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**Competition in the Communications
Industry: Where The Financial
Community is Placing Its Bets**

December 10, 1992

MIT COMMUNICATIONS FORUM
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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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**Competition in the Communications Industry:
Where the Financial Community is Placing its Bets**

**December 10, 1992
Bartos Theater
20 Ames Street
Massachusetts Institute of Technology
Cambridge, Massachusetts**

Speakers:

**Ronald Altman, Managing Director
Furman Selz**

**Joel Gross, Vice President
Donaldson Lufkin & Jenrette**

**Greg Sawers, Analyst
Sanford Bernstein**

Moderator:

**David Marsh
MIT's Corporate Relations Organization**

Marsh: Welcome to MIT's Communications Forum. My name is David Marsh of MIT's Corporate Relations Organization. Today's forum will focus on where the financial community is placing its bets in the communications industry.

A casual review of the newspapers of the last few months leaves no doubt that the race to define and capture the future voice and data communications services market has begun. A sampling of the headlines includes: "AT&T-MacCaw Link Stuns Baby Bells"; "MCI Files Plan for Wireless Phone Network"; "Satellite-linked Mobile Phones"; "Eight Cellular Firms Plan Vast Increase in Data Traffic"; and "Long Distance Phone Companies Gird for Wireless War." Technological advances are clearly spawning a host of competitive business opportunities.

The players in this high stake game are large and small, old and new, including local exchange carriers, inter-exchange carriers, cellular operators, wireless entrepreneurs, cable companies, and satellite systems integrators. Given the enormous amounts of capital required, we have asked three prominent communications analysts from the investment community to share with us how they see this competitive battle playing out.

Mr. Ronald Altman is Managing Director of Furman Selz, a New York research, brokerage and investment banking firm, wholly-owned by Xerox. Mr. Altman joined Furman Selz in 1990 as the Telecommunications Strategist and Director of its Telecommunications Group. His research and publications on the Bells and independent telephone companies have had wide distribution in the investment community. Previously, Mr. Altman was Chairman of his own firm of Altman, Brenner & Wasserman, and Chief Investment Officer and Senior Vice President of C.J. Lawrence. He is a member of the New York Security Analysts Society, and he attended the Baruch School of Business, City College of New York

Mr. Joel Gross is Vice President of Research at Donaldson, Lufkin & Jenrette, the large investment banking, investment management, investment research and brokerage firm headquartered in New York. Mr. Gross covers the telecommunications services industry, including the Regional Bells, Independents, and Long Distance companies. Prior to joining DLJ in 1987, he was Vice President of Research for Dean Witter Reynolds. He also worked for AT&T for eight years in regulatory analysis, marketing, sales, strategic planning, and product management. Mr. Gross was elected to the Institutional Investors All America Team in 1987 and has since been among the top three Wall Street analysts following the industry. He has a B.S. degree in Economics from Rutgers University and an MBA from Penn State.

Mr. Gregory Sawers is an Analyst for Sanford Bernstein, covering the telecommunications industry. Prior to joining the firm in 1987, Mr. Sawers spent two years at AT&T as Staff Manager of Strategic Planning and Staff Manager of Financial Analysis. During the early 1980's, he was Campaign Manager and Executive Assistant to Illinois Congressman John Porter. Mr. Sawers was awarded a B.S. degree from Georgetown University and an MBA from Harvard University.

Altman: Over the next five to ten years, I expect dramatic changes to occur in the

telecommunications arena. Technology will be the driving force behind those changes and, in their wake, much of the regulatory structure will substantially be altered. When the dust finally settles, the way we conduct business, where we live, and, to a great extent, the quality of our lives will be quite different from what we are accustomed to today.

Fiber optic transmission is going to be deployed by the telecommunications companies and possibly also by the CATV companies in the United States. In Europe, and in much of Asia, we believe fiber optic deployment is also going to take place over the next twenty years. Along with the fiber optic cabling, we also expect ATM switches to be installed throughout the public switched network. A combination of fiber optic transmission lines and high speed switching will, in our opinion, dramatically alter the quantity and quality of telecommunications transmission that is expected to be available to the public at large. Additionally, transmission is very likely to drop in price by several orders of magnitude by the end of this decade/

As high speed transmission is deployed, the price per bit will decline so rapidly that it will cause a sea change to occur between the cost of computing compared to the cost of transmission. Over the last several decades, we have witnessed precipitous decline in the cost of computing while the price of transmission came down much more slowly. Going forward, we envision that the price of transmission will decline much faster, causing a crossover to occur which, in turn, is expected to propel us rapidly into the Information Age.

Many observers today would argue that, while the technology might become available, the regulators will get in the way of it as they have in the past. In our opinion, this is rear-view mirror driving - not independent thinking. In the current economic environment, most states recognize that the only way to grow their GDP is to take market share from another state. One way to do that is to encourage investment in communication infrastructure. Interestingly, as that notion has begun to take hold, it is the state legislatures, not the PUCs, who are changing regulation.

Almost everyone in the telecommunications business is familiar with the story of how Tennessee managed to capture the GM's Saturn plant by orchestrating a commitment by the LECs in that state to upgrade the telecommunications infrastructure. What is not as widely known is the reaction that that loss had on the Michigan legislature. In early 1992, Michigan's legislature enacted a far-reaching change in its telecommunications laws. Michigan, by legislative action, eliminated Rate of Return regulation. We expect the same thing to occur in states like New Jersey, Illinois, Ohio, Pennsylvania, New York, and Texas over the next two years.

On the federal level, we expect that the upcoming review of the LEX price cap formula will result in an alteration of the current plan moving it to something similar in construct to the form of regulation that AT&T now enjoys. If that does occur, it will probably cause several other states to move more aggressively toward a price-only form of regulation, much the same as occurred when price cap was

first proposed. While the FCC was discussing that plan, several states, notably California, adopted a plan which is similar to the one that was eventually ordered by the FCC. This game of political one-upmanship is very likely to continue as the state commissions are always trying to show the FCC that they are the true innovators.

Given that the technology I have just mentioned is going to be deployed by the LECs, the next logical question is: will the cable tv companies also invest in their networks so that they become providers of switched broadband services? Before I give you a simple yes or no, let me first frame the costs for each side on an incremental basis. For the local telephone companies, the capital needed to convert to a switched broadband system is only slightly more than the amount they would spend cumulatively over the next twenty-five years in the normal course of capital spending. On the other hand, the cable industry would need to spend about the same amount of money, \$800 to \$1,000 per customer as the telcos would to install a switched network of their own.

Capital, however, is not uniformly available to both these sectors. The telcos have much more cash flow to spend than does the cable industry. For the telephone companies, expanding from a copper to a fiber plant does not require additional revenues, while, for the cable companies, the only way to justify a switched broadband system is on incremental revenues. So the answer to the question of will there be two competing broadband networks, cannot be answered until one addresses the question of additional revenue which these entities can garner from other areas of the economy.

This is where it gets interesting. Most observers have tended to focus on the telecommunications market from an extremely narrow point of view, in that they only look at the current revenues generated by the telcos and the cable operators. In recent months, as the cable industry has begun to talk about using compression to expand channel capacity and the telcos have said they will use ADSL to expand the throughput of their copper plant, video rental revenue has been added to the pot. Combined, the total is about \$130 billion with the LEC now having the lion's share. If that is all that exists, and at best that revenue will only grow at a rate of six percent per year, the implications of competition are horrendous for all concerned.

Given the scenario I have just described, it is unlikely that the cable industry will invest the sums of money needed to become a switched network. But there is another and much broader scenario which could cause the cable industry to join forces with the telcos and also bring into this orbit other players as well. That scenario is one which leads to a communications and information market whose potential is two or three times that of the \$130 billion of combined telco, cable, and video rentals.

Over time, a broadband switched network will replace the current networks and, as that happens, much of the classified advertising that appears in the print media will move to a video distribution system. Additionally, the decimation of news will be handled via the network, but not in a uniform broadcast mode.

Instead, I believe it will be sold as customized information packets tailored to each individual's needs. Shopping patterns will also change as the networks become and interactive multi-media system. Most durable items will be purchased over the network, rather than at free-standing shopping malls.

New industries will be created that will ride on this network and some that are just getting started today will explode in size. There is going to be a tremendous market for consumer electronics that will act as the displays or interfaces for these new products and services. The extent of the products and services that are going to be offered will be bounded only by the imagination of creative individuals, most of whom are still in grammar school today.

In this country, we will probably see a reversal of the growth that has taken place in the major metropolitan areas and a redistribution to the population to the more rural areas of this country. As information access becomes distance insensitive, the physical location of an individual to the data bank being accessed will no longer be a factor in the cost question. Education and medicine will not be limited by the physical location of the teacher or the doctor to their students or patients.

Interaction between individuals who share a common interest, be it work or play, will increase, not decrease, because of the capacity and availability of the transport network. This, in my opinion, will cause an acceleration in scientific activity resulting in an even faster rate of change of new innovations compared to the rate we have seen so far this century.

Admittedly, this may seem like a utopian view of the world, and many of my colleagues will be quick to point out that this is too optimistic a picture. I would like to remind them that a 3000 DOW was also viewed that in 1982 - only ten years ago, when the DOW was below 800.

Thank you for your time this afternoon.

Sawers: Well, I would argue that Ron got one thing right, at least from my perspective. I'll give him the argument that he is far too optimistic. I don't have any particular problems with his outlook for the future, sometime in the 21st century. As a Wall Street analyst, the problem is how to get from here to there. I will focus my remarks on these lines and what we, as financial analysts, are advising clients to do with their different investments in the communications industry. In particular, I'll focus on the regional Bell companies and their outlook, in large part because they are the biggest capitalization stocks in this controversy and, for most investors, that becomes the central issue.

For most portfolio managers, this is a very perplexing question. There are a lot of changes in technology coming. There are a lot of social issues that need to be addressed. There are also a lot of different economic issues. It is overwhelming for analysts to get a handle on all of this. What they have a tendency to do, therefore, is to default to the AT&T experience and see if, in the way of analogy, they can reach any conclusions about what the outlook for some of these stocks might be. If you do that, you tend to conclude that AT&T is a

reasonably good stock. Going back to the 1960's and 1970's, AT&T does at least as well as the market does. Due to its size, you can even argue that it is, to a certain extent, the market.

Then, in 1974, when MCI first started business, AT&T starts to underperform the market. The problem is relatively straightforward. On the one hand, there is regulatory stagflation, as some have called it, since the regulators simply don't know what to do with the likes of MCI and Sprint, aren't sure how to address a myriad of social, economic, and technical issues that MCI's existence brings about. On the economic front, the problem is also reasonably clear. AT&T's capital turnover begins to fall as MCI, Sprint and others, little by little, take pieces of the market share. In a capital-intensive business, that is a death knell. Earnings growth begins to slow. Dividends growth begins to be called into question. Little by little, AT&T begins to lag the S&P 500.

It is a problem that continues even immediately after divestiture, what many thought would be something of a panacea, a solution to AT&T's problems. When you think back, AT&T at divestiture made two proclamations. Divestiture occurred January 1, 1984. At 12:01 a.m. on that day, AT&T declared that it had, overnight and because of divestiture, become a lean, mean fighting machine and was ready to take on the world with a network that was second to none. Within three years, the better cost structure of MCI forced AT&T to lay off 100,000 people. Within three years, the superior technology of Sprint forced AT&T to write off its entire network. So, through 1987, AT&T is a stock that underperforms the S&P 500, giving a lot of pause to investors.

Portfolio managers look at that situation and the question becomes: is this the same thing that lies in store for today's incumbent phone company? I don't think this is a case where history is going to repeat itself letter by letter. There are certain similarities and differences between the environment that AT&T faced and the environment that the regional Bells face. To the advantage of the regional Bell companies, I think they have learned from AT&T's experience. They have come to understand many of the variables that were involved. They understand that the need to get their cost structures in line and that they need to come to terms with the regulatory issues.

It is also safe to say that the regulators have learned from AT&T's experience. Much of what went on during the AT&T pre-divestiture period, in the MCI start-up years, was debate about what the correct public policies would be and what the social outcomes and implications would be. Not only here but elsewhere where competition has been introduced, in the United Kingdom, Japan, New Zealand, etc., there is a consensus emerging from regulators about what needs to be done.

Finally, as an aside regarding advantages, the regional Bell companies have diversified outside of their core telecommunications business, I would argue, in ways better than AT&T has. On balance, I think we'll find that the regional Bell companies cellular holdings are going to prove to have been pretty profitable. The probably made some wise overseas investments and, in contrast to that, I would

point to most of AT&T's equipment businesses. There are a lot of analysts who would argue that rule number one for telecommunications and investing is to never invest in something that you can touch. Anything that is tangible is doomed to underperform the market. On balance, the regional Bells have gotten that right.

On the other hand, there are disadvantages which might overwhelm the advantages which the regional Bell companies might have. First, I think the fight will come much faster than we saw with AT&T, the flip side of the regulators' better understanding of what needs to be done is that they will simply implement the policies required to bring competition to the market much faster whereas they had to be dragged kicking and screaming into deregulation and competition when the question simply related to AT&T versus MCI.

Regulators are, at heart, politicians. Like politicians, they tend to blow whichever way the wind is blowing. They look at what has happened in long distance as a success. They are now all in favor of such actions. Depending on the jurisdiction, we have adopted either an implicit or an explicit regulatory policy which says that we are going to do to the regional Bell companies the same thing that we did to AT&T. The regulators are telling us what the outcome of this fight is going to be.

On the question of how fast this will happen, customers are now much more educated, whereas there might have been some leerness on the part of many to experiment with MCI or Sprint before, that will not be the case today. That will be true for big as well as for small businesses, for residential customers. That is true not only here in the United States but elsewhere in the world as well. There are no reservations anymore to choosing an alternative carrier.

Third, we will have many more competitors jump into this fray. AT&T managed to lose about one-third of its market share essentially fighting just MCI and Sprint. The regional Bell companies are going to have to deal not only with MCI and Sprint but also with AT&T itself, with all of the cellular firms, with all of the personal communications networks firms, with the cable companies, with new wireless entrepreneurs, and with new start-up companies that are metropolitan-area networks.

Everything we saw unfold over twenty to thirty years in the case of AT&T is going to take place in five to ten years in the case of the local exchange market place. I think it is also going to be harder to fight the traditional fight for the regional Bell companies. In the history of the AT&T system, it started with a wide range of services and their reaction to the introduction of competition was very much like that of all monopolists. They take this wide range of services, watch competition pop up in one area and lower prices there, go out determined to compete but feel as if they have some divine right to be held financially whole. As they lower prices and profit margins, they raise prices on everything that has been left as a monopoly.

That's what AT&T did until divestiture. The idea was to take all of the services which would eventually become competitive, spin those out into one company, and take all of the other services that would never become competitive

and put those into what we'll call the local exchange company, perhaps they could stop the hemorrhaging. The problem is that this set of services is not going to remain a monopoly. It is subject to much more uneven subsidy structures and pricing than was the Bell system before in its entirety and, in particular, than was the part that AT&T had to wrestle with.

The situation today is that maybe two-thirds of the traditional telephone services are priced anywhere from 100 to 400 percent above cost. Those services are toll services and access services. Then there is maybe one-third of the services priced somewhere between 100 and 400 percent below cost. These are the monthly phone rental costs. Not surprisingly, competition is coming to the areas that are priced way above cost first. That poses a real problem for the Bell system though because it is a game of hot potato. Historically, they just beat down one price after another, raising prices on everything that was still a monopoly. This strategy, I think, is about to come to an end because the only thing they'll be able to raise prices on in the near term, in a competitive system, is the cost of the monthly rental. That is a very politically sensitive issue.

Finally, no matter how hard or easy it is in a regulatory sense to fight this fight, there are a few economic issues that will work against the regional Bell companies. The two basic problems, if you make the comparison between AT&T and the regional Bells, is that the long distance market grows faster than the local market. Second, if you think of the telecommunications network as a kind of hierarchy, with everyone in their homes and offices forming the base, and the most long distance of long distance calls forming the top of the pyramid, the regional Bell companies occupy the base where capital turnover is much lower than it is at the very top of the pyramid. Combining those two factors is ultimately a very serious problem for the regional Bells because it gives the regional Bells a comparative disadvantage in asset utilization. I think we'll find that no matter how well the regulatory problems are resolved, we will go through this period where the financial problems are overwhelming.

To summarize, I see this all playing out as follows. One, competition is coming first to the markets in this business that are priced most above cost. It is the access market and its the toll market. The competition is coming from AT&T, from MCI, and from some of the metropolitan-area companies as well some of the cellular companies. The Bell system will react as it always has. It will slash prices in the access and toll markets and it will then raise prices in the local markets, and that is where what some call "the big burp" is going to come out of this system, that there is no other place to hide. Local prices will rise dramatically just as cellular capabilities expand, in part due to FCC rulings and in part because those networks will be digitized. We will then see five cellular carriers in every city, with tremendous amounts of excess capacity. They will combine with the cable companies to compete for local traffic and the game, started about thirty years ago, will be over for the Bell system.

As an investor, the net of everything I have described is as follows. Stocks today trade at fifteen times next year's earnings, implying that earnings will grow

over the next five years of somewhere between four and seven percent. I predict earnings growth of somewhere between positive two and four percent in the best of times and negative five or ten percent in the worst of times. These stocks are fundamentally overpriced on earnings. I see balance sheets that are overstated because the assets are overstated. So I predict tremendous amounts of write-offs. Between the write-offs and the earning shortfalls, I see companies that are flat out of cash, that are currently paying out too much to dividends and that fundamentally don't understand the challenges that they face ahead. I'm looking at, therefore, income statement balance sheets and funds flow statements that simply are not an accurate portrayal of what is coming.

If I could give two pieces of advice to the regional Bell companies, the first would be to focus on volume growth. All are making tremendous efforts right now at cutting costs. That is probably necessary in solving the problems. If they don't get the volumes up on these networks and solve the asset utilization problem that lies ahead, there is simply no way to alleviate the vast amount of pain that awaits in the next couple of years.

The second piece of advice would be to act now. If AT&T had to do it over again, I think it would try to play the political situation in Washington with somewhat less finesse, not just feel that it had to give up a certain amount of market share before it could take up the fight for deregulation with the FCC. I would encourage the regional Bells to get in the fight now and push for everything they can get. They certainly won't be any worse off for trying, and their stock prices may even increase as a result of such efforts.

That's all I have for opening comments.

Marsh: Thank you. Now Joel Gross has a point of light between these two extremes.

Gross: I don't know if it is a point of light between those extremes. I agree with about 90 percent of what Ron said, with two exceptions. First, I disagree on the issue of telco-cable and what is the right incremental cost, who has the advantage, etc. I also disagree with the scenario that the telcos and the cable companies will join forces. There is no one scenario; rather I predict a mixture of possibilities. In some cases, they may become allies, but in many others they are likely to become mortal enemies.

I also agree with much of what Greg said. About a year or two ago, they used to call me the Dr. Doom of the Bell stocks but I find myself a moderate these days. The Bell companies, or generically let's call them the local exchange carriers, do have long-term problems. I have yet to figure out the nice, clean answer and Greg implied the same thing.

Let's talk about the Regional Bells. There are a lot of things happening today but more so in the mid- to late-1990's. I think it will be business as usual for the next two or three years. I think the Regional Bells will have modest growth, maybe five percent; it won't be minus two but it won't be plus ten either.

I think dividend growth will be slow. They are paying out too high a percentage of their earnings in dividends. My concern is not the next few years but rather where I think the evolution is going to go. It is impossible to predict ten years into the future, given the tremendous state of flux of the industry; but I'll give you my view of the world and we can use that as a basis for discussion.

Overhead I: There are three spheres of things going on. Technology is changing. The market place is changing; people are not satisfied with the throughput they are getting nor are they satisfied with one vendor anymore. The regulatory policy realm is important also. These are not separate spheres. They all interact. Caught in the middle of all of this are the economic questions of who can do what under what conditions and what technology is doing to costs, etc., determines what the business case is, which in turn determines how much demand there is. It is very difficult to say what is going to happen precisely. I'll take a stab at it, though.

Overhead II: These are rough numbers. If you look at a phone company on the phone side, not including their diversified operations, most phone companies have roughly forty-five percent of revenues from local service. The second category is access charges at thirty percent. This is a very profitable business. How profitable they won't say; but it is extremely profitable by all secondary indications. Local toll calls are next, at about fifteen percent of revenue. Then there are "other" operations at about ten percent which is primarily the yellow pages. This also tremendously profitable, with huge operating margins. We'll leave directory out of this discussion, so we'll talk about the other ninety percent.

Over the next decade, I see four classes of strategic competitors, those who are sustainable and can do the most damage over long periods of time. One category are the ALTS, alternative local telecommunications services providers. Previously, these were referred to as bypass companies, just handling access, whereas a ALT is an alternative communications company, meaning many services. They are now in the pay phone business, the local exchange business, and they'll be in the switched services business, etc.

The next category are the wireless companies. Someday, perhaps by the end of this decade, I expect to see five or seven different types of wireless players, in all kinds of market niches, with different levels of prices, in the market. The market for cellular phones is important to understand. I'd note that over many decades, we've gone through numerous generations of technology in the phone business but we never changed the valuation just because the technology has changed. Now cellular comes along and it is somehow considered magically different. From my perspective, on one hand, it is just a phone; but it is also a competitive phone network. My point is that when the FCC issued the two cellular licenses in the early 1980's, they broke up the traditional phone monopoly but nobody noticed. We haven't had a monopoly structure for ten years. The cellular companies are not doing damage yet, i.e. cannibalizing traditional phones; but, at some point, if the functionality of cellular phones increases and if prices fall, people will switch to wireless phones and away from corded phones.

The cable industry is undergoing a major transition from being a program broadcast provider to a communications company. They have a network. Why should they constrain themselves to thinking of themselves only as a cable company? It is the old marketing myopia: are we a railroad company or a transportation company? Am I a cable company or a telecommunications company? They are evolving in all kinds of ways to try to meet this challenge. They are trying to use their networks to compete in the local access business.

Then there are the long distance companies. At the time of the Bell System break-up, there was a kind of unspoken stand-off between AT&T and its former subsidiaries. The long distance company wouldn't bypass the Bell companies as long as the Bell companies kept buying the long distance company's equipment. You couldn't put that in writing because that is anti-trust but that is implicitly what the agreement was. That didn't last long because their strategic interests started to diverge and we all know that AT&T is taking a real beating in market share with respect to the Bell companies in telecommunications equipment.

There is an array of competitors on one side going after the guts of the phone business on the other side. The phone company wants pricing flexibility to lower access prices and raises local prices; but that is only a temporary solution because it creates a window for the wireless and cable companies to compete in local markets. My suggestion to the Regional Bell companies is not to lower prices but to significantly lower their expenses -- perhaps by as much as thirty to fifty percent and improve their productivity.

Overhead III: The problem with the ALTS, of which there are about twenty-five companies, is that very few people know they are out there because they are not public companies. The middle column shows ownership. Three years ago, these were small, entrepreneurial companies funded by venture capital. That is changing; ownership is going to large companies. The big money has started to flow into the business. It is a big money business, requiring a lot of capital. So, the dynamics of ownership and where capital is coming from is changing dramatically. The last observation, from the column from the far-right, is that everyone thinks of this as a metropolitan problem centered in areas like New York City or maybe Chicago, maybe L.A. That is not the case. The range in city size is broad, as you can see. This is no longer a big city problem.

Overhead IV: Not only are there four classes of strategic competitors for Bell companies -- the telcos, wireless, cable, and long distance companies -- but they are converging with each other, which makes them a powerful and dangerous competitor for a Bell company. One of the ones I would like to talk about is Teleport, and companies like it. They have a corporate structure which they have built and now they are franchising it city by city. They go into one city, put in wires between the big buildings in the financial districts and downtown areas, and then they are putting in switches. Then the cable companies in the suburbs use their suburban networks as a platform to offer voice, data, and switching by funneling the traffic through the Teleport switch. Switching is complex. This way, the cable companies don't have to get into the switching business directly. This

hasn't fallen into place yet but it will soon. I could envision all of these groups converging. Policy changes someday will include the reversal of the Cable Act, undoing the MFJ, etc. Even without political change, though, there are business problems. The Bell companies have to find ways to compete with a switched broad-band network, which means getting rid of the copper and putting in fiber.

Overhead V: There will be a range of wireless players, including satellite. Think of a satellite-based network as having one central office in the air with a giant footprint all over the world, in Latin America, Europe, the U.S. The bottom chart is not meant to be taken too literally. It is meant only to demonstrate that we should not be myopic, looking at the world as a cellular duopoly, but rather we should anticipate a range of wireless players with different pricing, features, and functionality. Picture VB is from a paper that I wrote in 1991, focusing on the question of whether or not AT&T would be able to compete in the wireless market. We were talking about a seamless nationwide network and what that vision entailed. Wireless will one day replace some regular and cordless phones in the home. It is a pricing issue, not one of technology, since both types of phones essentially do the same thing. The vision of multiple calling zones and people wandering between them is the one that AT&T has for the future. The pricing is a problem now but I think that the market will take care of that.

Altman: As the only non-ex-AT&T employee around, let me try to throw a different spin on this. I would like to start with regulation. About six years ago, it occurred to me that the only way one could look at the local exchange business intelligently was to analyze regulation so I did something that my wife has lived to regret. I conned her into going into business with me. We talk regularly with regulators and I'd like to give you a synthesis of what I see as that point of view.

Regulation will change. It already is changing. It will go from rate of return to price regulation. The price regulation will be the maximum price that the telephone companies can charge for their service. That is a major change from what we are used to in this country and consumer groups are going to argue against it. The reality of the economic and technological environment is that that is the way things should and will go. Andy Barrett, one of the FCC commissioners, delivered a powerful address to the Florida Economic Club in August if anyone is interested in getting his paper from the FCC. The essence is that we get rid of cross-subsidy, depreciation schedules and capital recovery issues. Increased service quality as well as a fair and equitable price will be the foundation of the new regulation.

Telephone companies today for local service charge between a penny and a half a penny across town. No one will be dumb enough to build a competing network at that level. No one could compete. Will the telephone companies raise their local basic exchange rates in order to cover toll rates? That would invite competition in the local exchange market and it is politically unacceptable. So the telephone companies will swallow the eduction in the toll rates and hope that they can make this back in unit volume growth. I suspect that they will make back some

of it this way and some of it in cost reductions. The mistake that many people make in looking at the phone company is that people look at different services and determine different levels of profit.

The fact is, all of the cost allocation is artistic. Nobody really knows. This is a fixed cost business. There are n number of switches, x number of workers. These business can tell you how much their costs are going to be at the beginning of the year. They cannot tell you what their revenue will be. Revenue becomes a function of how many subscribers there are and on the usage patterns. Lately, it will also become a function of whether or not they can sell add on services, how much revenue they can get per access line. Think of it like a hamburger stand. Each telephone is a hamburger stand and the number of things that run through that stand determines revenue and it costs so much money to open the door every day. The phone companies will work hard to reduce prices and fixed overheads but they'll also try to increase traffic. Upping the speed through the line, selling movies at much more than the actual cost of transmission using the same copper wire used for local phone calls, can greatly increase revenues while keeping local toll costs low. This increases capacity utilization.

Joel mentioned the unconscionable profitability of the directory business. It is as profitable as any drug business in this country. It is about 40 percent margin of return on assets. Almost all of the advertising is local and it is a ten billion dollar a year business for the telephone companies. This could triple, by making it electronic delivery. This is why the telephone companies want to get into video on demand - because this can become electronic yellow pages. In thinking about the Bell operating companies, I wouldn't assume that the world is only voice transmission. The world is transmission.

Though fiber optics are in the business loop, they account for only about 200 million dollars in revenue out of 100 billion dollar business. The phone companies will use fiber optics and will do everything necessary to be competitive in the business market place for data. Is that business going to go to cable companies? Not with the historic credibility of cable companies for reliability of service. Phone company reliability rate is 99.997 percent of the time, compared with a norm of about 85 percent for the cable companies. There will be competition at the local level and the phone companies will lose some market share but the business will not be inhibited by regulatory constraints. The pricing will even out and the volume that will go through all of these networks will increase substantially.

I'm not a bear on cellular; I'm actually a bull here. But for our purposes today, we are looking for new investment opportunities, not just those in the existing big capitalization arena. I disagree with Greg. I think the Bell operating companies are going to see significantly positive growth in the next few years. I agree with Joel that not all of the companies are the same. This has been, in the past, a homogeneous industry. That is no longer true. In the future, it is going to be a heterogeneous industry. There will be discrimination from management. There will be some who will play it right and others who will play it wrong. I think

in ten years there may not be ten Bell operating companies. There may be five or six. Some will be squeezed out.

Q: You have given us a compelling case as to stocks to sell. Can you give us a case of the stocks to buy.

Sawer: AT&T before MCI was a world wherein computing power, intelligence, was very expensive and transmission was very cheap. As a result, only AT&T could afford intelligence. So, every time you wanted to place a call, you had to ask AT&T's brains how to do that. Not surprisingly, AT&T's brains suggested that you use their transmission systems. That's what has kept the monopoly in place. In that sense, AT&T is responsible for its own undoing back in the 1950's when they invented the transistor. This made brains cheap. Putting into many more people's hands these cheap means of transmission broke up the monopoly and it has been downhill since. Everything we have talked about today is about introducing more brains into the system and into the local distribution system.

In that context, I would own a portfolio of stocks that includes everyone who is going to pile into this business of providing alternative brains. I think you would do quite well owning a diversified portfolio of stocks that includes cellular, long distance, international companies, etc. I think all of these companies are going to do quite well.

Gross: I endorse what Greg has said. The technology is changing so quickly that if you're going to go with hardware companies, you have to diversify. Also, in situations like this, the incumbents tend to lose until the market restabilizes. That essentially was the AT&T story. It took AT&T through the 1980's to shift from a monopoly to a competitive mode. I don't think the Regional Bell companies have that much time. On the entrepreneurial side, the ALTs still aren't public. They look like the next MCI and many would like to invest here but that is a problem when companies are not public. Also to endorse Greg, investing in intelligence also means investing in software companies. There is much value here, particularly with systems integration types of software.

Q: I have been in telecom applications. I heard your comments on the possible information market place developing by the year 2000. I sense a lot of enthusiasm in the technology investment community with the change of administrations. I don't feel the same excitement when I compare the video text equipment with the artificial intelligence equipment. Will we see some video text?

Altman: The problem with being in the securities business, especially with a firm that is also in investment banking, is that you run up against something called the Chinese Wall. There are things that you find out about when you're consulting with companies that you can't write on and you can't speak about. I will have to answer your question in generalities. The telephone companies are currently in

very extensive negotiations with a lot of the print media companies.

In the next few years, print media companies will look at their distribution costs and will come to understand that that represents a very large part of their overhead. What does a print company do best? They aggregate information and classified advertising. The best method of delivering that might not be along current lines. To maximize current skills and minimize current shortfalls, electronic distribution may be best for delivering information. Think about this: why does the Wall Street Journal have a side bar every single day offering to load up a voice mail box, giving you a customized information package? Because the people who run the Wall Street Journal think the print media over the next decade or so is a dinosaur, so they are already beginning to position themselves in the new market.

I would also argue that customized information may be worth more money than the money you spend for your newspaper. If you had it delivered to your home, either audio or fax, and by the way I think fax is the next big consumer electronics market, you would get your newspaper delivered every morning but with all of the information you want. This is not that far away. The same gateway also allows you to communicate back up, then you have transactions and that is where it really begins to snowball. So, I agree with you. I think this business is about to take off.

Sawer: There is not much I can add to that. Well said and I agree.

Gross: The only problem with video on demand is that the incubation period tends to be much longer than anyone ever imagines. Second, coming out of a long-standing monopoly environment means that the Bell companies are not world class marketing outfits. They don't understand pricing, demand, etc. The Bell companies blamed their problems on Judge Greene. He wasn't the problem with video text. It was a terrible service. I'm not sure that video on demand is a great service the way they have it defined. It is essentially just a remote VCR. It is the old concept of computer time sharing, this time using VCRs for video instead of dumb terminals for data. They still have a lot to learn about being in a competitive not a monopoly environment.

Altman: Talking with regulators in D.C. as well as with many in the phone companies, not just financial types, I have found that the phone companies have actually begun to hire some smart people who know how to do consumer product research. They have listened closely to potential users and have responded effectively, particularly in revising the marketing and the nature of ISDN. I think we will see a lot more of this in the future. They have learned that they don't drive technology anymore.

Q: Until this last round, there were two words that hadn't been mentioned. Those words were fax and ISDN. How much impact has fax and second phone lines had

on the Bell operating companies and how much is it likely to have in the future? I'd like some substantive comments as well on the prospects for ISDN. This technology seems to offer some short term strategic advantages for phone companies; yet it has been ten years in coming and we seem to still have problems in getting this on a national level.

Sawer: The big problem with ISDN is that the telcos have traditionally treated this as a technical improvement to the network and have tried to market it as such. By doing so, they have ignored the question of what the real improvement in someone's life would be and so what marketing strategy to use. It is technically nice to have but entirely without demand.

Gross: The technology came out of the labs. They were trying to improve call completion and to help the long distance networks improve productivity. Then, once they had improved long distance services, they tried to think of ways to apply the technology to other uses. It was always a technology looking for a market to help spread the cost of the R&D back out.

Sawer: On your other questions regarding faxes and second lines, if I were a regional Bell, I would take 90 percent of my staff and make them spend 100 percent of their time thinking up things like that. Those have been tremendous successes. It is the only way they will be able to solve the problems that lie ahead.

Gross: This is a high fixed cost, almost zero marginal cost business. The first phone call costs a fortune and the rest that follow are essentially free. I am exaggerating but not by much. If you have a high fixed cost and you can leverage that in terms of new volume, it becomes very profitable. But, if you have a high fixed cost and you start losing share, your price umbrella comes down, you can be cut to ribbons. Where does that net out is the question. Those are the economic forces surrounding both sides of this debate.

Q: What are your thoughts on innovations in switching?

Sawer: I personally would not go out and buy stock only in companies involved in switching, since the ability to switch information is turning out to be quite straightforward at very high band-widths and very high rates.

Altman: The switch that you described that can transmit as much information as the entire long distance network is interesting. The Fujitsu probably has thirty to fifty times the capacity of an AT&T 5ESS switch in terms of throughput; but it is also stupid. That is why it is so good because it is not encumbered by intelligence. The intelligence goes into an adjunct processor. This is another good area for investment.

Q: The key to revenue growth would be new services. One wild card here is internet, the global academic unit. Where does this come into your thinking?

Altman: I think this will be part of the telecommunications scene and when you look at the world market place, there will be multiple networks of which internet will be one. The question will be which offer the best pricing and the greatest throughput. That is only one small part of the discussion because this is going to drive the price of transmission to nothing. The value to the network is to hang things on that transmission. If phone companies just think of themselves as commodity transport businesses, it is only a matter of time before they will be bankrupt. If they think their business is to have a high capacity transport network that is well managed, that has value added, then they will make a lot of money. Internet just helps drive that down faster.

Gross: The price could drop substantially. At the same time that the phone companies have to invest capital to buy those ATM machines and the fiber, the adjuncts, the processors, and the software, hence their capital requirements are going up, but their prices are going down. If they can't drive revenue up at the same rate, there is a net loss. They have to be careful so that they don't end up in the commodity transmission business. The trick is how to create value. That is a much more difficult equation, one, I would argue, in which the phone companies have not had much experience with. They will have to learn this. Getting back to faxes, there will be expanded use here but most of the revenues will go to the long distance companies due to flat rate pricing at the local market. And for ATMs, it is important to remember that anyone can buy these. It is not an exclusive technology; it is available to all of the players.

Sawers: On the issue of how phone companies measure volume growth, it is worse than just that some of the phone companies are on flat rate pricing. Some of the phone companies are actually consciously moving to this. They want to cut down on toll traffic and get into extended local calling areas. When we sit here and talk about increasing volume, either we are right or they are; but we are not both right about how to approach this problem.

If they move to a system of price caps or they get into a competitive business where volume growth suddenly becomes very important, productivity is the key to both of those. Wouldn't they want to increase the number of minutes of use, since this grows much faster than the number phones. Yet they are consciously moving away from this. Why? Because they see competition coming to the toll market and their response is to take something and declare it no longer toll, to call it local. That is how a monopoly reacts. As Ron pointed out, some of the companies get the game right. Others do not. Those that do not will fail.

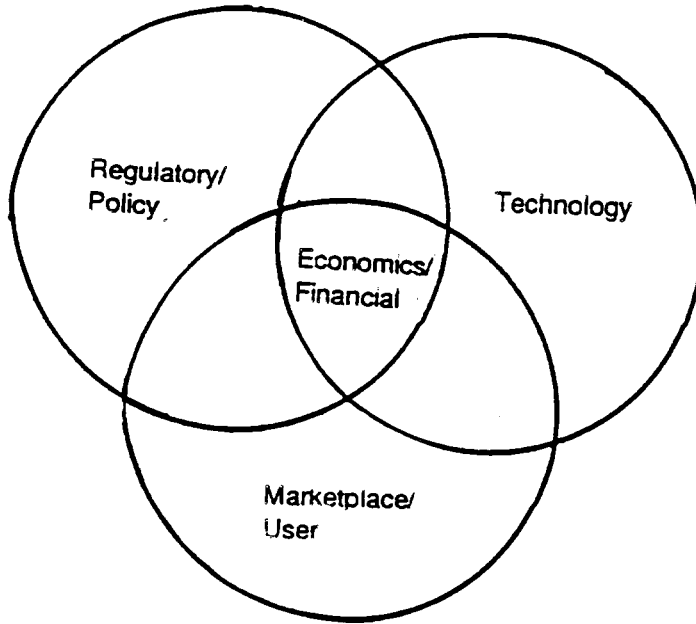
Altman: Anybody who wants to understand this, get Ameritech's pricing structure in Illinois. It is entirely measured usage.

Sawer: Or get Bell South.

Marsh: Thank you very much!

VIEWGRAPHS SHOWN BY MR. JOEL GROSS

I

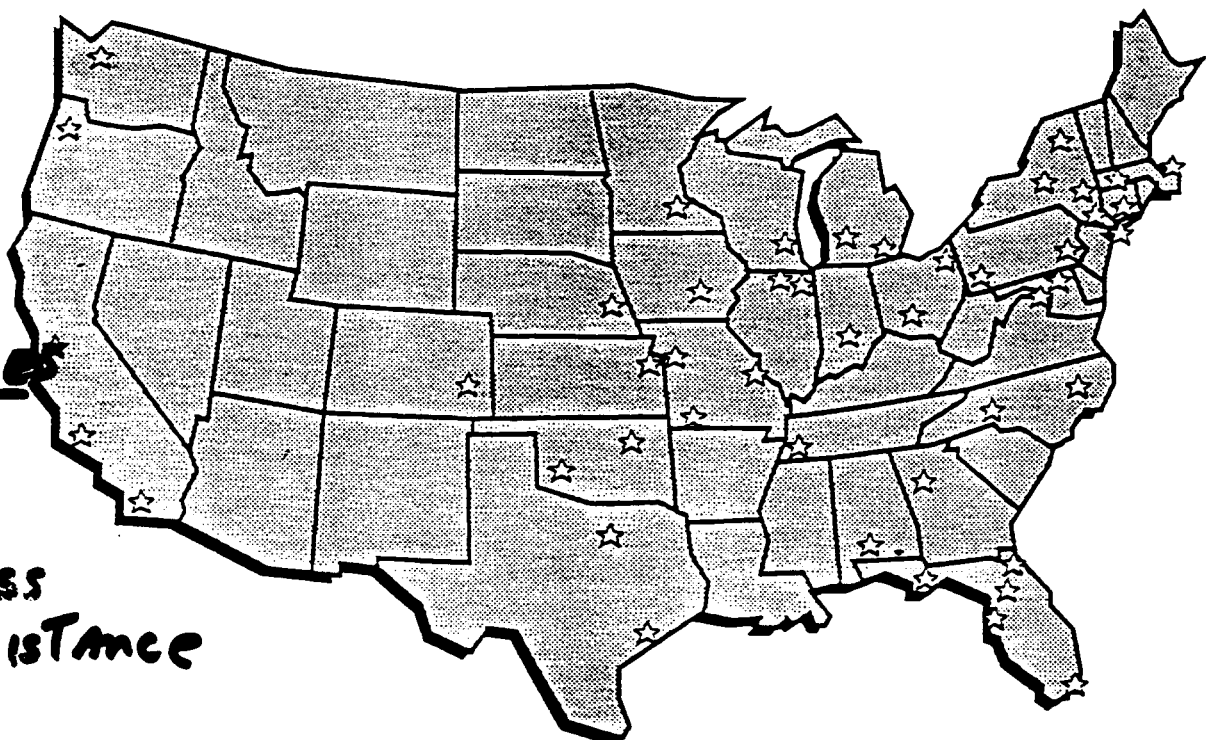


II

GENERIC TELEPHONE COMPANY INCOME STATEMENT

<u>% OF REVS</u>	<u>% OF PROFITS</u>	<u>REVENUE CATEGORY</u>	<u>CLASS OF COMPETITION</u>
45%	<45%	LOCAL	ALT
30%	>30%	ACCESS	WIRELESS
15%	>15%	TOLL	CABLE
10%	≥10%	OTHER (DIRECTORY)	LONG DISTANCE
100%	100%		

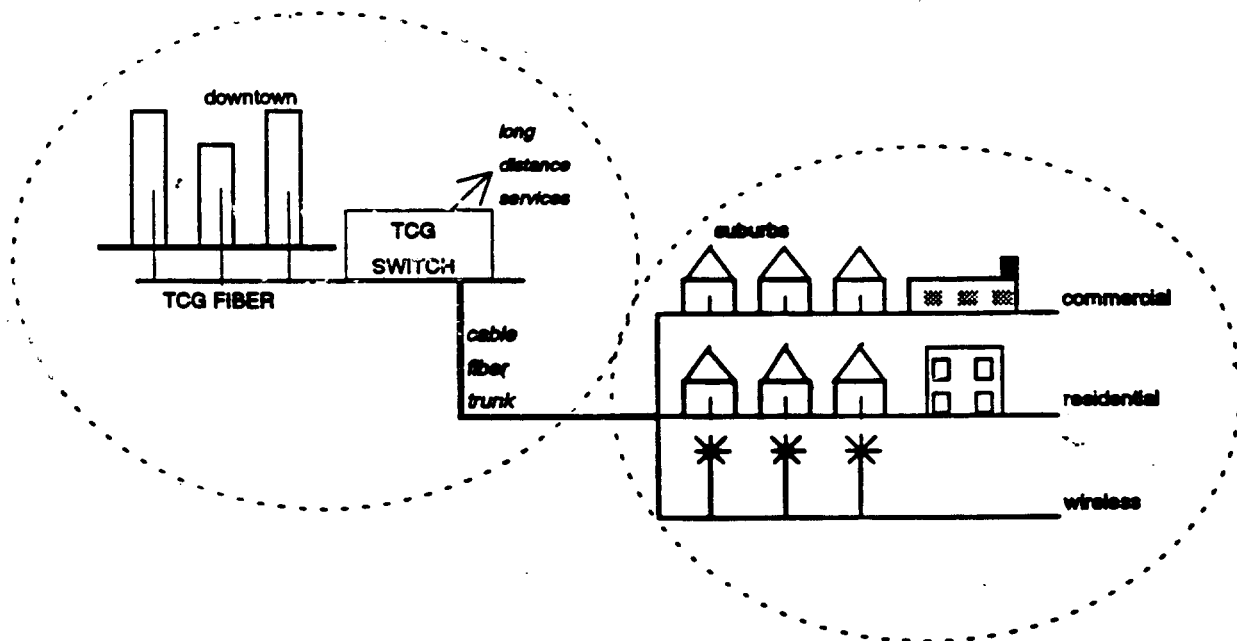
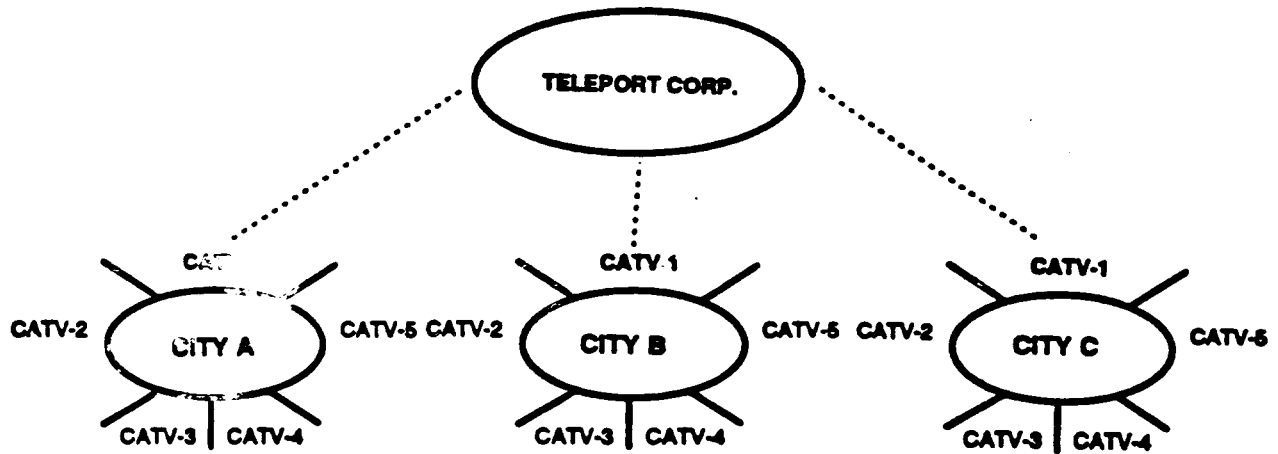
BUT DEREGULATION BRINGS COMPETITION . . .



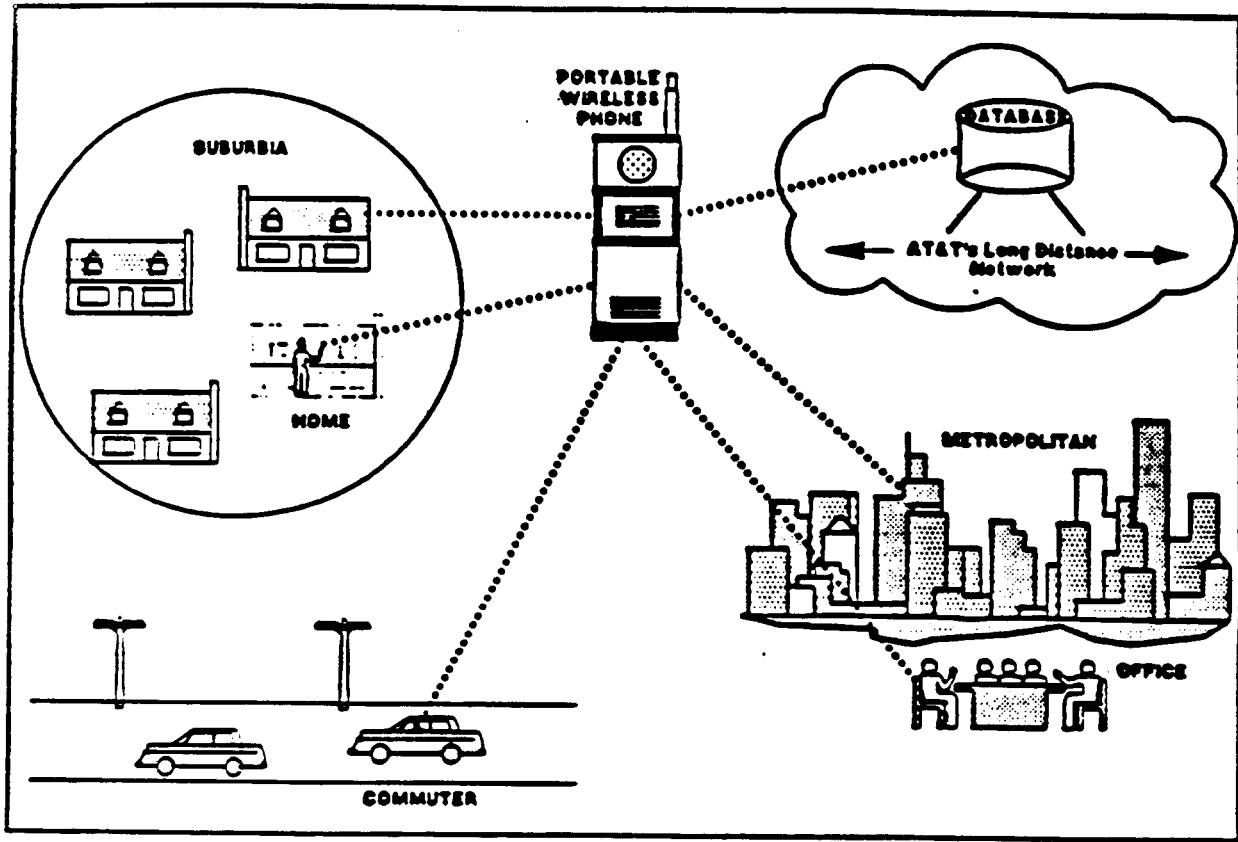
4 classes
 ALT's
 Cable
 Wireless
 Long Distance

<u>Company Name</u>	<u>Ownership/Investors</u>	<u>Cities Where Operate</u> (c) = under construction
Bay Area Teleport	Pacific Telecom	San Francisco
City Signal	entrepreneurs	Grand Rapids, Detroit
Diginet	Harold Sampson	North Shore of Chicago; Milwaukee, Kenosha, Racine, Wisc.
Digital Direct	Westmarc Comm./TCI	Seattle; Dallas; Chicago; Sacramento
Eastern Telelogic	venture cap; New York Life Ins.	Philadelphia & 4 counties: Montgomery, Philadelphia, Chester, Delaware
Electric Lightwave	Citizens Utilities	Portland, Seattle
Fibernet, Inc.	Rochester Cable (ATC)	Rochester, Buffalo, Albany(c), Syracuse(c)
Institutional Communications (I.C.C.)	now part of MFS	Washington, D.C.
Indiana Digital Access, Inc.	60% ATC, entrepreneurs	Indianapolis, Terre Haute (c)
Inter-Media Communications	public, New York Life, venture cap.	Orlando, Tampa, Miami (c), Jacksonville (c)
IOR Telecom (Iowa Resources)	Iowa Resources	Des Moines, IO
Jones Lightwave	Jones Cable	Atlanta
Kansas City Fiber Net	American Cablevision	Kansas City, Independence, MO.
Metrex Corporation of Atlanta	now part of MFS	Atlanta
Metrex	entrepreneurs	Birmingham, Huntsville, AL
Metro Com		Columbus, Cleveland (c), Akron (c), OH
MFS (not including I.C.C.)	80% Peter Kiewit and Company, entrepreneurs	Pittsburgh, Philadelphia; Chicago; L.A., San Francisco; New York City; Dallas, Houston; Boston; Baltimore; Washington, D.C.; Crystal City and Reston, VA.; New Carrollton, MD; Minneapolis; Atlanta (c)
New England Digital Distribution		Boston, Cambridge MA
Ohio Linx	entrepreneurs	Cleveland, Dayton (c), Toledo (c), Akron (c), OH
Penn Access Corporation	TCI/Digital Direct	Pittsburgh
Phoenix Fiberlink	Phoenix American	Sacramento (c)
Public Service of Oklahoma	P.S. Oklahoma	Tulsa
Teleport Communications Group	Merrill Lynch; to become TCI, 49.9%, Cox 50.1%	27 municipalities: New York (5 boroughs); Garden City, L.I.; Boston, Cambridge, MA; Chicago; L.A., San Francisco; Houston, Dallas; NY-NJ Corridor: Jersey City, Newark, North Brunswick, Princeton, Weehauken.
Teleport Denver	Intertel Communications Inc.	Denver

The convergence of four strategic competitors--
alternative local telcos, wireless, cable, long distance



V B



V A

