AT&T has experienced?

Mr. KAHN. First of all, we are in a more competitive era. We are developing giants. Look at the IBM-Rolm satellite business systems, MCI complex. The Huber report describes the evolution of a series of very large integrated complexes, manufacturing, communications and the like. We also have the openness of the market to all these small ones. The reason, of course, that the BOC's are——

Mr. RITTER. If I might interrupt, in my own discussions with some of the players, there seems to be a tremendous energy to do something like this national networking and building the information services of the future, kind of an electronic telecommunications highway. There does seem to be that kind of commitment that as soon as the possibilities are there—I might add that AT&T themselves have come out and said they do not oppose such an involvement by the Bell Operating Companies. They feel that maybe the Bell Operating Companies have some of those more localized connections that would then work to fill up their system, that is AT&T's system as well, things that would benefit the local network and the long distance.

Mr. SELWYN. You just said the key word, "highway." That is the proper role of the BOC's, to build that highway, but not to operate every lunch counter and every gas station and every factory and every store along that highway.

Mr. RITTER. Nobody has sought to create the integrated system. What we are hearing from the Bell Operating Companies is that they want to develop the U.S. version of the Minitel and they can develop it. No one else has tried.

Mr. SELWYN. Do we really want that? What do we want in this country? Do we want a single national monolithic information system? Do we want a multiple vendor accessible marketplace?

Mr. RITTER. I would like to be able in my home to take my computer, and I won't mention the brand, but I would like to be able to hook it up to a telephone system and just have a fairly dumb terminal where I would not have to go through all kinds of gyrations to plug into this, that, or the other system. I would like some standardization.

Mr. SELWYN. You can do that today.

Mr. RITTER. I would like the ability to get 30 or 40 services or 50 or 1,000.

Mr. SELWYN. You can do that today. You can do it this afternoon.

Mr. RITTER. I invite you into my office after these hearings and you can tell me how I can do it and how I can do it at a cost that is reasonable.

Mr. KAHN. I think it is undeniable that something is lost when you say to companies, you must confine yourself to this and you may not follow your technology or your perception of market op-

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portunities somewhere else. There are offsetting considerations. There are reasons for keeping them out. I don't think we get anywhere if we deny it is somehow counter technological to say to these people, you may not do it.

Mr. RITTER. The kind of thing that you are talking about, that you say I can do now, all I know is outside computer jocks and people who are really interested in this sort of thing, people are just not doing it. It is not like getting a phone in your house. That is what I would like to see. I would like to see this telecommunications network substitute for the telephone. I would like directories on the computer. I would like to shop for my wife's birthday present in different boutiques around the country.

I don't see that happening.

Mr. SELWYN. I don't think these services are confined to computer jocks, number one. No. 2; you also said a moment ago that one of the considerations was cost. I certainly agree. Cost is a concern. By the way, the FCC is about to issue a notice that would actually increase the cost of accessing information services from your home and from your office by as much as $5 an hour. In fact, the Commission may be working precisely against the very policy that I think you are advocating.

One of the very specific concerns that I have relative to the impending FCC action is the way it may be structured could have the effect of imposing that charge only on non-BOC providers and in effect, exempting BOC providers. That is something we will have to see once the written item comes out and is interpreted.

The important element there is the missing link in this process is the telecommunications network in this country has the ability today with existing technology and without any BOC involvement in information services per se, to make available to you all of the services you have just described, most of which already exist, at a very inexpensive communications rate, provided they make some modifications in their network to accomplish that.

What you are talking about in terms of integration is fundamentally going to the distribution mechanism, not to the application or the information service itself.

Mr. RITTER. The video text people, their trade association, as I understand the testimony of Howard Lieberman, these are a lot of the individual companies that are providing the services. It is a tremendous cross section of players in the game. As I understand it, they are favorably disposed towards BOC's providing information services. They see I think the generation of this network, this integration, this involvement in people's homes as a positive step for them, because I think they see there is a gap, they see a missing link.

Mr. SELWYN. I don't think they represent the majority of thinking in the video text industry and certainly not the majority of thinking in the information services industry. There is a group of potential video text providers who rather than make the capital investment to provide their own facilities, would like to find some way of effectively allowing the BOC's to deploy these facilities and to access them. That is one method by which these services could be provided but it is by no means the only one, and it offers, if the BOC's were to be permitted to do that, what it would effectively do

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is chill the interest on the part of others who might be prepared to make capital investments if they were not confronted with that sort of competition from the BOC's.

I think it would be incorrect to assume that his position is in any sense representative of all video text providers.

Mr. RITTER. Your statement is interesting. What I hear is there is this body of companies out there that are willing to get into a business and provide all kinds of services but you say they shouldn't be in that business.

Mr. SELWYN. No; that's not what I am saying. I am saying there are several possible approaches that can be adopted. What these folks are looking for is to in effect have the BOC's use their capital.

Mr. RITTER. Sounds like an efficient idea, when you look at who these folks are and you say they want to get into this, and there is this existing network, let's jump in and expand the horizons.

Mr. SELWYN. It's not so much the issue of jumping in on the existing network. The issue is in effect jumping in on the stock of BOC capital resources.

If we decide to go that way, that is a possibility, I would simply point out that if that is where we want to go, then we cannot possibly consider BOC's as being in a sense competing in the provision of network services. If the BOC's are the solution to providing the only way to get these services distributed, and I don't believe that is in any sense the case, but if that were the case, it is primarily because of a real estate advantage that they have and a capital resources advantage in terms of just their sheer financial strength.

The price we may pay for allowing the BOC's to enter the market in that way would be to largely inhibit almost any other kind of major entry, in the same way the creation of networks generally tends to inhibit entry into dominated markets. That is the real risk. We have to make a choice I think as a Nation as to whether we want to have information services provided by seven giant corporations, each monopolizing their own region of the country, or whether we want to have more diversity.

I don't think that in any sense follows that whichever choice we make is going to have any material effect on distribution of these services, provided that the highway is constructed. The highway is an independent issue from the question of whether or not processing capacity is going to be deployed by the BOC's to provide information services. That is an entirely separate issue. They should be building that information highway so you can have access from your home to low cost information services provided by a variety of firms.

Mr. RITTER. I see what you're saying, and I think you have some good rationale, but I guess the end result is, however, that we don't seem to be able to have this integrated network, and yet others do, and that's the way things are today. And what people like me are trying to do is get to that network and not just talk about what's available, but we don't have it.

Mr. SELWYN. Congressman Ritter, 7 or 8 years ago, there was the beginning of a discussion of a technology, a specific type of technology that was described and still is called the derived channel. The concept was that you could take the local loop, the residential loop going into each household, and provide multiple communications

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paths without having to construct new wire—place any new wire in the ground.

That technology has existed for some time. It could be implemented. It would give you the ability to be talking on your telephone and using a home computer and having your water meter read remotely and having your fire alarm and burglar alarm monitored remotely all at the same time.

Now they is fundamentally a common carrier service. It is a valid business for the BOC's to be in. Now that have, for whatever reason, dragged their feet on entry. One of the reasons that they dragged their feet on entry prior to divestiture is because there were plans at that time that existed within the AT&T organization to offer customer premises equipment that would be uniquely associated with those derived channels, and that there was, in effect, an attempt to retard the availability of the derived channel technology until AT&T, as a corporation, was prepared to exploit the customer premises end.

I think that what you're looking at here is a reticence to offer the very kind of services that you're asking be offered, precisely because the BOC's see some strategic opportunity to ultimately get into this marketplace. If you told them once and for all, "No way are you going to be allowed into this business. The only way you can make any money at it is to build that highway and let others get in there," I think they'd proceed. But as long as they see a strategic advantage to hold out until you let them in, with the notion that someday they're going to have this possibility to get into that market and exploit those technologies and tie their enhanced services into their transport functions and transport monopoly, then I think—I think that is what is creating the very delays that you're concerned about, and I think it's time that you put this matter to bed once and for all and told them, "No, we don't want you in that business. We want you to build the facilities that will give others access to that marketplace."

Mr. RITTER. Thank you, gentlemen, for your testimony.

I might add, though, one of the reasons, I understand, that Peter Huber is not with us today is that—I think these deliberations by Judge Greene are very sensitive and that he felt that perhaps at this point discretion was the better part of valor. But that's just my offhand understanding.

Thank you, Mr. Chairman, and I yield back.

Mr. MARKEY. I thank the gentleman. The gentleman's time has expired.

The Department of Justice, of course, is going to submit testimony to the committee, and I don't understand why Mr. Huber would not be as forthcoming, so I'm hard pressed to understand why he is not able to come and interpret his work for us. It's not the most intelligible, "The Geodesic Network 1987 Report on Competition in the Telephone Industry," and I can read the opening paragraph to you, if you want. It's called "The Geodesic Network." Here's how it reads:

> As networks expand horizontally, the companies that manage them grow vertically. The central paradox of the Information Age is that the dispersion of consumption is matched by a consolidation of production. Whatever the regional Bell Operating Companies are or are not permitted to do, the modified final judgment's basic

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vision of a horizontally stratified telecommunications marketplace, animated by an obsolescent mode of the network as a pyramid will not survive. AT&T, IBM, and other major U.S. and foreign telecommunications and electronics companies are already gathering for the wake.

Mr. MARKEY. In my first year at Malden Catholic Latin class, that would be about 1 week, trying to interpret that one paragraph.

So that we could properly instruct the students. I'm better off repeating, "Omnes Gallia in tres partes divisa est," by heart than in trying to repeat this in terms of what it means and what its implications are.

The real trick, I guess, for public policymakers is to translate a lot of this into English. How does it affect ordinary people? What are the real restrictions that are placed upon giving access to the public to all these technologies and all the language which is constructed by all of the experts that basically exclude people from understanding what those restrictions are and what the real competing interests and how the public can benefit are without question harmed by the experts always protecting themselves by using the jargon of the industry. They could easily have a substitutable language that is understandable by the millions of people who are watching on C-Span today.

My great fear is that 99 out of 100 people who have watched this whole proceeding on C-Span have no idea of what half the terms are which are used; yet they have incredible potential to benefit people in their everyday lives. And that's one of the great tragedies of this whole debate, because it ought to be one of the most vibrant and exciting debates in our country, and instead, because the experts refuse to reduce it to intelligible terms, we wind up with a very small number of people making—you know, having debates that unfortunately exclude the vast bulk of the American people from it.

One of the goals, by the way, of this committee in the course of this year will be to redirect this discussion in a way that does use terminology that ordinary people can understand, and we are going to try more and more to discipline this debate, so that it is put in a form which people can understand. Otherwise, I think we are going to retard the progress that we can make towards a fully operational telecommunications system on a timely basis. We're going to get mired down in the minutiae of the terminology rather than really advancing the long-term cause.

I know that—and I'm not commenting on the witnesses who are here. I'm commenting upon just the industry-wide malaise that unfortunately afflicts not just this industry but all too many industries, and they harm themselves, I think, in the long run.

Mr. KAHN. This one is worse.

Mr. MARKEY. This one is one of the worst. There's no question about it. But the number of members who should be sitting here and listening to this testimony is in direct proportion to their ability to understand, a lot of the terminology, and they just don't want to feel as though they need Brendan Sullivan standing next to them whispering what the terminology is and how they should respond to it on every single one of the questions. And it's a dilemma, and I hope in the course of my tenure as chairman of this sub-

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committee to help to redress that problem, because it's a very serious weakness in this whole area, people relying upon the terminology that they feel comfortable with, including Dr. Huber, but that unfortunately, absent people with a Ph.D. in any number of various sciences, excludes almost everybody else.

Let me ask you, Dr. Kahn, the Huber Report and the Justice Department recommendations are heavily dependent upon the implementation of the FCC's Computer III rules to assure that competitors have access.

Do you believe that consideration of a lifting of the restrictions on the Bell Operating Companies on providing information services should wait until the Computer III rules, including open network architecture, are fully developed and in place, so that we can be sure that we've got that kind of protection?

And just so our audience that is out there across America can understand what we're talking about, open network architecture is a proposal by the Federal Communications Commission that orders the Bell Operating Companies at that local level to develop a plan that will allow any competitor, quote, "equal unbundled, non-discriminatory access."

Now what does that mean? Well, what that means is that it will allow any competitor to connect their equipment into the Bell equipment at reasonable rates, so that more competitors can plug into the system and offer services to the people of our country that would want to take advantage of it, and in that way the competitors are protected from the Bell Operating Companies' control of bottleneck facilities.

And what is a bottleneck facility? Well, that's the local network in a local community that the Bell Operating Companies control under their monopoly.

So how do we make sure that you've got that open network architecture in place, so that competitors and consumers can benefit from all of the products that are out there that are sought to be offered to the people of this country?

Should we have it in place before we allow the Bell Operating Companies out from underneath the restrictions right now? Otherwise, they just might use their monopolistic opportunities to exclude for an indefinite period of time competitors from really having access.

So, Dr. Kahn, what do you think? What should be the timetable, if we are going to let them in, in terms of ensuring that you do have that open network?

Mr. KAHN. I don't want to rush to give you a conclusion that's firmer than I'm in a position to give. I have emphasized several times in my statement the importance of associating the two—that is, freeing the operating companies, subject to their ability to demonstrate that competitors do indeed have equal access.

I'm not in a position to confront the question of what do we do if we discover that providing that equal access is, in fact, prohibitively expensive or will take 30 decades. I just can't confront that question yet. It's obviously the kind of question you must ask.

But just as proposals to go farther in deregulating long-distance service are clearly conditional on equal access under the consent decree, and now the overwhelming percentage of the business now

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does have equal access for long-distance calling, so, I think, the association, the logical association, ideally should be between open network architecture and the freeing of the operating companies from the restraints on the provision of information systems.

As I say, I don't know what would happen if somebody said to me, "It's going to cost $40 billion." Then you have to choose. But clearly that's what the committee has to be looking into. Is that the nature of the choice, or can we have both, as would be ideal, having them simultaneously?

Mr. MARKEY. Well, what if the choice was not so much the cost, but that it might take 5 or 6 years to put in place?

Mr. KAHN. The same thing. I mean, again I just don't know what I would do if someone said, "Well, how about 3 years; how about 2 years?" I think it is worth waiting for if it can be done at reasonable cost and within a reasonable period of time, 2 or 3 years.

Mr. MARKEY. What if it can't be done in a reasonable period of time or at a reasonable cost? What do we do in that instance?

Mr. KAHN. Well, then I think you should be looking—I'm sorry; I'm not evading——

Mr. MARKEY. That's all right.

Mr. KAHN. I would want to know, what are we losing, better than I know now. In effect, Lee Selwyn is saying, "You're not losing anything." I find that—I can't accept that, just because I know that in the real economy there are advantages of integration.

Mr. MARKEY. But I guess Lee Selwyn would argue, well, we know what we're going to lose if we let them out and you don't have proper protection. You're going to lose the competitors. You're going to lose the opportunity to have the consumer at home having all of these other people trying to provide these services.

Mr. KAHN. That's right. The people who have their computers. The fear is that they will lose something.

I really don't believe that. The fear is that I will lose Dial-a-Porn? I'm willing to sacrifice that.

It seems to me one has to make an assessment of what it is that one is losing. All I urge on you is to recognize that the theory behind the modified final judgment and the division of fields, AT&T here, the operating companies operate the highway but they may not traverse the highway—the Freudians would call that anal. That is to say, it reflects a tidy separation that only the highly constipated must love.

And that in a vibrant, competitive market, which certainly Lee Selwyn is also in favor of, you would not have such boundary lines, so that there is something lost by retaining the boundary lines.

Ask me, would I get rid of them tomorrow, knowing what I know, even without open network architecture; the answer is no. I'd want to know what the cost is in terms of the availability of those alternative equal access systems. I don't have to be careful, because I'm obviously oral.

Mr. MARKEY. I know that you've got to scoot, Doctor Kahn, so let me just ask you this one final question.

The recent merger of Allnet, Lexitel, MCI, SBS, GTE Sprint, U.S. Telecom, and the substantial losses by many of AT&T's competitors have prompted concern about the viability of real competition in the interexchange network.

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Would Bell Operating Company entry into this market improve competition in a market dominated by AT&T?

Mr. KAHN. Well, I think I would oppose that now.

Mr. MARKEY. You would oppose it right now?

Mr. KAHN. Oppose it now. In my testimony, I suggested that be held in reserve, if indeed competition proves to be inadequate.

But, you know, I called to the committee's attention a study that was made by the Common Carrier Bureau of the FCC in December, which pointed out that MCI and the other common carriers have now built more than twice as much fiber optic capacity as AT&T, and that their total fiber optic capacity exceeds the total capacity of the entire interexchange network as of 1985.

So we've got a huge amount of capacity out there.

Mr. MARKEY. Do you think that there is a potential—and I know you can't speak authoritatively on this—but is there a potential that if we allow the Bell Operating Companies into the long-distance market that it just might sweep away the competitors—that is, MCI and Sprint, as we know them today, because they just wouldn't be able to survive that competition in the short run?

Mr. KAHN. Well, I think there is that danger, though I think their entry might likely be accompanied by a joining with or acquiring. Any company would be out of its mind to spend several billion dollars building additional fiber optic capacity when it's all out there. And ultimately that may be the happy solution.

I'm not prepared to call—anymore than in the airlines—anywhere near calling the game lost. I think we have very effective competition, even with a smaller number of very large integrated systems.

Mr. MARKEY. Thank you. I know you've got to catch——

Mr. KAHN. But it's because of that deregulation of the airlines. I've just got to go, or I won't get home.

Mr. MARKEY. We very much appreciate—could we get your feeling on whether or not we ought to ban smoking on the airlines? Would you support that proposal? Do you have a position on that?

Mr. KAHN. I don't smoke, but I don't believe in being beastly to smokers.

Mr. MARKEY. Thank you, Doctor, very, very much.

Dr. Selwyn, if you could just stay with us for a couple more minutes.

Mr. SELWYN. Sure.

Mr. MARKEY. That would be very, very helpful. The equipment manufacturing business has become highly competitive during the past few years.

What evidence do you have to suggest that the Bell Operating Companies would erode competition in this market if they were permitted to enter it?

Mr. SELWYN. I'm not sure that the concern, as I've said before, is with the equipment market itself as it is with the interrelationship between a BOC equipment affiliate and the BOC's regulated services. One could look at the issue from the perspective of other manufacturers or from the perspective of consumers.

If one takes the view that BOC entry into the manufacturing business could simply create—recreate the very vertical integration that existed prior to the breakup of AT&T, then we could be con-

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fronted once again with the potential for having the cross-subsidization of relatively competitive or risky ventures through the manufacturing affiliate be transferred to basic equipment—that is, purchased by the operating companies from that very same manufacturing affiliate.

Mr. MARKEY. So you think—your opinion is that you would run the danger first of having the Bell Operating Companies use the revenues which they've generated from their local ratepayers, people just dialing their local phone calls, take that revenue, construct a manufacturing wing, and then close the doors to other competitors and just develop a relationship with its own manufacturing ring that would basically cut down the potential for real competition?

Mr. SELWYN. Well, that's part of it. One of the contentions, for example, of a number of equipment manufacturers prior to the—in the mid-1970's when the competitive telephone equipment market was first becoming—coming into its own, was that Western Electric was, in effect, taking costs of product development of new and competitive products, such as electronic private branch exchange telephone systems, business telephone systems, and simply spreading that across to all individual single-line telephone sets that were then provided to principally residential customers. So since they were producing literally millions of those a year, if you add just a couple of cents to each one, you can generate a lot of money to support an R&D function.

The concern was that that, in effect, was using the captive monopoly basic telephone service, which at the time included a single-line telephone set, to simply fund the venture into more competitive markets.

Now we don't have BOC provision of single-line telephone sets, but the BOC's still buy a substantial amount of equipment and facilities—wire, cable, switches, electronic equipment and so on. If they were to begin to develop extensive manufacturing resources, we could be back where we were before we broke up Western Electric.

There is also the concern, I think, that we've seen an enormous amount of the manufacturing activity for telecommunications equipment leave our shores in the past 5 years.

I do not believe that there is any U.S. domestic manufacturing going on for a single line, ordinary home telephone sets, whereas 5 or 6 years ago, virtually all of them when they were still provided by Bell Companies were manufactured in this country.

The BOC's themselves have been marketing under private labels equipment that is manufactured offshore. There is simply no indication that merely by allowing the BOC's back into the manufacturing business, that business would be retained in this country and could well simply be used to further divert resources and business to foreign countries.

Mr. MARKEY. I thank you, Dr. Selwyn. We are going to conclude the hearing at this point. I would like to add parenthetically that a lot of the members are not here at this time because of the delay in our ability to get this hearing off the ground this morning. As a result, we have run into conflicts with their afternoon schedules. As a result, not as many members as would have liked to have par-

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ticipated have been able to take advantage of the excellent testimony we have heard today.

I think the earlier show by the members this morning is a clear indication of the real interest people have in this area.

This is the first of three hearings which we are going to have on this subject. In a couple of weeks, we are going to have testimony from the French and others with regard to the provision of information services to customers in our country and around the world, and what can be done to ensure that we expedite the process that will optimize the benefits that the people on our planet will be able to derive from the incredible advances which were made in the information area.

We are going to continue in an aggressive fashion as the year goes by to identify these issues, to explore them and try to explain them to the Congress and to the American public. That is what are the benefits which can be derived.

I would like to make one final concluding note. Minority counsel, Charlene Vanlier, is leaving us as of today's hearing. This will be her last day with us. She is going over to the Senate Judiciary Committee and will be working on the Bork nomination as one of her first assignments. We will miss her. She has worked with us in that spirit of bipartisan cooperation which we try to engender in this particular area of public policy. I don't think this area necessarily has to have an etiological bent to it. We have tried as best we can to reduce if not eliminate that part of the political process that often times injects itself into many other areas of public policy. We have tried to reduce it here.

Despite the fact that I am known as a liberal democrat from Boston and Charlene has had to give advice to many conservative republicans from other parts of America, at least in this public policy area, we have been able to find a substantial area of agreement on almost all issues. I think it is a reflection of the kind of cooperative working arrangement which can develop if you put your mind to it, and you try to exclude those elements that are really divisive and ultimately counterproductive to the long term objectives this country ought to have.

I just wanted to compliment and thank Charlene for her work for the full committee and our subcommittee and for America and we wish her good luck on her new opportunities over in the Senate.

With that, we conclude this hearing. Thank you.

[Whereupon, at 2:50 p.m., the subcommittee adjourned, to reconvene at the call of the Chair.]

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MODIFIED FINAL JUDGMENT

THURSDAY, JULY 30, 1987

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS AND FINANCE,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:43 a.m., in room 2322, Rayburn House Office Building, Hon. Edward J. Markey (chairman) presiding.

Mr. MARKEY. Good morning. This is a meeting of the Telecommunications and Finance Subcommittee.

Just so you can understand technically what we're going to do this morning, we are going to have first a briefing by representatives from France of the technologies in their country and the way in which they are able to get those technologies into the homes of people in their country, and we will conduct that in a briefing mode, and then when that's concluded, we will move into a hearing phase in which we'll actually hear from witnesses from our country in a traditional mode in terms of the way in which this subcommittee and other subcommittees of the Congress are conducted.

So with that, just so you can understand what the outline of what we're doing today will be, I'd just like to welcome you all to today's briefing and hearing, which will give us a unique opportunity to compare the information services marketplaces in France and in the United States.

We are pleased to have with us representatives of the French Minitel videotex systems and the U.S. information services industry.

Never before has a Congressional committee been presented with such a diverse array of sophisticated computer technologies and innovative applications. The computers surrounding us in this room demonstrate that the future is now. The Information Age is upon us, and if we embrace it wholeheartedly, we can create the opportunity for millions of consumers to enrich their lives through its benefits.

Today we will focus our attention on what types of services are available and how they are provided and what impact Federal regulatory policies have on the marketplace. We will examine not only the information marketplace as it already exists, but as we hope that it may be, tightly woven into the fabric of our domestic economy.

The information services on display are a graphic illustration of the present strengths and future hopes for our economy. It is an economy nurtured by individual initiative and entrepreneurship,

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innovative use of new technology, and a firm belief in the value of education.

Information services thus serve us as both a mirror of what is working in our economy and an engine for progress in areas that need assistance.

Today presents an ideal opportunity to compare the very differently structured information services marketplaces in France and in the United States. The French Government has played a vital role in bringing information services to the French public by supplying residential telephone users with the Minitel terminals at no direct cost to the consumer. This subsidy has provided the impetus for a large number of independent information service vendors to offer French consumers over 4800 information services.

By comparison, CompuServe and other information service vendors in the United States have not benefited from any French-type centralized subsidy to facilitate the provision of these services. Yet these vendors already provide hundreds of thousands of business and residential users with access to an equally broad spectrum of services. The voluminous information services available provide a wealth of benefits for average consumers. These include educational systems, home encyclopedias and tutoring centers, information sharing forums on issues such as mental health and concerns of handicapped citizens, systems which provide information for small-scale investors to make decisions and then assist them in the actual trading, and services which ease everyday tasks such as shopping and banking. The potential benefit of some of these services to the elderly and the infirm is incalculable.

Given the clear benefits of a broadened information marketplace, those of us in Congress must examine the regulatory structure of the market today and the proper course for the future. Under the Modified Final Judgment, which details the AT&T divestiture agreement, regional Bell Operating Companies are prohibited from offering information services to the public. But Judge Harold Green is now reexamining this restriction as part of the court's triennial review of the MFJ.

Both sides of the debate over the Modified Final Judgment restrictions have aired their positions before Judge Green. The BOC's argue that prohibiting their entry into the information services marketplace reduces the likelihood that consumers will be able to enjoy the benefit of these services. They point to the French model and claim that their provision of these services directly through the network would create efficiencies that would lower rates and stimulate demand for information services.

On the other side of the issue, many observers argue that the BOC's' entry into information services would present serious risks for consumers. For example, BOC's could potentially subsidize unregulated information services with rate increases on regulated basic phone services. Furthermore, the resources which could give BOC's a competitive edge in information services may well threaten the present healthy competition in that field.

In the event that Judge Green lifts the MFJ information services restriction, the next question which arises is whether the FCC's regulatory policies are adequate to prevent a deterioration of the competitive posture of the marketplace.

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For example, if the Bell Operating Companies were to offer information services, they propose that they would not have to do so through a separate subsidiary. Rather they would merely have to comply with regulations intended to safeguard competition in the marketplace.

A key competitive safeguard is the requirement that BOC's provide all information services vendors with open equal access to the Bell Companies' network. The FCC's concept of open network architecture, (ONA), is its primary answer to information services providers' problems regarding equal technological and pricing access.

In theory, ONA, open network architecture, is a grand solution to the potential concerns over BOC provision of information services. In reality, there remain a number of important and controversial issues which must be resolved. First and foremost, what is open network architecture? This question confounds the experts as much as the layman. Second, who will bear the cost of implementing and maintaining this regulatory structure? In addition, we need to ask if ONA will truly create a nationally uniform information services network and the value of such a uniform system.

The intent of today's briefing and hearing is to set our sights on the broader picture of information services. All too often, discussion of the communications marketplace gets bogged down with incomprehensible terms that cloud the greater consumer concerns. For too long the industry and policymakers have shielded themselves from the public behind acronyms and technological jargon such as ONA, CEI, ISDN, CCITT, asynchronous X–25 protocol conversion, and the like. We must demystify the debate and eliminate the jargon.

Serious policy issues lie behind all of these terms, but the trees filled with inside terminology must not blind us to the forest of the consumer need and market potential. The challenge facing telecommunications policymakers is to shape a coherent policy that will assure that American consumers reap the full benefits of the information age.

For the French, the choice has been a centralized subsidy. In this country, we stand at the crossroads, whether to centralize these services or to maintain a decentralized landscape with the many providers we now have.

I look forward to today's presentation and the input of our hearing panelists to help eliminate this choice.

Let me turn first and recognize the ranking minority member, Mr. Rinaldo, for an opening statement, if he wishes to do so.

Mr. RINALDO. Well, Mr. Chairman, I think you've used your 5 minutes up, and in the interests of time and in order to get this trade show and hearing on the road, I'll submit my statement for the record.

[The prepared statement of Mr. Rinaldo follows:]

OPENING STATEMENT OF HON. MATTHEW J. RINALDO

Mr. Chairman, I commend you for scheduling this hearing today in our continuing oversight of the implementation of the Modification of Final Judgment, or MFJ.

The demonstration this morning highlighted some of the real benefits of the "information revolution," and I want to thank our witnesses and those who have pre-

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pared this demonstration in helping the subcommittee gain a more immediate grasp of what is meant by information services.

What strikes me most from the demonstration and from the materials I looked over before coming here today was the tremendous opportunity and possibilities the "information revolution" provides to individuals and businesses. It is obvious that it has enormous potential for benefits to business and consumers, and that we in Congress ought to do all we can to maximize that potential.

Unfortunately, how we go about assuring the public of those benefits is not an easy answer. Through computer inquiries I, II and III, we have seen an evolution at the FCC on how to go about assuring that the framework of regulation in this area is not too restrictive. We are also in the midst of a debate on concepts such as "open network architecture" and "comparably efficient interconnection" the sole purpose of which is to see to it that the system evolves fairly, efficiently and progressively to the benefit of American consumers and businesses.

Coupled with the technological developments in this field are the legal developments that separated AT&T from the local Bell Operating Companies, and the ongoing question now in Federal District Court as to whether we should allow the Bell Holding Companies into the information services business. The Reagan administration, the Federal Communications Commission, the BOC's, and many members from both political parties have said that we should.

I hope the hearing today will give us a better grasp on this question, as well as on the broader question of the impact of information services to customers.

As I stated in our earlier hearing, I want to weigh the evidence and the testimony carefully and give the most thorough study to the ramifications of any legislation this subcommittee might approve.

To that end, I want to commend the chairman of the subcommittee, Mr. Markey, for his thoughtful approach to these questions. I think it will prove immensely beneficial to all members of the subcommittee when we confront thee questions later in this congress.

I look forward to the testimony this morning, and I yield back the balance of my time.

Mr. MARKEY. Any other members wishing to make an opening statement?

The gentleman from Iowa?

Mr. TAUKE. Mr. Chairman, I ask unanimous consent to submit a statement for the record.

Mr. MARKEY. Without objection, it will be included in the record.

[The prepared statement of Mr. Tauke follows:]

OPENING STATEMENT OF HON. THOMAS J. TAUKE

Thank you Mr. Chairman. Mr. Chairman, I want to commend you for holding this hearing on competition in the information services marketplace. I am very interested in hearing our witnesses and seeing the demonstrations that will be shown today, and I look forward to receiving an update on the status of information services.

I believe that it is imperative that the Bell Operating Companies (BOC's) should be permitted to provide information services so that our society can make rapid progress into the information age. To continue to withhold information services from a large portion of the American public is inexcusable. We should foster the innovative processes and the resulting competitive markets, and the firms should not be discouraged or prohibited from providing the information services.

Our telecommunications industry has matured to the point where some of the major restrictions on the BOC's can be lifted to improve competition, to provide new services for consumers, and to enhance the U.S. trade position. I believe that lifting these restrictions will benefit consumers and the telecommunications industry.

Information age technologies and the associated services should be made available to a broad sector of the American public. The information system should be developed to provide low cost terminals in the home. We have already seen economies of scale and competition drive the price of small home computer terminals down to where they are easily affordable by many. It remains to simply integrate the terminal with additional information sources that may evolve as a result of free market competition.

The Open Network Architecture (ONA) concept goes hand-in-hand with the providing of information services and ensures a level playing field for competitors to provide information services without being at a disadvantage to the BOC's.

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I understand that the ONA concept originated in the FCC's computer inquiries. The FCC is to be commended for having the foresight to develop the computer inquiries to enhance free market competition among the information service providers.

Mr. Chairman, I commend you again for holding this hearing to move us forward into the information age.

Mr. MARKEY. Any other members?

The gentleman from Tennessee?

Mr. COOPER. Thank you, Mr. Chairman. I would just like to make a brief statement.

I should probably disqualify myself from these hearings due to my hopelessly pro-computer attitude. I must tell you that being confronted with all this hardware and software is almost more than a computer lover can stand.

Mr. MARKEY. The gentleman's time has expired.

Any other members seeking recognition?

Mr. MARKEY. The gentleman from MIT is recognized for an opening statement.

Mr. RITTER. I want to associate myself with the remarks of my colleague from Tennessee and say that we are on the threshold of an acceleration and explosion of the Information Age, and I think it's exciting. I am delighted to see that this subcommittee has taken a leadership role.

There are so many possibilities. The chairman talked about 250,000 users in the United States. We know there's 2.5 million connected terminals in France. That would be equivalent to 10 million users in the United States. So I think what we should really understand at the outset is that with all of this excitement and all of this hardware and all of the enthusiasm, we're behind, and what we need to do in this subcommittee is grease the skids to catch up.

Thank you, Mr. Chairman.

Mr. MARKEY. I thank the gentleman.

The gentleman from Indiana?

Mr. COATS. Mr. Chairman, I feel constrained to say something. This is very intimidating to me.

I just had a computer installed in my office. I can't figure out how to turn the thing on yet. I don't like where we're going. I don't like——

This whole idea, it's intimidating to me. It's threatening to me. It's not what I was taught growing up. My kids know how to work these things better than I do. I'm losing out in this Information Age, and I think we ought to stop right now.

And get back to the basics. You can take shorthand.

Mr. MARKEY. If the gentleman would be willing to stay here for 2 hours, you'll be able to do it in French by noontime.

Mr. COATS. I realize this is where we have to go. I just want everybody to know I don't like it.

Mr. MARKEY. The gentleman's time has expired, and we're going to now bring up some representatives from the French Minitel system and would ask Marie Monique Steckel, who is president of French Telecom, Inc. and Georges Nahon, who is the managing director of Intelmatique. We welcome you to this briefing and we would appreciate it if you could make a brief opening statement to the committee to explain what it is that we have before us, and

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then if you'd be willing to take some questions from the committee as well.

Welcome.

STATEMENTS OF GEORGES NAHON, MANAGING DIRECTOR, INTELMATIQUE, S.A., ACCOMPANIED BY PHILLIPE PERRON; GEORGE M. MINOT, PRESIDENT, APPLIED INFORMATION TECHNOLOGIES RESEARCH CENTER; AND MAURICE A. COX, EXECUTIVE VICE PRESIDENT, INFORMATION SERVICES DIVISION, COMPUSERVE INC.

Mr. NAHON. Thank you very much.

Mr. Chairman and members of this important subcommittee and members of your staff, who have treated us so kindly and efficiently, ladies and gentlemen, I am honored to have this opportunity to share with you the experiences of what is called the most successful videotex program in the world, a success, by the way, that even now is spreading beyond the borders of France and even beyond Europe.

Let me first spell out that success in statistics. After 2 to 3 years of testing, experimentation, and trial and error, and telephone company in France has created a market of 3 million Minitel terminal users throughout the country. We will be 3.5 million at the end of this year and 6 million at the end of 1989.

The number of videotex services has grown to 5,700, at a rate of about 250 per month, and there is no current evidence of a slowdown in that growth.

The network currently carries 42 million calls a month, which represents above 4 million hours of connect time, plus another 900,000 hours for the directory service alone. The 1986 revenues for the telephone company and the entire videotex industry totaled $882 million.

The sole activity has created in the last 4 years 6,900 new jobs.

What does that success demonstrate? It demonstrates, we believe, that the Minitel has been accepted by a wide range of people with diverse interests in France. The Minitel service can be accessed by everyone without discrimination. People using Minitel are both rich or poor; they are in urban or rural areas; they are people at home, at their office, at their shop, or on the farm.

The Minitel system has been designed to serve both the residential and the business markets. This popularity has given the Minitel the status of a utility like the telephone in France.

Why has Minitel achieved this popularity and success? There were a number of strategic investment decisions made at the start of the videotex program in France in 1979 and during the almost 3 years of testing that followed. One of these key decisions concerned the critical mass necessary and how to reach it. The telephone company decided that the only way to achieve that critical mass was to make investments in terminal distribution itself, and it justified it by designing a nationwide online electronic telephone directory service that would create new revenues and reduce financial drain represented by the manual operator-assisted system.

And what kind of system would that be? One certainly that was easier to use than anything then on the market. Thus the Minitel

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terminal and its associated electronic directory service, a critical service in itself, but certainly not able alone to generate the traffic needed for a successful videotex system.

So what about additional services? Since the telephone company's first goal was to encourage usage on the network, it decided to make it as easy as possible for service providers to link their databases to the Minitel network, and at the same time it made it as easy as possible for the users to access these databases and services.

You will see during the demonstration that when you are in a Minitel service, the navigational commands are explicitly displayed on the screen and mean the same thing from one service or database to another. This is largely due to the design of the Minitel terminal, which has 10 prelabeled and predefined function keys, such as NEXT, INDEX, SEND, HELP, which are well understood by the user who had no prior computer literacy.

Finally, the question of billing for access and usage. The telephone company introduced the so-called kiosk billing system, which has nothing to do with public access to a videotex terminal. We use the word "kiosk" by analogy with a newsstand. With this system, the Minitel user pays on his telephone bill a usage charge. He has no need to notify himself or use one of several passwords or to learn any specific machine language to use the Minitel service he decided to call.

The telephone company handles the disbursement of revenues to the service providers, the packet-switching network, and keeps a portion for itself.

Throughout the development of the system and during its successful operation, the telephone company has maintained a transparent presence, leaving the role of providing videotex services and content to the people in that business.

Thank you, Mr. Chairman, and members of the committee.

Mr. MARKEY. Now I think it would be helpful for the subcommittee if you could provide a demonstration to the subcommittee and to those who are joining us this morning of how your system works. And if somebody could turn out the lights back there and if you could stay near a microphone there, maybe you could explain it to us how the system works.

Could we turn out the TV lights up there as well?

Mr. NAHON. What we have done is hooked a monitor up to France with the Electronic Directory Service. My colleague, Phillipe Perron, is going to demonstrate a different type of search.

Mr. PERRON. First of all, we will do a White Pages search and then we will do a Yellow Pages search and then a street directory search.

Mr. MARKEY. Could you move up to the microphone?

Mr. PERRON. I am going to look for a person called Mr. Jones in Nice. These are all the Jones, which is not a very common name in France.

On the next page, the directory will give me approximate spellings of Jones, according to French phonetics, which is Jaunet. After having looked at this, I am not satisfied. I haven't found the right Jones. I will extend my search outside of Nice, so I can in fact

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extend the geographical region, extend the search, to the neighboring communities or towns.

I would look at all of them. The first Jones I have found is in Caros, which is just next to Nice. I can browse around the different regions until I find the Jones I am looking for.

Now, I am going to do another type of search which is a Yellow Pages search, and a given street, for instance, I am looking for a dentist on the street where I am living. I wasn't precise enough when I put in "dentist." It asked me orthodontists or just an ordinary dentist or for a person in fact who is supplying equipment to dentists. I am looking for an ordinary dentist.

Here we have a listing of all the dentist which are in Rue Lecourbe.

I can have another search, I can combine the Yellow Pages and a street directory search. I can do an ordinary street directory search. I found there was a dentist in Rue Lecourbe, 24. I will double check. I will also have a listing of the other residents apart from the dentist. I have a list of all the residents at 24 Rue Lecourbe plus all their telephones indicated on the right.

I will now switch to another demonstration. Are there any particular search modes you would like to see?

I will have a look at home banking service.

Mr. NAHON. While Phillipe is dialing in France, let me tell you about home banking and on-line banking in France. Our estimate is that we have half a million regular users of on-line banking services. The largest bank involving home banking is CCF, Credit Commercial of France. They have over 200,000 regular users.

Mr. PERRON. I have pulled up an access service called Teletel II in France, where as an user I am being billed on my phone bill just for the network charges.

Mr. NAHON. Before Phillipe goes ahead, this is the welcome page of a gateway for a particular level of tariff, whereby the user pays on his telephone bill only the communications cost. He doesn't pay the cost of the service that he is accessing. From that point of view, he needs a password and a subscription.

Mr. PERRON. In calling CCF, I am going to seek the menu of services. I have to enter my I.D. code. What the bank's policy is, for instance, to have a quick look at my balance. My current balance is 7,174 francs, but I can look at previous statements from the day before. I can go back, and get the whole history of all my statements.

What I can also do is transfer funds between my accounts. For instance, I am going to transfer money between my savings account and my checking account. It will debit account number one, and credit number two. It reminds me of what the account numbers are and what I have in each account. I enter 2,000 francs and I have to write that in French. I have to confirm it. The transaction has just taken place and 2,000 francs between the two accounts and down at the bottom, it gives me the number of the transaction reported in the computer.

Mr. MARKEY. Thank you very much. We have a roll call on the Floor right now. The members will have to vote. We are going to take a recess for about 10 minutes and then we will return and pick up where we are.

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[Brief recess.]

Mr. MARKEY. Let's please dim the lights. Once again, we apologize for the interruption. Please continue with your demonstration.

Mr. NAHON. Thank you very much.

We have now established a connection with another gateway access point, called the Kiosk billing system, which I mentioned earlier. This is where the user pays on his telephone bill for both the communications cost and for usage of the services he wants to call.

You will notice that Phillipe is going to enter the name of the well known newspaper in France, Le Monde, and this name is translated into the right address in the network. The access point, the gateway, does that translation. Phillipe can now demonstrate a service, one of the 3,700 services available on this system. This one is provided by the newspaper, Le Monde.

Mr. PERRON. This is a major service. There are several things inside the service. For instance, we can look at the news, Reuters or AFP news flashes. We can browse through them until one interests us. We can look at one in detail.

In the Le Monde service, there are other services which are more interactive. This was just information. We have what we call a stock exchange service, which allows the users to keep a portfolio of stock. He can update his portfolio and follow the variations of the stock. I am looking at my portfolio.

I have to enter a nickname, Ge. I will consult my portfolio today. I have so much stocks. For instance, I have bought some more CCF stock. I will modify that. How many have I now? I have 20. I have now modified it. I can now consult my portfolio to see what the value is now. The last time I looked at it, on July 26, it was 11,000 francs. Today, it is 13,466 francs.

Another service in Le Monde is also a home shopping service, whereby the user may purchase from a large chain of supermarkets, who has an agreement with Le Monde, and he may purchase anything he wants, as far as consumer items go.

I can consult a list of products which are possible to order. I do have a list of products, whether they be fresh or frozen. Let's look at baby, order some diapers, which we call puis in France. Pampers mini, Pampers super.

I confirm my purchase. It will ask me my address and I will get it delivered on the same day between 6:00 and 8:00 when someone is home.

That covers Le Monde. It is a pretty comprehensive service.

Another service is one called Sesam, which is a hotel reservation system, whereby you can make a reservation for a hotel anywhere in France. You can choose a given chain of hotels but I'm not fussy, I'm just going to look at any hotel in the city where I am going, which is Nice. I have to give the date of arrival, I will be arriving on August 2, and departing on August 10. I want 1 room for 2 people.

I am going to get a listing of all the hotels in Nice. Of course, the hotels that have rooms available. I can book. It is going to give me a description of the hotel with the different prices. I have several different prices here, whether it is on the street, the garden or the top floors. It will ask me to confirm my reservation by asking—

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wait, there are other things I want to choose. If I want breakfast. I don't want anything. Now I am going to say how I confirm, with a credit card or a telex number or a letter with a check. I just give my credit card number.

That is a reservation system which is quite popular. We also have a similar thing for making train reservations.

Looking at the classified ads——

Mr. MARKEY. Let me just stop you right there, so we can give the people a full sense of what other alternatives are, that we want also to give American CompuServe a chance to display their wares here as well. In that way, we might be able to get a little bit of a sense of things that exist in this country.

Mr. Nahon, maybe you could give us a 1 or 2 minute summary right now, but then if you would be willing to come back after CompuServe gives their display, to answer some questions.

Mr. NAHON. That is fine. Thank you very much.

[The prepared statement of Mr. Nahon follows:]

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Intelmatique S.A.

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Washington D.C.
July 30, 1987

The Minitel Synergy

Presentation to the
Subcommittee on Telecommunications and Finance
of The Committee on Energy and Commerce
U.S. House of Representatives.

In May 1987, the international videotex market was experiencing a unique situation, where a single country had the majority of the world's videotex user population : as it stands today, France is the only country with a significant success in mass-market videotex. A measure of this success can be summarized by the following figures for May 1987 :

. 2.79 million Minitels are used by residential or business telephone subscribers,

. 5,700 different videotex services were accessed by 42 million calls totalling 4.35 million hours of connect time.

Furthermore,

. the total Minitel industry revenues in 1986 reached the $882 million,

. the companies involved in the videotex activity include well established major firms, and also a growing number of new-coming entrepreneurial companies.

These impressive figures illustrate the dimension of the Minitel market in France. But the purpose of this presentation will be more to determine the qualitative benefits of Minitel to residential and business users, as well as to the economy of the country.

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THE MINITEL : A FAMILIAR TERMINAL AND A UNIFYING FACTOR

The key-role of the Minitel in the French videotex development goes much further than the simple fact that its price is lower than the price of any other similar device.

The Minitel has played a significant role in the following areas :

- **User acceptancy of videotex**

  The Minitel counts a number of ergonomic attributes which make it a well accepted device by the man in the street.
  Its small foot print and limited weight, its positionning closer to a telephone set than to a PC or a TV-set, make it easy to implement in the home or the office.
  Easy to use, the Minitel requires no syntax language to access services. The use of pre-defined and pre-labelled Function Keys has simplified the dialogue with the videotex applications.

- **Unifying the access to data**

  The use of the function keys referred to hereabove has also led to a defacto unity in the way different Service Providers design the interaction between their services and the users. This unity cannot be boasted by the heterogeneous population of PC's and DP terminals.

- **A product with a familiar image**

  The Minitel range, having a similar aspect, has gained a familiarity similar to the standard telephone set. Users refer to the videotex concept and to the services by fucosing on the word 'Minitel'. New words have emerged, like 'minitelizing', 'peri-minitelie' (Minitel peripherals).

These characteristics have consistantly facilitated the introduction of the Minitel on a massive scale, and reaching a high degree of penetration. In the home in particular, Minitels are used daily by the whole family. Those especially, who had no prior computer litteracy and who had never touched a keyboard have enthusiastically adopted the Minitel.

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Among the business and professional users, which account for more than 500,000 Minitels, the perception of the terminal is different, depending on the type of user.

Executives and management are generally users of the upper range Minitel, which they consider more as an intelligent telephone. This terminal is perceived as a status symbol compared to the basic Minitels used by the staff.

The latter consider the Minitel as a complementary tool to other communicating terminals and word-processors. The simplicity of use and the small size of the terminal has favoured the introduction of the Minitel within companies at all levels.

Small businesses have welcomed the Minitel because it has introduced them to Data-Processing at low cost and with no prior training. Their perception of the Minitel is quite similar to that of the home users.

The trend in the business market is for a growing interest in the Minitel, since the introduction of an additional full ASCII 80 column mode in the terminal. The Minitel is now perceived as a low cost DP terminal and can be used to access any ASCII Data-Base or service within or outside France. A consequence of this trend is the recent increase in rental of Minitel by businesses (+10,000 per month).

However, these ASCII capabilities are of lesser interest to home users, who have been accustommed to the 40 column display, with a minimun of graphics and considerable user-friendliness as opposed to the 80 column display of pure text information.

SERVICE PROVIDERS AND APPLICATIONS

An open offer of services

The way the Minitel network is organized has particularly favoured the developement of services in all areas of activity. Service Providers are generally not involved and *do not have to worry about the billing of communications*, which is taken care of by the Telco on the telephone bill of the users.

The innovative *Kiosk billing system*, where the Telco bills the cost of the service to the user on behalf of Service Providers, has favoured the creation and expansion of a vast quantity of services. They are often marked by their originality, and they generally get their revenues from accesses by casual users.

This applies to the entertainment services, and also to business oriented applications.
These users, because of the integrated billing capability in the Minitel network, need not have a prior subscription to gain access to these Service Providers. No ID, no password are required to access to the majority of the 5,700 Minitel services.

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Another major benefit for the Service Providers has been the decision by the Telco to distribute the Minitels, either as part of the telephone subscription or on rental basis. In the same way they do not have to do the billing, they do not have to concentrate on the distribution, promotion or maintenance of a terminal of any kind.

The entertainment services

A number of successful services for consumers rely on entertainment features. They involve the classical chat-line systems and games which also have proven successful in various countries where on-line services have reached a certain level of penetration among PC users.

Furthermore, a range of new types of entertaining applications have appeared, on the basis of the high penetration of the Minitel in the French homes, and on the unique features of the terminal. Interactive games, like chess or Othello, interactive quizzes sometimes linked to a radio or TV game, sophisticated portfolio games based on the real stock exchange activity, have attracted a lot of users.

These services represent around 35% of the overall Minitel traffic, which is a very reasonable figure, as close to 75% of the terminals are used in households. *Together with the TV-set, the PC and even the telephone, the Minitel has aquired a new place in the entertainment of the families.*

The practical services

The practical services concern both residential and business users.

On the business side of the market, the Minitel applications are considered in two ways :

> As the extension of pre-existing types of application, already developed and used on classical DP terminals and sometimes on PC's.

Typically, this type of application covers the processing of information inside a firm or between vendors and clients, like ordering, stock-control, E-mail, etc. Information retrieval from specialized Databases is also part of this type of services.

The Minitel is not used in replacement of DP terminals, which are perfectly suited for regular usage and long connect times by trained operators. But it allows to bring the DP facilities to a new kind of user, whose usage requirements, in terms of connect time and volume of business, would never have justified the cost of a classical DP terminal, nor the training necessary to use it.
An example is the car-dealer business, were existing applications have been adapted to the Minitel and are now available even to the small dealers.

> Another type of application are those entirely created because of the wide availability of the Minitel in the small business community and of the availability of a transparent billing system.
This new development is well illustrated by the growing number of 'business opportunity services', for example in the transportation area. A number of services store the offers made by transport companies and any firm or even individual can have access to the information with the Minitel and select an appropriate offer.

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The Minitel is here a communications tool between businesses which have an *occasional* common interest.
This kind of application is new and it would not make sense if the number of potential callers were too restricted, for example to DP terminals or even communicating PC owners.

The benefits to businesses and professionals are similar to the benefits induced by the DP technology in the 70's, but easily expanded to small businesses and inter-company relationships :

. more efficiency within the firms, coming from gains in time (e.g. reduced delivery time), from more efficient management
. better organization of work (services available all-day 7 days a week)
. better and more direct relation between businesses and their clients or suppliers
. much more reliable transactions (e.g. no paper intermediary process in orders, source of errors and omissions)

The number and variety of practical services for residential users is also experiencing continual growth. They benefit from the experience aquired by many Service Providers in the entertainment market segment, especially in service ergonomy and software/hardware efficiency.
They cover all types of services discussed over the past years in videotex-related material : tele-ordering, home-banking, travel information and reservations, news, classifieds, interactive educational programs, and many more.

But here again, new kinds of applications have developed, due to the number of users and the transparent billing system.
Data-bases about drugs, flowers, road traffic, local news, local ordering of goods, have been put on-line. These are typical examples of services which can bring valuable help to the end-users, but cannot be commercially viable without the relevant market environment.

Many of these services could also be delivered by phone (ordering, information, etc), but the direct-marketing power of the Minitel has proven much higher.

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The benefits to the consumers are numerous and will certainly increase in the future ; yet to invent applications will be developed by imaginative marketeers.

Finally, the Electronic Telephone Directory (ETD), *the only service put on-line by the Telco* itself and which also includes a repertoire of the various videotex services, has played an interesting role in the development of the Minitel in France. The ETD is the kind of service which is clearly perceived as useful by the man in the street, with much more powerful search modes than the printed directory or the Directory Assistance service. Every new Minitel user gets familiar with the terminal whilst browsing through the ETD, and continues to regularly connect to the service. It remains the most popular service which accounts for 17% of total terminal connect time.

ECONOMICS

The Minitel terminal

In most of the cases, the terminal is lent by the Telco to the telephone subscriber as part of his telephone subscription fee. The user accepts the Minitel in replacement for the printed version of the local White Pages directory. Should the user require additional Minitels, which is often the case for businesses, the Telco will rent the basic Minitel for FF85 ($14.15). Presently, 230,000 devices are rented.

It is also possible to purchase a terminal, directly from the manufacturers, or to equip a communicating PC with a Minitel emulator, available for most models of PC's.

Usage costs

The great majority of costs appear on the users' telephone bill and they cover infrastructure and transmission costs (PSTN and PSDN), and also the cost of service provision for Kiosk accesses.
The costs per hour are summarized in the following table :

Transmisson	Service	End-user cost
(1) $3.65	$6.08	$9.73
(2) $3.65	$8.86	$12.51
(2) $3.65	$17.05	$20.70
(3) $3.65	$0.00	$3.65

(1) : Kiosk access for general public services.
(2) : Kiosk for business oriented services only.
(3) : Non kiosk access : free or subscription based services

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A 'toll-free' access service is also available, whereby the Service Provider bears the communication costs.

The average monthly cost on the telephone bill to the end-user is FF85 or $14.15.

Costs of subcriptions

The great majority of services payed by subscription concern business users. They amounted to $45 million in 1986, or $112 per business Minitel per anum.
The subscription services for consumers are mainly home banking services (100,000 subscriptions), which cost the user $5 per month on average.

THE IMPACT OF THE MINITEL ON THE ECONOMY

In 1986, the revenues generated by the Minitel activity were $882 million.
The breakdown of these revenues with regard to the various players in the activity, and also the jobs that have been created are indicated in the following table :

TYPE OF BUSINESS	1986 REVENUES	JOBS
Service Providers		
Kiosk refunds:	M$137	
Subscriptions:	M$46	
Open services:		1,500
CUG services:		400
Hosts, software, engineering:	M$208	1,800
Hardware:	M$333	2,000
Telco:	M$124	900
Transpac:	M$34	150
Press, advertizing and training:	?	150
Total:	M$882	6,900

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Most of the jobs created are not specific to videotex, like for example the software developers or the hardware manufacturers. However, videotex requires a range of products with new qualities and features. A number of companies took advantage from this new market and gained consistant market share with well adapted products, e.g. the French subsidiaries of AT&T and MacDonnel Douglas, in the high capacity host business (up to 2,000 ports). Small innovative firms have been created and are especially successful in the application software and the peripheral business.

A number of dedicated videotex jobs also have been created and their characteristics are still in the process of definition, as Minitel is a relatively young activity. These jobs are essentially in the application design, host operation, and the day to day service animation (cf. the radio DJ).

The number of videotex jobs in 1990 is expected to reach the 12,000.

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Mr. MARKEY. Let me ask Mr. George Minot, who is the President of Applied Information Technologies Research Center, from Columbus, Ohio, and Mr. Maury Cox, who is Executive Vice President of CompuServe, if they would come up to the witness table.

What I would ask you to do if you could, is very briefly describe where we are here in the United States in terms of the provision of these services, and then if you could as well, give us a brief demonstration of how your services work.

Please try to limit your opening statement to 5 minutes and then we will be able to more quickly move on to the demonstration. Welcome.

STATEMENT OF GEORGE M. MINOT

Mr. MINOT. Thank you, Mr. Chairman and members of the subcommittee.

My name is George Minot and I am the President of Applied Information Technologies Research Center. I am pleased to have the opportunity to speak with you this morning about some issues which I believe will have a direct bearing on the future of the information services industry in the United States.

By way of background, I have been in the data processing services business for 25 years, and that goes from the point where we were handling computing in the early days in a room-size computer that was run on vacuum tubes to today's technology which has a computer on a chip; from the point where we were storing 80 bits of information on a punched card the size of a dollar bill to the point where today we have the ability to store 550 million characters of information on a CD ROM that is about 5¼ inches in diameter.

So we have seen a great number of changes, and I have been involved in the forefront of the development of time sharing in the late 1960's and early 1970's to the point where we started introducing, with terminals going into the marketplace, such things as electronic mail, which it seems to be understood for most of the members of the Congress today are using that on a daily basis.

Where I don't come from is I don't come from preassigned territories, from rates that are guaranteed, from profits that are guaranteed. I come from the free enterprise sector, where there are always trade-offs. You make an investment, you sweat equity, financial equity, and you put your ideas out in the free market and see if somebody is going to buy them.

The point I want to make today is that allegations have been made to Members of Congress and their staffs, the SEC, and to Judge Greene that information services are not now available in the United States nor will they be in the future to the average residential consumer in the United States without judicial or legislative intervention. Such allegations are, quite simply, not true.

Information services are widely available today in this country. The services now available to United States consumers are rich, diverse and affordable. Now, I'm not going to spend my time describing those services to you as CompuServe will provide you with a demonstration that will more than validate my assessment.

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Furthermore, a variety of information service providers will be demonstrating their services throughout the day. I urge you to visit these exhibits, and they provide the kind of evidence that neither the regional Bell operating companies or their supporters have provided to you today on the availability of information services in this country.

You will be impressed. The services are accessible through, as you will see, very sophisticated, high powered personal computers as well as very inexpensive, simple to use terminals. However they are accessed, the prices for these services are reasonable and affordable.

There is nothing magical about foreign videotext services. I ask you to fairly and objectively judge our free market services against these foreign systems, which were promoted and in most cases subsidized by governments. Our free marketplace is a far more efficient device for identifying customer demand and satisfying that demand. There is no basis for believing that a free, non-monopolistic marketplace will not satisfy the demand for electronic information services in this country.

There are clearly some erroneous assumptions being promoted about the regional Bell operating companies' ability to offer low cost information terminals. Whether the terminals are the Minitels or the domestic varieties. The modified final judgment does not restrict the BOC's from selling or leasing such terminals. They can do so provided they don't manufacture the terminal and that they are supplied through a fully separated subsidiary. Nor does the FCC prevent the regional Bell operating companies from offering videotext terminals on an unregulated basis. In fact, companies such as NYNEX are already selling personal computers through separate subsidiaries.

Nor are the regional Bell operating companies prohibited currently from distributing intelligence in those networks. Furthermore, there is no regulatory or legal impediment that would prohibit the BOC's from allowing unaffiliated companies to place such intelligence in their networks.

I think it is entirely possible that the regional Bell companies have decided to pursue a strategy which is aimed at total removal of the information services restrictions, either judicially or by legislation, despite the fact that they are not foreclosed from engaging in significant activities that would be associated with providing such information services.

Put differently and more bluntly, at this point in time the REBOC's would prefer to gamble on controlling the entire market rather than only providing a piece of the service.

The next point I would like to address is the notion that there is no valid public policy objection to allowing regional Bell operating companies from providing non-content based information services. These services are often referred to as gateway services. I think a better characterization is gatekeeper services. I simply do not see the gatekeeper function as a neutral function often attributed to it. In order to satisfy the gatekeeper role, the regional Bell operating companies would be required to dictate the methodology used by individual system operators such as CompuServe and GE and the Source and the ones you will see today.

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Such commonality in the name of facilitating the availability of information services is frightening and completely unnecessary. It constitutes ownership. The gatekeeper would decide which information services gets top billing in the menus, and the regional Bell operating companies nor any industry should have that power.

Mr. MARKEY. If I could ask, Mr. Minot, because we want to get to the demonstration quickly, could you just summarize in 1 more minute the point that you want us to hold onto?

Mr. MINOT. Yes, Mr. Chairman.

I think the matters you are going to be considering today and which certainly will be before you in the future and critically important to the information services industry and the American information consumer are historic in nature. What you decide, what the court decides, whomever decides this issue, it is going to directly affect the outcome of the information age in the United States of America.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Minot follows:]

STATEMENT OF GEORGE M. MINOT

Mr. Chairman, members of the subcommittee, my name is George M. Minot. I am President of Applied Information Technologies Research Center. I am pleased to have the opportunity to talk with you about some important issues.

Allegations have been made to Members of Congress, their staffs, the FCC and Judge Greene that information services are not now available and will not be available in the future to the average residential consumer in the United States without judicial or legislative intervention. Such allegations are, quite simply, not true. Information services are widely available today in this country. In the future they will be even more ubiquitous and diverse. The services now available to United States consumers are rich, diverse and affordable. I am not going to spend time describing those services to you as Compuserve will provide you with a demonstration that will more than validate my assessment. Furthermore, a variety of information service providers will be demonstrating their services throughout the day. I urge you to visit these exhibits. These displays and Compuserve's demonstration provide real evidence—the kind of evidence that neither the Regional Bell Operating Companies nor their supporters have provided to date—on the availability of information services in this country.

Some have asserted that the French videotext experience is proof positive that the MFJ information services restriction must be lifted if information services are to be as available in this country as in France. As I have indicated earlier, in my view, this argument is entirely bogus. The Compuserve demonstrations and the other exhibits that will be available to you today provide real evidence that there is no substance to this argument. These demonstrations will show the rich diversity of information services that already are available to the American people. You will be impressed. The services are accessible through very inexpensive, simple, easy-to-use terminals. Alternatively, they can be accessed through very sophisticated, high-powered personal computers. However they are accessed, the prices for these services are reasonable and affordable.

There is nothing magical about foreign videotext systems. I ask you to fairly and objectively judge our free market services against these foreign systems which are promoted, and, in some cases, subsidized by governments. Instead of being diverse, the foreign systems are homogeneous; and instead of being able to incorporate new technology, the foreign systems are in a relative technological straitjacket. Our free marketplace is a far more efficient device for identifying consumer demand and satisfying that demand. There is no basis for believing that a free, non-monopolistic marketplace will not satisfy the demand for electronic information services in this country.

There clearly are some erroneous assumptions being promoted about the Regional Bell Companies ability to offer low cost information service terminals—whether the terminals are the minitels or the domestic varieties. the Modified Final Judgment *does not* restrict the BOC's from selling or leasing such terminals. They can do so provided that they do not manufacture the terminal and that they are supplied

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through a fully separated subsidiary. Nor does the FCC prevent the Regional Bell Companies from offering videotext terminals on an unregulated basis. In fact, Companies such as Nynex already are selling personal computers through separate subsidiaries.

Nor are the regional Bell companies currently prohibited from distributing intelligence in their network.

Furthermore, there is no regulatory or legal impediment that would prohibit the BOC's from allowing unaffiliated companies to place such intelligence in their networks.

I think it is entirely possible that the Regional Bell Companies have decided to pursue a strategy which is aimed at total removal of the information services restrictions, either judicially or by legislation, despite the fact that they are not foreclosed from engaging in significant activities that would be associated with providing information services. Put differently, and more bluntly, at this point in time, the Regional Bell Companies would prefer to gamble on controlling the entire market rather than only providing a piece of the service.

The next point I would like to address is a notion that there is no valid public policy objection to allowing the Regional Bell Companies from providing non-content-based information services. These services are often referred to as gateway services. I think a better characterization is "Gatekeeper" Services. I simply do not see the gatekeeper function as the neutral function often attributed to it. In order to satisfy the gatekeeper role, the Regional Bell Companies would be required to dictate the methodology used by individual systems operators. Such commonality in the name of facilitating the availability of information services is frightening and completely unnecessary. Furthermore, the gatekeeper would decide which information service provider gets top billing in the menu of information services maintained by the gatekeeper. The Regional Bell Companies should not have such power. This power, along with their control of access links, would position the BOC's to have the power to discriminate in subtle as well as overt ways against competing information service providers.

Last, the Regional Bell Companies could almost certainly engage in forms of cross-subsidization which would give them an unfair and dangerous advantage. While Compuserve and the rest of the information services industry is more than willing to compete on a fair and equal basis, as things stand now it is very doubtful that competition with the Regional Bell Companies would even approach fair competition.

You are going to hear a lot about ONA later. ONA is complex, but it also is very important to the information services industry and end users.

Put in perhaps excessively simple terms, Open Network Architecture is a way to improve connectivity to and availability of network functions for information service providers and end users. It is to the information and enhanced services industry a long overdue and much needed super highway. It is "equal access" for the information and enhanced services industry.

It has been claimed by some that ONA makes it possible for the regional Bell Holding Companies to enter the information services market without a significant, unfair competitive advantage. Whether ONA will succeed in this respect is very problematic in my mind based on the state of ONA development information. To date, the Regional Bell Holding Companies have not been very forthcoming in describing their ONA plans. And the FCC has taken, at least as far as I can tell, a hands-of-approach.

Elegant engineering and conceptual descriptions of the potential of ONA are meaningless if sufficient attention is not given to the actual implementation of ONA concepts. Specifically, even if appropriate functionalities are made available in open network architecture plans, the Regional Bell Holding Companies could virtually eliminate the economic utility of such functionalities to the enhanced services industry and end users if the functionalities are priced improperly. If regulatory authorities do not intercede to prohibit such pricing, the economic utility of ONA will be eliminated, and the regional companies will have an even more significant, unfair competitive advantage in the enhanced services market. Even if the FCC correctly implements ONA, State regulatory authorities could choose to adopt different pricing policies and use restrictions which would undermine the efficacy of ONA. The attitude and philosophy that will drive State regulatory authority approaches to ONA is something that has not been discussed widely in Washington, D.C. But yet many ONA functionalities will surely be tariffed at the Intra-State level.

On the other hand, if the ONA plans that are implemented at State and Federal levels really open the telecommunications network to the enhanced services industry and if the functionalities offered in these plans are priced properly, open net-

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work architecture will be an important opportunity, an opportunity that could facilitate the even broader dispersion of information services in our society. To serve that end, there are a number of principles that should be embedded in all ONA plans. I, however, at this time, will limit myself to explaining three:

1. *Cost Based Rates*—All ONA functionalities should be recognized to be and treated as monopoly offerings. As such, the rates for these offerings should be set on the basis of proper costs. The Regional Bell Holding Companies should not be allowed to realize super competitive prices and profits from their offering of ONA functionalities.

2. *Neutrality.*—Access to telecommunications network functions by Regional Bell Companies, enhanced service providers or end users should be entirely neutral. No one, including the Regional Bell Companies, should be afforded preemptive control of any entry point or gateway.

3. *National Uniformity.*—All Regional Bell Companies should be required initially to concur in a uniform, standard set of ONA functionalities. It would be intolerable for the enhanced services industry and end users to be required to deal with seven fundamentally different open network architecture plans, different ONA vocabularies and different technical requirements. Moreover, there should be uniformity in the administrative procedures relating to the provision of ONA functionalities to enhanced service providers and end users. We should not be required to endure the excessive delays, lost orders and plain unreliability that characterized the industry's provision of private line services immediately after divestiture. The FCC should be urged to ensure that the appropriate administrative systems are in place to prevent a repeat of that unhappy experience.

To help Congress focus on open network architecture in terms that are particular and real, as opposed to general and conceptual, I would like to submit for the record a document entitled, "An Open Network Architecture Proposal." This document was prepared by the Coalition of Open Network Architecture Parties, of which Compuserve is a member; and has been transmitted to the FCC, NTIA, the Regional Bell Companies and AT&T. It also has been distributed widely in the information services industry and the end user community. I know that the Coalition of Open Network Architecture Parties, also known as CONAP, would be very pleased to talk with members regarding this paper and ONA generally.

The matters which you are considering today and which will certainly be before you in the future are critically important to the information services industry and the American information consumer. I know that you will consider these matters carefully, that you will not accept rhetoric and that you will demand reasoned arguments and facts from those that appear before you. The stakes are simply too great to settle for less.

I thank you for the opportunity to make these remarks. I would be pleased to answer any questions that you might have and would be delighted to assist you in any way you deem helpful and proper.

Thank you.

Mr. MARKEY. Mr. Cox, do you have a demonstration that you want to present to us here?

Mr. Cox. I have a brief statement that I would like to make and give a demonstration, yes.

Mr. MARKEY. Please try to make the statement as brief as possible, try to keep it down to 1 or 2 minutes, and then get into the demonstration.

STATEMENT OF MAURICE A. COX

Mr. Cox. Mr. Chairman, distinguished members of the subcommittee, I am extremely pleased to be here to give you a brief overview of the information services industry in the United States.

There is a misperception being advanced by some that computer communications in this country are inaccessible to most Americans, difficult to use and require expensive, complicated equipment. What I would like to do in the next few minutes is show you that there are services readily available at an affordable price and easy to use and offer limitless amounts of useful information.

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The information industry is growing at a steady rate in the United States. There are 4.4 million personal computers today with communicating modems that allow access to on-line information services, and this is expected to grow to 13.2 million by 1992. CompuServe, the company that I represent, has 365,000 subscribers to the CompuServe information service, and it grows between 5,000 and 7,000 new subscribers each month.

Through low cost personal computers, our subscribers have ready access to more than 1,100 independent data base offerings. You have an opportunity to sample some of those services first-hand at the conclusion of my remarks. Our service is accessed with a local phone call in more than 600 U.S. cities, and that covers 90 percent of the U.S. population.

Almost one million Americans subscribe to and use data base and communication services supplied by CompuServe and our competitors today. The companies provide a variety of easy-to-use services ranging from simple electronic messaging to interactive conferencing, transactional services such as airline, hotel reservations and home shopping.

Advances in technology have permitted the interconnection of some of these companies' services in what are called gateway arrangements. These gateways are independent of the local telephone company involvement. For example, CompuServe and MCI subscribers can send messages to each other linking over half a million electronic mail enthusiasts.

Through gateways, computer users can also retrieve information from a variety of other data bases not resident on CompuServe's computers. CompuServe subscribers have access to over 800 specialized data bases through one of our gateway arrangements. Such gateway arrangements are becoming prevalent in the industry, with the customer receiving the ultimate benefit of access to virtually unlimited amounts of useful information.

I quickly want to address the kinds of equipment that a user needs to access an information service. Very simply, a modem-equipped personal computer or terminal, communications software and access to a telephone line. The personal computer does not need to be expensive or sophisticated. For example, the Tandy color computer, which is used with an ordinary television set, which is right here, can be purchased with a modem for as little as $165 at Tandy computer stores throughout the country. This morning we have installed a variety of personal computers, including the Tandy, for today's demonstration.

At the same time that cost of personal computers is on a steady downward trend while the function of machines is on an increase. In 1983 an IBM personal computer with disk drives, monitor and a modem cost $4,600. Today an IBM personal system II, with twice the power of the 1983 model, costs $1,600. An IBM-compatible machine with similar features costs $687.

In summary, communications by computer in the United States is affordable, is available, serves as a powerful resource and is easy to use. Use of these services have fueled the growth of a young, vital industry that is now growing in excess of 20 percent per year.

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We urge the members of this subcommittee to carefully consider the ramifications of allowing monopolistic influences to control the flow of information to the American public.

Now we will quickly give you a demonstration of our services.

This is the top menu of the CompuServe service. We thought we would select number 4, news, weather and sports, and choose number 7 the AP Videotex service. This provides constantly updated news from the AP wires. By choosing number 1, the latest news update, we can see current breaking news. There are hundreds of stories coming across the wires each day that we have available to us.

Now, if we just go back to the top of the service by issuing the "T" command for top, we will quickly take a look at the electronic mall shopping service, number 6. The electronic mall, number 1, allows us to look at merchants in a variety of different ways. We will shop by department.

We will choose number 3, books and periodicals, and we will look at the books provided by Ballantine, number 1. If we choose number 7, for and about business, we will see books available on business topics. There are ten books available. If we wanted to order number 10, "Success," first of all we get a brief description of the book, and by entering an "O," we could now go into ordering, but we will enter "T" and go to the top of the service.

That is a very quick overview of the news and the shopping services on CompuServe. We invite you to take a look at the over 1100 services that we will be showing during the rest of the day.

Mr. Chairman, I would like to submit for the record a folder containing information about CompuServe and the information services industry. In addition, I want to submit for the record a CompuServe Information Service Almanac, which typifies the wide range of data bases available from our company and others in the industry.

Thanks very much for this opportunity to speak with you.

Mr. MARKEY. Thank you very, very much, Mr. Cox and Mr. Minot. If it would be possible, if you could just change seats once again and let Mr. Nahon and Mr. Minot sit up here so they can answer some questions at this time. We would like to have the subcommittee get some basic information from both of these witnesses in terms of how the United States and the French are dealing with this question of how to provide the services.

I would like to recognize first the gentleman from Pennsylvania, Mr. Ritter, for an opening round of questions. His interest in this issue is, I think, the highest of any Member of Congress, and I think that he would like to have a chance to be able to address the experts we have with us today.

The Chair recognizes the gentleman from Pennsylvania, Mr. Ritter.

Mr. RITTER. I thank the chairman. I was just content to watch these screens all morning. But I do have a few questions.

For the gentleman from Minitel, Mr. Nahon, what is the current status of the payments for the terminals that are placed in people's homes? Right now who is paying for those terminals? How is the money generated to pay for those terminals?

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Mr. NAHON. The large proportion of terminals are not paid for; they come as part of the telephone subscription if one wishes to get a Minitel in replacement of the printed white pages. The telephone company recovers the investment for each terminal within 4 to 5 years by the extra traffic generated on the video text network, plus the savings in the operation of the directory assistance system, plus additional revenues we get on the value added that we bring at a gateway level in the network.

Mr. RITTER. So as I understand your response, the placing of terminals in people's homes today, the cost of that is recovered at this stage, is not a subsidy, or is it still a subsidy?

Mr. NAHON. It is no more subsidized than the basic telephone set used to be until in France 5 years ago when as part of the telephone subscription the telephone subscriber received a basic telephone set. He had the option to buy one from the market, but there always was a basic telephone set as part of the subscription.

Mr. RITTER. So in a sense, the units are placed in people's homes but the cost is amortized by the providers and users of services?

Mr. NAHON. Yes. It works exactly the same way it used to work for the basic telephone service where the telephone company recovers the investment in its network switches and terminal equipments by the volume of traffic or the usage of the telephone network. It generates more telephone network. So it is not subsidized in the sense that it is paid. The money invested in the terminal is recovered by the traffic generated on this particular video text network.

Mr. RITTER. Another point on costs. We are very much concerned on maintaining a division between the essentially monopoly services and the regulated services to residences and businesses and any new information services that might be generated as a result of modifications of the modified final judgment.

What kind of barriers do you have in your system, if any, or is the information service provided through the Minitel network considered part and parcel of a basic telephone service? Are you worried about creating a wall or a gap between normal telephone use and what you are showing us here today? Do you have this concern that we have here very strongly?

Mr. NAHON. You mean in the provision of content and information services?

Mr. RITTER. In the accounting and in the investment.

Mr. NAHON. We do not provide more than the electronic directory service as an information service.

Mr. RITTER. Then that is part of your basic telephone service, so that this system is integrated with ratepayers' regulated services; is that correct?

Mr. NAHON. It is a regulated service, yes.

Mr. RITTER. So the system is part of the telephone system, including the white pages and yellow pages?

Mr. NAHON. Right.

Mr. RITTER. And everything beyond that is separated by accounting systems and legal barriers?

Mr. NAHON. I see what you are getting at.

Mr. RITTER. I am just trying to get a comparative view of your system versus ours.

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Mr. NAHON. OK. We have only one packet switching network in France, one nationwide packet switching network. It is run as a separate company. It's called Transpak. Although we are using Transpak as a backbone network for video text, the telephone company is a customer of Transpak so we have separate accounts, separate budgets, and we are a customer of Transpak so we pay Transpak for the use of their lines when we use them for the video text network.

As far as the terminals are concerned, it is all part of our own budget, the telephone company budget. We have 230,000 of these terminals rented. They are rented and people pay about $12 per month for each terminal, and the rest of the 3 million terminals, as I said, are not paid for. They are not paid except that we do not provide any more the printed white pages, and we expect people to generate traffic on the network with their terminal.

Mr. RITTER. Do you do substantial marketing of your services?

Mr. NAHON. We don't. The service providers do for us in a way. It is very much like joint marketing in some cases, but the services providers themselves market their service, and sometimes they will market our market and the use of the Minitel. If you look at any of the ads on this directory, you will see company names promoting the use of the Minitel, but we are not mentioned.

Mr. RITTER. Mr. Chairman, I would like to just summarize this line of questioning. What we now understand is that there is no significant barrier that exists in their system of Minitel and their normal telephone system. Whatever it's worth, I think it's very important that we recognize that fact.

Mr. Minot, you made reference to, I suppose, providing gateways. You talked about gatekeepers. Now, it occurs to me that perhaps Bell Operating Companies could become gatekeepers and keep people from coming in or coming out or establishing certain kinds of priorities in marketing and what have you, but it just seems to me that the toll taker on the toll road, so to speak, wants as much traffic going through his toll in order to make the system as profitable as possible. You would think an intelligent gatekeeper, even if you use your term "gatekeeper," would want as much as possible to help sell, so to speak, the individual provider services in a very comparable way that Minitel seems to be doing with its providers.

In other words, there is a real synergism, there is a real alliance between the system and the network and the providers of service. Could you comment on that?

Mr. MINOT. As I understand it was described in France, there is only one packet switch network in France and they have all the business. I think in terms of as to why the Bell Operating Companies would not be satisfied with that part of the service, I really can't answer that question. I think as long as they believe that they have the opportunity to control the whole thing, that they will not settle for less than that. That was part of my comment. I think as long as we hold that out to them, that they will, in fact, say we will.

Mr. RITTER. Let me close on this remark. It would seem to me that the manager of the system, the gatekeeper, if you will, has a tremendous capability to assist and to be involved with the marketing and with all of these service provisions which actually comple-

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ment, supplement, synergize the individual providers. It seems to me that we have developed an analogous situation. It seems to me that prior to the development of the Federal interstate highway system, if we had had individual private highway companies in individual States or individual regions, they would have strongly objected to the creation of a Federal interstate system.

I think there is something to be gained by having a kind of national, integrated, standardized network that the individual providers could then use in a way that supplements your individual service. I think your numbers are very small in comparison to what they could be.

Mr. MARKEY. The gentleman's time has expired. Thank you.

The Chair recognizes itself for a round of questions. I would just like to follow up on Mr. Ritter's questions because I think it is going to be important for us to understand the costs, the investment of the French Government in their subsidies to this program so that we can get an idea of what the American Government or whatever entity in our country we might ask to shoulder this burden might have to invest in order to get the same type of program that you have.

How much money did France spend? How much has the French Government invested in this system?

Mr. NAHON. The French Government has not invested one franc in this program. It is the telephone company, which, although it is run as a government body, has a separate budget and, as a matter of fact, is financing the government.

Mr. MARKEY. So socialism does work, huh?

Mr. NAHON. Very well.

Mr. MARKEY. I just wanted to get the message over here. It seems we have a role reversal here, and the irony is too rich to miss and it might not happen again.

Mr. MARKEY. How much money has the government-run telephone company invested?

Mr. NAHON. $2.3 billion in the last years.

Mr. MARKEY. And what was that money spent on?

Mr. NAHON. It was spent essentially on purchasing terminals, Minitel. So far we have purchased 6.5 million terminals, and the improvement, the enhancement of the local loop to convey the traffic, the video text traffic in the proper conditions, the purchase and installation of the gateways, the dedicated gateway for video text, which we didn't have before, and the advertising budget, which is $5 million per year, which is very small compared with our overall budget.

Mr. MARKEY. So let's then look at where the revenues came from. Did the revenues come from rate payers, from general revenues, from rate increases? What was the source of the revenue that you used to come up with those billions of dollars?

Mr. NAHON. The revenues come from usage on the network.

Mr. MARKEY. No, I'm talking about the initial outlay. When you initially made your decision to publicly through the telephone company subsidize this endeavor, where did those revenues come from?

Mr. NAHON. Well, the money that we invested, you mean?

Mr. MARKEY. The money you invested.

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Mr. NAHON. It comes partly from our own internal financing that we——

Mr. MARKEY. From the French Government itself?

Mr. NAHON. No, no, no, from the telephone company. We have 65 percent self-financing, internal financing.

Mr. MARKEY. And where did the revenues—from what pool of money inside the telephone company did you draw in order to make that initial investment?

Mr. NAHON. It comes from our regular operation of the telephone network.

Mr. MARKEY. So it came from the rate payers? You are saying the rate payers were paying their general bills in order to receive ordinary telephone service, and then you took from those revenues the money in order to invest in these particular systems that could then be given out to consumers?

Mr. NAHON. Yes, which is exactly the way we do it for switches or trunks, equipment.

Mr. MARKEY. I understand. Was that the sole source of revenue that you used, or did you have any revenue that you took from the general treasury of the French Government?

Mr. NAHON. No. We borrowed money from the financial markets also.

Mr. MARKEY. And just so we can understand, how much money did the individual who received these units have to supply in order to have one of the Minitel computers put in their home?

Mr. NAHON. They don't have to pay anything for the first Minitel they want to acquire, but they accept at the same time not to receive the printed white pages.

Mr. MARKEY. What is the present level of penetration in French homes of the Minitel service? How many homes have it? What percentage of French homes have a Minitel system in them today?

Mr. NAHON. We have 18 million homes, and we have 3 million terminals.

Mr. MARKEY. So 3 million homes have them?

Mr. NAHON. Well, 2.5 million because half a million are used by business users rather than people at home.

Mr. MARKEY. 2.5 million. And what is your ultimate target?

Mr. NAHON. We would like to be able to create a market of 8 million, which represents ⅓ of the total population of telephone users in France.

Mr. MARKEY. Why is your goal not universal application of these technologies?

Mr. NAHON. We will not refuse terminals to a citizen in France willing to get one beyond the 8 million, but our calculation shows that beyond 8 million, the return on investment will not be as good as it is for the first 8 million.

Mr. MARKEY. The return on investment.

Mr. NAHON. Yes, because we would have to reach people in, for example, holiday houses or country homes where people spend maybe a week in the year, so we don't want to be in a position to equip all these telephones with Minitels.

Mr. MARKEY. Tell us a little bit about the services that you might provide here in America and in France to shut-ins, to elderly, to people who might come from those types of segments of the

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population so that we can get a sense of what the general public beyond those who are interested in specific services might expect in the long run in terms of services.

Mr. NAHON. Well, the services provided by the different government agencies first, Department of Labor, Department of Social Security, Department of Health, for example. We have now a service available for hearing-impaired people who can use the Minitel to communicate if they cannot do that with an ordinary telephone set. There is a special service for hearing-impaired people in the Minitel network.

We have also town hall sponsored services. Almost any town in France, any mayor has set up a community service with all types of information and services helpful to the citizen.

Mr. MARKEY. Let me let Mr. Minot take a shot. What kind of services could you provide for elderly, for shut-ins, for people you might not consider to be traditional computer users.

Mr. MINOT. There are some 150 special interest groups. A number of those special interest groups—we have a handicap forum to provide an opportunity for them to exchange ideas, get more information. We have, of course, a large following in the educational base. I think that is one area that has not been touched on this morning, in terms of educational data bases.

Mr. MARKEY. So how would you contrast your services with the French? Is there any difference?

Mr. MINOT. I am not familiar with the French. Based on what he has told me, I think we have a wide variety of services available to those folks as well. You must understand that a great deal of what goes on on these services are people communicating with people in various forms, direct, virtual connection, electronic mail, bulletin board environments where they are exchanging ideas and getting information from not only information providers but also from individuals who have that information.

Mr. MARKEY. Let me ask you this, Mr. Minot. We have been told that the French right now have 2.5 million homes with these computers in them and their target is 8 million homes by—what date do you target that?

Mr. NAHON. 1995.

Mr. MARKEY. 1995. Give us your view of the United States, where we are now and what we can expect to see in the future.

Mr. MINOT. You have heard some of the numbers bandied around. It depends on which expert you are listening to. I think by close estimate there are approximately 15 million homes that have personal computers or some device installed. Of those, about 20 percent have, in fact, subscribed.

Mr. MARKEY. That would be approximately 3 million homes?

Mr. MINOT. Yes. And we have a penetration now of about one-third of those collectively in the industry.

Mr. RITTER. Mr. Chairman, if you would yield just on that point, I think what we have to really consider here is the extent of the 3 million home access to information services. I think what the gentleman is saying—we heard the number earlier that 1 million homes had information services. Now it is up to 3 million. Is that 3 million figure one form or another of an information service extended out to the limits of the definition? I think that is what it is.

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We do not have 3 million homes that have a full menu of information services. We are nowhere near that.

Mr. MARKEY. I think that is the point that Mr. Minot was making, was it not, that ⅓ of that 3 million, or 1 million——

Mr. MINOT. One-third of those 3 million have it.

Mr. MARKEY. Have the full service.

Mr. MINOT. If you look at the almanac that has been read into the record, it gives you an idea of the full range of services that are available on CompuServe, and I think that you or your staff will see today demonstrated from the other service providers in the United States a wide variety of other services. Some are complementary to what they might get off of CompuServe, some of them are duplications.

Mr. MARKEY. How many vendors are there in the United States?

Mr. MINOT. Actively?

Mr. MARKEY. Yes.

Mr. MINOT. Probably 25.

Mr. MARKEY. So in France there is 1 vendor, and in the United States there are now 25; is that correct?

Mr. MINOT. Well, when you say active, there are 25 major services. I am guessing. I don't have a count.

Mr. MARKEY. Let me ask you this, Mr. Nahon. The French consulting firm of Videotex, International, among others, has estimated that of all the, let's say, 2.5 million terminals in use in France, nearly 2 million are used exclusively for electronic yellow pages and white pages. Does that indicate that even with the successes, the French system has been unable to really stimulate the interest in the other services which might be available? Do you agree with that analysis, by the way?

Mr. NAHON. I think the figure is a little bit too high, but I agree that a large number of Minitel users only use the directory service, but it does not say that there is no interest in the other services. What has to be understood is that most people receive the terminal as part of the directory service, so they link in their mind the terminal to the directory service, and then they have to be exposed to this literature or to advertising or whatever to be—for example, their bank can invite them to be part of a home banking service, for example. But yes, I agree with the figure.

Mr. MARKEY. How many people have plugged into the Yellow Pages and then plug into the banking system? You are saying that has not yet happened? They get the Yellow Pages and then they go through a traditional mechanism in terms of their interface with the bank, they don't then plug in, as of yet, into the banking technology?

Mr. NAHON. This is because we cannot and for the time being, we do not deliver as much as would be necessary to reach those consumers who may have the right profile to be interested in the other services. If someone comes to our telephone shop and says, I am a telephone subscriber and I want Minitel, we have to deliver, but we don't know if that person has the right profile to do anything but calling the directory.

Mr. MARKEY. Let me just finish up my final question.

Mr. Minot, take us 5 or 10 years down the line in the United States; what do you envision under existing conditions? That is, the

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rules as they are today? What can we expect in terms of the entrepreneurial activity and the ultimate result in terms of consumer access to these technologies?

Mr. MINOT. My crystal ball is no clearer than anyone else's. I would tell you that the thing that we see and there are several factors here, for example, the first microprocessors were delivered to high schools in small numbers in 1977. We are now in 1987. Those people are just now coming into the market, if you will, for information services. They have completed college or apprenticeship programs and now they are going out on their own. We think this thing is just ready to explode.

I would expect that what we have seen is some trials and adaptations of other technologies, the British technology, the Canadian technology and in some degree, the French technology. There have been experiments on a number of different technologies. They are zeroing in now on what people are buying. That is the kind of services that CompuServe, The Source, and Dow Jones and a number of other companies who you see today are buying. This will encourage more and more people to get involved in the business.

We have also indicated to you that this is an early market today. They are looking for highly targeted information. This is a perfect vehicle for them to zero in on exactly the kind of interests they want.

Therefore, we think we are on the verge, if left alone, to the normal processes of business, and there will be failures and there will be successes, that this will flourish in the United States. It is a behavioral change problem. It is not a problem of regulation or deregulation. It is a behavioral change and we have to do that.

Understand that in 8 years, it has come from nowhere to 1 million subscribers. Televisions were the only thing, I think, that came in after World War II that even approximated the growth rate we are seeing in the adoption of this technology.

Mr. MARKEY. Thank you. My time has expired. The Chair recognizes the gentleman from Iowa, Mr. Tauke.

Mr. TAUKE. Thank you, Mr. Chairman.

Mr. Nahon, just a factual inquiry. Are there any geographic limitations on the system in France, or do all areas of the country have access to the system?

Mr. NAHON. In continental France plus Corsica, it is accessible, the service is accessible from anywhere in the country, with the same commercial conditions.

Mr. TAUKE. Mr. Minot, you just had a little discussion about what you thought were some of the barriers to usage in this country for these kinds of services. I looked at the figures that were cited earlier, 15 million people having access to some kind of minicomputer at home.

Why would we not see a greater percentage of those people who obviously wouldn't have a behavioral problem in dealing with this kind of technology, why wouldn't we see a greater percentage of them moving into the arena? Are there other barriers?

Mr. MINOT. The barriers are that we have not appealed to them. We have not gotten enough information or we have not reached them in the form of advertising. They may not have time. This society that we have is very demanding. It takes time to sit down and

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do that. A lot of people just absolutely do not have the time for this, even if they have a terminal sitting in their room.

Mr. TAUKE. Give me a little indication of what your typical subscriber is like. Is it a business? Is it an average homeowner? Is it a young person, an older person? Do you have any kind of profile you can give us?

Mr. MINOT. At this point in time, Mr. Tauke, the profile would be a 34 year old male, American, making in excess of $35,000 a year.

Mr. TAUKE. Individuals rather than businesses?

Mr. MINOT. Yes, they are individuals. There is some percentage of the total population. It's hard to distinguish because those people are generally in business of some form, either an agricultural business or whatever, and they are using the same information, maybe in a different form, during the business day as well as in the evening. It is predominately an after 6 p.m. service. We see a growing number of users coming on in the day.

We have through efficiencies and a business decision, stimulated what we call the 8 to 6 by lowering the price to match the non-prime time price. It is the same price all day long now, and that has encouraged more people to use it during the day time.

Mr. TAUKE. I received a letter recently from one of my constituents who is a user of your services, who was concerned about the FCC's proposed rulemaking in Docket 87-215, which apparently would increase the rates for this user, if it went through.

Do you think rate increases—first of all, do you have any observations on the proposed rate increases in the proposed rulemaking? Second, do you foresee they will have any kind of chilling effect on the expansion of these services?

Mr. MINOT. Yes, sir. The proposal will likely have an adverse effect on many individual subscribers. We, too, have received hundreds and hundreds of letters since that announcement was made. It will certainly stifle the growth of the information services industry in the United States.

This FCC mandated usage sensitive access charge would cause serious reduction in personal and educational database usage. Most of these services are new. At best, are operating on a marginally profitable basis. Many will experience extreme difficulty in staying in the business with the down turn in usage.

Mr. TAUKE. You obviously don't want the Bell Operating Companies in the business. I can understand that from a variety of perspectives. The argument that you used is you don't want the Bell Operating Companies in the business because you thought it might assert some inappropriate monopoly into the business.

Let's assume for the moment that the FCC has both the ability and the desire to prevent the Bell Operating Companies from abusing whatever monopoly power they might have. Would you then oppose the Bell Operating Companies getting into the business?

Mr. MINOT. You are asking me to make a quantum leap in faith to make that assumption. I would have to say all those other things being equal, the answer is yes.

Mr. TAUKE. The next question is do you think it is possible for the FCC to prevent any monopoly power from being abused?

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Mr. MINOT. I can only deal in history and so far, they have not been able to do that. I do not have any faith that is possible in the near term. There are a number of propositions on the table, joint costs, ONA, a number of things that we are interested in. We think that open network architecture is a way to improve that connectivity that we need. There are a number of things that the Bell Operating Companies could be doing to help improve the ability of information service providers to deliver their services most cost effectively to the subscriber.

I don't have the answer why they are not working on those today. The only thing I can surmise is they are holding back thinking they are going to have an opportunity to control the whole industry.

Mr. TAUKE. Has it ever occurred to you that maybe the Bell Operating Companies would mover faster in some of these activities if they had an economic incentive to do so?

It seems to me that one of the things Computer III is all about is to try to encourage equal access for everybody, including enhanced service providers, long distance carriers and so on.

It would seem to me for the Bell Operating Companies at the current time, they don't have a lot of economic incentives to move quickly, because there isn't any great return for them. If they were participants in the process, it seems to me they would have a greater economic incentive to implement Computer III.

Mr. MINOT. Mr. Tauke, it is a chicken and egg problem. It is my understanding that both the FCC, and I'm not a legal expert, for example, the FCC says, you go out and you provide all these wonderful things that you said about equal access and CEI is tantamount to being equal access for enhanced services providers, that indeed, you can do that under certain restrictions. Those restrictions are based on historic abuse in any competitive activity. There is nothing to preclude them from supplying the terminals, as the French Telephone Company has done. That makes it a good business decision on their part. Nothing to prohibit them from going out and being in some of these services on a fully separated basis with the proper safeguards for this tender, young industry that is just starting to grow in this country.

Mr. MARKEY. The gentleman's time has expired. The gentleman from New Mexico, Mr. Richardson, is recognized.

Mr. RICHARDSON. Thank you, Mr. Chairman.

First, I want to thank you for appearing before a congressional committee of the Congress. I think your company, your gesture is much appreciated. I don't think I have ever been in a hearing with somebody of your caliber, et cetera. I commend you for appearing before us.

I want to direct my questions to you, because there are those of us who try to make a decision based on whatever Judge Greene does, I'd like to ask you your view about what do you think the impact on information services in this country, and surely you are knowledgeable about our system, would be if the Bell Operating Companies would be allowed to come in?

Do you think it would give more access to these services? Would it help, hurt, in your experience, visualizing and dealing with our country?

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I guess as a corollary to that, I wonder if you could talk a little bit about the French experience. The information industry, as I understand it, has grown to $130 million a year. I would like to know what in your judgment has been the impact on your industry if the telephone company there had become a major provider of information services, would it have hurt the industry, reduced the willingness of private firms to enter the business?

I think we can benefit from your experience and your opinion.

Mr. NAHON. Thank you very much.

The first question is a difficult question for me to answer and try to give you a modest contribution. It seems to me from what I know about the American market for information services that the telephone companies have not been very much involved, apart from limited trials and experiments. This is, of course, a major difference with what has happened not only in France but in Europe in general.

The telephone companies have an interest in leveraging the traffic usage on their network. If a telephone company can stimulate usage on their networks and add value to the information services, the computers, and by the way, we can access computers from France with Minitel by our gateway network. I am personally a subscriber of CompuServe.

Mr. RICHARDSON. It works.

Mr. NAHON. It works. It shows a gateway like CompuServe and an information system like CompuServe can also be connected to another gateway like ours in France.

The telephone company is not very much involved in the United States. If they could provide to the end user the equivalent of any simple to use device for any consumer to be able to reach any of the information services available or to be creative, I think that will probably help create the momentum for the penetration of the mass market.

What has completely changed the situation in France is the fact that we have at the same time created a market of users with a distribution of terminals, almost the same terminals for everyone, and make it completely transparent for the database provider, the content providers, to be able to reach all these people with terminals.

The second question is linked to the first one, the impact of the involvement of the telephone company on the information industry in France has been very significant. I can give you 1 example.

Until 1 month ago, we only published one tariff level on our billing system, because initially we did that billing system for consumer oriented services, especially services provided by newspapers, such as news, horoscopes, games, jokes and so on, so there was a need to charge a limited amount of money for a short period of time.

The success of this open access to information services with no subscription has attracted a lot of business and they came to us and we decided to add another, in fact, two other levels of tariffs for the business community interested in delivering their content to a wider audience than they have today. They could reach all the Minitel users today, but via subscription, which does not work properly as the Kiosk system works.

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Mr. RICHARDSON. Thank you.

Mr. Minot, it seems you have a very fine system but obviously is well suited for institution's libraries, educational institutions. If this question has been asked, I apologize. Do you have any special pricing for some of these outlets to afford your services? Couldn't your system be a leader in bringing your system to the attention of a far wider audience?

In other words, do you feel besides making a profit, you have a commitment to public service?

Mr. MINOT. I think the approach that we have tried to make at this point in time is to try to treat everybody equally and by that, to offer the lowest device to everyone.

Mr. RICHARDSON. You have no special prices?

Mr. MINOT. We have no special discounts.

Mr. RICHARDSON. Isn't your market right now rather narrow? Who would you say are your main clients?

Mr. MINOT. I describe the clients as people who have installed a device and a modem in their home or place of business that wish to get information in an interactive mode or communicate with others in some fashion. That has turned out at this point in time to be the early adopters, the people who have generally been the first to buy VCR's and the ones to buy personal computers or game machines or television sets, down through the history. Those have been the early adopters, the ones who had the disposable income and could afford to make that purchase early.

We have seen a dramatic drop in the costs of the kinds of devices that you see before you, in that we have seen the coming of age of a group of people who are not intimidated by computer keyboards or computers themselves. They are insisting these services be available. That is what we are shooting for, that next generation moving in. That is when you are going to see that dynamic growth.

Mr. RICHARDSON. Mr. Chairman, I thank you. Mr. Nahon and Mr. Minot, thank you for appearing, especially Mr. Nahon, from our great friend and ally.

Mr. COOPER [presiding]. I would like to personally thank you all for coming, particularly Mr. Nahon.

Mr. RITTER. Mr. Chairman?

Mr. COOPER. Yes, the gentleman from Pennsylvania.

Mr. RITTER. If you would indulge me in some further questions for the——

Mr. COOPER. I had a few questions of my own. I wasn't dismissing the panel now.

Mr. RITTER. Oh, I thought you were dismissing them. OK.

Mr. COOPER. I had to miss part of the earlier hearing. Perhaps CompuServe had a demonstration before the assembled hearing. I did not see it. But the Minitel demonstration was amazing, and I appreciate the opportunity to see firsthand what is being done in France.

On the access charge question, I would like to invite the computer users of America to join in supporting the Wyden bill. I am a rural legislator. Many of my constituents practically never dial long-distance, and therefore they are very upset about the access charge imposition. It seems to me that these rural telephone subscribers are perhaps the natural allies of online computer services

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who probably use long-distance too much in comparison with the average telephone user.

In either case, it seems that the access charge is an unfair and very harmful way to assess revenue. So any additional support we could get for the Wyden bill would be appreciated.

I have a question about how important having a gateway system or a one-telephone-number access is to these services. As I understand it, in the Minitel system, you call the kiosk, and the kiosk can put you in touch with virtually anything, including CompuServe.

Mr. NAHON. Yes.

Mr. COOPER. Is that a vital part of the system, or is it OK, as I understand it, for the current U.S. system where you dial CompuServe, where you dial one of the other services instead of just having one number that can gain access to virtually everything?

Mr. NAHON. Well, we have three different phone numbers depending on which service you want to reach and the price per service. So we have already three different numbers, but the gateways are the same. I mean, physically, technically, they are the same units.

Mr. COOPER. So your gateway is determined on the frequency of use? Like you would dial one number if your were a plain residential consumer that would dial in occasionally; you would dial another number if you were a heavy business subscriber and had to be online for several hours during the day?

Mr. NAHON. It would depend on the class of service that you are calling. If you are calling a service like Le Monde, it's one particular phone number, because you will pay on your telephone bill everything, and if you call the bank, you will call another phone number, because you have this time to identify yourself to your bank, so it's no longer an open access service. You're not buying content. You have access to your account statement, and so it's not the same thing.

That's why we have different numbers. But the gateway, as you said, if you take one of the gateways, it gives access to most—well, to all services available on the network, all computers.

Mr. COOPER. Mr. Minot?

Mr. MINOT. Well, certainly, the single dialing capability for the service is probably available today, if that was—I mean, that technology is in place. We've seen it with 976 and other types of services. So, yes, it would be nice for CompuServe to have a single number that you could dial throughout the United States.

I think that what you're saying is, would I accept a gatekeeper that would determine how my number was presented to the subscribers around the country. No, I'm not willing to accept that.

Certainly, if they wanted to give me number one billing, I'm greedy enough to take it.

That's one of the things that we've spelled out, and CompuServe is part of the group that—the coalition of open network architecture parties, and we have presented a study here to help Congress focus on this open network architecture in terms that are particular and real, as opposed to some of the general concepts that have been bandied around, and we would like to submit to you a record, a document entitled "The Open Network Architecture Proposal,"

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and in that, one of the elements is, of course, this concept that you've described, the ability to have a single number nationwide. It would certainly help overcome some of the conversation about it's too difficult to use.

It's another thing, because we have a highly mobile population today, and we have to fight the battle of getting service changed in a lot of different cities and publishing and trying to keep up to date all these directories.

So the answer is yes. We would like to have a single number. I don't want it to be controlled by the BOC's.

Mr. COOPER. The committee would be happy to accept the document that you mention. I take it that it has not been presented to the committee before during this hearing.

Mr. MINOT. No, it has not.

Mr. COOPER. I don't think it's perhaps necessary to have it printed in the record.

Do I have the consent of my colleagues on that? Just to accept it by the subcommittee but not print it in the record.

We've talked about the one phone number. How important is central billing, for having a billing for your service come with the telephone bill? Is that a plus or minus? Is it a sword that cuts both ways, as apparently the one telephone number does?

Mr. MINOT. Well, central billing is not essential. We have 370,000 subscribers that we're handling without that. Certainly I think the ability to offer certain services and have it billed along with somebody that is billing them anyway every month is certainly a service that we might consider subscribing to, not unlike other services that companies subscribe to. But it is not the essential element in this scheme of making this a business.

We have those costs. Any time we can look for an alternative way to reduce the costs of doing business, such as billing, we certainly would be welcome and open to that consideration.

Most of our services are billed on credit cards.

Mr. COOPER. Mr. Nahon, have you found central billing to be a key marketing tool for Minitel?

Mr. NAHON. Yes. Sixty percent of the overall usage and traffic is going through the kiosk billing system. We chose—how successful the open access and the ability to be billed on the telephone bill are important. That has been part of the success, yes.

Mr. COOPER. One final question. Mr. Minot, if you could ask this committee for three things that would help your business grow and develop and others like it, what would those three things be? Perhaps you've described them already in your testimony.

Mr. MINOT. I think that we would like to ask you not to move hastily on these decisions and that we've talked about such things as ONA and CEI and a number of other safeguards which have been debated strongly and commented on, and everybody is willing to give it an opportunity to work. That's not the point. I think it has to have time to be proven, and to move hastily on this, without having proven safeguards in place, would be disastrous.

So that would be my first wish, is don't jump off the edge.

Second is to understand that we have a regulatory system here that is overburdened, understaffed, just like everybody else, and that we can't depend on them to be—to give us anymore back than

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we can give them in terms of resources to work with, and this has become a tremendous task, and I don't think that the structure, the infrastructure that you have in place, is capable of monitoring this sort of activity. It needs to be reworked, relooked at, and refinanced.

Mr. COOPER. That's only two wishes. You've got your big chance for a third one.

Mr. MINOT. And the third wish is that somebody would step forward and give away 1 million—2 hundred, 3 hundred thousand, however many terminals it takes. We would welcome someone stepping up to that.

Mr. COOPER. Someone like Congress.

Mr. Ritter from Pennsylvania has a question.

Mr. RITTER. Thank you, Mr. Chairman.

You know, I'm curious as to why, given the—purely the technological superiority of the United States' telecommunication system and computers, that all told, the United States has 1 million subscribers, OK, and Minitel has 3 million subscribers. This is equivalent, given population differences, to 12 million potential subscribers. In other words, 12 times the volume of business just on the basis of numbers of subscribers being conducted in France. The question is, why the difference in users as a percentage of population.

The computer is going to replace the telephone, and to think of it in any other way is simply avoiding this next stage in the information revolution.

Mr. Minot, you talked about your profile of users.

Mr. MINOT. Yes.

Mr. RITTER. 34 years old, male American, I suppose white, earning more than $35,000 a year sounds like a Yuppie to me.

Let's just call a spade a spade here—the French system serves rich and poor alike.

Now you mentioned, when Mr. Tauke asked the question as to why we didn't have the extent of services that the French have, you mentioned a couple of factors. You said the people haven't gotten enough information. God, we're the most information-rich society on the globe.

The people don't have time. Let me tell you, the American people are bursting with information. They're just not getting the right information.

The American people have a lot of time for good products, and you see it every day as new Japanese products enter the market that we never even dreamed of, and the American people have time for that.

No. I really think we're talking about quality of service here, and you don't have to be a tech head to comprehend that the quality of the video picture of the Minitel is substantially higher than the quality of the CompuServe picture, and I think that's part of it.

Regarding ease of access, you cannot deny that there's people who are not 34 years old or earning greater than $35,000, who also have business interests, probably invest in the stock market, white male Americans, are willing to overcome the hurdle of ease of access.

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I think the billing situation is also chaotic. How do you pay for this thing?

I think Mr. Richardson asked some excellent questions. What would happen in your mind, Mr. Nahon, if the Bell Operating Companies were involved? You essentially said that there is a vested interest on the part of the Bell Operating Companies, the providers of this network, to get as many subscribers in the system as they can.

Now maybe that doesn't conform with the dominant market position in the limited American market today of CompuServe, but I think it conforms to the best interest of the American people.

Now one other question: Mr. Minot, you talked—I understand that an American company, U.S. Videotel of Houston, has recently imported 12,000 Minitel terminals to develop a U.S. version of Minitel. I would hate to see the great American telecommunications industry dominated by a French company, but in any event, 12,000 is not a large number, obviously. We have 15 million terminals, only 1 million of which are connected. Doesn't that tell you something?

Could you—and I regret that these people might not be here to tell us a little about what they're plans are, but could you tell us about what's going on with Minitel in the United States and what you're doing to serve this market?

Mr. NAHON. Yes. We are not ourselves involving any commercial sale activity of products, equipment. It's up to the manufacturers to handle that aspect. But, yes, as you said, U.S. Videotel is one recent customer of Minitel, which, by the way, is an American version of the one we use in France. It's just exactly the same.

Mr. RITTER. Is that the little white terminal over here?

Mr. NAHON. That's right, yes. Well, the color has changed, of course, but as a—had to be changed, so although they are many feet from the mass production of the other one in France, they are manufactured in a separate line, production line.

Well, I think U.S. Videotel is in a much better position than myself to let you know what they are doing, but I think they are building business based on some of the recipes that we have developed in France. I think they will market terminals; they will rent terminals. As part of this price, there will be a limited number of free services. They have their own network. They operate a small network for the time being, and they plan to offer the same type of range of services that we have in France and invite third-party service providers to provide services even from France.

Mr. RITTER. If you had 1 or 2 recommendations for the United States to somehow integrate its capability and get on with providing this new electronic telecommunications highway of the future, what would you advise us to do?

Are you a brave man?

Mr. NAHON. Yes.

Mr. RITTER. Good. Then please answer or attempt to answer the question.

Mr. NAHON. Well, the two critical, most critical points, I think, I believe are the open access to all potential existing and newly created information and transactional online services, so that there is no need to subscribe or to be aware of what is required to be a member or subscriber of this particular service or another service.

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So this open access to all existing services wishing to be accessed by the largest number of users, I think is a key element. That's why we have implemented this billing system, this open billing system where people pay on their telephone bill for the service they call, and they do not require any password.

You saw the demonstration. You just dial a number. It's very similar in nature to the 976 dial services in the principle. You dial, you pay for what you have used, and maybe you will not use anymore that service for the next 12 months.

The second critical point is the availability in consumer—a device like the Minitel, which has to come as part of a utility service like the directory service has been in France for the French market. I don't know if it would have the same effect here, but most people who have a Minitel in France, I can tell you, would never have bought a terminal or bought a personal computer.

We have services in France like CompuServe, based on micro only and on subscription, and they are not successful at all, even if they provide information, news, and so on. The ones which are successful are the ones available on the kiosk, like Le Monde, and relying on this simple—the use of a simple device.

But few people would go out and buy a terminal just because they know there is something they can do with this terminal. They have to have the terminal in their hands as part of minimum offer of services, like the directory has been in France, the main catalyst, the white pages.

Mr. RITTER. I thank the gentleman. And one just underlining comment: there is not a one-to-one exchange, in my mind, white pages and yellow pages, for an electronic directory. The capability of an electronic directory so expands an existing white pages capability or a yellow pages. The white pages and yellow pages haven't changed in five decades, and to say simply that all you've done is exchange a white pages or yellow pages for an electronic sign, so to speak, is simply missing the point.

The access that goes with white pages, yellow pages, to a variety of satellite, ancillary information is tremendous.

Anyway, Mr. Chairman, thank you for indulging me.

Mr. Minot and Mr. Nahon, thank you. Merci, bien. Bon voyage.

Mr. NAHON. Merci, beaucoup.

Mr. COOPER. I'd like to thank the witnesses in English for their outstanding job.

We will now move to the hearing aspect of today's proceedings, and we'll examine the impact of the FCC's regulatory policies and the Modified Final Judgment of the AT&T/Justice Department consent decree on the future of the information services marketplace. This panel is dismissed.

And we welcome Anthony T. Rutkowski, Co-Director of the MIT Research Program on Communications Policy, and Mr. Charles L. Jackson, President, Shooshan and Jackson, Washington, D.C.

We will first hear, I believe, from Mr. Rutkowski.

Mr. RUTKOWSKI. Thank you, Mr. Cooper.

Mr. COOPER. In accordance with regular committee practice, if you could limit your oral statement to 5 minutes or less, the committee has already taken a copy of your written testimony, and an

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abbreviated version would allow more time for committee questions.

Mr. RUTKOWSKI. Indeed, I will.

STATEMENTS OF ANTHONY T. RUTKOWSKI, CODIRECTOR, RESEARCH PROGRAM ON COMMUNICATIONS POLICY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY; AND CHARLES L. JACKSON, PRESIDENT, SHOOSHAN AND JACKSON

Mr. RUTKOWSKI. It's a pleasure to be here, and thank you very much.

I just wanted to point out some highlights of what I have presented as written testimony. I think it is axiomatic that everyone today is in the information business, and within the national information fabric, different capabilities can exist almost anywhere. We are dealing with——

Mr. COOPER. If you could speak a little closer to the microphone that would help the audience.

Mr. RUTKOWSKI. With the national information fabric today, the different capabilities can exist almost anyplace, and when we are dealing with the public facilities environment, it is obvious that complex disputes over creation, access, pricing, and control are going to be endemic. However, the ability to effect these functions outside the public network, as well as, I think, ineffectively implemented ONA can provide useful checks, the Computer III regime, of course, rests on the public network's being configured in such a way that all information service providers have equal access and control over the yet undefined set of transport related functions that the Commission has called "Basic Service Elements."

It is worth noting, however, that all of this is not occurring in a vacuum, and I have presented extensive information. Within, I think, the last 6 months, there is an order of magnitude increase and a lot of revolutionary technologies that are worth noting, and particularly these are what are generally referred to as "broad band technologies," which are going to, I think, profoundly change network architectures and the kind of services that are available in the next decade.

As to an assessment of the advantages and disadvantages of allowing the RBOC's to enter the information services market, I think a useful subdivision has already been made in the three-tier classification in the divestiture case. It is roughly dividing things between the advantages of BOC's providing network facilitating information and services, and I think providing these facilities overwhelming outweighs the disadvantages for the more sophisticated kinds of processing storage and retrieval services. I think ONA, CEI safeguards appear necessary.

And, as to the third category, as to the creation of offering of non-network information, the matter, I think, seems problematic. But, clearly, this country needs, requires a national information fabric for the world of the 1990's and beyond, as well as low-cost basic information services.

In ONA, I think—by the way, I think it is a useful point that ONA can itself be a useful tool to promote flexibility and innova-

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tion in network architectures in the provision of information services.

However, the cost of openly providing the necessary network interfaces, BOC's, especially, on a nationwide scale, with older equipment, can be enormous.

On the other hand, a minimal set of seemless national information services and capabilities seems very important to most users.

Perhaps some of the best examples of the capabilities and services on the immediate horizon can be obtained from the very substantial work now occurring in standards groups, both here and abroad; and these go, generally, under the rubric of basic bearer services and supplementary services. I think they give us a snapshot of what will be emerging beyond the next couple of years.

And another point I wanted to make, I think, with allowing the BOC's to begin to provide some measure of information services, is the bringing of some of the Nation's best R&D resources into the public telecommunications network planning environment.

As to progress in ONA forums, I think in the near-term forums, it has been slow but improving, and everyone has benefited from the lines of communication that have been established. The distrust there has been reduced, and the ideas have been shared. The process has proceeded about as well as could be expected. I think in the longer term forums', which I alluded to, work has been extremely rapid, and I think will be of potentially great benefit.

In summary, I would just like to state that there are significant storage processing and low-level formatting functions that will exist in the public networks as a powerful national resource, and it will remain for the Nation's collective information policy community to decide how this resource has been used.

However, we need stable interfaces, and we do need a ubiquitous set of services. ONA issues, I think, will increasingly involve disputes over creation, access and control at different levels of virtual functionality, something which present regulators are really very familiar with.

Close, continuing, knowledgeable regulatory vigilance, and facilitation and adjudication will be required. I think what is needed is an organized technology-based national leadership for that national information fabric, at least on the scale of that possessed by Japan.

Thank you, Mr. Chairman.

Mr. COOPER. Thank you very much.

[Testimony resumes on p. 143.]

[The prepared statement of Mr. Rutkowski follows:]

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Testimony of

ANTHONY M. RUTKOWSKI

PROVISION OF INFORMATION SERVICES IN THE UNITED STATES THROUGH THE PUBLIC TELECOMMUNICATION NETWORK AND THE IMPLEMENTATION OF OPEN NETWORK ARCHITECTURES

1. Introduction

I would like to thank you, Mr. Chairman, for this opportunity to be here and assist your committee in dealing with these most important matters. As you know, we created a special project at the Massachusetts Institute of Technology to apply some of the school's resources to this subject, to provide a neutral interdisciplinary forum and examine the issues in the light of emerging information technologies.

I am a co-director of that project, as well as adjunct associate professor at New York Law School, and Associate Publisher/Executive Editor of *Telecommunications* magazine, a major monthly trade publication in which we focus on strategic network developments. Formerly, I was a member of the FCC staff for more than a decade, where I held diverse positions - generally involving new technological developments - and assisted the Commission and other federal agencies in devising policy, and representing the United States in these matters at many domestic and international forums. Prior to that, I was a design engineer and project manager for telecommunication systems at the Kennedy Space Center. My training is both as an engineer and a lawyer. I am author of several books and more than a hundred articles and treatises devoted to information technologies, public policy and organizations.

The views expressed in the body of this testimony are my own. I would like to acknowledge, however, the role of my colleagues at M.I.T., especially co-director Richard Jay Solomon, and those throughout the telecommunication community who have significantly contributed to a better understanding of these issues.

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▪ Physical and logical realities: devices, functional capabilities, and services. In describing the technology that enables the provision of information services, in the desire to be forward looking, I'm deliberately using the concepts and terminology employed by contemporary digital information network planners. Not all networks today are digital, but they soon will be. In any case, there is a certain backward compatibility in the concepts.

At the lowest level - what can be called physical reality - the world is fairly simple. There are: input/output devices like display screens and keyboards that act as information translators between the human and electronic/photonic worlds; processors that manipulate and switch the information; memory that stores the information; and transmission paths through which information can be moved. What happens is determined by executing real time or pre-programmed instructions in the form of software, firmware, etc. For the purposes of providing information services today, few people need to deal with physical reality.

It is logical (also frequently referred to as "virtual") reality that matters. These are the functional capabilities that are actually provided to other machines, networks, and people, and that enable the provision of information services. Such functions can include an incredibly varied assortment of information access, transport, storage, administrative, and delivery capabilities.

Because such functions are generally layered - from the primitive to the sophisticated - disputes over access, control, and pricing are likely to be endemic to the public facilities environment. However, the ability to effect many of these functions outside the public network should provide a useful check.

Such capabilities can packaged in countless different ways to provide services to users. These users may in turn provide these capabilities to still other users. Open information networks always allow this kind of endless daisy-chaining.

The FCC *Computer III* ONA regime rests on the equal availability of an undefined set of transport-related functional capabilities that the Commission called *Basic Service Elements (BSEs)*. In doing so, the FCC has embraced a well established network concept. However, it is not clear that

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2. Overview of the technology that enables provision of information services

The most important technologies that enable the provision of information services today are electronic or photonic. Intelligence of value to our society or to us as individuals is converted to electronic or photonic representations, whereupon it is generally transported, stored, processed, and ultimately converted to some form that is perceivable and useful to us as humans. The ability to do this effectively and efficiently is critical to our society today, and frequently to our personal well-being. The continued improvement of our ability to accomplish this is a key strategic factor in the world economy of tomorrow.

▪ Processing (and frequently storage) is integral to information transport. As Peter Huber observed in his report,[1] regulatory agencies have over the years sought to artificially impose boundaries between the transmission of information and all other kinds of information services, largely for jurisdictional and regulatory purposes that had little relationship to technological reality.

If such boundaries made little sense in the past, they appear to make no sense today. Virtually every manufactured active electronic product is operated by a microprocessor with associated memory under the direction of stored programs. We live in a world of digital intelligence interconnected with other digital intelligence through defined protocols. These configurations are called network architectures.

Some of this interconnected intelligence is brought together in networks optimized for one particular information service: transport. The point is that we are dealing with technology that is common to all information services. The real question for policy makers is how to employ and foster that technology for the greatest public good. Trying to put some of the constituent components into boxes labeled "enhanced," or "data processing," or "information services" and stamped "hands off" will remain a frustrating and largely meaningless exercise. Today everyone is axiomatically in the information services business.

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[1]Peter W. Huber, *The Geodesic Network: 1987 Report on Competition in the Telephone Industry*, U.S. Department of Justice, Antitrust Division (1987).

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the FCC will be able to resolve the disputes that come with the territory.

▪ Revolutionary, strategically important changes in the technology are now occurring. One of the most difficult challenges in understanding information services technology (much less regulating derivatives of the technology) is the unceasing, profound change now taking place on every level, from the molecular structure of materials to global network architectures. The field has always been noted for change, but during the past twelve months, the changes taking place can be described as nothing short of revolutionary.

An entirely new generation of highly innovative and aggressive specialists in digital processing and switching techniques are taking existing and anticipated electronic and photonic technologies and collectively developing transport architectures that represent a radical departure from the past and orders of magnitude improvement in capabilities. Simply put, they are fashioning a universal, optical, super high speed network in which all information - data, voice, or video - is packaged and transported to any location in the most efficient possible fashion. However, effective implementation may require very integrated operation, administration, and maintenance of all constituent networks at the transport level.

All the major industrialized nations are extensively involved in these broadband developments - many with considerable direct government funding and strategic planning. At the recent Hamburg meeting of CCITT's Study Group XVIII the Asynchronous Transfer Mode (a kind of fast packet switching) was adopted as the global imperative toward which all nations will plan. See Appendix E.

In the next decade, optical fiber will begin to be deployed extensively in the "last mile" to business and residences, bringing with it the prospect of broadband services - especially digital television of exceptional quality. At the same time, local central office facilities, customer premises information systems and work stations will offer ever more powerful capabilities at rapidly descending cost. This may result in synergistic uses of the public networks in ways not even anticipated today.

These revolutionary and strategically important changes impart a

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nificant additional dimension in considering national policy options for information technologies.

3. **How information service providers use the local network.**

▪ Cost-effective functional capabilities: physical and logical. Huber divided information services into seven categories: call and network management; code and protocol conversion; computing; access/retrieval; messaging/ transactional; and personal/environmental. He also stated what is probably the definitive, ultimate standard for decision making on the integration of information services in the network: "for each type of information service there is an optimum point at which to locate the user's gateway into the electronic world."[2]

The use of the local network to provide information services today is highly varied and relatively primitive. In some cases, raw transmission capacity is leased. This can involve capacity from that of a single voice or derived data circuit to DS-3 rates (45 Mbit/s). In most instances, the provider simply uses existing switched voice circuits to allow customer access directly or through intermediate "value-added" or interexchange networks. The FCC has recently authorized several BOCs to provide asynchronous to X.25 packet-switched services, although the extent of implementation and use is unknown.

In addition to the transport capacity of the local network, a variety of OA&M services, as well as some limited concentration, formatting, and protocol conversion capabilities are provided.

These uses of the local network are discussed in Chapter 6 of the Huber Report. Although the efficacy of bypass alternatives is disputed in some of the recent submissions in the divestiture action, Huber's characterization of existing uses of the local network by information services providers seems accurate.[3]

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[2]Huber, *supra*, at 6.5.

[3]*See, e.g., USA* vs. *Western Electric Co.*, U.S.D.C., D.C, Civil Action No. 82-0192, Comments of the Independent Data Communications Manufacturers Association, Inc.; Selwyn & Montgomery, *Factual Predicates to the MFJ Business Restrictions, A Critical Analysis of the Huber Report*, A Report to the Ad Hoc Telecommunications Users Committee and the International Communications Association, Economics and Technology, Inc. (March 13, 1987) and attached to the Comments of the International Communications Ass'n.

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4. Assessment of the advantages and disadvantages of allowing the BOCs to enter the information services market, including effects on consumers and service providers

■ The issue is not a matter of entry per se, but what functional capabilities and services should the BOCs provide, and under what conditions entry should occur. As one source wryly noted during the preparation of this material, "if the information services prohibition were fully enforced today, the national public network would be shut down." The proscription makes no sense today. It was not surprising that modifying or lifting the information services proscription recently garnered overwhelming support in the divestiture case.[4]

After this threshold, however, the assessment will vary for different classes of information services. For example, the advantages of BOC provision of "network facilitating" information services overwhelmingly outweigh the disadvantages. For more sophisticated kinds of processing, storage and retrieval services, effective ONA/CEI and other safeguards appear necessary. In a third category, the creation and offering of non-network-related information, seems problematic.[5]

■ The matter involves a complex balancing of technical, economic and national policy considerations. This is an extraordinary complex subject, made even more difficult by the extraordinary rate of change in technology, the large investments involved, and the strategic importance to the nation. It is not a simple matter of fostering competition or deregulating. The country requires a national information fabric for the world of the 90s and beyond, as well as low-cost basic universal services. It also needs to foster continued research and development, and remain a leader in these technologies.

Removing the bar against BOC provision of information services, especially when coupled with an ONA mandate, is a critical first step in pursuing these objectives. ONA is much more than a means of controlling the

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[4] *See* summary on this point in Ameritech's Response to Comments on the Report and Recommendations of the United States Concerning the Line-of-Business Restrictions (April 24, 1987) at 24.

[5] A similar three tier classification is set forth in the Comments of the American Newspaper Publishers Association in the divestiture case, at 61-69.

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BOCs. ONA can itself be a useful tool to promote flexibility and innovation in network architectures and in the provision information services.

Like any tool, however, it must be carefully crafted and employed. The costs of openly providing the necessary network interfaces and BSEs, especially on a nationwide scale and with older equipment, can be enormous. A minimal set of seamless national information services and capabilities is very important to most users. Constant balancing of these considerations will be endemic to the public network ONA environment, and the attendant forums and activity for accomplishing this will increase dramatically. Indeed, in the case of the T1 Committee and the CCITT (International Telegraph and Telephone Consultative Committee) this has already occurred.

■ There are new information capabilities and services that the BOCs should be able to offer to consumers and service providers. A survey of the comments relating to information services filed by the BOCs in the divestiture case does not provide much detail concerning potential new services and capabilities. Some said little or nothing. Ameritech, on the other hand, filed several pages of possible offerings, together with an annexed list of information services available from the public networks of other countries.[6] Voice storage and retrieval, and electronic mail are prominent.

Bellsouth, among the regional companies, generally evidences the largest and most advanced network planning effort at standards and professional forums. It chose in its comments to emphasize a more global consideration. "Maximum deployment of information services requires that BOCs be permitted to integrate basic 'system management' functions into the local network that would permit the development of a common interface for vendors and users. BOC provision of these system management functions [are necessary for] the development of a mature information services marketplace...."[7]

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[6]*See* Ameritech's Comments on the Report and Recommendations of the United States Concerning the Line-of-Business Restrictions at 25-28; Attachment D.

[7]Comments of the Bellsouth Corporation on the Justice Department Recommendations Concerning Section II(D) of the Modification of Final Judgment at 7.

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Perhaps the best examples of capabilities and services on the horizon can be obtained from the very substantial work now occurring in the services working groups in the T1 Committee (T1D1.1) and CCITT Study Group XVIII (XVIII/1). See Appendices A and D.

▪ One of the most significant benefits is the application of some of the nation's best R&D resources to advancing the public telecommunication network. The United States has relatively few institutions that devote significant resources to long-range research and development activities in the information services field. It is very difficult and costly to acquire and maintain innovative and expert staff, to assemble and analyze information for their use, to fund their participation in collective planning and professional forums, and to conduct experimental activities. In almost every other region of the world, these efforts are supported entirely by the government. In the U.S. there is little government money available for these purposes and we rely on the private-sector. Most companies simply focus on short-range opportunities.

A simple review of those participating in domestic and international telecommunication standards and professional forums today makes it clear that a very large share of U.S. R&D in new transport-related information services emerges from Bell Labs, Bell Communications Research, or people from those institutions that have migrated to other companies. This is a vital national resource that should be regarded as a significant advantage to allowing the BOCs to enter information services markets.

5. Progress of ONA forums.

▪ Progress in "near-term forums" is slow but improving. The work in "near-term" ONA forums (i.e., those focussing explicitly on the plans that must be submitted by the BOCs on 1 February 1988) has been slow but progressive. There have been two major national forums administered by Bellcore for the BOCs, each holding company has held formal and informal forums in its region, and other vehicles of communication have appeared. A third national forum is expected in the near future. Among the regional companies, Southwestern Bell, deserve special recognition.

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For the most part, I share Mr. Jackson's observations on this process. Certainly, everyone has benefitted from the lines of communication that have been established, the distrust that has been reduced, and the ideas shared. This process has proceeded about as well as could be expected.

The matter of national uniformity, however, deserves continuing vigilance. Along with pricing, it remains the dominant concern of users. While most BOCs seem committed to achieving a baseline national uniformity, and see it as a natural consequence of a common equipment and service company environment, some still seem ambivalent. Such uniformity was a serious adverse consequence of divestiture, and deserves more than just lip-service by regulatory authorities. It is far easier to assure substantial uniformity for basic capabilities and services by laying down a mandate today, than it will be to rectify the matter after millions are spend on specialized switch software.

The lack of substantial participation in the forums by any state regulatory commission other than California, could give rise to problems later. On the other hand, it may be indicative of a willingness to defer to national ONA approaches.

Attention should also be given to the recent preparation of "An Open Network Architecture Proposal" by the Coalition of Open Network Architecture Parties. This overture sets forth a list of principles and 14 categories of Basic Service Elements. Notable is the concern that "excessive granularity in the definition of unbundled network functions may have the effect of increasing the aggregate cost of providing *all* network services and functions, both bundled and unbundled."[8]

▪ Progress in medium and long-term forums is rapid. The near term ONA forums are not the only, or even perhaps the most important, forums on this subject. Bellcore recently instituted a continuing Intelligent Network/2 process, and immense domestic and international resources are devoted to long-term ONA-related activities in the T1 Sub-Committees and CCITT working parties. It was essentially this community that con-

[8]An Open Network Architecture Proposal, prepared by: the Coalition of Open Network Architecture Parties (July 1987) at 2.

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ceived most of the ONA concepts, and it is they who are ultimately shaping the implementation options for the next decade and beyond. See Appendices A, C, and D.

Integrated information networks today are a global business, and no one can afford to go it alone. Fortunately, this community seems willing to flesh out many of the details of open network architectures, even if individual foreign national implementations may not always be as open as in the U.S.

It seems likely that the T1 Sub-Committees, perhaps especially the newly emerging T1S1 on Network Services and Architectures, will play a significant formal technical and network planning role in any continuing ONA process. Some kind of continuing, broad-based policy forum is also necessary, and a clear concern of most participants in today's near-term process.

6. Services that will be made available as a result of ONA.

It seems speculative at this time to suggest precisely what services will be made available as a result of ONA. The ONA regime will result in an array of functional components being made available. BOCs will have a new opportunity for the provision of new services ancillary to information transport.

The availability of actual services will depend on market demand, costs, standardization, innovation, and regulatory mandates.

7. The costs and benefits of further implementation of ONA.

Present cost/benefit ratio should improve with implementation of new network facilities. New switch and network architectures will be deployed with ONA capabilities. These facilities are, however, extremely costly, and the rate at which this is done will depend in significant measure on the willingness of state authorities to allow faster write-offs of old equipment.

This evolution is made more difficult by the rapidly changing technology - especially broadband developments. This is tending to migrate network intelligence toward the periphery of the network. This may en-

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hance the desirability of virtual collocation arrangements where multiple parties can write their own software and share in real-time, the processing, storage, and transport resources in a local exchange. Network planning has become a difficult task indeed.

It is fairly apparent that resolving the many expected controversies may be difficult and complex, requiring an understanding of the technology not presently possessed by regulatory agencies. As one industry executive recently emphasized in the title of a recent article: The Future - Back to Technology.

8. **Conclusions.**

In summary, I would like to offer the following general conclusions:

- Significant storage, processing and low-level formatting functions will exist in the public networks as a powerful national resource. It will remain for the nation's collective information policy community to decide how this resource will be used. It may well be worth trading less competition at the lower transport levels for more competition and innovation at the higher information service levels.
- Uniform, stable, characteristics for a ubiquitous, minimal set of interfaces, functionalities, and seamless cost-effective offerings are critical to an effective and efficient national - indeed global - network fabric.
- If properly implemented, ONA can be highly useful tool and catalyze innovative new applications.
- ONA issues will increasingly involve disputes over creation, access and control at different levels of virtual functionalities: what should be performed at various levels and by whom.
- Close, continuing, knowledgeable regulatory vigilance, facilitation and adjudication will be required.
- The Bell research facilities and the matrix of planning/standards forums continue to play dominant role in shaping network evolution, and represent a remarkable collective resource.
- What is needed is organized, technology-based national leadership toward a national information fabric, at least on the scale of that possessed in Europe and Japan.

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Mr. COOPER. Mr. Jackson.

STATEMENT OF CHARLES L. JACKSON

Mr. JACKSON. Thank you for inviting me here today. I prepared a long written statement. I will just touch on a few high points.

Maybe before I begin, though, I would just like to react to the demonstration we saw, in particular, the questions that were raised as to what we need to do in the United States to allow services like Minitel to grow, and perhaps relate that to ONA.

One change I see, and it came up in the discussion, what would help us have services like Minitel in the United States would be a kiosk-like billing arrangement. Some situation where when a consumer calls an information provider, uses their home terminal or their home computer to call a firm that offers news briefs, that they get charged for that usage as part of their phone bill.

Now, in fact, this element, Mr. Minot mentioned that his firm launched an organization called CONAP. It stands for a group of firms that are interested in the ONA process as information providers, not as telephone companies; and they are pleading that they filed—they asked for this capability, a billing provision whereby an information provider could arrange for the telephone company to get billing.

So, I think if you look at the ONA process, you see people trying to develop things like kiosk billing in the United States.

The second feature that I see that is very important is some form of gateway menu, where a person can call into a data network run by a telephone company, and connect to that in a simple standardized fashion, and then use computer capability to search through the various services that are on that network whether they are indices, or tree-type structures, search capabilities, so that they can find their services rather than having a long list of phone numbers.

And I think those are two of the kinds of services that could come out of the ONA process that would substantially enhance our ability to deliver such services in this country.

As I said, let me go on to my general testimony and highlight just a few points.

I have been a close observer of the ONA, the FCC's ONA process, and I guess I'd characterize it as it's working as well as can be expected given the complexity of the problem people are dealing with.

To define things quickly, ONA, Open Network Architecture, is the FCC's approach to equal access for data services. The FCC, in its Computer III order last year, directed the Bell Operating Companies to break their services into basic service elements, and, in some sense, this idea of open architecture goes beyond equal access, because they have directed the telephone companies to improve the access they are delivering to enhance service providers, whether or not they want to use that themselves.

The process has been very difficult for everybody. If you read the Commission's order, the Commission directed the BOC's to develop these entities called basic service elements, but it left it kind of vague as to what they were; and the BOC's had to figure out from

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some very general principles what kinds of services they were supposed to be providing.

The same thing happened on the other side of the fence, and, hence, service providers faced the same vague language; and, when they thought about what kinds of services they wanted from the phone company, it was hard to define.

I think that the primary short-run benefit of the ONA process is that it has forced the BOC's to take a fresh look at enhanced service provider needs, look at their needs and the ways to serve them outside of traditional regulatory barriers, and without some of the problems of corporate culture that may have handicapped their looking at these services in the past.

And it has also offered the BOC's the carrot and the stick in dealing with these services. The carrot is the opportunity to participate in these markets themselves; and the stick, of course, is that the rules say they must do it.

So the Commission's ONA process has substantially changed the incentive and the behavior of these organizations.

I see one major problem with the ONA process that troubles me more than anything else, and this is the clash between the State and Federal regulators. As some of you may be aware, last week the National Association of Regulatory Utility Commissioners (NARUC) adopted a resolution on ONA. I think the conflict between the State and Federal regulators over ONA is unnecessary.

Former Chairman Fowler and the head of the Common Carrier Bureau, Bert Halprin, were co-authors of a paper called "Back to the Future." I mention them because I know that Chairman Markey is such a fan of Mr. Fowler's regulatory enterprises.

And the "Back to the Future" paper set forward a model of deregulation of local telephone service in an atmosphere of open interconnection and Open Network Architecture approach to deregulation of the local telephone company.

Naturally enough, some of the State regulators weren't too happy about this. They didn't want the FCC in its attempt to regulate information services, setting up the institution to unwind the system of local subsidies, and a provision of services that they see as their legal responsibility, their political obligation.

And my own view of what's going on in ONA today, compared to the strong claims that are made for ONA in "Back to the Future" is that the FCC's current ONA process is not rocking the boat in terms of the State jurisdiction, and that the primary problem with ONA and the State regulators was that article, "Back to the Future," which raised the spectre of something that might happen 10 or 20 years down the road with a far more comprehensive Open Network Architecture.

And I think if there is an area that the subcommittee might want to look at, it's how to arrange that the State and the Federal regulators work together effectively on implementing ONA and CEI.

Mr. COOPER. I'm afraid that due to the vote in the House, the committee is going to have to take a short recess.

I apologize for interrupting your statement. Chairman Markey, when he returns, I am sure, will allow you to continue on.

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Mr. JACKSON. Let me just close with one sentence so that nobody waits around.

We don't need to wait for ONA. We can lift the MFJ information services bar today. We have CEI, which is equal access for data, and the purpose of lifting the MFJ is to allow consumers a better choice of services, a wider variety, lower costs, more like Minitel. It's not to do a favor to the poor little BOC's; it's to do consumers a favor.

Thank you very much.

[Testimony resumes on p. 174.]

[The prepared statement of Mr. Jackson follows:]

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Testimony of

CHARLES L. JACKSON

I. Introduction

Thank you, Chairman Markey and members of the Subcommittee, for inviting me here today to share some of my thoughts on the FCC's Open Network Architecture (ONA) and Comparably Efficient Interconnection (CEI) policies.[1]

A word or two of introduction first. I am a principal in the telecommunications consulting firm of Shooshan & Jackson Inc. and also an adjunct professor at Duke University. Prior to founding our consulting firm, I was staff engineer to the House Communications Subcommittee, a predecessor subcommittee to this subcommittee. Before that I worked at the FCC as special assistant to the Chief of the Common Carrier bureau and as engineering assistant to Commissioner Robinson. Prior to that I worked as an engineer on computer and communications systems.

Our firm consults for both telephone companies and enhanced service providers. We conducted a major study of user needs for ONA services for Bell Atlantic, one of the seven Regional Bell Holding Companies (RBOCs). My statements here today reflect only my own views, however, and not those of any client of our firm.

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[1] I would like to acknowledge the many helpful comments I received on an early draft of this testimony. In particular, the comments offered by Henry Geller of the Duke Washington Center, Jeanne Schaaf of Telenet, Kenneth Robinson of NTIA, Roger Burge of BellSouth and George Morlan of AT&T were especially helpful.

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II. What is ONA?

Just about a year ago, in mid-June 1986, the FCC released its Report and Order[2] in its Third Computer Inquiry (CI-III). That order proposed to remove the then-current requirement that AT&T and the Bell Operating Companies (BOCs) provide enhanced services only through separate subsidiaries. Instead, AT&T and the BOCs would be subject to several nonstructural safeguards. The order continued the legal distinction between regulated basic telecommunications and unregulated enhanced communications, but it established two primary safeguards -- cost accounting and improved interconnection[3] -- to replace the separate subsidiary requirement. I won't say anything more today about cost accounting except that it should be clear to anyone familiar with public utility regulation that cost accounting is needed in this situation, and will prove to be a difficult and contentious issue in its own right.

The key point for today is that the FCC ordered improved interconnection between the BOC networks and the enhanced services industry in order to better serve the public interest. Improved interconnection is a tool for achieving competitive equality between the BOCs and the enhanced service providers. This improved interconnection will be of two kinds: Comparably Efficient Interconnection (CEI) and implementation of an Open Network Architecture (ONA).

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[2] FCC 86-252, FCC Report and Order In the Matters of: Amendment of Sections 64.702 of the Commissions Rules and Regulations (Third Computer Inquiry); and Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Thereof, Communications Protocols Under Section 64.702 of the Commission's Rules and Regulations, FCC CC Docket No. 85-229.

[3] The FCC's rules also require carriers to disclose network information, regulate the use of customer information, and enforce non-discriminatory access to basic services.

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Let me briefly discuss CEI and then I will turn to ONA.

CEI. Comparably Efficient Interconnection (CEI) is an interim, ONA-like requirement. If any BOC desires to offer an information service on an unseparated basis between now and when their ONA plan is approved, they must file a CEI plan which describes how they will offer firms competing with their enhanced service "equal access" to the transmission services used by their enhanced service. They cannot begin offering the enhanced service until their CEI plan has been approved and cost-accounting standards have been met.

The essence of CEI is that competitors and the BOCs enhanced service use the basic network on an equal footing. CEI is much like ONA, but it requires unbundling and equal access only to those communications services used by a carrier's enhanced service. In contrast, ONA is far broader since it requires unbundling of the network to meet the needs of enhanced service providers -- whether or not the enhanced services of the BOC will ever use the elements of ONA.

It took a little less than a year from the time the FCC put forth the CEI requirement before any BOC filed a CEI plan. Today, only two BOCs have filed CEI plans and neither has been acted on by the FCC.

ONA. Let me now try to describe ONA. The FCC's rules require each BOC to file an ONA plan by February 1, 1988. After an opportunity for public comment, the FCC will then approve, modify or disapprove the plan. FCC approval of a BOC's ONA plan is one of the preconditions to relief from structural separation.

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These ONA plans will describe how the carrier intends to unbundle its basic services into Basic Service Elements (BSEs). The FCC's rules are quite vague as to what constitutes a BSE. Indeed, a good part of the effort in developing ONA plans has gone into figuring out what the FCC meant by BSEs! These ONA plans will also contain descriptions of the BOCs' ongoing procedures to develop additional BSEs in response to changing technology and changing demand.

BSEs will be tariffed services. The BOC enhanced service operations will obtain BSEs under tariff just like other customers.

We don't know yet what kinds of services will be offered as BSEs. But we have some indication of what is being developed today. There have been two national ONA forums hosted by the RBOCs and Bell Communications Research (BellCore), and many of the RBOCs have held their own regional forums. At these forums and in mailings to interested parties, the BOCs have begun to set forth their views on initial BSEs.

Quite frankly, most of the proposed BSEs are technical and sound dull to the non-specialist. For example, many of the enhanced service providers would like the telephone network to have the ability to turn off the call-waiting feature. If one has call waiting and is using a personal computer or data terminal to access a remote data service, and a call comes in, the call waiting signal can cause the computer to hang-up on the data call which causes a real problem. Therefore, it's not surprising that suppressing call waiting is being discussed as a BSE.

Similarly, another proposed BSE is a telephone call which is set-up without a ringing signal. This wouldn't be very useful for people, but it might be quite useful for

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remote meter reading or transferring computer files. This proposed BSE truly represents unbundling of the local network.

A third example of a potential BSE is automatic number identification (ANI). The local telephone network can be modified to transmit the telephone number of the calling party to the called party's computer (or telephone) at the beginning of a call, just as the local telephone network transmits this information to long-distance carriers today at the beginning of long-distance calls. It doesn't take much imagination to see how valuable this capability could be. I would certainly feel more secure if my bank would only accept telephone transfers which originated from my home telephone. The same security benefit probably applies to any high-value information service. But, this BSE might also bring some privacy concerns -- depending upon how it was implemented and how it was explained to consumers. This BSE does not represent unbundling of the network, rather it involves adding new, valuable capabilities to the network.

The above three examples of proposed BSEs were chosen to be easy to explain. Other BSEs under discussion, such as direct access to the ISDN D-channel or trunk-side connections with line-side signalling, are more complex and would take more time to explain than is appropriate here.

The definition and development of initial BSEs is one of the primary ONA activities underway today. The RBOCs are working hard on this task, they are meeting with enhanced service providers and other users. Users, individually and in groups, are working to define their own lists of desired BSEs. Next February, when the ONA plans are scheduled to be filed, we will see what how the BOCs have chosen to unbundle their services into BSEs.

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III. Background on "Open Architectures"

The FCC wasn't the first to use the term "open architecture." It has been used in a similar fashion in the computer and communications industry for the last decade.

Example 1: The OSI Model. The most prominent use of the "open" catchword was in the International Standards Organization's (ISO) development of the Open System Interconnect (OSI) model for digital communications (the ISO/OSI model). The Open Systems Interconnect model defined standard data communication interfaces which, if adopted by all manufacturers, would allow a DEC terminal to connect to an IBM mainframe or allow an IBM mainframe to send messages to a Honeywell mainframe. The standards were characterized as "open" to contrast them with the proprietary (closed) standards of the individual manufacturers. Development of the OSI model began in the mid-seventies. The ISO Basic Reference Model became an International Standard (ISO 7589) in the spring of 1983. They are widely referenced. Unfortunately, the OSI standards are complex and still incomplete, and systems from different manufacturers do not always work in harmony even though each manufacturer claims adherence to the OSI standard.

In fact, the issue of whether or not equipment conforms to the Open System Interconnect standards gave rise to a new organization, the Corporation for Open Systems (COS), which will test equipment to see that it meets open network standards.[4] COS is a membership organization. Its members include such firms as IBM, AT&T, PacTel, and National Semiconductor. COS began operation a little over a

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[4] See the special advertising section in Business Week, June 1, 1987, describing the Corporation for Open Systems.

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year ago, and it is probably too early to judge its success. But the very existence of the Corporation for Open Standards shows the widespread acceptance of the "open system" approach to communications standards.

Example 2: The IBM PC. The IBM PC, introduced in 1981, was widely characterized as having an "open architecture". Users could open up the box and plug in their own hardware. IBM made the hardware and software specifications for their equipment available at the same time they put the machine on sale. I think it's fair to say that IBM did almost everything it could to facilitate the provision of add-on hardware and software by other vendors. Some of these add-on hardware products, such as display controller boards, competed directly with IBM product offerings. Other add-on products, such as analog/digital converters or digitizing tablets, had no direct counterpart in IBM's product line.

IBM's open approach resulted in an avalanche of products compatible with the IBM PC including such famous products as the Lotus 1-2-3 software package. The availability of these add-on products, in turn, made the IBM PC a better buy and contributed substantially to the marketplace success of the IBM PC.

There was a down-side for IBM in its openness. They defined the standard so well and so clearly, using off-the-shelf building blocks, that it was relatively easy for competitors to build copy-cat or "clone" IBM PCs. Many firms are doing so today, and they have captured a major share of the IBM PC and compatible market.

IBM did not invent the concept of the open architecture. Many minicomputers provided such an environment as did the original Apple II (to a somewhat lesser

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degree). Other well-known personal computers, in particular the Apple Macintosh, were closed systems. Apple made some gains by keeping the Macintosh a closed system. For example, production costs were lowered since there was no need to protect users from hazardous voltages inside the case. A closed architecture also eliminated the competitive threat posed by clones.

More recently Apple has introduced updated versions of its Macintosh computer including one model known informally as the "open Mac."[5] It would appear that the benefits of offering customers open systems outweigh the disadvantages in some cases.

Example 3: Some examples in everyday life. I find it difficult to give examples of open and closed architectures outside the computer and communications industries. Most of the examples I come up with are forced similes, but they may help convey the concept.

1950s cars versus 1980s cars. In the 1950s, a teenager could put a bigger carburetor on a car engine and add a 3/4 race camshaft, and obtain improved performance. In contrast, most of today's cars have computer controlled carburization or fuel injection

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[5] Apple Computer Inc. is now running two-page magazine advertisements for its Macintosh II which are headlined "Now open for business." Newsweek, July 27, 1987 between pages 58 and 59.

See also the editorial "Open Systems" in the April 1987 issue of BYTE magazine. That editorial states in part:

> the trend toward open, flexible personal computers has become dominant once again . . . Since the Apple II world and the IBM PC have long had open architectures, the entire industry seems to recognize once again the need to let users upgrade their systems and adapt them for different applications. It is much easier to build in flexibility than to have 20/20 foresight about every owner's future needs.

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systems and associated emission control systems which make such modifications difficult or impossible.

Lego blocks versus HO gauge trains. The popular Lego blocks used by many children are a closed system. Historically, Lego has protected its proprietary designs through patents. You cannot plug your Lego blocks into your Fisher-Price blocks or into your Tinkertoys. In contrast, all HO scale-model trains run on the same scale tracks. You can mix trains of one manufacturer with trains of another on the same set of tracks. HO trains provide an open architecture.

The essence of an open architecture is freedom -- the user is free to choose which parts to use to build a complete system. Users are able to combine part X from vendor A and part Y from vendor B, plug them together and have a system that works. Even if vendor A has a monopoly on product X (due say to patent rights), he or she cannot transfer that monopoly to the market for product Y, since the user can plug product X into any manufacturer's product Y. The standard, open architecture interface between product X and product Y eliminates[6] the possibility for the transfer of the monopoly. In antitrust terms, technological forcing of tying sales is eliminated. Market power cannot be easily transferred from one product to another.

Open Architecture and the FCC's Third Computer Inquiry. Two years ago,[7] the FCC began its Third Computer Inquiry (CI-III). They were searching for a substitute to the structural barriers they had placed on the provision of enhanced telecommunications

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[6] Eliminates may be too strong a term here. Perhaps one should say "substantially reduces and may eliminate."

[7] Third Computer Inquiry CC Docket 85-229 by NPRM [FCC 85-397] rel. August 16, 1985.

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services by local telephone companies. At the same time they wanted to retain safeguards which would prevent cross-subsidy or anti-competitive conduct by the local telephone companies from damaging competitors and thereby denying the customers access to better service or lower prices.

In their notice, the FCC put forward the concept of Comparably Efficient Interconnection (CEI), an unwieldy phrase which they used to refer to the concept that a telephone company should give competitive enhanced service providers access to basic communications services which is about the same as the telephone company uses for its own enhanced services. CEI was not the centerpiece of the Commission's notice, it was one of many ideas put forward.

However, the U.S. Department of Justice took that idea and expanded upon it in their comments to the FCC on Computer III. To quote them:

> The public interest would best be served by Commission efforts to condition provision of ancillary services[8] by carriers controlling bottleneck monopolies on such carriers' affording other providers of ancillary services with the same interconnection to the bottleneck that the dominant carrier provides itself. To the extent network open architecture can put all ancillary service providers, including the dominant carrier, on an equal footing, accounting tools and non-discrimination rules may be sufficient to protect against anticompetitive abuses. By limiting the bottleneck monopoly in this manner, the Commission can rely on technology rather than direct governmental regulation to promote competition in the most cost efficient manner.[9]

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[8] Department of Justice is using "ancillary services" to refer to enhanced services and terminal equipment.

[9] Comments of the United States Department of Justice in FCC CC Docket No. 85-229 at 2. (Emphasis added) Note that they use the phrase "network open architecture" a closer tie to the pre-existing "open architecture" concept than the alternative phrase "open network architecture."

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Looking back, it seems clear that U.S. Department of Justice was extrapolating from their generally successful experience with equal access for long-distance[10] to the enhanced services market. If they could find an analog of equal access for information services, then the bottleneck would be circumvented. Network open architecture was to be equal access for information services.

Similarly, in comments filed the same day, US West strongly urged the FCC to adopt "Open Network Architecture" as the linchpin of its telecommunications policy. US West used the term "open network architecture" in quotes to refer to their concept.[11] Ameritech filed comments describing their concept of a Feature Node/Service Interface (FN/SI) which contained similar ideas.[12]

While there were suggestions of concepts[13] similar to ONA floating around at the time of the U.S. Department of Justice, US West, and Ameritech filings, those filings seemed to crystallize those ideas into one well formed regulatory proposal. After the filings, the ONA concept received careful attention in the industry and by the regulators.

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[10] I am thankful to Kevin Sullivan, who was Assistant Chief of the Communications and Finance Section of the Antitrust Division of the Department of Justice at the time DOJ's Comments were filed in CI-III, and to Richard Levine who was also with the Department of Justice just prior to the beginning of CI-III for an explanation of the development of DOJ's position on CI-III.

[11] See Comments of US West, Inc., in FCC CC Docket No. 85-229 (Third Computer Inquiry) at v.

[12] See Comments of the Ameritech Operating Companies, in FCC CC Docket No. 85-229 (Third Computer Inquiry).

[13] The FCC's own CEI proposal was one. Ameritech's Feature Node/Service Interface (FNSI) concept had been discussed publicly before the filing date.

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IV. Open Networks in Communications Regulation

Why are open networks so important? Why have they become an issue today? In this section of my testimony, I look first at some of the underlying economic theory which argues for open network approaches to regulation. I then turn to the historical use of mandatory interconnection as a regulatory tool in telecommunications in this country. My purpose in this section is to show that open networks are a sensible public policy reaction to a real problem, and that the FCC's current ONA policy is just the latest in a long line of similar policies which this nation has adopted.

Monopolies from Consumption Externalities. There is much discussion of natural monopolies in telecommunications. Generally, a firm is described as a natural monopoly if there are economies of scale -- that is, if the more subscribers the telephone company has, the lower the costs per subscriber.[14] The existence of natural monopoly is used to justify much regulation.

But, for the sake of discussion, consider a hypothetical telephone technology which exhibits no economies of scale -- with this technology it costs exactly ten times as much to service 100,000 subscribers as to service 10,000 subscribers. Now, consider two firms offering competing telephone service in a town with a population of 100,000. Assume that one firm has a 60 percent market share, the other a 40 percent market share, that they each charge the same for telephone service, and that the systems are not interconnected. If the town is strongly polarized -- if none of the 60 percent want to talk to the 40 percent and vice versa, then two firms can coexist in a stable equilibrium.

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[14] More sophisticated definitions of natural monopoly rely on sub-additivity of the cost function over the feasible set of potential subscribers, etc. It all comes to the same thing: one firm is cheaper than two.

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In contrast, if everybody in town likes to talk to everyone else equally well, then this situation is not stable at all. Rather, customers will desert the smaller telephone company and move to the larger because it gives them access to a larger group of co-subscribers. In economists jargon, the externalities created by other subscribers to the telephone company have created an economy of scale on the demand side.[15] In non-economists terms, the bigger network wins in the market place even if its costs are higher.[16]

Similar phenomena occur with other products where purchase decisions of one consumer affect the value of the product to other consumers. For example, there are two videocassette standards, VHS and Beta. It appears that VHS is outselling Beta, and that, in response, movie rental stores are beginning to stock more titles in VHS than in Beta. Thus, consumers who want access to the largest choice in movies at the rental store will buy VHS machines. Each additional purchaser of a VHS machine increases the value of choosing VHS to the next purchaser. Terms such as "critical mass" and "bandwagon effect" are used in the economic literature to refer to the likely success of the network or standard with the larger market share.

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[15] The seminal paper describing the effect of consumption externalities on subscribership to telecommunications services is Jeffrey Rohlfs, A Theory of Interdependent Demand for a Communications Service, The Bell Journal of Economics and Management Science, Vol. 5, No. 1, Spring 1974. For a discussion of some of the same issues in the context of choosing technical standards see Besen and Johnson, Compatibility Standards, Competition and Innovation in the Broadcasting Industry, R-3453-NSF, Rand Corporation, November 1986, and Besen and Saloner, Compatibility Standards and the Market for Telecommunications Services. Paper presented at the Brookings Institution conference on Technology and Government Policy in Computers and Communication, June 1987. See also the references cited in Besen and Johnson, and in Besen and Saloner.

[16] As long as its costs are not so much higher that they wipe out the positive externalities.

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Interconnection as a Cure for this Monopoly Problem. In the case of our two hypothetical telephone companies, the argument would be drastically changed if technology allowed for easy, low cost interconnection of the two systems. If the systems were interconnected, a subscriber to the system with 40 percent of the market would not need to switch to the other system in order to call its subscribers. Now, a firm with a 60 percent market share may not wish to interconnect with a firm with a 40 percent share. The larger firm may just wish to let the market operate.

Of course, under these conditions,[17] the public will soon have to deal with the problems created by having a single telephone system. Public utility regulation of the monopoly provider may then be attractive. But, if society chooses to require mandatory interconnection, the two telephone firms will compete, there need not be any collapse of the industry to a single firm, and no need for public utility regulation. Notice that regulation is not eliminated in this example, rather a simple form of regulation substitutes for a complex form. It is far easier to believe that regulators can insure that two telephone companies exchange traffic, than to believe that regulators can set prices efficiently or can calculate fair rates-of-return with precision.

Actual Use of Interconnection as a Regulatory Tool. Historically, we chose to regulate local telephone companies as public utilities rather than merely force them to interconnect with local competitors.[18] I suspect that, in the days of manual operators,

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[17] No interconnection of carriers, substantial consumption externalities, and a lack of stratification in the community.

[18] Vietor reports that 26 states enacted laws between 1907 and 1913 requiring interconnection. Richard H.K. Vietor, AT&T and the Public Good: Regulation and Competition in Telecommunications, 1910-1987, Harvard Business School, Division of Research, 1987 at page 7. Walker reports that, by 1919, 34 states had enacted laws requiring physical interconnection of telephone companies. Paul A. Walker, Proposed Report Telephone Investigation, (Walker Report), U.S.G.P.O., 1938, at page 153. These

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interconnection was expensive and inefficient. A call which had to go through two operators would be significantly less convenient than a call completed by a single operator. Thus, 50 or 80 years ago, mandatory interconnection may not have been technically acceptable as a regulatory solution.

While mandatory interconnection of local systems faded away with duplicative local telephone systems, AT&T had agreed to interconnection between its long-distance network and the local systems of independents in the famous Kingsbury Commitment of 1913. The Communications Act of 1934 authorizes the FCC to order interconnection between carriers when it finds such interconnection in the public interest.[19]

Starting in about 1950, in a series of FCC proceedings, the regulators began to require interconnection of the local telephone network to competitive equipment and networks. In most of these cases, interconnection was required for its own direct benefits, not as an substitute for public utility regulation.

But, if we look at terminal equipment, we see mandatory interconnection leading to reduced regulation. The sequence was:

- Carterfone (1968)
- The Registration Program (1975)
- Computer Inquiry II (1980)
- Divestiture (1984).

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references do not make it clear whether it was interconnection of competing local exchanges that was required or if the required interconnection was of adjacent local exchanges or of long-distance carriers to all local carriers.

[19] See 47 USC 201.

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With its Carterfone decision, the FCC opened the door to a competitive market for terminal equipment. In 1975, the FCC established a scheme for allowing competitively provided terminal equipment to be attached to the telephone network easily, and on an equal basis with terminal equipment provided by carriers. By 1980, they were able to order that, henceforth, essentially all new terminal equipment was to be provided in the competitive marketplace and outside economic regulation. The technical regulation of the FCC's registration program was maintained, as were the safeguards of Computer Inquiry II which restricted the actions of the Bell System companies. After the Modified Final Judgment (MFJ) in the AT&T antitrust suit was announced, the FCC modified its rules so that all the embedded terminal equipment of the Bell System would be deregulated at divestiture.[20] By the standards we apply to regulatory actions, the FCC terminal equipment registration program was a raving success! It facilitated competition, it reduced direct economic regulation, and complaints about the program are minimal today.

Similarly, the FCC has used mandatory interconnection and removal of restrictions on the use of interconnected circuits in other proceedings[21] to limit monopoly power. In the long-distance market we saw a gradual evolution from allowing competitive long-distance carriers to use local loops for private line services to the full equal access

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[20] See Report and Order, In the Matter of Procedures for Implementing the Detariffing of Customer Premises Equipment and Enhanced Services (Second Computer Inquiry), 95 F.C.C.2d 1276.

[21] For two recent examples see the FCC's resale decision, Resale and Shared Use, 60 F.C.C.2d 588 (1977), or its cellular decision which mandated interconnection of the cellular carriers with the local wireline exchange and required resale of cellular service. Inquiry Into the Use of Certain Frequency Bands for Cellular Communications Systems; and Amendment of Rules Relative to Cellular Communications Systems, 46 F.R. 27655 (1981).

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required by the MFJ. It is only fair to point out that there is still vast confusion and controversy over both the effectiveness of equal access in creating a competitive long-distance market and whether or not the benefits of the rapid transition to equal access were worth the cost.

This Subcommittee has used mandatory interconnection as a tool when allowing competition. The Record Carrier Competition Act of 1981[22] allowed domestic record carriers to provide international record service also, but it required record carriers to interconnect with one another for a limited time, and it also required domestic record carriers[23] to provide equal access to all international record carriers -- equal to the access provided to their own international operations.

Information Services. The history of interconnection in information services differs significantly from the above examples of carrier interconnection. In the early days of computer-based information services (the 1960s), computers plugged into network just like a telephone, and the rules governing CPE controlled operations. In Computer Inquiry I, the FCC required "maximum separation" between the regulated network and computer services. At this time there was little evidence of network-based information services beyond time and weather.

Network-based information services did develop in the 1970s (e.g., Dial-a-Joke, Custom Calling II, 900 service). Computer Inquiry II outlawed provision of Custom Calling II and Dial-a-Joke in the regulated network and the information services prohibition of the MFJ outlawed the BOCs' provision of services relying on voice storage technology

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[22] See Public Law 97-130, 95 Stat. 1687-90, Dec. 29, 1981 or 47 USC 222.

[23] This only applied to carriers with a significant market share.

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whether those services were provided inside the network or through separate subsidiaries.

Dial-a-Joke was reborn as 976 service. In the customary arrangement, 976 calls are made to a number such as 976-xxxx. The information service provider's recording machine answers the call and supplies a pre-recorded message, e.g., a joke. The telephone company bills the customer, keeps some of the money, and sends the rest to the information service provider. The 976 service has opened up the information service market -- a far wider variety of recorded message services are available today than were available before divestiture. But, in the view of many, there have also been misuses of the capability. Among the most prominent uses of 976 are for "adult" services and "children's" services[24].

Custom Calling II has not yet reappeared. However, just this month, Pacific Bell filed a CEI plan at the FCC which would allow them and others to offer voice storage services much like Custom Calling II service.

I believe that, at the time of Computer Inquiry I, technology neither allowed nor required integration of information services with the telephone network. But, since then there has been an enormous fall in the cost of electronics. It's hard to define that fall since new technology is used in ways which just were not possible 20 years ago. But, it seems fair to say that costs of electronics have fallen by a factor of 100 to 1,000 between the beginning of Computer Inquiry I today.

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[24] Last December, my four year old daughter, Ann, came home, held out a piece of paper, and proudly announced that she had Santa Claus' phone number. Sure enough, the first three digits were 976! She knew how to call Santa, she just didn't know that it cost 50 cents per call.

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We can confidently expect that the costs of electronics will continue to fall.[25] The enormous continuing fall in the cost of computation and storage has changed the stakes in telecommunications regulation. When computers were expensive, regulatory rules and industry practices which raised costs by a few percent created little harm. But, with the change in the price of electronics, that same amount may now be the dominant system cost!

One way to think of this changed regulatory problem is to ask what would be the proper regulation of information services if computers were free? After all, if computers were free, would we be concerned that BOCs would cross-subsidize their purchase? Modern low-cost electronics make it possible to place information processing functions in the telephone network at little cost. Indeed, the evolution of processing capabilities makes it almost imperative that functions which were once regarded as information processing be built into the telecommunications network.[26]

Summing Up. Open architectures are a well understood approach to limiting market power. Over the last few decades we have begun to use mandatory interconnection as a regulatory tool, complementing traditional public utility regulation. In some circumstances, it has successfully allowed for a reduction in direct economic regulation (PBXs aren't in the rate base anymore). At the same time, we have reached the point

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[25] For a recent discussion of future possibilities, see Myers, Yu and House, "Microprocessor Technology Trends," Proceedings of the IEEE, Vol. 74, No. 12 (December 1986) at 1605-1622.

[26] For example, modern microprocessors allow use of error-correcting protocols on data links at very low cost. Such protocols are now widely used today. Some are implemented by CPE, others are provided by equipment inside the network. Current ISDN standards require widespread use of such processing, and to my knowledge, no party has objected to this element of ISDN plans.

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where information processing has become so inexpensive that it can naturally be built into the telephone network.[27] This implies that the costs (in benefits foregone) of the separate subsidiary requirement of the Computer Inquiry II rules have increased -- indeed in the FCC's judgment they have become intolerable. Thus, we need a new safeguard.

ONA is well matched to our times. ONA fits the historical trend to interconnection-based regulation, and it may allow integrated provision of information services without abuses. ONA lacks the simplicity of terminal equipment interconnection, however. It is far more difficult to specify an ONA plan, than to specify the minimal rules needed to govern terminal equipment interconnection.[28] Thus, while ONA appears well placed in its historical context that is not enough to insure that it will be successful.

V. Observations on ONA Process

Let me share with you a few observations on the ONA process.

Definitions. First, the definition of ONA is vague -- far less precise than the equal access requirements of the MFJ or the requirements of the FCC's CPE registration program. This vagueness creates two problems which are really two sides of the same coin. It will be difficult for telephone companies and regulators to tell if a specific ONA plan fully conforms to the rules. It creates the opportunity for petitioners to

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[27] When information processing was much more expensive than today, it made economic sense to spend money on telecommunications if that made the use of computing more efficient. With today's costs of information processing, it makes sense to use information processing to make telecommunications more efficient.

[28] Basically the FCC's rules do two things. They require that all terminal equipment be designed to prevent harm to the network and they require carriers to notify manufacturers and users of their interface standards. The FCC rules do not actually specify those interfaces or the signalling protocols used over the interfaces.

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continually ask for more, since they can plausibly argue that any specific plan is lacking in one or another possible aspect. It creates an environment where contention and strife are natural. This contention may overshadow any successes of the ONA approach to regulation.

Start-Up Problems. Second, both RBOCs and the enhanced service provider/user community appear to have found the ONA process difficult at the beginning. The BOCs faced an obligation to develop and file an ONA plan by February 1, 1988. Yet, the FCC's rules hardly specified what they should put in their ONA plans. Instead, the FCC set broad goals and directed the RBOCs to file ONA plans which meet those goals. Necessarily, the RBOCs began in the dark and first had to invent a few candles before they could go looking for ONA plans.

Those who will use ONA services, the enhanced service providers and the large users, faced a similar problem of trying to understand what services the telephone company can provide. In our study for Bell Atlantic of user needs, we came across these phenomenon several times. As one interviewee put it:

> "We have always regarded the telephone network as a given, like the laws of physics. It's an interesting idea to think how it might be changed to allow us or our customers to provide better service, but it's not something I have ever thought much about. I'll have to give it more thought before I can respond."

I believe that, as time has passed, both the RBOCs and the user communities have begun to think through their capabilities and needs in a systematic fashion, and there is less confusion today than there was a few months ago.

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A Major Short-Run Benefit. Third, I believe that the biggest short-run benefit of ONA is that it has forced the BOCs to systematically examine the needs of the enhanced service providers market in an environment where all the old corporate and regulatory rules were questioned. Some have criticized the marketing orientation of much of the RBOCs' exploration of ONA services. Yet, in my opinion, this is one of the biggest benefits of ONA. The RBOCs are looking at the needs of an important class of users, the enhanced service providers, and are asking

> How do we serve these users better? How do we best give them the ONA BSEs which they need and we are obligated to give to them under the FCC's rules?

In considering this question, the RBOC market analyst is far less fettered by old regulatory rules or existing corporate policies than is the case in the normal, day-to-day market analysis. I believe that we will see substantial benefits from this wide-open examination of service needs.

Changed Incentives for the BOCs. The ONA rules changed the BOCs incentives. In the past, they had little incentive to either understand the enhanced services industry, or to craft special arrangements to serve that industry better. Indeed, to the extent that serving the enhanced industry more efficiently meant losing sales of old-fashioned network services, their incentive was not to rock the boat. Today, the BOCs face both a carrot and a stick. The carrot is the opportunity to make money in the enhanced services marketplace. This carrot will cause the BOCs to work harder to understand the enhanced services market and to understand how improvements in local exchange service can aid enhanced service providers. The stick is the FCC's requirement that the BOCs must develop broad general ONA plans, which call for

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improving interconnection for all enhanced services -- not just those which the BOC will compete against.

ONA and the MFJ. Many of the enhanced services which a BOC might offer are also information services, as defined in the MFJ. Thus, most of the benefits of the FCC's ONA initiative cannot be realized unless the MFJ is relaxed to allow BOC provision of information services. MFJ relief from the information services restriction need not wait until ONA is in place. CEI (or the separate subsidiary requirement) already applies. CEI is a clear equal access requirement, and the obligation to provide CEI applies today and would continue to apply if the MFJ prohibition is removed.

VI. Contentious Issues in the ONA Process

Confusion and Distrust. The early difficulties in the ONA process which I mentioned above, together with the natural communications problems between differing, sometimes competitive firms, led to what might be characterized as an atmosphere of confusion and distrust between the RBOCs and some in the enhanced service provider community. More recently, this distrust seems to be diminishing. There is probably no cure for this problem except time and experience.

Uniformity. There is a clear conflict between national uniformity and regional autonomy. In our interviews and workshops, to the best of my recollection, all firms which did business in more than one region expressed a strong preference for nationwide uniformity of ONA services. Generally they were not asking for uniform prices,[29] but uniform definition of services and uniform availability of services. Each ONA service would be available in every region with the same name and the same

[29] One of our subjects actually did request nationwide price uniformity.

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technical characteristics. This same preference has been expressed at the national ONA forums and in statements by user groups.[30]

Concern for national uniformity is understandable. Users and manufacturers operating in national markets would benefit substantially from uniformity. Yet the FCC's ONA rules apply to seven RBOCs operating in 48 states and don't apply to non-Bell telephone companies.[31] Clearly, any firm using ONA services nationwide should be concerned about national uniformity. However, guaranteed uniformity was lost with the AT&T divestiture.

I personally feel that the concern for uniformity is overblown. One of the benefits of divestiture is benchmark competition among the RBOCs. Forcing uniformity on ONA plans wipes out the gains of such benchmark competition in the ONA world at a stage in the process where this competition can be most beneficial in "fleshing out" the ONA concept. Additionally, I expect that market forces (in particular, the fact that telecommunications equipment manufacturers such as AT&T and Northern Telecom offer products to nationwide and worldwide markets) and the fact that standardized ONA BSEs will sell better than differentiated BSEs create strong forces for national uniformity. I would also observe that the RBOCs, in response to the concern for uniformity, have committed themselves to achieving substantial national uniformity.[32] I

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[30] See the proposal dated July 16, 1987 by the Coalition of Open Network Architecture Parties (CONAP), a group of user organizations. That proposal contains nine ONA principals -- the first of which is national uniformity.

[31] The FCC has not ruled out applying the ONA rules to non-Bell companies at some time in the future. See the Computer III order at para. 132.

[32] For example, see page 4 of the June 30, 1987 letter from J. J. Appel and S. M. Harris of Pacific Bell to Mark Golden of the Association of Telemessaging Services International or July 8, 1987 letter from G. Marble of Bell Atlantic to J. S. Blaszak of the Ad Hoc Telecommunications Users Committee. These letters promise to work

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doubt that any regulatory intervention to assure uniformity is necessary or desirable at this time. If a lack of uniformity turns out to be a problem, the regulators can always intervene later.

State/Federal Conflict. There is one area of special concern to me which could determine the ultimate success or failure of the entire ONA process. The FCC's Computer Inquiry III rules require the Bell Operating Companies to offer a host of new services -- the ONA BSEs and any services needed for CEI -- most of which will be offered in state jurisdictions. This requirement alone creates a conflict, since state regulators may feel that the very existence of certain BSEs distort the pricing structure they have developed over the years and that the authority to order now local services properly rests with local regulators. But, the FCC has also inserted itself into local ratemaking. Paragraphs 167 through 186 of the FCC's Computer Inquiry III order discuss the proper principles for pricing CEI/ONA services and set forth standards governing such pricing. Additionally, Mark Fowler, former chairman of the FCC, co-authored a law review article[33] which called for removing rate and rate-of-return regulation on local exchange carriers if those carriers were subject to an Open Network Architecture.[34] Naturally enough, some state regulatory authorities have demurred[35] from this expansive view, and, given the circumstances, it would be natural

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towards national uniformity.

[33] Fowler, Halprin and Schlicting, "Back to the Future": A Model for Telecommunications," 38 Fed. Comm. L. J. 145 (1986).

[34] Ibid. at 195.

[35] See the article by Vial and Dumas, Gone with the Wind: a State Regulator' View, Telecommunications, January 1987, at 94. Mr. Vial is a member of the California PUC and Ms. Dumas is Counsel for the CPUC. Note also that NARUC adopted a resolution last week at their convention which expressed their concern at possible federal overreaching (although they were polite enough to avoid using the term "overreaching").

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for state regulators to suspect that the FCC's agenda for ONA goes far beyond merely assuring a level playing field for all enhanced service providers.

The conflict between state and federal authority is real, not merely hypothetical. Bell Atlantic and Pacific Bell have both filed CEI plans with the FCC. In each case they presented to the FCC, for its prior approval, their plans for pricing new local services. Local rate issues are being considered first at the FCC before they being presented to state regulators.

Similarly, a group representing some large firms interested in ONA has submitted a proposal on ONA principles to the FCC and to the RBOCs.[36] That proposal states that

> BSE rates should be set on the basis of cost as determined in accordance with appropriate regulatory costing methods and without supercompetitive prices and profits to the BOCs.
> CONAP Proposal at 5, emphasis in original.

It appears to me that the CONAP parties want the FCC to dictate to the states the proper pricing of local exchange services. They appear to be asking that BSE rates not embody any cross-subsidies from their members to the small business or residential ratepayer. Such subsidies may be good or bad public policy, but they are local ratemaking issues, and in our federal system and under current law, should not be issues before the FCC. If there is one part of the ONA process where Congressional attention and perhaps even action is needed today, it is the clear definition of the State/Federal boundary.

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[36] See CONAP proposal at n. 30 above.

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VII. Conclusions on ONA

Let me offer you a few of my own personal conclusions on ONA.

First, so far it appears to have been a beneficial process. The additional attention it has forced the BOCs to pay to their enhanced service provider customers and, equally important, the special circumstances of the ONA service development process have allowed the needs of the enhanced service providers to be considered outside the normal regulatory and organizational constraints governing marketing efforts at the BOCs. The ONA process will cause the BOCs to become better suppliers to the enhanced services industry and will benefit both the enhanced services providers and their customers.

Second, I believe that -- as was the case with terminal equipment interconnection and long-distance equal access -- ONA and CEI can provide significant safeguards against potential BOC abuse of their control of the local network while allowing the BOCs to provide some enhanced communications services as part of their network. That is, I believe ONA and CEI will allow the BOCs to compete fairly in the enhanced services market. It is too early to be sure that this is the case, but we can find out only if we go forward.

The collision between the FCC's ONA rules and state regulation is unfortunate. If any single force can derail ONA, it would be concerted opposition from the state regulators.

ONA appears to fit the times. The FCC is relaxing a bar on the BOC provision of enhanced services in the network -- a bar which makes little sense given the state of

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today's technology -- and in return is requiring a form of "equal access." This approach to regulation matches our recent experience in many areas -- from terminal equipment to international record service. Unfortunately, ONA is more difficult to achieve than our earlier forms of equal access. One can imagine that the ONA proceedings will degenerate into a never ending cycle of pleadings where special interests try to wrest new services -- or old services in new packages with lower prices -- from the BOCs using the FCC's ONA rules as their crowbar. The FCC is taking a risk with its ONA rules, but, in my judgment, the risks are slight compared to the potential reward.

But, after saying all this, I must finish by saying that it is too early for a negative or a positive conclusion on ONA. All in all, the FCC's ONA initiative seems well designed and on track, although one must recognize that there will be problems, especially with definitions and the state/federal regulatory boundary. Next February, the BOCs will file their ONA plans, and by this time next year people will have had a chance to look at those plans and respond. At that time, we will have a better view of the success or failure of ONA.

That concludes my comments today. Thank you again for the opportunity to appear here before you.

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Mr. COOPER. I'm glad you eliminated the suspense.

The committee will be in recess for 5 to 10 minutes.

[Brief recess.]

Mr. MARKEY. We apologize for the interruption. It's just, you know, the natural course of business on the floor, and, for your information, the bill on the floor is an Energy and Commerce Committee bill, the Price-Anderson Act Reauthorization, and, as a result, there is a large chunk of the subcommittee membership which was out on the floor interested in managing the amendments which are now pending, and I regret that has caused a little bit of the confusion today.

But, as you are all, I'm sure, very well aware, it is impossible to predict what the floor schedule is when you schedule hearings far in advance.

I just wanted to apologize to you for any inconvenience.

So, the Chair recognizes itself for a round of questions, and, Mr. Jackson, welcome back to the subcommittee.

Mr. JACKSON. Thank you. It's good to be back.

Mr. MARKEY. Let me ask you this: only 3 years have passed since the effective date of the AT&T divestiture. What has happened in the last 3 years to create significant new competition in the local exchange marketplace, which would warrant lifting the BOC restrictions on entering the information services market?

Mr. JACKSON. Well, I'd like to respond to that, and, first, I would just point out that I think that the information services bar was an error from the beginning; it was wrong 3 years ago, and it's harmful today.

The primary change has been the experience with BOC's competing or offering yardsticks, one with the other. We have not had such a change in the provision of local exchange services that that by itself, I think, could be used to argue for dropping the information services bar.

But, rather, we are seeing in a variety of areas, such as the balloting procedure which one BOC adopted for equal access choice by consumers, and then was ultimately used by all the BOC's, or the different approaches the BOC's are taking to issues such as co-location, that the independent decisionmaking of the BOC's provides a check, one on the other.

And, I think, also, we've had the change that the Commissioners put forward, its Computer III order, with its concepts of ONA and CEI—those are regulatory strictures which didn't exist 3 years ago.

So, we have really two things: the proven benchmark experience, or yardstick competition, and the new FCC rules, plus the information services bar was a mistake in the first place.

Mr. MARKEY. Mr. Rutkowski?

Mr. RUTKOWSKI. I tend to agree with that, but I would also raise the new technologies that have come on the scene within the last few years, which, in fact, will ultimately make, I think, ONA not only viable from a regulatory standpoint, but if done right a very useful tool in stimulating a lot of new information services.

Mr. MARKEY. Given the slow pace in disclosing ONA plans and the Commission's weakening in its reconsideration of the requirements for the initial ONA plans, won't it be impossible for the ini-

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tial ONA plans to be a justification for removing structural safeguards?

Mr. JACKSON. Well, we have to see what the initial ONA plans are. I don't think that's going to be the case. I think that it's been very hard for both the telephone industry and the enhanced service providers to figure out quite what ONA means, and what they should be providing.

I think we saw—you look at last fall, the initial ONA forum, or the second forum out in L.A., that as time has gone by, both the telephone companies and the information service providers have gotten a clearer idea of what should be provided in an ONA environment; and how to use those ONA services to ensure equal access.

And I think the true answer to your question can't be made until February but I'm quite—February 1988, when the ONA plans are scheduled to be filed; but I am confident from what I've seen that it's a very large step towards equal access for data.

Mr. MARKEY. In Computer Inquiry III, the FCC indicated its intent to move away from structural separations when non-structural safeguards were created. One of the FCC-stated safeguards is equal access for enhanced service providers. And competitors contend that equal access includes the guarantee of an equal price for competitors and Bell Operating Companies who use the Bell Operating Company Network to provide information services.

Now, this concern is evidence in a debate over physical co-location of the enhanced service providers equipment at the Bell Operating Company Central Office, or the use of virtual co-location, which would provide enhanced service providers with a rate equal to the Bell Operating Company's rate even when enhanced service providers' equipment is located outside of the BOC central office, but within a designated area.

NTIA has suggested a virtual co-location feature in its comments on Bell Atlantic's comparably efficient interconnection plan. Do you believe that co-location or virtual co-location requirements are necessary to have equal price access, and should a co-location requirement be a part of Open Network Architecture or comparably efficient interconnection ONA/CEI plans?

Mr. RUTKOWSKI. I think they should—short answer. You might be aware of the fact that there is kind of two definitions to "virtual co-location." And one relies upon a concept of sort of a condominium of moving equipment outside the office; the other is a concept that would allow vendors, enhanced service vendors, people that write software, to actually write and run software right in the BOC processor, and increasingly that may be necessary with the emerging new switches to effectively implement true equal access, and true competition and true fostering of innovation in the local exchange in the provision of services.

Mr. MARKEY. My time has expired.

The Chair recognizes the gentleman from Pennsylvania for 5 minutes.

Mr. RITTER. Thank you, Mr. Chairman.

Dr. Rutkowski——

Mr. MARKEY. Could I just inform the gentleman, just out of courtesy to him, I am going to have to adjourn the meeting in 5 min-

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utes because of the conflict on the floor and the inability to get other members who are managers on the floor to take the Chair here for me because I have a——

Mr. RITTER. I would be willing to take the Chair, Mr. Chairman.

Mr. MARKEY. I understand that.

Mr. RITTER. If the rules of the House would allow it.

Mr. MARKEY. Well, the rules of the House and 60 more Republican Members can be found on the floor every January. I am prohibited by the rules from continuing with other than a Majority member chairing; so we can only really continue for 5 more minutes, as there is another meeting that I have to be at in 5 minutes.

Mr. RITTER. I wish this could go on for a long time.

Dr. Rutkowski, I was interested in your comment about the R&D capability that could be applied to creating this kind of national network. Would the BOC's have the opportunity to enter into the information services?

I think that's very important. I hadn't really focused on that, but I would suspect that one of the reasons for a kind of limited services, the kind of limited quality and character that we see, perhaps, in some way is reflective of the fact that there is no massive R&D effort behind what we have today.

Am I correct?

Mr. RUTKOWSKI. I think that's in large measure true, as applied to the kinds of services, I think, that are manifest into the public network.

What I think is probably at least as important is the application of that R&D in forums, like the T–1 committee—and I hate to use the acronym CCITT, in which there is a collective decision to plan the network in certain directions and to have certain uniform standards for the provision of services and networks that act as a catalyst, the provision of all sorts of new services.

That's patently the case, going to be the case in broad band services, where we stand on the threshold of, I think, a remarkable new array of services, largely because of the people in the R&D facilities, either in the BOC's or in the manufacturers serving the BOC's.

Mr. RITTER. So, you are concerned about the uniformity? And is it your view that the BOC's entering the information services would assist in the provision of greater uniformity?

Mr. RUTKOWSKI. That could be the case.

There is a near-term problem, I think, in which Mr. Jackson and I differ slightly with respect to the initial set of BOC's.

Mr. RITTER. The question of uniformity in Open Network Architecture?

Mr. RUTKOWSKI. Yes.

Mr. RITTER. Could you explain that just a moment?

Mr. RUTKOWSKI. I think it is critical that end users, I think, have emphasized this by constantly putting it at the top of their list. It's critical that there be a uniform minimum basic set nationwide of BSE's and services, and that mandate really hasn't been emphasized enough, I don't think, by the Commission; and, as I say, it is critical.

Mr. JACKSON. I disagree. I think that there is a strong need in the marketplace for uniform BSE's, but I think that pressure by

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the Commission or the Congress at this time to have the BOC's get together and decide what BSE's they are going to offer will wipe out many of the advantages of yardstick competition.

I think that those who are pushing for it don't want the idea of the BOC's to sit down and vote on co-location. They would probably vote 6 to 1 against it, and I think that it is much better on some of these BSE's to allow the marketplace to experiment. We'll see substantial natural national uniformity just because most of the switches that are going to provide these services are provided by AT&T and Northern Telecom, and there is going to be, I would suspect, 1 change generically, not 7 different versions of the change, generic software for these switches; and the economic forces pushes towards national uniformity, there are going to be substantial political forces in that direction. Any further intervention, I think, would wipe out benefits of diversity.

Mr. RITTER. Mr. Rutkowski, I noticed in your testimony in assessing whether the BOC's should be allowed to enter the information service marketplace, you say one must balance technical, economic, and national policy considerations.

Can you elaborate on this, especially your discussion of "strategic importance to the Nation?" What do you mean by that? Is that national security? Is that trade? Is that economy? What is that?

Mr. RUTKOWSKI. All of the above, and it is particularly with respect to, again, rapidly emerging so-called broad band technologies, which really are kind of a disservice to what's going on; but probably best characterized by fast-packet kinds of capabilities.

I was fortunate to be on the U.S. Delegation to CCRT's Hamburg meeting a couple of weeks ago, and all the network planners of the world got together and made this an imperative for the future. Our ability to do this effectively with our network is going to bear upon all three of those considerations.

Mr. RITTER. You know, I might add that when the gentleman representing CompuServe, Mr. Minot, was speaking, he talked about healthy growth in CompuServe of 6,000–7,000 subscribers a month. That's a very small number in comparison to the 100,000 subscriber growth Minitel in France, and for the United States it's an enormously—it's an inordinately small number. We are talking about a population of 240 million.

Dr. Jackson, one last——

Mr. MARKEY. Gentleman, I have—I beg the indulgence.

Mr. RITTER. I would prefer that the gentleman stay here and not go on the Floor and——

I mean, the national interest would be served.

Mr. MARKEY. The gentleman would prefer to stay here and not go on the floor, but unfortunately I can't do it.

Let me suggest this: that we will submit in writing questions of the gentlemen from several members, the full committee chairman, others really do have a lot of questions which they wanted to propound to the witnesses who are here before us right now.

I know Mr. Jackson is sensitive to the difficult legislative scheduling, and I appreciate your indulgence. And we do very much appreciate as well the indulgence of the gentleman from Pennsylvania who has an enormous interest in this subject matter.

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Let me—there are just a couple of housekeeping chores that I've got to get done here, and one of them is that there has been a lot of talk here about the interest of consumers. Yesterday, the subcommittee received a letter from the Consumer Federation of America and the National Consumers League, just 30 seconds, a quote from their letter to us about——

Mr. RITTER. Equal time, Mr. Chairman.

Mr. MARKEY. I call CFA—I'm just going to put it on the record—both CFA and NCL believe consumers may benefit from new services provided through the telephone network. They agree, however, the lifting of information service restrictions comprises the development of adequate cost allocation rules to effect some of the needs for affordable basic phone service and is against public interest.

We have the entire letter, and all their information. We are going to put that in the record without objection.

[The letter follows:]

JULY 29, 1987.

HON. EDWARD MARKEY,
Chairman, House Telecommunications and Finance Subcommittee,
House of Representatives,
Washington, D.C.

DEAR CHAIRMAN MARKEY: The Consumer Federation of America (CFA) and the National Consumers League (NCL) wish to clarify an apparent misperception concerning our organizations' position on the Modified Final Judgment's information service line-of-business restriction. Both CFA and NCL believe consumers may benefit from new services provided through the telephone network. We agree, however, that lifting the information services restriction prior to the development of adequate cost allocation rules to protect consumers' needs for affordable basic phone service is against the public interest.

Though the FCC has developed new regulatory rules through its Computer Inquiry Proceeding, CFA and NCL believe that many of these rules, still in the design stage and untested and untried, do not establish an adequate basis for protecting ratepayers against inappropriate local rate increases. Though NCL has expressed its concern that restriction of the BOC's impedes technological innovation, NCL concurs with CFA's position that current regulation would be inadequate to protect ratepayers. Congress should pressure the FCC to develop an efficient method for allocating costs, to insure an adequate contribution to the network from information services revenue.

We are hopeful that the regulatory process can be improved in the near future, with new cost allocation rules that would lead to local rate reductions as efficiency gains are realized in the telephone network. In addition, once new regulatory concepts like "open network architecture" and "comparably efficient interconnection" become a reality, it may be possible to prevent the types of discriminatory practices that required imposition of the information services restriction in the first place. CFA and NCL are hopeful that the Congress will help to define a cost allocation method which would overcome current inadequacies in the FCC's regulatory rules.

We would be happy to share with you our ideas concerning the regulatory changes necessary to preserve our Nation's goal of universal phone service.

Sincerely,

GENE KIMMELMAN,
Legislative Director, Consumer Federation of America.

JANE KING,
Deputy Director, National Consumers League.

Mr. MARKEY. We'll be providing written questions to the people here on the panel from other members if they would be willing to answer it, and with that, I'd like to note that the hearing is adjourned.

But for the benefit of those computer-hungry people in the audience and for vendors, there will be a short recess for lunch. During the recess if all persons except technicians would exit the room, the

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subcommittee will make quick preparations for our afternoon demonstrations.

It is very important, however, for the room to be cleared quickly so that we can set up the room for the demonstration by the various vendors. The vendors are Trintex, General Electric, Dow Jones, The Source, Quantum, Pacific Telesyst, Dun and Bradstreet, Apple Pie, U.S. Videotel, and Viewtex.

So, we thank you all very much for your cooperation, especially the witnesses for your understanding.

Thank you very, very much.

The committee is adjourned.

[Whereupon, at 12:50 p.m., the subcommittee adjourned, to reconvene at the call of the Chair.]

[The following responses to subcommittee questions were received:]

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Responses of George Minot

Applied Information Technologies Research Center

Question

One of the most important factors in the future growth of these information services is cost to consumers. Can you tell me what factors contribute to the pricing of these services?

Because information services in the United States are provided in a competitive marketplace environment, the prices which consumers pay reflect very closely the underlying costs incurred by the information service providers. The major cost elements confronting an information service provider are support personnel,marketing, royalties to information providers, computer operations, other general and administrative and, of course, telecommunications costs.

As explained in response to Question 2, the FCC's access charge proposal would increase dramatically the telecommunications costs incurred by information service providers in making their services available. The increased ongoing costs incurred by information service providers to use the local telephone facilities they need to make their services widely available would have to be passed on to consumers in the form of steeply higher prices.

Further, telecommunications costs will be directly impacted by the ultimate pricing and configuration of Open Network Architecture -- the FCC's attempt to develop requirements whereby the various technical capabilities and functionalities of the public common carrier telecommunications network will be available on a nondiscriminatory basis to all entities who could benefit from them. Today, the concept of ONA is only theoretical and remains wholly undeveloped.

The possibility of supracompetitive ONA pricing and other anticompetitive actions by the BOCs prompted many enhanced service providers to join with large telecommunications users and other concerned parties in the Coalition of Open Network Architecture Parties (CONAP) in submitting "An Open Network Architecture Proposal" to the FCC on July 16, 1987. A copy of that CONAP proposal is attached to the response as Exhibit A.

NOTE: Exhibit "A" entitled "An Open Network Architecture Proposal" is retained in the subcommittee files.

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Question 2

On June 10, 1987, the FCC adopted a Notice of Proposed Rulemaking assessing "access charges on enhanced service providers." What effect will the FCC's proposal to levy access charges on the information and enhanced services industry have on development and availability of information services in this country?

The FCC proposal to levy access charges on enhanced service providers will have a substantial adverse impact on the continued development and availability of information services in this country. Imposition of access charges would greatly increase the cost of on-line computing and information services. If the Commission's proposal were adopted, the ongoing cost of the local dial-up lines used by information service providers to make their services available will increase by approximately 15 times -- from about $.30 per hour now to approximately $4.47 under the FCC's proposal. Obviously, information service providers like CompuServe could not absorb such a tremendous increase and would be compelled to pass through most or all of this access charge to their customers.

The higher prices could be expected to have a devastating effect on the continued development of a vibrant information services marketplace that is now making available a wide variety of innovative and useful services to ever-increasing numbers of consumers. Particularly hard hit would be the development of new information applications. And, of course, the home and educational markets, which are experiencing rapid growth, would also be negatively impacted by the severe rate shock caused by the FCC's proposal. While large business users could be expected to try to avoid the increase by constructing their own private networks -- to which the access charge apparently would not apply under the FCC's proposal -- small business and residential consumers do not generate enough traffic, of course, to make a private network a viable option. It is these users, therefore, that would be hurt the most by the FCC's proposal.

It should also be stressed that the FCC's proposal could impact seriously the United States' position as world leader in the development of innovative and productivity-enhancing information services. This especially would impact the country's high-tech centers, such as Silicon Valley, Boston, Austin, and Northern New Jersey, which have heavy concentrations of information service industry participation. The proposal would affect adversely an industry where the United States now enjoys a positive balance of trade -- and where the United States clearly has a vital interest in maintaining its leadership position.

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Question 3

> In France, Minitel users can access the Kiosk system and with one number reach a laundry list of information services. Couldn't the BOCs provide a menu or gateway function so that customers in this country could dial one number and reach a number of different services, such as CompuServe, or Quantum, or Dow Jones?
>
> Is there any other means of providing this type of menu or gateway function besides permitting the BOCs to do it?

Answering the second question first -- Yes, there are other preferable means of providing the menu or gateway function, and they are presently in use. The goal of changing services easily without burdening the user with redialing on every occasion can easily be met by the user's personal computer. From the user's perspective, it makes very little difference whether the menu is stored and presented by his personal computer or by a host maintained by a BOC, provided he has control over his menu and choice of services. Virtually any personal computer will allow the user to prepare his own menu of information services, enter the appropriate phone numbers and from then on simply select the desired service from the menu to gain access. Substantially all modems sold today have a dial-up function that will connect the user to the chosen service. The personal computer itself stores the menu and phone numbers and can automatically "tell" the modem how to access the service selected by the user through a single entry. The cost of these modems is dropping and is already less than $50.00 for 300 baud and less than $100.00 for 1200 baud. Regardless, they would be necessary equipment to connect with a BOC menu or gateway service.

Additionally, information service providers are fully capable of performing the gateway function. The August 21, 1987 issue of "IDP Report" published by Knowledge Industry Publications, Inc., reports that:

> [N]early all major information retrieval systems provide gateways, which allow their subscribers to access other services' primary host computers. According to a survey by IDP Report, six of the top eight services in terms of password counts . . . offer gateways: CompuServe, Dow Jones News/Retrieval, Dialcom, Dialog, The Source and Genie . . . . IDP learned that most vendors which provide gateways are actively seeking more gateway arrangements.

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IDP's survey of the 12 vendors, including CompuServe and five other top services, provides real evidence that other means of providing this gateway function already exist. A copy of the article is attached as Exhibit B.

While the BOCs could perform a "gateway function," their participation raises some important issues, particularly issues relating to potential favoritism by the BOCs. For example, there is a significant correlation between menu placement and usage level. Thus, the criteria for listing a service and determining when, where, and in what manner services are listed obviously are of vital concern to information service providers. If the BOCs were allowed to be the "gatekeeper" by controlling the menu, any BOC provision of information services (through direct ownership or some less direct form of participation) poses serious conflict of interest concerns. The BOCs would have natural incentives to favor their own information services in performing their "gatekeeper" function. The airline reservations computer systems are now required to provide equal and unbiased information and reservation capabilities. However, continuing regulatory concerns about the obvious favoritism in prominence and ease of making reservations with the airline providing the particular information system demonstrates the extreme difficulty in avoiding substantial bias. Even if the BOCs are not involved in providing information services, the potential for bias as "gatekeeper" still exists, even though the bias may be completely subconscious.

Question 4

> Information service vendors have always acknowledged the great advantage enjoyed by BOCs in terms of easy direct access to customers. If BOCs were to take over billing responsibility for information services, what would be the balance of costs and benefits to information service providers?

The characterization that information service providers have acknowledged the BOCs' advantage of easy access to customers does not capture the issues of concern to information service providers. Information service providers depend upon the bottleneck local exchange facilities of the telephone companies in order to make available their services. When additional bottlenecks such as centralized billing or a menu function are created, the potential for abuse and the attendant regulatory burden are greatly increased. (See response to Question 3.)

For example, a potential harm flowing from centralized billing concerns the dependence upon the BOCs which would be created. If centralized billing were to become the accepted manner of obtaining information services by consumers, information service

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providers obviously would be concerned about the cost of this service and the standards of quality and accuracy to which the BOCs adhered in performing the function. Again, if the BOCs were involved in providing their own information services, concerns about favoritism in the performance of centralized billing would arise.

Further, widespread billing is presently performed by financial institutions through their credit card operations. The BOCs' extension of credit and collection for services provided by third parties raise many difficult issues that must be addressed. Will they be subject to the same requirements as institutions in the highly regulated credit and finance sector? Does their monopoly position provide an unfair competitive advantage in relation to these interests? Would the BOC charges be regulated to approximate the margin charged by the credit institutions? Are the BOCs willing to perform centralized billing on the basis of being the "guarantor" of a user's default or fraud? Or consider a frequent traveler who accesses various information services through several LECs. Which of the LECs become the "guarantor" of the various information service providers in a case of default or fraud by the frequent traveler?

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EXHIBIT B

IDP Report
Information and Data Base Publishing Report
For Informational/Professional/Sci-Tech and Business Publishers
Knowledge Industry Publications Inc.

Volume 8, No. 13 August 21, 1987

AMERITECH,TELECOM CANADA,TELENET PLAN U.S. MESSAGING/DATABASE SERVICES VENTURE

Telecom Canada, which comprises ten Canadian telephone companies, including Bell Canada, will make a version of its iNet 2000 electronic mail and information management service available in the U.S. this year. The company will introduce the service to the U.S. in a venture with Chicago-based Ameritech and Reston, VA-based Telenet. The company, which plans an announcement next week, would give no further details at presstime. (Cont'd on p. 5)

McGraw-Hill's DRI Communications Information Service unit launched Telecommunications Network Services (TNS), a forecasting service which features an historical database of revenue and conversation minutes by leading telecommunications carriers for major toll services. TNS is available via floppy disc, magnetic tape, timesharing or downloading.

To Expand British-based Business Information Services Globally...
DUN & BRADSTREET INT'L, BofA FORM JOINT VENTURES WITH BRITISH COMPANIES

Two separate joint ventures have been announced this week which combine the financial and marketing strength of two major U.S.-based companies with the business information expertise of U.K. information service providers. Both of these agreements have been established to further the development and marketing of international business and financial information globally.

Dun & Bradstreet International, London-based unit of Dun & Bradstreet Corp. (New York), has formed a joint venture with Oxford Analytica Ltd., research, consulting and database service firm based in Oxford, England. (Cont'd on p. 6)

Most Vendors Actively Seeking to Expand Gateway Offerings...
LEADING ONLINE VENDORS FIND INFORMATION GATEWAYS BENEFITIAL ADDITIONS

Nearly all major information retrieval systems provide gateways, which allow their subscribers to access other services' primary host computers. According to a survey by IDP Report, six of the top eight services in terms of password counts (IDP, July 16) offer gateways: CompuServe, Dow Jones News/Retrieval, Dialcom, Dialog, The Source and GEnie. The two that do not are BRS and Mead Data Central (LEXIS, MEDIS and NEXIS). In all, IDP talked to 12 vendors that provide gateways. IDP's survey focuses on information systems and excludes gateways to electronic mail systems, banking and brokerage services. It should also be noted that, while several gateways are two-way--allowing users of each

CONTENTS

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