How the Rapid Changes in the International Telecommunications Industry Are Impacting the Market for Callback Systems

E.K. Morice

Lynn University

Follow this and additional works at: https://spiral.lynn.edu/etds

Part of the International Business Commons

Recommended Citation
https://spiral.lynn.edu/etds/62

This Thesis is brought to you for free and open access by the Theses and Dissertations Collections at SPIRAL. It has been accepted for inclusion in Student Theses, Dissertations, Portfolios and Projects by an authorized administrator of SPIRAL. For more information, please contact liadarola@lynn.edu.
HOW THE RAPID CHANGES IN THE INTERNATIONAL TELECOMMUNICATIONS INDUSTRY ARE IMPACTING THE MARKET FOR CALLBACK SYSTEMS

A Graduate Project Submitted
to the Graduate Project Committee
of the School of Business as
Required by MIM665

by

E.K. Morice

Lynn University, School of Business

September 25, 1995
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td>i</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>ii</td>
</tr>
<tr>
<td>CHAPTER 1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Introduction to area of interest</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>7</td>
</tr>
<tr>
<td>CHAPTER 2. LITERATURE REVIEW</td>
<td>9</td>
</tr>
<tr>
<td>Introduction</td>
<td>9</td>
</tr>
<tr>
<td>Barriers to International Callback</td>
<td>10</td>
</tr>
<tr>
<td>Privatization of Foreign PTT’s</td>
<td>11</td>
</tr>
<tr>
<td>Cellular Phones and Callback</td>
<td>16</td>
</tr>
<tr>
<td>Manufacturers of Equipment and Software</td>
<td>17</td>
</tr>
<tr>
<td>CHAPTER 3. RESEARCH METHODOLOGY</td>
<td>19</td>
</tr>
<tr>
<td>Data Needed for Research</td>
<td>19</td>
</tr>
<tr>
<td>Location of Required Data</td>
<td>19</td>
</tr>
<tr>
<td>How Data Was Collected</td>
<td>20</td>
</tr>
<tr>
<td>How Data Was Used</td>
<td>20</td>
</tr>
<tr>
<td>CHAPTER 4. RESULTS OF RESEARCH</td>
<td>21</td>
</tr>
<tr>
<td>The Callback Market</td>
<td>22</td>
</tr>
<tr>
<td>CHAPTER 5. CONCLUSIONS</td>
<td>25</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>28</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>31</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Introduction to Area of Interest

This paper will discuss how economic, legal, and technical changes in the telecommunications industry will impact the market for International Callback Systems. "Callback" has been defined as any long-distance service in which a price advantage is achieved by changing the billing point of the call.¹ International callback involves two or more different countries. International callback exists because foreign telephone rates are generally much higher than American rates. Aiming to exploit this spread, a callback provider creates an American-based, automated service that "sells a US dialtone" to overseas customers, at a markup. The client saves money, and the provider makes money.² Callback is not a new concept. People have used many informal methods to redirect billing over the years, but callback was not offered commercially as a service until 1986.

Reliable and rapid communication is vital to all businesses regardless of size. A small "mom and pop" hardware store must reorder inventory often, usually by telephone. General Electric must be in close contact with its personnel, customers, suppliers, and many other entities in many different locations around the world. Instantaneous communication is taken for granted in the United States and in several other developed countries. We accept rapid, inexpensive, reliable communications as a normal, everyday process.

Unfortunately there are still many countries where even placing a telephone call is a true challenge. This is largely due to the fact that in the majority of foreign countries the telephone companies are owned by the government. Since there is little or no competition there is no incentive to improve service or to lower long distance telephone rates. Many countries around the world are years behind in their communications systems technologies. Nevertheless the rapidly expanding global economy is highly dependent on reliable telecommunications. Imagine a large multinational company such as McDonald's or Gillette trying to cultivate overseas markets where communications are high-priced and inefficient! Governments of countries that lack adequate facilities are seeing their economic growth rates fall behind their more progressive neighbors. In fact, the total number of telephones installed in a country can often provide a better barometer of the economic development than per capita income. Thus it is the dramatic growth of international trade and finance that is driving the development of telecommunications in most countries around the world. A telecommunications revolution is beginning and International Callback Systems are becoming an important segment of this revolution.

**Background**

Callback or call reversal is not a new telecommunications concept. In the fifties, various systems were devised by college students who wanted to call home but wanted their parents to be billed for the call. “Two rings and then hang up” would be a typical message for the parents to call back to the student. In the sixties business owners found

---

ways for their field representatives to get messages to the home office either without a long distance call or for the best available rate. This became known as “code calling”.\(^5\) AT&T and other carriers were not happy with the resulting loss of revenue and tried to persuade the Federal Communications Commission (FCC) to make code calling illegal. Although regulations have never been passed to ban the practice, flagrant violations of carrier filed tariffs fall under existing wire fraud laws.

It is important to understand code calling because it is the premier technological underpinning of callback. Most international service providers have agreed that regardless of where a call originates and terminates, if it isn’t answered, the caller doesn’t pay for it. Conventional international callback services use such unanswered phone calls as signals to trigger their equipment to call back whoever called, providing a US dialtone over a second trunk line and disconnecting the original line.\(^6\) Code calling gives the service provider an easy, and more importantly, cheap, method of allowing a non-US caller to signal that he wants service. In its simplest form, the service provider assigns a unique US telephone number to each subscriber. When the subscriber wants service, he simply dials the number, lets it ring a few times and hangs up. As long as the telephone line on the US end is not answered, the non-US subscriber never has to pay for the call.

It is difficult to determine an exact date as to when callback actually started as a service. The providers of callback services have always been worried about whether or not the FCC would start enforcing the FCC 214 Tariff with respect to wire fraud. As a result their solicitations have been made very discretely and hard copy of advertisements is

quite rare. Many people credit Viatel, now one of the largest callback companies, as the first to offer callback commercially. Others say that the 1-800 operator assisted system offered by Gateway USA was the first. Strange as it may seem, AT&T introduced a service known as USA Direct in the United States in 1984. “So AT&T was the first significant callback company! Considering AT&T’s apparent position since then, this is quite a revelation. AT&T has never taken a position against international resale itself, or against callback, just against the practice of code calling”7 USA Direct uses a “call through” technique, utilizing international toll free access to the carrier’s facilities. This is still reversing the direction of the call, since the 1-800 usage charges are incurred in the US end of the initial call. Miami, Florida is currently a hotbed of callback activity with many service providers in operation.

In most foreign countries the telephone companies are owned by the government and the government also regulates them. The telephone companies in these countries are known as the “Post, Telephone and Telegraph”, or PTT. In other words the post office and the telecommunications company are the same. With this system, there is no competition which has the following results:

(a) Service may be seriously inadequate. In Pakistan, for example, people sometimes have to wait up to 10 years for a telephone line.

(b) Telephone service may be extremely unreliable.

(c) Telephone rates are normally much higher than they are in the United States.

It is, therefore, an advantage to be billed at the US rates for calls originating in countries with PTTs. The difference between billing at US rates and foreign rates can easily be

100% or more. As an example, a recent advertiser claimed a ten minute call during peak hours from Brazil to New York would cost $48.73. Using callback service this same call would cost $11.97 for a saving of 75.4%.8

Telecommunications is a vital component of building a thriving international economy.9 To expand and grow, companies are looking offshore for new markets. Communication expenses grow rapidly when foreign countries are involved. It is important that managers working for a multinational company understand the role that callback will play in their ability to operate profitably around the world. Callback represents a satisfaction of the worldwide need for cost-effective communications.10

Two major obstacles have limited the commercial development of international callback until the mid-eighties:

1. Legal aspects of using callback; and

2. The availability of reasonably priced reliable equipment.

In the first case, recent rulings by the Federal Communications Commission (FCC) have at least partly resolved the question of the legality of international callback. On April 27, 1995 the FCC adopted a ruling that confirms that international “callback service using uncompleted call signaling violates neither US nor international law. It said that call-back is in the public interest because the resulting competition between US callback providers and foreign carriers charging higher rates ultimately lowers foreign rates to the benefit of consumers and industry both abroad and in the United States.”11 The FCC added,
International Callback

however, that US-based callback operators may not provide callback using uncompleted call signaling in foreign countries where this offering is expressly prohibited by law.12

Secondly, new and innovative callback equipment is rapidly becoming available. Slow and outdated mechanical switches and twisted-pair type wiring are rapidly being replaced by highly developed multi-feature equipment using the latest telecommunications technology, including high-speed electronics digital switches, fiber optic cable, and satellite transmissions. Speed, quality of service, and reliability are improving dramatically.

The supply of telecommunications services available has increased dramatically as regulators are agreeing on numerous aspects of liberalizing policies. An example is the recent permission that has been granted by the FCC13 to provide basic services via various forms of international resale. Many countries are “privatizing”, by transferring ownership and or operation of government-owned telephone enterprises to private owners or operators. New international network arrangements resulting, for example from callback and international simple resale, are allowing entry into markets that have been “closed” to traditionally facilities-based operations by foreign carriers.14

Statement of the Problem

When callback emerged in 1992 in its present largely machine-mediated form, the difference between most foreign and US rates was large enough that providing callback

---

13 Ibid.
services was a good business opportunity. Today, it is probable that providers' margins have been driven down by increasing and more intelligent competition. The European market with its fairly modern infrastructure and fairly liberal attitudes is rapidly opening up to level-field competition. There are those who say that the European market will cease to be of interest to callback providers in as little as 18 months.15

As countries privatize their telephone systems, competition normally drives the price of telecommunications down. As this happens the demand for callback diminishes. The immediate assumption might be that the market for callback would also diminish. This research will look at the forces that work against the callback market as well as the forces that tend to increase the market. To do this it is necessary to compare data on countries that have little or no telecommunications competition, those that are being privatized, and the potential size of the callback market.

**Definition of Terms**

**Analog** The standard method of transmitting a radio phone call. The call is converted into electrical impulses that travel in the form of electrical waves, which are analogs (analogous) to the sound waves that originate the voice.

**Bandwidth** A range of radio frequencies occupied by a carrier wave assigned to a service.

**Callback** Any long-distance service in which a price advantage is achieved by changing the billing point of the call. The technique that is used is to send a code that triggers a return call.

---

Call Through In this mode of operation, the user calls a toll free number, is asked for an account number and PIN by a voice response device, and after verification, can make one or more calls. This method of access does not require a callback, code calling or other “questionable” practice.

Code Calling Unanswered phone calls used as signals for the person being called to call back whoever called.

DID Direct Inward Dialing. A special service offered by a local exchange carrier that allows an inward call to a PBX, for example, to directly connect with a specific station user.

Digital Switch A solid-state electronic switch with no moving parts.

FCC Federal Communications Commission. The regulatory agency for all communications in the United States.

PTT The government owned post, telephone and telegraph company in most foreign countries.

PBX A private communications network installed in a firm. Most modern PBXs operate in a digital manner and can transmit voice, data, text, images, and other types of information over a network.

Simple Resale Sale of time by the owner of a switch to a purchaser who does not have a switch.

X.25 A world wide communication network capable of supporting thousands of connections at one time. This is the ultimate in a party line that stretches to the four corners of the world. They are very nearly real time and relatively inexpensive.
CHAPTER 2

LITERATURE REVIEW

Introduction

The telecommunications industry is full of contrasts. Technology varies from the most sophisticated — such as satellite transmission to Deutsche Telecom’s antique mechanical central office switches. The market for telecom services varies from highly competitive, as in the United States and Britain, to completely protected as in countries using PTTs. The industry is changing rapidly in several major countries due mostly to deregulation of the government owned or highly monopolistic phone combines. For example, India announced recently that it “wants to become one of the world’s most open and competitive telecommunications markets.” 16 India currently has one of the highest number of citizens per telephone line of any major country in the world.

Callback, within this huge industry, is a relatively obscure service. Callback operations started as an option for US business customers who tired of paying high monopoly rates for international calls. International callback is a form of non-traditional “carrier” operation whereby callback service providers buy network minutes in bulk from large US long-distance line providers such as MCI, then resell those minutes to users of callback. The callback “industry” is made up of both service providers and the manufacturers of the required equipment.

16 Peter Waldman, “India Seeks to Open Huge Phone Market.” The Wall Street Journal, July 25, 1995, A9
**Barriers To Callback**

Even though callback providers represent less than 1% of the international long distance market, AT&T and a consortium of Central American PTTs complained to the US State and Justice departments that callback resale is illegal. In response to this complaint, the FCC ruled that callback conforms to international law, principles of international comity, and International Telecommunications Regulations.17

Although the legal barrier has been lowered to some degree by this recent ruling, there are other barriers to overcome. The current state of callback art is that it depends on touch-tone dialing as opposed to non-touch-tone (also known as rotary or push-button). Unfortunately, touch-tone is not as prevalent in many countries as it is in the United States. PTTs, in some countries, actually use the lack of touch-tone as a means of limiting competition even though most phones sold around the world today are capable of either touch-tone or dial pulse operation. Many PTTs fail to realize that by limiting touch-tone they are passing up considerable long distance revenue. To get around the touch-tone problem, callback providers encourage the use of inexpensive adjunct touch tone dialers. Callback operators are also watching the development of voice recognition systems. Unfortunately the quoted accuracy of voice systems is at best 90%-95%.18 Considering the number of digits that must be dialed for an international call, the probability of an error due to voice recognition technology is very high.

---

One of the first countermeasures instituted by a PTT in an attempt to shut down callback operation in their country was to block all calls out of their country to certain area codes and exchanges in the US. Unfortunately, when a PTT blocks calls to a certain exchange, all calls to that exchange are blocked - not just callbacks. Callback operators are ingenious. One country blocked all calls to a midwest exchange from receiving code calling attempts. As a countermeasure, the callback service provider got a group of DID (Direct Inward Dialing) numbers in Washington, DC in the same exchange as the country’s embassy. Blocking these calls would have shut their embassy off completely from the government!19

Another method of restricting the use of callback by a PTT is by listening to the telephone line electronically. If the device hears more than a certain number of touch-tone digits in a given period of time, it disconnects the line.20 Unfortunately, most systems used by PTTs in an attempt to stop or restrict callback operations also limit other important operations such as retrieval of voice mail by citizens of that country when traveling abroad.

Privatization of foreign PTTs

Liberalization and deregulation of telephone companies around the world is occurring at an accelerating rate as these countries begin to realize how vital having competitive systems is to their economic well-being. In the US, in spite of a few dire predictions that the entire communications network in this country could fall apart as a

20 Ibid., 73
result, the break up of the Bell System has proven to be a great experiment that has worked wonders. Consumers have benefited from increased competition resulting in improved quality of service and falling rates. This success has clearly inspired others. India hopes, for example, to strive to become one of the world's most open and competitive telecommunications markets. Their four-year goal is to triple telephone penetration which is presently only 10% of the world average. Even China's line penetration is twice India's. India, with its population of over 900 million, is a huge market for telecommunications and this has resulted in a scramble by very large telecommunications companies, including AT&T Corp., US West Inc., Bell Atlantic Corp., Nynex Corp., as well as other non-US phone companies, to capture this market. Development of telecommunications in India will not happen without problems. Progress in India is highly unpredictable due to militant trade unions and its byzantine politics.21

In Europe, telephone giants from the US and Britain and the continent are jockeying for position in anticipation of liberalizations. New joint ventures and strategic alliances, and other more exotic cooperatives are being announced almost daily but most have produced little in the way of results. The exception is British Telecommunications which has approval for most of its ventures; however protective regulations still limit competition.22

The sale of state-owned companies was an investment bonanza in Britain. This has not been the case in other European countries such as France, Spain, Italy, and the

21 Peter Waldman, "India Seeks to Open Huge Phone Market," The Wall Street Journal, July 25, 1995, A9
Scandinavian countries. Based on Britain's success at privatization, too many governments tried to unload too many companies. Share prices to the public were too high. Bad management and government interference was also a negative factor. Another factor was the fact that many European countries saw the sale of government assets as a way to reduce their large debts but failed to realize that former communist countries were also eager to raise capital for their own state-owned industries. The market was glutted with people trying to sell shares.

Although it has been argued that big companies have the economies of scale, cash reserves, and the technical expertise needed to succeed in an increasingly competitive global phone marketplace, the large phone companies are not winning all of the bids to privatize Europe. For example in June 1995, a partnership of Dutch and Swiss phone companies was awarded a 27% stake in the Czech phone company, PST Telecom. They selected what they hope to be a friendly, modern, commercial alternative to the big phone companies of Germany, France, or Italy. The Czechs reasoned that size is not the determining factor but rather the quality of service.

In this world of advanced technology, Germany stands out as an example of what a state-owned telephone monopoly can do to limit technical progress. Deutsche Telekom is still using outdated electro-mechanical switches in their telephone system. "Customer satisfaction" is an unfamiliar concept. Most advanced countries use electronic devices for

---

switching. German regulators recently spelled out how they intend to end Deutsche Telekom’s monopoly over the nation’s telecommunications market. AT&T, Bell South and large German firms such as RWE and Daimier-Benz AG are gearing up to compete for basic phone service beginning in the fall of 1998. The big question is how much competitors must pay to enter the market.

As in most countries that are announcing plans for privatizing telephone companies, the changeover will be slow. It is anyone’s guess as to how long it will be before new systems are in place and when rates begin to change. Telecommunications resellers who are involved in international callback will be watching Germany’s progress with interest. Timing will be an important issue for resellers.

Deregulation of Canada’s long-distance telephone business was expected to be bad for old monopolies such as the Bell companies. As it turns out, the Bell companies are proving to be such fierce fighters that new companies hoping to compete as a result of deregulation are hurting badly. Earnings of established companies are down and losses are piling up at even the most established of the alternative providers. As a result of the Canadian Radio-Television and Telecommunications Commission’s decision to phase in long-distance competition over the last years, and a final step last year to give “equal access” to telephone lines to all competitors, long-distance rates have plunged.

In June 1995, Sprint Corp. announced that it will form a global venture with Deutsche Telekom AG and France Telecom to offer one-stop shopping to corporations.

---


and consumers.\textsuperscript{28} It is too early to tell what this venture will do to long-distance telephone rates. This is due to the process usually followed. Typically, a country announces its intention to privatize and that it is studying the options. A task force is formed and begins to set the ground rules. Endless economic data is compiled and studied, comparing the home country to other countries that have privatized. Meanwhile government bureaucrats do not want to give up their privileges and powerful position. Callback moves in. The foreign government does not like this and appeals to the US government. This wastes more time because the US government that has long ago decided that monopolies should not exist. The government is forced to act. The government “packages” the telephone company as a business entity and sells the ownership of this new entity to the public via the sale of shares of stock.

The following are examples of countries that are in the process of privatizing or have announced plans to do so:

**Spain**

Telefonica de Espana announced that they will begin privatizing September 11, 1995 step by offering 12% of its shares for to the public. This is the first step in plans for full liberation by 1998.

**Germany**

Germany’s timetable for deregulation of their telecommunications market is to open the market by January 1998.

India

India expects that its five year liberalization program will yield $8 billion in license and access fees by the year 2000.

Canada

A year after Canada deregulated its long-distance telephone business, new long-distance carriers are struggling to gain market share.

Belgium

The deadline for submitting bids for Belgacom SA, the state-owned Belgian phone operator, is near. Bidders include Bell Atlantic, British Telecommunications PLC, and others.

Cellular Phones and Callback

Until recently, callback has been so cumbersome to use that callback providers have only targeted the end user. US providers of callback services have begun striking wholesale deals with cellular phone companies, presaging a new era of discounting for international telephone services. Cellular providers can route their international calls through callback providers and thus pass part of their savings on to their customers.²⁹ Communications companies such as Pacific Link Communications, Ltd., based in Hong Kong, Technology Control Services, a Miami based company, and Kallback, a Seattle based firm, have all started providing callback service to their cellular customers. Pacific

International Callback

International Callback

Link provides callback to all of its international routes except China which recently declared such services illegal. Now, because of new techniques using the X.25\textsuperscript{30} packet network colocated with the local cellular switch, callback is made almost transparent to the user.\textsuperscript{31}

**Manufacturers of Callback Equipment**

Companies such as Immix Telecom, Inc.\textsuperscript{32} provide control mechanisms (i.e., the “black boxes”) for providers of international callback systems. Callback equipment can be either very expensive or relatively inexpensive. Although there are many companies providing equipment in the lower cost category, there are very few “boxes” that provide the full featured capability and reliability desired by corporate and hotel customers. An acceptable unit provides a “seamless” system, meaning that the end user living in a foreign country can pick up the telephone, and if one of the units is installed at that location, they can dial the destination number and after a short pause they are connected. The call will then be billed at the US rate.\textsuperscript{33}

It is difficult to provide the right equipment in such a new and evolving industry. Every situation is different and the requirements are so different. There is a definite connection between equipment selection and a good marketing plan. It is much better to start with a marketing plan and tailor the technical plan to match it. For example, if the

\textsuperscript{30} X.25 is an international packet network system which is becoming very popular and is being used for airline booking systems, banks and financial institutions, and the communications industry itself. Important characteristics of the X.25 circuits is that they are nearly real time and are relatively inexpensive. There are X.25 connections in virtually every country in the world.


\textsuperscript{32} Samples of information provided by advertisers are located in the Appendix.

\textsuperscript{33} Elizabeth Bates, Interview with Elizabeth Bates, Immix Telecom, interview by E.K. Morice, August 18, 1995
marketing plan call for targeting businesses where employees tend to travel a lot, some form of 1-800 call through functionality is a necessity. On the other hand, if hotels are the target, emphasis will be on speedy call completion, and the use of premises equipment to make the process transparent to the end user.\(^{34}\)

There are basically two modes of operation, callback and call through. Call through was historically the first one used. Using this method the first call is connected using an incoming toll free number. The user is then prompted for his account information, and once verified, the user is allowed to place one or more calls. This is very similar, if not identical, to the original MCI and Sprint modes of operation when they began US domestic resale.\(^{35}\) At one time, callback service providers tended to operate in one mode or the other, but usually not both. Most providers will now provide both\(^{36}\)

\(^{35}\) Ibid., 52
\(^{36}\) Ibid., 111
CHAPTER 3

RESEARCH METHODOLOGY

Data needed for the research

Information relating to recent liberalization of PTTs around the world was of prime importance to the research. Governments plans for privatization as well as the methods that they are using was helpful. Information as to whether or not large companies such as AT&T have a positive or negative attitude toward callback was helpful to the project. The projected size of the callback industry and targeted customers was looked at.

Location of the required data

The very nature of the history of callback tends to limit the data that is available for study. Providers of callback services in the US have been cautious not to arouse the FCC. Users of callback in countries where the legal systems are even stricter are not anxious to discuss callback. (As a matter of fact, users of callback have recently been arrested in several foreign countries.) It is interesting to note that while MCI and Sprint are not telling the world that they are in the callback business, callback providers have to be using time on someone’s long-distance lines.37

Although there is no industry association, and there are no labor unions that can serve as data sources, periodicals are beginning to appear addressing issues involved in the

---

industry. At least one book has been published that is directly related to callback. The best information available is invoked by interviewing the developers of callback software and hardware and the telecommunications resellers. Naturally these people and companies are somewhat reluctant to discuss certain aspects of the business. The broad subject of telecommunications, in contrast, is a frequent subject for articles periodicals such as The Wall Street Journal.

**How the data was collected**

Interviews with people directly involved in the telecommunications and callback industries were held, taped, and transcribed. Libraries were a the major source of other data.

**How the data was used**

Much of the information is subjective in nature. Absolute conclusions are therefore not be appropriate. The purpose of the author’s investigation was to question whether or not callback is truly a rapidly emerging market that will have a relatively long future for independent resellers.
CHAPTER 4

RESULTS OF RESEARCH

It might seem that it would be unwise to be in the international callback business. Users of callback devices have been arrested, some PTTs do not allow it, and AT&T has complained to the FCC. In spite of this, the business is growing. The providers of callback equipment are selling equipment to carriers and subcarriers around the world. In countries where callback is being used extensively, PTTs are seeing a gain in their total long distance telephone traffic. This is a result of an agreement made many years ago that the PTTs would charge a price on outbound traffic and AT&T would charge a price on inbound traffic. At the end of the month there is a settlement. As it turns out, AT&T ends up sending considerable money to the foreign PTT. Naturally some PTTs are happy about this and will thus not prohibit callback.

Telecommunications has become a very dynamic industry. Clearly the US is presently involved to a much greater degree than most other nations, but large telephone companies around the world are gearing up to be a part of the communications liberalization or revolution that is taking place in many of the 250 or more countries on the globe. In America, the cost of long distance rates has been the leading competitive determinant. After the breakup of "Ma Bell" in 1984 and the entry of competing phone companies into the market, things have never been the same. Long distance rates have been decreasing steadily in the years following the breakup. As part of the 1984 breakup AT&T was thrown out of the local phone business. This resulted in a confusing system
of services and rates. In August, 1995 landmark legislation passed by both the House and Senate allowed AT&T to return to the local business. For the telecommunications industry this could mark the start of a cataclysm of change greater than even the wrenching division of the old AT&T empire in 1984.\(^{38}\) This has been the stimulus that has fed the callback industry. It is predicted that this action may slow or even reverse the downward spiraling long distance rates - but only temporarily.

What does this all have to do with callback? As rates fall in the US as compared to rates in most other countries around the globe, everyone would like to be take advantage of the low US rates. In the fifties, when the children went to college, the family found ways to reverse the charges when the children called home. Today, businesses and individuals have found ways to call from foreign countries using low US rates through the callback industry.

**The callback market**

Callback, like all industries is expected to go through a typical life cycle. From its beginnings back in 1986 the industry grew slowly but steadily up to 1992. In 1991, when it was introduced as a primary international vehicle, it caught on like wild fire.\(^{39}\) Now the callback industry is in the entrepreneurial phase where it expected to remain for a relatively long period of time. The market has shown a phenomenal growth rate but still only represents approximately 1% of the total long distance market. It would not be unreasonable in the next five to six years to see callback grow to a 20, 30 or 40% market

---


share of the international long distance market. The potential market could be huge! Some predict a market in excess of $3 billion by 1996.

Although the European market is not encouraging for callback, there are other great opportunities in other parts of the world. South America, Africa, Asia, and the Pacific Rim are inviting. These locations can be difficult for small providers which may eventually shake some of the small operators out of the business as easier markets dry up.

Most larger callback firms are developing their own complex, private international networks. They are leasing lines between popular call-origination and destination points. They are installing super-intelligent switching gear to send traffic over these networks in the most efficient way.

"Callback providers are actually becoming long distance carriers - competing in an ever-freer world market for telecom services that they, themselves helped to bring into existence. Callback opportunities are not going away. As free markets emerge and telecom infrastructures are upgraded, more bandwidth will become available. This will inevitably lower the "price floors" achievable by callback operators, and create room for multiple alternative carriers."

The International Telecommunications Union (ITU), representing 184 countries, is holding its 7th World Telecommunications Exhibition, Forum, and Book Fair in Geneva, Switzerland beginning October 3, 1995. The purpose of the exhibition is to inform Union Members of the latest developments in telecommunications technology, and to enable

---

41 Ibid.
43 Ibid.
telecommunications specialists and members of the industry to publicize their activities.

The expected 822 exhibitors from all 184 ITU member nations are evidence that the telecommunications is a huge industry. The list of exhibitors (See Appendix) includes all major companies in the world that are involved in the telecommunications industry. Many callback providers and manufacturers of callback equipment are included in the list.

The telecommunications industry has been among the best performing industries in the world in recent years. It is no longer the safe domain of staid utilities operating in completely regulated, comfortable environments. It has become competitive.

Changes in the telecommunications industry are driven by vigorous customer demand and fundamental changes in technology.44

There is a large emerging market for the international callback industry. Although there is little publicity appearing that relates directly to callback as a separate industry, it takes little imagination to see that it will just be a matter of time until it becomes an open issue. Almost daily things are changing and developing in the global telecommunications industry. The global marketplace is beginning to demand reliable, state of the art communications systems. The pace is so rapid that technology seems to be far ahead of the industry to apply it. Satellite systems are changing the total concept of global communications.

The short term outlook for the callback industry is positive. Although it is expected that US long distance rates will continue to decrease (after a short period when they will rise), this trend is not so evident in most foreign countries. Research indicates that even with privatization, many PTTs will still effectively be under the control of the government. Thus competition will continue to be limited. The typical privatization scenario is that a country will announce its intention to privatize, and that it will be studying the options. Sometime later, a task force will be formed and begin to set the ground rules for its study. The process will be slow and detailed. In the meantime, the providers of callback recognizes a significant opportunity and moves in.\textsuperscript{45} Nevertheless, the government moves slowly, not wanting to give up its competitive advantage. There

are countries such as China that have made callback illegal but the market forces may change that eventually as multinational companies move into the economy.

AT&T has been expected to be one of the big players in the international PTT privatization game, but this could change. Supporting expansions into foreign countries will require vast financial resources. AT&T now has to also consider their planned expansion into the local phone company business made possible by the removal of barriers by congress in August 1995, will require large expenditures of capital. But AT&T is surprisingly constrained for a company with $80 billion in annual revenue. It spends over $4 billion a year on its vast network and has less than $1 billion in cash on hand - a meager sum for a giant with $8 billion in annual cash flow. Its ability to borrow money may be limited. Moody’s Investor Service recently put AT&T’s $15 billion debt under review. “If AT&T wants to keep a double-A rating, it can’t borrow much,” says Jack B. Graham, a Salomon Brothers, Inc. analyst. “AT&T looks invincible, but they’re really hamstrung.”

Not everyone would agree with this, however.

Callback refers to the original, and still prevalent, technique that uses code calling to trigger a call return request. There are many techniques for triggering a return call but they are all a form of callback whether they are called call reversal, dialback, call turnaround, or any of the other dozen terms that are used. The results of the research indicate that callback should have a relatively long future but that it will evolve rapidly. It is expected to become a much larger part of the overall telecommunications industry.

Manufacturers of callback equipment have enough confidence in the future of the industry

---

to invest years and millions to develop and market equipment. It is interesting to note that while MCI, Sprint, and AT&T do not like to acknowledge publicly that callback exists, it is their lines that are being used for callback and are therefore receiving revenue that is being generated by callback customers.48 Thus they have an incentive to encourage the growth of this industry.

Not unlike the global telecommunications, the callback industry is a very dynamic industry that changes almost daily. "Nobody knows what is going to happen. We and those of us in the business do expect it to be around a long time. We do not expect it to be operating the same way in a year. We expect it to be operating in a different way in that it may be called call redirection and we won't be calling it callback. We will be redirecting calls to various switches. Callback today routes most of the calls back to the United States. What companies are doing now and what Europeans are doing, for example, is that they are putting switches in countries in Europe so that your traffic does not have to bounce back to the United States, it will take the least cost route."49

49 Ibid.
BIBLIOGRAPHY


A book covering the nature of international business and the environments under which an international business person works.

Bates, Elizabeth, Interview with Elizabeth Bates, Immix Telecom, interview by E.K. Morice, August 18, 1995

Notes that were transcribed from a taped interview with Prof. Bates at the Immix Telecom location in Margate, Florida.


An article that discusses the regulatory and trade considerations related to callback and international simple resale. New global network arrangements are now allowing entry into the callback market. In the past these markets have been basically closed.


From an address delivered by Mr. Billingsley during a conference by the Association for Investment Management and Research. The conference consisted of talks relating to the present and future status of the global telecommunications industry.


This article discusses issues involved in the liberalization of Belgacom. A key question concerns the ability of Belgacom’s new “Strategic partner” to preserve as many jobs at the troubled company as possible.


An article covering the expected announcement of a planned joint venture involving Bell Atlantic Corp., British Telecommunications PLC, and Belgacom, SA.
Federal Communications Commission, IC Docket No. 94-31, April 27, 1995

A FCC Document prepared for the International Telecommunication Union World Radio Communications Conferences covering an order adopted by the commission confirming the legality of callback.


An article covering the biggest privatization in Eastern Europe. A partnership of the Dutch and Swiss phone companies was awarded a 27% stake in the Czech phone company, SPT Telecom.

Jainschigg, John “International Callback”, Teleconnect, September 1995

This article covers America’s $1 billion evolving callback industry. It covers the changes that are taking place in the once “shadow industry” and is a general description of how callback works. The article concludes with a roundup of some of the manufacturers of callback equipment.


This article covers plans by AT&T to attempt to take a large stake of the Bell company’ local service that has been denied them since the breakup in 1984. The Bells are expected to fight back.


This article reviews how cellular phone companies are enabling users to take advantage of lower rates available in other countries by routing their international calls through callback providers, thus avoiding the high rates of monopolies.

Naik, Gautam “Sprint Signs $4.1 Billion Agreement With French, German Phone Carriers,” The Wall Street Journal, June 23, 1995

This covers the agreement for Sprint to sell a 20% stake to Deutsche Telecom AG and France Telecom. The pact enables Sprint to extend its duel with MCI and AT&T to the global marketplace.

A book written to give prospective users, service providers, and other interested parties comprehensive view of the callback industry. It contains information on every aspect of this business, including how to set up equipment, how to build a customer base, and how to negotiate with carriers.


Contrary to the hopes of many investors in Europe the eagerly awaited stock sales by companies being privatized have turned out to be duds. According to money managers, too many companies trying to unload at lofty prices and bad management and government interference has been the cause of the problem.


An article outlining how German regulators plan to end state-owned Deutsche Telekom AG’s monopoly over the nation’s telecommunications market. The goal is to have a number of firms to provide basic phone services to Germany and a smaller number to compete for the network infrastructure.


Although the FCC recently ruled that callback is legal unless considered otherwise by a country, the debate still continues. AT&T still has a problem with it even though they are using a form of callback with their USA Direct program. MCI and Sprint seem to have no problem with callback, but will never endorse it.


This article discusses India’s program to privatize its phone system. Considering the archaic nature of their system, the auction for providers of telecommunications services could prove to be one of the world’s richest auctions. It also discusses the politics involved.
What is the best gauge for measuring a country's level of development? Is it (1) per capita income, (2) state of the construction industry, (3) density of pollution, or (4) number of telephones? If you selected number four you are right, according to the International Telecommunications Union (ITU). In a recent report, the ITU observed that the total number of telephones installed in a country can often provide a better barometer of economic development than even per capita income.

The corollary is that nations with widespread and efficient telephone systems also have highly developed economies and large disposable incomes. Conversely, countries with poor telephone service are often plagued with underdeveloped economies and low-income levels.

In using the number-of-telephones principle to assess a country's fortunes, it is interesting to look at the United States. Recent statistics show that there are 95 telephones for every 100 households; and Beverly Hills, California, and Washington, D.C., have more telephones than people.

In contrast, Asian Development Bank (ADB) data show that in Asian countries, the telephone density per 100 population is only 2 compared to 5.5 in Latin America and 0.8 in Africa. In Bangladesh and Nepal, there is less than one (0.1) telephone per 100 persons.

Most developing countries thus have a nagging communications problem. For example, an ADB report points out that in Pakistan the telephone density is 0.5 per 100 population. But in rural areas, the situation is even worse, with as little as one telephone per 1,000 people. In fact, out of Pakistan's 45,000 villages, only about 1,900 have access to telephone services. One reason for this is that less than 15,000 villages have electricity.

Moreover, the demand for telephone service continues unabated in Pakistan, where people sometimes have to wait 10 years to obtain a telephone. The quality of service also leaves much to be desired. A sample survey revealed that only 25 percent of local and 15 percent of international call attempts were successful.

Poor telecommunications services take their developmental toll. According to Yoshiro Takano, a telecommunications specialist of the ADB, there is evidence of significant losses in efficiency incurred in agriculture, transportation, commerce, banking, government, tourism, and other sectors due to the lack or inadequacy of telecommunications services. Telecommunications also contribute to the quality of life by facilitating communication with kin and friends as well as access to emergency services.


Zenith, the American TV and computer manufacturer, moved the production of its monochrome computer monitors from Taiwan to Mexico in 1992 because of the lower Mexican wage rates.

What are the reasons for the relative changes in labor costs? Three factors are responsible: (1) compensation, (2) productivity, and (3) exchange rates. Hourly compensation tends to vary more widely than wages because of the appreciable differences in the size of fringe benefits. Unit labor costs will not rise in unison with compensation rates if the gains in productivity outstrip the increases in hourly compensation. In fact, if productivity increases fast enough, the unit costs of labor will decrease even though the firm is required to pay more to the workers.

Table 7–6 illustrates the rapidity with which labor compensation costs change. In 1975, five nations had higher average hourly rates when expressed in dollars than did the United States. This number had increased to seven by 1980, but then dropped to zero in 1982 (not shown). The United States had the highest hourly rate until 1986, when it was surpassed by Switzerland,
Interview with Elizabeth Bates at Immix Telecom Aug 18, 1995

ELIZ: MCI, AT&T & British Wireless &Cable own the line LDDS

As customers we don’t care who owns the line

If a customer is of a certain size it can go directly to MCI, LDDS... to buy blocks of time; if not big but sometimes not - there is another level in there we call the WHOLESALER

so the RESELLER would buy direct from ...... ????

If the amount they contract for per month, whether they use it or not, is significant. & if their blocks are not big enough, then they will go to a MASTER DISTRIBUTOR and buy it from them who has already blocked off a lot of time

EK: Do they lose this time if they don’t use it?

ELIZ: That’s what we understand but we’re not sure how the deals work because they are all negotiated differently & it’s really a negotiated, no-fixed deal. Okay, totally whatever you can negotiate with the companies. So now what happens is this, the resellers, some of them are what we call SERVICE PROVIDERS- these are the ones you read about in the call-back book. They are providing callback time for companies around the world. And so what’s happening is they are reselling time to these, you know people are using their time and what’s happening then is they contract with- for example, if they are big enough, with MCI or SPRINT.

Now MCI or SPRINT are not telling the world that they’re in the business but whose lines are we using?

EK: Exactly, (???)

ELIZ: They’re right. But because they’re making deals with the PTT’s around the world they won’t announce they’re in the business. They HAVE to be in the business because there is no line; they own the lines and they’re not going to say “NO” to traffic. They don’t care where the traffic comes from as long as there’s traffic on the network. And so that’s why- are they in the business? Publicly- not. Are they in the business- ABSOLUTELY, without question. Because there is no other business line available; they are in the business.

EK: Now you sell your product to the resellers

ELIZ: The resellers

EK: Whoever they might be?

ELIZ: Whoever they might be. And to - or large individual corporations.

EK: Who might use a number of units from you?

ELIZ: Right, but we as a manufacturer, we- most of our customers are in the hundred-plus. They buy a hundred-plus units from us on a yearly basis. If the Wednesday, Tuesdays are the big guys so we have a big distributor set-up

EK: You have a bunch of people around the world?
ELIZ: Just US Now I the callback business what is happening is that you ahve the service provider and in order to sell around the world how do you get them to use .... they have what they call selling agents located in all the countries.... the service providers for the callback business. This provider is someone who provides telephone service who could be a reseller and usually if they are a reseller they might have their own switch. thats a piece of hardware that can take the phone call and switch the call to another location. So the service providers because many of them are American companies, what they have done they have contracted with what you call master distributors of selling time, so we call them sales agents. The sales agent buys like maybe a territory like all the rights to Argentina all the way to Brazil. They in turn have hired subsellers(sub agents) What these sales agents do they get a percentage of the time cost that the user..end user uses on the network and they get a percentage as a sales commission.

EK: These rates are all worked out between the countries like it says in the callback book

ELIZ: AT&T will work out their price then they relsell that to a service provider then the service provider offers the price for their markup to the end user. you and I. And then because they are not available to have a sales staff located in 250 countries they might make a 10% commission.

EK: The book says that the PTTs in some countries don’t mind the callback because it probably increases the volume of their calls even though they dont make as much per call. There is a settlement between this country and the US..

ELIZ: That is correct. They made this agreement many many years ago that the PTTs would charge a price on outbound traffic and AT&T would charge a price on inbound traffic. At the end of the month they have a settlement and that is what the settlement rate is called. In actuality AT&T is sending money to these countries because.....

EK: Are you involved in resale?

ELIZ: No. We manufacture hardware that is used by resellers.

EK: What are the opportunities?

ELIZ: The opportunities are many, great, and big. We provide the control mechanism that allowes these companies to handle this business. And we provide it in what we call "seamless" callback. Seamless callback means that I as an end user living in a foreign country can pick up the telephone and if one of our units is installed at the location they can pick up the telephone and just dial the destination number and our C3-II all the calls to the switch rig back and handle it all.

EK: You dont have to wait for it to call back?

ELIZ: Yes. You do have to wait but you dont have to sit and dial extra digits you just have to dial your destination. The C3-II is programed to recognize who you are and contact the switch, wait for the call back and the switch in America handles the ....

EK: What are your target markets?

ELIZ: As a provider of callback equipment we sell to the world. These units are bought by carriers and subcarriers all over the world. They are bought by service providers who then make installations. They are bought by sales agents who want them in their customer base so they can route the traffic to their switch that they are getting commissions on. The one thing about the C3-IIis.... and another thing you asked is who is the major competition? One of the thing that our device does it does what you call least cost routing so we could have a business, lets say that we are situated in Belgium or Brussels and we ahd an office in Brussels and we wanted to call all over the world we could do what we deal with at least five service providers when I pick up the phone and call, if I am calling France I have amde a deal with the
phone company, I might have made a deal with another company to handle my British traffic, and made a deal with another company to handle my US based traffic. There are devices that if you pick up the telephone and start dialing the international number, we can route that call to wherever we want it to go and that's programmed into the box.

Do we have competition? Not in the price range that we are selling. We are what you call a very low cost router in the business. You can do this task with higher priced equipment that is PC based and we are non-PC based. The box just sits in a telephone closet. And so from that aspect we don't have any real competition doing exactly what we do today, but that doesn't mean that we won't have competition...

What are the major threats? For our business anything can happen and for anybody who is in the business anything can happen because legislation can put these guys out of business tomorrow. We don't think that's going to happen and the people in the business don't think it is going to happen because it takes a long time in other countries to get legislation changed. There is no threat here because the FCC is no problem, no problem. We're a competitive society and there would be too much pressure within the US to not do that, and so AT&T did bring a suit against, you know, these foreign countries said to AT&T if you want to do business with us, you must bring this to the FCC and challenge it, and the FCC kicked it back and said no we are not going to... no it's not illegal. Those are the articles that you read. So from that aspect we don't have any American... but certainly anything can happen in any world country.

EK: In your opinion what is the product life cycle of callback?

ELIZ: Nobody knows the answer to that. Nobody knows what is going to happen. We and those of us we talk to in the business do expect it to be around in the way it is right now. We don't expect it to be operating in the same way in a year. We expect it to be operating in a different way which is when you read an ad, it says call redirection and we won't be calling it callback and what we will be doing, we will be redirecting calls to various switches and will be notifying various switches that these people want to make a call. So it is callback but not necessarily the way it is today. Call back today routes most of the calls back to the United States. What companies are doing now and what the Europeans are doing, for example, is that they are putting switches in countries in Europe so that your traffic does not have to bounce back to the United States, it will take the least cost route.

EK: And that's changing a lot like in the European Community where the rates are going down.

ELIZ: Ya Ya Ya. What makes our product even better and more interesting for us, especially in Europe, is that we our device lets companies do that.

EK: They have the choice.

ELIZ: They have the choice.

EK: Can they do that themselves, or do you?

ELIZ: They have to have a program to do it, they have to buy our box and have someone program it or do it themselves. If that's what you mean. We don't have to program the box, the're is programmable. It's like buying a PC and you load in the software you want to do the task that you want.

EK: Is there an extra unit that you sell with...?

ELIZ: No No. You don't need it, it's one unit. You can program it with a PC.

EK: With a PC
ELIZ: Or you can program it with your ordinary telephone but you aren’t going to do that because it’s just a lot of commands to key in. We give the software away for them to do it.

Ah, making an attempt to educate the PTTs. No. 7, OK ques, are they educating the PTTs?

They are really not educating them; putting pressure on them and forcing them to say, “hey, let competition in, let the ball game change.” And it will move faster than it did in the United States, we predict, because they havea model to follow, but our long distance companies deregulated we have a US model to follow. Now it may not be the best model but certainly the rest of the world has a model to follow for deregulation, and that’s what they’re doing. And so it will be much swifter than it did in the United States.

EK: Well now there a big market apparently from what I read for AT&T and British Telecom, or whatever in these foreign countries to go in there and set up phone companies, but the question do they have the capacity to do it?

ELIZ: You got it, ya, no one knows that answer, OK, except the people who own the network itself, ah, yeah they do. I believe we can handle that because #1 we can stick another satellite up there. We’re not fully used on satellite time. You can do that. You can reroute. We are not rerouting as much as we can do that.

EK: Well and that’s another question I had in mind. If we have all this satellite communication, isn’t that a threat to these systems, because we can reroute this stuff to anywhere we want.

ELIZ: Yah Yah, but yes yes it is. The people that are in the service business are grabbing time on the satellites and are also installing switches in other countries so they don’t lose the traffic. So, yes there is a lot of activity going on; there are a lot of deals being made, there is a lot of mergers going on at the moment. So that’s going on.
New global network arrangements

Regulatory and trade considerations

Keith E Bernard

The economic forces of supply and demand are generating changes in the market and potential network arrangements for international telecommunications. The supply of telecommunication services available has changed dramatically due to numerous aspects of liberalizing policies agreed among regulators, particularly the provision of international value-added networks (IVANs) and more recently the permission to provide basic services via various forms of international resale. Also, many liberalization opportunities have opened the provision of traditional services by permitting entry of non-traditional ‘carrier’ operations. The demand for ‘global’ telecommunications is a reflection of the increasingly multinational nature of business operations (it is estimated that there are 2500 multinational corporations) and the derived demand for intra-company, seamless telecommunication services to support these operations.

In response, the world’s major carriers are reshaping business strategies to enter new markets and to go after some portion of this ‘high end’ multinational business market, which is valued at $10 billion worldwide. Importantly, no single carrier has sufficient financial resources, the necessary global presence or the range of capabilities to individually take advantage of the numerous opportunities to serve – in the traditional sense of telecommunications provision – this ‘global’ demand.

Accordingly, virtually every major carrier is attempting to expand or extend its network into a global operation through the establishment of new ‘carriers’ in liberalized markets and/or through strategic alliances and affiliations.

There is a need, however, for the implementation of regulatory and trade policies to facilitate the development of global networks. Regulatory considerations include licensing criteria for entry (either via facilities ownership or resale) and international settlements policy.
major hindrance to the development of global networks is a high, possibly excessive, level of concern for settlement imbalances. While cost-based settlement rates will promote economic efficiency (with a provision for 'global' universal service to be discussed later), global networks themselves complicate the interpretation of settlement imbalances and call into question simplistic conclusions.

Trade considerations revolve around the manner of use and definition of reciprocity as an entry criterion — and whether a bilateral or multilateral approach should be utilized. Even then exactly what constitutes 'reciprocity' is an open question and a factor which prevents governments with liberalizing inclinations from proceeding.

Lastly, although much of the regulatory and trade policy intended to support global market trends has been determined, there remains a need for governments to fully articulate these policies in order to clarify the ground rules for service providers.

Alliances

AT&T, through its recently announced World Partners Program, is fostering service and marketing arrangements with a number of PTTs (some monopoly operators) and is developing exclusive services which it hopes will provide an advantage in the provision of global products. AT&T also owns 20% of Unitel, the second Canadian carrier; participates with numerous PTTs for network restoration with its Pacific partners; has ownership interests in the PTTs in Venezuela and Ukraine; and has an extensive global IVAN network, operating in the USA, Canada, the UK, Japan and Hong Kong as well as numerous other countries. Also, AT&T is reviewing Project Atlantic which would involve participation in the joint venture being formed by France Télécom and Deutsche Telekom.

MCI has recently accepted BT as a 20% equity investor and will jointly manage Syncordia with BT. Also, MCI is the largest shareholder in Infonet, an enhanced service provider, in which it shares revenue and profit with 11 PTTs. Further, it has formed an exclusive joint marketing agreement with Stentor of Canada, in which the two will provide seamless international service between these countries using an identical intelligent network platform. MCI has also set up long-distance and international operations in both New Zealand and Australia.

Sprint operates data networks in 36 countries, 22 via wholly owned subsidiaries. Additionally, Sprint has an agreement with Unisource (an alliance among the Swiss PTT and PTT Netherlands, which are de facto monopolies, and Telia, the dominant carrier in Sweden) to connect to its international data network. Sprint also owns the US end of PTAT (with Cable & Wireless as the UK owner) and the two companies have formed a marketing alliance for global products. Further, Sprint has just acquired 25% of CallNet, the largest resale carrier in Canada.

Cable & Wireless is, in the words of James Ross, Chief Executive Officer, the world's 'oldest alliance' operating in approximately 50 countries and partnering with such diverse carriers as Bell Canada, BellSouth. US West, Pacific Telesis and even AT&T. Most recently Cable & Wireless has taken advantage of liberalization opportunities in Sweden and Australia.

Appendix 1 provides illustrations of the scope of this alliance/partnership trend.
The telecommunications industry has been among the best performing industries in the world in recent years. Yet, it can no longer be considered the safe domain of staid utilities operating in completely regulated, comfortable environments. Competition is here to stay—and to intensify—in all the various segments of the industry.

The changes in the telecommunications industry are driven by vigorous customer demand and fundamental changes in technology. The convergence of cable, television, telephone, and personal-computer use has created a dramatic tension between market and regulatory forces and a blurring of traditionally segmented lines of business. Interactive multimedia products are reported to be in demand even before the market seems to understand what they are, and strategic alliances to produce the products abound. Indeed, everyone seems in a hurry to get on the “Information Superhighway,” although no one can say clearly where it is going.

What is clear is that technology and imperative market forces have forever changed the telecommunications industry and that investors must sort out the implications of the dramatic changes for both potential rewards and risks. The presentations in this proceedings help form a coherent framework for evaluating the often confusing, challenging, and potentially profitable companies in the telecommunications industry.

The industry is defined in this context to include companies providing local-exchange and long-distance telephone services, cable television (CATV), cellular (and wireless) communications, competitive access providers, interactive multimedia producers, and telecommunications equipment manufacturers. The discussions of each industry segment reveal the themes of increased diversification and integration among segments, the convergence of technologies, increasing competition, the tensions introduced by regulatory constraints and unequally yoked competitors, and the importance of distribution channels and the control of content.

Global Perspective on Telecommunications

Robert Morris provides a global perspective on the performance of the telecommunications industry in recent years. He attributes the above-average performance of its equities to four key factors. First, telecommunications stocks have proved to be more growth stocks than utility stocks. In the majority of economies worldwide, telecommunications firms’ unit growth rates have been between 1.5 and 3 times their country’s underlying GDP rate.

Second, costs in the industry have been declining dramatically as capital is increasingly substituted for labor and the productivity of capital improves. In the telecommunications industry, once the formidable up-front capital has been spent, variable costs are negligible. Thus, the industry is impressively profitable because its asset-turnover rates continue to increase.

Third, unlike many other industries, telecommunications has not relied on pricing for its growth. Although declining prices in the industry are obviously not preferred by its companies, they do bring benefits. Declining prices have stimulated demand, especially in lesser developed countries (LDCs), and reduced competitive pressures.

Fourth, the rigid regulation of the telecommunications industry is softening throughout the world. Thus, new opportunities are being created for both existing companies and new market entrants.

Morris observes that telecommunications firms are unified by several common characteristics. Interestingly, the technology is fairly homogeneous worldwide. Furthermore, the distribution systems of various technologies are merging. For example, distribution systems of the CATV segment are merging with those of telephony, and the wireless distribution system is starting to resemble that of more conventional telecommunications. Digital technology is the primary facilitating factor. Service offerings also serve as a unifying characteristic of the industry; the majority of the vertical services offered throughout the world, such as 800 service, are similar.

The telecommunications industry is also characterized by a fairly consistent life cycle. The industry is in different phases of the cycle at different points of the globe. The early phase is associated with a large pent-up demand for services, lack of an estab-
Canada’s Bells Hold Off Their Rivals in a Bitter Fight
New Long-Distance Carriers Struggle to Gain Market After Deregulation

By Solange De Santis
Staff Reporter, The Wall Street Journal

TORONTO — Deregulation of Canada’s 6.8 billion Canadian dollar (US$5 billion) long-distance telephone business was supposed to be bad for old monopolies. But a year after the gates were opened to full competition, the Bell companies are proving to be such fierce fighters that upstarts, including some backed by U.S. telephone companies, are hurting badly.

The battle for long-distance market share has turned into a war of attrition. Earnings of the established telephone companies are down. Losses are piling up at even the most established of the alternative providers. Analysts and industry officials predict the ranks of Canada’s long-distance companies will shrink sharply.

There are about 200 competitors now, but that number will be in the 100 range in two to three years, partly through mergers and acquisitions, some through business failures,” said Stan Kabala, president of the largest of the provincial telephone companies.

In a stark indication of how vicious the competition has become, a recent employee newsletter at Bell Canada (the large national telephone company, owned by BCE Inc. of Montreal) congratulated employees in one location for combing through trash at customers' offices to gain information on competing companies.

"Any Kind of Information"
The employees looked for "any kind of information, from proposals, contracts, competitors' propaganda, letters, advertisements, brochures, bills and even newspaper clippings," the newsletter said.

The purpose was to "keep current with what's happening behind enemy lines." One employee was quoted as saying, "We searched the office set up "trash-person-of-the-month" awards, with cash prizes. Competitors criticized the campaign as a "corporate spy mission." It wasn’t supposed to get this chaotic.

Telephone deregulation in Canada took a different path from what occurred in the U.S., where, in 1984, AT&T Corp. retained the long-distance business and the regional phone companies took local service.

North of the border, the Canadian Radio-television and Telecommunications Commission, or CRTC, the federal regulator, allowed the 10 provincial telephone companies to keep long-distance and local service, in order to have sizable Canadian companies that could compete on a global basis.

The CRTC phased in long-distance competition during the past three years with a series of decisions, culminating in the final step a year ago: "equal access," which forced the telephone companies to give competitors full access to its lines. Callers no longer had to use a code of as many as 17 digits to gain access to a discount long-distance company. Now, they are automatically connected when they dial 11, the area code and number.

Prices have plunged, in a development called "heaven on earth" for the customer by analyst lain Grant, managing director of a Brockville, Ontario, consulting firm called Yankee Group.

The average price for a 1000-mile call in Canada has fallen to 30 Canadian cents from 50 Canadian cents in 1992. Calls after 11 p.m. can be made for as little as five Canadian cents a minute, according to Toronto consulting firm Emeron Hoey Associates.

Hell for Some Providers
But heaven for the residential and business customer has become hell for some providers.

Unitel, losing about C$600,000 a day, has been surviving month-to-month as it seeks to reschedule C$650 million in bank loans. Unitel's major shareholder, Canadian Pacific Ltd., wants to sell its 48% stake, and the other owners, AT&T Corp. and Rogers Communications Inc., are considering whether to make a bid for more of the company or just walk away. Unitel also has retained J.P. Morgan & Co. to seek additional investors.

Unitel was the first Canadian company to get a license to provide alternative long-distance service in 1992. At the time, industry forecasts said the Bell companies and Unitel would effectively operate as a duopoly in a deregulated long-distance environment, with smaller competitors scurrying for tiny bits of market share.

Frenzy in the Market
What actually happened was a marketing frenzy. Upstart long-distance companies responded aggressively, sending salespeople to knock on doors at dinner-time and running advertisements that promised huge savings over Bell rates. Canadians jumped at the chance to cut their telephone bills. Many switched companies every few months, as soon as competing savings plans were announced.

"We missed it, the regulators missed it. There was pent-up demand there. Customers were aware of the price levels [for long-distance] in the U.S. and prices were so much higher in Canada," said Bernard Courtois, group vice president for law and regulatory matters at Bell Canada.

Leading up to "equal access," U.S. firms, enthralled by the possibility of a lucrative new market, had entered Canada, lending financial and marketing muscle.

AT&T, based in New York, bought 22.5% of Unitel. Sprint Communications Co., Kansas City, Mo., purchased 25% of Call-Net Enterprises Inc., the parent of Sprint Canada Inc.

ACC Corp., Rochester, N.Y., owns 70% of Toronto-based ACC TelEnterprises Ltd.

MCI Communications Corp., Washington, D.C., threw in its lot with the telephone companies, helping them through a strategic partnership to develop sophisticated services, such as virtual private networks.

The telephone companies lost market share faster than predicted. Although they still retain 78% of the market, their own discount-service plans have cut into earnings. Currently, Unitel holds 7% of the market, Sprint 5% and all others 10%, according to Yankee Group.

Wrongheaded Planning
Unitel's saga shows how wrongheaded planning, and higher-than-expected marketing and capital costs can take their toll on the bottom line. Last year, Unitel posted a loss of C$239.3 million.

Losses at other, smaller alternative providers also are significant. Call-Net had a loss of C$55.4 million last year; ACC TelEnterprises had a loss totaling C$11 million.

STN Inc., 17%-owned by LCI International Inc., McLean, Va., is negotiating an extension of C$60 million owed to LCI and C$13.6 million owed to merchant banker Warburg, Pincus Capital Co., in 1994, STN incurred a loss of C$47.5 million.

At the company's recent annual meeting, a major shareholder said STN "has failed in some of the most basic management and operational capabilities." STN's executives said the company spent so much on up-front sales commissions and marketing efforts in the "equal access" frenzy that it had little capital for such other operations as sending out timely bills.
Bell Atlantic, British Telecom Expected
To Bid for 25% Stake in Belgacom SA

By MARTIN DU BOIS

Staff Reporter of THE WALL STREET JOURNAL

BRUSSELS — Bell Atlantic Corp. and British Telecommunications PLC are expected to announce a joint bid to acquire about 25% of Belgacom SA, the state-owned Belgian phone operator.

Officials close to the companies said the total value of Belgacom has been put at $3.5 billion to $4.5 billion, giving a 25% stake a value of about $1 billion. The deadline for submitting offers for Belgacom’s privatization is tomorrow, and so far spokesmen for Bell Atlantic and British Telecom have declined to comment.

Other key bidders for Belgacom, according to people close to the privatization process, are expected to include the Dutch phone company Koninklijke PTT Nederland — possibly teaming up with AT&T Corp. — as well as another U.S. company, Ameritech Corp.

Belgian Telecommunications Minister Elio Di Rupo repeatedly has stated that the highest bidder won’t necessarily win the contest. A key element of the decision, government officials said, will be the ability of Belgacom’s new “strategic partner” to preserve as many jobs as possible at the troubled company. The government intends to complete the sale by the end of the year.

Belgacom has 26,000 employees, and analysts say the company will need a dramatic boost in productivity to compete after 1998, the deadline for liberalizing the entire European Union telecommunications market. Many expect big layoffs at Belgacom, something Belgacom Chief Executive Officer John Goossens has said he can’t exclude as a possibility. In addition, Belgacom is saddled with huge pension liabilities, which the company estimates total more than 140 billion Belgian francs ($4.92 billion).

But Belgacom, analysts say, also offers an attractive location for routing international phone traffic and serving the dozens of multinational companies that have established European headquarters in and around Brussels. A study commissioned by the Belgian government last year valued Belgacom at 160 billion Belgian francs.

Acquiring control of Belgacom would help Bell Atlantic and British Telecom — which owns a 20% stake in MCI Communications Corp. — compete with two other fledgling networking giants: The Dutch-based Unisource NV, a joint venture of the Swedish, Swiss, Dutch and Spanish national phone companies allied with AT&T; and the state-owned monopolies Deutsche Telekom and France Telecom, which last week signed a definitive agreement to jointly buy 20% of Sprint Corp.

Bell Atlantic, a regional phone operator based in Philadelphia, is expected to assume majority ownership in the consortium expected to bid for Belgacom.

— Leslie Canley in New York contributed to this article.
The Commission has adopted an Order on Reconsideration confirming that international "call-back" service using uncompleted call signalling violates neither U.S. nor international law. It said that call-back is in the public interest because the resulting competition between U.S. call-back providers and foreign carriers charging higher rates ultimately lowers foreign rates to the benefit of consumers and industry abroad and in the United States. The Commission added, however, that U.S.-based call-back operators may provide call-back using uncompleted call signalling in foreign countries where this offering is expressly prohibited by law.

"Call-back" offerings enable customers abroad to access U.S. international service at pay U.S. rates for international calls rather than the generally higher prices charged by foreign carriers. One means of accessing U.S. international lines from a foreign country is "uncompleted call signalling." This method allows a foreign customer to access U.S. long distance lines by placing a signalling call to a computerized device in the United States as customer hangs up before the call is completed and thereafter receives a return call from the device which provides U.S. dial-tone. The call is then billed at U.S. rates.

After the Commission, on April 12, 1994, authorized three U.S. companies to resell international switched services in this manner, AT&T requested reconsideration on the grounds that call-back using uncompleted call signalling violated the federal wire fraud statute and Sections 201, 202 and 214 of the Communications Act. The Commission consequently expanded the proceeding to address questions of international law and comity which had been presented by a number of foreign governments and carriers. The departments of Justice and State submitted views, at FCC request, on the wire fraud and international issues respectively.

The Commission concurred with the Department of Justice opinion that the use of completed call signalling is not wire fraud because U.S. carriers do not charge for such is, and further confirmed that the practice does not violate the Communications Act.

(over)

The Commission also concluded that call-back using uncompleted call signalling does not violate international law. It agreed with the Department of State that call-back is not prohibited or otherwise restricted by International Telecommunications Union (ITU) regulations. The FCC noted, however, that some foreign countries have prohibited this offering within their territories. It reaffirmed its view, as a matter of international comity, that U.S. call-back operators are not authorized to provide uncompleted call signalling in those countries whose laws explicitly prohibit this offering. Accordingly, the Commission stated that it would take enforcement action against U.S. call-back providers which violate a foreign prohibition when the foreign government itself has been unable to ensure compliance. It also will use its enforcement authority to identify and sanction those reselling call-back providers, which are operating without proper FCC authorizations.

The Department of State will communicate the FCC findings to foreign governments. Any foreign government which has expressly adopted a statute or regulation finding international call-back using uncompleted call signalling to be unlawful, and which has been able to enforce its domestic law or regulation against U.S. providers of this offering, may notify the U.S. Government. Notifications should include specific documentation of legal
Czechs Award Phone Stake To Swiss, Dutch

The biggest privatization in Eastern Europe ended yesterday with a dark-horse winner: A partnership of the Dutch and Swiss phone companies was awarded a 27% stake in the Czech phone company, SPT Telecom, with a $1.45 billion bid.

The winning bid, by Koninglijke PTT Telecom NV, or KPN, and Swiss Telecom, was picked by the Czech government yesterday over competing offers from some heavyweights of the world phone industry, including alliances of Deutsche Telekom AG with Ameritech Corp. and France Telecom with Bell Atlantic Corp. Backing the Dutch and Swiss in their bid was AT&T Corp., which has agreed to provide them with technical help as they start steering a massive modernization of the creaky Czech phone system.

Another big phone company, Italy's Stet SpA, actually bid higher than the Dutch and Swiss, but investment bankers involved in the process said political considerations and a reputation for good management counted for more than cash in this contest.

The Dutch and Swiss "represented to the Czechs a friendly, modern, commercial alternative" to the big phone companies of Germany, France or Italy, said David Wheeler, managing director and head of Lehman Brothers International's media and telecommunications investment-banking group in London. (His firm advised one big player, SBC Communications, which dropped out of the bidding.)

That approach apparently appealed to Czech political sensitivities about being dominated by big neighbors. The Germans are seen in Prague as too bossy, the French have made enemies with past privatizations that later went sour, and the Italians didn't persuade the Czechs they'd bring the management help that SPT needs.

Another bidder, Tele Danmark AS — like the Dutch and the Swiss, a small and politically inoffensive company — was ranked second on the list of bidders that a committee managing the privatization recommended to the government.

For the past two years, the major phone companies of the world have been frantically coupling with one another to produce ever-bigger alliances. Only big companies, it's often argued, have the economies of scale, cash hoards and technical expertise needed to succeed in an increasingly tough global phone marketplace.

But Ben Verwaayen, president of KPN's PTT Telecom BV unit, said: "Size is not the determining factor. When it comes to being a local [telephone] operator, the skills you bring to the table are also effective."
What's callback? Simple. Foreign telephone rates are (generally) much higher than American rates. Aiming to exploit this spread, a callback provider creates an American-based, automated service that “sells U.S. dialtone” to overseas customers, at markup. The client saves money, and the provider makes money.

The tricky part is making this work in the real world. Here in America, telcos have a long tradition of unselfish public service, and compete freely and fairly for customers on a completely-level playing field (periodically gopher-holed by payoffs, subversion of due process, unfair competition, bureaucratic inertia, malignity and greed). Most foreign populations, by contrast, languish under the jackboots of brutal, government-backed telecom monopolies who maintain their stranglehold by excluding conventional (e.g., central-office mediated) competition. So you can't just tell PTT Whatever to jack Whatever-Landian customers straight into your network. In most places, you can’t even own a network.

So you have to be tricky. The usual way of “being tricky” is to take advantage of the fact (agreed to by most international service providers) that regardless of where a call originates and terminates, if it isn’t answered, the caller doesn’t pay for it. Conventional international callback services use such unanswered phone calls as signals (the practice is known as “code calling”), telling them to CALL BACK whoever called, and offer U.S. dialtone by bridging in a second trunk.

Yes, the caller pays for the callback call (from the provider to him), AND for whatever calls he makes on the second line (from the provider to wherever). Still, both “legs” of the transaction originate in the U.S. And the disparity between U.S. and foreign rates is normally so large that this can be a very good deal for customer and provider. The best deals arise when the call terminates in the U.S., as most international calls do. But significant savings are realized even when the destination is a foreign country — sometimes one bordering the country where the call originated. It used to be cheaper to use callback to call from France to Germany, than to dial direct, even though two transatlantic links were used in the callback transaction.

The spread is further increased when the provider acts as aggregator — obtaining lower rates by making high-volume deals with U.S. carriers, leasing lines to much-trafficked locations, etc.

One nagging detail remains: How does the provider know who to call back? Lots of ways. A frequent dodge is to give each customer their own DNIS (Dialed Number Identification System) or DID number, correlated to an account record that contains their callback location. DID information, delivered with the ring, tells the provider which number was dialed, hence which client is calling.

Other services and technologies (Caller ID/ANI, international 800, IVR, the Internet, etc.) can also be used for free or low-cost signaling. In each case, technologies are selected to identify the caller in the most economical way possible, consistent with legality, security, PTT rate and pricing policies; and, of course, with client needs and expectations. A provider who wants to offer service in many nations may have to implement several methods of signaling (and several pricing plans, and several local sales organizations, etc.) to be competitive in different areas.
Maw Bell
AT&T Eagerly Plots A Strategy to Gobble Local Phone Business
New Switches, Cellular Service And Potent Brand Name Are All Part of the Plan
But Bells Intend to Bite Back

By JON KELLER

Staff Reporter of THE WALL STREET JOURNAL

Can the company once quaintly known as Ma Bell manage to eat its young? A decade after getting thrown out of the local phone business, AT&T Corp. is aiming itself for a bruising re-entry into the $90 billion-a-year market dominated by its seven offspring, the Baby Bells.

By year's end, AT&T may begin tapping the Bells' most lucrative customers. It is now quietly putting together the pieces: a secret project to install more than seven offspring, the Baby Bells. ping the Bells' most lucrative customers. It would free the Bells to enter long distance and, in another twist, the way for cable-TV companies to cross into both markets.

Other Players

Also newly unstrained, of course, would be AT&T's long-distance rivals, MCI Communications Corp. and Sprint Corp. MCI has begun spending more than $2 billion on its project to build its own local telephone networks, bypassing the Bells in 20 U.S. markets. Sprint is linking its long-distance service with three of the nation's largest cable-television companies—Telecommunications Inc., Cox Enterprises Inc. and Comcast Corp.—which are upgrading their lines to deliver local phone service that would rival the Bells.

How AT&T navigates in this coming storm could determine whether it will thrive in the new world or wither. As the company maps out its strategy, it must contend with the looming threat from its powerful offspring: The Baby Bells could capture up to one-third of the $60 billion-a-year long-distance market just 18 months after getting in, some experts say. That would cost AT&T, which has more than 60% of the long-distance market, billions of dollars in business.

"AT&T's share could plunge into the low 40s," says Joseph Kraemer, a managing director at EDS Management Consulting Services. One AT&T executive warns: "If the Bells took a third of the market, we might have to cut another 15,000 jobs."

Cherry-Picking

For the Baby Bells, AT&T's local foray could shrink profits. "If AT&T comes into our business, they'll take 30% of our base within three to five years," frets Julia B. North, the chief of consumer services at BellSouth Corp.

"Their strategy is very rational," says Bell Atlantic Corp. Vice Chairman James Cullen; AT&T will "cherry-pick the top 25% of our 11 million customers." These include businesses and affluent individuals who use everything from local services to call-waiting, voice-mail and multiple phone extensions, and "account for 75% of our profit margin," he says.

So huge is the bet on local services that AT&T may sell some businesses to refocus. Insiders say its sinking computer unit, the former NCR Corp., may be sold, whole or in pieces. AT&T is also mulling a public offering of its $8 billion-a-year equipment business, AT&T Network Systems. Even the fast-growing Universal long-distance business could go. AT&T won't comment.

The reason is that AT&T is surprisingly constrained for a company with $80 billion in annual revenue. It spends over $4 billion

Please Turn to Page A6, Column 1
Callback firms wholesale service to mobile operators

U.S. providers of callback services have begun striking wholesale deals with cellular phone companies, pressuring a new era of discounting for international telephone services.

Callback reverses the direction of an international call, enabling users to take advantage of lower rates available in other countries, especially the United States. Cellular operators can bypass telephone monopolies or other conventional rate caps by routing their international calls through callback providers instead. And by passing on part of their savings to customers, the competitive cellular operators can gain a market advantage over the cellular units of the national network operators.

Pacific Link Communications Ltd., one of Hong Kong's competitive cellular operators, has been employing the callback option for two months on Link Only, an international call routes except China, which recently declared such services illegal.

Technology Control Services, a year-old Miami, Florida-based company dedicated to this wholesale callback market niche, provides Pacific Link with service using Sprint's international network. TCS is carrying about 1 million minutes a month for the operator, company officials said, though Pacific Link would not confirm this number.

Pacific Link says it derives savings of 15 percent or more from employing the callback option, though company officials would not give details on actual customer savings. Savings come in two steps: The use of callback alone cuts Pacific Link's cost of carrying international traffic by 5 percent, and the firm compounds its savings on callback services by interconnecting directly with Hong Kong Telecom International's gateway, rather than going through Hong Kong Telephone Co.'s local network, for the return call.

TCS is not the only callback operator moving into this market. "The transition from retail to wholesale callback is the phenomenon today—the use of another country's dial tone to provide service," said Michael Scheele, a telecom consultant with M.J. Schexel & Associates, of San Francisco. He predicts that all types of competitive carriers—not just cellular operators—will consider this option.

Callback, a Seattle, Washington-based callback provider, is negotiating deals with a handful of foreign cellular operators and is forming a department dedicated to pursuing this business. Over time, Callback could do as much as half of its business in the cellular market, said marketing director Eric Doesch.

Several European competitive cellular operators that were concerned said they are aware of the callback development but have no immediate plans to use the service.

Callback made easy

Until recently, callback providers targeted only end-users with their discount services. But while callback services have been less expensive, they have also been cumbersome.

When is a call not a connection?

More than a mere semantic issue, this question promises to be one of the single largest—and most controversial—faced by public network operators as they move to offer multimedia services. And answering it will pitch the tele-dominated world of circuit switching into a collision with the LAN-dominated world in which many corporate multimedia services are being developed.

Today's circuit switching, narrowband model for communications couples the call—the transmission of sound or data from one user to another—with the connection—the underlying signaling information that reserves a fixed amount of bandwidth and a path. The network knows a voice call needs 64 kilobits of bandwidth constantly and that the called party is also a voice user with a voice terminal.

But that model does not fit well with multimedia, which requires easy addittance of bandwidth or applications or users—some of whom may be talking via a desktop PC with video, while others are using a regular telephone.

Under the call model and signaling comes today's network, each call would have to be taken down completely and reestablished with the new parameters, given that call control and connection control are bound together. For example, it is not possible to dial into a multimedia conference with a couple of colleagues and then decide that you need to distribute a big graphics file using an additional 10 Mbps of bandwidth.

"We've known about this [separation] issue since the late 80s and people in the standards bodies started studying it in the early 90s," said Irving Ebert, vice president of systems engineering at Canada's Bell-Northern Research Ltd. While the call/connection separation arose as carriers were grappling with intelligent network call models, Ebert said, it was clear the same issue would arise in areas like multimedia and become even more urgent.

But changing the...
bersonic to use, discouraging other telecoms service providers from taking the callback option.

Now, callback is being made almost transparent to the user by such new techniques as X.25 call completion via packet switches colocated at cellular switching centers. And this is encouraging alternative carriers to take a fresh look at the option.

The system works in the following manner: A cellular subscriber places an international call, triggering the X.25 switch colocated with the local cellular switch. An X.25 message is sent to the U.S. callback switch, completing the call setup. Then the local switch links back to the cellular customer, who hears only the ringing of the number he has called, after a slight delay.

Asked how the arrangement is working, a senior Pacific Link source said: "On the financial side, I am pleased, but on the technical side, there are still a lot of loose ends. Congestion is a problem and they are still figuring out the best way of reducing the [call setup] time delay, although the quality of the calls is pretty reasonable."

The trend to wholesale callback services is only beginning. "I suspect there are about a half-dozen deals out there," Scheele said. "But the local PFTs are screaming bloody murder," said Herschel Shostek, a telecoms analyst with Herschel Shostek Associates, in Silver Spring, Maryland.

In Hong Kong, however, Hong Kong Telephone's legal challenges to callback have already been rejected by the Office of the Telecommunications Authority. But under the terms of its cellular license, Pacific Link is not permitted to market the callback service to customers. Instead, it simply has to provide it to all subscribers on a non-discriminatory basis.

New encouragement Callback providers have drawn encouragement from recent ruling in which the U.S. Federal Communications Commission gave its blessing in a form of callback known as "uncompleted call signaling." Under this technique, a customer outside the United States dialed a U.S. number, hung up before the call is completed and receives an automatic return call.

This method had been protested by AT&T, Japan's Kokusai Denshin Denwa, Telecom Italia and other operators, which said their own networks were suffering degradation as a result of this and other callback practices (CMT, 10 April).

The FCC, nevertheless determined that callback is not only legal but desirable as a means of preserving established carriers to lower their international rates. Bowing to concerns from other foreign operators, however, the FCC said it would take enforcement action against U.S. callback providers that violate foreign laws prohibiting them from using uncompleted call signaling.

The U.S. agency would take action only where the foreign government has expressly adopted a statute or regulation prohibiting uncompleted call signaling. It has been unable to enforce its own law, and can document evidence and enforcement measures.

The FCC issued its decision just as a study group of the International Telecommunication Union was taking up the issue in Geneva. With a potential new wave of wholesale callback, the ITU study group began to debate whether alternative carriers can reroute their traffic by such means as wholesale callback to avoid the accounting rate system. This system, whereby carriers have traditionally split revenue on international calls, is blamed for keeping international tariffs far above costs.

The study group will continue its work next year, with a number of developing countries asking that it considers the economic harm done to them by callback services.

Reputations cleared Although issues linger at the ITU, U.S. callback providers said the FCC's decision should finally clear their blighted reputation.

"After a couple of years of equivocating, they finally have recognized the callback industry as a legitimate offshoot of the entire telecommunications industry," Doesch said.

Today, the callback market generates about $450 million in annual revenue and serves 300,000 to 400,000 customers, Doesch said.

And since it is an international arbitrage market that takes advantages of rate discrepancies from one country to another, Scheele said, "until every rate in the world is the same price per minute, the market is vast."

---

**Gilat's FaraWay™ VSAT.**

Thin Route Telephony has never been more affordable, reliable, and available!

FaraWay features:
- Best value rural telephony satellite network
- Full-mesh DAMA architecture
- Single modem/single carrier operation
- Toll-quality voice, fax and data
- Revolutionary satellite access scheme

The FaraWay VSAT joins Gilat's two other products: The TwoWay™ VSAT, for interactive data communications, and the OneWay™ VSAT, for data broadcast. Find out more about our exciting "World of VSAT Applications" in the Gilat Pavilion (#2.230) at World Telecom 95 in Geneva.

Or contact us now!

Gilat Satellite Networks Ltd. Corporate Offices: 24a Habarzel St., Tel Aviv 69710, Israel
Tel: (972) 3-645-4222, Fax: (972) 3-648-7429

Gilat Europe: Tour Maine Montparnasse
33, avenue du Maine, 75755 Paris, Cedex 15,
Tel: (33) 1-45.38.89.90, Fax: (33) 1-45.38.89.99

Gilat China: Hui Yuan Apartments, Suite 321
Bldg J, Asian Games Village, Beijing 100101
Tel: (86) 1-492-3195, Fax: (86) 1-492-3196

**VSAT satellite networks at down-to-earth prices**

Circle Reader Service No. 37
Sprint Signs $4.1 Billion Agreement With French, German Phone Carriers

By Gautam Naik

Staff Reporter of The Wall Street Journal

NEW YORK — Sprint Corp. inked a much-delayed pact to sell a 20% stake to the national phone carriers of Germany and France for about $4.1 billion.

Sprint and its new partners, Deutsche Telekom AG and France Telecom, will form a global venture combining operations that fall outside their respective home service regions to offer one-stop shopping to corporations and consumers.

The venture, informally known as Phoenix, would start with $500 million in revenue, employ more than 2,000 people and could begin offering services in about 50 countries by early next year. The deal still must win approval from regulators in Europe and the U.S., and U.S. rivals have complained that Sprint shouldn’t get the green light until European markets open up more to foreign rivals.

The pact would enable Sprint to extend its duel with arch foes MCI Communications Corp. and AT&T Corp. to the global marketplace, especially in nascent markets such as Eastern Europe and less-developed countries. MCI sold a 20% stake for $4.3 billion to British Telecommunications PLC, while AT&T has formed somewhat looser links with Asian and European partners.

“You can’t be isolationist anymore,” said Sprint’s chairman and chief executive, William T. Esrey.

Fall in Share Price

Sprint and its two European partners haggled over price for much of the past year, after Sprint shares plunged to less than $30 in recent weeks from almost $40 when the deal was announced a year ago.

The original terms last June set a total price of $4.2 billion for a 20% stake, to be paid over two years, with each carrier owning a 10% stake in Sprint. The pact signed yesterday calls for a single payment of about $4.1 billion, or $47.23 a share for a total 86.2 million of new Sprint common shares. The final price could rise if Sprint shares trade above a certain range in the weeks before the deal closes.

Moreover, Sprint could get significantly less money from the French and German carriers—$3.5 billion—if the U.S. company sells or spins off its cellular business, which Sprint is considering. Deutsche Telekom and France Telecom have said they don’t intend to invest in a Sprint spinoff, which would reduce their investment in the parent company by about $500 million to $3.5 billion.

PCS Network

Sprint expects to use about $2 billion of the proceeds from the sale to finance an ambitious plan to offer new wireless “personal communications services” to U.S. consumers. Sprint and its cable-television partners, Tele-Communications Inc., Cox Enterprises Inc. and Comcast Corp., plan to spend about $4.2 billion to construct a new PCS network, including the cost of acquiring PCS licenses. Sprint’s share is about $1.7 billion.

A further $1 billion of the proceeds will be used to pay down Sprint’s $4.8 billion of long-term debt. (If the cellular operations are sold or spun off, the new entity will carry about $1 billion of Sprint’s debt.) Sprint will also use part of the European payment to offer build local-phone networks, Mr. Esrey said.

Sprint and its European partners are initially planning a three-pronged attack outside of the U.S., France and Germany. Phoenix will offer international voice, data and video services to large and small businesses, billing and operator services, as well as vital international phone links to newly privatized carriers in various nations, and telephone-card services to travelers.

Deutsche Telekom and France Telecom have agreed to acquire the 86.2 million shares of Sprint at $47.23 a share if the 20-day average trading price of Sprint stock prior to the closing of the deal is between $34.98 and $37.78 a share. At a market price higher than $37.78, the German and French carriers would pay a 25% premium to Sprint, up to $48.70 a share, or $4.2 billion.

If Sprint shares fall below $34.98, its partners must still make a $1.5 billion payment. However, Sprint may defer acceptance of the remaining investment for up to two years.

If Sprint spins off its cellular operations, its European partners would defer part of their investment until the transaction is completed. They would, however, make an interim investment of between $1.5 billion to $3 billion. After a spinoff, and based on Sprint’s stock price, the partners would invest an additional amount—up to $3.5 billion—in Sprint.
Chapter 1 - What is Callback?

What is callback? It is probably one of the most intriguing phenomena to hit the international communications scene in many years. Two years ago, the estimates of the so-called experts were that callback would start dying in two years, and be a thing of the past in five. But, it is not. In fact, if anything, the rate of growth of international callback is accelerating. As we will see, callback is probably the start of full fledged international resale of services and thus, a move toward establishing free market long distance rates throughout the world.

It is based on a very simple premise. Each country has the right, privilege and obligation to establish a price schedule for international long distance calls. In those countries where competition for long distance services is allowed, and there is more than one long distance telephone company, each long distance carrier will also set its own rates.

In the United States, where we have had long distance competition since 1968, and equal access since 1984, the competition has been fierce. At the same time, several technological trends, such as electronic switching and high capacity transmission facilities have reduced the carriers' costs for providing long distance telephone service. The combination of these two factors have led to the United States having, arguably the lowest domestic and international long distance rates in the world.

Probably, competition has had the greater impact, and has driven the technology by creating a market for high capacity networks. The US is one of the few countries in the world with an excess capacity in its network(s). In most of the rest of the world, competition has not pushed the market the way it has in the US. In most countries, there is only one official "phone company". In the vast majority of these countries, the national government owns the telephone company. Countries that own telephone companies tend to run them as they run the government, without competition and little, if any,
Later we will discuss in depth the way rates are set and how the telephone companies in different countries share the revenues with each other. But the most important thing to remember is that the DIRECTION of the call is the key element in determining how much the call will cost. If the two parties could agree on a specific time for the call to be placed, they could save a lot of money by having the US party initiate the call. Most families with units in South America and the US have this arrangement. The US unit places the call at a certain time on a specific day, and the South American end is there to receive the call. When the US unit gets the bill, both units split the cost of the call and save plenty of money.

This even works in the world of business. Companies outside the US agree on a time and date with their US counterparts, and the call is placed from the US end, saving plenty of money.

What's the hitch? Nothing, really, unless the non-US user has an urgent matter that cannot wait until the next regularly scheduled call, or if the non-US end wants to call someone else. There are several, usually inconvenient, ways to handle this. If you can make the adjustment, the savings are considerable.

But let's make sure that we have the basic concept firmly in our minds. A telephone call of a given duration between a US location and a location outside the US can dramatically reduce the cost of the communications by always placing the call from the US location to the location outside the US. This is the basic economic principle of callback, and as with most industries, the economic principle drives the technology, structure and marketing of the product.

For the purposes of our discussions, we will thus define “callback” as any long distance service in which a price advantage is achieved by changing the billing point of the call. This may appear to be a broad definition of callback, but we will show later how callback itself is only one technique for achieving the goal of international long distance reselling. Most serious callback companies also have some form of toll free access as part of their
Introduction

Some people simplified the system a bit, and just never answered any incoming calls, unless there were at least three rings. My father owned a drug store and had to pay for each call he made. If he wanted to call home, he dialed the home telephone number, let it ring twice, and hung up. We would then return the call, and since residential service was flat rate, meaning that there was no additional charge for calls made, we saved the message rate for the call. If the call rang at least three times, we answered the call. I hope the statute of limitations on this has expired!

A name was invented to describe this practice. It was dubbed “code calling”, since a code of some sort passed some intelligence over the network, without having the inconvenience of paying for the call. In the sixties and thereafter, AT&T and other carriers automatically added a prohibition against code calling as part of every tariff they filed. The FCC was persuaded, rightly so, that code calling should be considered an abuse and rules should be passed banning the practice. The FCC has never passed such regulations to any extent, but has accepted them on an individual basis as part of carrier filed tariffs. It believes that flagrant violations should fall under the existing wire fraud laws, and be charged and judged in accordance with the requirements of this legislation.

The reason for this discussion on code calling is because the premier technological underpinning of callback is code calling. Code calling gives the service provider an easy, and more importantly, cheap, method of allowing a non-US caller to signal that he wants service. In its simplest form, the service provider assigns a unique US telephone number to each subscriber. When the subscriber wants service, he simply dials the number, lets it ring a few times and hangs up. As long as the telephone line on the US end is not answered, the non-US subscriber never has to pay for the call.

The service provider detects that the subscriber’s telephone line was rung, and then hung up, so it looks up the data on the subscriber, gets their overseas telephone number, and initiates a call to them. When the subscriber answers, the service provider gives the subscriber US dialtone to make his call or calls. A billing and accounting system is provided to allow the service provider to track the revenue, and how a callback system oversees subscriber charges. There are numerous code calling aspects for a foreign subscriber answered. This can service provider or carrier have done to paid for this attempt charged for the call is anyone is.

In each case, provider to the subscriber, plus all destination, plus all tax saving savings. Of course, not provider have done paid for this attempt charges. Of course, not anyone is.
Section II

Overview

A new industry had sprung up, almost overnight. At this writing, it is still in its infancy, but the fact of its birth is undeniable. As we continue through this book, we will explore the state of the art, the future and the issues.

But before we leave the subject of the history, we must fulfill our promise to give the name of the first company to offer callback services.

It is none other than AT&T!

In 1984, AT&T introduced a service known as USA Direct in the United States. According to the advertisements placed in airline and other publications that year, a traveling American could save by paying the USA rates, which were then easily the cheapest in the world. This was an innovative service at the time, and predictably, incurred the wrath of the PTTs. This came at a time when the FCC was moving to make foreign entry into the lucrative US market more difficult. As we will see later, the tensions have eased somewhat because of the FCC’s relaxation of restrictions on foreign carriers operating in the US.

So AT&T was the first significant callback company! Considering AT&T’s position since then, this is quite a revelation. Don’t be deceived by the fact that USA Direct uses a “call through” technique, utilizing international toll free access to the carrier’s US facilities. This is still reversing the direction of the call, since the 1-800 usage charges are incurred at the US end of the initial call. As we shall see later, AT&T has never taken a position against international resale itself, or against callback, but against the practice of code calling.
Chapter 4 - A Rose by Any Other Name

Throughout this book, we use the term “callback” very loosely to refer to any type of “unauthorized” international resale. Callback, of course, refers to the original, and still prevalent, technique that uses code calling to trigger a call return request. Be mindful of the fact that there are many techniques for triggering a return call, and still more terms for the industry as a whole. A few of them are:

- TCC (Third Country Calling)
- Call Back
- Call Reversal
- Alternate Calling Plan
- Special Calling Plan
- Pirate (Especially in South America)
- Dialback
- Boomerang Box Service
- Call through
- Call Turnaround
- Call Redirection
- Dial Tone Exportation
- Call Re-origination
US market for them, but still had some extensive stocks of them available. The Radio Shack devices sold for about US$15.00 and had a memory calling function built in. There are many other sources for these devices, including Greybar, Anexter and other telecommunications suppliers. They are very easy to use, just press the rubber ring over the mouthpiece of almost any telephone set and push the desired buttons.

Service providers, in an effort to avoid discouraging users and make the system easier to use, have shown a great interest in equipment that connects to the callback systems and does the rotary dial to touchtone conversion for the end user. For the same reason, speech recognition techniques are generating a lot of interest also. We will discuss both of these issues, but be forewarned that, unfortunately, neither of these is a completely satisfactory answer. The rotary dial pulses themselves are a DC pulse, local to the Central Office that provides the lines, and are not passed through the network.

Rotary dial converters attempt to interpret them on the far end by listening carefully to the line and trying to hear the pulses, which are a kind of clicking noise. On a noisy circuit, the converter can get confused, and misinterpret pulses. Line dropouts, a common international phenomenon, can cause the equipment to miss pulses. The timing of the pulses is an issue, since the timing of the pulses is very erratic. Old dials dial digits slower, and most dials dial digits faster at the beginning of a long number, such as a “9” than at the end. This makes the job of the rotary dial converter even more difficult.

The other problem is that most converters are analog devices, so they cannot be wired directly to the channels on a T1, the line of choice for most callback service providers.

The other solution that eventually comes to the table is speech recognition. The technology is good, but just not good enough for the rigors of intensive callback applications. For example, AT&T’s CONVERSANT system, one of the most accurate voice recognition systems available, with the engineering expertise of Bell Labs, is quoted at 90% - 95% accurate. Even at 95%, this means that one out of every twenty characters could be faulty. The

Accounting equipment, in an effort to avoid discouraging users and make the system easier to use, have shown a great interest in equipment that connects to the callback systems and does the rotary dial to touchtone conversion for the end user. For the same reason, speech recognition techniques are generating a lot of interest also. We will discuss both of these issues, but be forewarned that, unfortunately, neither of these is a completely satisfactory answer. The rotary dial pulses themselves are a DC pulse, local to the Central Office that provides the lines, and are not passed through the network.

Rotary dial converters attempt to interpret them on the far end by listening carefully to the line and trying to hear the pulses, which are a kind of clicking noise. On a noisy circuit, the converter can get confused, and misinterpret pulses. Line dropouts, a common international phenomenon, can cause the equipment to miss pulses. The timing of the pulses is an issue, since the timing of the pulses is very erratic. Old dials dial digits slower, and most dials dial digits faster at the beginning of a long number, such as a “9” than at the end. This makes the job of the rotary dial converter even more difficult.

The other problem is that most converters are analog devices, so they cannot be wired directly to the channels on a T1, the line of choice for most callback service providers.

The other solution that eventually comes to the table is speech recognition. The technology is good, but just not good enough for the rigors of intensive callback applications. For example, AT&T’s CONVERSANT system, one of the most accurate voice recognition systems available, with the engineering expertise of Bell Labs, is quoted at 90% - 95% accurate. Even at 95%, this means that one out of every twenty characters could be faulty.
hotbed of callback activity, and there are many active services in the same telephone company exchange in, for example, North Miami Beach. A sledgehammer reaction is to block all calls to the exchange involved, so all calls to 305-555-XXXX are denied by the PTT. This keeps the subscriber from triggering a callback using code calling.

This also blocks all calls to that exchange, so if your mother was living in North Miami Beach, it would be impossible to call her from anywhere in the country. These exchanges also happened to be very popular for travel, tourism and business, so a major problem was created.

One country blocked all calls to a Midwest exchange to prevent a particular callback service provider from receiving code calling attempts. As a countermeasure, the callback service provider got a group of DID numbers in Washington, DC, in the same exchange as the country’s embassy. Blocking these calls would have shut their embassy off completely from the government!

**Barrier # 3 - In Band Filters**

Another South American country inserted “comb” filters designed with a narrow bandwidth to completely eliminate certain frequencies centered around touchtone. These filters have no effect on hearing speech, but can play havoc with some fax or data transmissions, if not carefully placed. By eliminating touchtone, callback is unable to function effectively.

The filter is placed only on calls coming into the country, not on those going out. This allows users in the country to still access voice mail, etc. outside the country. However on calls coming into the country, it effectively eliminates outside access to any interactive service in the country. This means if you live in the country that uses these filters, and travel outside the country, you cannot access your voice mail while you are gone. It also prevents any access to banking services, or even automated attendant systems operating within the country.
How To Be a Service Provider

Section III

Competitive Issues

Callback is similar to many other industries in that when it first began, there were more customers than there were suppliers. There was plenty of pent up demand because of the promise of lower long distance bills. The amount of activity that we saw at that time was a harbinger of things to come. They did come. From its rather inauspicious beginnings back in 1986 up to 1992, the size of the market grew at a relatively, steady, even, and slow rate. When callback was introduced as a primary international vehicle in 1991, it caught on like wild fire. Growth rates of 25-30% per year have been quoted for the industry and probably are not totally inaccurate.

It is too late to start in this new industry? Is there still room for another competitor? What are the growth prospects for the future? These are all questions which obviously remain to be answered, but based upon the steady growth rates that we have seen, there is no reason to believe that international resale business is going to do anything but grow over the next several years. Even with its phenomenal growth rates and the number of customers involved and the number of dollars that are involved, callback still only represents about 1% of the international long distance market. It would not be unreasonable in the next five or six years to see callback take a 20, 30 or 40% market share in international long distance. This means that the market will grow from its approximately US$250,000,000 today to somewhere in excess of US$3 billion by 1996.

Not counted in these figures, of course, is the impact of any PTT actions, lowering of rates, etc., that are natural occurrences in the business world. But even if the market only grew by half the anticipated rate, it still would represent a 2000% growth over the next five years. This is truly a phenomenal growth rate in any industry.

The question of is there room for another competitor in the marketplace is probably answered, “Yes.” In this marketplace there is still plenty of room for not only niche marketers but for major competitors to come on to the
Chapter 2 - Selecting the Right Equipment

What is the right equipment to provide callback services to your subscribers? The answer is not an easy one, because every situation is different, and the requirements are so different. Remember that this is a new and evolving industry, so there is really no standards, no market leaders, and very few successful people to emulate.

In this chapter, we will concentrate on the criteria and considerations to be used when evaluating callback equipment. Trying to present the alternatives and product reviews for the equipment available in the market today would be pointless, because most of today’s callback systems are based on custom designs and programming or adaptations of existing equipment. Each callback service company tends to operate in its own unique way, so even so-called packaged solutions are never the same for two different installations.

There is a definite connection between the marketing plan, the business plan and the technical plan. It is much better to start with the marketing plan, then tailor the technical plan to match it. For example, if the marketing plan calls for targeting business where employees tend to travel a lot, some form of 1-800 call through functionality is a necessity. On the other hand, if hotels are the target, the emphasis will be on speedy call completion, and the use of premises equipment to make the process transparent to the end user.

Keep in mind that any complexities in the marketing plan may lead to designing a system that is more expensive initially and more expensive to maintain without breakdowns. In this chapter, we will cover the process of designing a system, the tradeoffs between packaged solutions and customized systems, how to negotiate and implement the system and how to maintain the system on an ongoing basis.
transparency. And a market place looking for less expensive, more available and better communications.

There is not a single element in this mix that is going to decrease the market potential for the product. In fact, a bigger trend, the globalization of economies, is going to accelerate the need for all types of communications service and tend to stimulate its growth.

The typical privatization scenario that we are seeing is that a country will announce its intention to privatize, and that it will be studying the options. Sometime later, a task force is formed, and begins to set the ground rules for its study. The process is slow and detailed. At the same time, market forces are pushing the need to come to resolution. Economic interests in the country, trying to improve their overall position look at other countries which have already privatized and urge for parity.

The government moves slowly, not wanting to give up its advantageous position vis-à-vis pricing, and hopes that something will happen so it can keep inflated prices. It promises lower prices, and sometimes actually gives some breaks, and waits. In the meantime, callback recognizes a significant opportunity and begins to move in. Now the government first gets indignant, then angry. It applies whatever pressure it can bring to bare on first the US carriers, then on the FCC. It finds a laissez faire attitude at best, or outright skepticism at worst. It finds that US interests, who have gone far past the benevolent monopoly stage in their thinking are not very willing to assist them in prolonging a monopoly that they do not believe should exist.

At this point, the government attempts to give the appearance of making some moves in the direction of free compassion, but it finds that this only encourages the competitors to move more aggressively. Some of the strategies employed include announcing that competition will be opened slowly over the next several (or more) years. Or they might announce an intention to allow some limited and controlled competition in specific markets or products.
Section VII

The bottom line remains the same, no government owned monopoly is going to voluntarily relinquish any power if they are not forced to do so. It is the first lesson of political science, and telecommunications is no exception.

The main difference in this day and age is two things. First, this is a technological war, and as we have seen, it is possible and profitable to fight this war. Second, there is a trend in the world toward privatization, especially since the demise of the communist empire. The world has moved out of nineteenth century agrarian, nationalistic economics into a capitalist, industrial twentieth century global economy.

The breakup of the Bell System was the last barrier to world wide competition. It was a great American experiment that worked. Remember when the Justice Department filed the anti-trust suit against AT&T in 1974, there were predictions of disaster. It was argued that the US had the greatest telecommunications network in the world. And it did. It was also stated that by having multiple carriers and no one organization in charge of the "integrity of the network", we would likely set up a situation where the entire network would be at risk. At one point, the Department of Defense even issued a statement opposed to the breakup, on the basis of the risk to national security. Doom and Gloom.

Many other observers predicted that the ensuing marketing wars would cause AT&T and the others to compromise their engineering standards for more price competition. They went on to say that the severe decline in the quality and availability of communications would hamstring US industry, causing it to seek more expensive and labor intensive solutions to the crisis. This would then put US industry into a tailspin, causing the loss of millions of jobs. The result would be a recession that would make 1929 look like a Sunday School picnic and a recession that would crash the economy.

What was the outcome? Did the communications network in the US collapse into a technological tower of Babel? Were the US armed forces forced to capitulate throughout the world. Did the US economy crash?
providing a service that is only affordable, therefore available, to only the upper levels of the economic strata. This creates a “rich get richer, poor get poorer” atmosphere in these emerging economies. This does not benefit any nation that is trying to build a robust economy. The overall economy is boosted when more product is produced and shipped abroad in exchange for cash and products from abroad.

This is the basis of the strength of the US economy. Plentiful national resources are useless when overseas markets cannot be cultivated. In many of the world’s emerging nations, there are sufficient resources to allow the country to grow and prosper. But when the basic tools of business, like communications are held back from all but the insiders with sufficient size and power, the country as a whole stands to suffer.

Ironically, it is the increased availability of mass communications, such as radio and television, that have heightened the awareness of the unwashed masses to the benefits of modern telecommunications. They are not only aware of the benefits, but they desire to have them in a major way. At the same time, the trend in the world is toward global economies and this a global community. Traditional barriers to international commerce are falling everywhere, and it is a rare country that has not expressed some interest in pursuing the advantages of international trade. Telecommunications is a vital component in building an international economy.

If there is an awareness at the policy making levels of these nations of the seriousness of the situation, it is not readily apparent. There seems to be either a siege mentality or a cavalier approach to the increasing trend to telecommunications competition. The PTT (and its owner, the government) often don’t seem to understand the world wide forces that are at play. Since the demise of world wide communism, there is a clear trend everywhere evident toward free and open markets. It is much easier for a government to control the flow of goods, and to some extent, the flow of money, in and out of their borders, than it is to control the flow of information.
Europe Yields Many Losers In Privatizing

WORLD STOCK MARKETS

By Michael R. Sisit
Staff Reporter of The Wall Street Journal

LONDON—Ever since the sale of state-owned companies became an investment bonanza in Thatcher-era Britain, investors have been eagerly awaiting more privatization stock sales by companies elsewhere in Europe.

But after privatizations in continental Europe valued at $63.8 billion since the start of 1993, according to the specialist publisher Privatization International Ltd., a lot of stock sales by French, Italian, Spanish and Scandinavian companies look like duds. Among the biggest losers: issues of GiroBank of Denmark, Argentaria of Spain, dairy company Sachsenmilch of Germany, Rhone Poulenc of France, and VAE Eisenbahnsysteme of Austria have all fallen more than 22% in price since they were sold.

The results have been all the more shocking because through 1993 investors saw the price more than triple for British Telecommunications, which went public in 1984, and more than double for British Gas, which first sold stock in 1986. Regional utilities such as Northumbrian Water Group and Southern Electricity, privatized in 1989 and 1990, respectively, also did well, soaring threefold.

Privatizing state-owned companies is supposed to generate revenue for the state, improve management, and create more shareholders. Based on Britain's success, "privatizations have been sold as a panacea, that everyone is going to make a whole lot of money on their investments," says Albert Morillo, a senior investment director at Scottish Widows Investment Management Ltd. in Edinburgh.

However, he says: "Some of these things have been abominable."

What went wrong?

Money managers say too many governments tried to unload too many companies at too lofty prices, especially in 1994 when most major stock markets fell. They also complain of government interference and bad management.

In France, the chemical and drug company Rhone Poulenc and insurer Union des Assurances de Paris are 23% and 16% below their issue prices.

Please Turn to Page C11, Column 1
Many European Privatizations Run Into Trouble

Continued From Page C1

"Below prices at which they sold stock in secondary offerings — after their initial public sales — in November 1993 and May 1994, respectively.

In Austria, shares of VAE, a maker of railroad-track equipment, have fallen 23% since a secondary offering in the fall of 1993 and 21% since another offering a year later. In Madrid, brokers predicted that shares of banking concern Argentaria would climb from their November 1993 offering price of 6,050 pesetas ($51 at current rates) to 7,000 pesetas in 1994. But yesterday, they closed at 4,530 pesetas. In Denmark, shares of GiroBank are worth 23% less than when the government sold 51% of the bank 19 months ago.

Because governments generally sell off their best assets first, some money managers warn that the poor performances bode ill for future deals. "The first ones have to work," says John Hickling, a portfolio manager at Fidelity Investments in Boston. "If they don't, nobody is going to show up for the second and third ones."

Within months of government sales of two bank issues, Banca Commerciale Italiana and Credito Italiana, the banks both diluted shareholders' stakes by issuing new stock and embarked on expansion binge. Without adjusting for subsequent rights issues, BCI shares are 31% below an offering completed in March 1994.

Two French companies, banking concern Banque Nationale de Paris and Rhone Poulenc, issued warnings about their profits shortly after government stock sales in late 1993. "That doesn't instill a lot of confidence in future deals," says Mr. Morillo.

A bigger complaint centers on the old-managers management structure in French companies. For instance, Rhone Poulenc and oil giant Elf Aquitaine each bought shares in an offering by car maker Renault. These "core shareholdings" — noyeau durs in French — show little or no investment logic, money managers argue.

Some observers believe French corporate culture is beginning to change, focusing more on shareholder interests. But not soon enough for some investors.

On July 10, steelmaker Usinor Saclor sold a $3.6 billion initial public offering at 89 francs ($18.61) per share for institutional investors. Three weeks later, the market price is 86.4 francs. "Usinor was a bomb," says William L. Wilby of Oppenheimer Management in New York. "It's a classic case of how the French government has turned investors off."

Fund managers also grumble that many privatized companies offer little "novelty value." Many are in telecommunications, oil, banking or insurance, industries that have long been available to global investors in other markets.

"So you must get something else," Mr. Morillo says, "and that must be a good offering price."

Supply is another problem. Many European countries saw the sale of government assets as a way to reduce their staggering debt loads. But they ran into former communist countries also eager to raise capital for their own state-owned industries, at the same time as private corporations worldwide were selling off noncore assets as part of restructurings. Result? "You have had a market glutted with people trying to sell shares," says Mr. Wilby.

Even where privatized stocks have risen, investors sometimes would have done better by ignoring them. For instance, while Swedish defense contractor Celsius Industrier has risen 10% since its initial offering in June 1993, the Stockholm stock market has surged nearly 60% during the same period.

Another measure of investor disappointment is the performance of two big funds that together raised more than $1 billion in early 1994 to invest in privatizations. Shares in Mercury Asset Management's European Privatization Trust and the Kleinwort Benson European Privatization Trust, both issued at a pound each ($1.60 now), are now at 90.5 pence and 83 pence, respectively.

Mr. Morillo says governments must choose between rewarding taxpayers or investors. If shares are sold at a very low price, investors gain at taxpayers' expense. If the stock is priced high, taxpayers gain at investors' expense.

But Oppenheimer's Mr. Wilby says governments that burn investors are shooting themselves in the foot. "They think they may be helping the taxpayer, but they are hurting the taxpayer if they sell the stock and it immediately plum-mets, turning off investors to future deals," he says. "It means they will have a harder time getting good prices in future deals, which will hurt taxpayers. The more investors make money, the higher prices the government will be able to get in the long run."
Germany’s Proposal to Deregulate Telecommunications Is Unveiled

Plan to End Monopoly Held By Deutsche Telekom May Not Please Rivals

By GREG STEINMETZ

Staff Reporter of THE WALL STREET JOURNAL

BONN—German regulators spelled out how they intend to end state-owned Deutsche Telekom AG’s monopoly over the nation’s telecommunications market, but competitors may find the long-awaited announcement to be less attractive than they had hoped.

The German telecommunications market is expected to produce 100 billion marks ($70.51 billion) in annual revenue by the year 2000. AT&T Corp., BellSouth Corp. and large German firms such as RWE AG and Daimler-Benz AG are gearing up to compete for basic phone services after limits to competition fall in 1998.

The Postal Ministry’s proposal for deregulating Europe’s largest communications market, released yesterday, was immediately attacked for not allowing competition before the European Union’s 1998 deadline. It also left open such important questions as how much competitors must pay to gain access to Deutsche Telekom’s lines.

“That’s a very big issue,” said Sean Phelan, principal analyst in London with the Yankee Group, a consulting firm.

Liberal Framework

Yet Postal Minister Wolfgang Boetsch’s 16-page plan sets a precedent by offering a liberal framework for deregulation. The plan puts heat on France to follow suit, analysts said. And it could hasten U.S. regulatory approval of Deutsche Telekom’s proposed investment in Sprint Corp.

Washington wants U.S. firms to have the same access to foreign markets as foreign firms enjoy in the U.S. Deutsche Telekom and France Telecom have teamed up to buy 20% of Sprint.

At a news conference yesterday, Mr. Boetsch said he expected a number of firms to provide basic phone services in Germany and a smaller number to compete for the network infrastructure. “This plan would provide consumers with lower costs and better service,” he said.

The plan caught analysts off guard by suggesting that only Deutsche Telekom would have to offer service to every home and office. The costs of providing such universal service would discourage competition. The plan does that by requiring that companies with more than 25% of the market offer services to everyone; analysts say it will be years, if ever, before any newcomer reaches that level.

Rainer Liebich, managing director for AT&T Corp. in Germany, said the German political process also could dilute the ministry’s liberal intentions. “Now the question is whether this can obtain a consensus,” he said.

The government plans to begin selling off Deutsche Telekom to the public next year. The offering, one of the biggest in history, is expected to raise as much as 60 billion marks after all of its stages. But Bonn fears the company isn’t ready for competition.

“The government has an obvious conflict,” said a former government official who asked not to be identified. He said the Finance Ministry wants to delay competition so Deutsche Telekom isn’t destroyed by nimble upstarts. Bonn also worries how the company’s unionized work force will respond to competition, he said.

Conflicting Pressures

At the same time, Bonn is being pulled in the other direction, with industry calling for open competition before 1998. Veba AG, a big German utility that has joined with Cable & Wireless PLC of Britain to offer phone services and infrastructure in Germany, said yesterday that German firms could fall behind international competitors if they had to wait too long. “To assure functioning competition by Jan. 1, 1998, Veba maintains the awarding of licenses should occur in 1996,” it said.

Industry executives and analysts also objected to the fact that the document leaves open the important issue of the cost of connecting to the Deutsche Telekom network, which will continue to provide service to most of the population following deregulation. AT&T and others have called for fixed rates determined by the government rather than privately negotiated with Deutsche Telekom.

“In the early days of competition, most calls will go through Deutsche Telekom,” said the Yankee Group’s Mr. Phelan. “Its access rates will determine how profitable the competition will be.”
CALL-BACK OPERATORS STIR
DEBATE OVER VOLUME RESALE

Are Call-Back Schemes Good Business or Network Thierry?

Vince Vittore,
Associate Editor

They represent less than 1% of the long distance market, yet to some
interexchange carriers, international call-back firms are nothing more than
thieves stealing network minutes.

But supporters consider call-
back operators the Robin Hoods
telecom competition, taking
from rich foreign PTTs, who
charge “obscene rates” for
international calls, and giving
to the poor callers held hostage by
these rates.

Now the State and Justice
departments have voiced their opinion. In a
letter to FCC Chairman Reed Hundt,
both departments affirmed that callback is
legal and conforms with international law,
principles of international comity and
International Telecommunications Union
regulations. The letters responded to a
complaint filed by AT&T and a subse-
quent objection from COMTELCA, a con-
sortium of Central American PTTs.

This hardly signals an end to the con-
troversy. “I don’t think there’s an easy
answer as to where this is all going,” says
Dennis Miga, founder and former CEO of
Matrix Telecom, a telecom reseller.

Call-back operations started about three
years ago as an option for U.S. business
customers tired of paying monopoly rates
for international calls. Call-back service is
based on the assumption that it’s less
expensive to call Korea from the U.S., for
event, than vice versa.

The call-back process begins when a
caller in a foreign country dials a U.S.
access number. In most cases, the caller
hangs up after the phone rings twice. This
gives the switch enough time to grab the
automatic number identification (ANI)
information from the calling phone and
route a call back to the same location, pro-
viding U.S. dialtone (see figure). Call-
back operators then resell network minutes
they’ve bought in bulk from facilities-
based U.S. operators.

Network Arbitrage

“It’s basically network arbitrage,” says
Miga, who also serves as chairman of the
International Resale Council, which oper-
ates under the Telecommunications
Resellers Association umbrella. Call-back
companies simply are playing off the dif-
ference in rates between countries with
monopoly phone systems and more com-
petitive countries such as the U.S. and UK.
This drives the competition issue into
other countries, he says.

In fact, for European travelers, the
cheapest rates often are obtained from
UK-based call-back companies.

AT&T, the leading call-back opponent,
calls the practice plain old network they-
ery. The compa-
ny is not opposed to all callback, just those
instances that use code calling, which
occurs when the initial call is disconnected
intentionally.

“It’s basically stealing minutes where a
paying customer could be using the net-
work,” says Olga Chandra, an AT&T
spokeswoman.

Call-back proponents, who say code
calling is the “heart and soul” of call-back,
the back that code calling is no different
than standard “saver” features on
answering machines that allow users to
continued on page 43
disconnect the initial call. When that occurs, "AT&T is not going to have a leg to stand on," says Miga.

And even without the new technique, it’s unlikely any company will be able to slow international callback’s growth. According to Atlantic ACM, a Boston-based market research firm, the callback market will reach $260 million by the end of this year and continue growing rapidly until at least 1997, when European network operators will be forced into competition (see figure).

Other industry estimates, including those of TRA, put the figure closer to $1 billion, though accurate numbers are difficult to come by since most callback operators are small companies and all are privately owned.

One of the largest callback operators, Telegroup, has estimated revenues approaching $100 million, a pitance compared to the $500-billion international market.

However, their size also makes callback companies difficult to stop, even for foreign telcos with a lot of resources. In one case, says Miga, Argentina’s national phone company attempted to shut down an Omaha-based company by blocking all calls to the 402 area code. In response, the callback company packed its bags and moved its operation to Washington, D.C.

"Never underestimate the ingenuity of the American entrepreneur," says Miga, "The wave is moving in one direction. You may stop it in one area, but it’s going to rise up somewhere else."

**New Competition**

Profits are attracting new players, forcing those small leading-edge companies to rethink their business plans.

"They’re responding to a customer need," admits Chandra. "And a lot of PTTs are getting the message that they can’t charge these high prices for international calling. Their customers are now seeking rates at the global level."

In fact, AT&T’s USA Direct program could be considered a form of callback because it offers U.S. pricing on calls originating in foreign countries. That program, however, has the cooperation of PTTs, which are reimbursed through the settlement process, Chandra adds. Several other American telcos and even foreign operators are offering service similar to callback.

In one small Pacific Island nation, Miga says the national operator offers callback to certain foreign visitors. "It’s a hedge against themselves going out of business."

And when RBOCs are released from long distance restrictions imposed by the MFJ, don’t be surprised to see one of the seven jump into the callback market, he adds. "There’s lots of opportunity out there, and callback is aimed directly at that market opportunity."

The emergence of such players also comes at a time when the entire market is shifting: small companies are becoming big players, and more firms are looking off shore for new bases of operation.

"It’s really become a different ball game out there." Miga says. "Everything is up for grabs, and it’s changing fast."

---

**International Callback Market**

[Graph showing international callback market growth from 1993 to 1998.]

---

[Number of readers: 43]
India Seeks to Open Huge Phone Market
U.S. Firms Join Auction With Big Risks, Rewards

BY PETER WALDMAN
Staff Reporter of The Wall Street Journal
NEW DELHI — India, though fraught with risks for foreign investors, wants to become one of the world's most open and competitive telecommunications markets.

India is considering private bids, submitted last month, to build and operate 20 million Indian telephone lines over the next five years. The goal — a key part of India's four-year-old economic liberalization program — is to triple telephone penetration in the country. Currently, with 8.7 phone lines per 1,000 citizens, India's line penetration is just 10% of the global average. (China's line penetration, by comparison, is twice India's.)

To make the jump, the government is holding what may be one of history's richest auctions. On the block are rights to provide telecommunications products, including basic-telephone, entertainment and data services, to a market of nearly one billion people. If all goes well, and the privatization effort isn't stalled by strikes, political infighting or other potential pitfalls of Indian reform, planners expect telecommunications liberalization to yield India as much as $8 billion in license and access fees by the year 2000.

Doubts Persist

Though several of the world's biggest telecommunications companies submitted bids to provide services, doubts persist. India, the world's most populous democracy, has been rattled by the process of economic reform.

The Indian state of Maharashtra, for example, after a change of government, is reconsidering a signed contract with Houston-based Enron Corp. to build a $2.8 billion power plant. A similar, though smaller, deal by the Transpower unit of AES Corp., headquartered in Arlington, Va., based AES Corp. is also in trouble in India's Orissa state. If the deals are broken, overall foreign investment in India will surely suffer.

Similarly, more xenophobia surfaced recently when Indians protested the government-owned television company's decision to distribute Cable News Network of the U.S. in India.

India's Department of Telecommunications has divided the nation into 20 operating circles. India's major corporate conglomerates, teamed with minority foreign partners, can bid on as many circles as they wish. The government plans to select one basic-service operator for each circle, along with two providers of cellular services. The cellular auction, which began in 1992, but was interrupted by litigation, is being handled separately.

Assuming bidders meet financial and technological qualifications, the main criterion for selection, the government says, is how much money bidders offer for licensing rights. This has led, in the past six months, to a mad scramble by huge telecommunications companies, including U.S. players AT&T Corp., U S West Inc., Bell Atlantic Corp. and Nynex Corp., to devise bidding strategies for the vast, yet little-known market. Auction results aren't expected for months.

For example, AT&T and its Indian partner, Aditya V. Birla Group, said they interviewed 10,000 potential subscribers across India before submitting sealed bids to provide basic services in four operating circles, including India's largest cities.

"With everyone trying to size up the market, there has been a lot of espionage out there," says Mrityunjay Athreya, a Harvard-trained Ph.D. and management consultant who chaired the commission that charted India's telecommunication privatization drive. "I suspect most companies will err on the high side, just to get in the market."

Huge Upside

The upside is huge. Gross profit margins in the telecommunications industry run in the 10% to 12% range in most developed countries, and at least 10 percentage points higher than that in emerging markets. But those margins are generally for phone services alone. In India, the government requires the circles to be wired with state-of-the-art optical fiber and other technologies — except for the so-called last 500 meters from the curb — allowing transmission of entertainment, data and other information.

"We're planning to leapfrog in terms of technology," says Pramod Saxena, an executive with India's Essar Group, which is bidding for several circles with partner Bell Atlantic. "Telecom and entertainment are just the short term."

India remains highly unpredictable. Last month, many of the country's 450,000 telecommunications workers, afraid of the impact of privatization, staged a four-day strike over job security. They returned to work when the government threatened to fire them, but the unions continue to press for greater job protection.

Politics Another Wild Card

Another uncertainty is politics. Because India's telecommunications privatization is being handled at the federal level, and not by the states, executives say it entails less political risk than the power industry, which has been rocked by changes in state governments. But with national parliamentary elections scheduled for next year, and with the reformist Prime Minister P. V. Narasimha Rao looking unlikely to muster a strong majority, liberalization could suffer anew.

"There could be a temporary setback," says Mr. Athreya, the former chief of the telecommunications commission, "but telecommunications reform will go on."

After a rocky start, bidders praise the Department of Telecommunications' handling of the tender process. Even with privatization moving forward, the DOT has no plans to withdraw from the industry, creating an obvious conflict between the public and private sectors. The DOT plans to use the auction proceeds to expand its network, particularly in underserved areas, and to maintain its monopoly on in-country long-distance services. India's international long-distance carrier, Videsh Sanchar Nigam Ltd., also is to keep its monopoly.
APPENDIX
The Future of Call Re-Origination
The X.25 Packet Network is the future of International Call Re-Origination. Packet Network Signaling (PNS), provides direct signaling of Customer Identification, Carrier Identification, and Call Destination Number. Packet Network Signaling significantly decreases callback response time and increases call reliability. PNS technology permits call re-origination notification to the switch without the necessity to utilize DID (unanswered call signaling) or answered call signaling using the Public Switched Telephone Network (PSTN).

P-LINK (Premise Access Component)
The XP-LINK from Immix provides an economic solution for call re-origination. Located on the subscriber premise, the XP-LINK offers dial-in access to the X.25 network utilizing the X.28 interface standard protocol.

By providing virtual access to the X.25 network directly from the customer premise, the XP-LINK offers the fastest, most efficient method of seamless international call re-origination available. The subscribers simply dial the destination number they wish to reach and within seconds are connected. The XP-LINK is completely programmable to allow for Least Cost Routing, 1000+ Speed Dial Numbers, extensive Exception Tables, Pulse to Tone Conversion, Call Blocking, Call Timing, On-Site Call Costing and more...
You no longer need to rely on outdated technology to handle today's complex call control tasks. Take note of a few benefits offered by the C3-II:

- No Power Related Loss of Connection
- Increased Up-Time
- Unprecedented Call Reliability
- Unrestricted Table Lengths
- Flexible Programming Options
- No Battery Backup Required
- Call Log/Call Timer/NotePad
- Continuous On-Line Error Monitor
- Alternate Line Switching
- Modular 1 to 8 lines
- Heavy Lightning & Surge Protection
- Automatic Pulse/DTMF Conversion

Never before have you had the reliability, flexibility, programmability, and power found in a Call Controller as you will find in the C3-II.

The C3-II is powerful enough for use by the largest long-distance company and yet adaptable enough to allow for easy and efficient integration by busy local installers and technicians, to provide their customers with a versatile and flexible choice.
C3-II CUSTOMizing Call Controller

Seamless International Callback

The IMMIX C3-II CUSTOMizing Call Controller is the optimum choice for Callback Service Providers who demand exceptional quality for their customers. The C3-II combines full featured capability with unprecedented reliability, including state-of-the-art power protection, pulse to tone conversion, end of call signaling, remote programming, on-site call costing and much, much more. The C3-II is compliant with CCITT telephone standards throughout the world.

IDEAL FOR HOTELS and CORPORATE CUSTOMERS
The C3-II provides a seamless callback solution to answer the needs of hotels and large corporate clients. The C3-II is placed at trunk level between the PBX and the Central Office (C.O.), and makes call process decisions based upon subscriber dialed digits.

EXCELLENT RELIABILITY
The advanced technology in the C3-II make it the most reliable Call Controlling device in the market today. The C3-II provides superior power protection, contains no electro-mechanical parts, and incorporates flash ROM storage to provide increased up-time and decrease maintenance costs and user inconvenience.

FLEXIBILITY
The C3-II is adaptable for installation in diverse international environments. It has continuously met challenges such as; X.25 configurations, 48 volt battery requirements, low line power installations, and unpredictable switch response time. Optional Add-In cards such as the Voice Module, or the Precise Tone Detector provide even more flexibility to meet the changing global telecommunication requirements.

◆ Modular 1 to 8 Lines
◆ Least Cost Routing
◆ End Of Call Signaling
◆ Multi-Node Selection
◆ On-Site Positive Account Verification
◆ On-Site Call Costing
◆ Toll Restriction
◆ Call Home Reporting
◆ Call Blocking
◆ Programmable Audio Prompts
◆ 1000 Number Speed Dial
◆ Line Surge Protection
◆ Remote Programming
◆ Answer Supervision
◆ Routing By Exception
◆ Local Call Screening
◆ Call Timing
◆ Fraud Detection & Prevention
◆ Automatic Pulse To Tone Conversion
◆ Works With PBX & Centrex Systems

IMMIX Telecom, 1948 NW 54th Ave, Margate, FL 33062 tel (305) 968-5725 fax (305) 968-6527
INTERNET: immix@gate.net Home Page: http://www.gate.net/~immix/immix.htm
**C3-II CUSTOMizing Call Controller**

**ADDITIONAL FEATURES**
- Alternate Line Switching
- Time of Day Call Restriction
- NANN Ready
- Hot-Line Dialing
- Incoming Call Monitor
- Fraud Detect
- Programmable SMDR Content
- Solicitation Dialing

**PROGRAMMING**
- Terminal, DTMF, & Remote Programming
- Recursive Tree Structured Search Tables
- Recursive Tree Structured PAV Tables
- Multiple Rate Tables
- Multiple Number Substitution Tables
- Multiple Route Selection
- Unrestricted Table Lengths
- Buffered SMDR
- Automatic Call Home Reporting

**LINE CONNECTION**
- Individual Line Modules

**OPERATING ENVIRONMENT**
- 0 to 70°C

**COMPLIANCE**
- FCC Part 68 & 15
- UL Listed

**POWER**
- AC: 110V/220V Auto Switching
- DC: +5V, +/-12V, +48V

**PHYSICAL DESCRIPTION**
- 10" x 10" x 2.125"
- 3.2 lbs fully populated
- ABS Plastic Enclosure
- Wall and Rack Mountable

---

**immix telecom inc**
1948 NW 54th Ave, Margate, FL 33063
tel (305) 968-5725  fax (305) 968-6527  internet immix@gate.net
Introducing LOGOS Callback™

CALLBACK provides four main benefits to the frequent international caller:

1. **Lower Rates**
   Callback's principle benefit is its ability to help you significantly reduce your calling charges into the U.S. from other countries, and from overseas locations to other overseas locations.

2. **Simple Operation**
   Here is a simple example of how Callback works: Let's say your general manager in Barcelona needs to call you on a regular basis. Rates from Barcelona to the U.S. cost approximately $3.05 per minute. You install a Callback device at your location in the U.S., and hook it up to a standard

---

### Sample costs for a ten minute call to New York during peak U.S.A. business hours from 5 different countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Local direct dial charges*</th>
<th>Using LOGOS Callback</th>
<th>Savings using Callback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>$34.50</td>
<td>$12.95</td>
<td>62.6%</td>
</tr>
<tr>
<td>Brazil</td>
<td>$48.73</td>
<td>$11.97</td>
<td>75.4%</td>
</tr>
<tr>
<td>Israel</td>
<td>$26.93</td>
<td>$14.99</td>
<td>47.6%</td>
</tr>
<tr>
<td>Italy</td>
<td>$30.20</td>
<td>$11.91</td>
<td>60.5%</td>
</tr>
<tr>
<td>Spain</td>
<td>$30.58</td>
<td>$12.61</td>
<td>58.7%</td>
</tr>
</tbody>
</table>

*In U.S. dollars including VAT tax rate. Varies with exchange rates. Source: AT&T.
Touchtone line with the Three-Way Calling feature. Using your phone in the States, you can program in your manager's phone number in Barcelona, or he can do it remotely. When he calls the CallBack line in the U.S., he lets the phone ring 3 times and then hangs up. CallBack "grabs" the Three-Way Calling line and dials the number of your manager's phone in Barcelona. When he picks up the phone, he can dial out - using U.S. "dial tone" - to any phone or fax in the world . . . all at U.S. rates.

In this example, a call from the U.S. to Barcelona costs $1.26 per minute, a savings of $1.79 per minute or 59%.

Companies with multiple overseas locations can save literally thousands of dollars per month with CallBack. Individuals who are frequently overseas can recapture the cost of the device and the line in a very short time.

3. Greater Productivity

Saving money is great, but sometimes saving time is even more important. CallBack allows you to make as many phone calls as you wish without working through overseas operators or initiating a chain of individual phone calls. That means just one connection, and much better use of your telephone time.


Because CallBack is programmed to call back a specific phone number, only that phone is able to access the U.S. line to make outgoing phone calls. Hacking is denied. In addition, a series of access codes which can be changed at any time provide multiple levels of security.

Installation/Purchasing Options

Single-line desktop LOGOS CallBack units can be purchased individually for use with a dedicated phone line. Companies with multiple overseas locations may wish to install multiple CallBack units in a standard 19" rack-mounted card cage configuration including a cabinet as required.

CallBack service can also be obtained through a growing number of authorized service bureaus which provide CallBack service and maintain equipment for you.

Specifications

The LOGOS CallBack is stand-alone or rack mounted customer-premise equipment. Basic functions include remote access, call back, call out and serial dialing. Each unit requires a single Touchtone line equipped with Three-Way calling. Patent pending. Compatible with most fax machines.

The Satcom Group

13 Freeman Street • New Brunswick, NJ 08901 • (908) 846-6272

Logotronix™
**GLOBAL TELECOM SOLUTIONS, INC.**

**GLOBAL TELECOM SOLUTIONS RATE COMPARISON**

This example is based on the average cost of calls from Latin America.

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Average Local Rate per minute</th>
<th>Average Global Telecom Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>$7.00</td>
<td>$6.00</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>$6.50</td>
<td>$5.50</td>
</tr>
<tr>
<td>England</td>
<td>$6.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Japan</td>
<td>$5.50</td>
<td>$4.50</td>
</tr>
<tr>
<td>Germany</td>
<td>$5.00</td>
<td>$4.00</td>
</tr>
<tr>
<td>Taiwan</td>
<td>$4.50</td>
<td>$3.50</td>
</tr>
<tr>
<td>Italy</td>
<td>$4.00</td>
<td>$3.00</td>
</tr>
</tbody>
</table>

**SAMPLE RATES**

The following rates are an example of per-minute rates based on a three-minute call using Global Telecom's switching center.

**FROM ARGENTINA TO:**

- U.K. $1.22
- Japan $1.64
- Brazil $1.46
- Miami $1.74
- New York $1.89
- Canada $1.98
- Taiwan $1.71
- Spain $1.54
- Germany $1.44
- Bahamas $1.15

**FROM VENEZUELA TO:**

- Australia $1.05
- Taiwan $1.10
- U.K. $1.01
- Brazil $1.06
- Miami $1.25
- New York $1.08

**FROM EL SALVADOR TO:**

- Brazil $1.43
- Spain $1.10
- Peru $1.19
- Canada $1.98
- Miami USA $2.11
- New York USA $2.46
- Germany $1.38
- Italy $1.55
- U.K. $1.42
- Taiwan $1.24

**FROM UNITED KINGDOM TO:**

- Bahamas $1.37
- Germany $1.48
- Costa Rica $1.16
- Brazil $1.20
- Miami USA $1.48
- New York USA $1.65

**AVAILABLE TO ALL COUNTRIES**

**HERE IS WHAT HAPPENS WHEN YOU PLACE A CALL**

1. First, you call from Argentina to the GTS switch. You hang up after 1 ring. There is no charge for this call since you hung up.

2. Next, your private line in the U.S. calls you back in Argentina. This call is billed at U.S. rates.

3. Then you dial the number in England. That call is made from Miami and billed at U.S. rates also.

How is the call billed?

- Call 1: $0.00
- Call 2: $1.74
- Call 3: $0.48
- Total call: $2.22

A savings of $2.24 or 65%
WHAT IS GLOBAL TELECOM?
Global Telecom Solutions Inc. is an international switching center that provides access to U.S. telephone service to business clients anywhere in the world.

WHAT DOES ACCESS TO U.S. TELEPHONE SERVICE MEAN TO YOU?
- Up to 75% savings on international calling
- Itemized detailed billing and call management reports
- Better sound quality and higher percentage of call completion
- More precise billing (30 second minimum and 6-second increments)

HOW DOES IT WORK?
When you lease access to Global Telecom’s international switching center, we:
- Order a telephone line in your company’s name — This line is exclusively for your use. Only users authorized by you will use your line.
- Issue you a private access number for each user — This number will provide billing information, act as a security measure and provide information for the callback telephone location.
- Allow you to access our switching center with your private access number — Once accessed, you place a call on your U.S. phone line which is billed at U.S. rates.
- Send you an invoice for accessing our system at the end of the month — Our charge is a low flat rate of $99 per month per access port.
- In addition to our access charge, you will be billed for your phone line and long distance usage directly by the telephone companies.

WHAT DOES IT COST?
To calculate the cost of leasing an access port, you must add the following items:
- The number of access ports x $99 per month
- The number of private access numbers x $4 per month
- The number of telephone lines x $31.50 per month

In addition, you will incur installation charges from the phone company (approximately $95.00 per line) and may have to pay deposits if you have not had telephone service in the U.S. before. (Approximately $290 per line). All installation charges can be paid in installments to the phone company over a 6 month period.

WHY USE GLOBAL?
- Superior level of client service; you have 24 hour equipment supervision and the lowest rates available.
- Extremely fraud resistant system with minimum risk and low startup cost.
- Private phone line insures that your service will never be interrupted for others mistakes, and that you will receive error free billing directly from the long distance carrier of your choice.
Here's a NANP solution that'll knock your socks off, stuffed into a device with enough added features to make any gadget-freak delirious. IMMIX's (Margate, FL) C3-II is a computerized switch/line monitor that comes NANP-ready to handle 1+, 0+, 00+, and 011+ calls (just stick it on your trunks). But that's not all! The C3-II does incoming call monitoring, call blocking, call timing, speed-dialing (1,000+ numbers). It's an answer-supervision box, a lockout box, a call-accounting "fix," an LCR adjunct, a "call home" alarm and a seam-

less international call-back unit. It slices, it dices... you get the picture.

You program the thing with a PC, using a straightforward utility. It has room onboard for search tables, rate tables, substitution tables, etc. It lets you remotely monitor call progress, reset lines, etc. It talks tone, pulse, loop, and ground start. It incorporates power protection and battery backup, so that if the local generator blows up, you don't lose calls in progress. And it's small: it's set up modular, so you can add trunks as needed. Buy one, and build apps for it — it's neat.

Voice: 305-968-5725
Fax: 305-968-6527
Telegroup specializes in helping companies like yours save money on long distance telephone calls. Our unique programs are designed to provide you with the finest quality service in the world at the lowest possible cost.

Our state-of-the-art services utilize the sophisticated networks of major carriers (including AT&T, MCI, Sprint, and WITel). We can bring you rates previously available only to companies spending millions of dollars monthly on long distance.

Connect for Less
Telegroup Long Distance Services

- Save up to 30% on U.S. calls
- Save up to 40% on 800 calls
- Save up to 50% on international calls
- Crystal clear connections
- Superb customer service
- Six-second billing
- Call detail on paper or disk
- Free account codes
- Free sign-up
- Satisfaction guaranteed

“...We went on Telegroup's program in January 1990. We are a phone-intensive company and it is critical that our service be trouble-free and of the highest quality. We have been very impressed with Telegroup. Their service has been excellent and every month our bill shows a substantial savings on long distance calls.”

—Steve Rubin, CEO
United Foods International, Inc.
(International perishables brokerage firm)
Customer service is the heart of our business...

At Telegroup, your satisfaction is so important to us that our customer service department is larger than our sales department. And it always will be. We know that great service means more than just great rates—it also means responding quickly and accurately whenever you have a question or problem.

Our customer service representatives are the finest in the business, and they are just a phone call away. You will find them friendly, professional and eager to help. They will do whatever it takes to insure that you are completely satisfied with your Telegroup service.

Telegroup serves more than 20,000 businesses worldwide, ranging from small companies to branches of some of the world's largest. Many manufacturing, trade, and legal associations sponsor Telegroup programs to their member firms.

"Our accounting people were somewhat skeptical that we could realize the savings Telegroup projected. Telegroup's first invoice, I am happy to say, proved otherwise. Our original projected savings were $3600 per year, but now it looks like we will save over $6000 per year."

—John Ballou, Buyer
Barrett, Harrington & Co.
(Manufacturers of industrial pumps)

"Telegroup's clearly detailed bill has helped us recover an additional $500-$6000 per month. Telegroup is helping make our firm more profitable."

—Nancy Moore, Office Manager
Hayford, Snayo and Morgan
(Electrical contractor)

A bill you'll look forward to...

Our bill is easy to read and understand and can be sent to you on paper or computer disk. It provides complete call detail plus a wealth of summary information so you always have an accurate record of your calling patterns and expenses.

We offer a wide selection of billing options that can be customized to meet your needs.

One call is all it takes...

Call your Telegroup sales representative today and find out how you can start saving on all your long distance calls.

FREE INFORMATION
1-800-338-0225
1-515-472-5000
Fax 1-515-472-0845

Telegroup  ©TELEGROUP, INC. • 505 NORTH THIRD STREET • FAIRFIELD, IOWA 52556 USA
Introducing CallBack™ III

Until now, Logos CallBack™ has been a "one user—one number" machine. For example, each machine could store only one call back telephone number and, for all practical purposes, was usable by only one person. Now, with CallBack™ III, up to four numbers can be stored in one machine and four users can use the machine—but only one at a time, of course, since there is still only one telephone line associated with each CallBack™ III machine.

CallBack™ III allows for some exciting new options and it makes the CallBack™ system even more affordable. Heavy users of CallBack™ service may still need a dedicated CallBack™ system for their needs. However, light users (those making only several short calls per day), can share the use of a single machine with up to three other users. This saves money for service bureaus and/or end users by cutting the cost per unit in half, two-thirds, or even by three-quarters.

CallBack™ III requires the new "Custom Ringing" feature from the phone company*. This service provides you with up to four different telephone numbers. All four numbers are associated with one telephone line. Telephone number one generates ringing pattern number one. Telephone number two generates ringing pattern number two, and so on.

CallBack™ III can store up to four different call back numbers. It simply detects the ringing pattern to determine which international number to call back.

* Your telephone company may call Custom Ringing by another name—Ring Master, Ring Mate Service, Priority Ringing or Multi-Ring Service.
The Household Name Tractor Company has an overseas sales force of 45. Located the world over, each salesperson must call the office at least once a day. Bill, the MIS Director, has set up 45 CallBack II™ boxes in his telecom center. Bill is excited about his CallBack II™ system because it saves money and increases his security against toll fraud. Bill has assigned each salesperson a CallBack II™ network number, a four digit SDN account number, programmed each box to call each salesperson in their overseas office and set the total call time limit to two hours per salesperson.

To protect against fraud, Bill has set up six levels of security:

- the remote programming feature on all CallBack II™ units in the Household Name Tractor Company network has been turned off, so only Bill can change CallBack II™ telephone numbers, PINs, etc.
- to enter the network a thief would have to know the CallBack II™ network access number.
- if a hacker could find the access number, they would have to physically be in the overseas office that CallBack II™ was pre-programmed to call.
- upon receiving the return call, the hacker would have four guesses to punch in the salesperson's correct CallBack™ PIN. Four incorrect attempts turns CallBack II™ off completely (until Peter refreshes the CallBack II™ unit in the U.S.A.).
- prior to placing an outgoing call the hacker would have to know the salesperson's assigned AT&T SDN account number.
- should a hacker miraculously get by the preceding four levels of security, Peter limits the total fraud exposure by using CallBack II™ units which have been programmed to turn off after two hours of use.

According to Bill, the savings go beyond the difference between the cost of calls. Bill feels he has much better control over sales expenses; since he personally supervises and pays for all international calls from his office in the U.S.

Finally, the sales people love it because CallBack™ enables them to place more calls quickly, quietly and in rapid succession (serial dialing), completely avoiding any interaction with the native PTT.
Taoreed grew up in Nigeria. When people in Nigeria want to make an international call, they must go to a state store that places all international calls emanating from Nigeria. State stores are only located in the largest cities. For many Nigerians, calling internationally means walking to a city that provides international outbound lines. He uses CallBack™ to sell Nigerians international calls at 25% cheaper than the government telephone stores. Taoreed also places CallBack™ offices in cities that do not have government owned international long distance stores. Like the state, Taoreed collects the money for each international call in advance. Taoreed buys international long distance 50%-75% below the state PTT rates and as a result enjoys a substantial profit margin between what he pays in the U.S. and what he charges in Nigeria.

Amy uses her CallBack™ when she travels around the U.S.A. selling long distance. Strange but true. You see Amy sells AT&T Tariff-12 which offers a great price for domestic long distance calls. Amy’s office is provisioned to her Tariff-12 contract. When Amy is out of town she calls her office and has the CallBack™ device call her back in her hotel room. In this way she avoids credit card fees, hotel service charges and the expense of third party calls. Using her CallBack™ Amy can make all her daily calls, in succession, at Tariff-12 rates. No operators, no extra fees and clear billing to her office.

Maynard Medical School is a “Going to Extremes” type of off-shore medical school. Based in New York, Maynard has 700 faculty and staff living in their compound on an island in the Caribbean. Calling home used to be ridiculously expensive. Last term Maynard installed four CallBack™ units in their New York offices. Each box was provisioned to an AT&T SDN that requires a four digit account code for all outgoing calls. The administration then assigned every student and each member of the faculty an AT&T SDN account code. Finally, they set up four CallBack™ booths in the student center in the Caribbean. Now when someone wants to call home they simply go to the student center, pick up a CallBack™ phone, press speed dial #1, wait two rings and hang up. The New York based CallBack™ calls them and gives then a new dial tone. The student then dials the number they want to call, followed by their SDN account code. CallBack™ places the call, ACUS sends the itemized bill to Maynard’s New York office, where the administration marks the call up 50% and re-bills the call to the student in their monthly term bill. The medical school has cut its expenses, the students are saving plenty and the medical school is profiting from all their calls home.
Typical CallBack™ applications (our top eight best examples):

Peter is a manufacturer's representative. His office is in Bayonne NJ and he has clients all over the world. Peter uses his CallBack™ to save money on international calls whenever he is abroad visiting clients. In a typical week Peter travels to three different countries. To use CallBack™, he simply calls home whenever he arrives in a new country and programs his CallBack™ with the number he will be staying at. This is an expensive call, but it takes less than a minute to program CallBack™. Once programmed, Peter calls his CallBack™ device to take advantage of the considerably less expensive U.S. rate he has contracted for his office. Further, Peter enjoys all the features New Jersey Bell provides at home while he is overseas. Peter used to take hours to place a few urgent calls to the states. Now his CallBack™ unit helps him place numerous calls with one connection, usually taking a quarter the time it used to take! When Peter moves on to the next hotel or country, he simply calls home and reprograms the box to call him back there. Peter says that the CallBack™ paid for itself in savings the first month.

Megacorp International manufactures handbags in Italy. Twice a week they send interoffice data over telephone lines from Italy. Transmission time is about 18 minutes. Using CallBack™ they now save hundreds of dollars (or tens of thousands of Lire) per month.

The Gonzales brothers set up a CallBack™ service bureau six months ago. Arbitrating the difference between the rate charged in Chile and Argentina, the Gonzales are starting to make a handy living for themselves. Their system is simple, Jose runs ads in the local papers in Chile and Argentina. He advertises cheap rates to the USA and the rest of the world. Manuel lives in Florida and supervises the CallBack™ service bureau network. When Jose sells a new customer the service, he calls his brother (using CallBack™) and places an order. Manuel hooks up another CallBack™ card, orders a new line from the BOC and provisions to long distance to their Sprint dealer with aggressive Chilean and Argentinean prices. Jose bills the customers in Chile and Argentina. Manuel pays the Sprint bills in Florida. In just six months they have 300+ customers sharing 200+ CallBack™ units.

Unlimited Talent International is a major player in sports and entertainment management. Representing professional tennis players worldwide, they are forever faxing contracts and proposals from their European office in London. Most are long complicated documents. These faxes easily pass through CallBack™ and now Unlimited Talent is enjoying savings of 68% per fax.
## List of Exhibitors: TELECOM 95

Click on the column name you wish to sort on

<table>
<thead>
<tr>
<th>Exhibitor</th>
<th>Stand Number</th>
<th>Country</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>3DBM, INC.</td>
<td>1.315</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>3M</td>
<td>2.400</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>AAC CORPORATION</td>
<td>1.327</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ACCUGRAPH</td>
<td>1.339C</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ACTIVE VOICE CORP.</td>
<td>1.326</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ADC TELECOMMUNICATIONS</td>
<td>1.261</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>AIRNET COMMUNICATIONS CORPORATION</td>
<td>4.230a</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>ALLEN TELECOM</td>
<td>2.121</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>AMDOCS</td>
<td>3.31</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>AMERICA'S NETWORK</td>
<td>7.111-21</td>
<td>United States</td>
<td>Book Fair</td>
</tr>
<tr>
<td>AMERICAN COMPUTER &amp; ELECTRONICS</td>
<td>1.312</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ARITECH CORPORATION</td>
<td>1.288 B</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>A_RITECH INTERNATIONAL</td>
<td>1.299</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ANDERSEN CONSULTING LLP</td>
<td>7.233</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>ANDREW CORPORATION</td>
<td>1.309</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ANTENNA COMPANY, THE</td>
<td>1.257</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>APCO, INC. - Association of Public-Safety</td>
<td>1.283</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>APPLIED INNOVATION INC.</td>
<td>1.302B</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ARIA WIRELESS SYSTEMS</td>
<td>1.339B</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>ARRAYCOM, INC.</td>
<td>3.52</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>ASPECT TELECOMMUNICATIONS</td>
<td>7.741</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>2.270</td>
<td>United States</td>
<td>Co-Exhibit</td>
</tr>
<tr>
<td>ATI (ADVANCED TECHCOM, INC.)</td>
<td>3.51</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>ATLAS TELECOM</td>
<td>1.288</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>AURASTAR INFORMATION SYSTEMS, INC.</td>
<td>1.330</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>AURASTAR INFORMATION SYSTEMS, INC.</td>
<td>1.330</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>BELLCORE</td>
<td>1.250 A</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>BENNER-NAWMAN, INC.</td>
<td>1.310</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>BOSTON TECHNOLOGY INC.</td>
<td>1.323</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>BPOKTREE CORP.</td>
<td>1.330C</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CALIFORNIA MICROWAVE, INC. (CMI)</td>
<td>1.258</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CALIFORNIA STATE WORLD TRADE</td>
<td>1.267</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CHARLES INDUSTRIES, LTD.</td>
<td>1.297</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CHEYENNE SOFTWARE</td>
<td>1.282A</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>COHERENT COMMUNICATIONS</td>
<td>1.300</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>COMPRESSION LABS INC. (CLI)</td>
<td>1.301</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>COMSAT RSI</td>
<td>1.250-349</td>
<td>United States</td>
<td>Co-Exhibit</td>
</tr>
<tr>
<td>COMSAT WORLD SYSTEMS</td>
<td>1.250</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CONVERSE TECHNOLOGY INC.</td>
<td>1.307A</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>COVIA TECHNOLOGIES</td>
<td>1.120</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>CSC INTELCOM</td>
<td>1.263B</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>CYLINK</td>
<td>4.240</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DAPA COMMUNICATIONS, INC.</td>
<td>1.335</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DECIBEL PRODUCTS, INC.</td>
<td>2.121</td>
<td>United States</td>
<td>Co-Exhibit</td>
</tr>
<tr>
<td>DIALOGIC CORPORATION</td>
<td>1.338 A</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>DIGITAL EQUIPMENT CORPORATION</td>
<td>1.430</td>
<td>United States</td>
<td>Independent</td>
</tr>
<tr>
<td>DIGITAL LINK CORPORATION</td>
<td>1.302</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DIGITAL MICROWAVE CORPORATION</td>
<td>1.259</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DIVA COMMUNICATIONS</td>
<td>1.321</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DSC COMMUNICATIONS CORP.</td>
<td>1.338</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>DURACELL INC.</td>
<td>1.341 A</td>
<td>United States</td>
<td>Pavilion M</td>
</tr>
<tr>
<td>Company Name</td>
<td>Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESRI</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESSEX GROUP INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EUROPEAN MOBILE COMMUNICATIONS</td>
<td>Book Fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXECEL, INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXECUTONE INFORMATION SYSTEMS, INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFORMATION SERVICES</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NERAL DATA COMM</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENERAL MACHINE PRODUCTS INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLENAYRE ELECTRONICS INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLOBALSTAR</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GNB BATTERY TECHNOLOGIES</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GTE CORPORATION</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARRIS</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARRIS CORPORATION</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUGHES</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K.A.R.U.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KCT GROUP - INTERNATIONAL COMMUNICATION T</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KIT / INTERNATIONAL DISCOUNT TELECOMMUNICATIONS</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEEE COMMUNICATIONS SOCIETY</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMMEX TELECOM INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDUSTRIAL TECHNOLOGY AND MICRO COMPUTER T, INC.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFONET SERVICES CORPORATION</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INNOVATIVE DATA TECHNOLOGY</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTEGRATED NETWORK CORP</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTEGRATED POWER CORPORATION</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTELSAT</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERNATIONAL SATELLITE DIRECTORY</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTOVOICE, INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPETEK</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDIUM</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOCOR</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALLBACK</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OHLER CO. - POWER SYSTEMS</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARSCOM CORP.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASER PRECISION CORPORATION</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCKHEED</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORAL MICROWAVE-NARDA</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTUS DEVELOPMENT</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMUNICATIONS CORPORATION</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS INTERNATIONAL</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICOM COMMUNICATIONS CORP.</td>
<td>Pavilion Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICRO COMPUTER SYSTEMS</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICROLOG CORPORATION</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICROSOFT</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICROWAVE DATA SYSTEMS</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICROWAVE NETWORKS INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICROWAVE RADIO CORP.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEQ, INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SITORA INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NATURAL MICROSYSTEMS N.V.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRIX CORPORATION</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NETWORK MANAGEMENT FORUM</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NETTEL INTERNATIONAL, INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C'TEST COMMUNICATIONS PRODUCTS, INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CURRENT TECHNOLOGIES, INC.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNEX</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJECTIVE SYSTEMS INTEGRATORS</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEL COMMUNICATIONS CORP.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETECS PRECISION TIME DIV.</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>