2
Cuba

JOHN SPICER NICHOLS AND ALICIA M. TORRES

The government of Fidel Castro, in an arduous struggle to survive the economic damage caused by the collapse of the Soviet Union and its trading bloc, has undertaken a radical restructuring of Cuba's economy and trade relations. In the early 1990s the Cuban leadership—for decades, the Latin American paragon of state ownership and central planning—has become more open to private enterprise and foreign investment while attempting to retain its vaunted social welfare programs and the existing political system.

To achieve this difficult transition to a hybrid political system and mixed economy, as well as to reenter the capitalist world, Cuba must modernize its crumbling telecommunications infrastructure. Without the necessary capital and know-how to do it alone, the Cuban government has had little choice but to enter joint ventures with foreign investors. This is significant because nationalization of the foreign-owned telephone company was among the highest priorities of the revolutionary government when it came to power in 1959. The issue of foreign control—along with the country's proximity to, and conflict with, the United States—has long dominated life on the Caribbean island and, similarly, has been a key factor in the development of the Cuban telecommunications system.[1]

The last of Spain's colonies in Latin America to gain independence, Cuba suffered under colonial control many decades longer than other nations in the region. Life on the island centered around growing and exporting sugar and other crops to fuel the colonial economy of Madrid. More than a half million slaves were imported to do the backbreaking field work, and slavery continued in Cuba twenty-one years after the end of the U.S. Civil War. As a slave-powered agricultural society dominated by a colonial master, Cuba had little opportunity to develop its own economic and political infrastructure. The result was grinding poverty and political instability.

The confluence of a strong Cuban independence movement, the decline of the Spanish empire, and the emergence of the United States as a global power led to the transfer of control over the island. As a result of the Spanish-American War, Cuba gained independence from Spain in 1898, only to become a political and economic dependency of the United States. As a condition for withdrawal of U.S. troops after the war, Cuba was forced to incorporate into its new constitution the

so-called Platt Amendment, granting the United States the right to intervene in Cuba's domestic affairs. This was something the United States did routinely until the amendment was repealed in 1934. Consequently, the Platt Amendment has remained a powerful symbol of the history of U.S. intervention in Latin America and a rallying cry for Cuban nationalists and revolutionaries.

The 1959 revolution that brought Castro to power was, in large part, a reaction to U.S. control and a manifestation of years of economic hardship and instability. In the 1960s Cuba moved into the Soviet political and economic orbit and, as the first socialist state in Latin America, became the focus of Cold War tensions in the region.

With an area of 114,000 square kilometers, it is the largest of the Caribbean islands. A multiracial society, Cuba has a population of 11.5 million (July 1994 estimate). About 70 percent live in urban areas, including 20 percent in metro Havana. Highly educated by global standards, Cubans have remained poor by Latin American standards.

2.1 Early Development

The history of Cuban telecommunications is one of foreign control. Telegraph service began around 1851 when Cuba was still a colony of Spain. The system, which connected nineteen stations throughout the island, was initially used exclusively by the Spanish government and the railroads. Only years later was it opened to the general public (Gonzalez Porcell 1989, p. 152; Schroeder 1982, p. 338).

Cuba probably had the first telephone company in Latin America.[2] The Cuban Telephone Company (CUTELCO) was formed in 1881 by the Continental Telephone Company. A U.S.-based firm created by principals of the Bell Telephone Company, it held the Latin American rights to Bell's patents. By 1915 Cuba had a comparatively well-developed system. More than 67,000 miles of wire had been strung within and between 220 Cuban towns and cities and 60 sugar mills, and 19,876 telephones were in operation (Schroeder 1982, p. 335).

No later than 1906, and perhaps as early as 1904, the U.S. Navy was operating a high-power radio transmitter at Guantanamo Bay on the island's southeast coast. The Guantanamo naval base came under U.S. control at the conclusion of the Spanish-American War, and the United States later obtained perpetual treaty rights to lease the facility. For decades the base served as a coaling station for the U.S. fleet protecting sea lanes to the Panama Canal and as the hub of ship-to-shore military communications in the region (Brannigan 1994; Smith and Morales 1988, pp. 102–12).

Foremost among the U.S. companies that dominated the early development of Cuban telecommunications was Boston-based United Fruit Company (UFCO). Best known as a banana importer, UFCO entered the sugar business in Cuba at the turn of the century and by 1903 had established an extensive domestic telephone and telegraph network, primarily along railroad lines, to coordinate transportation between its cane fields, mills, and ports.

A reliable and speedy communications system connecting United Fruit's

remote plantations in Central America with its railroads, coastal ports, transport ships, and destinations in the United States was necessary to a profitable banana business. Otherwise, large shipments of fruit would be left spoiling on some siding or dock in the supply line. Because of the rugged terrain, great distances over mostly water, and harsh weather and climate, wired telegraph was largely impossible. Consequently, United Fruit was a pioneer in radio telegraphy. In 1904 the company built the first wireless station in Latin America at Bocas del Toro, Panama, using the earliest equipment produced by American De Forest Wireless Company. UFCO was thus one of the very first commercial users of the then-emerging radio technology.

In 1908, barely a year after Reginald Aubrey Fessenden demonstrated the radiotelephone, UFCO was using the new technology for a relay station strategically erected at Cape San Antonio on the western tip of Cuba. It was not only the first radiotelephone station on the island, it was also a key component of the first commercial point-to-point radio network in the world (Mason 1922, p. 384).

In recognition of the importance of telecommunications to its operations, United Fruit incorporated the Tropical Radio Telegraph Company as a wholly owned subsidiary in 1913. With strong support from the U.S. government, which feared potential European control of telecommunications in Latin America, Tropical Radio rapidly expanded its network and dominated point-to-point radio communications in Central America and the Caribbean for decades (Wilson 1968, pp. 153–67; Fejes 1982, p. 21).

The early Cuban telecom system grew mostly in conjunction with the transportation system (primarily railroads), both of which had the financial backing of sometimes competing and sometimes collaborating U.S. companies. Some parts of the island had railroad, telegraph, or telephone service exclusively under the control, and primarily intended for the private use, of U.S. companies such as United Fruit. Other parts were served by common carriers, such as Cuba Railroad Company and Cuban Telephone Company, that were financed and operated by U.S. corporations under franchises from the Cuban government. Still other parts had overbuilt systems served by two or more companies, some public and some private. But most parts of the country—those that did not generate significant profits for U.S. companies—had no modern transportation or communications system at all. The 1920s was a period of rapid consolidation. Most parts of each sector fell under the control of one company, often a large U.S.-based multinational corporation, sometimes in joint ventures with the Cuban state (United Fruit Company 1976, pp. 299–302).

For example, the Cuban Telephone Company came under the financial control of International Telephone and Telegraph (ITT). Sosthenes and Hernand Behn, the founders of ITT, first invested in the financially shaky and inefficient Cuban phone company in 1916, and it was their success in wringing a profit out of that system that led them to expand into the global market. The Behn brothers' shares in Cuban Telephone were among the three original assets of ITT when it was created in 1920 and, within two years, the brothers' new company had gobbled up 90 percent of its shares, thereby controlling phone service on the island (Sobel 1982, pp. 29–36; Fejes 1982, p. 24).

Just as Cuba's domestic telecom system was one of the earliest in Latin America and was dominated by U.S. companies, so was its international system. The island's first telecommunications link to the outside world was a submarine cable laid between Florida and Havana in 1867. The company that built the system, International Ocean Telegraph Company, was acquired in 1878 by Western Union, which established Cuba as its gateway to Latin America. Radio telephone service to New York began in 1928 and to Madrid in 1929 (Rippy 1946, pp. 118–19; Schroeder 1982, p. 332).

An underwater telephone cable between Havana and Florida, established in 1949, was owned and operated by the Cuban American Telephone and Telegraph Company—a Cuban corporation owned by AT&T and ITT. The cable was supplemented in 1957 by an experimental over-the-air tropospheric scatter transmission system. The first of its kind in the world, the system was originally designed to relay television signals across the Straits of Florida, which separates Cuba and Florida. The channel, 145 kilometers at its narrowest, exceeded the maximum distance a television signal could then be transmitted. However, it apparently was used only for voice communications (Associated Press 1957).

Simultaneous with the addition of these new telecom services, United Fruit, which had dominated Cuban telecommunications for decades, phased out most of its radio operations on the island, relying instead on the less expensive common carriers for its business communications. Its relay stations, frequently damaged by hurricanes, were costly to maintain and no longer essential to the company. Further, UFCO faced ongoing bureaucratic conflict with the Cuban Ministry of Communications dating from the government's refusal to allow the company to enter the Cuban domestic radio broadcasting business in the 1930s. The result of UFCO's departure from the Cuban telecommunications market was yet more concentration under foreign control.

One of the most novel forms of international communications also had its debut across the Straits of Florida. In the fall of 1954 the four-year-old Cuban television system—eager to broadcast the World Series live—leased a DC-3 and fitted it with a transmitter and two antennas. During the series, the plane flew 8,500 feet above the straits relaying the programming from a Miami station to a Cuban ground station, from where it was distributed by microwave to the five-station Cuban television network. The following year the same method was used by NBC, a U.S. television network, to transmit the first live telecast from Cuba to the United States.[3]

2.2 Change from the Revolution

The Cuban revolution, at its core, sought a complete restructuring of the country's political and economic system, including the organization, financing, and control of telecommunications. On the eve of the revolution, U.S. investors controlled more than one-third of the country's public utilities, dominating domestic and international telecommunications and controlling 90 percent of electrical generating capacity. They also owned 22 percent of Cuban land, had a 30 percent stake in

the sugar industry, and dominated the railroads, mining, and manufacturing (*Cuba at the Turning Point* 1977, pp. 16–17).

To the extent Fidel Castro had a coherent plan for his revolution, it was to extricate Cuba from the political and economic control of the United States. Within months of his guerrilla army seizing control of the Cuban government in January 1959, he began to nationalize U.S. properties. The primary focus was land. In May 1959 large agricultural tracts were expropriated from Cuban and U.S. owners, including the United Fruit Company. But even before tackling its major objective, the Castro government started tinkering with telecommunications.

On March 3, 1959, the Cuban government "intervened" (also called a "temporary" takeover) in the management of Cuban Telephone Company and revoked a rate increase authorized by the previous government. The revolutionary government also lowered the electrical power rates charged by U.S.-owned Cuban Electric Company. Finally, on August 6, 1960, Castro announced to a cheering crowd in the Havana sports stadium that he had nationalized U.S.$132.9 million in CUTELCO assets from ITT, U.S.$267.6 million from Cuban Electric (a subsidiary of Boise-Cascade), and U.S.$85.1 million from United Brands (formerly United Fruit), as part of a total of U.S.$2 billion seized from U.S. companies.

Castro's actions triggered a spiral of economic sanctions by the United States, Soviet assistance, Cuban retaliation against U.S. interests, additional U.S. measures, and so on. In January 1961 the United States broke diplomatic relations with Cuba and in 1962 imposed a trade embargo on the island, severing many long-standing communications links and heightening hostile relations between the two countries that would last for decades (Blaiser 1976, pp. 187–200; *Cuba at the Turning Point* 1977, pp. 22, 101–2).

The United States, in addition to imposing its own economic sanctions on Cuba, persuaded virtually all of Cuba's prerevolution trading partners to join the embargo. Almost all of them reestablished political and economic relations with Cuba during the subsequent three decades, but in the interim Cuba was forced to entirely transform its international trade and domestic economy. It had little choice in the 1960s but to establish trade relations with the Soviet Union and Eastern Europe. Given Cuba's geopolitical importance, the Soviet Union eagerly supplied and, to a considerable extent, subsidized the economy of its new ally. In 1958 about two-thirds of all Cuban trade was with the United States; three decades later, approximately three-quarters was with the Soviet Union. In effect, Cuba shifted its dependency from one superpower to another (*Cuba at the Turning Point* 1977, p. 19; Domínguez 1993).

2.2.1 Telecommunications under Castro

Economic control of Cuban telecommunications by the United States was largely replaced by state control. The new minister of communications was Jesús Montané, an original member of Castro's rebel army, a member of the central committee of the Cuban Communist Party, and one of the most trusted insiders in the regime. His appointment indicated the importance attached to controlling the telecommunications system and protecting it from the growing counterrevolution-

ary movement. Communications facilities were prime targets for sabotage by numerous paramilitary groups, including those backed by the U.S. Central Intelligence Agency as part of President Kennedy's aggressive policy against Castro and Cuba. Subsequent ministers of communications have been from the military.

But, in Castro's view, government control of telecommunications served important purposes beyond national security. "If we want to overcome the gap which separates us from the developed nations," he said, ". . . our resources [must be] used in a rational, organized way. There is no room for waste. We don't have the luxury of following the path of free competition to achieve economic development" (*Cuba and Fidel* 1976).

Castro considered the telecom system to be a precious resource that could not be left to the helter-skelter management of private owners under a capitalist system. He felt strongly that only central planning could bring the social and economic benefits of telecommunications to all Cubans, especially those living in the abject poverty of the island's isolated rural areas. For these reasons, investment in the communications infrastructure—especially in the countryside—was given priority during the early years of the Castro government. The result was expanded services, more widely distributed throughout the island.

In 1958, 73 percent of installed telephone service was in Havana, where about 20 percent of the population resided. By 1982, only 56 percent of new service was being installed in the capital, the rest was in the provinces. During the 1958–82 period, the number of telephones nationwide nearly doubled from 170,000 (2.4 per hundred inhabitants) to 447,000 (4.6 per hundred) ("Cuban Parliamentary Debate . . ." 1984, p. 2; Schroeder 1982, p. 335; *Statistical Abstract of Latin America* 1960, p. 28; Hunter 1991, p. 398).

In sum, although not matching the advances it achieved in health care and education, the revolutionary government made some significant improvements in Cuban telecommunications despite very meager resources. In the early 1990s, however, after the Soviet trading bloc collapsed, Castro's socialist ideology of a centrally planned and state-controlled economy became unsustainable.

2.3 Cuba in Transition

The disintegration of the socialist trading bloc in 1989 and the loss of an estimated U.S.$4 billion annually in Soviet subsidies in 1992 sent the Cuban economy into a tailspin. With its supply lines badly disrupted and without sufficient hard currency to purchase gasoline, fertilizer, and spare parts for farm machinery, the production of sugar—Cuba's primary cash crop—plummeted from 8.1 million tonnes in 1989 to 4.0 million in 1994. Projections for the 1995 crop were as low as 2.5 million tonnes. The gross domestic product of Cuba fell by nearly 50 percent between 1989 and 1993. Imports dropped from 8.1 billion pesos to 2.0 billion during the same period.

The purchasing power of a typical Cuban's income similarly dropped by half, and hundreds of thousands of workers—perhaps as much as one-fifth of the coun-

try's total workforce—are likely to have lost their jobs in the economic downturn. Daily consumption of calories per capita went from 2,845 in 1989 to 1,780 in 1993. As shortages of food and other basic goods cut deeply into Cubans' already meager existence, popular discontent and political tension increased (Mesa-Lago 1995; Domínguez 1993).

Analysts have been predicting the imminent demise of the Castro government for more than thirty-five years, and in the early 1990s the revolution has indeed faced a grave political and economic crisis. Without its Soviet patron, Cuba faced not only economic disaster but also international isolation. To avoid this fate, Cuba has been forced into the second complete restructuring of its national economy and international trade relations in little more than three decades. Although some experts have had serious questions as to whether it can succeed in this transformation, Cuba is in a somewhat better position than it had been during the 1960s. In the intervening decades, Cuba developed a relatively sophisticated infrastructure (by Caribbean standards) and a somewhat more diversified economy. Further, Cuba has been able to establish new trade relations with Western countries—with the obvious exception of the United States—an option not available to it in the 1960s (Griffin 1992; Zimbalist 1993).

While insisting that it is not forsaking socialism, Cuba has been steadily loosening state control over the economy and cautiously adopting capitalist measures in an effort to stem the economic free fall. Since 1993 the government has legalized the dollar, allowed self-employment and family businesses, permitted farmers to sell food at market prices, and begun to solicit foreign investment in Cuban industry. By the end of 1994, 185 foreign firms had signed joint-venture agreements with state-owned Cuban companies, resulting in a critical infusion of new capital, and some thirty more agreements were signed during the first eight months of 1995. Cuban law was amended in 1995 to allow foreign companies to own 100 percent of enterprises in all sectors except education, health care, and the military. Government control over foreign investment is still substantial, but these changes are remarkable in contrast to the early years of the revolution when foreign investments were nationalized. These and other economic measures appear to have stalled the rapid deterioration of the economy. But, although the economy apparently has bottomed out, there have been no signs of anything more than a slight recovery in the near term, and economic conditions remain grim.

After it came to power in 1959 the new government actively discouraged tourism (which had involved significant elements of gambling, prostitution, pornography, drugs, and organized crime). In the 1990s, seeking to capitalize on one of its greatest resources—some of the most beautiful beaches in the world—but lacking the funds and technical expertise to develop resorts, Cuba has aggressively sought foreign investors, primarily German and Spanish companies, to build and manage tourist hotels. As a result, many of the biggest foreign investments have been in the burgeoning tourist industry. From 1989 to 1994, the years of Cuba's steepest economic decline, gross revenues from tourism increased 406 percent to U.S.$850 million (Mesa-Lago 1995). There has been no stronger indication of Cuba's newfound economic pragmatism than its promotion of tourism.

2.4 The Domestic Telecommunications System

Reflecting the changes taking place in the overall economy, the Cuban telecommunications system was in transition in 1995 from a state monopoly to mixed public-private ownership. Prior to 1993 the Ministry of Communications operated all domestic telecom services through various state enterprises. The ministry, one of thirty major divisions of the Cuban government, was responsible for formulating policy recommendations on communications matters for the Council of State, over which Castro presides, and implementing the Council's decisions. Some operational decisions about domestic telecommunications, such as rates for services, were made by the Ministry of Communications in coordination with other government divisions; most were made by the local service providers under ministry supervision.

Cuban Telecommunications Enterprise (EMTELCUBA), the national telephone company, was a division of the ministry. The primary local operating unit was the Communications Enterprise for the City of Havana, which provided telephone service directly to homes and offices in the capital city. Local service outside Havana was similarly provided by provincial enterprises. Other divisions of the ministry handled international telephone, postal, telegraph, and radio and television service.

2.4.1 Technology and Services

Until the economic problems of the early 1990s, the Castro government provided rudimentary telecom services to a larger share of its population, at a far lower direct cost to the user, than most other Latin American countries at a similar level of economic development. In 1993 Cuba had 5.4 phones per hundred inhabitants. This compared favorably with other poor countries in the region, such as Guatemala (1.1), Nicaragua (1.6), and Ecuador (3.0), and was not far behind wealthier neighbors such as Colombia (5.7), Mexico (7.3), and Venezuela (7.3). Basic telephone and telegraph service reached almost all populated areas on the island. According to the vice minister of communications, a high percentage of the phones were either residential or public. Although hard data supporting the claim were not available, in-country observations generally verified that telephones are widely available for public use.

Consistent with its socialist ideology, the government heavily subsidized local service. In 1994 a residential phone cost 6.25 pesos per month for the average household plus a onetime installation fee of 100 pesos. Local calls on pay phones cost 5 centavos, the same as in 1959 (Marrero 1994; Lopez 1993; Luxner 1991, p. 17).[4]

The Cuban telephone system had become a hodgepodge of antiquated equipment by the 1990s. Analog technology was still being used for almost all of the domestic network. Of the 20,000 kilometers of phone lines, the vast majority were copper wire and pole mounted. Less than 1,000 kilometers of fiber optics were in use, mostly connecting switches in the Havana area. In 1993 there were more than 500,000 access lines in Cuba, 40 percent of them in the Havana area, where approximately 20 percent of the population resided. The majority of central offices—about 56 percent—still used electromechanical equipment, 1940s tech-

nology from the United States. Another 43 percent used step-by-step technology, primarily 1970s East European equipment. Only about 1 percent used digital technology. The switches in a few isolated rural areas were still manually operated.

Beginning in the late 1970s, the Ministry of Communications began to upgrade the national long-distance network with coaxial cable. It decided against introducing fiber optics after concluding the technology was too expensive, too sophisticated, and not sufficiently compatible with Cuba's old copper wire system, which the authorities recognized was not likely to be replaced soon. There were 15,000 kilometers of coaxial cable in Cuba by 1994. Because of the elongated shape of the island, the national network was relatively easy to build. A backbone extends east and west from Havana with short branches, usually of 80 kilometers or less, reaching all major population centers. The coaxial network also is used for television and other services. In addition, an analog microwave system carries domestic long-distance calls and radio and television signals. Electronic mail is in limited use (Marrero 1994; Lopez 1993; Roche and Blaine 1994).

Cuba does not have cable television service, nor is there direct satellite reception in Cuban homes. An estimated 200 satellite dishes were in use on the island in 1993, but all were for Cuban government or foreign entities, including tourist hotels in Havana and at beach resorts, which receive domestic and foreign television programming, including CNN (Coro 1994).

From 1962, when the United States imposed a trade embargo on Cuba, until the late 1980s, most communications equipment was imported from the Soviet Union and Eastern Europe. Some equipment was purchased from Japan, Canada, France, Sweden, and other Western countries that had ceased participating in the embargo. In an exercise of bad timing, Cuba launched a five-year plan in 1984 to increase the proportion of equipment from Eastern-bloc countries to 95 percent. With the embargo tightened during a peak in Cold War tensions, the Cuban government had sought to decrease its dependence on what it saw as less reliable Western suppliers ("Cuban Parliamentary Debate . . ." 1984).

Although most communications technology was imported, Cuba had developed a reasonably sophisticated electronics manufacturing industry, primarily in the 1970s and 1980s. The government had hoped to avoid the common practice in developing countries of importing all high technology. Radio and television receivers, semiconductors, and specialized medical equipment were assembled with foreign parts in Cuban factories. Believing that computer technology was important to the central planning of its economy, yet blocked from purchasing most Western-manufactured computers, Cuba also built domestically designed minicomputers using imported parts beginning in 1972 but has since abandoned those efforts (Barquin 1975; "Statistics on Computer Use . . ." 1989).

2.4.2 Deterioration

By the early 1990s the Cuban telecommunications system was rapidly deteriorating. The telephone system was particularly bad. Problems such as frequent interruptions in service, long delays in repairs and installations, network congestion, dialing difficulties, and scarcity of functioning public phones and even phone

books were common in the dilapidated system. Much of the equipment had been cannibalized because of lack of replacement parts due to the U.S. embargo, and the few parts that were obtained were used primarily to maintain the military communications system. Most of the phone network was jerry-rigged to accommodate incompatible equipment imported from a variety of countries.

The already serious problems in the system were badly compounded in November 1988 when a mentally disturbed phone company worker set a fire that destroyed the main exchange in Havana. Preceded and followed by severe hurricanes that ravaged the national telephone network, the blaze caused an estimated U.S.$30 million damage and knocked out nearly 30,000 local lines, including those of key government offices, for as long as two years. An ambitious plan announced by Castro in 1989 to replace the lines lost in the fire, add 20,000 new lines in Havana, and begin installing high-technology equipment to restore the failing system was soon abandoned as the Cuban economy declined (Luxner 1991; "Fire Interrupts Telephone Service . . ." 1988; "Castro Speaks . . ." 1989; "$20 Million Planned . . ." 1989).

In 1993 U.S. technicians surveying the Cuban phone system reported that the deterioration was so serious that some interior cities could lose service by 1994 and predicted that the number of working lines would drop to 2.0 per 100 Cubans, from 5.4, within a year. They further reported that less than 18 percent of domestic calls were completed ("Phones Failing . . ." 1993). These predictions might have been exaggerated, but in-country observations and interviews in mid-1995 do indicate an estimated 30 percent of the country's access lines were inoperable.

2.4.3 Lack of Electricity

In the best of times Cuba had difficulty supplying enough electricity to meet basic demand. Virtually all its generating capacity is dependent on imported oil. Beginning in 1989 the Soviet Union, plagued by its own political and economic disruptions, terminated the barter arrangements that brought over 13 million tuns of oil and oil products to Cuba annually at far below market prices. In 1994 Cuba imported only 1.5 million tonnes of oil from the former Soviet republics, a nearly 90 percent drop (Mesa-Lago 1995).

Discovery of small amounts of low-quality domestic crude helped cover the shortfall somewhat, but the Cuban government had hoped to reduce its dependence on foreign oil by finishing construction of a nuclear power plant at Cienfuegos, a major southern port. However, because of frequent construction delays, design problems, huge cost overruns, and the dwindling supply of equipment and technical expertise from the Russian contractors, the project was halted in 1992. At that time, U.S.$1.1 billion had been spent and the project was 70 percent complete. Work resumed in late 1995. Completion is not anticipated in the near term.

The oil drought is one of Cuba's graver problems. As a result, electricity has been strictly rationed; work hours shortened; street lights and air conditioning to public buildings are frequently shut off; restaurants, nightclubs, and movie theaters close early; entire neighborhoods are blacked out for hours at a time; and bicycles have replaced automobiles on Cuban streets. In the late 1980s, the Cuban

economy already was in decline, but without sufficient fuel to harvest and transport the sugar crop (Cuba's primary source of foreign exchange), there is little or no prospect for a significant economic recovery.

Electronic communications also have been hit: sufficient electricity is obviously important to effective operation of a telecommunications system. Although television was an extremely popular source of entertainment for Cubans living in increasingly bleak conditions (in 1986 Cuba had the second highest number of television receivers per capita, 202 per 1,000, in Latin America), it was an early casualty of the crushing energy shortage. Not only do transmitters require large amounts of power, but the Soviet-made television sets in widespread use are not energy efficient, consuming about three times the power of typical U.S. or Japanese sets. Television transmissions were cut to as little as five hours a day. Because radio receivers require very little energy, radio transmissions were not cut significantly. However, batteries were in very short supply (Marrero 1994). In mid-1995, as an indication of the stabilizing economy and the importance of television to the entertainment-starved Cuban population, television schedules were expanded to twelve hours a day. Blackouts also were far less frequent.

2.5 Partial Privatization

By the late 1980s the inability to operate the telecommunications system at full capacity had become a serious drain on the Cuban economy. According to the vice minister of communications, Cuba was faced with a stark, ideologically troubling dilemma: either most Cubans would continue to have the physical access and financial ability to make a call on a telephone system that did not work, or far fewer Cubans would be able to make calls on a system that did work (Marrero 1994). Further, Cuba was unlikely to attract the foreign investments essential to its economic survival plan without dependable telecommunications.

Faced with the necessity of modernizing telephone service, yet lacking sufficient capital to do so, the Cuban leadership was forced to compromise on its socialist principles. Ideology gave way to pragmatism, and EMTELCUBA, the state phone company, sought a foreign partner.

On June 13, 1994, Castro and then Mexican President Carlos Salinas de Gortari announced in Havana that Grupo Domos, a Mexican holding company, had signed a U.S.$1.1 billion joint-venture agreement to overhaul and operate the Cuban phone system. Domos acquired a 49 percent interest in EMTELCUBA, which was given a fifty-five-year monopoly concession on Cuban domestic and long-distance service, plus opportunities to expand into other services such as cable television.

Domos paid the Cuban government U.S.$700 million and pledged a U.S.$400 million capital infusion for EMTELCUBA. Because the Cuban government also will put U.S.$400 million into EMTELCUBA, the company has U.S.$800 million to refurbish the system. Allowing for its capital contribution, overall the government netted U.S.$300 million, consisting of U.S.$100 million cash and U.S.$200 million in Cuban debt to Mexico.

The agreement calls for installation of 1 million telephone lines, including

replacement of 200,000 existing lines, by the year 2000. The government said priority would be given to social service providers such as hospitals, senior citizens' homes, and day care centers (Bardacke 1994; Whitefield 1994).

The venture was finalized in 1995 and Javier Garza Calderon, director general of Grupo Domos and member of a wealthy Monterrey family, became president of EMTELCUBA's council of stockholders. Domos was expected to take on a technical partner with telecommunications expertise to help defray its investment and manage the new enterprise. It did this in mid-1995 by selling a 25 percent stake in the venture to Stet International, a unit of Societa Finanziaria Telefonica, the Italian state-controlled telecom holding company, for U.S.$291 million. Garza Calderon, an unsuccessful bidder for the Mexican phone monopoly Telemex when it was privatized in 1990, was also reportedly negotiating with U.S. companies to launch a competitive long-distance service in Mexico (Torres 1994; "Italy's Stet Taps . . ." 1995).

Although foreign investment had been flowing into Cuba for several years, selling a partial stake in EMTELCUBA was the first privatization of a state enterprise since Castro came to power in 1959 and was the largest foreign investment of any type to date. Given the history of foreign control and nationalization of the Cuban phone system, the deal with Grupo Domos demonstrated the dramatic changes in Cuban economic conditions and the importance that the previously orthodox socialist government attached to telecommunications in those changes.

2.5.1 CUBACEL

In 1992 the Cuban government had approved another, albeit tiny by comparison, telecommunications joint venture with other Mexican investors. Telecomunicaciones de Mexico SA (TIMSA) paid U.S.$8 million for a 50 percent stake in the Cellular Telephone Company of Cuba (CUBACEL), a new enterprise created to construct a cellular network that bypasses the existing wired network. Connecting foreign businesses, diplomatic missions, international organizations, foreign news agencies, and government offices in the Havana area and offering direct-dial international service, the first stage of this elite network, which became operational in 1993, was intended as a stopgap measure until the wired system could be overhauled.

The CUBACEL system routes telephone traffic through its own switches, totally independent of the regular phone system. The infrastructure was built by L. M. Ericsson AB and the phones were primarily supplied by Japanese companies such as Toshiba. After eight months of operation, over 400 subscribers were paying U.S.$40 monthly plus 30 to 40 cents per minute in hard currency for the service. In 1995 cellular service was also available in Veradero, the primary beach resort. Expansion into other major population centers was planned ("Cuba's Cellular System" 1993; Luxner 1993; Colina 1993).

2.6 International Telecommunications

With about one-tenth of the Cuban population living in the United States, mostly in South Florida, there has been great demand for telecom services between the

two countries. However, the U.S. embargo not only has prevented U.S. corporations from servicing or investing in the Cuban domestic telephone system, but it has for decades blocked upgrading the antiquated international telecommunications links between the two countries. Consequently, despite high demand, direct electronic communication between the United States and Cuba has been little more than a trickle since 1962 and was nearly impossible between 1987 and 1995.

Cuba has maintained some of its prerevolutionary telecom links with the outside world, such as the Cable & Wireless telegraph lines to the West Indies and a submarine cable to Spain, but virtually all development of Cuba's international telecommunications between 1959 and the early 1990s had been with the patronage of the former Soviet Union.

In 1973 Cuba joined the Soviet-led satellite consortium, Intersputnik, which linked the Cuban gateway at Jaruco, just outside Havana, to Moscow and Eastern European capitals. In 1991, with the disintegration of the Soviet Union and its economic and political bloc, Cuba and the other members of Intersputnik became stockholders in the reconfigured and considerably less relevant satellite system. Cuba began using Intelsat in 1979 with a Standard B ground station, also located at Jaruco. A more advanced Standard A station became operational in 1991 to handle television coverage of the Pan Am Games in Havana (Gonzalez Porcell 1989, p. 151).

2.6.1 Ending the Bottleneck in U.S.-Cuba Calling

Development of Cuba's telephone communications with the United States in essence froze in 1962 after the U.S. embargo was imposed on the island. At that time there were only two direct links—the 1949 underwater cable, which had 130 telephone circuits, and the troposcatter radiotelephone, with a maximum capacity of seventy-nine simultaneous phone calls.

The cable, owned by AT&T's Cuban American Telephone and Telegraph (after the revolution, ITT had sold its CATT shares to AT&T) and operated under a service agreement with EMTELCUBA, continued to carry telephone traffic despite the embargo. The U.S. Treasury Department, which enforces the embargo, allowed AT&T to operate it under a grandfather clause but prohibited upgrading the technology or expanding the number of circuits and blocked any payment to Cuba.

In 1987 the cable wore out, leaving only the troposcatter system. The U.S. Treasury permitted AT&T to install a replacement cable comparable to the old one. When AT&T was unable to locate a cable of an equivalent low capacity and level of technology, Treasury granted permission to use the oldest cable available, a mothballed segment of an old transatlantic copper-wire cable. The World War II–vintage replacement, with a capacity of 138 circuits (which can be expanded to over 300 with compression technology), was laid between Cojimar, Cuba, and West Palm Beach, Florida, in 1989 at a cost of U.S.$8 million.

However, AT&T could not activate it until EMTELCUBA signed a new service agreement, which Treasury had to approve. Given the long-standing hostility between the two governments, the three-party negotiations were politically charged, exceedingly complex, and glacial in pace. The major stumbling block was the U.S. government's reluctance to allow AT&T to pay Cuba its share of the

revenues generated from the new cable. The U.S. administration did not want any hard-currency payments made to Cuba at the very time it was attempting to tighten the embargo in hopes of toppling the Castro government. Cuba not only wanted full compensation plus the usual installation and maintenance fees, it also demanded release of its past proceeds, which had been frozen in the United States. Under provisions of the embargo, since 1966 AT&T had been required to place Cuba's share of revenues in an escrow account. (Estimates of the amount range from U.S.$65 to U.S.$130 million; the Cuban foreign minister has put the actual figure at U.S.$100 million [Robaina 1993].) Over some five years, Cuba rejected several iterations of a U.S. government-approved formula before agreement was reached (Workman 1993; Robaina 1993; Luxner 1991).

Because AT&T was then the only authorized U.S. carrier to Cuba, the more than 1 million Cubans living in the United States had to squeeze their phone calls to relatives still on the island through a very narrow bottleneck—the aging seventy-nine troposcatter circuits. (For comparative purposes, the Dominican Republic, a Caribbean country with less than half the population of Cuba, had about 1,000 circuits to handle a much lower demand for calls with the United States.) Of the approximately 60 million phone calls attempted from the United States to Cuba in 1991, only about 500,000 were actually connected. Calling in the opposite direction was considerably easier because Cuba was not bound by the rules of the embargo and connected calls through third countries. Of all international telephone calls originated in Cuba in 1993, 72 percent were to the United States, immediately followed by the former Soviet Union (4 percent), Spain (3 percent), and Mexico (3 percent) (Lopez 1993; "Phones Failing . . ." 1993).

The problem was seriously compounded by Hurricane Andrew, which swept through south Florida in 1992, severely damaging the troposcatter facilities and toppling a microwave tower that linked it to Miami. Prior to the storm, the transmitter (the only one of its kind still in operation in the western hemisphere) was already in serious disrepair, and replacement parts to keep the system working were nearly impossible to find. AT&T decided not to repair the storm damage to this last remaining direct telephone link to Cuba. As a temporary measure, Cuba permitted AT&T to route a limited number of calls—about 2,000 per month—from the United States through ItalCable, Italy's intercontinental telco, with which EMTELCUBA had signed a joint venture agreement in 1991 (Workman 1993; "AT&T Says Cuban Government . . ." 1992).

Circuitous calling routes quickly developed. In 1992 several companies in Canada, which had direct-dial access to Cuba and were outside the jurisdiction of the U.S. Treasury Department, began to offer service. Popular with Cuban exiles, these companies typically charged U.S.$45 for a ten-minute call—U.S.$3 per minute plus a U.S.$15 handling fee—three and four times more than AT&T's rates. E-mail through Canada also was a reliable means of communicating with Cuba. These technical and legal end runs satisfied some of the demand for phone service to Cuba but resulted in lost revenues to AT&T, caused tension between the U.S. government and Canada, and reduced the possibilities that Cuba would relent in its dispute. Consequently, the U.S. government began to reconsider its telecommunications policy toward Cuba (Nordheimer 1994; Holmes 1993).

Enactment of the Cuban Democracy Act of 1992 set the stage for a reversal of U.S. policy. Intended to tighten the trade embargo on Cuba and facilitate the fall of the Castro government, the new law also required the president to permit adequate telecommunications services between the United States and Cuba and authorized him to license payments to Cuba for its portion of the service. The sponsors of the legislation were persuaded that more telephone traffic would undercut the Cuban leadership and were supported by Cuban-Americans eager to call relatives on the island. The legislation received broad, bipartisan congressional support. Then-presidential candidate Clinton endorsed it, and President Bush signed it into law (Gunn 1994; Skrzycki 1993).

Citing the new law as authority for powers it already had, but now with sufficient political cover to respond to lobbying by U.S. telecom companies upset over losing business opportunities in Cuba, the Clinton administration changed course and authorized U.S. telecom companies to share their proceeds with Cuba. In 1994, after extended and highly contentious haggling, Cuba dropped its demand for payment of the escrowed revenues and agreed to a standard bilateral arrangement for future compensation—a 50 percent split of toll calls up to a limit of U.S.$1.20 per minute plus a U.S.$1.00 surcharge for collect calls originating in Cuba. The Clinton administration approved the deal, and direct-dial service began in November 1994, ending the long drought in U.S.-Cuban telephone communications (Robaina 1993; "FCC Gives . . . Go-Ahead" 1994).

Despite continued hostile relations between the two countries in the 1990s, telecommunications was one of the very few areas in which the two governments had serious and sometimes productive negotiations, further indicating the importance of electronic communications even between adversaries.

As of 1995, five U.S. companies had either launched new telecommunications services to Cuba or were seeking approval from both governments for future services: AT&T, formerly the exclusive U.S. carrier to Cuba, had activated its undersea cable from Florida and was authorized to expand service to a predicted 10,000 calls daily, a volume severalfold larger than was previously allowed monthly; MCI Telecommunications was licensed to provide direct-dial telephone service to Cuba via satellite; IDB WorldCom Services was planning direct telex and telegraph services to the island; LDDS Communications had announced it would provide long-distance service to Cuba; and WilTel International had agreed with Cuba to lay a fiber-optic cable from Florida and was applying for U.S. permission. Other services by other companies were also anticipated.

2.6.2 International Telephone Joint Venture

Cuba's attempt to reestablish economic relations with the noncommunist world, its plans for continued development of tourism, and the rapidly growing number of foreign companies operating in the country require a modern, restructured international telecommunications system. The increasing international telephone traffic resulting from expanded tourism and trade has brought badly needed foreign exchange into the Cuban treasury because all international calls made by foreigners are paid for in hard currency.

In late 1991, lacking the start-up capital to restructure the system, Cuba sold a 50 percent share in a new international telephone venture to ItalCable, Italy's intercontinental telephone company, for U.S.$41 million. Under a multiyear agreement with the Ministry of Communications, ItalCable agreed to provide equipment, know-how, and the management necessary to establish a modern, computer-operated, direct-dial international telephone service to Europe and Cuba's new trading partners. The key component of the joint venture was the construction of a satellite earth station linking Cuba—especially its growing beach resorts—with ItalCable facilities in Rome, thus ending dependence on the increasingly irrelevant Intersputnik system. There were also plans to connect Cuba to ItalCable's optical fiber submarine cable under construction from Europe to North America (Luxner 1992; Lopez 1993).

2.7 Conclusion

The Castro government has viewed telecommunications as a lifeline needed to help save a badly leaking Cuban economy adrift in a turbulent sea. That the lifeline is partially owned by a foreign company is not of overriding importance to Cuba, given the gravity of the situation. It is, nevertheless, ironic that the Cuban revolution, predicated on liberating the nation from U.S. control and brought to the brink of extinction by its economic dependence on the former Soviet Union, had to seek massive foreign investment in hopes of surviving. Although the ideological foundations of the Castro government dictate that telecommunications and other parts of the Cuban infrastructure must be free of foreign control, the past, present, and the probable future of Cuba are for substantial foreign involvement in the organization, management, and financing of its domestic and international communications.

The Cuban revolution was a closely watched political and economic experiment. Fidel Castro's defiance of the United States and nationalization of vital industries was once viewed as a viable alternative by revolutionary movements in other poor countries in Latin America. In the dramatically changed world of the 1990s, that model is no longer seen as realistic. Cuba is now being carefully studied to see if it can navigate the difficult transition to a mixed economy and reenter the world marketplace without sacrificing its social and economic advances. What role will electronic communications play in this process? What are the implications of foreign investment in Cuban telecommunications? As often said, the one thing predictable about Castro's Cuba is the unpredictable.

Notes

The authors gratefully acknowledge the assistance and cooperation of the Cuban Ministry of Communications and Ministry of Foreign Relations; Terry L. Haines and Douglas A. Boyd, contributors to field research in Havana; Michael Krinsky of the law firm Rabinowitz, Boudin, Standard, Krinsky & Lieberman; and Penn State student researchers Sara Leipold, Krishna Kishore, and Michele Carlson.

1. Obtaining current and accurate information for this chapter was difficult because Cuba was undergoing rapid and unpredictable change and there has been continuing hostility between the U.S. and Cuban governments. During the period we were writing this chapter, U.S. researchers were prohibited by the Treasury Department from conducting academic research in Cuba without a license, and some Cuban officials were reluctant to release information about the telecommunications system because of national security implications.

2. The region's other early telephone companies—those in Mexico, Panama, and Uruguay—apparently were formed in 1882 and 1883 (Rippy 1946). The historical record is unclear on the exact founding dates and, therefore, on which telephone system was first. These conclusions are based on the best evidence available to the authors, but should be used with caution.

3. See "Game on Video" 1954; Salwen 1994; Shanley 1955. Airborne television relay, called Stratovision, was used on a limited scale in the United States by Westinghouse during the late 1940s. Prior to the introduction of coaxial cable, Stratovision was seen as a possible means of achieving the economic efficiencies of network television.

4. The monthly minimum wage in Cuba is 108 pesos (mid-1995). However, the value of the peso relative to the U.S. dollar has been quite volatile. According to Mesa-Lago (1995), the annual average black market exchange rate for Cuban pesos went from 7 per U.S.$1 in 1989 to 83 per U.S.$1 in 1994. Other sources, including in-country observations by the authors, indicate that the black market rate may have gone as high as 150 per U.S.$1 in late 1994 but dropped to as low as 10 per U.S.$1 in 1995 in response to the government's economic measures, such as legalizing the dollar and opening farmers' markets.

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