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WIRELESS: RADIO, REVOLUTION, AND THE MEXICAN STATE, 1897-1938

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF HISTORY

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## Abstract

This dissertation explores the interplay of early radio technology and twentieth-century state power in Mexico. It argues that wireless technology was crucial to government attempts at incorporating frontiers, foreign policy, the outcome of the Mexican Revolution, and the formation of the single-party state that ruled from 1929 to 2000. Examining radio development in Mexico is especially useful because political leaders first incorporated the technology immediately preceding a fractious revolution turned civil war. The subsequent dissolution and reconsolidation of the political order shows how wireless technology affected new attempts at state building during the first half of the twentieth century. Initially used as a tool of centralization, trade, and military domination, the Revolution proved that in the hands of insurrectionists and foreigners, radio could also be a tool of decentralization. The Revolution intensified the tendency of leaders to focus on the medium's military potential as warring factions incorporated wireless devices to advance their causes. The destabilizing potential of the technology pushed the victors to pursue a policy of strict surveillance and regulation over radio, provoking heightened attempts at centralization and monopolization. At the exact time that the warfare wound down, advancements in wireless technology gave rise to a more expansive form of communication—broadcasting. Radio was no longer used solely as a point-to-point tool of generals and communications officers; it had become the first electronic form of mass media, a crucial medium for integrating the general population across the national territory by means of generating consent, and at the same moment that a revolutionary government was attempting to consolidate its control militarily and culturally. These coinciding processes helped establish populist politics in Mexico earlier than in other Latin American nations.

# Introduction

## A Tale of Two Revolutions

On Valentine's Day 1924, the residents of Mexico City awoke to discover a strange and tragic story in the daily *El Demócrata*. After scratching a brief note into a piece of maguey, a middle-age man purportedly distraught over his wife's adulterous affair had climbed to the top of one of the radio towers near Chapultepec Castle and jumped to his death. The article described his end in gruesome detail. The next day, however, the tale took a dramatic turn when the newspaper revealed that instead of a heart-broken lover, the deceased was actually a member of the rebellion recently started by Adolfo de la Huerta, a high-level member of the revolutionary leadership who was then attempting to overthrow the president, General Alvaro Obregón Salida (1920-24). Apparently the death in question had resulted when the man electrocuted himself in a botched attempt to sabotage an important component of Obregón's communications system.[1]

This tale of espionage, sensational as it was, touched upon real problems and fears. Just as surely as spousal infidelity wreaked havoc on Mexico City marriages, *delahuertistas* had taken a number of important wireless stations in the country, and spies were operating radios from the rooftops of crowded houses in the nation's capital. General of the Federal District, Arnulfo Gómez, then ruthlessly hunting down insurrectionists, went so far as to tell journalists that radio was "the principal enemy of

[1] "Desde la cúspide de una torre inalámbrica del bosque de Chapultepec se arrojó un sentimental y excéntrico suicida," *El Demócrata*, 14 Feb. 1924, II 1; "El hombre que cayó de la torre inalámbrica de Chapultepec no era un suicida sino un audaz agente de los rebeldes," *El Demócrata*, 15 Feb. 1924, II 1.

the government," and to demand that radio owners register all their devices.[2] In reality, Gómez was articulating a fear of wireless communication that had developed among military commanders during the preceding Mexican Revolution (1910-20). A massively violent and destructive civil war that erupted after the overthrow of the longtime dictator Porfirio Díaz (1876-80, 1884-1911), it sired a number of subsequent revolts, of which the De la Huerta Rebellion was among the most significant. Porfirian generals close to Díaz had first brought radio devices to Mexico in order to expand state power. The Revolution disrupted this plan while simultaneously expanding the use of the technology. But whatever the political situation, radio remained a component of control. Just as the Díaz administration hoped to unite the nation's hinterlands to Mexico City, the leaders of the various revolutionary factions used the medium to gain dominance over their enemies. Territorial control and communications went hand in hand, for to have the former, one had to develop and maintain the latter.

Because of the difficulty of preserving and expanding wire communications, revolutionary leaders increasingly turned towards a new technology, one that was going through a revolution of its own. Telegraphs and telephones had been the dominant form of electronic communication in the 1910s, but they were easily disrupted. All one had to do was cut, at any point, a part of the miles of indefensible cables upon which the technologies relied, and the connection failed. But radio stations had no interconnecting wires, and were harder to sabotage. As a result, radio gained a more prominent place in communications. Before the end of the Revolution, wireless technology itself went through a metamorphosis. American engineers and experimenters had made the

[2] "Formal batida contra los aparatos radiotelefónicos," *El Universal Gráfico*, 16 Jan. 1924, 2.

adjustments necessary to transform wireless transmitters and receivers from tools used for point-to-point transmissions of Morse code to a medium of voice broadcasting that could reach thousands of people. Consequently, commercial broadcasters in the United States began airing music and advertisements. Almost immediately thereafter, Mexican engineering students, businessmen, and military communications specialists with U.S. connections started their own experiments.

The fact that radio developed and then radically changed during the revolutionary era begs a number of questions. Did wireless technology affect the outcome of the Revolution and the revolutionary state? How did the extreme violence and instability affect radio development in Mexico? How did the subsequent government leaders, whose control over the state was still challenged, attempt to use and manage radio? To what extent could they? All of these questions, in turn, relate to more fundamental issues, namely, the complex role of electronic communications in war, government, and modern society.

Radio, of course, was not the only technology transforming Mexico. It was but one of a number of important innovations that occurred during the long administration of Porfirio Díaz and the subsequent Revolutionary era. Fueled by industrialization and scientific research in Europe and the United States, a massive technological transformation was sweeping across much of the inhabited world. Steamships, railroads, electricity, machine guns, and telegraphs all proved useful to agents of imperial powers who were rapidly expanding global trade and exploiting colonial possessions.

Similar to European and U.S. empire-building practices, Díaz first adapted radio as a means to advance trade and connect frontier hinterlands. In the decades prior to his rule, especially before 1867, civil war, banditry, and foreign invasions had all wreaked havoc on Mexico's transportation and communication networks. The government had failed to maintain roads adequately, and in some ways the region was more disunited than it had been under Spanish rule prior to 1821. In the 1840s Mexico lost nearly half of its territory—a huge portion of the northern periphery with which the capital had possessed weak transportation and commercial links—to the rapidly expanding United States. In the south, creoles in the mostly disconnected Yucatán briefly declared independence and became absorbed in a bloody civil war with Mayan communities that had become upset by the costs of maintaining the nascent Yucatecan state and by the associated growth of political violence. Between these extremes, even many of the more central states maintained a relatively high degree of isolation from federal authority.

Attempts at advancing communications had been underway since the 1850s, and included such innovations as the first railroads and telegraph lines. The invasion of French forces in 1862, however, temporarily halted progress in transportation and communications. Following the French intervention, Napoleon III made Archduke Maximilian of Hapsburg the Emperor of Mexico in 1864. The latter individual and his wife, Carlota, traveled aboard Mexico's first train. As described in a popular history textbook, the royal couple took the newly constructed railway but disappointingly had to depart at the small community of Totalco, where the tracks ended well short of Mexico City. Originally transferring to an ornate carriage that they brought from

Europe, the imperial family discovered that it constantly broke down on the poorly kept road, forcing them to switch to a hardier and more rustic stage for the remainder of the journey.[3] But during Maximilian's reign, and following his defeat and execution by nationalists under the leadership of Benito Juárez, laborers slowly added new railroad tracks and telegraph lines. The Veracruz-Mexico City railway, for example, reached completion in 1873.[4]

But it was not until the Díaz era that modernization advanced at a rapid and consistent pace. Indeed, the administration presided over a genuine communications boom. The government funded and directed the maintenance and construction of a large number of roads, and the Secretary of Communications and Public Works (SCOP), in collaboration with foreign capitalists, expanded railroads at an astounding pace. There were fewer less than 400 miles of railroad track in 1877; by 1910, there were over 11,000 miles of track.[5] Meanwhile, telegraphy and telephony experienced similar growth. In fact, railroad and wire communication growth often went hand-in-hand. Train stations often doubled as telegraph offices. Juan de Granje, a Mexican merchant of Spanish origins, introduced telegraphy to Mexico in 1849. As with the railroad, the construction of the first telegraph line occurred in the1850s between the port of Veracruz and Mexico City. But it was not until the late 1870s that cables connected the Atlantic and Pacific coasts. Over the next two decades the newly created Department of National Telegraphs (DGTN), under the direction of the SCOP, started

[3] Michael C. Meyer, William L. Sherman, and Susan M. Deeds, *The Course of Mexican History*, 9th ed. (New York: Oxford University Press, 2011), 293.

[4] John H. Coatsworth, *Growth against Development: The Economic Impact of Railroads in Porfirian Mexico* (DeKalb: Northern Illinois Press, 1981), 35.

[5] Ibid, 36-37.

expanding lines, once again in collaboration with foreign businesses, to the country's fringe territories.[6]

But despite the massive increase in development, the vast majority of the country remained unconnected by electronic communications. Particularly problematic were the frontiers, especially Mexico's two peninsulas, which remained separated from Mexico City by harsh terrains and large bodies of water. The SCOP struggled, often unsuccessfully, to construct telegraph lines through the jungles and deserts, or to lay them under the Sea of Cortez. It was in these regions that the Díaz administration decided to build the first radiotelegraph offices, bypassing the problem of connecting the regions by wire. In early 1903, with the aid of German engineers, the DGTN finished the first two stations, one in the Southern District of Baja California and the other in Sinaloa.[7] Prior to the Revolution, the Díaz government used radio for these frontier-connecting developmental programs and maritime trade, though military experiments with portable wireless technology were also underway by 1907.

Radio operations by state and rebel officials increased during the Revolution, an important development overlooked by most scholars. Indeed, there is a general absence of research and publications on the role of modern technology in the Mexican Revolution. This is a strange void, since there are enough books about this great upheaval to fill a small library, and because the Revolution was unquestionably a testing ground for modern machines. For example, the first bombings of surface warships from

[6] Leopoldo Noyola, *La raza de la hierba: Historia de telégrafos Morse en México*, 2nd ed. (Puebla: Benemérita Universidad Autónoma de Puebla, 2004), 19, 24-5, 56-7, 66.

[7] Leandro Fernández, *Memoria . . . por el Secretario de Comunicaciones y Obras Públicas*, 1902-1903 (Mexico City: Tipografía de la Dirección General de Telégrafos, 1904), 244.

an aircraft occurred during the Revolution.[8] Alongside machetes and old rifles, airplanes, cars, trucks, machine guns, trench warfare, steam powered and electrified ships of war, and, of course, radio, all contributed to the armies of the various fighting factions. Of these, radio has been especially ignored despite the fact that he DGTN had already constructed ten stations when the forces of Francisco I. Madero, a wealthy landowner from Coahuila, overthrew the octogenarian dictator. Although briefly interrupted by the subsequent civil war, political and communications leaders continued to expand on the practices and ideas of their Porfirian predecessors. Indeed, many of the SCOP and DGTN employees who built government radio stations in the 1910s and 1920s had either worked for the same agencies during the Porfiriato, or were trained in Porfirian universities. Radio also proved crucial to important battles during the wars, as each faction possessed its own cadre of wire and wireless telegraphy operators. The Constitutionalists under the leadership of Venustiano Carranza (1915-20), the victors of the Revolution, relied on these specialists and increased their ranks while reconsolidating control over larger and larger portions of the country. Due to continuing instability and the threat of anti-Constitutionalist communications, Carranza decreed a policy of state monopolization of wireless technology, which legislators codified in the Constitution of 1917. When the famous one-armed general Alvaro Obregón took the presidency in 1920 following the last successful coup of the

[8] See, Alan Knight, *The Mexican Revolution*, vol. 2 (Lincoln: University of Nebraska, 1986), 148, 161. Knight also suggests that the first use of aerial propaganda occurred during the Mexican Revolution. See also, Dan Hagedorn, *Conquistadors of the Sky: A History of Aviation in Latin America* (Gainesville: University Press of Florida, 2008), 76-77.

Revolution, twenty-seven radiotelegraph stations operated across the country, in addition to a number of portable military radios.[9]

The following year the first broadcasting exhibitions took place during the Mexico City centennial celebrations of independence from Spain. This new use of radio revolutionized politics as the Obregón and subsequent Plutarco Elías Calles administration (1924-28) obtained a firmer if still contested control over the state apparatus. While military radio helped the army contain rebellions, broadcasting allowed revolutionary leaders to spread their ideals among labor and peasant groups, foreign audiences, and a growing urban middle class. This transformation had massive ramifications. Radio was no longer used solely as a point-to-point tool of the postal service, seafarers, and the military; it had become the first electronic mass-media medium, a crucial tool for integrating the general population across the national territory by means of generating consent.

Unlike Carranza, subsequent leaders, beginning with Obregón, abandoned the policy of monopolizing radio development. Recognizing the economic and political potential of broadcasting, Obregón followed the advice of state technicians and representatives of a prominent Mexico City radio club who promoted private commercial and experimental radio use. The relationship forged between commercial radio leaders, most notably the Azcárraga family, and the government leaders of the 1920s and 1930s, established a mutually beneficial partnership that helped establish one-party rule, the consolidation of commercial broadcasting under XEW, XEQ, and their affiliate stations, and a vibrant and complicated Mexican nationalism.

[9] *Informes de las dependencias de la Secretaría de Comunicaciones y Obras Públicas del 11 de abril de 1919 al 31 de mayo de 1920* (Mexico City: Dirección de Talleres Gráficos, 1921), 175.

This dissertation examines the advancement of radio communications in a crucial period of technological, political, and societal change. It first follows how people used radio devices from their initial incorporation into European empires in the late 1800s, and then turns its gaze toward Mexico. Most of the work focuses on the period between the establishment of a Mexican radio system under Porfirio Díaz to the founding of the single-party state by the *Partido Nacional de la Revolución* or National Revolutionary Party (PNR) in 1929 and the subsequent *Partido Mexicano de la Revolución* (PRM) and presidency of Lázaro Cárdenas (1934-40). Instead of treating these political eras separately, or dividing radiotelegraphy and broadcasting, I have placed them together, allowing me to better trace political and technological continuity and change. Radio development, like the belief in the progressive nature of technology and modernity, bridges the positivist and nationalist eras.

My work shows that radio development was a major component in government plans for nation and state building, beginning with the first radiotelegraphy stations. I argue that the Revolution affected the developmental course of the technology in important ways and vice versa, which makes Mexico an especially interesting and important place to study early radio development. During the Revolution, wireless messages influenced the outcomes of decisive battles and greatly aided the ultimate victory of Carranza's Constitutionalist forces. The most significant consequence that the Revolution had on the radio development was that military concerns continued to shape how government leaders, mostly military men themselves, perceived the medium.[10] This focus on preventing radio from aiding new rebellions or being used to

[10] Here, my work compliments Edwin Lieuwin, *Mexican Militarism: The Political Rise and Fall of the Revolutionary Army, 1910-1940* (Albuquerque: University of New Mexico Press, 1968), 58; see

spread anti-government messaging limited the brief democratic tendency in radio that occurred with the advent of broadcasting and the coinciding growth of private radio hobbyists and privatization under Obregón. As a result, the state continued to play a strong role in wireless use and growth; those whom the government allowed to transmit radio services faced strong regulatory restrictions, and all political broadcasting became dominated by state leaders who collaborated in the PNR and the subsequent PRM. In addition to domestic uses, state communications officials used the technology to establish a new era of foreign relations. Radio spread presidential addresses and fomented international trade, government alliances, and transnational cultural diffusion in a way never before conceivable. But there were also a number of important continuities that bridged the Revolution. Presidents following Díaz, including Madero and then Carranza, Obregón, and Calles, expanded on preceding Porfirian policies, aided by increased radio equipment imported for military activities. By the end of the Calles era (1924-35), radio had become a larger component of national and international public communications services, plans to incorporate the frontiers, military operations, and intelligence gathering.[11]

As a result of the state's strong role in broadcasting and government leaders' fears of instability, radio became an essential part of postrevolutionary populist politics beginning with Calles. The intertwined trends of state broadcasting and populism reached their zenith during the Cárdenas administration. But by the time that Cárdenas took office, presidents had been using broadcasting for over a decade, and wireless

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also Aaron Navarro, *Political Intelligence and the Creation of Modern Mexico, 1938-1954* (University Park, PA: The Pennsylvania State University Press, 2010).

[11] Although Calles's presidency ended in 1928, I am including the "Maximato" period, where three separate presidents—Pascual Ortiz Rubio, Emilio Portes Gil, and Abelardo Rodríguez—ruled under considerable influence and interference from Calles.

telegraphy for thirty-five years. The traditions of using radio to relay inaugural addresses, congressional speeches, state-sponsored events, and presidential campaigns had all been placed upon sturdy foundations built by Calles and, starting in 1929, the political party he helped found, the PNR. To a large extent, Cárdenas's ability to rouse large portions of the nation and to increase government corporatism had as much to do with the maturation of populist politics, the broadcasting industry, and radio consumerism as much as his own special skills as a political leader.

The legacy of pre-broadcasting practices and legislation, and of the Revolution itself, left other significant marks on Mexican broadcasting. Radio specialists who fought with Carranza's Constitutionalist forces transformed themselves into influential radio experimenters, builders of commercial-station transmitters, and government regulators. The historical precedence for state-controlled wireless operations and of political instability influenced the strong regulatory measures on commercial broadcasting in the 1920s and 1930s. Originating as an important auxiliary tool for expanding telegraphic communications, radio became a crucial component of post-revolutionary state building, including military domination, political and cultural broadcasting, the rise of populist politics, and the success of single-party rule.

As the title suggests, my dissertation emphasizes the relationship between radio and the Mexican state. Within the larger realm of radio, I am addressing wireless electromagnetic communications mediums, in particular radiotelegraphy, radiotelephony, and radio broadcasting. In regards to the Mexican state, I generally agree with an expanded version of Max Weber's well-known definition, that "a state is that human community which (successfully) lays claim to the monopoly of legitimate

physical violence within a certain territory."[12] But the state's role cannot be limited to "legitimate" or legal violence; rather, the state is also the sum of people who operate and enforce a system of law within a country's political boundaries. During the Revolution, factions fought over control of the state apparatus. As a result, a substantial portion of my work examines the way that those fighting over possession of the state incorporated radio into their strategies, and how the legacy of the Revolution, and the preceding era, affected the rebel leaders who eventually came to dominate the central government based in Mexico City.

**Review of Literature**

My dissertation fits within a number of different but intertwined historiographies. In a broad sense, it contributes to a growing literature on the correlation between technology, empire, state formation, and nationalism. University of Toronto professor Harold Innis's *Empire and Communications* (1950), based on six lectures given at Oxford University in 1948, provided an foundational survey of how communications influenced the rise and fall of empires, from clay tablets to telephones, from Babylon to the British Empire.[13] Of the numerous studies that subsequently provided more nuance to the field, those on modern transportation and telecommunications practices proved most informative to my study. Representative of these works are the publications of Daniel R. Headrick, Michael Adas, Hugh G. J. Aitken, Susan J. Douglas, James Schwoch, Sungook Hong, Anton A. Huurdeman, Aitor Anduaga, Russell Burns, Tapan

[12] Max Weber, quoted in Duncan Kelly, *The State of the Political Conceptions of Politics and the State in the Thought of Max Weber, Carl Schmitt and Franz Neumann* (Oxford: Oxford University Press, 2003), 77.

[13] Harold Innis, *Empire and Communications* (Lanham, MD: Rowman & Littlefield, 2007).

K. Sakar, Daqing Yang, Bernard Finn, Peter Hugill, David Paull Nickles, Michael A. Krysko, Jill Hills, Jorma Ahvenainen, Dwayne R. Winseck, Robert M. Pike, David McCreery, Rebecca Raines Robbins, Hugh Barty-King, and Tim Wu.[14] Although these authors write about different political and business entities and stages of communications development, they all discuss the role of telecommunications in one or all of the reinforcing processes of globalization, empire, state formation, and nationalism.

[14] Hugh G. J. Aitken, *Syntony and Spark: The Origins of Radio* (New York: John Wiley & Sons, 1976); Hugh Barty-King, *Girdle Round the Earth* (London: Heinman, 1979); Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (New York and Oxford: Oxford University Press, 1981); Susan J. Douglas, *Inventing American Broadcasting, 1899-1922* (Baltimore: The John Hopkins University Press, 1987); James Schwoch, *The American Radio Industry and its Latin American Activities, 1900-1939* (Urbana: University of Illinois Press, 1990); Daniel R. Headrick, *The Invisible Weapon: Telecommunications and International Politics, 1851-1945* (New York: Oxford University Press, 1991); David McCreery, "Wireless Empire: The United States and Radio Communications in Central America and the Caribbean, 1904-1925," *South Eastern Latin Americanist* 37 (Summer 1993): 23-41; Rebecca Robbins Raines, *Getting the Message Through: A Branch History of the U.S. Army Signal Corps* (Washington, DC: Center of Military History, United States Army, 1996); Jorma Ahvenainen, *The History of the Caribbean Telegraphs before the First World War* (Helsinki: The Finnish Academy of Science and Letters, 1996); Peter Hugill, *Global Communications since 1844: Geopolitics and Technology* (Baltimore: The Johns Hopkins University Press, 1999); Sungook Hong, *From Marconi's Black-Box to the Audion* (Cambridge, MA: The MIT Press, 2001); Jill Hills, *The Struggle for Control of Global Communications: the Formative Century* (Urbana: University of Illinois Press, 2002); David Paull Nickles, *Under the Wire: How the Telegraph Changed Diplomacy* (Cambridge, MA: Harvard University Press, 2003); Anton A. Huurdeman, *The Worldwide History of Telecommunications* (Hoboken, NJ: Wiley-Interscience, 2003); Russell Burns, *Communications: An International History of the Formative Years* (London: The Institution of Electrical Engineers, 2004); Jorma Ahvenainen, *The European Cable Companies in South America before the First World War* (Helsinki: The Finnish Academy of Science and Letters, 2004); John A. Britton and Jorma Ahvenainen, "Showdown in South America: James Scrymser, John Pender, and United States-British Cable Competition," *Business History Review* 78 (Spring 2004): 1-27; Tapan K. Sakar et al, *History of Wireless* (Hoboken, NJ: John Wiley & Sons, 2006); Dwayne R. Winseck and Robert M. Pike, *Communications and Empire* (Durham: Duke University Press, 2007); John A. Britton, "'The Confusion Provoked by Instantaneous Discussion': The New International Communications Network and the Chilean Crisis of 1891-1892 in the United States," *Technology and Culture* 48 (Oct. 2007): 729-757; Bernard Finn and Daqing Yang, eds., *Communications under the Seas* (Cambridge, MA: MIT Press, 2009; Aitor Anduaga, *Wireless and Empire: Geopolitics, Radio Industry & Ionosphere in the British Empire, 1918-1939* (Oxford: Oxford University Press, 2009); Daquing Yang, *Technology of Empire: Telecommunications and Japanese Expansion in Asia, 1883-1945* (Cambridge, MA and London: Harvard University Press, 2010); Michael A. Krysko, *American Radio in China: International Encounters with Technology and Communications, 1919-1941* (New York: Palgrave Macmillan, 2011); Tim Wu, *The Master Switch: The Rise and Fall of Information Empires* (New York: Alfred A. Knopf, 2011).

My dissertation has also benefited from a number of important studies on radio, culture, and national identity. In addition to Douglas's *Inventing American Broadcasting, 1899-1922* (1987), Joelle Neulander wrote a history of radio culture and national identity in 1930s France.[15] A number of U.S. scholars of Latin American history and communications have provided studies of radio's importance to modern culture, nation-building, and populist politics. Especially relevant to my study are Bryan McCann's *Hello, Hello Brazil: Popular Music in the Making of Modern Brazil* (2004), Robert Howard Claxton's *From Parsifal to Perón: Early Radio in Argentina, 1920-1944* (2007), and Mathew B. Karush's *Culture of Class: Radio and Cinema in the Making of a Divided Argentina, 1920-1946* (2012). These works provided information that allowed me to place my findings on state broadcasting and the relationship between the Mexican government and commercial station owners in a comparative context.[16] One clear and interesting difference between Argentina, Brazil, and Mexico, for example, is that Mexican state officials deliberately and directly used broadcasting to build a corporatist base of support much earlier than governments in Argentina or Brazil—a consequence of the Revolution.[17]

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[15] Douglas, *Inventing American Broadcasting*; Joelle Neulander, *Programming National Identity: The Culture of Radio in 1930s France* (Baton Rouge: Louisiana State University, 2009).

[16] Other trailblazing studies in Latin American radio include, Enrique C. Betancourt, *Apuntes para la historia: Radio, televisión y farándula de la Cuba de ayer . . . .* (San Juan, Puerto Rico: Ramallo Bros., 1966); J. A. De Armas Chitty, *Historia de la radiodifusión en Venezuela* (Caracas: Edición de la Cámara Venezolana de la Industria de la Radiodifusión, 1975); Raúl E. Barbero, *De la galena al satélite: Crónica de 70 años de radio el Uruguay, 1922-1992* (Uruguay: Ediciones de la Pluma, 1995); Juan Gargurevich, *La Peruvian Broadcasting Co.: Historia de la radio* (Lima: La Voz Ediciones, 1995); Elizabeth Fox, *Latin American Broadcasting: From Tango to Telenovela* (Lutin, England: Lutin University Press, 1997); Hermano Vianna, *The Mystery of Samba: Popular Music and National Identity in Brazil*, ed. and trans. by John Charles Chasteen (Chapel Hill: The University of North Carolina Press, 1999); Beatriz Sarlo, *The Technical Imagination: Argentine Culture's Modern Dreams*, trans. by Xavier Callahan (Stanford: Stanford University Press, 2008).

[17] Also see Bryan McCann, "Carlos Lacerda: The Rise and Fall of a Middle-Class Populist in 1950s Brazil," *Hispanic American Historical Review* 83, no. 4 (Winter 2003): 661-96.

Joy Elizabeth Hayes is one of a small number of U.S. scholars who have provided significant contributions to the history of radio in Mexico. Her *Radio Nation: Communication, Popular Culture, and Nationalism in Mexico, 1920-1950* (2000) is the most comprehensive English-language book on the subject. Preceding her, Philip Barbour, Marvin Alisky, and James Schwoch wrote respectively on radio legislation, education, and U.S. corporate influence.[18] But Hayes's work, more than that of any other American scholar to date, has influenced U.S. historians of Latin America. In many ways my dissertation reinforces her arguments about the importance or broadcasting to the culture and growth of Mexican nationalism during President Cárdenas's presidency. He used the medium with political skill, gaining a huge popular base of support for his policies. We also agree that Mexican broadcasting can only be understood within the context of American expansionism.

Two other American scholars who have contributed to Mexican radio studies are Rubén Gallo and Elissa J.Rashkin, who both completed works that discuss radio in Mexican avant-garde culture during the 1920s.[19] Two recent dissertations have further informed my work, especially the sections that look at education and the U.S.-Mexican border in my final two chapters.[20] Chappell H. Lawson's *Building the Fourth Estate: Democratization and the Rise of a Free Press in Mexico* (2002), looks at the democratization of broadcast media in the 1990s. He also discusses how mass media

[18] Marvin Alisky, "Educational Aspects of Broadcasting in Mexico," PhD diss., University of Texas, Austin, Texas, 1953; Philip Barbour, "Commercial and Cultural Broadcasting in Mexico," *Annals of the American Academy of Political and Social Science* 208, Mexico Today (Mar. 1940): 94-102.

[19] Rubén Gallo, *Mexican Modernity: The Avant-Garde and the Technological Revolution* (Cambridge, MA and London: The MIT Press, 2005); Elissa J. Rashkin, *The Stridentist Movement in Mexico: The Avant-Garde and Cultural Change in the 1920s* (Lanham, MD: Lexington Books, 2009).

[20] Elena Jackson Albarrán, "Children of the Revolution: Constructing the Mexican Citizen, 1920-1940," PhD diss., University of Arizona, Tucson, Arizona, 2008; Sonia Robles, "Shaping *México Lindo*: Radio, Music, and Gender in Greater Mexico, 1923-1946," PhD diss., Michigan State University, Lansing, Michigan, 2012.

became monopolized during the "perfect dictatorship" of the *Partido Revolucionario Institucional* (PRI). Indeed, the history of Mexican communications is a growing field in the United States. These works are providing a better understanding of how modern Mexico developed and how artists, entrepreneurs, and government officials portrayed their country to their fellow citizens and the outside world. As a result, their works, and I hope mine as well, provide important insights into how mass media has been crucial to twentieth-century nation building and transnational cultural and political diffusion.

Mexican communications scholars have a much stronger record of publications on the history of radio in Mexico. I owe a great debt of gratitude to a number of talented academics who wrote prior studies on telecommunications. The works of Roberto Ornelas Herrera, Carlos A. Merchán Escalante, Gloria Fuente, and Ana Luz Ruelas were especially important to my research since they provided the first investigations into pre-broadcasting wireless communications in Mexico.[21] Also important to my project are a number of scholars who invested tremendous time and energy studying broadcasting, including but not limited to Jorge Mejía Prieto, Felipe Gálvez Cancino, Fernando Mejía Barquera, José Luis Ortiz Garza, Ángel Miquel, Enrique E. Sánchez Ruiz, Rosalía Velázquez Estrada, Gilberto Vargas Arana, Virginia Medina Ávila,

[21] Roberto Ornelas Herrera, "Radio y contidianidad en México (1900-1930)," in *Historia de la vida cotidiana en México*, tomo V, vol. 1, Siglo XX, Campo y ciudad, edited by Aurelio de los Reyes (Mexico City: Fondo de Cultura Económica, 2006); Roberto Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX (Las comunicaciones inalámbricas en México 1900-1924)," tesis de licenciatura, Universidad Nacional Autónoma de México, Mexico City,1998; Carlos Merchán Escalante, *Telecomunicaciones* (Mexico City: Secretaría de Comunicaciones y Transportes, 1988); Gloria Fuentes, *La Radiodifusión* (Mexico City: Secretaría de Comunicaciones y Transportes, 1988); Ana Luz Ruelas, *México y Estados Unidos en la revolución mundial de las telecomunicaciones* (Mexico City: UNAM, 1996); also useful for understadning wire telegraphy in Mexico is Leopoldo Noyola, *La raza de la hierba: Historia de telégrafos Morse en México*, 2nd ed. (Puebla: Benemérita Universidad Autónoma de Puebla, 2004).

Cuauhtémoc Anda Gutiérrez, Romeo Figueroa Bermúdez, and Fátima Fernández Christlieb.[22]

The first serious study of radiotelegraphy in Mexico appeared with Carlos Merchán Escalante's *Telecomunicaciones*, written for a volume on communications coordinated by Enrique Cárdenas de la Pena and sponsored by the Mexican Secretariat of Communications and Transportation (SCT) in 1988. Although only one component of a more general work on telecommunications, Merchán Escalante used the department's public records to trace electronic communications development from the first telegraphy project to the country's multi-faceted network of 1988. His work is more descriptive than analytical, providing basic information on when and where stations were built and, occasionally, on how they were used. He also discusses early radio legislation. Though no small work by any means, Merchán Escalante only scratched the surface of available documentation, predominately limiting himself to SCT records. Gloria Fuentes's *La Radiodifusión*, part of the same series, is similar in many ways, but with a greater focus on broadcasting.

[22] Jorge Mejía Prieto, *Historia de la radio y la t. v. en México* (Mexico City: Editores Asociados, 1972); Felipe Gálvez Cancino, "Los felices del alba," tesis de licenciatura, Universidad Nacional Autónoma de México, Mexico City, 1975; Fátima Fernández Christlieb, *Los medios de difusión masiva en México* (Mexico City: Juan Pablos, 1982); Enrique E. Sánchez Ruiz, *Orígenes de la radiodifusión en México: desarrollo capitalista y el estado* (Mexico City: ITESO, 1984); Fernando Mejía Barquera, *La industria de la radio y televisión y la política del estado mexicano (1920-1960)* (Mexico City: Fundación Manuel Buendía, 1989); José Luis Ortiz Garza, *La guerra de las ondas: Un libro que desmiente la historia "oficial" de la radio Mexicana* (Mexico City: Planeta Mexicana, 1992); José Luis Ortiz Garza, *Radio entre dos reinos: la increíble historia de la radiodifusora mexicana más potente del mundo en los años 30* (Mexico City: Vergara, 1997); Ángel Miquel, *Disolvencias: Literatura, cine y radio en México (1900-1950)* (Mexico City: Fondo de Cultura Económica, 2005); Rosalía Velázquez Estrada, "La Radiodifusión Mexicana: encuentro con su espada (1923-1945)," in *Miradas sobre la nación liberal: 1848-1948: Proyectos, debates y desafíos*, Libro 2, *Formar e informar: la diversidad cultural* (Mexico City: Universidad Nacional Autónoma de México, 2010): 275-313; Virginia Medina Ávila and Gilberto Vargas Arana, *Nuestra es la voz, de todos la palabra: Historia de la radiodifusión mexicana, 1921-2010* (Mexico City: Universidad Nacional Autónoma de México-FES, Acatlán, 2011).

Roberto Ornelas Herrera's *tesis de licenciatura* "La radiodifusión mexicana a principios del siglo XX (Las comunicaciones inalámbricas en México 1900-1924)" (1998) was the first work to specifically address early radio technology in Mexico.[23] He followed this with a published essay titled "Radio y contidianidad en México (1900-1930)" (2006). Opening the box on the previously hidden lives of radiotelegraphers during the Porfiriato and the Revolution, Ornelas Herrera also provides the first academic study to focus on radio's role in the Revolution. To better understand this crucial period, I expanded on Ornelas Herrera's work by adding new source materials from previously unused archives and newspapers and by expanding the historical and geographical context. Like Ornelas Herrera, I find that the number of radios and radio specialists expanded significantly because of the Revolution and played an important role in the rise of Mexican broadcasting.

Although this dissertation compliments these works, my research stands apart in a number of ways. I argue that radio was a crucial factor in the outcome of the Revolution, changing the course of important battles and uprisings. The Constitutionalists' dominance over communications technologies, especially radio, proved critical to their ability to win the war. Just as importantly, wireless use during the Revolution and subsequent rebellions directly influenced government policies. By continuing to examine the role of radio in military and transportation endeavors, I show how the technology became an important facet of state suppression and structural development while also serving as a tool for populist politics and cultural nation building. In turn, military concerns remained a dominant part of the thinking of leaders

[23] A *tesis de licenciatura* is a thesis written for the obtainment of what in the United States would equate to a bachelor's degree. However, these works are more similar to a U.S. master's thesis, and often represent high levels of scholarship.

during the 1920s and 1930s. As wireless technology diversified, the state's use of radio became more complex, the government leaders controlled and supervised political and military aspects of radio while they encouraged commercial entities they favored to expand cultural and nationalist broadcasting.

While recognizing my debt to Hayes, I must also point out crucial differences between her work and my own. One, we highlight different times and aspects of radio development. She focuses most of her attention on the 1930s to 1950, giving brief attention to the 1920s, whereas I examine the use and influence of radio from 1897 to 1938, emphasizing the pre-Cárdenas years. Whereas Hayes's book looks at theories of modernism and anti-modernism, culture, paternalism, and nationalism, my dissertation focuses more attention on radiotelegraphy, state building, intelligence practices, structural development, militarism, and corporatist politics. My research also emphasizes the importance of the Calles administration and the PNR in the development of nationalist and populist broadcasting. In regards to radio, Cárdenas capitalized on well-laid foundations more than inventing any new method of using mass-media. Lastly, I use a wider variety of primary source materials, a fact that has allowed me to detect actors and tendencies invisible to previous scholars.

As with Hayes, most Mexican publications on radio focus on the 1930s through 1950s, although some carry the development up to more current times. My work delves deeper into the roots of early Mexican radio. By examining the technology's origins in Europe and the role of Mexican ambassadors in obtaining wireless equipment, I broaden the historical and geographical context of Mexican radio studies. This approach has also allowed me to bridge the historiographical divide between works on

communications and empire building and those on radio and Mexican nationalism and state formation. The processes of state consolidation in Latin America and European and U.S. empire building went hand-in-hand, and at times the former mirrored the latter. I additionally lay a much stronger emphasis on the role of the Revolution and subsequent violence on state broadcasting policies. It was a fear of continued insurrection, together with the drive to consolidate a firm control over the state that pushed the military to expand its wireless operations and national political leaders to increase government broadcasting, collaborate with specific commercial stations on programming and state propaganda, and to limit the scope of oppositional political speech over the air. As aforementioned, the Revolution is why populist politics emerged over the airwaves in Mexico earlier than in other Latin American nations.

My work also makes a contribution to the existing literature on the Porfirio Díaz era and the Mexican Revolution. The works on these periods are so numerous that listing them all would be a cumbersome task. Some publications about the Porfiriato discuss technology, public works projects, and modernization, but none excepting the aforementioned works on telecommunications discuss the importance of wire and wireless communications to Porfirian schemes.[24] Similarly, most books on the Revolution and the subsequent governments tend to focus on ideology and culture more than structural development. Some larger monographs on the Revolution do make

[24] For examples see, Coatsworth, *Growth against Development*; Stephen Haber, *Industry and Underdevelopment: The Industrialization of Mexico, 1900-1940* (Stanford: Stanford University Press, 1989); Priscilla Connolly, *El contratista de don Porfirio: Obras públicas, deuda y desarrollo desigual* (Mexico City: Fondo Cultura Económica, 1997); Paul Garner, *Porfirio Díaz* (Edinburgh: Longman, 2001); William Beezley, *Judas at the Jockey Club and Other Episodes in Porfirian Mexico*, 2nd ed. (Lincoln: University of Nebraska Press, 2001); Claudia Agostoni, *Monuments of Progress: Modernization and Public Health in Mexico City, 1876-1910* (Calgary: University of Calgary Press, 2003); Michael Matthews, "*De Viaje*: Elite Views of Modernity and the Porfirian Railway Boom," *Mexican Studies/Estudios Mexicanos* 26, no. 2 (Summer 2010): 251-89.

reference to technologies, though none emphasize the point, but still, they are excellent works that I used and hope to complement.[25]

Perhaps it should not be surprising that radio was important in the Revolution, first as a military tool and then subsequently in the 1920s and 1930s as a mass medium to spread revolutionary culture. There has been a longstanding relationship between communication mediums and revolution. Often scurrilous penny-papers helped build momentum for the French Revolution.[26] Following the Mexican Revolution, radio became an essential component of revolutions and counterrevolutions in Cuba, Guatemala, and Nicaragua. Scholars and journalists since 2010 have commented on the importance of the Internet and social media in the Arab Spring.[27] A growing international movement has used both conventional broadcasting and the Internet to influence people struggling under an oppressive regime in North Korea.[28]

The Mexican Revolution provides the earliest example of radio technology in a major social revolution. It shows that electronic communications have been important to both challenging and maintaining government control since their introduction. Radio during the Revolution was a novel but valuable tool for administrating government in

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[25] Gallo's *Mexican Modernity* focuses on technology and culture. Some of the many works on the Mexican Revolution that are of high caliber include, Frank Tannenbaum, *The Mexican Agrarian Revolution* (New York: The MacMillan Company, 1929); John Womack, Jr., *Zapata and the Mexican Revolution* (New York: Vintage, 1970); Adolfo Gilly, *La revolución interrumpida* (Mexico City: El Caballito, 1971); Ramón Eduardo Ruíz, *The Great Rebellion, 1904-1924* (New York: W.W. Norton & Company, 1980); Knight, *The Mexican Revolution*, 2 vols.; Friedrich Katz, *The Life and Times of Pancho Villa* (Stanford: Stanford University Press, 1998); Berta Ulloa, "La lucha armada (1911-1920)," in *Historia general de México* (Mexico City: Colegio de México, 2000), 757-817; John M. Hart, *Empire and Revolution: The Americans in Mexico since the Civil War* (Berkeley: University of California Press, 2002).

[26] See Jeremy D. Popkin, *Revolutionary News: The Press in France*, 1789-1799 (Durham: Duke University Press, 1999).

[27] Thomas L. Friedman, "A Theory of Everything," *New York Times*, http://www.nytimes.com/2011/08/14/opinion/sunday/Friedman-a-theory-of-everyting-sort-of.html?src=ISMR_AP_LO_MST_FB, accessed 14 August 2011.

[28] "Fleeing North Korea through 'Asia's Underground Railroad'," *Talk of the Nation*, 4 Dec. 2012, National Public Radio, audio program, http://www.npr.org/2012/12/04/166500413/fleeing-north-korea-through-asias-underground-railroad, accessed 4 Dec. 2012.

conquered territories, organizing military operations, and conducting foreign relations. But unlike penny-presses and Facebook, wireless telegraphy was not, at least intentionally, a mass media. Still, its value and importance as a communications tool should not be under emphasized. The use of radiotelegraphy during the Revolution is also important because it provided a cadre of wireless specialists and inspired authoritarian tendencies in later Mexican broadcasting. Brought to Mexico by private experimenters and military men, broadcasting became an essential component in the way that revolutionary-era governments attempted to garner public support and shape the image of the new Mexican state. These coinciding social and technological revolutions make radio development and its role in state formation and centralization especially interesting in Mexico.

Born from experiments conducted in laboratories in Europe, radio became a crucial tool for the acquisition and solidification of state power in Mexico. From the moment the technology reached Mexico in 1899, it was a tool of state expansion and nation-building. But as the Revolution clearly demonstrated, the technology, when not monopolized or firmly controlled, could be a force of rebellion, resistance, and factionalism. As developed and amplified during one of Mexico's most massive and violent struggles over state power and the course of the nation, controlling radio became an essential component of war and governance.

# Chapter One

## Scientists and Inventors, Empires and Latin America: Early Global Wireless Communications

Brripp—brripp—brripp—brripp.
Brripp—brripp—brripp—brrrrrr—
Brripp—brrrrrr—brripp. Brripp—brripp!
—Cleveland Moffett, describing
Guglielmo Marconi's wireless
telegraphy in action, 1899

In the summer of 1899, Cleveland Moffett, a journalist for *McClure's Magazine*, traveled far to get the scoop on a much talked about new invention, Guglielmo Marconi's wireless telegraph machine. The writer crossed the Atlantic, leaving the United States for the Isle of Wight, a small island of the southern coast of England. Making his way to the westernmost point of the isle, Moffett reached the Royal Needles Hotel at Alum Bay. Marconi had set up his experimental station inside and outside of the two-story building. Over the course of the next few days, Moffett became better acquainted with radiotelegraphy. Marconi, for his part, had already achieved worldwide fame by transmitting Morse code messages through the air. He had succeeded in sending signals from Alum Bay to mainland England and between England and France across the Strait of Dover. The ambitious experimenter was now enthusiastically anticipating his chance to exhibit his apparatus for U.S. newspapers during the upcoming American Cup yacht races.[1]

[1] Cleveland Moffett, "Marconi's Wireless Telegraph," *McClure's Magazine* 8, no. 2 (Jun. 1899), American Periodicals Series Online, hereafter cited as APS; "Marconi's Wireless," *New York Times*, 23 Jan. 1898, IWM3; "The Wireless Telegrapher, *Friends' Intelligencer* 56, no. 52 (Dec. 30, 1899): 995; "Wireless Telegraphy," *New York Times*, 29 Mar. 1899, 1; "Wireless Telegraphy for Yacht Races," *New York Times*, 30 Mar. 1899, 3.

Over the course of a number of investigative trips to Britain and France, Moffett discussed the workings and possibilities of Marconi's wireless telegraph with the inventor and his employees, summing up his findings for *McClure's* magazine. Moffett, and his boss Robert McClure, were thoroughly intrigued with Marconi's invention, and deeply curious about its implications for their publication and the world. After describing one of Britain's most famous natural landmarks, "the horseshoe cavern of Alum Bay, a steep semicircle, bitten out of chalk cliffs," and the "brripp" of Morse code in action," Moffett expounded on the process of wireless telegraphy for his readers:

> With each movement of the key bluish sparks jump an inch between the two brass knobs of the induction coil . . . For one dot, a single spark jumps; for one dash, there comes a stream of sparks. One knob of the induction coil is connected with the earth, the other with the wire hanging from the masthead. Each spark indicates a certain oscillating impulse from an electrical battery that actuates the coil; each one of these impulses shoots through the aerial wire, and from the wire through space by oscillations of the ether, travelling at the speed of light, or seven times around the earth in a second. That is all there is in the sending of these Marconi messages.[2]

Moffett provided a well-summarized and readable account of how wireless telegraphy functioned, but the simple explanation concealed a history of years of research by a number of people. Scientists and electrical experimenters originally fostered radio-wave technology in Europe and the United States during the mid 1800s. Practical applications, however, did not emerge until the 1890s. By 1897 leaders in these regions perceived radio as a new and valuable tool for maritime communications, empire building, and the economic exploitation of colonies. As a result, the technology first

[2] Moffett, "Marconi's Wireless Telegraph."

became popular among navies, in colonial hinterlands, and for connecting island possessions to the mainlands of nearby nations. Demand for the devices quickly expanded to a number of developing countries as well. In Mexico, Porfirio Díaz's government obtained radios in 1899 at about the same time that Moffet made his journey to the Isle of Wight. But before we enter into that story, it is essential to understand more about early radio use in Europe and the United States, because Mexican officials borrowed directly from the policies that these expansive governments used for centralization, state building, trade, and the suppression of autonomous groups. Mexican leaders also hoped to counter the influence of the very same empires they mirrored. Exploring global developments and trends in wireless technology also provides a better geographical, political, and cultural context for understanding decisions and practices regarding radio in Mexico.

**Scientists and Inventors**

There already exists an impressive body of literature on the earliest pioneers of radio.[3] The child of many parents, wireless technology possesses a long history filled with the obsessive work of a large number of scientists and amateur experimenters. Throughout much of the 1800s, European physicists, or "natural philosophers," debated electromagnetic theories and phenomenon, with ideas ranging from the prescient to the hair-brained. In the preceding century, many natural philosophers focused on

[3] Important works on this topic include W. H. Eccles, *Wireless* (London: Thornton Butterworth Limited, 1933); Aitken, *Syntony and Spark*; Douglas, *Inventing American Broadcasting*; Tom Lewis, *Empire of the Air: The Men Who Made Radio* (New York: Edward Burlingame Books, 1991); Hong, *From Marconi's Black-Box to the Audion*; Huurdeman, *The Worldwide History of Telecommunications*; Russell Burns, *Communications: An International History of the Formative Years* (London: The Institution of Electrical Engineers, 2004; Tapan K. Sakar et al, *History of Wireless* (Hoboken, NJ: John Wiley & Sons, 2006).

astronomy, but the nineteenth century ushered in an era of increased interest in electrical phenomena in general, not only among physicists but across scientific disciplines, and additionally among businessmen. As an American delegate to the 1927 International Radiotelegraph Conference put it,

> The knowledge of laws of electricity, in conjunction with the fundamental laws of mechanics learned by the astronomers, has had a tremendous influence on the industrial history of the world since that time [the 1800s]. Radio is but one of the examples of the complementary relation between mathematical and experimental effort in furthering human progress.[4]

Additionally, the mid to late 1800s ushered in a more cooperative era between western European academics, something that intensified research into electromagnetic waves. This coactive spirit allowed Europe to gain an edge in science and empire building, and sparked competition among its member states, but ultimately led to world wars and, in many ways, Europe's fall from global dominance.

Although we could trace the progression of radio development to earlier scientists and experimenters, a practical starting point is the experiments of Danish physicist and chemist Hans Christian Oersted. Already infatuated with the relationship between electricity and magnetism for a number of years, he confirmed this electro-magnetic partnership during a lecture on electricity, galvanism, and magnetism at the University of Copenhagen on April 21, 1820. That day he exhibited that an electric current affected the needle of a compass. Later that year he penned an article on electric currents and magnetic fields, a publication that had a profound impact on the European

[4] Laurens E. Whittemore, "The Development of Radio," *Annals of the American Academy of Political and Social Science*, 142, Supplement: Radio (Mar. 1929): 1.

scientific community, including French physicist André Marie Ampère who conducted more extensive work on electromagnetism.[5]

A number of scientists and amateur experimenters built on these advances by tinkering with wireless experiments during the mid 1800s. Mahlon Loomis provides a good example. An American dentist, he demonstrated radio communication in 1866 when he transmitted signals between "two mountains in the Blue Ridges range, at a distance of 22 km."[6] Although the theoretical underpinnings for his experiments would not hold up to later scientific rigor—he believed the Earth was blanketed in a "static sea" or layer of static—he did successfully exhibit his "aerial telegraph" on multiple occasions and received the first patent for wireless telegraphy.[7] As communications scholar Anton A. Huurdeman noted, Loomis—shortly before he died—wrote to his brother stating "The time will come when this discovery will be regarded as of more consequence to mankind than Columbus's discovery of a new world. I have not only discovered a new world but, the means of invading it. My compensation is poverty, contempt, neglect, and forgetfulness."[8] Interestingly, at least one later academic has referred to the discovery of wireless communications as "in many ways analogous to the discovery of a new continent."[9] And, indeed, the discovery of messaging through the "ether" did, in many ways, open up a whole new world. However, Loomis was not the only person experimenting with this new and little understood form of

[5] George Sarton and John Christian Oersted, "The Foundation of Electromagnetism," *Isis* 10, no. 2 (Jun. 1928): 435-44; Roberto De Andrade Martins, "Resistance to the Discovery of Electromagnetism: Ørsted and the Symmetry of the Magnetic Field," http://ppp.unipv.it/Collana/Pages/Libri/Saggi/Volta%20and%20the%20History%20of%20Electricity/V&H%20Sect3/V&H%20245-265.pdf, accessed 21 Jan. 2012.

[6] Huurdeman, *The Worldwide History of Telecommunications*, 200.

[7] Ibid.

[8] Mahlon Loomis, quoted in Huurdeman, *The Worldwide History of Telecommunications*, 200.

[9] Aitken, *Syntony and Spark*, 32.

communication, a number of experimenters had successfully sent wireless signals through methods of electromagnetic induction in the 1840s.[10] But as with Loomis, a limited theoretical understanding of electromagnetic waves and the limitations of this specific form of wireless communication made it impossible for them to regularly obtain clear reception beyond small distances. The discoveries were awe inspiring, but by the same token, not very practical.

It was the mathematics of James Clerk Maxwell that established a sound theoretical underpinning for electromagnetic wave studies. In turn, he had a profound impact on later exhibitions of radio and its more successful applications. Indeed, his 1865 paper, "A Dynamical Theory of the Electromagnetic Field" laid the groundwork for Heinrich Hertz's successful, if primitive, demonstration of radio transmission and reception. With the publication of his article, Maxwell was the first to articulate mathematically how electromagnetic waves could be transmitted through the air and that they travelled at the speed of light. As economics and communications scholar Hugh G. J. Aitken summed up, Maxwell's theory argued that "light itself *was* electromagnetic radiation, within a certain narrow range of wavelengths. If Maxwell's models were valid, optics and electromagnetism would merge, and science would have at its disposal a single conceptual scheme with vastly greater explanatory power than either of its distinct and separate antecedents."[11] His research influenced generations of

[10] Douglas, *Inventing American Broadcasting*, 11. In the late 1820s and 1830s American scientist Joseph Henry and British scientist Michael Faraday discovered electromagnetic induction. For the transmission of wireless signals, the method involves two unconnected wires. When a magnet is placed near the wire it creates a constant magnetic field. If the magnet is moved it induces a current. Any change in the current of one wire will induce a change in the other. By manipulating the state of the current one can send signals.

[11] Aitken, *Syntony and Spark*, 22. The italics are Aitken's.

scholars and amateurs who worked with light and radio, including Albert Einstein and his Theory of Relativity.

Heinrich Hertz was the first person to successfully prove Maxwell's theory. In 1886, while a professor at the Karlsruhe Technical High School he began to seriously experiment with the production of electromagnetic waves by creating osculating sparks of energy. After devising sufficient equipment the following year, he triumphantly sent and received radio waves across a short space in a recordable manner. His findings made a huge impact in scientific circles. But just as importantly, they influenced a number of inventors outside of those circles. Newspapers, magazines, and other public presentations provided a large platform for Hertz's findings. However, Hertz had no intention of financially capitalizing on the transmission of electromagnetic waves for wireless communication; he was not even sure if obtaining profits from this scientific breakthrough was feasible.[12] But influenced by this discovery, the young Guglielmo Marconi became obsessed about the practical and profitable possibilities for transmitting messages through the air. Although he had no intention of doing so, Hertz had laid the foundation for a new period of communications, the "spark era of long-distance wireless."[13]

The British physicist Oliver Lodge also needs mentioning because of the importance of his work to radio technology. While Hertz was attempting to prove Maxwell's theory in Germany, Lodge was doing the same thing—via different means—in England. Although beat to the punch by Hertz, Lodge's coherer, based on the experiments of Edourd Branly, became the model for those used in the first

[12] Charles Süsskind, "Hertz and the Technological Significance of Electromagnetic Waves," *Isis* 56, no. 3 (Autumn 1965): 342-45.

[13] Aitken, *Syntony and Spark*, 66; also see, Douglas, *Inventing American Broadcasting*, 13-15.

radiotelegraph machines. The coherer was essentially a small glass tube filled with metal filings. The resistance of these filings decreased when affected by electromagnetic waves. However, they returned to their state of higher resistance when the coherer was tapped. Unlike Branly's, Lodge's coherer possessed a "trembler," or a decoherer, which mechanically knocked the filings back into their original state. This development made it easier for later inventors and manufacturers to produce radio devices for telegraphic communication. Lodge's coherer was also the most sensitive wave-detection device that had been created up to that point, making it a desirable model for the construction of radio receivers.[14] Lodge additionally claimed that in 1894 he, not Marconi, was the first person to exhibit that radio technology could operate as a medium for Morse code, a claim that has caused considerable disagreement among communications scholars since.[15]

However, it was not until Guglielmo Marconi began to market radios as practical communications devices that the technology found its way into commercial and popular culture. Although others claimed to have used wireless for similar reasons beforehand, he, more than any other person, made wireless communication a reality. His machines were based on the work of prior scientists, such as Hertz, Branly, and Lodge, but Marconi, in 1896, was the first to file a patent on Hertzian-wave telegraphy, and he worked tirelessly to showcase and market his wares to governments and businesses around the world. In the words of William Crookes, a prominent British scientist and contemporary of Marconi: it was when Marconi's efforts in the 1890s that "induced the

[14] Douglas, *Inventing American Broadcasting, 1899-1922*, 13-14.

[15] Eccles, *Wireless*, 53-55; Aitken, *Syntony and Spark*, 123; Anthony N. Stranges, "Review of *Syntony and Spark* by Hugh G. H. Aitken," *American Historical Review* 91, no. 5 (Dec. 1986): 1166-67; Hong, *Wireless*, 25-51; Sungook Hong, "Marconi and the Maxwellians: The Origins of Wireless Telegraphy Revisited," *Technology and Culture* 35, no. 4 (Oct. 1994): 717- 49; Burns, *Communications*, 274.

British post office and foreign governments to try large scale experiments did wireless signaling become generally and popularly known or practically developed as a special kind of telegraphy."[16] His company became the frontrunner in the manufacture and sale of radio equipment, and the policies of Marconi's Wireless Telegraph and Signal Company had major ramifications for radio development and international debates over how the new technology was to be used, including in Mexico.

Born in Italy in 1874, Marconi came from a prominent family. Marconi's father, Giuseppe Marconi, was a wealthy landowner with property near the city of Bologna. Marconi's mother, Annie Jameson, descended from the well-off Scot-Irish Jameson family, which had gained wealth as whisky distillers. From an early age Marconi experimented with machines and electricity. He acquainted himself, for example, with the scientific work of Benjamin Franklin and Michael Faraday. While attending the Technical Institute of Bologna as a young teenager he learned Morse code from a retired telegrapher, and in 1893 his mother convinced the noted Italian physicist Aguste Righi to allow Marconi to attend his classes and obtain access to the University of Bologna labs and library. It was from Righi that Marconi learned important theoretical concepts circulating in academia and practical techniques used in the physicist's laboratory. Meanwhile, Marconi's mother made sure that her son mastered English, a skill that would prove invaluable to him.[17]

Shortly after conducting his first successful tests sending Morse code messages at his family's property in Italy, Marconi shifted towards making his experiments into a financially fruitful enterprise. His mother tirelessly supported and promoted his efforts

[16] William Crookes, "Address of the President before the British Association for the Advancement of Science, Bristol, 1898," *Science*, New Series 8, no. 201 (Nov. 4, 1898): 603.

[17] Douglas, *Inventing American Broadcasting*, 14-16.

and was crucial to his initial success. After the Italian Ministry of Posts and Telegraphs displayed no interest in her son's invention, she turned her attention to Britain, where she possessed greater influence. It was there, in 1896, that Marconi obtained a patent and where he first marketed his device to William Preece, Chief Engineer of the British Post Office. The following year he started the Wireless Telegraph and Signal Company, promoted his product on a greater scale, and began successful negotiations with the navies of both Britain and Italy.[18]

A number of other experimenters quickly followed suit. In 1897Adolf Slaby, a German radio pioneer who had witnessed an exposition of Marconi's work earlier that year, conducted successful wireless experiments using military balloons in Germany.[19] In May 1898, W. J. Clarke, the manager of United States Electrical Supply Company, exhibited radio equipment at Madison Square Garden in New York City. In addition to using the technology to ring a bell and to send telegraphic messages, he showed how electromagnetic waves could be used to detonate an explosive by blowing up a model Spanish cruiser.[20] Lee De Forest, John Stone, and Reginald Fessenden started wireless companies in the United States. Russian physicist Alexander Popov established his homeland's first radio stations. Based largely on Popov's designs, Edourd Ducretet's devices were for sale in France by 1898. Julio Cervera Baviera, who had visited some of Marconi's stations, developed a radio system in Spain during 1901 and 1902.[21] These are but a few of the people working in the field of wireless communications during the 1890s and the first decade of the 1900s.

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[18] Ibid, 16-17, Hong, *Wireless*, 1.
[19] "Telegraphy without Wires," *New York Times*, 9 Oct. 1897, 7.
[20] "New Way to Fire Mines," *New York Times*, 7 May 1898, 12.
[21] Domencio Mazzotto, *Wireless Telegraphy and Telephony*, tr. by Selimo Romeo Bottone (London: Whittaker & Co., 1906), 217.

Marconi was far and away the most successful in the business arena. He had operations in multiple countries, including the Marconi Wireless Telegraph Company of America subsidiary established in 1899.[22] He ardently strove to dominate the ship-to-shore telegraph business and to challenge, at least by 1901, wire cable services. And as stated before, he successfully aspired to provide apparatuses to navies and militaries. In fact, his determination to succeed pushed him to pursue a policy of monopolization. Important to this development was the Marconi Company's non-intercommunication rule, which stated that Marconi operators and equipment could only be used to communicate with others from Marconi.[23] Marconi disallowed the use of their devices to contact or receive message from other wireless providers, such as by Slaby or Ducretet, except for in cases of emergency. Although Marconi ultimately sought to dominate the global market, his most pressing goal was to first connect the British Empire and to be its sole wireless provider. As the 1900s began, his goal of monopolization became an increasing reality. He had formed partnerships with the English and Italian navies, multiple steamship companies, coastal radio stations, and most importantly a contract with Lloyd's of London, a company that provided (and continues to provide) marine insurance, and which possessed operations across the British Empire. If they stuck to Marconi's non-intercommunication policy it would force the large number of businesses that worked with Lloyd's to do the same.[24] This attempt at domination, however, provoked the ire of other European state officials and wireless providers who began an international crusade to halt this process, resulting in the first international conferences on radio in Berlin in 1903 and 1906. Mexican

[22] "Wireless Telegraphy," *Zion's Herald* 77, no. 48 (Nov. 19, 1899): 1515.
[23] Douglas, *Inventing American Broadcasting*, 70; Hills, *The Struggle*, 93-152.
[24] Ibid, 67-70.

leaders, dissatisfied with the high prices of Marconi's instruments and services, allied with German firms, joining the representatives who opposed Marconi's monopolistic practices.

**Empires**

As other scholars have discussed, communications and transportations technologies have played an immensely important role in empire building, maintenance, and colonial exploitation.[25] Mexican governments would also incorporate centralization schemes with the same tools. During the nineteenth century these technologies included steamships, railroads, and cable telegraphs. Radio technology was the last of these nineteenth-century communications developments utilized for empire, though it became a much more important factor in the subsequent centuries. And although cable telegraphy remained dominant during the early 1900s because many government officials and businessmen considered the technology more secure, economical, and dependable, many European leaders outside of Britain hoped radiotelegraphy could break the British monopoly on submarine cables. Early wireless communications made the greatest headway in four areas: ship-to-shore communications, connecting insular possessions, naval operations, and in colonial hinterlands.

Almost from the technology's inception, experimenters and state leaders used radiotelegraphy to incorporate island populations to larger mainlands. The reason was

[25] Innis, *Empire and Communications*; Headrick, *The Tools of Empire*; Headrick, *The Invisible Weapon*; Anduaga, *Wireless and Empire*; Yang, *Technology of Empire*; Ahvenainen, *The History of the Caribbean Telegraphs*; Ahvenainen, *The European Cable Companies in South America*; McCreery, "Wireless Empire"; Winseck and Pike, *Communications and Empire*; Hills, *The Struggle*.

twofold: to communicate with ill-connected populations and to better link lighthouses and sea vessels. Starting in 1897, Marconi and British Post Office employees applied wireless technology to the task of connecting smaller islands to the rest of Britain. That year postal authorities selected Sark, the smallest of the Channel Islands, as the first post office to rely on radiotelegraphy because "the island has no telegraphic communication with the outside world, and is often isolated by fogs and storms."[26] Other operations that began shortly thereafter included between Lavernock Point and Flat Holm Island in the Bristol Channel (3.3 miles) and between Ballycastle, Ireland, and Rathlin Island (7.5 miles).[27] In Russia, Alexander Popov built a wireless link between Suursaari Island in the Gulf of Finland and Kotka, the nearest mainland town 31 miles away.[28]

Beginning in 1898, the British corporation Trinity House acquired Marconi's services to establish wireless communication between the company's lightships (ships that acted as beacons in water too deep for lighthouse construction), the South Foreland lighthouse, and the company headquarters. The apparatuses proved crucial in a number of emergencies, highlighting radio's practical applications to marine search and rescue operations.[29] Similar developments occurred in other parts of Europe and the United States. The U.S. Signal Corps established a wireless link between Fire Island and the Fire Island lightship in 1899.[30] The following year, the Marconi Wireless Telegraph Company established wireless communications on the German lightvessel *Borkum Riff* and the Borkum lighthouse, and on multiple Belgian steamers in addition to a

[26] "The Outlook," *Zion's Herald* 75, no. 27 (Jul. 7, 1897): 1, APS.
[27] Burns, *Communications*, 302-03, 306.
[28] Ibid, 351.
[29] Ibid, 308; G. Marconi, "Origen and Development of Wireless Telegraphy," *The North American Review* 168, no. 510 (May 1899): 628, APS.
[30] "Colonial Telegraph Lines," *New York Times*, 6 Nov. 1899, 7.

corresponding Belgian shore station at La Panne.[31] In 1905, during the escalating dispute between Marconi and the German company Telefunken, the latter company began building shore stations to replace the Borkum operation at the request of Kaiser Wilhelm II.[32] These are but a handful of examples of early radio stations used for maritime safety. Such operations corresponded with an increasing use of wireless equipment aboard commercial and naval sea vessels.

And European navies were quick to adopt wireless. Until the introduction of radio, sea vessels relied on flags and light signals for communications. Wireless provided a number of advantages: messages could be sent in the dark and through fog, at further distances, and from naval officers on land. And even though some sea captains disdained the loss of their autonomy, the military benefits of the technology pressured navies to adopt it.

British sea forces took to Marconi's radio devices almost instantaneously. It helped that officers within the navy were already experimenting with the technology. Although more conservative members of the Royal Navy were wearier of change, sailors including Captain Henry B. Jackson embraced Marconi's findings and applied them to naval explosives and communications.[33] Jackson also built a number of radio sets for the navy himself. But naval officers also realized that wireless transmissions could be a liability. One commander commented on the possibility of jamming radio signals by transmitting from other devices on a similar wavelength.[34] During a mock skirmish in 1901, one fleet picked up and deciphered the messages sent by the opposing

[31] Burns, *Communications*, 351.
[32] Huurdeman, *The Worldwide History of Telecommunications*, 272.
[33] Burns, *Communications*, 273, 284-86.
[34] Ibid, 305.

ships, leading to the loss of a "decisive battle."[35] But overall, the admiralty found that the benefits outweighed the liabilities. By 1900 Great Britain's fleet far outpaced any other navy in wireless communications. They possessed over fifty sets and had already used some of them in military operations.[36]

Although Britain's Royal Navy possessed a commanding lead in radiotelegraphy in 1900, the navies of other countries and imperial powers began using the technology as well. The Italian navy bought Marconi devices starting in 1897, placing them on a handful of ships and in shore stations at La Spezia, Leghorn, San Bartolemo, and Varugiano. By 1900 the Japanese possessed five Marconi sets in their navy. Germany had a small number of apparatuses that the different sections of the military shared. The navies of France, Russia, and the United States had experimented with radio but had not incorporated a wireless system of any kind.[37]

During the next five years, however, these powers, and a number of other nations, more fully embraced radio use in their navies. In 1901 the *New York Times* reported that the "British, French, German, Japanese, Russian, Italian, Spanish, and Swedish navies have adopted wireless telegraphy to a greater or less extent."[38] In 1902 Kaiser Wilhelm II, in protest of Marconi's monopolistic tendencies, ordered that all German navy vessels and shore stations use Slaby-Arco devices. According to one report, thirty-two German ships of war already possessed the equipment.[39] In 1903, after accepting the inevitability of radio's growing presence on the seas, the American navy seriously invested in radio. Officers obtained approximately fifty sets and built twenty-

[35] "Defeat of Admiral Noel," *The Rhodesia Herald*, 21 Sept. 1901, 4.
[36] Burns, *Communications*, 349-50.
[37] Ibid, 350-351; "The Wireless Telegrapher," *Zion's Herald* 56, no. 52 (Dec. 30, 1899): 995, APS; "Wireless Telegraphy in Germany," *New York Times* 11 Mar. 1899, 7.
[38] "Report on Foreign navies," *New York Times*, 31 Aug. 1901, 2.
[39] "In Foreign lands," *New York Times*, 6 Apr. 1902, SM16.

four stations along the coast of the U.S. mainland and two in the Philippines. By the end of 1904 the Italian government controlled nineteen shore stations and Germany had equipped seventy-five ships and four Baltic stations. France had five stations along the Atlantic and plans to build others along the coasts of Corsica and its possessions in northern Africa.[40]

Using radio in colonial hinterlands played a prominent role in how imperial leaders visualized the technology's role. This was especially true where officials had difficulty constructing cable telegraphs and where combat regularly occurred. Britain, for example, used wireless telegraphy in its distant territories. Yet, because of Britain's dominant position in regards to submarine cables, using radio to connect the empire often met with detractors. Throughout the first decade of the 1900s, Marconi pushed for the British government to help fund a huge wireless network throughout the empire, but he encountered resistance from officials who felt that the idea was too costly and unpractical, or who wanted greater state control over the medium.[41] British residents in the imperial colonies, however, paid close attention to radio. Jagadish Chandra Bose, the great Indian polymath, started experiments with radio by 1895 and newspapers in India regularly reported on wireless developments in the late 1890s and early 1900s.[42] In 1899 Nagendra Chandra, a professor residing in Agra, India, in conjunction with employees of the government telegraph office there, made his own coherer and successfully conducted wireless experiments at a distance of 108 yards.[43] Although

[40] Burns, *Communications*, 356-57.

[41] Douglas, *Inventing American Broadcasting*, 67-70; Headrick, *The Tentacles of Progress*, 126-27.

[42] Burns, *Communications*, 273; Untitled article, *The Pioneer* (Allahabad, India), 22 Aug. 1897, 6.

[43] "Experiments in Wireless Telegraphy," *The Pioneer*, 16 August 1899, 5; "News and Gleanings," *The Tribune* (Lahore, Pakistan), 22 Aug. 1899, 1; "Experiments in Wireless," *The Pioneer*, 30 Aug. 1899, 5.

some tech-savvy residents hoped that radio would better connect India to other parts of the world, development was slow. The demand was limited. India already had cable telegraphs that connected it to England and other parts of the globe.

Events in South Africa had a greater influence on wireless use. Unlike India, South Africa was not yet connected to the rest of the British Empire by submarine cables. The region had also been the site of ongoing military conflicts. In 1899 the Second Boer War rocked the colony, threatening to oust the British government. The Boers, Dutch and English settlers of the breakaway nations of Orange Walk and Transvaal, originally outnumbered the British forces and surrounded the South Africa cities of Kimberley, Mafeking, and Ladysmith.[44] Knowing that militaries were excellent potential customers, Marconi consistently emphasized how wireless technology could be useful for these types of conflicts. The *New York Times* stated in one article that "Signor Marconi is enthusiastic over the uses of his invention in case of war."[45] He, like American inventors of the era, mentioned the possibility of detonating explosives via wireless. More importantly, he argued that his devices would allow for communication when combatants cut regular telegraph lines—a problem that had worried the British in South Africa since the First Boer War (1880-81). In Marconi's words:

> Let us imagine a small detachment of Europeans, say during one of these frontier wars, stationed in a rather lonely spot. They of course set up telegraphic communications with wires. The enemy is not likely to allow this state of things continue, and one night the little band is surrounded and the wires are cut down … Now, with the new system there would be nothing to give notice

[44] For an account of the Second Boer War, see Thomas Pakenham, *The Boer War* (London: Abacus, 1997), originally published in 1979.

[45] "Marconi's Telegraphy," *New York Times*, 23 Jan. 1898, IWM3.

> to the enemy that these small outlying parties were in communication with the main body, and all the time the electric waves are in use, and perhaps ten miles away they are reading by the ticking of a receiver, messages of paramount importance.[46]

South Africa became Marconi's testing ground and leaders in Mexico took note.

One of Marconi's first big equipment sales was to the British War Office in 1898, which used the devices in the Second Boer War.[47] Accompanying British reinforcements, at least five apparatuses arrived for the fight in South Africa the following year. The military leadership hoped to use the radios to better facilitate the landing and then to subsequently support the expeditions to the besieged towns.[48] On March 04, 1899, *The Times of Swaziland* printed an account of the first successful wireless trials in Cape Town.[49] By the end of 1899, wireless complimented the British armed forces by offering a means of communication that avoided sabotage by Boer forces and transmitted useful military intelligence. For example, a letter from a British officer to a Boer general in *The Mafeking Mail* stated "I fear from what I have just heard by wireless telegraph that the natives are contemplating further operations should your forces continue to remain within or on the border of their territories."[50] Information supplied to foreign presses stated that radio experiments in the settlements of Modder River and De Aar, and along the Orange River, had been "highly successful," some at the distance of seventy miles.[51] In attempts to improve

[46] Ibid.
[47] Aitken, *Syntony and Spark*, 232.
[48] H. M. Dowsett, *Wireless Telephony and Broadcasting* (London: Gresham Publishing Co., 1924), 9; Burns, *Communications*, 401.
[49] "Local and General," *The Times of Swaziland* (Bremersdorp, Swaziland), 4 Mar. 1899, 4
[50] "A Letter to the Boers," *The Mafeking Mail* (Mafeking, South Africa), 12 Nov. 1899, 1.
[51] "Foreign Intelligence," *The Pioneer*, 20 Nov. 1899, 1, APS; "Wireless Telegraphy," *Zion's Herald* 77, no. 48 (Nov. 29, 1899): 1515, APS; "Enemy's Guns," *Los Angeles Times* 27 Dec. 1899, 2; "War Office is Assailed," *New York Times*, 27 Dec. 1899, 2.

transmission and reception, and to acclimate wireless to warfare, the British used "war kites" and balloons developed by F. S. Balden-Powell of the Scots Guards to help send messages.[52] The British navy used wireless to communicate orders between the Kosi and Delagoa Bays and in their operations off of the South African coast.[53] Interestingly, the *Los Angeles Times* also reported that British forces seized "six Marconi instruments intended for the Boers" at Cape Town, though it appears that the Boers used wireless far less than the British, if they ever managed to use the technology at all.[54] While the war was winding down radio development continued, though more so for infrastructural development than warfare. In early 1902, after the formation of the Marconi-Lloyd's partnership, the Cape Town government made plans with Lloyd's for the installment of wireless stations on Dassen Island and Robben Island, which were then to be connected to Cape Town.[55]

But using wireless technology proved difficult during the Second Boer War. Other reports on the Moddle and Orange River experiments stated that there was considerable interference, blaming iron-filled hillsides.[56] One African paper stated that "Wireless telegraphy appears up to the present to have done very little service during the present war."[57] Although kites worked to some extent, the lack of sufficient masts was problematic. Facing constant difficulties, the Director of Army Telegraphy ordered

[52] "Hero of Mafeking," *Mexican Herald*, 23 Apr. 1900, 8. Marconi and Slaby used kites in previous experiments.

[53] "The War," *Rhodesia Herald* (Harare, Zimbabwe), 19 Jun. 1900, 3.

[54] "Enemy's Guns," *Los Angeles Times* 27 Dec. 1899, 2.

[55] "Wireless Telegraphy," *The Journal* (Graham's Town, South Africa), 23 Jan. 1902, 2.

[56] "Foreign Intelligence," *The Pioneer*, 29 Dec. 1899, 1; "Enemy's Guns," *Los Angeles Times*, 27 Dec. 1899, 2; "Wireless Telegraphy," *The Rhodesia Herald*, 18 Jan. 1900, 2.

[57] "Wireless Telegraphy," *The Bulawayo Chronicle* (Bulawayo, Zimbabwe), 20 Jan 1900, 3; Burns, *Communications*, 400-02.

the South Africa land sets dismantled and transferred to the navy in 1900.[58] Thereafter, aboard the ships of the Delagoa naval squadron, the equipment served an important role in the blockade of the Lourenco Marques region, preventing supplies from reaching the Boers in the Transvaal.[59] The devices functioned better over the ocean. But even if only somewhat successful, the radio experiments during the Second Boer War provided the first testing space for wireless in warfare. And despite the problems, military officials around the world believed that the technology was going to play an increasingly important role in combat.

French officials and businessmen also took up radio. As communications scholar Daniel R. Headrick states: "there had always been a crying need for better communications in the colonial empire, especially in equatorial Africa and Indochina, where telegraphs were unsatisfactory. It is there that French radio developed."[60] Radio experiments had started earlier within France itself, where inventor Edouard Ducretet had experimented with radio since 1897. The government had also collaborated with Marconi. In 1901 French officials successfully implemented wireless communication in Gabon in Africa. The following year, the volcano Mont Pelé had erupted on the island of Martinique in the Caribbean, razing the city of St. Pierre and destroying the telegraph lines.[61] In order to establish communications with the island, army telegraph officers Gustave-Auguste Ferrié and L. Magne established a successful wireless operation between Martinique and the island of Guadeloupe where there was a submarine cable link. In 1904 French operatives built three small portable radios in

[58] Peter Lewis and Corinne Pearlman, *Media & Power from Marconi to Murdoch: A Graphic Guide* (London: Camden Press, 1986), 37.
[59] Burns, *Communications*, 349, 402.
[60] Headrick, *The Invisible Weapon*, 128.
[61] Ibid, 123-24.

Indochina, placing them in Hanoi, Kien-An, and Cap Saint-Jacques, which aided colonial businesses and military officials battle the Chinese who were cutting telegraph lines on the colony's northern frontier.[62]

The German state, under the leadership of Kaiser Wilhelm II, invested heavily in radio. Wilhelm's government and German businesses hoped to increase the power of Germany's maritime operations, break Britain's monopoly on electronic communications, and build stronger contacts with its colonies and developing nations. In 1903 Wilhelm II prompted the two largest German wireless firms, Adolf Slaby and George von Arco's *Allegemeine Elektricitäts-Gesellschaft* (AEG) and Siemens & Halske, which famed scientist Karl Ferdinand Braun had partnered with, to merge forces, creating Telefunken. The company had strong support from the emperor and the military. In 1905 Germans started construction on powerful radio operations at Nauen and Nordiddeich. With these latter two stations, German officials strove to communicate with the Americas and with colonies in Africa, especially Togo. Although Germany officers could boast of transmitting at distances of over 900 miles, they could not achieve direct wireless communication with its African possession or the Americas until the World War I era. AEG also provided equipment for the Herero War of 1904 and the Russo-Japanese War.[63]

The Spanish too used radio to connect to their colonies and insular possessions. Immediately after losing a number of their overseas domains to the United States, Spanish officials worked to install wireless communications in their northwest African colonies and to connect the Balearic Islands in the Mediterranean Sea with mainland

[62] Ibid, 128; Headrick, *The Tentacles of Progress*, 127-28.

[63] Headrick, *The Invisible Weapon*, 123. Telefunken sold sets to Russia. Marconi sold radios to Japan.

Spain.[64] Despite Spain's losses during the late nineteenth century, its remaining possessions were relatively close, providing an ideal environment for radio development.

The American victory over Spanish forces in the Spanish-American War (1898) enticed U.S. government officials and businessmen to grow their imperial ambitions. Radio became an important tool in this period of American expansionism. Although the rise of wireless occurred at the same time as the Spanish-American War, and despite the fact that members of the U.S. journalist community had promoted the need to develop radio during the conflict, the use of the technology was extremely limited.[65] In late 1899 General Adolphus Washington Greely, head of the U.S. Signal Corps, talked about joining "close together the United States and its Pacific colonies," and he believed that radio would provide "a means of connecting the islands of the West Indies, Hawaii, and the Philippines."[66] In 1904 American naval officials constructed a station near Manila. Shortly thereafter the U.S. military constructed more wireless operations in the Philippines at Jolo, Zamboanga, and Cabra.[67] Greely also used wireless technology in the Signal Corps' plans to better incorporate the territory of Alaska. In addition to building the Washington-Alaska Military Cable from 1900 to 1903, the Signal Corps

[64] "Navies of the World," *New York Times*, 3 Sept. 1901, 8.

[65] "Wireless Telegraphy," *Scientific America* 78, no. 14 (Apr. 2, 1898), 213, APS; Rebecca Robbins Raines, *Getting the Message Through: A Branch History of the U.S. Signal Corps* (Washington, DG: Center of Military History, 1996), 105. Raines states that wireless may have been key in the Battle of Santiago de Cuba, the largest naval engagement of the war.

[66] "Colonial Telegraph Lines," *New York Times*, 6 Nov. 1899, 7.

[67] Adrian M. Peterson, "Early Wireless Stations in the Philippines, *Wavescan*, http://www.ontheshortwaves.com/Wavescan/wavescan090830.html, accessed 21 Feb. 2012.

installed radio outposts spanning the 107 miles across Norton Sound in 1904, "where ordinary cables fail in important points owing to climatic conditions." [68]

Private enterprises played a large role in U.S. endeavors. The Spanish-American War ultimately gave the United States actual colonial possessions in Puerto Rico and the Philippines, and a protectorate in Cuba. American expansion continued with the annexation of Hawaii in 1899 and the subsequent acquisition of Midway, Wake, Guam, and American Samoa. But colonial imperialism as carried out by European powers in Africa was losing popularity.[69] In response, the U.S. government turned to a model of economic expansionism and dominance—a sort of informal empire.

**Latin America**

Top U.S. government officials promoted American private business abroad as a method to achieve greater hegemony over areas it decided to exploit, especially in Latin America.[70] Radio was one component of this strategy. In 1901 a subsidiary of United States Rubber Company—Amazon Wireless Telephone and Telegraph Company—commenced wireless operations in the Amazon basin of Brazil. Using Fessenden-designed apparatuses, the company expanded deeper into the dense-forested inland to obtain new rubber sources.[71] In 1902 the Ward Line, a steamship company, brought De Forest equipment to Havana, Cuba, in order to establish a station there.[72] Three years

[68] "Wireless Telegraph Bids," *New York Times*, 7 May 1902, 3; Christopher H. Sterling, *Military Communications: From Ancient Times to the 21st Century* (Santa Barbara, CA: ABC-CLIO, 2008), 200; Raines, *Getting the Message Through*, 103, 138.

[69] Schwoch, *The American Radio Industry and Its Latin American Activities*, 25.

[70] For information on the development of cable communications in South America and the Caribbean, see Ahvenainen, *The History of the Caribbean Telegraphs*; Ahvenainen, *The European Cable Companies in South America*.

[71] Schwoch, *The American Radio Industry and Its Latin American Activities*, 14-15.

[72] "Wireless System for Havana," *New York Times* 15 Jun. 1902, 8.

later the station was in prefect operating order. The following year the American military established a station at its newly established military base at Guantanamo Bay.[73]

The United Fruit Company ran the most successful of the American commercial radiotelegraphy operations. In 1903 it established a wireless network using De Forest equipment that included stations at Port Limón, Costa Rica, and Bocas del Toro, Panama. They soon thereafter established other stations in Colón and Panama City, Panama. By 1913 United Fruit had equipped its "Great White Fleet" of passenger steamships in addition to expanding its land stations. Throughout United Fruit's endeavors in wireless, it possessed the firm backing of the U.S. government, including the navy.[74] Sometime around 1906, American mining interests also started using radio apparatuses in Latin America, especially in Mexico.[75] These businesses used wireless outposts for communications in their mines, but also to talk with their parent companies in the United States. Most of these stations operated contrary to the policies of the Mexican government, failing to register with the SCOP, which Díaz charged with providing licenses in order to keep a close eye on private operations and to comply with the1906 International Radio Telegraph Convention of Berlin. Although it was difficult for the Díaz administration to enforce compliance, it pushed for strict regulation and preferred state ownership of wireless telegraphy services.

[73] José Altshuler, "La telegrafía sin hilos en Cuba (1899-1916)," *LLULL* 20 (1997): 450-51.
[74] Schwoch, *The American Radio Industry and Its Latin American Activities*, 21-22; Ahvenainen, *The History of the Caribbean Telegraphs*, 159; also see McCreery, "Wireless Empire."
[75] Schwoch, *The American Radio Industry and Its Latin American Activities*, 20.

Across most of Latin America, governments agreed that state consolidation and economic advancement rested on attracting investments and exporting commodities.[76] Industrialized empires invested heavily in Latin American infrastructure and public works, as an asset in and of itself, but also as a way to gain greater access to a wide array of foodstuffs and natural resources. Oftentimes this led to outright ownership of transportation services, agricultural operations, and mines. However, empires faced limitations to their imperial endeavors and their ability to exploit Latin American countries. As historian Tulio Halperín Donghi stated, "Whatever their political and economic insufficiencies, the sovereignty of Latin American countries was well established, complicating any project of imperial expansion in the region."[77] Local elites demanded a share of the benefits and wealth and they demanded respect of their nations' sovereignty. This was especially true in the Latin American countries with larger economies.

Radiotelegraphy was a tool of nation-building and empire building for imperial powers, but it was initially used more strictly for internal centralization in Latin America countries. Governments, including in Mexico, used radio to help incorporate populations that resisted central control, but this was done within existing political boundaries. Transportation and communication technologies in general provided the key to development strategies that allowed Latin American states to establish greater control over their political domains. Goods could be moved faster and military forces could more easily react to rebellions. In turn, foreign governments and local capitalist

[76] Victor Bulmer-Thomas, *The Economic History of Latin America since Independence* (Cambridge: Cambridge University Press, 1994), 46.

[77] Tulio Halperín Donghi, *The Contemporary History of Latin America*, ed. and tr. by John Charles Chasteen (Durham: Duke University Press, 1993), 161.

were more willing to invest their money, helping facilitate a new wave of economic growth, and a new era of wealth inequality.[78] Radio was not usually the most important of these technologies. Railroads and telegraphs played more dominant roles. But radio proved useful to imperial resource-extraction projects that occurred in parts of South and Central America where there was little infrastructural development and where building telegraphs would be difficult and costly. In other countries, including Mexico, government officials had shifted towards a more nationalistic position and kept a firmer control over wireless services, using them for their own state-expansion projects.

By the end of the 1910s radio had affected most Latin American nations. United Fruit dominated the technology throughout Central America and in parts of the Caribbean. The Colombian government allowed the Central and South American Company, a U.S. entity, to monopolize wire and wireless communications between Colombia and Panama. In Venezuela, representatives from France, Britain, and the United States jockeyed for influence in cable and wireless communications. The Venezuelan government did concede to some private concessions but ran its own radio stations off the coast by 1912. The British governments established wireless offices in their positions. Specialists established stations in Trinidad and Tobago in 1906 and in Trinidad and British Guiana shortly thereafter. Jamaica had a fully operational office by 1913. United Fruit built a station, with permission from British officials, in British Honduras.[79]

[78] John Coatsworth, "Economic and Institutional Trajectories in Nineteenth-Century Latin America," in *Latin America and the World Economy Since 1800*, eds. John H. Coatsworth and Alan M. Taylor (Cambridge, MA: Harvard University Press, 1998), 23-55.

[79] Ahvenainen, *The History of the Caribbean Telegraphs*, 159-89; Ahvenainen, *The European Cable Companies in South America*, 275.

Of course, progress in wireless communications differed in Latin America according to the circumstances and decisions of the members of each nation. Argentina, Brazil, Chile, Mexico, and Uruguay led the way in radio development, and they were the first Latin American countries in which European and American radio businesses established commerce. In 1901, for example, the German electric company AEG put serious effort in courting officials from these countries, displaying their wares to their representatives.[80] It was also these countries that represented Latin America at the 1906 International Radio Telegraph Convention of Berlin.[81]

Argentine experimenters and government officials, meanwhile, delved into radio development quickly and enthusiastically. They interacted with both Marconi and Telefunken. The Argentine Postal Service enforced laws about radio, but private foreign firms maintained the services. Argentina possessed its own gifted wireless enthusiasts as well. Physicist Teobaldo Ricaldini began replicating Marconi's work as early as 1896, and in 1898 he designed the radiotelegraphy station at Dársena Norta near Buenos Aires. Argentine experimenter Federico N. del Ponte performed spark transmitter experiments as early as 1902.[82] Marconi began operations in Argentina the same year.[83] He hoped to build a link between Italy, the United States, and Argentina, the latter being home to a growing number of Italian immigrants. In 1905 American

[80] M. Covarrubias to the Secretario de Relaciones Exteriores, Berlin to Mexico City, 5 Nov. 1901, caja 41-16-5, Secretaría de Relaciones Exteriores, Archivo Histórico Genaro Estrada, Mexico City, hereafter cited as ASRE.

[81] *International Radio Telegraph convention of Berlin: 1906* (Washington, DC: Government Printing Office, 1912). The Latin American governments sided with Germany over England and Marconi.

[82] Claxton, *From Parsifal to Perón*, 2-6.

[83] Mexican Consul General to Argentina to Secretary of Foreign Relations Ignacio Mariscol, Buenos Aires to Mexico City, 7 Dec. 1902, caja 41-16-5, ASRE.

Marconi sent George Monroe to complete that very task.[84] The Marconi Company also sent engineer Edgar Berry to oversee the construction of a powerful station at Bernal, near Buenos Aires. He additionally installed the first wireless station in neighboring Uruguay, initiating commercial radio services between the two countries. AEG had also been selling equipment—with the approval of the nation's Department of Letters and Telegraphs—in Argentina since at least 1904.[85] They established their own subsidiary in Buenos Aires to compete in the country's shipping business.

In Brazil government leaders tended to focus their plans for wireless development on the coasts and with sea vessels, allowing foreign industries to have greater control over service in the interior. American and French companies each possessed radio operations in the country during the early 1900s. U.S. Rubber's subsidiary Amazon Wireless began radio experiments in the Amazon basin in 1901 and received an official concession for radio communications from the governor of the state of Amazonas the following year. A government commission in 1905, however, ruled against Amazon Wireless's operations, especially its interstate transmissions, but U.S. businesses continued in disobedience of the Brazilian government. Undeterred, a French communications company applied for a radio concession to establish a link between the city of Pará and French Guiana the same year. It was not approved, however, until 1907. Meanwhile the Brazilian government pursued its own plans for radiotelegraphy. In 1904 Brazilian communications officials established their own wireless stations that connected Rio de Janeiro with Grande Island 70 miles away. They also started to

[84] Mexican Consul General to Argentina to Secretary of Foreign Relations Ignacio Mariscol, Buenos Aires to Mexico City, 9 Dec. 1905, caja 41-16-5, ARSE.

[85] "El comienzo de la telegrafía sin hilos en Uruguay," http://aturuguay.50webs.com/TelegrafiasinhilosenUruguay.htm, accessed 23 Feb. 2012.

incorporate radio services into their navy.[86] But state officials appear to have focused on cable telegraphy for developing communications in the Amazon, a practice that some Brazilian critics later attacked as less practical and more costly than building radio stations.[87]

In Mexico, wireless communications were predominately a matter of the state. Unlike other public transportation and communication works where foreign investors operated the services, government telegraphers ran most of the first radio stations. Mexican communications and military leaders bought the equipment abroad, mostly from Germany, and had German engineers train Mexican operators. But Mexicans ran the stations upon their construction. Even though some U.S. mining interests brought radio equipment into Mexico, federal telegraphers ran the main wireless operations, including in the port of Veracruz, on both sides of the Gulf of California, and in the Mexican frontier with British Honduras, or present-day Belize.

**Conclusion: The First Decade of Wireless Expansion**

Looking back at the first decade of applied radio technology, promoters and innovators could already claim many advances. The medium had gone from a handful of experiments in university labs and attics to a viable global system of communications. Despite lingering problems with reception and transmission, many of the most advanced navies had successfully incorporated devices and the first experiments with wireless in warfare had already occurred in Africa and Asia. The medium had helped empires to grow and consolidate their control over vast regions

[86] Schwoch, *The American Radio Industry and Its Latin American Activities*, 15-19.
[87] Diacon, *Stringing Together a Nation*, 136-37.

while simultaneously expanding trade capabilities and maritime safety. But this new tool, which promised to link the world and build new partnerships, also intensified divisions. The English, Germans, and Americans became especially competitive over who controlled wireless development. The English, French, Russians, and Japanese had all used radio in combat, showing the medium's dark side. Indeed, while wireless improved general communications and useful postal services in a number of the places that technicians built facilities, state and corporate forces used the technology to reinforce their power over others.

At the same time, or at least by 1900, Latin American nations had also started to incorporate the technology for what were essentially the same reasons: increased trade capabilities, control over territory, and the suppression of autonomist groups. In this case, nation and empire building mirrored each other. As with other technologies, the embrace of radio also represented an attempt by Latin American leaders to exhibit the power and potential of their respective countries as they strove to push their way into a more important role in the global community. Wireless communications during the 1890s and the first decade of the 1900s aided imperial ambitions, but they were also important to nation formation in Latin America. The presence of Argentina, Brazil, Chile, Mexico, and Uruguay at the 1906 International Radio Telegraph Convention in Berlin, and their use of radio communications itself, symbolized the importance of these growing nations to the world economy. It was one of a number of ways—including

developments in electricity, medicine, sanitation, public works, and transportation—in which Latin American leaders paraded their countries as upcoming and modern.[88]

[88] A small sample of works on Latin American modernization projects and displays include Pricilla Connolly, *El contratista de don Porfirio*; Agostoni, *Monuments of Progress*; Jorge Larrain, *Identity and Modernity in Latin America* (Cambridge, UK: Polity, 2001); Mauricio Tenorio-Trillo, *Mexico at the World's Fair: Crafting a Modern Nation* (Berkeley: University of California Press, 1996); Julia Rodriguez, *Civilizing Argentina: Science, Medicine, and the Modern State* (Chapel Hill: The University of North Carolina Press, 2006); Jorge Coronado, *The Andes Imagined: Indigenismo, Society, and Modernity* (Pittsburgh: University of Pittsburgh Press, 2009).

## Chapter Two

## Imperial Designs for a Mexican Nation: Wireless in Porfirian Mexico

> The effective government of large areas depends to a very important extent on the efficiency of communications.
> —Harold Innis[1]

Staring out over the gulf waters off the coast of Veracruz in 1902, the young telegrapher Alejandro Gutiérrez dreamed of accomplishing great things. The government had selected him to learn the new science of wireless telegraphy and to head experiments with recently acquired devices. Using German equipment, Gutiérrez had already successfully signaled a fellow radio operator on the steamship *Melchor Ocampo,* a coast guard vessel, with great success. He bragged that he consistently achieved a clear reception at distances of "more the than 113 kilometers [70 miles] . . . under bad and good atmospheric conditions."[2] Although deservedly proud of his accomplishment, not only in distance of transmission, but in communicating with a moving target, Gutiérrez and other DGTN and military officials had actually reached a plateau in their experiments, which had been underway for over two years. But despite the hurdle in moving beyond the 70-mile mark, he still aspired to connect "Veracruz, Frontera, Progreso, Campeche, Tampico, and Túxpan, for the service of the Public Administration."[3] He genuinely believed in the ability of the technology to expand trade,

[1] Innis, *Empire and Communications*, 7.

[2] "La telegrafía sin hilos," *El Mundo*, 1 Apr. 1902, 1; Tomás Guzmán Cantú, "Telegrafía sin hilos," in *Historia de las telecomunicaciones*, eds. Manuel Rosales Vargas and Virginia Licona Peña (Mexico City: Telecomm/Telégrafos, 1999), 11.

[3] "La telegrafía sin hilos," *El Mundo*, 15 Feb. 1902, 1; "La telegrafía sin hilos," *El Mundo*, 1 Apr. 1902, 1.

increase the reach of government, and to facilitate Mexico's rise into the membership of modern nations.

Foreign practices and developments greatly influenced Porfirian leaders, including perceptions about radio. But unlike other public works, state officials established a stricter monopoly over this new form of communication. They wanted to expand the power of the ruling elite, not the power of outsiders. Díaz and his advisors argued that it was time to assert Mexico's place as a sovereign and respected nation. Noting how European imperial powers incorporated *telegrafia sin hilos* or TSH to control and exploit colonies, Mexican military and communications officials decided to apply the technology in similar ways.[4] Mexico possessed no provinces outside its own claimed political boundaries, but it did have frontier territories that resisted central control and others threatened by U.S. usurpation. With the assistance of German engineers, the first large-scale radio projects in Mexico aimed at building stronger federal links with these largely autonomous regions. Although some private enterprises—foreign and domestic—used radio in Mexico during this period, state officials with the aid of foreign experts drove development. This government initiative was but one component of the complicated but intertwined forces of state expansion, nation building, globalization, and modernization underway in Mexico during the last decade of the Porfiriato.

**Learning of Radio: Mexican Ambassadors and Information Abroad**

The first challenge facing authorities was how to adapt radio, a foreign technology, to their own designs. Ambassadors in Europe first brought news of radio to Mexico. Military officials shortly thereafter began fact-finding missions abroad to

[4] *Telegrafía sin hilos* literally translates to telegraphy without wires—wireless.

examine and acquire wireless devices. The accounts of these envoys reveal the international breadth and high demand of the technology, the motives behind the businesses and governments first involved with wireless, and the reasoning behind the Mexican government's decision to purchase its own apparatuses at the turn of the twentieth century. Additionally, a growing interest by Mexican periodicals during the last five years of the Porfiriato helped shape public opinion about radio among communications officials and urban populations.

The story of Mexican radio starts in Italy: a fitting location actually, since it was the birth place of Guglielmo Marconi. Italy's leaders and scientists took pride in the inventions of their increasingly famous native son and publishers enthusiastically spread word of his innovations. In 1897 Marconi returned to Rome from England to conduct experiments in the palace of the Minister of the Navy and between the shore of Spezia and Italian ships of war. By the latter half of the year, Marconi had successfully communicated with the ironclad *San Martino* at a distance of up to 12 miles.[5] By October these experiments were "followed by the greatest interest in Italy by royalty, the government, the press, and the public."[6] The widespread publicity about TSH also reached the ears of the Mexican consul in Rome, G. A. Esteva. Recognizing the possibilities of the technology and the attention that it was rapidly receiving, Esteva relayed information about the new marvel "that interests the entire civilized world" to Ignacio Mariscol, the Secretary of Foreign Relations in Mexico.[7] Esteva expounded on

[5] G. Marconi, "Origin and Development of Wireless," *The New American Review* 168 (May 1899), 625, APS; "Ethereal Telegraphy," *The Living Age*, 3 Dec. 1898, 625, APS.

[6] "Wonders of Wireless Technology," *The Living Age*, 16 Oct. 1897, 216, APS.

[7] G.A. Esteva to the Secretaría de Estado del Despacho de Relaciones Exteriores, Rome to Mexico City, 16 Jul. 1897, caja 41-16-5, Secretaría de Relaciones Exteriores, Archivo Histórico Genaro Estrada, Mexico City, hereafter cited as ASRE.

his initial statements by sending back publications and more elaborated opinions on the medium's development. His first package consisted of an article in the Italian journal *L'elettricista* by the prestigious professor Angelo Banti, which summarized some of Marconi's work. The piece was likely a part of, or a predecessor to, Banti's *Il telefono senza fili sistema Marconi* (1897), an illustrated monograph on Marconi and wireless telegraphy.[8] Mariscol, in turn, disseminated this news to other sectors of the administration, including President Porfirio Díaz, Secretary of War and Marine Bernardo Reyes, Secretary of Communications and Public Works Francisco Z. Mena, and Camilo González, the Director of National Telegraphs.

Consuming information from across the seas, officials gathered opinions about radio and sought out possible purchases. A number of Mexican authorities searched for equipment in countries leading the way in wireless experimentation—Great Britain, France, Germany, Belgium, Spain, and the United States.[9] As the home of Marconi's main business, England quickly stood out as a rational place to turn. Britain was the premier nation of radio; Marconi supplied machines for the postal system and the navy**.** Soon thereafter, Marconi started to work with a number of other governments as well, but continued to base his operations in England. In November of 1898, Adolfo Brule, the

[8] G. A. Esteva to the Secretaría de Estado del Despacho de Relaciones Exteriores, Rome to Mexico City, 13 Aug. 1897, caja 41-16-5, ARSE; Banti, a specialist in electricity, founded *L'Elettricista* in 1892; "Angelo Banti: Un pioneer dell'elettrotecnica," (Maggio, 2003)," http://www.anonimocosano.it/doc/biografiaAngeloBanti.pdf, accessed 2 Jul. 2011; Angelo Banti, *Il telefono senza fili sistema Marconi* (Roma: Gli Editori Dell'*Elettricistta*, 1897).

[9] G. A. Esteva to the Secretaría de Estado del Despacho de Relaciones Exteriores, Rome to Mexico City, 12 April 1899, caja 41-16-5, ARSE; M. Covarrubias to the Secretaría de Estado del Despacho de Relaciones Exteriores, Berlin to Mexico City, 10 May 1901, caja 41-16-5, ARSE; Experimentation was also occurring in Russia, though Mexico does not appear to have contacted Russia as much as the European powers further west.

Mexican ambassador in London, began sending Mariscol, Mena, and González documents on "the new 'Marconi' system of wireless telegraphy."[10]

Interestingly, it was the reports of J. Beuif, the representative in Belgium, which initially and most dramatically grabbed the attention of Mexican officials. Belgium officials had quickly reached out to Marconi about his devices. Soon thereafter they started their own experimental trials. Beuif mailed back numerous letters about radio tests and negotiations, in addition to describing accounts of TSH in the European press. The ambassador, much like the Belgian royal court, was especially intrigued by the medium's military applications.

In addition to possessing a strong interest in radio, Belgium's scheming monarch King Leopold II had an interesting connection to Mexico. His sister, Charlotte of Belgium, had married Archduke Maximilian of Austria, the younger brother of Emperor Franz Josef, in 1857. After initiating a hard fought invasion of the country, Napoleon III of France made Maximilian the emperor of Mexico in 1864. Thereafter, Charlotte became known as Carlota of Mexico by admirers and detractors alike. During the withdrawal of French forces in 1866, and preceding the subsequent execution of Maximilian, Carlota returned to Europe in an attempt to gain support for her husband. Following Maximillian's death and the collapse of the Mexican Empire she remained in Europe suffering from a degenerating emotional and mental breakdown. She lived insane and largely kept out of public view until her death in 1927.

In 1900 King Leopold II had been engaged in a "philanthropic" colonization project in the African Congo. Although according to Beuif, Belgium was a country "not

[10] Adolfo Brule to the Señor Ministro de Relaciones Exteriores, London to Mexico City, 9 Nov. 1898, caja 41-16-5, ARSE.

disposed towards war," Leopold's imperial endeavors—even if paraded as a project of goodwill—were built on exploitation and genocide, a violent imperialist endeavor based on ideas of racial and cultural superiority.[11] Like many other European "civilizing" and economic projects of the era, this mission was also about modernization. It utilized newly developed technologies including railroads, machine guns, and electronic communications.[12] These tools made possible the suppression of local populations while extracting ivory and other valuable commodities.

King Leopold II, whose boundless greed had generated an interest in matters of geography, economics, and technology, quickly perceived the potential of Marconi's ethereal telegraph. In April 1900, while the monarch's forces were suppressing a prolonged rebellion in the Congo, Leopold invited Marconi to the Royal Palace in Brussels to exhibit his new wares. The king was especially interested in the medium's combat applications. In addition to foreign ambassadors, including the Mexican envoy, the guests largely included military engineers. Indeed, the Belgium armed forces, like those in England, France, Germany, and Russia, had already been experimenting with radio.[13] Befriending the Belgium general who headed the telegraph division, the ambassador collected data on the applications of radio in the armed forces. According to

[11] J. Beuif to Secretario de Relaciones Exteriores, Brussels to Mexico City, 1 Jun. 1900, caja 41-16-5, ASRE.

[12] "Wireless Telegraphy for Africa," *The Central African Times*, 7 Mar. 1902, 4; "'Wireless' West Africa," *The Sierra Leone Weekly News*, 5 Apr. 1902, 7. For more on King Leopold II and the Congo, see Adam Hochschild, *King Leopold's Ghost: A Story of Greed, Terror, and Heroism in Colonial Africa* (New York: First Mariner Books, 1999).

[13] "Tesla's Torpedoes, *The Beira Post* (Beira, Mozambique), 15 Feb. 1899, 4; "Important News. Boers Getting Excited," *Mafeking Mail and Protectorate Guardian* (Mafeking, South Africa), 30 Sept. 1899, 3; "Navies of the World," *New York Times*, 3 Sept. 1901, 8.

Beuif, Mexico too possessed "talented Military engineers and telegraphers that could take advantage of the new referred to advancements."[14] Reyes and Mena agreed.

Reyes wasted no time in obtaining wireless equipment. In 1901 he sent a small delegation to Europe, under the leadership of Colonel Ignacio Altamira, to seek out information and a good price on apparatuses. Belgium and Spanish radio experiments—the latter was first reported to Mexico vis-à-vis Belgium—initially interested Mexican army officials the most, though they also communicated with French and German representatives. Over the next five years, Altamira toured Europe and the United States searching out new information. Reyes himself became more involved in obtaining equipment. In fact, he played an important role in sealing a partnership between the Díaz government and AEG, the German electric company that supplied the equipment and expertise for many of Mexico's first radio stations. Indeed, this partnership remained strong for two decades. Reyes hoped to use wireless technology to increase the power of the Mexican state and his military expeditions in places including southwest Yucatán.[15]

Other ambassadors in Europe continued to send back reports. They not only provided information to government and military leaders about new developments and uses for radio, but also on how foreign powers were applying policies and legislation on TSH. For example, in 1904 the consul in Britain sent information regarding British laws that aimed to bring about more state regulation of radio operations, especially in case of war. Espionage and the transnational nature of wireless worried many British officials

[14] J. Beuif to Secretario de Relaciones Exteriores, Brussels to Mexico City, 1 Jun. 1900, caja 41-16-5, ARSE; J. Beuif to Secretario de Relaciones Exteriores, Brussels to Mexico City, 8 Apr. 1900, caja 41-16-5, ARSE.

[15] Bernardo Reyes to the Secretario de Relaciones Exteriores, 1 Aug. 1901, Mexico City, caja 41-6-5, ARSE; M. Covarrubias to the Secretario de Relaciones Exteriores, Berlin to Mexico City, 10 May 1901, caja 41-16-5, ARSE.

and their turn toward a statist approach influenced Mexican leaders.[16] News of state-directed stations in France also influenced public opinion in urban Mexico.[17]

Starting in 1904, news about American-made wireless equipment became more prevalent. Coronel Altamira reported on U.S. radios that could transmit successfully at a distance of 50 miles. The following year, Andrew Plecher, a U.S. businessman, approached the Mexican consulate in Los Angeles with a proposal to establish a wireless system between Sinaloa and the Southern District of the Territory of Baja California. The consul dutifully relayed the information, though the Díaz administration had no desire for an American-controlled radio system, especially in that part of the country where U.S. influences were particularly strong. The Díaz regime was selective in its providers of radio devices, and it was Mexican ambassadors and military officials abroad who provided the administration with information on what was available and how other governments and businesses used the technology.

**Internalizing Empire**

In the 1890s the government prided itself on the increased rate of material development in the country. Mena received the country's first wireless devices in the summer of 1899, one of a number of new electric technologies arriving in Mexico.[18] Electricity, still fairly novel itself, had become more prevalent in the largest population

[16] Mexican consul in Great Britain to the Secretario de Relaciones Exteriores, 1 Jul. 1904, London to Mexico City, caja 41-6-5, ARSE.

[17] "La telegrafía sin hilos: Monopolio del gobierno francés," *El Mundo*, 16 Aug. 1906, 2.

[18] Francisco Z. Mena, *Memoria…por el Secretario Comunicaciones y Obras Públicas . . . 1 Jul. 1900 a 30 Jun. 1901*, (Mexico City: Tipografía de Dirección General de Telégrafos, 1902), 169-70. Other authors have stated that the first radio equipment arrived in 1900 or 1901. I selected the 1899 date because Mena in this *Memoria* specifically states that he received the devices at the beginning of the previous fiscal year, which would have been the summer of 1899. His statements in the remainder of the *Memoria* suggests he understood well how the fiscal-year system worked.

centers. Electric lines, like humming spider webs, began to crisscross the air above important thoroughfares. From 1887 to 1911 more than one hundred light and power companies registered in Mexico. These operations relied on small thermal power plants and dynamos, at least until hydroelectric plants began supplying urban areas starting in 1906.[19] Telephone service had expanded too but was still relatively rare, especially in rural areas. The French Lumière brothers had brought cinema to the country in 1896, and shortly thereafter began filming Mexican movies. Representatives of the American inventor and businessman Thomas Edison introduced his Vitascope, another moving picture device, the same year. Edison's movies were made in the United States, but many of the Lumière films, like those made by Enrique Moulinié y Churrich, a French radical living in Mexico, and Mexican filmmaker Agustín Jiménez, made films about daily life across the country, the travels and political life of Porfirio Díaz, and regional cultural practices. For example, Moulinié y Churrich made a brief recording of a performance by the nation's star *torero* or bull fighter Ponciano Díaz in Puebla in 1897. Many of these and the subsequent films during the Porfiriato possessed themes or provided news that strove to build a Mexican national identity.[20] Along with phonographs, typewriters, cars, and railroads, radio added to a developing mental and physical landscape that increasingly included modern technologies.

Elite members of urban society usually saw these technological developments in a positive light. A number of journals and magazines praised the increased mileage of railroad tracks, telegraph and electric lines, and associated goods. The editors of *El*

[19] Elio Agustín Martínez Miranda and María de la Paz Ramos Lara, "Funciones de los ingenieros inspectores al comienzo de las obras del complejo hidroeléctrico de Necaxa," *Historia Mexicana* 56, no. 1 (Jul.-Sept. 2006): 231-86.

[20] Aurelio de los Reyes, *Medio siglo de cine mexicano (1896-1947)* (Mexico City: Editorial Trillas, 1987), 8-50.

*Mundo*, *El Mundo Semanario Ilustrado*, *La Revista Moderna*, and *El Cronista de México* published articles relating material progress to the establishment and maintenance of peace and stability, even while railroad development was causing strife in the countryside for many people. Yet some criticism existed, mostly ardent nationalists who resented the growing influence and presence of foreigners, especially Americans. Many Porfirian intellectuals and government leaders, however, believed that exhibiting Mexico's modernity in big public displays at home and in international exhibitions helped increase the nation's status abroad, and in turn, the likelihood of increased investment, and that this was a good thing. [21]

Popular perspectives tended to be more critical and reactive. Some illustrations, including a number of images by the profuse artist José Guadalupe Posada, and coinciding broadsheets by Antonio Vanegas Arroyo, often cynically joked about the middle-class and elite urbanites who took up bicycling, seeing it at as a foreign and passing phase. Posada's work also explicitly demonstrates the fear and critical beliefs circulating about electric trolleys, which started operating in Mexico City in 1900, and even electricity in and of itself. People held suspicions about the mysterious force that moved the streetcars, "the invisible colossus that powers them, which shows itself only with sparks and crackles . . ." Similar concerns developed among many who first encountered radio. Not understanding the science, many feared the devil's work. Of course, the fact the trolleys ran over hundreds of people in their first years of operation

[21] Matthews, "*De Viaje*": 251-89; Beezley, *Judas at the the Jockey Club*, 16; Tenorio-Trillo, *Mexico at the World's Fairs*, 19, 37.

did not help relieve criticism. But as the years passed, electricity became a generally accepted norm in parts of Mexico City, if less so in the vast countryside.[22]

The rise of electricity had other more subtle but important material effects as well. The dramatic increase in electricity in the 1890s, especially in more industrialized nations, allowed for more efficient production of a wide array of substances and manufactured goods. In the United States, factory workers used electricity to separate chlorine and sodium from salt and brine. Manufacturers used the chlorine, combined with lime, to make bleaching powder for paper and textiles. Sodium figured into the creation of caustic soda, used in soaps and an assortment of other goods. Electrified machines and motors made industrial fabrication more rapid and efficient, leading to the improved production of iron, brass, copper, glass, porcelain, rubber products, asbestos, and mica. The increase in the number, quality, and variety of goods had a subsequent impact on Mexico as Americans and Europeans increasingly sought to sell their products abroad.[23]

Many of these goods came to Mexico through the port of Veracruz. As a result, the city made a fitting entry point for wireless equipment. In addition to being the main hub for foreign trade, it had become a focal point of Porfirian progress and modernity. Steamships slowly traversed the murky waters. Sweaty-browed dock workers unloaded foreign products from boats, placing the goods on trains bound for the capital. SCOP employees had also been at work in the port. These federal agents had devoted considerable time improving trade and communications facilities over the past decade. Radio was their newest tool.

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[22] Patrick Frank, *Posada's Broadsheets: Mexican Popular Imagery, 1890-1910* (Albuquerque: University of New Mexico Press, 1998), 187-91.

[23] Elihu Thomas, "Electrical Advances in the Past Ten Years," *Forum*, Jan. 1898, 527-40, APS.

With the new wireless machines now in hand, Mena fixed his sights on lofty goals. Above all, he, like the younger Gutiérrez, imagined connecting the growing ports of the country and directing ships in the Gulf; he envisioned increasing Mexico's national power. The general had kept abreast with radio developments in Europe. In addition to memos derived from embassies, he read about Marconi and other innovative entrepreneurs making newspaper headlines. After much difficulty, Mena had imported equipment from the French inventor Edouard Ducretet, the renowned wireless pioneer. Operating out of his Paris laboratory, "equipped with a mast seventy-five feet high above the roof," Ducretet had started his commercial endeavors in 1898.[24] Based on the designs of another technological trailblazer, Russian scientist Alexander S. Popov, Ducretet's newest contraptions were already in demand.

His radios, however, failed to live up to the general's expectations. Experiments with the instruments started when Mena and González ordered the formation of a technical group, which began trials along the coast near the city of Veracruz in 1900. With frequent shipping traffic, the port was a logical place to set up the first operations. The devices worked satisfactorily at a distance of about 1000 feet. The transmissions, however, became more difficult to comprehend when further separated, and they failed altogether past 4 miles. These results shattered Mena's dreams of communicating with places like Campeche from Veracruz, or for that matter, even with ships at sea.[25]

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[24] "Wireless Telegraphy," *Los Angeles Times*, 25 Dec. 1898, A5; John I. Waterbury, "The International Preliminary Conference to Formulate Regulation Governing Wireless Telegraphy," *The North American Review* 177, no. 564 (Nov. 1903), 656, APS; "Six Great Pioneers of Wireless," *EBU Technical Review* (Spring 1995), 90-92, http://tech.ebu.ch/docs/techreview/trev_263-pioneers.pdf, accessed 24 Jun. 2011.

[25] Francisco Z. Mena, *Memoria por . . . el Secretario de Estado y del Despacho Comunicaciones y Obras Públicas, 1 Jul. 1900-Jun. 1901* (Mexico City: Tipografía de la Dirección de Telégrafos, 1902), 169-70; Agustín M. Chávez, "Los directores de telecomunicaciones en la historia, *El Telegrafista* 3, no. 20 (Apr.-May 1955), 8.

Mena contended that he had the solution to the problem: he needed better equipment. And according to most specialists, that meant radios from the Marconi Company of England. Mena explained to congress that it had been a mistake to buy from Ducretet. Marconi's appliances were proven to be more reliable and powerful. Mena continued that the English apparatuses could transmit 12.5 miles over land and almost 95 miles over the sea. But as other SCOP employees reported, Marconi's equipment could not actually send messages at these distances, at least not reliably.[26] Still, many officials agreed that the English products would considerably best the 6 kilometers (3.7 miles) of Ducretet's machines. But these hopes too ended in failure. The talks between state leaders and Marconi broke down over a dispute about policies and costs.[27]

Consequently, the undauntable Mena focused his attention on inventors in Mexico. This time he approached V. Sauvade, an inventor and French national who had lived in Mexico for some time. Not only did Sauvade provide new radio equipment—which he invented himself—he also came along to assist in the operation of the devices and to educate telegraphers, especially Alejandro Gutiérrez, on how to use them. SCOP employees additionally continued to work with the Ducretet products, including a Popov-Ducretet radiotelephone that they had acquired. This latter group transmitted messages regularly along the coast of Veracruz between Hornos and the Isla de Sacrificios, a distance of 2.5 miles.[28]

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[26] Carlos Merchan Escalante, *Telecomunicaciones* (Mexico City: Secretaría de Comunicaciones y Transportes, 1988), 51.

[27] Francisco Z. Mena, *Memoria . . . por el Secretario de Estado y del Despacho Comunicaciones y Obras Publicas, 1 Jul. 1901-Jun. 1902* (Mexico City: Tipografía de la Dirección de Telégrafos, 1903), 205.

[28] Ibid; "La telegrafía y telefonía sin hilos," *Industria é Invenciones* (Barcelona), 16 Jan. 1904, 8-9; "La telegrafía sin hilos," *El Mundo*, 1 Apr. 1902, 1.

Mena was most impressed, however, by the Sauvade equipment. SCOP officials conducted a number of experiments in 1901 and 1902 with these radios in the port of Veracruz and between Boca del Rio and the Isla de Sacrificios (5.6 miles). They continued with trials between Boca del Rio and Isla de Enmedio (12.5 miles), Santiaguillo and Boca del Rio (18.5 miles), and the Fortaleza de Ulúa and Santiaguillo (23 miles), all with consistent clarity. They also made successful transmissions from the Fortaleza de Ulúa to the *guardafaro* or coast guard vessel *Donato Guerra*, which was moving at 20 kilometers per hour at a distance of 70 miles, thus the experiment began the use of TSH for communication with government ships. [29] Mexican officials, like their Italian, British, German, Russian, and American counterparts, hoped to modernize communications in their navy, even if Mexico's flotillas paled in size and strength.

President Díaz's personal offices additionally became involved in radio. Towards the end of 1900, Reyes, on behalf of President Díaz, asked Treasurer José Yves Limantour to release 40.24 pesos to buy parts necessary to build another experimental TSH machine.[30] Under the charge of Dr. Roberto Jofre, a prestigious medical doctor, radio tests began between Díaz's residency of Chapultepec and the National Palace.[31] It was in that December that Jofre and a crew of assistants sent what they had thought to be the first radio message in Mexico. In honor of the president, it stated a simple and

[29] Mena, *Memoria . . . 1901- 1902*, 205.

[30] The value in U.S. dollars would be approximately half the number in pesos.

[31] Bernardo Reyes al Secretario de Haciendo, *Memoria . . . por el Secretario de Estado del Despacho de Guerra y Marina, 1 enero 1900 al 30 Junio 1901*, Tomo 1 (Mexico City: Tipografía de la Oficina Impresora de Estampillas, 1901), 323; "Continuaciones de 'el estudio'," no. 1, *Anales de Instituto Médico Nacional* (Mexico City: Oficina Tipográfica de la Secretaría de Fomento, 1894), 2; Ornelas Herrera, ¨Radio y contidianidad en México," 128. Ornelas Herrera argues that this was the first successful radio experiment in Mexico.

historically relevant message: "congratulations on your sixth reelection."[32] Using another modern technology, photography, they took a picture of one of the devices and the group who helped make the experiment a success. But it was SCOP officials, especially within the DGTN, who drove the development of radio operations.

As the Chapultepec experiment indicates, corresponding with sea vessels and between ports were not the only designs for wireless communications. More than anything else, SCOP and military personnel used this technology in attempts to connect and control Mexico's frontiers. They wanted to combat previous failures to bring fringe regions within Mexico's political boundaries under the control of the central government. This lack of control presented a number of problems for the Díaz administration**.** For one, these territories had resources that were either underdeveloped or in foreign hands. These same areas possessed local populations who promoted independence or failed to recognize Mexican authority. And finally, the border regions in the north remained threatened by an expansive United States, whose population, economy, and ambition appeared insatiable.

In Mexico, as with most other countries, radio applications built on previous designs for cable communications. As mentioned in the introduction, Juan de a Granje, a Mexican merchant of Spanish origins, introduced wire telegraphy to Mexico in 1849. The construction of the first telegraph line, starting out of Veracruz, began in 1851. As early as 1847, the year after the United States took approximately half of Mexico's territory, President José Joaquín Herrera strove to establish a climate of security for Mexico, undoubtedly a daunting task. Telegraphy featured into his and subsequent

[32] Photo of the first radio experiment in Mexico, December 1900, Colección Fotografía Familiar, Acervos Históricos, la Universidad Iberoamericana, Mexico City, further stated as AHI; Although Díaz's sixth term in office began in December 1900, it would have marked his fifth re-election.

governments' national security plans. The first wire telegraphy operations took place between Veracruz and Mexico City and then between Mexico City and Orizaba, but plans to increase telegraph lines to the frontier territories were in the works during the 1850s and 1860s.

Although the number of these cables grew during the governments of Benito Juárez and Sebastián Lerdo de Tejada, construction of telegraph lines expanded at a much greater rate under the Díaz administration. By the late 1870s cables for Morse-code transmissions connected the Pacific and Atlantic coasts. In fact, by the height of the Porfiriato, telegraphy had become an indispensable tool for large businesses, the government, and the military. In the 1880s and 1890s, state agents expanded telegraphic operations in the northern and southern frontiers to thwart or at least better respond to internal rebellions and filibusters from "expansionist gringos."[33] General Mena, who worked to bring TSH to Mexico, played an important role in the development of this preceding form of electronic communication. Although largely owned by U.S. businesses during the Porfiriato, government leaders used—or at least wanted to use—these lines to deter foreign filibusters from establishing independent "republics," internal rebellions, and attacks from Kiowas and Comanches who raided from the United States. Mexican military officials in the northern frontier pressed the Díaz administration to increase communications, arguing that a "lack of communication makes government action difficult and allows for the frequent cases of banditry and foreign invasions…that cause grave dangers of international foment." [34] Similar statements could have been said for the area around the southern border as well.

[33] Noyola, *La raza de la hierba*, 19, 24-25, 56-57, 66.
[34] A *jefe militar* quoted in Noyola, *La raza de la hierba*, 65-66.

But the construction of telegraph lines in the nation's hinterlands proved problematic. Not only were they farther away from main centers of capital, resources, and the federal government, the environment made the construction and maintenance of telegraph lines costly and extremely difficult. In the case of Baja California, the Gulf of California separated the territory from mainland Mexico except for a narrow, remote, and inhospitable strip of the Sonoran desert. This arid and sparsely populated environment hindered telegraph construction and an attempt to lay a submarine cable across the Gulf, for some undeclared reason, had failed as well.[35] State officials believed radio would remedy the communications situation. Although originally pitched to imperial powers in need of a more efficient connection remote colonies, Ducretet and Marconi originally emphasized this exact point. As Marconi stated in 1898, TSH's "main value will lie in its use in places which have not before been practicable for telegraphic communication, where, in fact, wires were an impossibility."[36] Like the stations built at the Isle of Wight and each side of the English Channel, Mexican officials could use radio to cross a relatively narrow body of water in order to establish important communication links.

The Gulf of California project matured under the direction of engineer Leandro D. Fernández, who replaced Mena as the head of SCOP in 1902. Fernández and his family came from a prestigious Durango family that thrived during the Porfiriato. Like his siblings, he was born on his family's hacienda, San Diego Mancha. Prior to becoming Secretary of Communications and Public Works, he had served as governor of Durango from 1897 to 1900. His brother, Estaban Fernández, followed in his footsteps, ruling as

[35] Leandro Fernández, *Memoria . . . por el Secretario de Estado y del Despacho de Comunicaciones y Obras Publicas . . . 1 de julio de 1902 a 30 a junio de 1903* (Mexico City: Tipografía de la Dirección General de Telégrafos, 1904), 244.

[36] "Marconi's Telegraphy," *New York Times*, 23 Jan. 1898, IWM 3; "Wireless Telegraphy," *Los Angeles Times*, 25 Dec. 1898, A5.

the state's chief executive from 1904 to 1908. His other siblings helped manage their extensive properties.[37] But Leandro, unlike his family members, was also a scientist. Indeed, before and after his stint at the SCOP he enjoyed a distinguished academic career. As a cabinet member he worked hard at expanding Mexico's infrastructure and was an enthusiastic supporter of radio. The continued success of the early experimental transmissions in Veracruz convinced Fernández to move forward with the construction of permanent public and military stations to unite the less developed provinces with the core of the nation. He had the perfect first project in mind.[38]

Fernández's plan was to create a reliable means of communication across the Gulf of California that separated the two districts of the Territory of Baja California from mainland Mexico. The distance across this body of water was far less than that between the major ports along the Gulf of Mexico, a fact that made the project much more feasible. And though Baja California had historically had a relatively small population—the 1900 census estimated the population of the entire peninsula at only 47,082 people—the region had increasingly become important to trade in the Pacific, especially with the United States, and as a center for mining.[39]

Economic development was a key driving factor in the advancement of communications between the mainland and the peninsula. Gold, silver, and copper had enticed a number of Mexicans and foreigners into mineral extraction endeavors in the area during the last half of the 1800s. In turn, some of these enterprises became major

[37] "El Ministro de Comunicaciones," *El Mundo*, 4 Jun. 1906, 1; "Enciclopedia de los municipios de México, Durango: Poanas," http://www.e-local.gob.mx/work/templates/enciclo/durango/mpios/10022a.htm, accessed 17 Jun. 2011.

[38] Fernández, *Memoria . . . 1902-1903*, 244.

[39] Secretaría de Fomento Colonización e Industria, *Censo de 1900* (Mexico City: Oficina Tipografía de la Secretaría de Fomento, 1901), Colección Porfirio Díaz, AI.

developers. The mining company El Boleo, for example, possessed a small fleet of ships and put substantial resources into fostering growth in the peninsula. Their employees largely built the townsite of Santa Rosalia shortly after Frenchman C. A. la Forgue founded the outfit in 1885. Backed with substantial capital from the Rothschild family in Europe, El Boleo became one of three largest foreign-financed mining companies in Mexico and a major economic power on the peninsula. They extracted hundreds of thousands of tons of copper each year out of lower Baja California. They exported much of this metal but sold some domestically to be used in things like wires for telegraph lines.[40] El Boleo additionally played a large role in the construction of the first radio station in Baja California, which they used to their financial advantage.

Powerful political reasons also existed for building the first radio stations in Baja California and Sonora. Internal revolts rocked the region in the 1850s. In the same decade, foreign filibusters, driven by the successful U.S. land grabs of Mexican territory during the Texas Revolution and its subsequent annexation into the United States (1835-36, 1845), the Bear Flag Revolt in Alta California (1846), and the Mexican-American War (1846-48), invaded both Sonora and Baja California in the 1850s. Most famous of these adventurers was William Walker, who after failing to successfully establish the "Republic of Lower California," took power in Nicaragua in 1856. Similar plots cropped up in the 1880s and 1890s and continued into the twentieth century.[41] Filibustering after

[40] Lawrence D. Taylor, "The Mining Boom in Baja California from 1850 to 1890 and the Emergence of Tijuana as a Border Town," *Journal of the Southwest* 43, no. 4 Border Cities and Culture (Winter 2001), 463-72; "En la Baja California se ha despertado gran interés," *El Economista Mexicano*, 4 Jan. 1908, 207; For more information on El Boleo, see Edith González Cruz, *La compañia El Boleo: Su impacto en la municipalidad de Mulegé, 1885-1918* (La Paz: Universidad Autónoma de Baja California Sur, 2000).

[41] Albert L. Hurtado, "Empires, Frontiers, Filibusters, and Pioneers: The Transnational World of John Sutter," *Pacific Historical Review* 77, no. 1 (Feb. 2008), 19, 37-43; Rufus Kay Wyllys, "The

the Mexican-American War consistently failed, but the policies of Díaz and previous administrations had allowed northern Baja California and Sonora to become well within the economic orbit of the United States vis-à-vis capital, railroads, and telegraphs. Díaz dangerously planned to gain from this infusion of American money and technology while providing increased training for Mexican specialists. To balance the swelling presence of foreigners, he created stronger communications links between central Mexico and the northwest, an arrangement that he hoped would help hold these more autonomous regions and eventually bring them under stronger federal control.

Under the direction of Fernández, González, and Enrique Schöndube—AEG's main radio representative in Mexico—work on the Gulf of California radio stations began in 1902. Schöndube had previously worked with the Porfirian government on a number of projects involving electricity, and he knew Díaz personally. Along with two other German engineers, Schöndube surveyed the area for the best place to build the stations. The original idea was to construct one radio outpost on the Vigía Hill just north of the town of Guaymas, Sonora, and the second directly across the gulf in the coastal town of Santa Rosalía, Southern District of Baja California. But following the German engineers' initial survey they abandoned the Vigía site after concluding that the mountainous terrain would interfere with radio signals. Instead, they selected a high point near the light house at Cabo Haro, which resided along the shore. The Santa Rosalía site proved to be a good original choice and construction began at both places in December of 1902. The projects did not take long to complete. El Boleo and government employees finished the Baja California station on January 31, 1903. The operation on the other side of the sea was

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Republic of California, 1853-54," *Pacific Historical Review* 2, no. 2 (Jun. 1953), 194-213; Andrew F. Rolle, "Futile Filibustering in Baja California," *Pacific Historical Review* 20, no.2 (May 1951), 159-66.

completed on February 6.[42] After hiring telegraphers Luis Sánchez Martinez, Raymundo Sardaneta, Juan José Flores Treviño, and Pedro N. Cota to study radio and to operate the stations, the two posts exchanged their first "*marconigramas*" on February 16.[43] Communications officials additionally ordered the construction of cables to connect the Sonoran radio station to central Mexico via wire telegraph, which workers completed over the following year.[44] The radio stations ultimately accelerated a wave of construction of all available means of modern communication in the area.[45]

Unlike previous experiments, these stations were open to the public. The government wanted businesses and residents to communicate with mainland Mexico. The government also charged for the service, recouping some of the thousands of pesos they had sunk into the adventure. According to one 1906 newspaper article, the cost to use the radio stations was the same as the other telegraphic operations underway in western Mexico: "one peso for the first ten words and ten centavos for each additional word."[46]

To the great excitement of Fernández, the stations worked well at first, though problems arose shortly thereafter. Radio equipment at the turn of the twentieth century was not consistently reliable. In addition, most Mexican telegraphers had little real experience with the technology and largely learned on the job. Fernández admitted to congress that that government's communications officials still lacked mastery of the

[42] Fernández, *Memoria . . . 1902-1903*, 245.
[43] Fuentes, *La radiodifusión*, 24.
[44] Fernández, *Memoria . . . 1902-1903*, 245; "El telégrafos sin hilos," *El Mundo*, 9 Dec. 1902, 1.
[45] "Telégrafos en California," *El Mundo*, 1 Oct. 1903, 1; "Sonora," *El Mundo* 11 Dec. 1903, 2; "Sinaloa," *El Mundo* 11 Dec. 1903, 2; "Las vías de comunicación," *El Mundo*, 19 Aug. 1903, 1; "Más líneas telegráficas" *El Mundo*, 5 Jun. 1906, 1, "En la Baja California se ha despertado gran interes," *El Economista Mexicano*, 4 Jan. 1908, 207.
[46] "Más Líneas telegráficas," *El Mundo*, 5 Jun. 1906, 1.

"theories and practices" of radio.[47] The first years of experiments, however, had taught officials a few things, mainly that atmospheric interference, despite technological improvements, occurred frequently from July to September when the rain and heat was most intense.[48]

Although problems persisted, the stations worked well enough to entice Fernández to order the construction of further works. In 1906, a pivotal year in terms of radio development, the same communications officials and German specialists continued to expand operations in the areas around the Gulf of California. This time they aimed at connecting the port of Mazatlán, Sinaloa—interestingly enough, home to an increasingly powerful German community—to the telegraphic offices in the Southern District of Baja California.[49] The engineers decided to erect the outposts at Cerritos, north of Mazatlán and next to the city of San José del Cabo. Once again, overland cables connected both stations to other telegraph offices in their respective states and into the federal system. These outposts took two years to construct and were not completely finished until April of 1908.[50]

In 1905, the year before the Mazatlán-San José del Cabo project got underway, Fernandez's offices had started the construction of radio stations in another provincial territory: Quintana Roo. For these operations they chose the small and newly established town of Payo Obispo (present-day Chetumal), which had a population of 1,500 in 1906, and the also recently constructed naval port of Xcalak. Like the previous stations, SCOP

[47] Fernández, *Memoria . . . 1903-1904*, 195.
[48] Ibid.
[49] "Alemanes en Mazatlán," *El Mundo*, 23 Feb. 1906, 2; Fernández, *Memoria . . . 1906-1907*, 102; "Telegrafía sin hilos," *El Mundo*, 22 Sept. 1906, 1.
[50] Leandro Fernández, *Memoria . . . por el Secretario de Estado y del Despacho de Comunicaciones y Obras Publicas . . .1 de julio de 1908 a 30 de junio 1909* (Mexico City: Tipografía de la Dirección General de Telégrafos, 1910), 101.

officials used German equipment, though now from AEG's successor company—Telefunken.[51] The receptor, however, possessed an older cohesor that did not live up to expectations. Along with the naval facilities, the stations stood out in their rural tropical environment. The Quintana Roo stations possessed antennas "consisting of 36 lines in the form of umbrellas suspended from a tower of iron twenty-seven meters tall."[52] If Marconi's radio tower startled the natives of the Isle of Wight, surely the Maya and British colonial woodcutters of the Rio Hondo river basin, further removed from industrialized centers, were even more surprised.

Separated by the Bay of Chetumal, the two stations lay only 37 miles apart, a reality that made their construction a very workable proposition. Multiple other reasons existed for building these stations. Like Baja California, residents in the area had evaded the control of the central government. The region was little developed and government officials saw radio as a convenient way to start incorporating the southern frontier. But these stations, in addition to some commercial and postal applications, possessed a dominant military element. Not only were there continuing conflicts between the government and various Mayan groups, especially the Santa Cruz, but also increasing military conflicts in neighboring Central American countries.

In the late 1800s many Maya communities in southeast Yucatán remained independent from the Mexican government. A legacy of the Spanish empire's failure to suppress and incorporate the area, the early Mexican Republic and the short-lived independent state of Yucatán (1841-48) fared to do any better. Political, economic, and cultural contentions exploded a long and often brutal war in the region fought

[51] Juan de Dios Bonilla, *Apuntes para la historia de la marina nacional* (Mexico City: publisher not stated, 1946), 244.

[52] Fernández, *Memoria . . . 1908-1909*, 102.

predominately between Mayan peasants on one hand and the Yucatecan and Mexican government on the other, a war that lasted from 1847 until the 1910s. Scholars commonly refer to this period, especially during the 1840s and 1850s, as the Caste War. The pacification of the Maya along Mexico's southern frontier remained a goal throughout Díaz's time in office. The final conquest of Chan Santa Cruz in 1901 by Porfirian general Ignacio Bravo and collaborating local leaders is sometimes regarded as the definitive end to the Caste War, however, segments of the region's population contested Mexican control until after the Revolution.[53]

Another important factor in establishing firmer control in the region was Mexican relations with the British Empire, specifically the colony of British Honduras.[54] For most of the 1800s the British colonists reluctantly supported the Maya population in the area that would become Quintana Roo. The colonists cut valuable woods on Mayan lands in trade for weapons and other goods. The Maya communities also formed a barrier between British Honduras and the Mexican state. As trade with Mexico became more important to Great Britain during the 1890s, however, a shift in policy took place. British officials informed the leaders of British Honduras that they needed to comply with Mexican attempts to pacify the region. Between 1893 and 1897 Mexico and England formally agreed that the Hondo River was the boundary between the two countries and in 1898 Mexican officials and businessmen began work founding a city along the Bay of Chetumal, Payo Obispo, and a naval site, Xcalak. The bay, in turn, became one of the

[53] See Paul Sullivan, *Unfinished Conversations: Mayas and Foreigners between Two Wars* (Berkeley: University of California Press, 1991); Terry Rugeley, *Yucatán's Maya Peasantry & the Origins of the Caste War* (Austin: University of Texas Press, 1996); Terry Rugeley, *Rebellion Now and Forever: Mayas, Hispanics, and Caste War Violence in Yucatán, 1800-1880* (Stanford: Stanford University Press, 2009).

[54] Present-day Belize.

main military bases of operations, complementing Peto, which rested in inland Yucatán east of Chan Santa Cruz.[55]

Engineers and local workers built the Quintana Roo wireless stations at the two newly established settlements on the Bay of Chetumal. There were various reasons for selecting these locations. For one, Mexico had ordered its small southern flotilla to observe the bay and the Hondo River, which drained into it, with the mission of stopping British contraband to Maya rebels, especially weapons. However, Great Britain and Mexico had come to a disagreement over the allowance of Mexican ships traveling to Payo Obispo. The only passable channel through the shallow bay zigzagged across the international border and British officials feared that any decision allowing free passage to Mexican vessels would someday haunt them if Mexico continued to become a more powerful nation.[56] The radio station connecting the naval base and the entrance of the bay and Payo Obispo at the other end helped alleviate some of the communications problems. It allowed Xcalak to send messages about naval operations and other matters to Payo Obispo, which could then be relayed to Peto—and in turn Mexico City—or to British Honduras and vice versa.[57] Military officials may have also hoped that the stations could be used to communicate with portable radios carried by military detachments. The army had started experimenting with such portable devices beginning in 1906.[58] However, it appears—at least on record—that they did not use the devices in

[55] Wayne M. Clegern, "British Honduras and the Pacification of Yucatan," *The Americas*, 18, no. 3 (Jan. 1962): 243-54; Carlos Macías Richard, *Nueva frontera mexicana: Milicia, burocracia y ocupación territorial en Quintana Roo* (Chetumal: Quintana Roo, 1997), 31-67.

[56] Clegern, "British Honduras and the Pacification of Yucatan," 252.

[57] *Convención entre los Estados Unidos Mexicanos y la Colonia de Honduras Británica para el enlace de sus líneas telegráficas*, 1910, Ramo Diplomático, caja 7-14-58, ARSE.

[58] Leandro Fernández, *Memoria por el Secretario de Estado y del Despacho Comunicaciones y Obras Publicas . . . julio de 1906 a junio de1907*, (Mexico City: Tipografía de la Dirección General de Telégrafos, 1908), 103-04.

military campaigns until the first year of the Revolution in 1910 and 1911.[59] These Quintana Roo installations also complemented the incorporation of radio devices aboard Mexican coast guard vessels and the anticipation of continued advancements in naval communications.[60] Here again, military officials drew directly from Marconi's designs for radio and how European militaries had used the medium in warfare.

The construction of the Quintana Roo stations tested Porfirian can-do to the limit. For one, the appropriate materials were hard to obtain. Communications officials often had to travel to Mérida in the neighboring state of Yucatán to acquire the essential products. It was also difficult to obtain enough workers and, according to Fernández, especially competent workers. The stations, nevertheless, were completed by 1907.[61] In total, the government spent 155,650 pesos on constructing these stations and those in Mazatlán and San José del Cabo.[62]

Beginning in 1906 private enterprises also started building radio operations. This became most common among American mining industries in northern Mexico. Influenced by the success of the government stations, George H. Holmes of the La Esmeralda mine obtained permission from the Díaz administration to start transmissions between his mine and the communities of Guadalupe y Calvo and Hidalgo del Parral,

[59] Juan A. Hernández to Gral. de División Secretario de Guerra y Marina, Chihuahua to Mexico City, 17 Dec. 1910, exp. xi/481.5/60, tomo 2, Fondo Revolucionario, Archivo Histórico de la Secretaría de la Defensa Nacional, hereafter cited as AHSDN; Juan A. Hernández to Gral. División Secretario De Guerra y Marina, Chihuahua City to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN; J. A. Hernández to Gral. Srio. Guerra y Marina, Chihuahua to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN; "Another Victory for Mexican Rebels," *New York Times*, 27 Dec. 1910, 4

[60] Merchán Escalante, *Telecomunicaciones*, 57.

[61] Fernández, *Memoria . . . 1906-1907*, 103.

[62] Fernández, *Memoria . . . 1906-1907*, 102. The cost in US dollars was approximately half the number of pesos.

Chihuahua.[63] Most American mining businesses, however, were more concerned about communicating with corporate offices in the United States. This was certainly the case with stations constructed by the American Smelting and Refining Company, the Cananea Consolidated Copper Company, the Lluvia de Oro Gold Mining Company, and the owners of the Chispas Mine, which operated illegally without government concessions.[64]

However, the use of private radio spread beyond mining operations. According to a 1906 article in the newspaper *El Mundo*, a handful of businesses and hacendados obtained radio equipment to "communicate with neighboring populations" because storms commonly destroyed telegraph lines.[65] There is some evidence that some tech-savvy hacienda owners had also become interested in TSH not only for communication, but for agriculture. They had paid attention to foreign reports of how the technology was employed in a number of commercial applications. One interesting topic that caught the attention of this group was the effects of radio waves on plants. In the early 1900s a handful of scientists, U.S. military technicians, and Mexican engineers and hacendados experimented and read on the topic.[66] In response to individual and business requests, the Díaz administration created a specific department within SCOP to grant radio permits to private businesses. Officials specialized in communications and public works legislation drew up contracts with private entrepreneurs and experimenters, an arrangement that allowed for some supervised private radio use.[67]

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[63] "La telegrafía sin hilos," *El Mundo*, 2 Jan. 1906, 1.
[64] Schwoch, *The American Radio Industry and Its Latin American Activities*, 20.
[65] "La telegrafía sin hilos," *El Mundo*, 2 Jan. 1906, 1.
[66] "Experiencias sobre telegrafía sin hilos," *Anales de la Asociación de Ingenieros*, 49-84; "Extraño empleo del radio," *El Progreso de México*, 22 Apr. 1910, 170.
[67] "La entreviste de hoy: Guillermo Moreno Arenas, *El Telegrafista* 3, no. 24 (Dec. 1955): 19-20.

Although the Díaz administration approved of some private radio use for personal business communications, the government controlled all public operations and, outside of Telefunken, remained resistive to foreign wireless companies. In 1906, SCOP shot down an initiative by the American De Forest Wireless Company to establish radio posts to communicate with ocean vessels along "the entire coast of Mexico where it would pay to erect them." [68]

While the SCOP was building stations in Quintana Roo and Baja California, the Porfirian government also participated in 1906 International Radio Telegraph Convention in Berlin. For the event, the Díaz administration sent General José M. Pérez to contribute to global radio policies and debates about Marconi's attempt to monopolize radio services. It was the second-ever international conference on wireless communications, and it had expanded significantly since the first meeting in Berlin in 1903. The earlier convention only included representatives from France, Great Britain, Italy, Austria-Hungary, Russia, Spain, and the United States.[69] In 1906 there were delegates from twenty additional countries, including five from Latin America: Argentina, Brazil, Chile, Mexico, and Uruguay. In addition to working out an alphabet for international signaling, the meeting discussed matters of war, trade, and especially transmissions between ships and from sea vessels to shore. Precedents for the discussion were not only the first radio convention, but also the October 9, 1874 Treaty of Berne and the June 15, 1897

[68] C. C. Wilson to Hon. Secretary of State, Republic of Mexico, Denver to Mexico City, 17 May 1906, caja 41-16-5, ARSE; Illegible name to the Secretario de Relaciones Exteriores, Mexico City, 22 Jun. 1906, caja 41-16-5, ARSE.

[69] Letter from the German ambassador to the U.S. Secretary of State, "International Wireless Telegraphy Convention," *Papers Relating to the Foreign Relations of the United States with the Annual Message of the President, Transmitted to Congress, December 3, 1906, part 2* (Washington, DC: Government Printing press, 1909), 1513-14; Linwood S. Howeth, *History of Communications-Electronics in the United States Navy* (Lansing: University of Michigan Library, 1963), 547-48. For more on the 1903 and 1906 conferences, see Hills, *The Struggle for Control*, 100-07.

Washington Universal Postal Convention; both of which had focused on unifying disjointed international mail services and regulations.[70] These discussions indicate how many of the attending officials viewed radio services as an extension of public postal and telegraphic operations. However, there was a large military element to Mexico's position as well. In fact, the general had specific orders to "ensure the interests of Mexico; understanding the military relationship to the coastal stations and aboard our ships of war."[71] Following the wishes of his superiors, Pérez sided against Marconi and England, as most other representatives did, and with Mexico's German radio providers.

Backing the agreement, the senate ratified the terms in 1907, which the *Diario Oficial* published in Spanish and French in February 1909. This conference, along with the Constitution of 1857, largely guided communications officials. The telegraphers and engineers involved in the newly constructed Cerritos and San José del Cabo stations quickly switched their operating frequency in order to fit within the new international guidelines.[72]

In addition to Cerritos and San José del Cabo, the Mexican state continued to expand coastal stations with the assistance of German equipment and expertise. Although much of the early energy of radio development shifted to the Pacific and the Caribbean, experiments continued along the coast of Veracruz as well. DGTN employees had also conducted a number of transmissions from the Yucatán peninsula in hopes of connecting the region to Veracruz, other gulf ports, and of further incorporating

[70] *International Radio Telegraph Convention of Berlin: 1906* (Washington, DC: Government Printing Press, 1912); "General Postal Union; October 9, 1874," The Avalon Project: Documents in Law, History and Diplomacy, Yale Law School, Lillian Goldman Law Library, http://avalon.law.yale.edu/19th_century/usmu010.asp, accessed November 22, 2010.

[71] Merchán Escalante, *Telecommunications*, 57.

[72] Merchán Escalante, *Telecomunicaciones*, 56-61.

southeastern Mexico into the federal communications system. These experiments carried huge trade implications, but they, like the other radio projects, also had ramifications for military and political consolidation plans.[73]

The wireless project in the Gulf of Mexico, however, did not meet with the desired success until the last year of the Díaz administration. After struggling to find the appropriate location to build the radio stations and eventually expropriating land to build the towers, regular "*Marconigrafía*" services commenced between Veracruz and Campeche in October 1910. The stations could transmit at a distance of 500 kilometers, or almost 310 miles, and the original dreams of SCOP officials had finally been realized. Although atmospheric conditions occasionally caused problems, the systems worked to the satisfaction of SCOP engineers who exuberantly stated that their achievement made Mexican ports of "the first order."[74] Radio was becoming more and more an essential part of international commerce as businesses and governments of the most prosperous nations equipped their ships with wireless apparatuses.

While working out the last kinks in the new Veracruz and Campeche stations, the SCOP also constructed new buildings for their expanding operations. In Veracruz, where the old telegraph and post office suffered from rusting metal and general dilapidation, workers built a new building "looking over the sea" with new furniture, "hygienic conditions," and refurbished electric and telegraphic connections.[75] Locals and SCOP officials inaugurated its opening December 7, 1909. Its newer proximity to the water

[73] "Aumento de empleado Telecátan," *El Diario*, 8 Jul. 1907, 2.
[74] "Aparatos de telegrafía sin hilos en el Golfo," *El Imparcial*, 29 Oct. 1910, 5.
[75] "Edificio de correos y telégrafos," *El Imparcial* 6 Dec. 1909, 2, 8; "El telégrafo en Veracruz," *El Imparcial*, 11 Dec. 1909, 7.

allowed for more efficient communications with commercial and government ships. Similarly, the main telegraph office in Mexico City received a partial make over.[76]

In 1910 wireless operations expanded in another area as well. The staff at the penal colony on the Isla María Madre off the Pacific coast of the state of Nayarit completed a station that communicated with San José and Cerritos. Not only did this radio allow communications between the prison and the mainland, but it also provided news about ships in the Pacific and the Gulf of California.[77]

Life for federal telegraphers at these early radio stations must have been fairly simple, if not boring at times. Although interaction with foreign traders and important officials must have been interesting on more than one occasion, these outposts were often in desolate locations. Employees commonly opened their doors to business at eight in the morning and generally closed around one in the afternoon.[78] Although often separate from nearby villages, these stations sometimes included things like warehouses, a small naval base, an oven for baking bread, a post office, a wharf, and a rain-catching systems for drinking water.[79] Typical for the building housing the radio equipment was "a house of Iron and wood and two iron towers forty-five meters tall upon elevated land."[80] One Mexican scholar described the epicenter of these locations as "a couple of buildings: the work station with a gigantic antennae and the staff house, which included a kitchen and a cellar. In the rooms, the furniture was minimal, and the workplace was full of cables and bulky equipment."[81]

[76] Fernández, *Memorias, 1908-1909,* 101.
[77] Merchán Escalante, *Telecomunicaciones,* 63.
[78] Ornelas Herrera, "Radio y cotidianidad en México," 132-34.
[79] Ibid, 132.
[80] Fernández, *Memoria . . . 1906-1907,* 102-03.
[81] Ornelas Herrera, "Radio y cotidianidad en México," 132-33.

Apparently the work could be dangerous as well. In February 1909 the manager at the Cabo Haro station ignited the radio building while cleaning a gas generator. After the fire exploded nearby cans of gas, oil, and alcohol, the blaze ravished most of the structure within minutes. The fire also destroyed all of the radio equipment suspending communications with Santa Rosalía until the government constructed another station at Bacochibampo near Guaymas in June 1910.[82] But even if the work was sometimes tedious, telegraphers were important to a number of powerful businesses and government leaders. While usually not an entrée into high society, the job of radio telegrapher offered stability, respectability, and relatively good pay.

**Radio and Military Modernization**

As previously stated, the military played an important role in radio development. Army officials had scouted Europe and the United States for new developments in radio technology and had also worked out trade agreements with Germany. As exhibited by the first frontier stations, these military officials, like their SCOP counterparts, hoped that radio would help consolidate state control, damper threats of American filibustering, and to finally quell Mayan rebellion forever. Also, like SCOP directors, leaders of the Secretariat of War and Marine (SGM) saw radio largely as an extension of wire telegraphy. Army commanders, however, also started the first experiments with portable field radios, hoping to incorporate wireless communications as a part of a more modern military organization. These portable wireless communication devices, however, were still in an experimental stage when the Mexican Revolution erupted in 1910. Although

[82] Fernández, *Memoria . . . 1909-1910,* 107.

radio became better known and increasingly used by the last year of the Porfiriato, most army and naval units still relied on older forms of technology.

A whole company of telegraphers already had existed in the army's Department of Engineers. In time of war it was organized into divisions of "ten telegraphers, ten orderlies, and ten horses." Some of their main tasks included "the construction, reparation, and destruction of paths of transportation," "the installation, conservation, exploitation, and destruction of telegraph and telephone lines, military as well as public and private," and "the establishment of posts for telegraphic signals of any system and the arrangement of the corresponding codes." They operated as the vanguard and rearguard of army operations, gathering and transferring information, preparing means of transportation, and preparing points of communications. In times of peace, they studied theory and applications useful for military service. The Department of Engineers additionally possessed a *jurado tecnico*, or technical group, that also studied the "reception and transmission of telegraphic signals and dispatches." The Military College likewise taught courses in campaign communications. Among the professors and technical groups in the armed forces, radio had become a new and important topic in communications development, and engineering, telegraphy, and naval students were at least introduced to the subject.[83]

Radio operations in the military, as in other sectors of Mexican society, accelerated in 1906. Indeed, the SCOP and the military worked together. The radio stations under construction in Quintana Roo served the army and the navy.[84] SCOP

[83] Bernardo Reyes, *Memoria . . . 1900-1901*, 36, 328, 359-60, 364-67; Manuel González Cosio, *Memoria . . . por el Secretario de Estado del Despacho de Guerra y Marina, 1 enero 1908 al 30 Junio 1909* (Mexico City: Talleres del Departamento de Estado Mayor, 1909), 146.

[84] "Telegrafía sin hilos," *El Mundo*, 22 Sept. 1906, 1.

officials, including Luis Sánchez Martinez, who would continue to work with wireless military applications throughout the Revolution, also began a series of field radio experiments for the military.[85] The goal was to build portable equipment that could successfully transmit messages at a distance of 30 kilometers or 18.6 miles and over flat terrain. Officials built two sets from parts imported Europe and fabricated in Mexico. The resulting products must have been an impressive spectacle. Each one possessed a bronze antenna 35 meters tall, a "ground antenna, of six similar poles and about forty meters long, which rest almost horizontal" and "a dinamo of 45 volts per amp mounted on a bicycle frame to power it [the radio] by means of the corresponding pedals."[86] With the addition of numerous other pieces of equipment to the already large contraptions, the devices may have been "portable," but they were not easily moved.

The first experiments with these *estaciones portátiles* began in February 1907 in the vicinity of Mexico City. SCOP employees began by transmitting at short distances. They set up one station on the campus of the School of Agriculture and the other in the community of San Alvaro, a little over a mile away. The following month, the radio operators moved the second device to the Hacienda de Aragón northwest of the city, increasing the distance to 5 miles. After achieving clear transmissions at both locations, they moved the equipment at the School of Agriculture even further away to Ixtapalapa, 14 kilometers or nearly 9 miles from Aragón. Messages came through clear in the latter location but a little weaker in Ixtapalapa. Nevertheless, communication was maintained between the two points. On April 5, the experimenters moved the Ixtapalapa station to *Cerro de Estrella*, or Star Hill, but could not obtain a satisfactory signal. After again

[85] Fernández, *Memoria . . . 1906-1907,* 104; Fuentes, *La radiodifusión*, 24.
[86] Fernández, *Memoria . . . 1906-1907,* 103-04.

moving the contraption to another hill by the town of Texcoco, 15.5 miles from Aragón, they again were able to transmit messages, though with some difficulty. Deciding to move the operations a little closer together, the SCOP officials moved the radio in Texcoco to its final testing grounds in the Hacienda de Tepetotlán and then to the town of Los Reyes. After some early problems, communications stabilized at these last locations. The resulting report concluded that the portable radios worked well enough at distances of 12.5 miles, but not at the 18.5 miles that the military had hoped for.[87]

Most soldiers, however, had little actual experience with radiotelegraphy. Outside of the few portable devices, the Quintana Roo and Chapultepec stations, and experiments on sea vessels, radio was largely something heard about and rarely seen. Even in the areas of the military where TSH had the most applicability—the Department of Engineers, the Navy, expeditionary forces—older technologies were far more prevalent and relied upon. Specialists largely learned how to set up and destroy wire telegraphic and telephonic operations and how to use flag signaling. In addition to light signals, most sailors still relied on flag communications. Even though experiments were undoubtedly underway, the reports of the Secretary of War and Marine to congress rarely make any mention of radio training or services, on land or sea.

**Conclusion: Porfirian Radio**

By the end of 1910, radio still played a secondary role in communications in Mexico, as it did in all countries using the technology. Wire telegraphs and telephones were far more relied upon to connect the nation. But radio played an essential role in increasing the country's connection to the outside world and in linking provincial

[87] Fernández, *Memoria . . . 1906-1907,* 104.

territories—especially those with less developed means of transportation, including Baja California and Quintana Roo—to the mainland. Political, economic, and military motivations drove the development of this technology, though a small group of engineers and academics experimented with radio as well. A handful of powerful private enterprises and hacendados frustrated with the shortcomings of wire telegraphy, or in the case of American mining industries, disconnected from far away corporate offices, also turned to radio as a new means of communication. It was, however, SCOP officials and the military, with the assistance of foreign engineers and businessmen, who were responsible for most of the progress in wireless communications from 1900 to 1910.

It was state employees that managed the public stations. They also operated the army and naval radio operations in the country. These officials were in the process of making portable radios more efficient when the Revolution started in late 1910. With the outbreak of the subsequent civil war, especially after 1913, combat shifted the emphasis of radio use to fit the tumultuous circumstances. Although the Revolution wreaked havoc on the economy, the combatants' desire for radio and other technologies actually accelerated the growth and use of wireless equipment, and the warfare provided training for many of Mexico's future radio specialists.

Chapter Three

Revolutionary Radio

> Religion and science both profess peace (and the sincerity of the professors is not being doubted), but each always turns out to have a dominant part in any war that is going or contemplated.
> —Howard Nemerov[1]

Throughout the month of December 1910, a mixture of anxiety and curiosity filled the streets of El Paso, Texas. A revolution had erupted in Mexico. Francisco I. Madero, the reformist son of wealthy land owners, had called the nation to arms after unsuccessfully running against Díaz in a fraud-filled election for the presidency. Rebels were attacking federal outposts and towns in the northern mountains and the aging seven-term president had sent forces north from Mexico City. The day after Christmas, a weary American mining engineer crossed into El Paso from Chihuahua. The escalating violence convinced the Spanish-American War veteran to return to the United States. Upon his arrival, he told reporters that he had run into the federal forces of Brigadier General Juan J. Navarro, an old and decorated military companion of Díaz. The Mexican president had charged Navarro with punishing the insurrectionary upstarts along the northern frontier. His soldiers, however, lacked the drive needed to combat the mountain insurrectionists. According to the engineer, Navarro's three-hundred "sorry-looking fighters" looked ragged and demoralized from long marches and recent defeats. Indeed, they had just suffered at the battles of Aldana and Mal Paso, where they left many of their dead comrades to rot unburied.[2] The American had low

[1] Howard Nemerov, "On the Resemblances between Science and Religion," *Figures of Thought: Speculations on the Meaning of Poetry & Other Essays* (Boston: David R. Godine, 1978), 54.
[2] "Another Victory for Mexican Rebels," *New York Times*, 27 Dec. 1910, 4.

expectations for the government's army. He also provided a second bit of intriguing news; another advancing force—the 9th Battalion—carried the iron, cables, batteries, and bicycle essential for wireless operations. Having established a radio tower in Chihuahua, they hoped to restore communications with Navarro and the frontlines of battle. The time had come for the military to test its portable equipment in combat.[3]

Although the Revolution was not the first war in which combatants used wireless communications, radio became an important component of information gathering, naval encounters, espionage, and the movement of forces. Wire telegraphy still dominated electronic communications, but TSH increasingly played a more important role as the "eyes and ears" of war. In fact, the warfare accelerated much of the technological revolution that had begun in the mid-nineteenth century. This was definitely the case with radio. Wireless use expanded significantly during the Revolution as combatants adapted the medium to meet war conditions. Not only did the number of devices increase, but so too did the number of radiotelegraphers. However, the increase was almost solely among militants; indeed, growth was hampered among experimenters attempting to avoid risks associated with the warfare. But as Carranza gained a greater, if still fragile, control over larger portions of Mexico, his administration reinvigorated the drive to use wireless telegraphy to consolidate control over the nation with a new intensity. In his acquisition of radio devices, Carranza increasingly turned to the United States because of its proximity and technological superiority, U.S. actions against President Victoriano Huerta (1913-14), including the

[3] Juan A. Hernández to Gral. de División Secretario de Guerra y Marina, Chihuahua to Mexico City, 17 Dec. 1910, exp. xi/481.5/60, tomo 2, Fondo Revolucionario, AHSDN; Juan A. Hernández to Gral. División Secretario De Guerra y Marina, Chihuahua to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN; J. A. Hernández to Gral. Srio. Guerra y Marina, Chihuahua to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN.

lifting of an arms band against the *carrancistas* in February 1914, and the disruption of easy access to European equipment caused by World War I. These revolutionary-era leaders saw radio through the lens of military application. The Revolution intensified this tendency as the technology provided an important communications tool for combatants. Wireless messages changed the course of decisive battles, and military considerations would continue to color how post-revolutionary leaders saw radio in the subsequent decades.

**The Madero Rebellion and the Continuation of Porfirian Wireless Policies**

The Madero uprising and presidency, the first chapter of the Revolution, started as a political revolt in 1910 and ended with the assassination of Madero in February 1913. Like Díaz himself, much of the Porfirian administration—cabinet members, advisors, military officers, governors—had grown old and stingy with their power. A younger generation of middle-class professionals in league with ostracized elites variously agitated for a greater voice, for democracy, or at least political spoils. Few of these middle-sector discontents were genuinely radical; rather, they saw themselves as champions of the ideals of the 1857 Constitution, ideals to which Porfirian political leaders had shown only lip service.

It was in a 1908 interview with American journalist James Creelman that Díaz inflamed political fires to a point where they could not be easily extinguished. Telling the reporter that he would not run in the 1910 elections, Díaz's comments spurred a burst of widespread civil activity. The dictator's decision to betray his word antagonized his now energized opponents. By 1910 Madero had solidified his position

as the candidate of the *anti-reelecionistas*, a newly formed opposition party. In fact, Madero had gathered enough of a following to prompt Díaz to order his arrest before the presidential contest. After escaping incarceration Madero proclaimed his rebellion while in exile in Texas. His revolt fared poorly at first as most of his urban intellectual followers met an early defeat.[4] That might have spelled the end of his revolt if a large number of disgruntled rural Mexicans had not also responded to his call-to-arms. Leaders from the northern mountains, including Pascual Orozco, José de la Luz Blanco, and Pancho Villa gained armies of peasants, laborers, and small ranchers, who battled the federals to a standstill, breathing air into the struggling revolution.

It was under these conditions that Díaz sent Navarro's forces north. Through the arid terrain they made their way during the cold of winter to scout and skirmish with rebels in the vicinity around the city of Chihuahua. A number of witnesses made note of their appearance, including the aforementioned American mining engineer. After obtaining some small victories, rebels under the leadership of former muleteer Pascual Orozco dealt Navarro's forces an obvious and serious defeat. Not only had the these battles, which occurred on December 17-18, 1910, killed dozens of government soldiers and demoralized many of those that survived, the attackers had succeeded in temporarily isolating the federals, disrupting the wire telegraphs and the nearest railway line. In response, Díaz demanded the accounts of almost every surviving officer involved and sent the 9th battalion to Chihuahua.[5]

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[4] Knight, *The Mexican Revolution*, vol. 1, 183-84.

[5] Juan A. Hernández to Gral. de División Secretario de Guerra y Marina, Chihuahua to Mexico City, 17 Dec. 1910, exp. xi/481.5/60, tomo 2, Fondo Revolucionario, AHSDN; Juan A. Hernández to Gral. División Secretario De Guerra y Marina, Chihuahua to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN;

The defeat of one of the more powerful federal forces in the north also prompted Díaz and the military to test one of Marconi's earlier sales pitches for TSH, to use the technology to connect with troops in a "lonely spot" where rebels had cut the telegraph lines.[6] General Angel Garcia Peña, head of the Geographic Explorers Commission, tagged along with the 9th battalion, bringing radio materials to "establish and experiment with TSH in order to connect Navarro to this city [Chihuahua]."[7] Improvements in field radios had allowed for transmissions of slightly greater distances than in 1907, but they were still far from reliable in the mountainous terrain of northern Mexico. And one set of field radios was far from enough to save the crumbling regime and its demoralized army.

Rebels too had realized the potential of electronic communications, including radio, though access to such equipment was extremely limited. In addition to the northern rebels, an uprising in the small state of Morelos over the loss of peasant lands led by Emiliano Zapata had been underway since 1909. Nominally joining forces with Madero, *zapatistas* took advantage of TSH via an American reporter who appears to have had access to a transmitter. After they captured the state capital, Stephen Bonsal, a special correspondent for the *New York Times*, stated on May 22, 1911 that "Cuernavaca is quite orderly under the rebels, and foreigners are reassured. As an advance on wireless telegraphy I would state that the revolutionary authorities in the city reported to me the capture of Cuernavaca five hours before they took the place, but they made good on their word."[8] Rebel leaders in Morelos, contrary to popular

[6] "Marconi's Telegraph," *New York Times*, 23 Jan. 1898, IWM3.

[7] J. A. Hernández to Gral. Srio. Guerra y Marina, Chihuahua to Mexico City, 18 Dec. 1910, exp. xi/481.5/60, tomo 3, Fondo Revolucionario, AHSDN.

[8] Stephan Bonsal, "Mexican Catholics Plan to Rule Nation," *New York Times*, 23 May 1911, 1.

notions— then and now—possessed a keen understanding of how to use media and communications technologies for propaganda.

Madero also knew about radio. He had used modern technologies while managing his family's properties prior to the war. Well-read and well-traveled, he surely knew about the progress and uses of TSH. His forces as well as Zapata's intentionally targeted other means of federal communication for destruction, especially trains and telegraphs. In both Ciudad Juárez and Cuernavaca rebels burned down these stations.[9] Most tellingly, Madero rapidly expanded wireless technologies after Díaz's defeat.

With the fall of Ciudad Juárez and Cuernavaca, Díaz read the writing on the wall and resigned. Uprisings had sprouted up across the country. He boarded the steamship *Ipiranga* and set off for exile in Europe. Within days of the ascension of Madero an earthquake hit central Mexico, an uneasy sign for the new government. Díaz received news of the disaster via an Atlantic City radio station. He gave his laments as he sailed away . . . both over the waves.[10]

Rebellion, however, did not stop with Madero's presidency. Some of the old revolts continued and new ones arose as Madero failed to enact the social changes that so many of those that fought under his banner demanded. The reluctance to make quick or extreme decisions, especially in matters of land distribution and municipal autonomy, provoked the *zapatistas* to continue their fight against the federal government. Orozco rebelled in 1912 with the support of many of his original supporters but also from powerful Porfirians including Luis Terrazas and Enrique Creel, making for an

[9] Las comunicaciones cortadas," *El Imparcial*, 10 May 1911, 1; "Los rebeldes incendiaron varios edificios comerciales y la estación del ferrocarril interoceánico," *El Imparcial*, 20 May 1911, 1.

[10] "El Sr. Gral. Díaz recibe noticia del temblor," *El Imparcial*, 10 Jun. 1911, 1.

interesting mix of reactionary forces with revolutionaries who sought out greater reform. Counterrevolutionaries also took up arms under the banners of Félix Díaz, the deposed dictator's nephew, and Bernardo Reyes, the former Porfirian Secretary of War and Marine and governor of Nuevo León.

Wireless communications proved advantageous for *maderista* forces. Using TSH, Commodore Manuel Azuerta reported the outbreak of the counter-revolutionary rebellion in Veracruz initiated by Díaz. Azuerta contacted the Madero government in Mexico City via the radio system on an American Ward Line vessel in the harbor, by which he also obtained orders from the capital. Along with the response of Generals Joaquín Beltrán and José Hernández, Azuerta's actions were crucial to the quick defeat and capture of Díaz, who was arrested within in a manner of hours and sent to prison in Mexico City alongside Reyes, whose previous revolt had also been defeated.[11]

The Madero administration installed TSH devices aboard its own ships as well. In 1911 communications specialists installed radios on the gunboat *Bravo*. At the time, the *Bravo* was one of the Mexican navy's best ships. It not only roamed the coasts, usually in the Gulf of Mexico, but also represented Mexico in the Caribbean. For example, that year it made a visit to the Cuban port of Santiago, where the country's officials showered the Mexican marines with a festive reception before providing a tour of the city's most historic sites. As one of the navy's vessels that voyaged to other countries, wireless apparatuses made travel and communications with foreign nations and ships easier. Needless to mention, this type of equipment provided Mexican ports a more modernized image. Additionally, as done on the Ward Line vessel, officials

[11] Ornelas Herrera, "La radiodifusión mexicana," 120-21; Ulloa, "La lucha armada (1911-1920)," 1102.

hoped that the *Bravo* would relay important messages to coastal stations and to the capital. In 1912 communications officials installed a similar device on the *Melchor Ocampo*, a coast guard vessel that kept surveillance of Mexican shores; in this instance, in the Gulf of California.[12]

On land, the army under Madero—mostly the same forces that served Díaz—installed a French-made transmitter and receptor in the forest surrounding Chapultepec Castle and in the city of Torreón, Coahuila, exclusively for the use of the armed forces.[13] The Chapultepec station, overseen by engineer Estanislao González Salas, Director of Works of the National Palace and Chapultepec, consisted of "two elevated towers and a little house in the center for the employed operators" located in the northern part of the forest near the boundary of the park.[14] In addition to field radios, these stations established improved communications between the president and the front of (counter) revolution rekindled in the north by Orozco. Through these stations Madero and the military improved one of the communication deficiencies of the Díaz administration. Although the federal army under Madero had difficulty in decisively defeating Orozco, these radio posts helped the government maintain control in the Torreón vicinity.

Outside of Torreón, the wireless posts surrounding Baja California were the only government stations close to continued revolutionary upheaval. Taking advantage of the momentum provided by Madero, members of the radical *Partido Liberal Mexicano*

[12] Merchán Escalante, *Telecomunicaciones*, 65; Fuentes, *La radiodifusión*, 25; "Agasajos á marinos del cañonero Bravo, *El Imparcial*, 12 Aug. 1911, 5; De la Fuente, *Memoria por el Secretario de Estado y del Despacho de Comunicaciones y Obras Públicas, 1911-1912*, 129-30.

[13] Fuentes, *La radiodifusión*, 25. Bonleper was the name of the French company that supplied the equipment.

[14] Carlos Rincón Gallardo to the Ministerio de Gobernación, 27 May 1912, Mexico City, Vol. 1254, Exp. 400, Fondo Ayuntamiento, Archivo Histórico del Distrito Federal, further stated as AHDF.

or Mexican Liberal Party (PLM)—nominally led by the intellectual Ricardo Flores Magón from his armchair in Los Angeles—in addition to members of the Industrial Workers of the World and foreign soldiers of fortune, invaded Baja California with aspirations for adventure and creating an anarchist utopia. Although the invaders, who saw themselves as liberators, successfully captured the cities of Algodones, Tecate, and Tijuana, the different factions and motives within the rebel force turned the *floresmagonista* invasion into a comic farce that ultimately caused residents of Baja California and leftist groups in the United States to abandon support for the movement.

When former Porfirian diplomat Francisco León de la Barra became interim president (1910-11)—Madero waited for formal elections to hoist him into high office—Flores Magón rebelled against his tentative former ally. News about continued *floresmagonista* actions reached Mexico City via telegraph connections through the United States, but also via the Santa Rosalía and Bocochibampo wireless stations. The head of the Santa Rosalía *rurales*, a rural police force first created in the late 1860s, for example, used the station there to report that approximately "sixty filibusters were marauding around Santa Rosalía and Camilla," an area that Flores Magón more or less correctly argued was controlled by *El Boleo*, "a rich French company."[15] Radiotelegraphers also noted the arrival of the steamship *Korrigan*, from which federal forces disembarked to Juventino Rosas's famous waltz "*Sobre las Olas*" or "Over the Waves." The song was a relevant choice considering the naval component of the operation and that the wireless telegraphers transmitted news of their arrival via radio[16]

[15] "Vuelven á aparecer filibusteros en la Baja California," *El Imparcial*, 19 Jul. 1911, 4; Agustín Cue Canovas, *Ricardo Flores Magón: La Baja California y Los Estados Unidos* (Mexico City: Libro Mex, 1957), 50-53.

[16] "Los magonistas merodean por Santa Rosalía," *El Imparcial* 24 Jul. 1911, 3.

The federal forces defeated the remnants of the PLM soldiers in the summer of 1911, thus ending the invasion.[17]

Nature took a far greater toll on radio stations than rebels. A Pacific hurricane devastated a number of communities along the Gulf of California on October 4, 1911. Blowing in around midnight and lasting until 2:00 a.m., the fierce storm destroyed thousands of dollars worth of property and almost completely devoured small coastal villages in Baja California and Sinaloa. In Guaymas, the storm threw fishing boats and large steamers alike onto the beaches and into the town.[18] The telegraph lines from Guaymas to the Bocochibampo radio office broke in a number of places. The storm had ripped that station's roof off, flooding the building and soaking the equipment. In Santa Rosalía the hurricane snapped the northern radio tower 20 meters up and broke the telegraph line that connected the station to the neighboring town of Mulegé. In San José del Cabo, at the southern tip of the peninsula, the water and winds damaged the base of the antenna. Radio communications broke down between Santa Rosalía and Bocochibampo and between San José del Cabo and Mazatlán. Crews re-established communications at the former in four days and the latter in seven.[19]

Interestingly enough, the same day that *El Imparcial* printed its story on the Gulf of California hurricane, it also reported experiments of another sort of wireless device.

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[17] Works on Ricardo Flores Magón and the PLM invasion of Baja California in 1911 include, Canovas, *Ricardo Flores Magón*; James A. Sandos, *Rebellion in the Borderlands: Anarchism and the Plan de San Diego, 1904-1924* (Norman: University of Oklahoma Press, 1992); Colin M. MacLachlan, *Anarchism and the Mexican Revolution: The Political Trials of Ricardo Flores Magón in the United States* (Berkeley: University of California Press, 1991); Ricardo Flores Magón, *Dreams of Freedom: A Ricardo Flores Magón Reader*, eds. Chaz Bufe and Mitchell Cowen Verter (Edinburgh: AK Press, 2005).

[18] "Worst Storm in Fifty Years," *Los Angeles Times*, 13 Oct. 1911, I5; "Fue espantoso el ciclón que azotó al Puerto de Guaymas, *El Imparcial* 20 Oct. 1911, 1; "La población de San Ignacio casi destruida por el ciclón," *El Imparcial*, 21 Oct. 1911, 4.

[19] De la Fuente, *Memoria por el Secretario de Estado y del Despacho de Comunicaciones y Obras Públicas, 1911-1912*, 130.

In October engineer Coronel Vito Alessio Robles commenced heliograph tests between the National Palace and Chapultepec Castle. Similar to TSH, heliography relied on Morse code to transmit wireless signals. The difference, as the name suggests, is that heliographs transmitted messages via light, usually the sun. Using a pivoting mirror and a rude shutter, the device could transmit messages over long distances. Like radio, the British had used heliographs in the Second Boer War. The American military had likewise adopted these apparatuses, most famously in its wars with Apache bands in the U.S. southwest. The Mexican armed forces incorporated a greater number of heliographs to better communications, a sign of the escalating conflicts.[20]

The Madero rebellion, however, brought little change to the course of radio development that was underway during the Porfiriato.[21] The advancements in military communications were already in planning before Madero took office. Employees and engineers contracted by the DGTN continued with the projects that they had begun during the Porfiriato. In Mexico City newspaper readers still kept abreast with the newest developments abroad, just as they had before. Residents read about the new U.S. station at Fort Meyer, which communicated with a sea vessel approximately 2,500 miles away, destroying the previous record of 600 miles.[22] They read about how the Brazilian, Argentine, Paraguayan, and Uruguayan governments were all developing a national wireless system.[23] Upgrades to the new SCOP building continued, receiving

[20] "Los aparatos heliográficos en el ejercito," *El Imparcial*, 20 Oct. 1911, 1.

[21] This finding reinforces similar conclusions reached by other scholars about the Mexican economy and industry 1910-1913; see Stephen Haber, *Industry and Underdevelopment: The Industrialization of Mexico, 1890-1940* (Stanford: Stanford University Press, 1989), 124.

[22] "Un radiograma a mas de dos mil millas," *El Imparcial*, 27 Mar. 1911, 2.

[23] La telegrafía in hilos en el Brasil," *El Imparcial*, 29 Mar. 1911, 3.

praise from Madero and his Secretary of Communications and Public Works Manuel Bonilla.[24]

The biggest changes were transitions at the highest levels of government. Díaz reshuffled his cabinet as a last ditch effort to remain in power in March 1911. The Undersecretary of the SCOP and the Director of the Postal Service "resigned." On May 25, Francisco León de la Barra, whom Díaz had just recently placed as Secretary of Foreign Relations in the March realignment, became the provisional president of Mexico while Madero campaigned to win the presidency by election.[25] Under De la Barra, engineer Manuel Urquidi became Director General of National Telegraphs and then, under Madero, Undersecretary of SCOP. Miguel A. Cosio filled Urquidi's former position for a short time in 1911.[26] The following year Madero gave the position to communications specialist Mario Méndez in January 1912.[27] The new president made Manuel Bonilla his Secretary of Communications and Public Works. The shifting was constant.

Although new to the job, Bonilla knew, or quickly learned, national and international communications policies. Almost as soon as he obtained the position he exhibited a firm grasp of Mexico's wireless agreements and stations during a dispute with the New York and Cuba Mail Steamship Company of the United States and U.S. Ambassador to Mexico Henry Lane Wilson, Madero's implacable foe. In October 1911, one of the American steamers had entered the waters around Veracruz.

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[24] "El Nuevo edificio de comunicaciones fue visitado por el Sr. Madero, *El Diario*, 28 Dec. 1911, 1.

[25] For more on De la Barra, see Peter Henderson, *In the Absence of Don Porfirio: Francisco León de la Barra and the Mexican Revolution* (Wilmington, DL: Scholarly Resources, 2000).

[26] "Entrevista al Sr. Ing. Urquidi," *El Imparcial*, 3 Jun. 1911, 3; "Mañana tomará posesión el nuevo director de telégrafos," *El Imparcial*, 9 Jul. 1911, 5.

[27] "Nuevo Director de Telégrafos," *El Diario*, 4 Jan. 1912, 1, 4.

Communicating to the newly functional wireless station, the ship's telegrapher discovered that their calls were unwelcome. Cosío, than the managing official at the Veracruz station, responded that under orders from a 1909 circular, Mexican stations were not to communicate with vessels from countries that had not ratified the provisions of the 1906 International Wireless Convention of Berlin except in cases of emergency. Cosío then recommended that agents of the American steamship company contact the U.S. government in order to work out an arrangement. Infuriated, Assistant General Manager W. D. Macy wrote an angry letter to Wilson, hoping to resolve the issue with the Mexican government. Macy argued, and Wilson reiterated, that even though the United States was not in compliance with the 1906 International Wireless Convention of Berlin, Mexican officials should provide the New York and Cuba Steamship Company special communications privileges since it possessed a contract with the Mexican government to deliver mail abroad. Macy contended, however, that the real issue was that agents of Marconi's Wireless Telegraph Company had built the stations. Because they were in direct competition with the United Wireless Company, which sold equipment to the New York and Cuba Steamship Company, Marconi's agents had convinced Mexican officials not to communicate with American vessels.[28]

Bonilla responded firmly and elegantly, displaying not only a way with words but also a keen intellect. Of course, the fact that Macy's reasoning was dead wrong made it easier for Bonilla to refute the accusations. His own words state the Mexican government's position clearly:

> It having been shown that the provision grew out of the [1906] Convention, the presumption of Mr. Macy has no

[28] W. D. Macy to Henry Lane Wilson, Mexico City, 11 Nov. 1911, RG 59, 812.74/1, U.S. National Archives, Washington, DC, further stated as USNA.

> foundation, as in order for the same to be true it would have been necessary for the Marconi Company to have exercised its influence in the mind of all the countries represented at the Convention…besides, the Mexican Government, in the case in question, would never have accepted any foreign influence…the General Office of the Federal Telegraphs is no way obligated to the Marconi Company, it also being untrue that the Veracruz and Campeche stations were constructed by the above mentioned company, as stated by Mr. Macy, but by the 'Telefunken" Company of Berlin, Germany.[29]

Indeed, Telefunken had provided the equipment as well as experts for the construction of the Gulf of Mexico wireless stations. Mexican communications officials had also attempted to strictly apply the Berlin regulations, including in matters of adjusting wave frequencies of radio stations and the liquidation of account balances between participating countries. In fact, the latter issue made Veracruz operators reluctant to accept American calls. Since the U.S. Senate failed to ratify the provisions of the convention, Mexico had no legal means to enforce that American citizens pay the required tariffs asked by the Mexican government and stipulated in the 1906 conference. Bonilla actually proved willing to work with the U.S. government on the issue bilaterally if this fiscal component could be agreed upon. American ships provided an important means of international communication for Mexico. But Bonilla, even though new to the job, proved to be a capable negotiator who failed to be intimidated by the arrogance of Macy and Wilson. Lucky for Bonilla, he also had a small but knowledgeable group of communications officials that had worked with TSH over the previous decade.

[29] Manuel Bonilla to the Secretary of Foreign Affairs, 30 Dec. 1911, México DF, RG 59, fold. 812.74/1, USNA.

The multiple transitions in the leadership of SCOP had little consequential impact on the work of the engineers and telegraphers below them. They continued their operations with little pause or change in direction. Most of the government stations rested in areas little touched by the rebellions in 1910 and 1911. As previously planned, experts including engineer José de Prida and foundational telegraphers including Juan José Flores Treviño and C. Alejandro Gutiérrez—with the assistance of German and Norwegian electronics specialists—put the finishing touches on the Veracruz and Campeche stations. Prida additionally worked on improving the equipment at Payo Obispo, which by mid 1911 was in consistent contact with the Campeche operation, and in turn, Veracruz.[30] SCOP had the station completely rebuilt with new equipment before the end of 1912. [31] All were new accomplishments, but none were new goals.

In June, SCOP leaders completed another station as well. Replacing the incinerated Cabo Haro post, they proudly opened the doors to the Bocochibampo wireless office. In the 1911 presidential address, Provisional President Francisco León de la Barra exclaimed that the Santa Rosalía and Bocochibampo were exchanging messages "with great success." [32] As with preceding state leaders, he emphasized the importance of connecting Baja California with the rest of the nation. The DGTN was additionally working on establishing four other stations in San Quintín, Bahía Magdalena, Loreto, and Miramar—all in Baja California. As with the first radio towers, these operations were to be connected with wire telegraphs that linked the

[30] "Nuevas estaciones de telegrafía sin hilos," *El Imparcial*, 2 Jun. 1911, 5; "Estaciones de telegrafía inalámbricas," *El Imparcial*, 3 Jun. 1911, 3; "Telegrafía inalámbricas," *El Imparcial*, 22 Jun. 1911, 5; "Estaciones de telegrafía inalámbricas en Campeche," *El Imparcial*, 25 Jun. 1911, 4.

[31] David de la Fuente, *Memoria por el Secretario de Estado y del Despacho de Comunicaciones y Obras Públicas, 1911-1912* (Mexico City: Talleres Gráficos de la Secretaría de Comunicaciones y Obras Públicas, 1913), 129.

[32] "El mensaje presidencial," *El Imparcial*, 19 Sept. 1911, 5.

remainder of the territories. In total, government leaders spent over 32,000 pesos on operating, maintaining, repairing, and constructing the stations at Bocochibampo, Campeche, Cerritos, the Islas Marías, Mazatlan, Payo Obispo, San José del Cabo, Santa Rosalía, Veracruz, and Xcalak.[33] In April 1911, officials working in line with the stipulations of the 1906 International Wireless Convention of Berlin made their first "*liquidaciones*" or transactions for radiotelegraphic services with Germany, France, Spain, and Norway.[34]

Federal telegraphers reached other important benchmarks during the De la Barra and Madero administrations. In 1911 the DGTN put into action a plan to better organize the national radio system. For the first time, the government demanded systemized call letters for the country's wireless operations: XA for coastal stations, XB for merchant ships, and XD for internal stations.[35] Perhaps most impressive, radio operators reached new distances with their transmissions from the Veracruz and Campeche operations. With new German equipment in hand, they transmitted messages over 500 miles during the day and over 800 miles at night. They commenced communications with the Isla Madre María, San José del Cabo, and Mazatlán posts. They additionally reached international stations for the first time. From that point forward these stations possessed a regular means of contact with Havana, Cuba; Pensacola, Key West, and New Orleans in the United States; and Colón, Panama.[36]

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[33] De la Fuente, *Memoria por el Secretario de Estado y del Despacho de Comunicaciones y Obras Públicas, 1911-1912*, 129-32.

[34] Ibid, 153.

[35] Merchán Escalante, *Telecomunicaciones*, 64.

[36] David de la Fuente, *Memoria del Secretario de Estado y de Despacho de Comunicaciones y Obras Públicas, 1911-1912* (Mexico City: Talleres Gráficos de la Secretaría de Comunicaciones y Obras Públicas, 1913), 129; Francisco I. Madero, "El Sr. Francisco I. Madero, al abrir las sesiones ordinarias del congreso, el 16 de Septiembre de 1912," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 38.

However, Madero and the new SCOP leadership cannot solely be credited with accomplishments in wireless development. Almost all of these initiatives were part of plans drawn up during the Porfiriato and by specialists and government employees who had worked under the Díaz administration. Most of these engineers and telegraphers remained loyal to the state—more so to their jobs—even though the top leadership changed frequently. Needless to mention, insufficient electronics and communications specialists existed to replace the DGTN workers who had built the Porfirian radio system, even if *maderistas* had wanted to, which they did not. These experts and experimenters had made notable strides and their work remained solicited.

Overall, communications developers under Madero continued plans articulated during the Porfiriato. But federal telegraph employees did make impressive gains. Their work from May 1911 to February 1913 focused on organizing the national radio system, completing and improving Mexico's coastal stations, and equipping the navy. As during the Porfiriato, these projects were aimed at obtaining greater control over Mexico's fringes, improving trade, and projecting a modern appearance to the world. However, as exhibited by the military stations in Chapultepec and Chihuahua, the acquisition of heliographs, and the arming of the *Bravo*, the continuance of armed rebellion shifted the focus of radio development towards putting down the very uprisings that Madero himself had inflamed.

**The Usurper and the Militarization of Radio**

News of Madero's death reached Cuba, and in turn, the United States via radio from Mexico on Valentine's Day 1913. Acquiring the information from Havana, the

editors of the *New York Times* printed a report on the president's death the same day. [37] The only problem with the account was that Madero was still very much alive. He was, however, murdered eight days later by a disgruntled army major following a ten-day long coup started by supporters of Félix Díaz and Bernardo Reyes called the *Decena Trágica*. Following the release of Díaz and Reyes from Mexico City prisons, the overthrow attempt turned into a battle in the capital's streets. Madero was ultimately betrayed by Victoriano Huerta, the general that the president had entrusted to defend the government. After working out an agreement with Díaz and American ambassador Henry Lane Wilson—Reyes had accidentally got himself shot on the first day of the uprising—Huerta assumed the presidency on February 20. The following night, a small group of angry soldiers executed Madero and his vice president, José María Pino Suárez, just past midnight, likely on Huerta's orders.

With the ascension of General Huerta to the presidency, military matters dominated radio development, as with almost every other aspect of his government. Although Huerta initially tried to appease U.S. officials, contentions with the United States remained a prevalent and serious issue. Madero had already increased TSH operations for the suppression of rebellion, but communications became a key element of Huerta's plans to secure his position and to tame the spreading violence. With militarization in mind, he invested more on wireless apparatuses, and at a quicker pace, than any of his predecessors. His short term in office, however, did not allow him to take full advantage of the devices he strove so diligently to acquire. In fact, Carranza, his successor, ended up benefitting more from Huerta's investments, though Carranza also ended up with much of the bill.

[37] "Madero Killed, Havana Hears," *New York Times*, 14 Feb., 1913, 2.

Huerta spoke about radio advancements during his first address to congress on April 1, 1913, only a month and a half after Madero's assassination. He mentioned that the new coastal stations worked satisfactory. Interestingly, he also stressed that service was underway between the wireless operations in Campeche and Veracruz and the New York and Cuba Mail Steamship Company. Although U.S. and Mexican officials worked out the previously mentioned issues surrounding this company when both nations agreed to the provisions of the 1912 International Wireless Convention in London, it is notable that the topic was one of first things about radio that Huerta mentioned to congress.[38] This move surely appeased Ambassador Wilson, and constitutes one of Huerta's initial attempts to warm to the United States.

The general, however, quickly ran into his own conflict with the northern colossus. The 1912 U.S. elections ushered in President Woodrow Wilson, who disdained Huerta's coup and the possibility of U.S. complicity. Only months after Wilson's election, a conflict erupted over the placement of U.S. wireless devices in the Mexican embassy at Tampico. This poorly planned event caused an anti-American uproar in early July 1913. U.S. Marines, in uniform, disembarked from the warship *South Carolina* to install the equipment, causing public unrest. This hampered Huerta's attempts to appease the United States. Although some historians, most notably Alan Knight, have argued that anti-American protest in mid-1913 "represented officially-orchestrated reactions to crises in Mexican-American relations" (and surely this was the case in many instances), this Tampico incident was genuinely popular in nature even if

[38] Victoriano Huerta, "El president Interino, Gral. Victoriano Huerta, al abrir las sesiones ordinarias del congress, el 1 de abril de 1913," *Los presidentes de México ante la nación*, 75. Although the unrest caused by the Madero rebellion prevented Mexico from sending a representative to the London wireless conference in 1912, the Madero administration did sign onto the agreement before the assassination of Madero in 1914. The U.S. government signed onto the international treaty as well.

the Huerta regime tried to use it afterwards to rally domestic support.[39] People in the gulf ports, like many government officials, had become wary of the American navy, which had been floating off the shore since 1912, a presence that had been brought about not only by the recent revolts but also by the constant and exaggerated complaints of Ambassador Henry Lane Wilson and William W. Canada, the U.S. consul in Veracruz. Both men constantly used radio to shoot their messages across the gulf. It was a tense situation.

The establishment of an American wireless station in Tampico was a non-issue turned into a loud mess by the negligent actions of the U.S. armed forces. In mid and late June 1913, Huerta's Minister of Foreign Affairs, Francisco León de la Barra, the SCOP leadership, and the Wilson administration worked out a deal to allow the establishment of the radio office in the American consulate in Tampico so that it could communicate with the American war ships, the consulate in Veracruz, and the embassy in Mexico City.[40] In early July, however, the disembarking of disallowed, uniformed marines caused a "very bad impression among the public." It was only after this public protest that the governor of Tamaulipas and other federal officials withdrew the permission to install the radio equipment.[41] Huerta, upset with the U.S. government for stalling recognition of his dictatorship, and with America's increased military presence, may have capitalized on the anti-American outbreak, but he did not initiate it. His administration did order the removal of the devices, antagonizing American officials

[39] Knight, *The Mexican Revolution*, Vol. 2, 71.

[40] Henry Lane Wilson to Francisco León de la Barra, Mexico City, 11 Jun. 1913, caja 16-9-72, ARSE; Francisco L. de la Barra to Henry Lane Wilson, 12 Jun. 1913, caja 16-9-72, ARSE; Carlos Pereyra to the Secretario de Comunicaciones, Mexico City, 13 Jun. 1913, caja 16-9-72, ARSE

[41] Peña y Reya to the Secretario de Comunicaciones, Mexico City, 3 Jul. 1913, caja 16-9-72, ARSE.

who were "loath to believe that . . . [Huerta's] government would place obstacles in the way of prompt and adequate protection of its citizens in the Consular District of Tampico."[42] A month and a half later the Huerta administration agreed to reconsider the matter as long as no member of the U.S. armed forces, in uniform or not, installed or operated it.[43] The decision proved to be one that Huerta would later regret.

This little-recognized event strained tensions and foreshadowed future encounters. Thereafter, public sentiment against the United States along the Gulf of Mexico ebbed and flowed but nevertheless persisted. It reached new heights with the Tampico Affair and the U.S. invasion of Veracruz in 1914. The former erupted when, on April 9, 1914, a U.S. naval ship docked at Tampico to gather supplies. Under heightened stress caused by nearby rebels, in addition to the capture of U.S. civilians attempting to provide them arms, *huertista* soldiers ordered the crew out and subsequently arrested them.[44] After realizing their mistake and the possible consequences of what they had done, the soldiers' regional commander ordered the Americans released and provided an apology. However, as Knight points out, the "apology did little to satisfy Rear Admiral Henry T. Mayo," who, like his superior Admiral Frank Fletcher, was bored of the inaction of the navy in the gulf and infuriated by the disrespect of Huerta's soldiers. Mayo ordered an official apology and a twenty-one gun salute to the American flag, without consulting any of his military or civilian superiors.[45] Wilson had already decided that he wanted Huerta out of office, but the

[42] Nelson O'Shaughnessy to Federico Gamboa, Mexico City, 13 Aug. 1913, caja 16-9-72, ARSE.
[43] F. Gamboa to Nelson O'Shaughnessy, Mexico City, 15 Aug. 1913, caja 16-9-72, ARSE.
[44] Robert E. Quirk, *An Affair of Honor: Woodrow Wilson and the Occupation of Veracruz* (Lexington: University of Kentucky Press, 1962), 8-31.
[45] Knight, *Mexican Revolution*, vol. 2, 150-51.

independent nature of top naval officers would continue to shape U.S. actions, often contradicting each other and complicating U.S.-Mexican relations.

Huerta's frustration with the United States mounted, and he increasingly drummed up anti-Americanism as Wilson's opinion of the usurper became clear; meanwhile, U.S. operatives continued to use wireless communications—on land and ships—not only for American residents in Mexico but also for military and diplomatic matters. The Wilson administration fed on these transmissions, trying to sort out the divided opinions received from diplomatic and military personnel. The navy was especially crucial to Wilson's intelligence gathering operations. The Secretary of the Navy Josephus Daniels was close to the president, and wireless devices, like those on the battleship *New Hampshire*, transmitted important matters relating to the situation in Mexico, including Huerta's threat not to accept their esteemed passenger, President Wilson's new replacement for Henry Lane Wilson, John Lind, in August.[46] Indeed, throughout the Revolution, U.S. warships and consulates used radio to relay messages about Mexico to the United States, increasing communications and news of revolutionary events, but offering a wide array of contradictory perspectives.[47]

Actions from the U.S. Pacific Fleet exhibited these incongruities. The American navy had been "observing" the Revolution from the Gulf of California just as their counterparts did in the Gulf of Mexico. Interestingly, the crews in the Pacific showed less hostility to Huerta's forces than the squadron in the Gulf of Mexico. In fact, Huerta's ships clearly benefitted from the former's wireless messages. The Constitutionalist navy in the Gulf of California—consisting of one ship, the *Tampico*—

[46] "Bryan Calm on Huerta Note," *New York Times*, 9 Aug. 1913, 2.

[47] "Rebels Menace Line to Capital," *New York Times*, 18 Dec. 1913; Adolfo Gilly, *The Mexican Revolution*. trans. Patrick Camiller (New York: The New Press, 2005), 91.

possessed radio facilities. The ship and its crew switched to the Constitutionalists' side in February 1914. Fernando Sánchez Ayala, a radio telegrapher, who had worked for SCOP during the Porfiriato and for the Huerta administration during 1913, installed and operated the equipment.[48] The remaining federal gunboats in the Gulf of California, especially the *Morelos* and *Guerrero*, quickly moved to punish their traitorous brethren. On March 31st the latter ship attacked and greatly damaged the *Tampico*. Limping back to the small Sinaloan port of Topolobampo, the sailors and local rebels moved to repair the vessel. *Carrancista* general Alvaro Obregón toured the ship while it was under reconstruction in mid-April 1914. He hoped to use the *Tampico* in a siege of Mazatlán among other operations.

It is not clear if Obregón and the Constitutionalist forces possessed other radio devices that were in close enough range to communicate with *Tampico*, though it is likely that at least one existed. Of course, rebels did not need to have this equipment for the ship's wireless device to be useful. The crew could still use it to listen in on federal radio stations, including orders to and from the better-outfitted federal warship *Guerrero* and other coast guard and contracted merchant vessels that possessed TSH equipment. The small but proud Constitutionalist navy certainly attempted to use this information to their own advantage and passed it along to their compatriots when back in harbor.

Despite possessing a radio, the *Tampico* could not match the *Guerrero* in battle. Shortly after Constitutionalist craftsmen repaired the *Tampico* in Topolobampo, the *Guerrero*, still in service, attacked it again, this time on June 16 off the shore of the Isla

[48] Merchán Escalante, *Telecomunicaciones*, 74.

de San Ignacio, in between Guaymas and Mazatlán. And this time the *Tampico* sank.[49] The American Pacific Fleet had tipped off *huertista* general Joaquín Téllez via a "wireless bulletin" that the rebel ship had taken back to the waters in order to aid the siege at Mazatlán.[50] Téllez then ordered the *Guerrero* out to confirm the American message. The U.S. navy then watched the subsequent encounter, idling nearby. Rafael López Fuentes, a federal soldier who boarded the disabled *Tampico* to gather booty, reported that he collected a projectile fired by the *Guerrero* that had not exploded but "probably followed the following path: it penetrated the stern, went through the chimney, the letter room, [and] the wireless station, killing two men . . ."[51]

During these naval engagements, the siege of Mazatlán, and, indeed, all of the Revolution, American warships floated close by, observing the naval engagements and fighting along the coast. U.S. officers interacted with their Mexican counterparts and rescued American citizens. Press agents on board relayed combat news to the naval radio station in San Diego, and in turn, the U.S. press. One American correspondent on the *U.S.S. California* reported that just moments before the sinking of the *Tampico* an American lieutenant from the American destroyer *Preble* had "inspected" the rebel ship. The rebel crew had asked for American assistance with a tow or ship repairs, but the U.S. sailor refused, saying that such an action would counter American neutrality. Afterwards, the officer stated that he "found the vessel pitifully unprepared for a fight. The guns were without sights and there were only one hundred rounds of ammunition. The ship's boiler had been burned out by the inexperienced crew, and the commander

[49] Obregón, *Ocho mil kilómetros in campaña*, 130-31.

[50] Enrique Cárdenas de la Peña, *Semblanza marítima del México independiente y revolucionario*, vol. II (Mexico City: Secretaria de Marina, 1970), 224.

[51] Quoted in Ornelas Herrera, "La radiodifusión mexicana," 133.

of the ship was crippled as a result of an accidental bullet wound in the leg." But "for four hours the *Tampico* made a gallant struggle."[52] Shortly thereafter, the *Guerrero*'s radio operator contacted Rear Admiral Thomas B. Howard, commander of the U.S. Pacific Squadron, stating that his ship was going to move north to Guaymas. The cruiser *Denver* accompanied the federal vessel for much of its voyage, which the *New York Times* relayed as "evidence of the friendly relations existing between Mexican federal officials and the United States naval forces."[53] After intercepting and partially decoding American messages about the U.S. invasion of Veracruz, *huertista* naval officials became "very confused" respecting an increasingly tense international situation.[54] Something did not make sense. President Wilson may have set his aims against Huerta, but American naval officers showed little ill will in the Pacific.

Despite the actions of the U.S. Pacific Fleet, Wilson not only saw Huerta as an illegal usurper of power but also a militarizing and—contrary to the hopes of many conservatives in the United States and Mexico—a destabilizing force; he went against the long-term interests of the United States. The Wilson administration put in place an arms embargo against Huerta and instead slowly fed his opposition. Huerta, as a result, imported a record amount of war materials from Europe and Japan, including wireless devices from the former. According to a *New York Times* correspondent in Berlin, Huerta hired a German company in January 1914 for the erection of a wireless station "to maintain communication with the columns of Federal troops operating against the rebels in various parts of the country . . . because ordinary telegraph wires are so

[52] "Huerta Gunboat to Guaymas," *New York Times*, 21 Jun. 1914, 2.
[53] Ibid.
[54] De Dios Bonilla, *Apuntes de la historia de la marina nacional*, 296.

frequently cut."[55] In an April 1914 presidential address Huerta stated that he contracted with a German firm to complete the installation of radio communications across the country.[56] Huerta also allowed the German consulate to continue radio communications in Mexico.[57] He additionally bought wireless apparatuses from France. As early as June 1913, as Americans were attempting to get the Tampico embassy station approved, Huerta was ordering ten radio stations with 20 horse-power engines and 100 meter-tall towers from Harlé & Cie. of Paris. His agents also bought twenty heliographs and two automobiles from the same company. Harlé sent the equipment in mid-1914.[58] The secret nature of radio operations by the military preceding and during Huerta's rule makes it difficult to determine the precise number of radios in use, but Huerta definitely bought more equipment in a shorter period of time than any of his predecessors. European officials, for their part, agreed that Mexico needed a strongman, and in turn overwhelmingly supported Huerta's regime. Indeed, European military and communication equipment sales to Huerta deliberately—if only briefly—challenged American influence in Latin America and isolated the Wilson administration diplomatically.[59]

Still more evidence documents Huerta's campaign to militarize TSH. In 1913 he reorganized the military, adding a Department of Transportation and Communication within the Secretariat of War and Marine. The next year he decreed the opening of a

[55] "Huerta to Use Wireless," *New York Times*, 18 Jan. 1914, 2.

[56] Victoriano Huerta, "El Gral. Victoriano Huerta, al abrir las sesiones ordinarias el congress, el 1 de abril de 1914," *Los presidentes de México ante la nación*, 103-04.

[57] "Huerta to Free Our Guns," *New York Times*, 21 Mar. 1914, 2.

[58] General Subsecretario de Guerra y Marina to Secretario de Relaciones Exteriores, Mexico City, 6 Jan. 1916, caja 16-16-99, ASRE. This folder is filled with correspondence between the Carranza government and Harlé & Cie. over the remainder of a bill owed the French company from the radio equipment bought by Huerta.

[59] Mark Benbow, *Leading Them to the Promised Land: Woodrow Wilson, Covenant Theology, and the Mexican Revolution, 1913-1915* (Kent, OH: The Kent State University Press, 2010), 46.

school for military communications. He also put to work the Mexican navy, with vessels equipped with new radio equipment, in pacification projects, especially along Sonora, and "to transport troops in the tropical climes."[60] Under orders from Huerta's SCOP, Mexican wireless pioneer Luis Sánchez Martínez had installed the Telefunken radio equipment on the warship *Guerrero* used during its battles in the Gulf of California.[61] Huerta also stressed that coastal stations were in contact with Chapultepec, emphasizing the centralized control over the service while insinuating that the military possessed these strategic tools. Technological domination had been a key feature of state power before and during the Revolution, and Huerta, even more than former presidents, expanded TSH as a means of control, though his centralizing objectives were more narrowly focused on suppression. In response, Huerta's enemies gathered their own weaponry and communications networks.

**Radio Contra Huerta**

The escalation of fighting after Madero's assassination led to a substantial increase in the importation and use of radio equipment. Not only did the Huerta regime accelerate the buying and implementation of TSH, but so too did the Constitutionalists, the rebel forces under "First Chief" Venustiano Carranza who picked up the banner of the preceding Madero revolution. Unlike Huerta, *carrancista* forces mostly obtained wireless materials from the United States, initiating the beginning of serious U.S. radio sales to Mexico and showing the permeability of the border and Wilson's decision to tentatively back Huerta's opposition. In 1913 and 1914 radio equipment proved

[60] Victoriano Huerta, "El Gral. Victoriano Huerta, al abrir las sesiones ordinarias el congress, el 16 de septiembre de 1914," *Los presidentes de México ante la nación*, 89-91.
[61] Merchán Escalante, *Telecomunicaciones*, 74.

decisive to Constitutionalist and federal maneuvers, and in battles that directly led to Huerta's ouster from office.

Well within a year of Carranza's call to arms, he and allied anti-Huerta insurgents possessed a radio station in Hermosillo, the capital of Sonora, where a wireless office had been functioning by late 1913. After capturing the city of Chihuahua on December 8, 1913, Villa oversaw the construction of a sister station. Carranza and Villa used the operations to spy on the communications of federals and Americans. Pablo González, the Constitutionalists' General of the Army of the Northeast, established a wireless office on his train of war. According to the memoir of his secretary Manuel W. González, the telegraph car adjoined the general's personal quarters. It was well kept and fitted "with bunk beds for the telegraphers and some of the officials of the general staff," and a telegraph station. His radio operator was well liked, tall, fat, and a bit of jokester. Both Pablo and Manuel González valued his work as highly as they did his likeable personality.[62] A nearby radio was a coveted tool.

TSH thus affected all the three main armies of the Constitutionalist forces: the Army of the Northwest, the Army of the Northeast, and the Division of the North. Of these forces the Army of the Northwest possessed the least amount of wireless equipment. No record exists that shows that Alvaro Obregón, the leading commander, ever utilized field radios during his slow and methodic operations along the Pacific coast. He never mentioned possessing this type of equipment in his memoirs. He did write about using telegraphy regularly, indeed that it was crucial to his operations. Some statements infer the possibility of TSH use. Obregón wrote that Wallace Buctoll of the U.S. Pacific Fleet had contacted him in late April 1914. In June, Obregón told

[62] Quoted in Ornelas Herrera, "La radiodifusión mexicana," 125.

Villa—then in a dispute with Carranza—that he was unclear on the exact details of their conflict because the continual rains had hindered the clarity of his telegraphic service.[63] These suggest, though they do not definitively prove, that Obregón used radio operations in his army.

Either way, he most certainly understood the importance of this form of communication. Obregón studied the military developments of the Second Boer War, and he strove to apply these and other tools and techniques of modern combat.[64] He also knew that Huerta's forces possessed stations that threatened his operations in the area. On June 4, 1914, Obregón reported to Constitutionalist General Rafael Buelna, that he had dispatched Captain Medina Cruz of San Blas, Tepic, to overtake the small federal outpost in the Islas Marías with the goal of destroying the radio office there. After commandeering the steamship *Union* that evening, Medina and a small force landed on Isla Magdalena—the island with the wireless post—early before sunrise the next morning. There, he and his small contingent of soldiers overtook and arrested the ten federal soldiers and their commanding officer. Immediately afterwards, Medina's men disabled the wireless outpost by sabotaging the connection between the station's motor and its electrical source. Obregón commented that by removing this means of communication from the federal arsenal, Medina had disabled an operation that greatly jeopardized their actions.[65] The Islas Marías station was indeed important for gathering and relaying federal intelligence. It not only provided information to the other stations

[63] Obregón, *Ocho mil kilómetros in campaña*, 116-117, 133.

[64] Knight, *The Mexican Revolution*, Vol. 2, 147. Huerta also studied developments in war craft that occurred during the Second Boer War.

[65] Obregón, *Ocho mil kilómetros in campaña*, 126.

in the region under Huerta's control—in Guaymas and Mazatlán—but also to and from ships of war and Mexico City.

Villa, chief of the Division of the North, proved impressively keen and intelligent in his understanding and manipulation of communications and transportation networks. Historians have noted Villa's smart use of trains, telegraphy, and force during his capture of Juárez after his failed first attempt to take the city of Chihuahua. Although federal forces assumed he fled south to lick his wounds, he actually moved around and seized a train to the north of the city, forcing by gunpoint a train station telegrapher to tell Juárez officials that the line to the south was destroyed. In turn, the Juárez operators told the train to return. Villa loaded up his men, violently convincing telegraphers along the way to give the clear. As historian Alan Knight put it, "Villa's Trojan train rolled into an unsuspecting town."[66] He captured the city without a fight. Villa installed a radio station there the following year.

Villa's use of TSH was fairly extensive. He obtained wireless equipment to build a station in Chihuahua after succeeding to capture the city on December 8, 1913. Like González, Villa constructed a mobile device on a military train for his personal use. He most likely acquired these materials from defeated federal forces or from the United States, whether as contraband or after Wilson lifted the arms embargo against the Constitutionalists in February 1914. Villa clearly used radio during his decisive campaign into central Mexico in the spring of that year.

Wireless communications played a key role in one of the most important battles between *huertista* and *villista* forces, and of the Revolution: Torreón, March 1914. This battle directly led to Huerta's resignation from office. Both Huerta's generals and the

[66] Knight, *The Mexican Revolution*, vol. 2, 115.

rebel forces relied heavily on radio communication not only to give orders, but also to make important tactical decisions. Transmissions overheard by the U.S. army and Villa's wireless operators initiated the movement of forces at key moments. On March 15, Villa ordered his troops to advance towards Torreón: "His action was hastened by the interception of a wireless message from Pres. Huerta at Mexico City to Gen. Refugio Velasco, commanding the federal garrison at Torreón. As caught by Villa's wireless station, the message directed Velasco to take the offensive immediately against the Constitutionalists."[67] Consequently, Villa set in motion his own advance and also sent information about his actions, including radio interceptions, to the U.S. press via imbedded reporters and telegraph messages. American soldiers at Ft. Bliss, Texas, also overheard *huertista* messages sent out from Torreón to the federal's advancing forces. The benefits that Huerta hoped to gain from radio communications, in this instance, were countered by TSH's military weakness: it could be overheard. Federal forces in Torreón, however, remained in contact with Mexico City leaders until their complete defeat on April 6, 1914. Because of radio, the Huerta leadership knew well of their loss, but they continued to spread misinformation to the press and emissaries in the capital until the regime could no longer hide the reality of the situation.[68]

**Conventionalist Communications**

Despite misinformation to the press and the people of Mexico City, Torreón fell. It was the beginning of the end for the Huerta regime. The usurper left for exile in July

[67] "Say Federals Moved First," *New York Times*, 16 Mar. 1914, 1; "Foes at Torreon Move to Battle," *New York Times*, 16 Mar. 1914, 1.

[68] "Say Villa Being Flanked," *New York Times*, 26 Mar. 1914, 2; Knight, *The Mexican Revolution*, Vol. 2, 145-46.

as his remaining forces continued to deteriorate. But instead of ending the fighting, the violence escalated further as the Constitutionalists split, starting another round of civil war. The October 1914 Aguascalientes Convention ended in failure, ending in dreams of peace. Intended to mend differences, the meeting facilitated the joining of *villista* and *zapatista* forces under the "presidency" of convention-elected Eulalio Gutiérrez against those who remained loyal to Carranza. The former group designated themselves the Conventionalists, while the later retained the name of Constitutionalists. Almost immediately thereafter the Conventionalists captured Mexico City while the Constitutionalists fled to Veracruz to set up their base of operations there. However, as it quickly became apparent that Gutiérrez was little more than, as one historian put it, a "store front" president, Villa and Zapata retained their positions of leadership and fought the *carrancistas* on their own terms.[69]

Villa built on established foundations. As aforementioned, Villa relied substantially on electronic communications, including radio, before and after his brief stint in Mexico City. For example, they played a key part in his maintenance of military domination and his attempts at economic stimulation in his Chihuahua stronghold. Silvestre Terrazas, Villa's close aid, wrote that

> the telephone network, with its center in the capital [Chihuahua], was augmented by many kilometers, connecting many of the distant villages of the Sierra Madre, thus beginning civilized life. And with the wireless station, we achieved immediate communication with the whole world. During Villa's occupation of Chihuahua, the area immediately witnessed the consolidation of all kinds of communication, and with the

[69] Michael J. Gonzales, *The Mexican Revolution, 1910-1940* (Albuquerque: University of New Mexico Press, 2002), 143.

> well cared for postal service, greatly facilitated activity and transactions throughout the region.[70]

Other sources confirm Villa's efforts to establish a well-functioning government and economy in the region.[71]

Once in nominal control of Mexico City, the Gutiérrez administration worked with the remaining SCOP officials to expand the power of the Chapultepec station beginning in November of 1914.[72] They also took time to repair the telegraph lines connecting their bases of support in Morelos and to the north. The relationship between the Conventionalist and SCOP leadership, however, never had time to cement. Gutiérrez, members of his general staff, and the *villista* and *zapatista* armies, possessed a limited understanding of how the Mexico City bureaucracy worked.[73] The civil war itself disrupted any chance of educating themselves. Before the improvements to the Chapultepec station were complete, Constitutionalist forces were already on the march to re-take the capital.

Throughout much of 1915 the fractious rebel forces fought over Mexico City. After *carrancistas* successfully took control of the capital for the first time since their original evacuation, Villa moved back to the north and Zapata to the south, the regions where each felt most secure. But still, Conventionalists continued to force the *carrancista* generals Obregón and González to each evacuate the city after securing it for a short period of time, the latter for only eight days in July. Indeed, the capital changed hands five times from July 1914 to July 1915. On each occasion the

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[70] Silvestre Terrazas, *El verdadero Pancho Villa: El Centauro del Norte…sus heroicas batallas y acciones revolucionarios* (Mexico City: Ediciones Era, 1985), 180.

[71] "Aliens Safe, Says Villa," *New York Times*, 19 Dec, 1913, 2; Katz, *The Life and Times of Pancho Vill*a, 397-442.

[72] "Los torres inalámbricas situados en Chapultepec," *La Convención*, 16 Jan. 1915, 8.

[73] "El C. Presidente hizo una visita al palacio de comunicaciones," *La Convención*, 4 Jan. 1915, 6; "Franquicias Telegráficas para los jefes militares," *La Convención*, 21 Dec. 1914, 8.

surrendering army sabotaged the wireless station and then the invading forces worked to repair it.[74]

By February 1915, *zapatistas* possessed a radio operation in Cuernavaca: "The Clandestine Wireless Office."[75] The beginning date for this station—or at least when it show up in historical documentation—suggests that the equipment may have arrived with the provisional Conventionalist government as it fled to Cuernavaca from Mexico City in late January 1915. L. G. González and a handful of other operators used the office's receiver to intercept messages. What they found varied greatly. Transmissions ranged from personal regards to family members to information about Constitutionalist operations to messages sent to business headquarters from U.S. shrimp companies.

Although interference made reception difficult at times, the equipment generally functioned well. These intelligence agents always worked at night, when reception of radio signals was clearest. According to González, "the results in the wireless office were far better than I had originally hoped for."[76] One night he picked up coded messages from a radio in *zapatista* territory, an unknown portable device sending messages to the enemy. During the same listening session he tuned into transmissions from a Japanese vessel on the high sea north of the Isla Marias.[77] How surreal it must have felt to have been dialing in mysterious signals from far away while in the throes of a struggle for existence at home.

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[74] "Carranza Forced to Give Up Capital," *New York Times* 20 July 1915, 7; "Expects Carranza Reply this Week," *New York Times*, 24 Aug. 1915, 6.

[75] L. G. González to the Oficial Mayor Encargado del Cuartel General, Cuernavaca, 1 Mar. 1915, caja 15, exp. 9, Fondo Emiliano Zapata, AGN.

[76] Ibid; Illegible name to the Oficial Mayor Encargado del Cuartel General, Cuernavaca, 16 Mar. 1915, caja 15, exp. 10, Fondo Emiliano Zapata, AGN.

[77] L. G. González to the Oficial Mayor Encargado del Cuartel General, Cuernavaca, 1 Mar. 1915, caja 15, exp. 9, Fondo Emiliano Zapata, AGN. Caja 15 of this fondo is filled with the transcriptions of wireless message interceptions.

Most overheard transmissions came from *carrancista* stations along both the Gulf of Mexico and the Pacific Ocean, which were frequent. Oftentimes these messages were about small financial matters and the movements of individuals or troops. Many of them were inconsequential, but others consisted of discussions on important topics by Constitutionalist leaders including Luis Cabrera, Governor Luis Caballero, General A. I. Villarreal, General Jesús Acuña, General Alvaro Obregón, and even First Chief Venustiano Carranza.

American businesses and ships provided the other great source of messages. San Francisco and New Orleans based companies communicated fairly regularly with ships off of Mexican waters but also with the stations at Mazatlán and Veracruz. These companies, along with others—especially from the U.S. West Coast—were engaged in trade with Mexican companies and with Constitutionalist forces, all while the navy anchored nearby. In the Gulf of Mexico, the Cuernavaca station intercepted messages from the U.S. navy to Washington, DC, via the Key West wireless station. Most of these signals, however, were in a code that the *zapatista* radio operators failed to crack.

The *zapatistas* also possessed at least one field radio. They used it in the battles over Mexico City, likely using it to communicate between Cuernavaca and the front lines. In July 1915, *carrancista* General Coss captured one such *zapatista* unit retreating from Mexico City.[78] The predominate image of *zapatistas* stands that they were peasant rebels, but they achieved a certain degree of technological sophistication little acknowledged.

However, it is difficult to discern who if anybody communicated with the Clandestine Wireless Office in Cuernavaca. Apparently at least one field device

[78] Manuel W. González, *Contra Villa* (Mexico City: Editorial Botas, 1935), 349.

existed. But messages from *zapatista* portable radios or *villista* stations do not appear in the historical record, an interesting and confounding omission. It may be that this particular Cuernavaca operation only received messages—nothing is mentioned about transmission. Of course, not sending messages had one advantage; *zapatista* communications could not be overheard. The clandestine nature of these operations makes historical certainty, in this case, a difficult if not impossible endeavor.

Meanwhile, Villa constructed stations in areas he controlled in northern Mexico. In May 1915 his men started construction on a tower and radio house in the city of Durango. *Villistas* built another station in Ciudad Juárez. At times, Villa's forces controlled wireless communications not only these cities but also in the city of Chihuahua, Torreón, Mexico City, and in the field. His communications system was impressive, but maintaining it against Constitutionalist forces proved problematic.

**Conclusion: Radio, Civil War, and U.S. Intervention**

After reviewing the first five years of the Revolution, it is clear that the upheaval increased the presence of wireless technology while shifting radio use from national expansion to the needs of factional combatants. Under Madero a number of important advances were made, including wireless communication with foreign nations, but development occurred largely along the lines already established during the Porfiriato. Madero, and especially Huerta, also increased TSH imports specifically for military purposes. Following the assassination of Madero, Huerta's opposition, the Constitutionalists, built their own radio network in response to the overthrow, ultimately benefitting from Wilson's distaste for Huerta. When Carranza could no

longer maintain control over his own alliances, the breakaway Conventionalists used their portion of the wireless operations to facilitate governance and for intelligence gathering, but the Constitutionalists who remained loyal to the First Chief proved keener in communications strategy and development. The struggle to establish dominance in telegraphy would become an essential component of their military and administrative planning. They were also well aware that as long as any side failed to monopolize communications the struggle would continue to divide and damage the nation.

The operations of the U.S. navy and diplomatic core also proved disjointed but significant to the course of the war. Whatever the motives of Woodrow Wilson's decision to oust Huerta, and there were many—the influence of Presbyterian covenant theology, personal beliefs about democracy and stability, business interests—enacting a clear policy in Mexico proved difficult.[79] The reason why was twofold. First, Wilson faced a barrage of contradictory accounts from diplomats, special agents, and admirals; and secondly, the actions of naval personnel along the Mexican coasts complicated matters. While the newly formed Wilson administration diligently strived to understand the situation, naval officers in different theaters often acted on their own accord while awaiting orders. Nonetheless, Wilson's dislike of Huerta ultimately favored Carranza, especially after Huerta dissolved congress on October 10, 1914, and Wilson more firmly set his mind to regime change in Mexico. The Constitutionalist forces gathered steam as they gained greater access to American supplies and as the Huerta

[79] Quirk, *An Affair of Honor*, 8-31; Emily S. Rosenberg, *Spreading the American Dream: American Economic and Cultural Expansion, 1898-1945* (New York: Hill and Wang, 1982), 64; Knight, *The Mexican Revolution*, vol. 2., 68-71; Katz, *Secret War*, 167-84; Benbow, *Leading Them to the Promised Land*, 26-41.

administration suffered from constant U.S. harassment. One of the more important military imports from their northern neighbors, radio proved crucial to Carranza's operations, and the Constitutionalists utilized the equipment with skill, helping to facilitate victories during the renewed civil war against Zapata and Villa.

Chapter Four

Reconsolidating the Nation-State

Wireless communications defied the bandits, and in a large measure our success was due to our ability to keep in touch with centers of supplies and the outer world.
—Ignacio Bonillas, 1916[1]

After a number of months battling over the nation's capital, Carranza's forces entered Mexico City once again on July 31, 1915. And though their position was still fragile, this time they stayed. Taking the capital, in addition to subsequent victories over Villa's forces in battles including Celaya and León, allowed Carranza's government to obtain firmer control over the country while marginalizing the *villistas* and *zapatistas*. During the next five years the Constitutionalists strove to bring the whole of the national territory under their power, making great strides though never completely succeeding. Nevertheless, radio, like railroads and wire telegraphy before, became a crucial tool for reconsolidating state power and to obtaining recognition from governments abroad. It was vital for defeating opposing revolutionaries and reactionaries still at large and in bringing the centralization and nationalist movements of the late Porfiriato to new heights. Radio technology also became a more crucial element in foreign relations under Carranza, not only in interactions with the belligerent empires fighting World War I, but also in the Constitutionalists' opposition to U.S. imperialism and their own expansionist endeavors in Central America.

[1] Ignacio Bonillas, quoted in "Mexico Being Reconstructed," *New York Times*, 5 Nov. 1916, SM9.

**Winning the Civil War**

From the onset of Carranza's participation in the Revolution, he considered communications vital to his success. Radiotelegraphy continued in importance during his actions against opposing militant factions from 1915 to 1920. Warfare had taken a toll on the country's transportation and communication networks and repairing sabotaged telegraph lines became increasingly difficult and costly. Of course, Carranza ardently repaired these links, but to help offset this problem, the Constitutionalist leadership also increasingly sought out radios. In April 1917, Carranza told the Constituionalist congress that telegraphers were "the vanguard of the military column." And that they were essential to the "triumph of the Constitutionalist forces."[2] In the same speech he proclaimed that his administration had purchased $261,088 dollars worth of radio equipment from the United States, that they controlled twelve land stations—four of which he deemed high power—four wireless sets aboard ships of war, and five portable military radios.[3]

Carranza had maintained wireless services throughout the civil wars. The station in Veracruz, the First Chief's temporary base of operations in late 1914 and early 1915, remained functioning and carried out important communications to foreign and Constitutionalist sea vessels, the United States—mainly New Orleans—and other *carrancista* offices. During the same time, Carranza's communications officers re-established wireless links between Saltillo and Veracruz. They also maintained control

[2] "Venustiano Carranza, al abrir las sesiones extraordinarias el Congreso, el 15 de abril de 1917," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 157-58.

[3] Ibid.

of the high-powered Campeche station.[4] General Pablo Gónzalez found ways to incorporate TSH In the northeast of the country. On December 26, 1914, he boarded the New York and Cuba Steamship Company's steamer *Santiago* at port in Tampico and convinced Peter Podell, Chief Wireless Operator of the ship, to fix the port city's wireless station. Before Podell got underway, Gónzalez used the *Santiago* radio to send messages to Carranza.[5] These gulf stations were important to Carranza. They made possible revenue increases from more efficient trade, greater communication with companies that provided foodstuffs and war materials, and ongoing conversations with outside political agents, increasing Carranza's influence abroad and his chances of recognition by foreign governments.

In addition to heliographs, flags, and wire telegraphs, Constitutionalist general Alvaro Obregón used wireless devices in his spring 1915 campaign against Villa. As John Mason Hart states in *Empire and Revolution*, "The Constitutionalists who marched out of Veracruz . . . to defeat the Villistas and Zapatistas carried a wide array of arms, including strategically important artillery and field radios for spotters."[6] Although it is debatable whether the Americans purposefully left this equipment specifically to aid the *carrancistas* as Hart concludes, it was left and used nevertheless. Carranza also understood that radio messages could be overheard by *villistas* and Americans, which he played to his advantage during and after battles including Celaya, especially as a means of psychological warfare and publicity.[7]

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[4] "Three Capitals Neutral," *New York Times*, 23 Dec. 1914, 20.

[5] Peter Podell to Venustiano Carranza, Progresso to Veracruz, 8 Jan. 1915, XXI. 24. 2379. 1, CEHM.

[6] Hart, *Empire and Revolution*, 310.

[7] Juan Barragán Rodríguez, *Historia del ejército y la revolución constitucionalista*, vol. 2, (Mexico City: Talleres de la Editorial Stylo, 1946), 268; Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX," 142.

Like the *zapatistas*' Clandestine Radio Office in Cuernavaca, *constitucionalista* stations also worked as intelligence gathering outposts, though they had the additional benefit and risk of possessing relatively reliable and powerful transmitting apparatuses. *Carrancista* communications officials, such as Mario Méndez—a close Carranza communications advisor, lover of all things German, and then head of the Campeche station—especially focused on American transmissions.[8] This station remained in *carrancista* hands throughout the remainder of the Revolution.

Carranza also obtained much of Huerta's small but significant navy, including radio-equipped vessels such as the *Guerrero* and the *Melchor Ocampo*. The latter saw important action in battles over Tampico in 1915 and 1916. In 1914 the radio-savvy General González ordered wireless devices placed aboard the *Zaragoza*, an old corvette. Indeed, by April 1917 the Constitutionalists had at least four ships with radios. The last of these, the *Progreso*, was a war transport that an American company in New Orleans revamped with "a modern radiotelegraphic station with a range of six hundred miles in all directions." Before Obregón's rise to power in 1920, wireless specialists additionally equipped the government ship *Chiapas*.[9]

Following the Conventionalists' final expulsion from Mexico City, the *villista* and *zapatista* radio operations fell one by one into the hands of the marching Constitutionalists. In August 1915, Jesús Acuña, Carranza's Minister of Foreign

[8] Mario Méndez to Venustiano Carranza, Campeche to Mexico City, 7 Oct. 1914, XXI. 17. 1721. 1, CEHM; Mario Méndez to Venustiano Carranza, Campeche to Mexico City, 12 Oct. 1914, XXI. 17. 1721.1, CEHM.

[9] "West Coast Wants Peace," *New York Times*, 25 Dec. 1914, 6.; Ornelas Herrera, "La radiodifusión mexicana," 155; "Está ya reconstruido el transporte de guerra 'Progreso'," *El Pueblo*, 10 Jan. 1917, 1; "Venustiano Carranza, al abrir las sesiones extraordinarias el Congreso, el 15 de abril de 1917," 157; Adolfo de la Huerta, *Informes de las dependencias de la Secretaría de Comunicaciones y Obras Publicas del 11 de Abril al 31 de mayo de 1920* (Mexico City: Dirección de Talleres Gráficos, 1921), 170.

Relations, proclaimed that the Chapultepec station was "now in complete working order."[10] With field radios originally used against Huerta in addition to those left behind by American forces, Obregón and González pushed into enemy territory.[11] By the end of December 1915, *villista* officials turned over Juárez and its radio station to Constitutionalist agents. *Carrancista* general Francisco Murguía took Torreón from the east and Obregón took Chihuahua City the following year, gaining the wireless operations in those respective cities as well. In the summer of 1916, González took over the *zapatista* radio operation in Cuernavaca.

*Carrancista* officials improved the facilities with new equipment during the following year.[12] Although often sabotaged by their withdrawing enemies, Constitutionalists repaired these stations and had them in full working order before the end of 1916. In fact, in the final battle of Torreón the defending Constitutionalists used radio much like *huertista* forces had before. Some of it was the same equipment. This time, however, the defenders were being honest when they transmitted news of Villa's defeat.[13]

The Constitutionalists also used radio to keep tabs on and interfere with the U.S. forces, especially after Villa's raid on Columbus, New Mexico. Desperate after a number of disastrous defeats and angered by U.S. recognition and support of Carranza, Villa and a small band of his soldiers raided the small American town on March 9, 1916. This action would once again provoke the Woodrow Wilson administration. This time he sent the Punitive Expedition, led by General John "Black Jack" Pershing,

[10] "Expects Carranza Reply this Week," *New York Times*, 24 Aug. 1915, 6.
[11] Hart, *Empire and Revolution*, 310.
[12] Pablo González to Venustiano Carranza, Cuernavaca to Mexico City, 1 Jun. 1916, XXI. 81. 8985. 1, CEHM; "La campaña del sur y la telegrafía inalámbricas," *El Pueblo*, 21 Feb. 1917, 1.
[13] "Discuss Villa's Campaign," *New York Times*, 25 Dec. 1916, 14.

to destroy the *villistas*. This, in turn, shifted Constitutionalist radio use in a new direction—spying and interfering with American ground forces. The Carranza government wanted Villa's remaining army disbanded, but it could not look weak or tolerant of Americans in Mexico. He definitely did not want to look like a puppet of U.S. whims, precisely what Villa accused him of being. Carranza's forces kept tabs on American and *villista* movements, using spies and Villa's old border radio station in Juárez.

The American chase for Villa was truly a wireless event. In fact, it was a major testing ground for U.S. military technologies as a whole. Although the American armed forces had used planes, automobiles, and radios to increase vigilance along the Mexican border, the invasion provided the first application of these technologies in a military campaign into a foreign territory. Despite difficulties, imbedded journalists sent back news of the expedition via wireless to the United States on a daily basis. In the United States, newspapers printed these reports in sensationalized accounts in cities across the country. Soldiers in the field and naval radio operators in warships along the Mexican coasts sent and received messages from American forts along the U.S.-Mexico border.

*Carrancista* radio operators, in turn, interfered with American transmissions. U.S. army officials regularly complained that their services were "repeatedly interrupted by high power radio waves sent out from one or more [Mexican] stations."[14] Of course, intentional sabotage by Mexicans was not the sole problem. Constitutionalist radio operators sending reports to Mexico City about U.S. messages they overheard caused

[14] "Interrupt Army Wireless," *New York Times*, 31 Mar. 1916, 2.

inadvertent interference. American messages also "got tangled up with such things as wheat quotations" or other non-military related transmissions.[15]

*Carrancista* spies were more interested in using TSH for gathering intelligence than disrupting services. The Juárez station, freshly taken from Villa, proved especially useful. On a nightly basis operators listened to the messages transmitted to and from Fort Bliss and Fort Sam Houston, Texas, the American army in northern Mexico, and other U.S. stations along the border. To the surprise of wireless listeners in Columbus, New Mexico, and Fort Bliss, Texas, they discovered the Juárez operation after overhearing Mexican transmissions discussing American messages. U.S. military officials thought that Carranza's soldiers had disabled Villa's station in Juárez.[16] They were wrong. In fact, a *carrancista* employee had just recently finished slapping a new coat of paint on the facilities in addition to refurbishing the electric wiring.[17] Radio did not likely change the outcome of the Punitive Expedition, but it did help Carranza maintain a rapid system of intelligence, which influenced the policies of Constitutionalist leaders.

As the Punitive Expedition plodded its way out of Mexico, Carranza's forces dominated wireless communications across Mexico. They controlled thirty radio offices by March 1917—only sixteen fully functional—but still, no other group in Mexico could challenge their domination in wireless technology.[18] Serving as Carranza's Minister of Communication, Ignacio Bonillas, who would later become Carranza's infelicitous selection for the 1920 presidential succession, stressed the

[15] Ibid.
[16] "Expect Carrancistas to Seize a Railroad," *New York Times*, 27 Jun. 1916, 2.
[17] Subsecretario de Hacienda to Venustiano Carranza, Mexico City, to Guadalajara, 8 Mar. 1916, CDLXXX. 1. 84. 1, CEHM.
[18] "Una de las grandes obras de la revolución, *El Pueblo*, 12 Mar. 1917, 10.

essentialness of radio to the Constitutionalist cause. In early November 1916 he said that as the war progressed and they acquired more territory, communications grew more difficult, leading *carrancista* officials to "establish a system of wireless telegraphy that extended all over Mexico . . . The overwhelming importance of such a system was demonstrated during the Revolution. Wireless communications defied the bandits, and in a large measure our success was due to our ability to keep in touch with centers of supplies and the outer world."[19] In order to obtain these apparatuses, Bonillas furthered that the Constitutionalists dispatched experts to the United States to secure the "most modern appliances and inventions."[20] Nearly in the same breath, he commented that government officials had taken over the wireless operation at the American Copper Company's Cananea mine in Sonora. The Constitutionalists would buy American products but they would not tolerate private U.S. wireless operations in Mexico, at least those without Carranza's consent.

Publications by Modesto C. Rolland, a young engineer and former *carrancista* communications officer who was serving as a propaganda agent in the United States, provided comments similar to Bonillas's. In 1917 he argued that "The wireless service has been improved to such an extent that we are able to make the assertion that the entire Republic is covered by stations that control the country in a far more efficient manner, proportionately, than the same service does in the United States."[21] Although a bold and perhaps overstated

[19] Ignacio Bonillas, quoted in "Mexico Being Reconstructed," *New York Times* 5 Nov. 1916, SM9.

[20] Ibid.

[21] M. C. Rolland, *A Reconstructive Policy in Mexico* (New York: Latin-American News Association, 1917), 7.

claim, the Constitutionalists had indeed made significant headway in expanding wireless communications across the nation.

Nevertheless, Villa, Zapata, and Félix Díaz, the nephew of Porfirio Díaz, remained threats to *carrancista* control. Villa, for example, forced Carranza to maintain a large military presence in Chihuahua and Coahuila where *villista* guerilla forces remained active.[22] The radiotelegraphy stations in those states continued to be used for military operations. Indeed, communications officials updated these stations with new high-powered devices. Still, Villa briefly took Torreón, the home to one of these facilities. Carranza's officers, including Francisco Murguía, who repulsed Villa from the city of Chihuahua in 1917, possessed "two mobile devices that communicate with the wireless stations of Chihuahua, Tampico, Alamos, etc . . . which has been improving the condition of our forces in that region."[23] Indeed, radio increasingly became a regular component of intelligence gathering in the last campaign against Villa from 1917 to 1920. But despite the technological edge, the *carrancistas* never caught Villa, who prided himself on his intimate knowledge of the northern mountains.

The *zapatistas* also remained a serious if weakened threat. As previously mentioned, General Pablo González had revamped the wireless office in Cuernavaca in 1916 and the *carrancistas* had taken possession of most, if not all, of the *zapatista* wireless equipment. Meanwhile, the forces under his command ravaged the state. Still, by the end of the year, González had failed to suppress the rebels who continued to wreak havoc on trains and along the

[22] Douglas Richmond, *Venustiano Carranza's Nationalist Struggle, 1893-1920* (Lincoln: University of Nebraska Press, 1984), 161-62.

[23] "La campaña del sur y la telegrafía inalámbrica," *El Pueblo*, 21 Feb. 1917, 1.

southern fringe of Mexico City. He subsequently withdrew from the state without success. It is not clear if the *zapatistas* recovered any of the wireless equipment afterwards. It appears that González took it with him. A February 1917 article in the Constitutionalist newspaper *El Pueblo* reported that the Morelos radio station was in good working order and that communications were clear between Chapultepec and Morelos: a strange statement since Zapata's forces retook Cuernavaca in January 1917.[24] Morelos remained largely in *zapatista* hands until 1918, when González marched into Morelos once again. Even after the assassination of Zapata in 1919, many of Morelos' residents resisted Constitutionalist control until Obregón gained power in 1920, thereafter making amends with much of the remaining *zapatista* leadership.[25]

According to historian Douglas Richmond, of all the threats of the time "Carranza considered the conservative Félix Díaz to be his greatest menace."[26] Largely fueled by provincial uprisings against Carranza's military and political policies, Díaz, along with a number of Porfirian reactionaries, used the local unrest to gain supporters in central and southern Mexico beginning in 1916. They proposed a return to the 1857 Constitution and defended against what locals perceived as northern interlopers. Even without Díaz, states including Tabasco and Chiapas had large populations that resisted *carrancista* forces from northern Mexico. Díaz took advantage of these regional sentiments.

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[24] Ibid; John Womack, Jr., *Zapata and the Mexican Revolution* (New York: Vintage, 1970), 271-78; Samuel Brunk, *¡Emiliano Zapata! Revolution and Betrayal in Mexico*, (Albuquerque: University of New Mexico Press, 1995), 188-94; Paul Hart, *Bitter Fruit: The Social Transformation of Morelos, Mexico, and the Origins of the Zapatista Revolution, 1840-1910* (Albuquerque: University of New Mexico Press, 2005), 214-15.

[25] Knight, *The Mexican Revolution*, vol. 2, 366.

[26] Richmond, *Venustiano Carranza's Nationalist Struggle*, 162.

Díaz's forces prompted Carranza to expand radio communications into Tabasco. Striving to establish greater control of the state, *carrancista* SCOP officials started construction on a radio tower in Villahermosa in 1917. Some within the SCOP had wanted to build the wireless office in the coastal town of Frontera, but Governor Luis Domínguez argued that Villahermosa was the better choice because it was the state's capital, centrally located, and would be better situated to assist against Díaz's operations near the Tabasco towns of Teapa and Tacotalpa.[27] And as historian Alan Knight mentions, the *felicista* forces that operated through Veracruz, Oaxaca, Chiapas, and the border of Tabasco jeopardized "communications between the central plateau and both the Gulf Coast and the Yucatán Peninsula."[28] Building the station in Villahermosa allowed for a more consistent communications link between these areas without relying on the always susceptible wire telegraphs.

Throughout Carranza's rule, the military continued to expand radio. In 1918 and 1919 the government built stations in Guadalajara, Jalisco, and Córdoba, Veracruz, both "dedicated to the military necessities of the states, in combination with two portable stations."[29] They used these instruments to connect urban bases of operation to combat zones and to counter the sabotaging of telegraph lines in contested areas. Wireless technology helped the Constitutionalists keep tabs on American, *villista*, *zapatista*, and *felicista* forces,

[27] Luis Domínguez to Venustiano Carranza, Villahermosa to Mexico City, 30 Mar. 1917, caja 139, exp. xi/481.5/285, AHSDN.

[28] Knight, *The Mexican Revolution*, vol. 2, 375.

[29] "Estaciones radiotelegraficas," *El Heraldo de México*, 2 Sept. 1919, 6.

which allowed Carranza to maintain at least a modicum of control over large swaths of territory.

**Rebuilding the Nation**

The pro-Carranza newspaper *El Pueblo* titled a March 12 headline "One of the Great Works of the Revolution." Discussing the growing wireless system, the article stated that "The services provided by this network to date, are immense, and are due, in large part, to the progressive march that has followed the military operations in all of the national territory."[30] State building and conquest went hand-in-hand. Carranza not only sought out military success but also wanted to establish the foundations of a new Mexican nation. A number of his administrators pushed for the expansion of radio as a means to modernize and solidify the Mexico of the future, one they hoped to shape and control.

Indeed, radio development became a crucial part of a renewed nation-building campaign. Although nationalist tendencies were not new when the Revolution broke out, Carranza brought rhetoric about Mexican sovereignty and nationalism to a new fever pitch. After the military, Carranza spent more funds on communications and transportation than anything else.[31] Carranza further nationalized the railway system, taking control of the lines that had remained in foreign hands. He also proclaimed state control over the railroad telegraph and telephone operations. From 1915 to 1919 the Carranza administration dramatically increased telegraph services in almost all of Mexico, expanding the lines from 1,500,000 kilometers to well over 5,000,000

[30] "Una de las grandes obras de la revolución," *El Pueblo*, 12 Mar. 1917, 10.

[31] Ruíz, *The Great Rebellion*, 346. There was also a significant amount of spending within the military budget on communications and transportation.

kilometers.[32] By mid 1917, the SCOP took up a number of other public works projects as well. These were mostly projects started during the Porfiriato but had been abandoned during the Revolution, including new railroads, harbor improvements, irrigation development, and the national theatre in Mexico City.[33]

In regards to radio, Carranza's government enacted two important laws. Although it had been government policy since the Porfiriato that all wireless operations obtain a state permit to operate legally within the country, most of the U.S. mining businesses possessing wireless equipment failed to register their devices. Porfirian officials had either not known or ignored these trespasses, but the First Chief shut these stations down. For one, their existence provoked his nationalist sentimentality, but more importantly, they sent messages about Mexican forces to the U.S. military, consulates, and businessmen. In mid March, Carranza established a strict censorship on these stations. Plutarco Elías Calles, then military governor of Sonora, ordered the dismantling of the wireless plants in the Cananea and the Nacozari mines.[34] On October 19, 1916, in response to the continuing civil war but also the Pershing Expedition, Carranza and Manuel Rodríguez Gutiérrez—Bonillas's successor as Minister of Communications—published a decree clarifying the First Chief's policies on radio. The regulations mainly reiterated that individuals or companies could not operate radio equipment without government permission. They were further prevented from divulging government information transmitted via radio. Those who broke the law could face a 500 to 1,000 peso fine, up to eleven months in jail, and the confiscation

[32] Richmond, *Venustiano Carranza's Nationalist Struggle*, 92-93.
[33] "Mexico Plans Many Big Improvements," *Los Angeles Times*, 7 Jul. 1917, 19.
[34] "Optimism along Border," *New York Times*, 30 Mar. 1916, 2.

of their equipment "to the nation."[35] A difficult law to enforce, but it proved useful in providing a legal basis for expropriating enemy radio equipment.

This law also largely affected foreigners since only two of the dozen or so foreign radio operations in Mexico, including the *El Aguila* oil company, were legally registered. Under this decree *carrancistas* continued to bring more pressure on American mining endeavors. The American military, or at least the navy, also became weary of these stations, since they were not only illegal in Mexican law, but also because international observers saw them as a breach of the London International Wireless Convention of 1912, of which both Mexico and the United States were signing members. American officials had grown increasingly wary of squabbles over infringements of international communications.[36]

Legislators further codified wireless communications in Article 28 of the 1917 Constitution, which disallowed private or government monopolies excepting those "relating to the coinage of money, to the postal, telegraphic and radiotelegraphic services."[37] Carranza believed that this section of the document held significance because it restricted the creation of foreign monopolistic practices.[38] It also clearly categorized radiotelegraphy as a type of public work to be controlled by the government. To help enforce the new policies, Carranza sent "special wireless men" to search "the hills near Mexico City, and [to make sure] all state governors have received instructions from Mexico City to keep a

[35] "Que la reglamentada la instalación de estaciones," *El Economista*, 26 Oct.1916, 1.

[36] State Department to Navy Department, "Memo. for Aid for Operations," Washington, DC, 16 Feb. 1915, RG 59, fold. 812.74/33, USNA.

[37] *The Mexican Constitution of 1917 Compared with the Constitution of 1857*, translated and arranged by H. N. Branch (Philadelphia: The Annals of the American Academy of Political and Social Science, 1917), 25.

[38] Richmond, *Venustiano Carranza's Nationalist Struggle*, 110.

close watch to prevent the establishment of wireless plants without government authorization."[39] This also served to counter American claims of rogue German operations in Mexico; after all, World War I was now in full swing.

The Constitutionalist leadership spent large sums of money developing a national communications system that emphasized increased radio services. In late 1915, a Carranza agent in California sought out "seven radio outfits to be furnished to the Mexican government for use along the lower west coast."[40] In addition to the stations taken from Villa and Zapata, *carrancista* general Salvador Alvarado finished a radio station in Mérida, Yucatán.[41] Towards the end of the year communications workers toiled "day and night" to build a wireless office just outside the city of Oaxaca on Fortín Hill.[42] A station in Acapulco, Guerrero, was also up and running before the year's end.[43]

Under Manuel Rodríguez Gutiérrez's directorship of the SCOP (late 1916-1920) wireless development flourished. In 1917 he "ordered the installation of wireless stations in all the ports open along the coasts of the Republic, both on the Pacific and on the Gulf."[44] A highly ambitious goal, but the government was genuine in its developmental course, if not successful at every port. The administration spent $261,088 dollars on TSH that year alone, a significant sum. One station under construction, on the Isla de Lobos, Veracruz, worked in tandem with a cast-iron Porfirian lighthouse that guided ships around Cabo Rojo, the Red Cape.[45] The

[39] "Hear United States will Embargo Food," *New York Times*, 14 Jun. 1917, 11.
[40] "Radios for the Mexican Coast," *Los Angeles Times*, 20 Nov. 1915, II 1.
[41] "La estación inalámbrica de Mérida," *El Economista*, 9 Nov. 1916, 5.
[42] "La estación radiográfica de Oaxaca," *El Economista*, 13 Nov. 1916, 6.
[43] Fuentes, *La radiodifusión*, 25.
[44] "Estaciones inalámbricas en todos los puertos," *El Economista* 25 Feb. 1917, 1.
[45] "Estación inalámbrica en la Isla de Lobos," *El Economista*, 3 Mar. 1917, 1

following year radiotelegraphers were using it to communicate with new equipment in the port of Túxpan, 33 miles away. With these devices, Carranza profited from increased trade and important international political links. The Pacific coast stations likewise improved trade routes, aiding passenger liners and cargo ships.[46] New services, for example, began between Mazatlán to the Islas Marias. Inland, Carranza's DGTN made "radical repairs" on the Alamo station in southern Sonora. Before mid year, the wireless office was in a 'perfect state," with "direct service to Mexico City, Bocochibampo, Mazatlán, and San José del Cabo."[47]

Before the end of 1918, the Carranza administration possessed eighteen functioning stations in total and was in the process of building four more. The government—with substantial assistance from German specialists—also finished the powerful "experimental" receiver at Ixtapalapa, Federal District. [48] During the following year, the government acquired land for a new wireless office in Saltillo, Coahuila, and opened the radio stations in Túxpan and Isla de Lobos, Veracruz, and Necaxa, Puebla, for public service. Pascual Ortiz Rubio, the governor of Michoacán, solicited authorization to build a station in the state capital of Morelia. General Francisco D. Santiago likewise asked to establish a radiotelegraphy office in Tepic, Nayarit.[49] The same year, SCOP officials installed newer and higher-powered devices at stations in the cities of Tampico, Torreón, Guadalajara, and Mexico City. Political and military leaders increasingly saw the technology as a necessity.

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[46] "Nueva línea de vapores en la costa del Pacifico," *El Economista*, 30 Jan. 1917, 3.

[47] "La estación inalámbrica de Alamos," *El Economista*, 15 Feb. 1917, 3.

[48] "Venustiano Carranza, al abrir las sesiones ordinarias el Congreso, el 1de septiembre de 1917," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 220.

[49] M. M. Diéguez to Venustiano Carranza, Guadalajara to Mexico City, 16 Dec. 1918, XXI. 127. 14442. 1, CEHM.

The following year Carranza bought thousands of dollars worth of equipment from abroad. These devices and parts came from the United States, but also from Germany. Employees of the DGTN added equipment to the Tampico station, erected a high-powered radio station in Salina Cruz, Oaxaca, and started preparations for new works at Puerto Morelos, Quintana Roo, and Bahía Magdalena, Baja California. Trade and state control in important frontiers and commercial areas drove the construction of these later operations more than fighting *villistas* or *zapatistas*. SCOP officials and German specialists also finished a 200-kilowatt transmitter and two smaller devices at Chapultepec. Consisting of three giant towers 165 meters tall and 12 by 42 meters around, the station could send messages over a distance of 9,320 miles, at least on a good night. It compared well with the most advanced transmitters in Europe and the United States. In tandem with the sensitive receiver that picked up messages from around the world at the Ixtapalapa station, communications officers could send messages to a large portion of Europe, Japan, and South America. By 1919 there were twenty-three fully functional radio stations in Mexico that sent 304,089 messages in that year alone.[50]

In the process of building a viable wireless network to combat their enemies and to dominate communications with foreigners, the Carranza administration renewed the old goal of increasing central control over Baja California and Quintana Roo. They repaired and refurbished the station at Xcalak, which a hurricane destroyed. Workers

[50] "Don Venustiano Carranza, al abrir las sesiones ordinarias el Congreso, el 1 de septiembre de 1919," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 356-357; "Contestación del Dip. Arturo Méndez, Presidente del Congreso," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 381; "Estaciones radiotelegraficas," *El Heraldo de México*, 2 Sept. 1919, 6.

fixed the device quickly because "the remote area" had "no other kind of communication with the rest of the country."[51] In 1919 the government finished building another high-power station in La Paz, Southern District of Baja California, to replace the San José del Cabo office, which was also cut down by a hurricane. Indeed, repairs were needed constantly at most stations, especially for those that faced harsh weather conditions. The business paper *El Economista* stressed that radio was a "great benefit to all the peninsulas states because they can obtain rapid communication with the interior of the country."[52] In addition to building a new radio station at Puerto Morelos, Quintana Roo— between present-day Cancún and Playa del Carmen—the Carranza administration reopened discussions with Great Britain about Mexican ship access to Payo Obispo via Chetumal Bay.[53] In 1917 Carranza deployed a federal forest commission to study the valuable woods located in the region. With improved port facilities and access, scientific knowledge, and increased communications, the Carranza administration and affiliated commercial operatives hoped to reap rewards from the timber and chicle or gum industry.[54]

The return to a frontier-connecting radio policy is also clearly demonstrated in the continued writings of Modesto C. Rolland. In 1919 he headed a commission designed to report on the economic and infrastructural conditions in the Northern District of Baja California. Another underlying goal of the mission was to bring the Baja California peninsula, which had remained largely independent during the Revolution, back under federal control. Rolland

[51] "Acaba de inaugurarse una importante estación radiográfica," *El Pueblo*, 21 Jan. 1917, 6.
[52] "Estación inalámbrica en Quintana Roo," *El Economista*, 24 Feb. 1917, 3.
[53] "Un nuevo puerto en Quintana Roo," *El Economista*, 22 Mar. 1917, 1.
[54] "Dentro de breves días regresará de Quintana Roo, la Comisión Forestal que visitó en estudio el territorio," *El Pueblo*, 12 Mar. 1917, 10.

believed that one of the best methods for establishing a stronger presence was wireless communications. He praised the region's radiotelegraphic operations. Carranza officials had recently built powerful stations in La Paz in the south, and in Mexicali, the capital of the north. Constitutionalists also constructed or took possession of local stations built in the Northern District of Baja California, including Ensenada, Tijuana, Tecate, and Los Algodones. These wireless outposts not only linked the territory together, but through Mexicali "intimately united this remote region with the center of the republic which had lamentably lived disconnected due to a lack of efficient communication."[55]

Rolland additionally warned that northern Baja California had become too reliant on the United States to relay information. This especially became problematic when American officials placed stricter regulations on communications during World War I. Rolland argued that without the Mexicali station, the Northern District of Baja California "would become almost completely isolated due to the severity of the measure employed by the neighboring nation."[56] These stations helped facilitate a long process of dragging the peninsula back into the federal system.

**German Influences and Constitutionalist Foreign Relations:**
**The Zimmerman Telegram, World War I, and Carranza's Expansion of Radio**

Connecting the frontier peninsulas to Mexico City via radio was a return to the policies of Díaz and Madero, but Carranza went a step further by overseeing the

[55] Modesto C. Rolland, *Informe sobre el Distrito Norte de la Baja California* (Mexicali: Universidad Autónoma de Baja California, 1993), 38-39.
[56] Ibid, 51.

construction of high-power stations in the capital and expanding radio's role in foreign relations. Mexico renewed its participation in international conferences about wireless policies and donated a radio station to El Salvador, attempting to counter U.S. influence in the region. But these foreign policy endeavors were aimed just as much at securing Constitutionalist control in Mexico as asserting their power outside of the country; they were mutually reinforcing undertakings. World War I greatly influenced these developments. In fact, the war, like the Revolution, was responsible for quickly expanding state radio services in Mexico from 1916 to 1919.

German officials took up a stronger interest in Mexico because of changes in U.S. policies. The German government had relied mostly on the Sayville radio station in New York as the main receiver in the Western Hemisphere for their Nauen transmitter. The U.S. government also allowed Germans access to overseas cables, which were used to communicate with Latin America. In 1915, however, the American navy began listening to and censoring the Sayville messages, and in April 1917, when the United States joined World War I, the American link was completely closed to Germany.[57] U.S. officials additionally began a widespread crackdown on German operatives residing in the United States. German agents saw Mexico as a key location for re-establishing a communication link to Germany, and as a base of operations to spy on the United States and spread German propaganda to Latin America. Indeed, plans for helping the Carranza government build high-power radio stations in Mexico City had been under discussion since 1916. The well-established relationship between Germany and Mexico in radio development and Carranza's well-known nationalist and anti-American sentiments aided these German initiatives. It had mostly been the

[57] Katz, *The Secret War in Mexico*, 416-17.

tentative backing of Huerta by German leaders, and the latter's invasion of Western Europe, which hindered Germany's trade capabilities, that caused the Carranza administration to earlier turn to the United States for wireless devices in 1914 and 1915.

But domestic affairs, namely defeating his enemies within Mexico and securing control over the country, motivated Carranza to allow the Germans to design the Mexico City stations, which both Carranza and the German government funded. It was a pragmatic and shrewd decision. Despite the fact that Mexican officials willingly transmitted and relayed German messages and propaganda, it was largely Mexicans that operated the transmitters and receivers, which were mostly used for Constitutionalist designs. It was within this context that Foreign Secretary of the German Empire Arthur Zimmerman sent the now famous Zimmerman Telegram, proposing a military alliance between Germany and Mexico, to the German ambassador in Mexico Heinrich von Eckardt. And although the German government genuinely perused a policy of persuading Mexico to join the war on their side, Carranza was unwilling to do so. He only seriously considered the notion in the case of a full out U.S. invasion of Mexico, a conflict that his advisors worked tiredly to avoid.

Von Eckardt headed a number of German operations in Mexico, including the construction of the massive radio plants.[58] Beginning in1916, Von Eckardt solicited his superiors in Germany for the creation of a high-power wireless operation in Mexico City, arguing that it "would make us independent of the North American stations."[59] The German Reich Post Office originally resisted the idea, stating that the greater

[58] The German note proposed a Mexican alliance with Germany against the United States in exchange for the lands Mexico lost to the United States in 1846, if the United States joined the war against Germany.

[59] Heinrich von Eckardt, quoted in Katz, *The Secret War in Mexico,* 417.

distance and cost made the station undesirable. Its leaders backed down, however, in the face of growing communications problems and increased pressure from the German Admiral Staff and Foreign Office, both of which supported the idea. The Germans planned to bring the equipment for the station from New York, where a Telefunken subsidiary still operated.[60] Possessing their own internal motives for the station, leaders of the Mexican Secretariat of Foreign Relations showed their approval for the plan in December 1916. Discussions on the topic, however, remained ongoing throughout the following two months while German agents were gathering the equipment in New York. Indeed, a dialogue about the stations between Von Eckardt and Secretary of Communications and Public Works Cándido Aguilar occurred regularly, even in the midst of the constitutional convention in Querétaro.[61]

While still working out the details about the Mexico City station, the Carranza administration, with the assistance of German specialists, donated a wireless station to El Salvador in January 1917. The equipment was of German and Mexican make. Mexican specialists led by the ever important Luis Sánchez, and including Adolfo Girón and Gustavo Santibáñez, built the 4-kilowatt station and trained Salvadoran telegraphers. Upon the Mexican warship *Jesús Carranza*—named after the First Chief's recently killed brother—the Mexican communications officers arrived along with towers and other necessary parts.[62] Building radio stations in Central America had actually been a goal of Mexican state officials since 1912, when they had started their first international broadcasts and campaigns to extend telegraph and telephone service

[60] Katz, *The Secret War in Mexico*, 418-19.

[61] Heinrich von Eckardt to Cándido Aguilar, Mexico City, 15 Jan. 1917, caja17-9-278, ASRE; Heinrich von Eckardt to Cándido Aguilar, Mexico City, to Querétaro, 31 Jan. 1917, caja 17-9-278, ARSE.

[62] "Llegaron a El Salvador los telegrafistas mexicanos," *El Pueblo*, 8 Jan. 1917, 1; Fuentes, *La radiodifusión*, 26.

abroad.[63] Interrupted by the Revolution, Sánchez and company did not complete the tower and connecting office until September 1917.

The renewed emphasis on the Salvadoran station resulted from three intertwined foreign relations issues: Carranza's attempt to expand Mexican influence in Central America, El Salvador, and Mexico's joint opposition to American and Guatemalan power, and the strong communications relationship between Germany and Mexico. Although *El Pueblo* proudly proclaimed that Carranza was establishing a new "vigorous and strong" policy in Central America, his administration had built squarely on Porfirian foundations. President Díaz had possessed firm relations with Salvadoran leaders and he had hoped to raise his international prestige as a mediator in Central American affairs. He additionally tried to counter the influence of the United States and Guatemala in the early 1900s. And indeed, many the isthmus' leaders emulated Díaz, even if they did not always agree with him.[64] By the time Carranza had obtained the presidency, El Salvador was the only Central American nation that remained truly friendly to Mexico. And as historian Jürgen Buchenau states, Carranza, like Díaz, "assumed that the rest of Latin America could learn from Mexico's example."[65] But more than the old dictator, Carranza presented himself forcefully as the torch bearer of Latin American nationalism and sovereignty.

Verbally, Carranza and many of his administrators lambasted American imperialism and all that it included: dollar and gunboat diplomacy, and U.S. military

[63] "Fraternidad salvadoreña," *El Pueblo,* 3 Jan. 1917, 8.

[64] Jürgen Buchenau, *In the Shadow of the Giant: The Making of Mexico's Central American Policy, 1876-1930* (Tuscaloosa: The University of Alabama Press, 1996), 49-53, 108-09.

[65] Ibid, 121.

intervention in Latin American countries.[66] Carranza wrote editorials promoting nationalism and the right to self-rule. He appealed not only to the revolutionaries of Mexico, but to the "revolutionaries of Latin America, the revolutionaries of the universe."[67] As the closest nation south of the United States, Mexican officials and artists showed Mexico leading the way against imperialism. Carranza and his communications leaders hoped that the Salvadoran station would help spread this message to Central America, to help counter U.S. dominance, and to keep an ear on Guatemala's legendarily paranoiac strongman, *el señor presidente* Manuel Estrada Cabrera.[68]

There were other important motivations involved in building the station as well. Confronted with inconsistent trade and embargos from the United States, El Salvador became a reliable if limited partner for the Constitutionalist forces. In exchange for the radio equipment, two Mexican-constructed aircrafts, and assistance during a devastating earthquake, Carranza received good deals on ammunition and a reliable ally on Mexico's southern border.[69] El Salvador was also the only Central American country that, like Mexico, took a neutral stance during World War I. German spies and communications operatives full-heartedly supported the radio project there and helped provide the necessary equipment and expertise. By 1918 El Salvador received daily bulletins from Mexico, including German news and propaganda.[70]

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[66] "El imperialismo de los Estados Unidos," *El Pueblo*, 12 Jan. 1917, 3.
[67] Venustiano Carranza, "Frente a frente," *El Pueblo*, 12 Jan. 1917, 9.
[68] As vividly portrayed in Miguel Angel Asturias, *El señor presidente* (Madrid: Cátedra, 1997).
[69] Buchenau, *In the Shadow of the Giant*, 126.
[70] "La estación de Chapultepec es un prestigio para México," *Revista de los Telégrafos Nacionales* 1, no. 1 (May 1921), 7-8; Katz, *The Secret War in Mexico*, 421.

While Sánchez raised the towers in San Salvador, German engineers and other SCOP officials finally got the Mexico City project off the ground. Construction began in March 1917. The shipment of radio materials had left New York on February 28, the day before the U.S. press published the soon-to-be notorious Zimmerman telegram.[71] Historian Friedrich Katz hypothesized that this is why American naval officials halted the ship and confiscated most of the materials before the crew could unload the goods in Veracruz. Katz's assumption seems reasonable. The public release of the Zimmerman telegraph caused an uproar in the United States and greatly heightened American sensitivity to German communications in the Western Hemisphere. However, a letter from Von Eckardt to Aguilar dated January 31, 1917—before the publication of the Zimmerman telegram—exhibits that German operatives already suspected that Americans might try to halt the shipment.[72]

This setback did not stop the construction of the station. Germany had sent other equipment in December of 1916 and some of the February 1917 shipment may have made it through as well. German and Mexican agents also did a good job of improvising in response to the circumstances. American officials had been mostly correct to note Mexico's reliance on foreign technologies, but the increased difficulties in obtaining war materials due to U.S. restrictions and World War I provoked the Carranza administration to become more self sufficient. As a result, the Constitutionalist military began manufacturing ammunition, airplanes, and communications equipment. Mexican technical groups began building radio

[71] For more on the Zimmerman telegram, see Nickles, *Under the Wire*, 137-60 and Barbara W. Tuchman, *The Zimmerman Telegram* (New York: Ballantine Books, 1958).

[72] Heinrich von Eckardt to Cándido Aguilar, Mexico City, to Querétaro, 31 Jan. 1917, caja 17-9-278, ARSE.

components based on Telefunken designs and made to work with Telefunken equipment. Carranza also tapped domestic manufacturers. The Compañia Fundidora de Fierro y Acero de Monterrey provided the iron for the project. A generator and rotor was constructed from parts made in Monterrey and Mexico City. Mexico's National School of Telegraphy also began to add new classes on radiotelegraphy and a publicity campaign to obtain new recruits.[73]

From 1917 to 1919 German and Mexican officials worked together to build a receiver and transmitter, which they decided to put in different locations. They constructed the former in Ixtapalapa and the latter in Chapultepec, tackling the receiver first. They chose to build it in Ixtapalapa, a neighborhood on the southern outskirts of Mexico City, to hide it from American intelligence officers but also for technical reasons. The first messages from Nauen arrived in late April 1917. Afterwards, Von Eckardt and other members of the German legation and intelligence community received messages from Germany on a regular basis, relayed by Carranza officials sympathetic to their cause. German leaders decided that a high power transmitter in Mexico City would also be beneficial to Germany. To build the transmitter, the German government relied heavily on Gustavo Reuthe, an engineer who had worked at the Sayville station until forced out of the United States by American officials. Reuthe, Eugene Dzinzilewsly—another German engineer—and Mexican specialists Luis Sánchez, Agustín Flores, Ignacio Galindo, and Salvador Teyabas, completed the station

[73] William Canada to the Secretary of State, Veracruz to Washington, DC, 10 Mar. 1917, RG 59, fold. 812.74/61, USNA; "La estación de Chapultepec es un prestigio para México," 8; Enrique Cárdenas de la Pena, *El telégrafo* (Mexico City: Secretaría de Comunicaciones y Transportes, 1987), 125-26; "Se desean telegrafistas y celadores de telégrafos," *El Pueblo*, 9 Jan. 1917, 2.

in July 1918.[74] From this point until his death, Reuthe would become an important communications operator, teacher, and government consultant in Mexico. He had a huge influence on a number of Mexico's top radio specialists. He also continued to work on Telefunken's behalf, and to aid the Mexican efforts to expand their wireless reach in Central America. But the Germans never controlled the Mexico City stations. They were not "German operated" as U.S. intelligence reports and subsequent scholars contended.[75] Early transmissions, also failed to reach Nauen. This problem persisted throughout the year, though operators somewhat circumnavigated the issue by sending messages to Spain which were then forwarded to Germany.[76]

But German leaders saw the Mexico City radio stations as serving a greater purpose than the reception and transmission of military messages. German leaders before, during, and after the war hoped to expand their influence in communications in a more general sense. As Katz pointed out, the German leadership feared that they might lose control of their country's international cable telegraphs once the war ended in their loss. Radio became a significant component in their plans to continue to operate strategic global communications, both for political and commercial reasons. In Latin America, German officials specifically targeted Mexico, Brazil, Uruguay, Chile and Argentina. Reuthe remained an important advisor in Mexico City and Telefunken

[74] Fuentes, *La radiodifusión*, 25-26.

[75] Friedrich Schuler, *Secret Wars and Secret Policies in the Americas, 1842-1929* (Albuquerque: University of New Mexico Press, 2010), 176-88. Although Schuler provides important insights into U.S. and German intelligence operations in Latin America during World War I and the Mexican Revolution, he argues that Germans influenced the Carranza administration more than Mexican archival sources exhibit. Indeed, Schuler's decision to not incorporate Mexican sources skews the facts. He fails to recognize the complex domestic goals that influenced Carranza's relationship with German agents, that Mexican officials had a significant part in building the German-designed wireless stations, and that it was Mexicans who mostly operated the transmitters and receivers, and often for their own purposes.

[76] Katz, *The Secret War in Mexico*, 420-23; Gustavo Reuthe, "Estudio sobre la radiotécnica: Su desarrollo en general y especialmente en la República," Mexico City, 1922, unpublished study, caja 525 exp.9, Fondo Secretaría de Comunicaciones y Transportes, AGN.

remained a large supplier of radio equipment to Mexico and Latin America well into the 1920s, as it had been previously during the Díaz and Huerta administrations.

In the United States, the Zimmerman telegram and subsequent articles about German spies brought fears about wireless communications in Mexico to a near state of hysteria. On March 1, 1917, when the contents of the telegram began to circulate widely among American newspapers, articles described "100,000 Germans" in Mexico, as if they were poised to invade.[77] The same writings described extensive secret wireless networks. One report stated that "authorities" in the San Diego area had known about German wireless operation in Baja California for weeks. These included "three wireless stations 600 or 700 miles south of San Diego in the vicinity of San Quintin, Baja Cal."[78] These wireless operations supposedly had collapsible masts that Germans lowered during the day and raised during the night. The *New York Times* further claimed that there was another Baja California station around Turtle Bay or Bahia Tortugas, which was high-powered and had been overheard "sending in a slow, methodical way."[79] Paranoia was rampant.

One March 9 *New York Times* article is particularly interesting for its curious blend of accurate information and critical mistakes. It stated that "semi-official" sources told of a powerful wireless station built in Mexico City that allowed "direct communication between Germany and Mexico City." It also mentioned that one source stated that it was not powerful enough to send messages to Germany, but that it could

[77] "100,000 Germans are in Mexico," *New York Times*, 1 Mar. 1917, 2; "Germany Seeks Alliance against Us," *New York Times*, 1 Mar. 1917, 1.
[78] "100,000 Germans are in Mexico," 2.
[79] Ibid.

receive transmissions from Nauen.[80] The strange thing is that the Mexican receiving station in Ixtapalapa was not in operating order until April. Indeed, the article appears to have caught the German Admiral Staff by surprise.[81] Katz states that "the premature American announcement was either the result of false information by the U.S. intelligence agencies or, since the announcement was made one week after the publication of the Zimmerman note, was consciously calculated to intensify the impact of the note by attempting to exaggerate German influence in Mexico."[82] The details of the newspaper account lends very strongly to a U.S. intelligence source, but at least one U.S. operative working with the American embassy in Mexico, someone who had closely monitored Mexican radio development, believed that there was "no plant in the country capable of being used by Germany in communicating directly to Germany, and none can be established without our knowing about it."[83] Perhaps the U.S. government provided the statement to increase American fears, and perhaps to let German leaders know that U.S. intelligence agents were on to their plans for wireless in Mexico, even if they did not know the exact details.

The article additionally discussed the El Salvador station built "just over the Guatemalan border" in Acajutla. The source contended that Germans wanted to influence Mexican foreign policy in Central American and to make "[El] Salvador a base of operations for the invasion of Nicaragua by revolutionists" who would allow Germany to build a canal through the country. This statement played into American

[80] "Wireless from Mexico to Germany," *New York Times*, 9 March, 1917, 1.
[81] Katz, *The Secret War in Mexico*, 419.
[82] Ibid, 420.
[83] Frank R. McCoy, "Wireless Stations in Mexico—Memorandum for the Ambassador," 12 Mar. 1917, RG 59, fold. 812.74/60, USNA; Henry P. Fletcher to the Secretary of State, Mexico City, to Washington, DC, RG 59, fold. 812.74/60, USNA.

fears about losing control over the trans-isthmian route between the Atlantic and Pacific oceans. Like U.S. intelligence reports, journalists gave little credit to Mexican specialists, arguing that Germans ran the El Salvador station and that it was German agents that brought the equipment there on the Mexican ship *Jesús Carranza*.[84] Although Germans played an important role in training and assisting Mexicans, it was the latter who predominately constructed the station in El Salvador, even if the tower met with the approval of Germans. And although the leadership in Germany welcomed all of these developments, it put little actual effort into fomenting revolution in Central America.

Newspaper articles throughout the remainder of 1917 stated that German spies in the United States and Mexico were sending information to Germany, "probably by wireless."[85] Some American officials proclaimed Mexican transmissions to Germany were an absolute certainty. Senator James Hamilton Lewis of Illinois, for example, blamed Mexican stations for sending sensitive information to Germany about ships carrying American soldiers to Europe. He declared that "because of such information they [U.S. ships] were pursued by submarines and their landing [was] announced days before our navy was ready." He argued that Wilson and his cabinet knew of these messages.[86] The Constitutionalist government rejected the claims that it spied on U.S. military movements and that it sent wireless messages to Germany, stating that its equipment was not capable of transmitting that far. It did, however, admit that it transmitted messages regularly to El Salvador.[87]

[84] "Wireless from Mexico to Germany," *New York Times*, 9 March, 1917, 1.
[85] "Spy Reported Caught Tipping Naval News," *New York Times*, 23 Aug. 1917, 2.
[86] "Wireless in Mexico Told of Our Troops," *New York Times*, 19 Jul. 1917, 1.
[87] "Mexico Plans Many Big Improvements," *Los Angeles Times*, 7 Jul. 1917, I 9.

The members of the Carranza administration and the Mexican press were actually divided between pro-ally and pro-German leanings. Pro-German officials in the Carranza administration included Mario Méndez, Cándido Aguilar, Gen. Benjamin Hill, and Rafael Zubarán Capmany. Pro-ally leaders included Félix Palavicini, Pastor Rouaix, and Alberto Pani. Carranza and much of the military leaned towards Germany, though they were just as much against American imperialism as pro-German.[88] Obregón, Carranza's most powerful general, however, tended to favor the United States and its allies.[89]

It was in this superheated atmosphere that some prominent Mexicans came to the United States and spoke of German wireless outposts and corrupt Mexican officials. Juan Suárez—half brother of José Maria Pino Suárez, the Mexican Vice President whom *huertistas* had assassinated along with Madero, and an editor for the pro-ally Mexico City paper *El Universal*—told American reporters and businessmen that even though Carranza was trying to curb German influence, he could be doing a better job. In Suárez's words, the greatest threat

> to the peace and mutual prosperity of our nations is the great net-work that the spy system Germany has been able to promote in Mexico, especially along the western coast. They have twenty-one wireless stations; one of them [is] supposed to be the most powerful in existence in the City of Mexico and although carefully watched by the Mexican secret service, common rumor says it is operated by many unscrupulous persons, who would do anything for cash. A number of Germans are also employed at this station. News of Berlin could be rushed across to Berlin without being checked.[90]

[88] Richmond, *Venustiano Carranza's Nationalist Struggle*, 149-56.

[89] Jürgen Buchenau, *The Last Caudillo: Alvaro Obregón and the Mexican Revolution* (Malden, MA and Oxford: Wiley-Blackwell, 2011), 88.

[90] Juan Suárez, quoted in "Mexico to Break with Hun-Suarez," *The Oklahoman*, 20 Jun. 1918, 1.

Suárez had specific "unscrupulous persons" in mind in his exaggerated statement, including important members of the Carranza administration's communications department, men including the Director of National Telegraphs Mario Méndez. Trinidad W. Flores—an important telegraph official and spy for the faction supporting Alvaro Obregón during the 1920 presidential succession—later noted that Méndez admired the Germans, welcoming the officials who had operated the Sayville station in New York to work at Ixtapalapa and Chapultepec. According to Flores, Méndez happily relayed information to Von Eckardt and flaunted German-Mexican connections.[91]

U.S. intelligence gatherers confirmed Mexican involvement in relaying German information in the fall of 1918. By that time, the Chapultepec station could finally transmit across the Atlantic, and American radio operators along the U.S.-Mexican border had been regularly searching the airwaves for suspicious signals coming out of Mexico. The Military Intelligence Division sent reports on their results to the military attaché to the American embassy in Mexico City, the State Department, the Office of Naval Intelligence, and the Department of Justice. After connecting an "unknown 6300-meter station," which operated each night between 11:30 p.m. and 2:00 a.m., to Chapultepec, the Military Intelligence Division spied on the frequency from August through October. They reported each week on the number of messages sent in code, Spanish, and English. On October 3 they reported that

> There have been developments in the Radio Subsection which may influence our Mexican relations. Evidence

[91] Trinidad W. Flores, Mexico City, 30 May 1919, in *Contraespionaje político y sucesión presidencial: Correspondencia de Trinidad W. Flores sobre la primera campaña electoral de Álvaro Obregón* (Mexico City: Universidad Nacional Autónoma de México, 1985), 31, comp. by Alvaro Matute. Also see pages 60-62.

> has been secured that seems to convict the Mexican government of conniving in the German use of radio at Chapultepec for hostile purposes. This evidence, founded on the discoveries of operatives, is being placed in proper hands in the form of a detailed memorandum. The exact repetition of the code sent from Chapultepec in the latter part of August and upon corresponding days in September has resulted in an examination with a view to discovering a concealed cipher. The Radio Subsection has translated and forwarded 368 intercepted code messages in Spanish; received and forwarded 34 in English; received and forwarded 321 for decoding; and decoded and forwarded 3 in code.[92]

Although the United States and Mexico never came to war over German communications in Mexico, the evidence supports the claims that certain Mexican leaders helped relay information between Germany and German agents in Mexico.

Carranza, and many of his leaders, however, approached German advances pragmatically, just as he had approached U.S. businessmen and officials during his struggle against Huerta. They knew better than to openly support Germany during the war. They had too many problems of their own within Mexico, and once the United States joined World War I, the Carranza administration only entertained the possibility of an alliance with Germany if the United States initiated a full-scale invasion of Mexico.[93] Even if Carranza resented American interference, he still relied heavily on U.S. supplies, and he had no desire to risk another American invasion. But he also

[92] "Supplement of the Work and Activities of the Military Intelligence Division for the Week Ending October 3, 1918," p. 20, exp. 030201, inv. 5, leg. 6/12, Fondo Espías, Fideicomiso Archivos Plutarco Elías Calles y Fernando Torreblanca, Mexico City, hereafter cited as FAPECFT.

[93] Schuler, *Secret Wars and Secret Policies*, 183-4, reveals a number of initiatives that the Carranza administration undertook to prepare for a possible war with the United States, including military and diplomatic alliances with Japan and Germany, and arms and communications purchases. But he overstates foreign policy concerns and underestimates how domestic issues influenced Constitutionalist actions. Carranza sought out communications equipment and armaments from Germany and Japan in order to defeat internal enemies more than to fight a war with the United States. Indeed, most of Carranza's war materials came from the United States, not Germany or Japan.

concluded that allowing Germans to help build powerful wireless stations in Mexico had great domestic advantages.

Mexicans had their own goals for radio development, including for the powerful German-designed stations. In exchange for relaying German news and messages, the Carranza administration acquired its most powerful communications tools, advancing its influence over the Mexican nation and its ability to communicate with representatives of other countries. Although a small number of German specialists assisted, it was mostly Mexicans who operated these plants. As Aguilar reminded Von Eckardt on February 5, 1917, "only the Mexican government can establish wireless stations in the national territory."[94] Carranza and many of his generals saw the stations as a way to increase their own power and nationalist designs. Obregón reportedly supported the projects because the government in Mexico City could better communicate with military elements throughout the country.[95] The new stations in Ixtapalapa and Chapultepec allowed for a more consistent means of sending wireless messages across the whole of Mexico and to receive them in return, and telegraphers used them more for these operations than for communication with Germany.

The stations also fit well with the Carranza administration's foreign policy initiatives. Although the Mexico City-station operators willingly relayed German news, Mexican officials also provided their own nationalist and anti-imperialist propaganda abroad. They sent this information to El Salvador and they had plans to extend radio towers into other parts of Central America.[96] By February 1919, Mexico sent reports to

[94] Cándido Aguilar to Heinrich von Eckardt, Querétaro to Mexico City, 5 Feb. 1917, caja 17-9-278, ARSE.
[95] "Wireless Joins Mexican Capital and Germany," *New York Times*, 9 Mar. 1917, 1.
[96] Cárdenas de la Pena, *El telégrafo,* 125.

Buenos Aires, Argentina, and Punta Arenas and Valparaiso, Chile. The station also began "transoceanic press" services, which they sent to Germany, Japan, and ships at sea.[97]

During 1918 Mexican and Japanese communications officials worked to connect their representative nations by radio. They also designed codes for sensitive political messages, a topic of high importance to Japanese officials.[98] Japan had started a surge in its wireless ambitions, building stations not only in Japan but also for China.[99] However, by September 1918, the Mexican ambassador to Japan told Carranza that Japan could not yet transmit messages to Mexico City; in fact, their transmissions could only reach Honolulu, Hawaii. But he also stated that Japanese officials were working on a high-power station on Japan's northern coast, which they hoped would reach the Americas. By late 1918 or early1919 Japan was, at least occasionally, receiving Mexican radio transmissions. This was important to the Carranza government and Japan. Carranza had increasingly turned to Japan to purchase munitions, equipment to manufacture ammunition, and weapons in response to American embargos. Carranza had also bought warships from Japan. Japan, on the other hand, had increased its commercial investments in Mexico.[100] The radio link provided a new means of communication that avoided American channels.

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[97] De la Huerta, *Informes . . . de la Secretaría de Comunicaciones y Obras Públicas del 11 de abril al 31 de mayo de 1920*, 53, 170; Reuthe, "La estación de Chapultepec es un prestigio para México," 7; "Estudio sobre la radiotécnica: Su desarrollo en general y especialmente en la República," 10; Dr. Heller Krumm to the Secretario de Relaciones Exteriores, Berlin to Mexico City, 14 Aug. 1919, caja 16-27-26, ARSE.

[98] M. Pérez Romero to Venustiano Carranza, Tokio to Mexico City, 18 Sept. 1918, caja 16-27-28, ARSE.

[99] Yang, *Technology of Empire*, 64-68.

[100] Richmond, *Venustiano Carranza's Nationalist Struggle, 1893-1920*, 104, 159; "Carranza Seeks Japanese Favor," *New York Times*, 10 Mar. 1917, 1; "Japan Sends Mexico Munition Machinery," *New York Times*, 26 Feb. 1917, 1.

The desire of German leaders to maintain communications channels with the Western Hemisphere by building a radio station in Mexico played into Carranza's designs to use wireless to defeat his enemies and secure the whole of Mexico under his government. As long as he could publicly remain neutral and not incite the wrath of the United States, which was entangled in the war in Europe, Carranza could play on German and Japanese needs to fulfill his own. Carranza's nationalist and anti-U.S. policies, American off-and-on again embargoes, and a history of partnership with Germany drove Constitutionalist decision making. As World War I winded down in November 1918, the Carranza government used the German-designed stations for commercial and foreign relations with Germany, the United States, El Salvador, Argentina, Chile, and Japan, but also for domestic communications.

**Carranza's Fall**

With the European war over and 1920 on the horizon, the Constitutionalists prepared for their first attempt at presidential succession. Obregón appeared to himself and most others as the clear heir to Carranza's position. He was the most powerful general and, despite missing his left arm, he was an able and charismatic speaker. Carranza, however, had grown weary of Obregón, who had supported the more radical wing of Constitutionalists represented by the *Partido Liberal Constitutionalista* or Liberal Constitutionalist Party. Carranza also hoped to have a "civilian" replacement, one that he could influence. Instead of backing Obregón, the clear favorite, Carranza tried to impose Ignacio Bonillas as the next Mexican leader. As a MIT graduate and a capable Secretary of Communications and Ambassador to the United States, Bonillas

appealed to Carranza as the type of president that a modern Mexico needed. But Bonillas had little support. Few people outside of Carranza's close circle knew Bonillas, whereas people recognized Obregón as a victorious general.

Fearing Obregón's escalating power, Carranza attempted to undermine the general's base of support. The First Chief tried to intimidate or co-opt Obregón supporters, including prominent allies in the general's home state of Sonora. As a result, a number of Sonoran military leaders, including Obregón, Plutarco Elías Calles, and Adolfo de la Huerta revolted on April 23, 1920. They issued the Plan of Agua Prieta and prepared their march on the capital. Although Carranza had made progress in strengthening state power over much of Mexico, his failure to address key agrarian issues, his hostility towards workers and unions, and his consistent clashes with the United States, provided exploitable vulnerabilities. Obregón promised greater land distribution and greater political participation, not to mention a possible path of compromise for the remaining *villista* and *zapatista* forces. Most of the military joined Obregón, and when other prominent generals including Pablo González joined him as well, Carranza chose to flee to Veracruz in an attempt to once again use the port city as a place to regroup and reconquer the country. His ambitions were never realized; he was assassinated in the small village of Tlaxcalantongo in the mountains of northern Puebla. The Agua Prieta rebels took power after only twenty-seven days in rebellion, making Adolfo de la Huerta the provisional president until Obregón could be officially "elected" as president in November.[101]

[101] Knight, *The Mexican Revolution*, vol. 2, 492; Brian Hamnett, *A Concise History of México*, 2nd ed. (Cambridge: Cambridge University Press, 2006), 218.

Communications played a crucial and fascinating role in the run-up to the 1920 election and the subsequent Agua Prieta Rebellion.[102] Within the communications department, as with the Constitutionalist forces in general, officials split into factions: *carrancistas*, *obregonistas*, and those that "swam in both waters," or mediated between both sides.[103] These agents in turn fought an internal propaganda and intelligence war, communicating with foreign countries and carrying out acts of espionage and counter espionage. On June 25, 1919, Trinidad W. Flores wrote to a friend that Carranza loyalists in the "Department of Press within the Secretary of Foreign Relations communicated by wireless to Santiago, Chile, Buenos Aires, Panama, and El Salvador that general González would propose to general Obregón a pact to respect the results of the elections in order to avoid another revolution." Carranza officials spread other statements and rumors favoring them to other parts of Latin America, while *obregonistas* within the DGTN reported these statements to their leaders, who it turn sent out their own responses. Mario Méndez, the diehard *carrancista* director of the DGTN, also ordered his employees not to accept any messages from Tabasco's interim governor Tomás Garrido Canabal, because he no longer possessed "legitimate authority."[104] As tensions grew, Méndez attempted to censor information sent by Obregón supporters and to fire *obregonista* members of his staff.[105] His efforts, however, proved to be in vain as the tide of telegraphers, and most others, turned away from Carranza. When the rebellion started, regional Obregón supporters took control of

[102] Alvaro Matute, *Contraespionaje político y sucesión presidencial*, 14.
[103] Trinidad W. Flores, letter, Mexico City, 10 Jun. 1919, in *Contraespionaje político y sucesión presidencial*, 35.
[104] Trinidad W. Flores, letter, Mexico City, 10 Sept. 1919, in *Contraespionaje político y sucesión presidencial*, 70.
[105] Trinidad W. Flores, letter, Mexico City, 25 Nov. 1919, *Contraespionaje político y sucesión presidencial*, 101-03.

wireless operations. Factions within the central government, including the telegraphers of the Secretary of War and Marine, also sided with the Agua Prieta rebels.[106]

A week before Carranza's murder, the Sonoran leaders worked out the details of the provisional government largely over the radio. According to one newspaper article:

> In a telegram to the revolutionary junta in Washington, Provisional President De la Huerta said that he had been in communication with Gen. Obregón at Mexico City; that Gen. Obregón had recognized the plan of the provisional government, had subordinated himself to it and was in complete accord with all that had been done and with plans in contemplation for perfecting the provisional government. President De la Huerta remains in Hermosillo, capital of Sonora, and has established communications with Mexico City by wireless.[107]

During his hasty flight from the capital, Carranza took weapons, records, and money, but he failed to destroy the radio system, which provided the rebels an important communications link to Sonora and the American press. Some stations, however, including in Alamos, Acapulco, and Chihuahua, "had been interrupted by political events."[108] But most of the wireless network remained intact, and the Sonoran victors would greatly capitalize on Carranza's previous expansion of Mexican communications.

**Conclusion: Radio Control**

During Carranza's presidency, wireless communications became an important component of state control and foreign relations. Radio helped secure his government's victory over internal enemies and to consolidate his power over gained territory. The

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[106] Trinidad W. Flores, letter, Mexico City, 22 Oct. 1922, in *Contraespionaje político y sucesión presidencial*, 84.

[107] Arthur Sears Henning, "Seek Carranza Loot," *New York Times*, 13 May 1920, 1.

[108] De la Huerta, *Informes . . . Secretaría de Comunicaciones y Obras Públicas del 11 de abril al 31 de mayo de 1920*, 53.

Carranza administration's ability to communicate with foreign businesses increased its capability to obtain weapons, munitions, and other supplies. The medium also allowed Carranza to speak and receive messages from foreign political leaders who provided aid and legitimacy to Carranza's cause.

Radio also continued to be central to U.S. interventions into Mexico. Indeed, Mexico became a testing ground for American military technology in general. The Pershing Expedition allowed the U.S. military to test new automobiles, weapons, aircraft, and, of course, radio. Field operators relayed information from the front lines to Pershing and other commanders within Mexico and in American forts close to the border. Carranza communication agents, for their part, kept a constant ear on U.S. radio messages, often using stations recently acquired from *villista* forces. Immediately following the withdrawal of U.S. forces, Carranza and a number of his high ranking officials, including Bonillas, Calles, and Rodríguez Gutiérrez, worked to close down wireless stations operated by American miners—who were correctly scene as spies—while increasing their purchases of U.S. radio equipment.

World War I further escalated radio development in Mexico when German agents designed massive receiving and transmitting stations in the Federal District. These operations provided intelligence for German operatives, but Mexicans ultimately controlled them, using the devices to spread their own news and propaganda and to build closer relations with Latin America, the United States, Germany, and Japan. With this equipment, *carrancista*, telegraphers and state officials made wireless technology an important component of Mexican foreign relations. Controlling wireless

communications also became a crucial factor in governing: a point that Obregón knew well, and which would become even clearer to him during his own time in power.

Chapter Five

# The Pragmatic President, the Diversification of Radio and the De la Huerta Rebellion

"Mexico has been bitten by the radio bug"
—*Los Angeles Times*,
December 16, 1923

In late September 1921, not yet a year into his presidency, Alvaro Obregón presided over a massive centennial celebration in Mexico City. Honoring Agustín Iturbide's successful separation from Spain a hundred years before, conservative residents usually recognized the day more than others. But the Obregón administration seized upon the opportunity to put on a lavish display of his first year in office. The regional dances, national artwork, airplane shows, baseball games, and bullfights were all meant to endear the new government to local residents and visiting foreigners alike. The festivities promoted Mexico's rich and varied heritage, the new state, and the returning commercial elite. It mythologized Mexico's past and exhibited the nation's more modern future.[1]

The event was also very much a public display of Obregón's own policies and persuasions. He had billed himself as someone who could bring the country together, and as someone less flagrantly opposed to American interests than was his predecessor. He pushed capitalists and laborers to work together.[2] For the festival, Obregón's cabinet members invited urban workers and Porfirian-era industrialists alike.

[1] Michael J. Gonzales, "Imagining Mexico in 1921: Visions of the Revolutionary State and Society in the Centennial Celebration in Mexico City," 25, no. 2 (Summer 2009): 247-70; "Helen Delpar, "Mexican Culture, 1920-1945," in *The Oxford History of Mexico*, ed. by Michael C. Meyer and William H. Beezley (Oxford: Oxford University Press, 2000), 543-72.

[2] Buchenau, *The Last Caudillo*, 100-01.

According to Secretary of Foreign Relations Alberto J. Pani, it was "equally accessible to all social classes and exhibited a marked nationalist color."[3] And this vibrant nationalist color was definitely a mix of different paints. Alongside charros, rural dancers, and Aztec motifs stood exhibits of international companies, modern hygienics, film, and radio.

The Obregón administration's policies on wireless communications were also multifaceted and aimed at different audiences. He built on the structural progress of his predecessor while watching over the diversification and popularization of the technology, especially after the rise of broadcasting. This new form of radio revolutionized how people thought about the medium, both those who controlled it and those who listened. But underneath the jazz, national airs, and *canciones mexicanas* beaming from commercial and government towers, wireless technology remained a tool of military suppression, rebellion, and espionage. These developments challenged but ultimately strengthened the Obregón and Calles administrations' state and nation-building designs.

Obregón also expanded on Carranza's Central America policy of gifting radio stations and fighting against U.S. communications initiatives in Latin America. At the same time, he strove to increase trade with the United States, including the importation of music records, phonographs, and radio receivers. He allowed private entrepreneurs to take the lead in broadcasting while using the state to protect the growth of a nationalist industry. He also encouraged the newly created Secretariat of Public Education (SEP) to establish its own station. As with many of his policies, his actions

[3] Alberto J. Pani, quoted in Delpar, "Mexican Culture, 1920-1945," 543.

in wireless development stemmed from his pragmatist and capitalist leanings but also from reactions to outside impulses that forced him to look at radio in more novel ways.

**Diversification**

The 1921 centennial celebration was the first function to popularize radio in the imaginations of Mexico City residents. The attention stemmed largely from displays of newly acquired radiotelephone devices, which could transmit the human voice and music. Conversations were direct; telegraphers were no longer needed to decipher coded messages. Government officials had first used radiotelephones like walkie talkies for direct communication. However, a number of aficionados and commercial entrepreneurs in the United States, but also in Argentina and Mexico, began using radiotelephony to transmit musical performances to multiple receivers, creating the new field of radio broadcasting. Exhibitions of both point-to-point and broadcasting took place on September 27, awing thousands of participants.

In the event's International Commercial Exposition located in the *Palacio Legislativo* or Legislative Palace, the DGTN oversaw a popular booth filled with radio apparatuses. Showcasing German, American, and Mexican-made equipment, the department provided different examples of the "methods of rapid communication with the rest of the Republic and with foreigners."[4] Surrounded by smaller wireless pieces and cable telephones, a radio set with a giant windmill-looking antenna prominently received messages in the middle of the display. Operated by DGTN officials Agustín Flores and José D. Valdovinos, a 1-kilowatt De Forest radiotelephone garnered the most

[4] "El contingente del ramo en la exposición comercial internacional del Palacio Legislativo," *Revista de los Telégrafos Nacionales* 1, no. 6 (Oct. 1921): 4.

attention. Capable of sending and receiving voice transmissions, Flores and Valdovinos allowed various people to speak messages to the president, which he supposedly heard through a similar device set up in Chapultepec castle. Public exhibitions of the station occurred from nine to ten in the morning and four to five in the afternoon. In addition, Flores and Valdovinos also displayed German and Mexican radiotelegraphs. These devices received messages from Europe and the United States "with total clarity," especially at night when the atmospheric conditions were optimal for reception. The exhibit obtained even more publicity when the newspaper *Excélsior* and the journals *Revista de Revistas* and *Revista de los Telégrafos Nacionales* published articles on the booth.[5]

Just one of a number of government attempts to provide a modern image, the DGTN showcase provided other visual cues. Its location in the International Commercial Exposition alone announced that the Obregón administration was open for business and that it was obtaining technologies to further facilitate global exchanges. The transmission of the voice also possessed its own force, especially because local participants had never seen a contraption like this. To many residents the radiotelephone bordered on magical.

Many scholars argue that the first radio broadcast occurred at the centennial celebration.[6] That evening, using similar devices as those at the DGTN exhibit, radio aficionados and brothers Adolfo and Pedro Gómez Fernández, transmitted a music show to audiences at the *Teatro Ideal* and the *Teatro Nacional*, the present-day *Palacio*

[5] Ibid, 4-5; Felipe Gálvez Cancino, "Los felices del alba," tesis de licenciatura, Universidad Nacional Autónoma de México, 1975, 112-116; "Y llegó a comunicación sin cables: La primera transmisión de radiotelefonía en México," *Relatos e Historias de México* 35, July 2011, 81-83.

[6] Among others, Cuauhtémoc Anda Gutiérrez, *Importancia de la radiodifusión en México* (Mexico City: Cuauhtémoc Anda Gutiérrez, 2004), 17; Romeo Figueroa Bermúdez, *¡Que onda con la radio!* (Mexico City: Pearson Educación, 1996), 41; Gálvez Cancino, "Los felices del alba," 109-23.

*de Bellas Artes*. Airing the singer José Mojica, among others, the demonstration was the first time that a musical performance was transmitted to a large audience. The Gómez station continued to operate between five and seven in the afternoon until January 1922. Singer and musician Francisco P. Yáñes presided as creative director in addition to performing on a number of occasions.

The centennial festivities also brought attention to the use of radiotelephony in Mexico's young air force. Wireless communications became a component of pilot training during Adolfo de la Huerta's provisional presidency in 1920, but radiotelephony did not become a demonstrable fact until after the election of Obregón.[7] The day after the centennial celebration, President Obregón, along with members of his general staff, foreign diplomats, journalists, and military officers, drove to the Balbuena airfield just outside the capital. There, he presided over the inauguration of radiotelephone services at the base, as well as at a similar installation in Pachuca, Hidalgo. Air force officials had additionally equipped a Farman biplane with a radiotelephone. Obregón and his entourage watched Mexican aviators—inspired by American daredevil pilots who performed at the centennial—conduct aerial stunts. The president talked via radio to pilot Fernando G. Proal, who was a first-generation graduate from the *Militar de Aviación* and one of the country's most respected aviators. Proal also communicated with officials at the Balbuena and Pachuca stations, who also talked with each other. The latter station transmitted the popular revolutionary ballad "Adelita." According to a Mexico City newspaper, the president was "very pleased."[8]

[7] Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX," 184-93.
[8] "Las primeras pruebas de la telefonía inalámbrica," *El Universal*, 29 Sept. 1921, II 1.

The following day, the press reported on radio's increasing role in foreign relations. Rafael Cárdenas Jiménez, the Costa Rican consul to Mexico City, told the newspaper *El Universal* that President Obregón "decided to donate powerful wireless stations to Guatemala, Costa Rica, Honduras, El Salvador, and Nicaragua with the goal of establishing better relations with Mexico."[9] Obregón promised to escalate Carranza's radio policies in Central America at the exact same time that he was overseeing the incorporation of the medium in new ways into Mexican society.

The centennial events exhibited the major radio developments that had taken place during the first years of Sonoran rule. The celebration displays also hinted at the new challenges with using and regulating radio that the Obregón administration would. The most important change was the aforementioned radiotelephone. Although the technology had existed in the first decade of the 1900s, it remained impractical until De Forest made key improvements in the 1910s.[10] Incorporated into the DGTN by mid 1921, it was thereafter applied to inter-departmental communications, aviation, and in the navy. In the words of one newspaper article, "for the Mexican government the introduction of the modern [wireless] telephone communications system reveals the audacity of their work in the ever-increasing conquest of physical sciences employed in human activities."[11] Beliefs in the power of science were alive and well, and for many urbanites, radio was one of the newest tools in the story of human progress. Obregón

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[9] "La República Mayor de Centroamérica será gobernado por un triunvirato," *El Universal*, 30 Sept. 1921, 1; Virginia Medina Ávila and Gilberto Vargas Arana, *Nuestra es la voz, de todos la palabra: Historia de la radiodifusión mexicana, 1921-2010* (Mexico City: DGAPA/FES Acatlán, UNAM, 2011), 63.

[10] N. J. Quirk, "Wireless Telephony in the Navy," *Telephony*, Jan. 1908, 30-33, http://earlyradiohistory.us/1908df1.htm, accessed 30 Mar. 2012.

[11] "Dos estaciones de telefonía inalámbrica ayer inauguradas en la Exposición Comercial Internacional," *Excélsior*, 28 Sept. 1921, 1; "Telefonía inalámbrica en los faros," *El Universal*, 7 Oct. 1921, 3; also see Ornelas Herrera, "La radiodifusión" 62-77.

embraced these developments, partly because they were a necessary requirement for continued modernization, but also because Obregón—a capitalist and inventor himself— genuinely supported them.[12]

Radio had also expanded in other less publicized ways. When Obregón took office, twenty-seven radiotelegraph stations operated regularly across the country. DGTN officials reinstalled the wireless operation on the Isla María Madre where Obregón's forces had destroyed it six years before. Indeed, the DGTN moved to install "radiotelegraph stations in all the state capitals and the ports of both costs, putting them in rapid and constant communication with the Capital of the Republic."[13] The workshops of the DGTN amped up their production of radio equipment from none to some, providing receivers for the centennial exhibit, but also oscillators, switches, and antennas for stations. They additionally built four portable devices designed to be mounted on the backs of mules.[14] With an aim of modernizing further, the department sent prominent technicians to study abroad. José Flores Treviño and Raymundo Sardaneta studied Europe's most powerful stations, and Pedro N. Cota went to New York to attend conferences held by the increasingly powerful Radio Corporation of America (RCA).[15]

Efforts to standardize time relied on radio technology. Of course, this phenomenon occurred not only in Mexico but across much of the globe between the 1880s and the 1930s. Before the development of the atomic clock in the 1950s,

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**12** Lieuwin, *Mexican Militarism*, 58.

[13] "Adolfo de la Huerta, al abrir las sesiones ordinarias el congreso del 1 de septiembre de 1920," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 409.

[14] *Informes de las dependencias de la Secretaría de Comunicaciones y Obras Publicas del 11 de Abril al 31 de mayo de 1920* (Mexico City: Dirección de Talleres Gráficos, 1921), 175.

[15] Ibid, 171.

astronomers had long observed the movements of celestial bodies to measure time. In 1884, representatives from industrializing countries began an attempt to universalize time by corresponding the hour to its relation to the agreed upon prime meridian of Greenwich, England, establishing Greenwich Mean Time. Scientists based the measurement off of the angle of the sun with added adjustments accounting for the earth's elliptical orbit and tilt.[16] The development of far-reaching radiotelegraphy stations allowed scientists to transmit data on these measurements from locations around the globe, further standardizing time and measurements of longitude. In 1921 the Mexican Astronomical Observatory started the process of "perfecting" the time in Mexico according to international agreements to do so by 1925. Technicians at the observatory in Tacubaya, DF, transmitted measurements via wire to the radio station at Chapultepec, where the operators sent out the information to the other stations across the country.[17] Mexico's participation in the project allowed its leaders to participate in important scientific dialogues and conferences held by modern nations around the world. It aided trade and industry as well. Companies and governments could now count on a greater ability to track the progress of their goods and work. It also forced people into greater regimentation, for better and worse.

**Aficionados, Entrepreneurs, and the Rise of Commercial Radio**

Thus far it appears that Mexican radio was largely a state project, if dependent on foreign manufacturers and training. But while the revolutionary government

[16] Elisa Felicitas Arias, "The Metrology of Time," *Philosophical Transactions: Mathematical, Physical, and Engineering Sciences* 363, no. 1834 (Sept. 15, 2005): 2290-91.

[17] *Informes de las dependencias de la Secretaría de Comunicaciones y Obras Publicas del 11 de Abril al 31 de mayo de 1920*, 171; "El Gral. Alvaro Obregón, al abrir las sesiones ordinarias el Congreso el 1 de septiembre de 1921," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 451.

maintained a strong interest in radio, amateurs and local capitalists began to operate their own experimental stations. These enthusiasts mostly came from middle class and wealthy elements of society. They included revolutionary communication officials, sons of wealthy capitalists, doctors, a communist leader, and engineering students. Most were influenced by the rise of similar experimenters and hobbyists in the United States and the American radio periodicals they followed. These amateurs and businessmen brought about a brief democratic opening in radio use and new challenges for the state, especially in matters of economic development, state propaganda, nation building, transnational messages, foreign relations, and anti-government transmissions. Through legislation, international conventions, and less formal meetings, the private and government sectors ultimately compromised on these issues, reinforcing the consolidation of broadcasting into the hands of a few large corporations and the grip on the state by the Sonoran dynasty and the subsequent Partido Nacional de la Revolución.

Monterrey, a large industrial city close to the U.S. border, quickly became one of the largest epicenters for private radio use. Many privileged families in the region sent their children to the United States for higher education. These students, in turn, became interested in U.S. technology advancements and trends. The life of Constantino de Tárnava Jr. provides the classic example. Born to Constantino de Tárnava de Llano and Octavia Garza Ayala, members of the Monterrey business elite, Tárnava, Jr., came from a relatively wealthy family.[18] Two years after his birth in 1898, his father became a deputy director and the first treasurer of the Compañia Fundidora de Fierro y Acero de

[18] Juan Mora-Torres, *The Making of the Mexican Border: The State Capitalism, and Society in Nuevo León, 1848-1910* (Austin: University of Texas Press, 2001), 183.

Monterrey, a large smelting operation backed by local, French, and Spanish capital.[19] Tárnava, Jr., first attended Saint Edwards College in Austin, Texas, and later Notre Dame University in Indiana. Engineering classes in America whetted Tárnava Jr.'s interest in broadcasting. Arguably, he, not the Gómez brothers, conducted the first ever broadcasts in Mexico as early as 1919.[20] On October 9, 1921, he began more regular broadcasts from his experimental station 24-A, Tárnava Notre Dame (TND)—named after his Alma Mater—which provided news and music to other fans, including Rodolfo del la Garza, the manager of the Bank of Nuevo León.[21] His station became CYO after receiving an official license and commercial status in 1923, and XEH in 1939. It remains the longest running station in Mexico today.

Enthusiasts existed in other cities as well. Manuel Zepeda Castillo broadcast from the *Teatro Degollado* in Guadalajara and Tiburcio Ponce installed station 7-A Experimental in Morelia.[22] In Mérida, Arsenio Carrillo, the Secretary of the Yucatecan Association of Radiotelegraphers, operated an experimental station and relayed programs from radio station PWX in Cuba.[23] By 1922 numerous other cities had

[19] "La Fundidora Monterrey, S.A.," http://www.monterreyculturaindustrial.org/fundidora.htm, accessed February 26, 2010; Fátima Fernández Christlieb, *Los medios de difusión masiva en México* (Mexico City: Juan Pablos, 1982), 92-93.

[20] The evidence for his 1919 broadcast is sketchy and debated by Mexican scholars, see Fátima Fernández Christlieb, *La radio mexicana: Centro y regiones* (Mexico City: Juan Pablos Editor, 1991), 60; Figueroa Bermúdez, *¡Que onda con la radio!*, 41-42; Fernando Curiel, *¡dispara Margot, dispara!* (Mexico City: Premis Editora, 1987), 17-21. Although it is possible that Tárnava transmitted entertainment programming in 1919, documentary evidence does not exist to back the claim. He never mentioned doing so in interviews with communication scholar Marvin Alisky, see following citation.

[21] Alisky, "Educational Aspects of Broadcasting in Mexico," 26.

[22] Fernando Mejía Barquera, "Historia mínima de la radio mexicana (1920-1996)," *Revista de Comunicación y Cultura* 1, no. 1 (Mar.-May 2007), http://web.upaep.mx/revistaeyc/radiomexicana.pdf, accessed February 17, 2010.

[23] "Carnet social," *La Revista de Yucatán* (Mérida), 3 Mar. 1923, 4. PWX began service in 1922 and was picked up in many parts of Mexico.

broadcasting fans and participants, including Campeche, Xalapa, Oaxaca, Tampico, Veracruz, San Luis Potosí, Chihuahua City, Ciudad Juárez, Pachuca, and Cuernavaca.[24]

Like Monterrey, Mexico City was another center of radio fans and experimenters. In the capital, however, they came from a slightly wider swath of society. Engineering students like Enrique Vaca and José Peredo built their own radios from parts of other machines and instructions from U.S. magazines. Starting in the late 1910s, they listened to boat signals, radiotelegraphers, other radio aficionados, and after 1920, U.S. broadcasting stations.[25] Adolfo Gómez, the man who organized the centennial broadcast, was a military doctor. His brother, like his father, worked as a dentist. José Allen, one of the founders of Mexico's Communist Party, transmitted messages from the barrio of San Rafael in Mexico City.[26] Scientists and hobbyists spent long nights constructing radio apparatuses and other novel machines, rarely making much money from their efforts.[27] Engineers in the Federal District universities, and their counterparts in the militarily, experimented widely with electricity and radio.

Mexico City enthusiasts, engineers, and businessmen also formed the most powerful radio interest group in the country: the *Liga Central Mexicana de Radio* (LCMR).[28] Founded in early 1923, it was the result of the merger of the first Mexican radio society, the *Liga Nacional de Radio*, established on July 6, 1922 at the *Colegio Francés* and two other Mexico City organizations, the *Club Central de Radio* and the

[24] Mejía Barquera, "Historia mínima de la radio Mexicana"; "De la vista a la más estación difusora radiotelefonía aprendimos que México rinde el debido culto al genial Marconi: Una interesante entrevista," *El Universal*, 3 Oct. 1923, II 7.

[25] Rosalía Velázquez Estrada, "La radiodifusión mexicana: Encuentro con su pasado (1923-1945)," in *Miradas sobre la nación, liberal, 1848-1948*, libro 2, *Formar e Informar: La diversidad cultural*, ed. Josefina Mac Gregor (Mexico City: UNAM, 2010), 276.

[26] Fernando Mejía Barquera, "Historia mínima de la radio mexicana (1920-1996)."

[27] Ornelas Herrera, "Radio y contidianidad," 144.

[28] Central Radio Club and Center of Engineers.

*Centro de Ingenieros*.[29] The LCMR's leaders not only possessed technical knowhow, but also had important connections to the business community and the upper echelons of government. Modesto C. Rolland, the LCMR president in 1923, had been a mathematics and engineering professor under both Díaz and Madero, a propagandist and communications official for Carranza during the Revolution, and the author of De la Huerta's Free Port Decree of October 11, 1920.[30] José M. Velasco, another important member, owned a prominent radio store in Mexico City and operated some of the country's best receiving equipment, picking up stations as far away as Salt Lake City as early as 1922.[31] LCMR engineer Salvador F. Domenzáin installed radio equipment for Secretary of Foreign Relations Alberto J. Pani.[32]

American radio practices and programs not only influenced Mexicans, U.S. manufacturers also increased their exports of radio receivers to Mexico. Successful commercial broadcasting began in the United States in 1920 and shortly thereafter American radio companies began selling their products in Mexico though Mexican partners, especially by advertising U.S. programs.[33] Some U.S. stations even provided

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[29] Mejía Barquera, *La industria de la radio y televisión*, 35.

[30] For information on Rolland's roll in government see Carlo de Fornaro with chapters by Colonel I.C. Enriquiz, Charles Ferguson and M.C. Rolland, *Carranza and Mexico* (New York: Mitchell Kennerley, 1915); Modesto C. Rolland, *Lecciones sobre presas. Dadas en la clase de topografia, drenaje y reigos en la Escuela Nacional de Agricultura y Veterinaria* (Mexico City: Secretaría de Fomento, 1906); Michael M. Smith, "Carrancista Propaganda and the Print Media in the United States: An Overview of Institutions," *The Americas* 52:2 (Oct., 1995): 159-60; Modesto C. Rolland, *Towards A Single Tax in Mexico* (New York: Latin-American News Association, 1917); Gilbert M. Joseph, *Revolution from Without: Yucatán, Mexico, and the United States, 1880-1924* (Durham: Duke University Press, 1988), 97; "A Decree Establishing Free Ports in Mexico," *The Nation*, 27 Apr. 1921, 632-33; "Ship Railway Line Urged Across Mexican Isthmus," *Los Angeles Times*, 16 Apr. 1949, A5.

[31] "Radio, J. M. Velasco y Cía.," ad, *El Universal* 9 Dec. 1923, III 4; "Una importante junta efectuada por los miembros de la Liga Central M. de Radio," *Excélsior*, 22 Jul. 1923, III 10; "Telegram Wireless Concert Heard in Mexico," *Salt Lake Telegram*, 13 Jun. 1922, 13.

[32] Fernando Mejía Barquera, "Historia mínima de la radio mexicana (1920-1996)."

[33] Douglas, *Inventing American Broadcasting*, 300; Hayes, *Radio Nation*, 27-34; A January 1924 newspaper article lists over thirty businesses in the Asociación de Comerciantes de la ciudad de México that sold America radio products in Mexico City. "La recepción por radio no está prohibida en México, *Excélsior*, 27 Jan. 1924, II 6.

shows targeting Mexican audiences.[34] As communications scholar Joy Elizabeth Hayes correctly points out, "the birth of broadcasting in Mexico must be situated within the context of U.S. expansionism in Mexico and Latin America more generally."[35] Immediately after World War I and the decline of European influence in Mexico and Central America, U.S. manufacturers flooded Latin American markets with advertisements and goods. Radio was an important component of this economic surge, both as a communication tool for American businesses and as a commodity. During this time, the U.S. navy—after failing to convince congress to continue a navy-controlled radio monopoly created during the Great War—helped establish RCA in order to buy out American Marconi and gain control of wireless communications in the United States and abroad. By 1921 RCA surpassed previously prevailing German and British radio interests in Latin America.[36] A friend of modernity and capitalism, and knowing that Mexico lacked the industrial wherewithal to compete, Obregón allowed, even promoted, this American invasion of goods, while simultaneously encouraging the development of a domestic broadcasting system.

In response to these developments and multiple domestic proposals to build a radio-chain monopoly, Obregón asked a number of leaders and engineers to investigate the history of Mexican radio, recent developments in the field, and how to go about regulating the technology considering its growing diversification and use.[37] Beginning

[34] "Radio Concert Honors Mexico," *Los Angeles Times*, 17 Sept. 1922, II 8; "Mexicans Now Fond of Radio," *Los Angeles Times*, 21 Aug. 1923, 4.

[35] Hayes, *Radio Nation*, 25.

[36] Ibid, 27.

[37] For the first proposals to build private radio chains see L. B. Rauthbaum, "Proyecto para la instalación de la radio-telefonía como medio para desarrollar la instrucción y cultura del pueblo mexicano," 14 Jul. 1922, exp. 74, inv. 4759, leg. 1, FAPECFT; Also see the proposals in caja 252, exp. 803-R-21, Ramo Presidentes, Obregón-Calles papers, AGN; Also see Mejía Barquera, *La industria de la radio y televisión*, 24-29.

in October 1922, these radio specialists, including longtime consultants such as the German World War I-era émigré Gustavo Reuthe, provided their opinions and accounts. All of them saw the new trends in radiotelephony—early broadcasting—in the light of previous radio operations, building their narratives on the foundation of the country's past relationship with radiotelegraphy. However, as some specialists admitted, the technology had outpaced the existing laws as stated in the 1916 decree and article 28 of the 1917 Constitution. Many aficionados, entrepreneurs, and a number of SCOP officials believed that broadcasting paved the road to a new future for radio, where transmission of concerts, news, and lectures reached mass audiences. This perception, together with the growing reality, did not fit well with laws that addressed wireless as a form of point-to-point communication used more or less as a sort of postal service and military tool.

The vast majority of advisors recommended a cautious liberalization of radio use. One engineer argued that aficionados and experimenters who had been operating outside of the law had resolved a number of technical problems and were responsible for much of the progress in radio development. This fact led him to contend that they disserved more freedom to operate legally. Of course, the government had limited options in doing otherwise. Halting private use would have proved immensely difficult since many enthusiasts had already began to transmit experimental radiocasts and because U.S. and Cuban stations already broadcast programs that reached Mexico. As another specialist pointed out, receivers were fairly easy to make, and a number of residents had already constructed them.[38]

[38] Ingeniero en Jefe to the Ingeniero Consultar, Mexico City, 17 Nov. 1922, exp. 525/9, Ramo Secretaría de Comunicaciones y Transportes, AGN.

But every report to the president argued for strict government vigilance of private radio. Obregón's experts proposed that commercial companies should be allowed to grow—if the government did not want to exercise its right to monopolize the medium—but that they should all be licensed, censored, and operated by people with sufficient technical expertise. SCOP advisors continued that inspectors from their department should regularly check on any private transmitting operation. Another expert listed a long number of concerns about espionage, using radio against the interests of the administration, the divulgence of military operations, and interference with national radiotelegraph stations—accurately foreshadowing problems that arose shortly thereafter. Others discussed the very real chaos in the United States that resulted from ill-regulated radio transmissions coming from thousands of radio hobbyists. Another issue was the desire to make sure that control not be lost by putting concessions in foreign hands. All the advice was couched in patriotic, scientific, and moralistic prose, emphasizing what was best for national interests and development, what was best for the state: there should be nothing that "attacks the moral and healthy customs" of the nation, but the government should assist experimenters and aficionados who can work with the government and not interfere with "national stations" and who are not "dangerous for the nation."[39]

Aficionados themselves became influential advisors to Obregón, especially members of the LCMR. These specialists had intimate knowledge of the new trends in broadcasting and in mid-1923 they approached the government about authoring any

[39] "Estudio de las comunicaciones radiotelegráficas y radiotelefónicas," Mexico City, 25 May 1922, exp. 525/9, Ramo Secretaría de Comunicaciones y Transportes, AGN; Gustavo Reuthe, "Su Desarrollo en general y especialmente en la República hasta su estado actual así como los urgentes problemas que implica en la práctica para el país," Mexico City, unpublished document, 1922, exp. 525/9, Ramo Secretaría de Comunicaciones y Transportes, AGN.

new broadcasting regulations. Obregón agreed, but reserved the right to make any changes he saw fit. Other scholars have claimed that the LCMR solely represented wealthy commercial interests, but in reality, their members came from business, amateur, and state backgrounds.[40] They were a fairly diverse if mostly middle class bunch of characters. From the very onset of broadcasting in Mexico, these engineers, entrepreneurs, and government representatives worked together for profit but also for various ideals of nationalism. Little autonomy existed among these different sectors of society.

All in all, the LCMR-written regulations drafted between March and September of 1923 were a compromise. They addressed all the groups involved in radiocasting, but did lean in favor of business. They divided the ethereal space between experimenters, state stations, entrepreneurs, and radiocasts for "public service." The LCMR deemed public service broadcasts as those that provided educational and entertainment programs of "public interest," whereas amateur radiocasts were those dedicated to experimentation.[41] The guidelines also established rules for licensing and taxation. They allowed for private profiteering, but the SCOP had to approve all permits for which businesses had to pay an annual fee. The rules restricted the power of private transmitters to between 100 and 2000 watts, and limited the accessible frequencies to between 350 to 550 kilocycles in hopes of limiting interference over the airwaves in order to assure the clarity of the commercial stations then in preparation and

[40] Luis Antonio de Noriega and Frances Leach, *Broadcasting in Mexico* (London: Routledge and Kegan Paul, 1979), 15; Mejía Barquera, *La industria de la radio y televisión*, 36-37; Hayes, *Radio Nation*, 37.

[41] Mejía Barquera, *La industria de la radio y televisión*, 36.

to make sure amateurs did not interrupt military transmissions.[42] During the negotiations, Rolland argued for limiting experimenters and public stations from broadcasting during certain peak hours of the evening, suggesting his pro-commercial leanings. Yet, on the other hand, the following year the LCMR campaigned for amateur rights during the National Radio Convention.[43] Rolland also defended aficionados against what he saw as unfair fees, though he ultimately bowed to Obregón's taxation policies.[44] The LCMR additionally recognized and sought out the government as the protector of Mexican broadcasting, allowing for the state's "*supervigilancia*" over radio.[45]

Most LCMR members stressed elitist and nationalist visions of radio. One member, Argentina-born wireless specialist F. C. Steffens, disdained popular music. He and a number of writers and radio enthusiasts pushed the government to take a greater role in using the medium as a civilizing and educational tool. Rolland and Manuel M. Stampa, a prominent experimenter and officer of the league, declared that the LCMR's purpose was to coordinate the propagation of radio, which "suddenly puts the men of remote villages in contact with the civilization of the most advanced centers of culture."[46] When Rolland protested the tax put on wireless equipment, he stressed the detriment to education and human progress, not to enterprise (though he surely saw it as

[42] 100 to 1,000 watts were fairly typical for many radio stations around the world during this period. By the 1930s, stations in Mexico blasted transmissions at over 100,000 watts. Although the higher the wattage, the more power the transmission, a 1,000 watt station in Mexico City could be heard across much of North America, Central America, and the Caribbean on a clear night. "Los permisos para las estaciones de radiotelefónia," *El Universal*, 1 Sept. 1923, 3.

[43] "Dio principio la Convención Nacional de Radio," *El Universal*, 7 Sept. 1924, III 5, 11**;** Medina Ávila and Vargas Arana, *Nuestra es la voz*, 80.

[44] Modesto C. Rolland to Álvaro Obregón, Mexico City, 9 May 1923; Modesto C. Rolland, to Alvaro Obregón, Mexico City, 5 June 1923, Obregón-Calles Papers, caja 51, exp. 121-C-R-4, AGN; Alvaro Obregón to Modesto C. Rolland, Mexico City, 8 June 1923, caja 51, exp. 121-C-R-4, AGN.

[45] *Supervigilancia* basically translates to *supervision*. Quoted in Mejía Barquera, *La industria de la radio y televisión*, 36.

[46] "Una interesante conferencia sobre radiotelefonía," *El Universal* 4 Mar. 1923, 4.

a deterrent to business as well). Rolland argued that the fee impeded the spread of receivers, which college classrooms and households could use to tune into transmissions of important conferences and lectures.[47]

The close interaction between the various groups involved with broadcasting was on display during the first commercial broadcasts and the Mexico City Grand Radio Fair in 1923. Before the LCMR and the Obregón administration hammered out the final details of the regulations, CYL, *El Universal Ilustrado-La Casa del Radio*, aired the first commercial broadcast in Mexico on May 8, 1923. Manuel Maples Arce, an *estridentista* or Stridentist poet, delivered the first words. He leaned into the microphone and spoke: "Stars launch their programs at nighttime, over silent cliffs . . ."[48] A motley crew accompanied the tech-enthusiast poet. Businessmen, politicians, musicians, poets, and starlets had all gathered there in the capital, where the station sat tightly nestled in the urban center.

This group consisted of a number of prominent elites and intellectuals. Carlos Noriega Hope, editor of *El Universal Ilustrado* and an important author, helped organize the event. In addition to molding the occasion, he and *El Universal* editor Miguel Lanz Duret represented their respective papers, one-half of the station's partnership. The other partners, Raúl and Luis Azcárraga, owners of radio store La Casa del Radio, socialized with the attendees and participants. The head of SCOP, and former leader of Venustiano Carranza's revolutionary military telegraphers, Amado Aguirre, joined the celebration as a sign of government support and supervision.

[47] "Piden se anule el reglamento para el radio," *Excélsior*, 14 Jun. 1923, II 1.

[48] Manuel Maples Arce, "T.S.H. (El Poema de la radiofonia), *El Universal Ilustrado*, 5 Apr. 1923, 19. The Stridentists were clever and often iconoclastic artists that celebrated modernity similar to Futurist poets in Europe, though with less fascist sentiments.

Andrés Segovia, the increasingly famous Spanish guitarist, played his instrument to great applause. Mexican singers, musicians, and composers came to showcase their talents for the event as well. Actress Celia Montalván and vocalist Julia Wilson de Cháves sang various popular songs, and pianist Manuel Barajas and the renowned nationalist composer Manuel M. Ponce played original classical pieces. Before signing off and leaving the listening aficionados to the distant static, the function concluded with a broadcast of the Mexican national hymn.[49]

This inaugural radiocast was a foretaste of the country's multi-cultural future, a nationalist soundscape that combined nationalist composers, regional folk songs, and modern musical trends from Latin America and the United States. The program included avant-garde artists and editors who promoted a metropolitan and global worldview, nationalist composers who disdained popular shows, popular performers, a foreigner with monarchist sympathies (Segovia), and a revolutionary communications official. The entertainment provided was as varied as the participants. But as Barajas would make clear in the following year, not everyone agreed with this potpourri approach to radio.[50] Indeed, broadcasting unleashed a cultural debate about the medium, music, and Mexican nationalism.

The first commercial broadcast also exhibited the partnership between the new state and rising business elites. The Azcárraga family had obtained a small fortune selling Ford cars in Monterrey during the late Porfiriato and during the Revolution. Emilio Azcárraga, Raúl and Luis's brother, had just recently married the daughter of

[49] "Los artistas que tomaron parte en la inauguración, que anoche se efectuó, de la primera estación transmisora de radiotelefonia-'El Universal Ilustrado'-'La casa del radio," *El Universal* 9 May 1923, II 1; Rashkin, *The Stridentist Movement*, 96.

[50] Manuel Barajas, "Los filarmónicos y el radio," *Antena* 2, August 1924, 12.

Patricio Milmo, one of Monterrey's wealthier men and a member of the "Monterrey Group" of industrialists. The Obregón government backed the Azcárragas, participating in their opening broadcast and providing public praise. The partnership not only allowed private enterprises to shoulder most of the cost of broadcasting, but also helped form a bridge between the revolutionaries in power and businessmen who had not originally supported the Revolution.[51] Indeed, the Azcárraga operation became one of the biggest outlets for state leaders, and in turn, operated with full government approval, if not favoritism.

Immediately after finishing the 1923 regulations, the LCMR, along with the government officials and a multitude of businesses, organized the Grand Radio Fair in Mexico City, an impressive ten-day exhibit of wireless systems and products. Lasting from June 16 to 25, booths displayed locally made radio sets and the latest products from the United States. Participants visited the elaborate stands and admired the goods, contests, and wacky costumes. In one of the most outlandish displays, women gave away *El Buen Tono's* "Radio" cigarettes while wearing mock antenna hats that looked like diamond-shaped kites. The tobacco company was in the process of constructing the country's second commercial station, on which it would continue to promote its cigarettes. In competition with *El Buen Tono,* CYL representatives passed out "Radio" sodas. The government's participation in radio was prominently displayed as well. Obregón inaugurated the event, posing for photos ops at the booths with Rolland and the various businesses. Government radio stations JH-Secretary of War and Marine and

[51] Fernádez Christlieb, *Los medios de difusión masiva*, 92-93.

VPD-Department of Military Manufacturing both aired music, including the first broadcasts of Mexican military bands.[52]

The collaboration between the government and commercial broadcasting companies is seen in another important way as well; many of the station builders and operators worked simultaneously for the most important state and commercial stations during the 1920s. The CYB-*El Buen Tono* station provides a perfect example. Inaugurated in September 1923, CYB became one of the most popular stations in Mexico during the 1920s. *El Buen Tono,* founded by Ernest Pugibet during the Porfiriato, remained one of the most profitable enterprises in the country, surviving, and even profiting, during the chaos of the Revolution.[53] Although Obregón pressed for unpopular taxes on industrialists and catered more to worker demands then previous presidents, he generally supported Pugibet's successors at *El Buen Tono* along with many other *porfirista* entrepreneurs. The company's leadership, on the other hand, co-opted many revolutionary technocrats by giving them positions at *El Buen Tono*. Indeed, many of the most important members of CYB's management and technicians worked, or had worked, for the revolutionary state. Colonel José Fernando Ramírez, instrumental in the creation of army station JH, worked for CYB, in addition to other commercial stations. He also played a prominent role in military radio operations in the field. So too did former JH designers and operators Captain Guillermo Garza Ramos and José de la Herrán.[54] José Reynoso, manager of the tobacco factory and the station, was a senator of the state of México's from 1917 to 1920. Obregón himself was an

[52] "La feria del radio fue inaugurada por el Presidente de la República, ayer," *Excélsior,* 17 Jun. 1923, II 1; "La próxima feria de radio en la capital," *Excélsior,* 27 May 1923, III 9.

[53] Haber, *Industry and Underdevelopment,* 128-29.

[54] "Una de las estaciones de radio en México," *Excélsior,* 9 Mar. 1924, III 7; "Estaciones trasmisoras de radio en la República," *Excélsior,* 6 Jul. 1924, III 11.

"ardent radio fan." [55] He kept in direct contact with the specialists developing and regulating the medium. He not only inaugurated the 1923 radio fair but also radio stations. CYR-*Roserter y Cía***.** in Mazatlán, for example, commenced in the autumn with a message from the president.[56]

Before Obregón left office radio stations had already expanded significantly. The "Hour of Transmissions" section of *Excélsior* in October and November 1924 reported eighteen aficionado stations, one pro-Calles labor party station, and seven commercial stations. Dozens of other amateur transmitters existed as well. The central government operated three stations. The Chihuahua State Telephone Department ran another.[57] At the same time, Mexican radio listeners could pick up over a hundred U.S. stations, a continual presence in Mexico's electronic soundscape.[58]

Radio receivers had gained widespread popularity in urban Mexico rather quickly. Following the Grand Radio Fair, the U.S. Department of Commerce stated that radios were in high demand in Mexico.[59] Journalists reported that show windows were filled with radios, often blaring some Mexican or American radio station to the amusement of large crowds. Broadcasting was most popular in Mexico City, but it also had dedicated enthusiasts and salesman in Monterrey, Tampico, Mérida, Oaxaca, Mazatlán, Chihuahua, and other regional centers.[60]

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[55] "Mexico Now Fond of Radio," *Los Angeles Times*, 21 Aug. 1923, 4.
[56] "Mexico Radio Station Opens," *Los Angeles Times*, 19 Oct. 1923, II 3.
[57] "Horario de transmisiones," *Excélsior,* 5 Oct. 1924, III 11; "Horario de transmisiones," *Excélsior,* 19 Oct. 1925, III 8; [57] "Horario de transmisiones," *Excélsior,* 30 Nov. 1924, IV 9.
[58] "Estaciones transmisoras de Estados Unidos," *Excélsior*, 26 Oct. 1924, IV 10.
[59] "California Wares in Demand Abroad," *Los Angeles Times*, 12 Aug. 1923, V 13.
[60] "Mexico Now Fond of Radio," *Los Angeles Times*, 21 Aug. 1923, 14; "Mexico Now Will Allow Broadcasting," *Los Angeles Times*, 30 Sept. 1923, II 5.

**Foreign Relations**

In addition to supporting and regulating commercial broadcasting, the Obregón administration government continued to play a vital and direct role in radio in other ways, especially in foreign relations. Its station in Chapultepec relayed news from abroad. SCOP director and future president Pascual Ortiz Rubio ordered the station to provide the Mexican press with the foreign news it received.[61] Mexico continued to build radio towers in Central America. State officials developed their own broadcasting operations within the military and Department of Public Education. And as the election of 1924 neared, government and private stations transmitted speeches from top political leaders, including the first ever over-the-air address by a presidential candidate. The state also played a crucial role in protecting the fledgling commercial industry in an important international radio conference.

From his first days in office, Obregón built on the initiatives of his predecessors to enhance foreign relations through radio. This was crucial for Obregón's drive to gain support from foreign leaders from 1920 to 1923, when U.S. government withheld recognition. As a result, Obregón tried to influence policies via radio-listening audiences in the United States and wireless communications with German, Japanese, Salvadoran, and South American officials.[62] For their part, most Latin American countries recognized Obregón's government and chastised the United States for not doing the same. This stance was made clear when their representatives loudly vocalized complaints about non-recognition at the Pan-American Conference held in Santiago,

[61] "Mexican Congress Begins Work Today," *New York Times*, 21 Jun. 1920, 16.

[62] "Mexican Radio Talks with Chile," *New York Times*, 19 June 1922, 3; "La estación de Chapultepec es un prestigio para México," *Revista de los Telégrafos Nacionales* 1, no. 1 (May 1921): 7-8; "American Wireless Centre to be Here," *New York Times*, 19 Oct. 1920, 13.

Chile, in March 1923. Mexico did not attend in protest of U.S. polices.[63] The convention did, however, discuss inter-American communications, especially radio. The participants decided to hold a separate pan-American gathering specifically on electronic communications the following year, in Mexico City.

Obregón's greatest inniative was in Central America. Building on Carranza's work in El Salvador, Obregón promised at the 1921 centennial fair to develop stations in the isthmus for a number of countries, specifically in Costa Rica, Guatemala, Honduras, Nicaragua, and to improve the Salvadoran. The goal for completion was Mexican Independence day, September 16, 1923. The Secretary of Foreign Relations, Secretary of Communications and Public Works, and the director of the Department of National Telegraphs all backed the plan. For the equipment the government turned to their oldest ally in radio communications, Telefunken.

Some ambassadors in Central America, however, had serious doubts about the project, especially the ministers to Costa Rica and Nicaragua. The latter warned that the "unscrupulous" governments in the region might use the machines against the interest of Mexico, a curious statement since he continued on in the next sentence to say that he had little faith in the ability of Central Americans to operate and maintain the devices, arguing that they did not have the money or talent. He declared that in the near future the radio towers would be "outdated and useless . . . a mountain of old iron" gifted by the Mexicans.[64] Eduardo Ortiz, Obregón's nephew and the consul in Costa Rica, also vocalized fears about possible U.S. reactions to the devices and complaints about the

[63] "Monroe Doctrine to be Live Topic at Pan-American Conference," *New York Times*, 4 Mar. 1923, XX 10.

[64] Eduardo Ortiz to Alvaro Obregón, San José to Mexico City, March 14, 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

costs to the federal treasury.[65] He provided a counter idea, to forego the stations and to instead build "Mexican" libraries for the isthmian workers. Ortiz even went as far as to draw out elaborate blueprints for his imagined facilities. This concept fit into Ortiz's idea that the Mexican government should directly address the people of Central American more than government officials.[66] However, Obregón had already committed to the radio idea.

Interestingly, there was less reserve from the Guatemalan envoy and that country's representatives. Baltazar Chávez, a Guatemalan official who resided near where the radio station was being built, wrote directly to Obregón, giving the sincerest thanks from the city of Quetzaltenango and the whole of the country for gifting the wireless station that was "attended by personnel of all social classes, having great animation and affection for Mexico."[67] The consul to the region, Juan de Dios Bojórquez, consistently nudged Obregón to get the needed materials to Guatemala to speed along the production.[68] In response, the president directly inquired into the SCOP's progress on the Central American projects, urging them to complete the task.

The assignment was not an easy one. There were a number of complicated logistics involved. Much of the equipment had to make its way across the Atlantic from Germany to Central America, where it then had to be carried overland through rainforests and across undeveloped terrain. Most problematic, the government struggled to cover the costs, lagging in its payment to Telefunken. On June 13, 1923,

[65] Eduardo Ortiz to Alvaro Obregón, San José to Mexico City, 16 Apr. 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

[66] Buchenau, *In the Shadow of the Giant*, 153.

[67] Baltazar Chávez to Alvaro Obregón, Quezaltenango via Suchiate, Chiapas, to Mexico City, 22 Jul. 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

[68] Juan D. Bojórquez to Alvaro Obregón, Guatemala to Mexico City, 15 Jun. 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

SCOP employees crossed the border into Guatemala to ready the site and beginning construction on station's buildings. But back in Mexico City their fellow workers were still fabricating the necessary iron towers in the workshops in the Chapultepec station. Meanwhile, the actual receivers and transmitters had not yet left Germany because the Obregón administration still owed Telefunken $25,000 dollars.[69] The government also possessed a limited number of radio specialists like Luis Sánchez and Gustavo Reuthe capable of building these operations, which had to have put a constraint on production.

Despite the difficulties, and over the protests of some of his ambassadors, Obregón pushed ahead with his wireless plans in Central America. And though not all of the operations were in full working order by September 16, 1923, they were at least under construction. Realizing that Obregón would not change his mind, Ortiz changed his tone. He posed for photo ops with the Costa Rican president Julio Acosta García at the commencement of the station's construction. Their wives christened the radio tower with a bottle of champagne during the Independence Day festivities.[70]

The program of donating radio stations to Central America fits interestingly into Obregón's overall foreign policy in the region. Obregón faced a number of tricky problems in hemispheric relations. For the first years of his presidency he needed to be careful not to raise the ire of the U.S. government if he wanted to obtain recognition, which would aid him economically, politically, and militarily. At the same time, a large component of his own followers pushed for a more radical, nationalist, and at times, anti-American stance, including many of the ambassadors to Central America. They

[69] Subsecretario de Comunicaciones y Obras Públicas to Alvaro Obregón, Mexico City, 16 Jun. 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

[70] "Sección Editorial," *La Gaceta* (San José, Costa Rica), September 18, 1923, Ramo Presidentes Obregón-Calles, exp. 223-C-4, AGN.

believed that they needed to strengthen Mexico's presence and influence in the isthmus to build up Mexico's prestige and deter America's imperialistic tendencies.

Obregón approached the area with caution, but his policies were not as "hands off" as some scholars have argued.[71] To be certain, he did not meddle heavily in the military and political affairs of the region, keeping a low profile. But he did more than lay foundations for the future. He and his ambassadors established a greater cultural presence, including a number of libraries that the administration decided to build in addition to the radio stations. And although the continuous wave-radiotelegraphy towers were not set up to broadcast, the Costa Rican government, at least, worked to acquire the equipment to adapt the station to both forms of radio.[72] Radio receivers in general were on the rise in Central American cities. By the end of 1923, Central American urbanites heard a number of Mexican broadcasting stations including CYL, CYB, CYX-*Excélsior*-La Casa Parker, and CYF, in Oaxaca City. Before the end of the following year they could pick up the government's own public education operation, CYE.[73] Multiple stations joined them in international broadcasts over the course of the decade. These stations aired Mexican nationalist composers, foreign and domestic popular music, presidential speeches, hygiene lectures from the Department of Public Health, sporting events, news, and advertisements for Mexican beer and tobacco

[71] Buchenau, *In the Shadow of the Giant,* 153.

[72] "Sección Editorial," *La Gaceta"*; Over the next couple years the other Central American government added broadcasting equipment, but radio development in the region during this period is still lacking a good history.

[73] "Una de la estaciones de radio en México," *Excélsior*, 9 Mar.1924, III 7; "Nuevos testimonios del éxito de nuestra estación transmisora "*Excélsio*r-Parker'," *Excélsior,* 13 Apr. 1924, III 9; [73] Plutarco Elías Calles, "Informe rendido por el C. General Plutarco Elías Calles, Presidente Constitucional de la República, en el primer año de su gobierno, ante la 31 legislatura, el 1 de septiembre de 1925," in *La educación pública en México: A través de los mensajes presidenciales desde la consumación de la independencia hasta nuestros días* (Mexico City,: Publicaciones de la Secretaría d Educación, 1926), 245.

products. They heard a lot of classical music, jazz, and popular Mexican *canciones* like "Mi Viejo Amor."[74]

But underneath this cultural campaign, the stations gifted to Central America aided Obregón achieve other goals. For one, he acquired more efficient communications with the region's governments while building a stronger coalition against American cultural expansionism. It also allowed his administration to work against U.S. attempts to dominate communications development in the isthmus. With the blessing of their government, American agricultural outfits, especially United Fruit, had largely controlled wireless operations in Central America until the 1920s, owning the only stations in addition to their own small fleet of ships equipped with wireless devices.[75] Obregón's radio campaign impeded American communications dominance by building a Latin American coalition to increase state oversight of radio development and to oppose American inniatives for a free market policy. The Costa Rican press exhibited this statist position following the groundbreaking for the radio tower donated by the Mexican government, stating—contrary to American interests—that Costa Rica would build a nationalist wireless system, structured on a government monopoly of radio services.[76]

This position for Latin American unity against the United States on the matter of wireless communications was in full display at the Inter-American Committee on Electronic Communications held in Mexico City in 1924. Convention participants publicly stated that the goal of the meeting was to improve Pan-American telegraph and broadcasting operations, but another consideration soon became apparent as the

[74] Ad, *El Universal*-CYL, *El Universal*, 19 Oct. 1923, 7.
[75] Schwoch, *The American Radio Industry*, 21-22.
[76] "Sección Editorial," *La Gaceta*."

delegates of the fourteen countries divided into two camps. On one side, the United States promoted private capital-driven communications development with limited government intervention. On the other side stood the Latin American representatives who pushed for a more state-directed policy towards radio. Ignoring the subtleties of the issue, U.S. spokesmen claimed that the argument revolved around commercial versus state-run radio.[77] But the Latin American stance against U.S. policy did not mean that they opposed the development of private communications industries within their perspective countries. Quite to the contrary, some countries, Mexico included, pushed for greater state regulation of wireless telegraphy and radiocasting to protect the growth of newly initiated broadcasting industries. For Mexican officials, it was also about sovereignty. Radio was one of the few "public works" that foreigners never controlled. The problem was that Latin American governments feared the domination of American businesses at the expense of native companies and governments.

All the Latin American delegates in attendance voted against the position of the United States and accepted the guidelines put in place by the Mexico City conference. The American representatives abstained from voting. However, the rules established at the 1924 meeting had little lasting impact on international communications policies. Only four of the attending nations ever ratified the agreement.[78] Instead, they decided to wait until the next meeting, which was announced in 1925 and took place in Washington, DC, two years later. But the 1924 conference did exhibit the Mexican government's long held unwillingness to allow U.S. corporations to control Mexican

[77] See the comment by U.S. delegate Allen H. Babcock in *Inter-American Committee on Electrical Communications: City of Mexico, May 27-July 27, 1924* (Mexico City: Secretaría de Relaciones Exteriores, 1926), 269.

[78] Schwoch, *The American Radio Industry*, 73.

radio. The meeting also helped create a framework that the legislature used for federal radio legislation, especially the 1926 Law of Electronic Communications, which provided the government more regulatory power over broadcasting.[79]

**The Beginnings of State Broadcasting**

Within Mexico, a number of state officers hoped that radio would become a tool of the revolutionary education system. José Vasconcelos, the first head of the SEP, planned to establish a powerful station in order to transmit scientific and cultural programs to schools across the country.[80] The department's leadership believed that radio was going to help incorporate rural and indigenous residents into the national fold and to spread Mexican culture and political propaganda abroad. At the same time that the SEP struggled to incorporate radio in 1923 and 1924, it was also establishing the department of anthropology and the Cultural Missionary Program to spread revolutionary ideology and a secular curriculum to the countryside. These nationalist educators planned not only to reach children but also rural adults who were often illiterate and had received little in the way of state education.[81] The subsequent heads of the SEP, Dr. Bernardo J. Gastélum and José Manuel Puig Casauranc, carried on

[79] Fernando Mejía Barquera, *La industria de la radio y la televisión*, 31-34.

[80] "Conferencias científicos por telefonía inalámbrica," *El Universal*, 23 Feb. 1923, 1; "Habrá estación de radio en la Secretaría de Educación Pública," *El Demócrata*, 2 Dec. 1923, 6; "Conferencias educativas serán transmitidas por radio," *El Universal*, 12 Jan. 1924, 8.

[81] "Serán creados los departamentos de antropología y de escuelas rurales e incorporación cultura indígena en la Secretaría de Educación Pública," *El Demócrata*, 16 Dec. 1924, 1, 6; Marvin Alisky, "Educational Aspects of Broadcasting in Mexico," 22, 37; Bernardo J. Gastélum, *Palabras del Dr. Bernardo J. Gastélum en la inauguración de la estación de radio de la Secretaría de Educación Pública C. Y. E., instalada en esa dependencia del ejecutivo por acuerdo del C. Secretario de Educación Dr. Bernardo J. Gastélum, siendo Presidente de la República el C. Gral. Alvaro Obregón México, 30 de noviembre de 1924* (Mexico City: Editorial "cultura," 1924), 3-10.

Vasconcelos's goal of building the station to aid these endeavors. In the romantic words of Gastélum at the station's inauguration:

> Teachers, workers and students: The Secretariat of Public Education will end its labor during the presidential period of Gen. Don Alvaro Obregón inaugurating this new fountain for the dissemination of thought, which will light all corners of the country with the voice of the teacher, the eloquent words of our most distinguished intellectuals, and harmonies that will surprise those in the classroom, in the office or in the workshop, evoking in the spirit the memory of ancient and romantic visions, the most noble emotions, to inculcate the beauty in the soul and charity in the mind.[82]

The public education station also had non-government supporters. Fernando Sayago, writer and director of Mexico City's Commercial Museum, argued in July 1924 for a "cultural crusade." In one article, he pushed the SEP to urgently establish a high-powered station to throw the voices and melodies of specialists and classical composers across Mexico, especially into classrooms.[83] Many members of the LCMR shared similar opinions.

The station, in the works since 1923, began transmissions in November 1924. SEP employees and American specialists outfitted the operation with U.S. equipment.[84] The first broadcast was transmitted not only from the SEP's small transmitter but also via the powerful Chapultepec station. People heard the inaugural radiocast all over Mexico, United States, Canada, and even in Europe.[85]

It is hard to uncover exactly how much impact these early state "cultural" broadcasts really had. The SEP imported over a hundred radio receivers for rural

[82] Gastélum, *Palabras del Dr. Bernardo J. Gastélum*, 8-9.
[83] Fernando Sayago, "Lo que falta en los conciertos de radio," *Antena* 1 (Jul. 1924): 19.
[84] "Muy pronto estará concluida la estación radiotelefonía de la Secretaría de Educación," *El Demócrata*, 20 Sept. 1924, 2.
[85] Ibid.

schools in late 1924. When Calles took office, he commented that the government had succeeded in placing radios in "the majority" all of the federal schools, which numbered approximately one thousand.[86] The devices were definitely used in rural areas in and around the Federal District; "small towns, especially of indigenous populations."[87] Obregón had clearly stated the goal of the program: "teachers will meet somewhere near the ranches and neighborhoods of their students to transmit, on a predetermined day and time, a lesson about a useful theme, music, and news to arouse their interest so they can participate in the life of our country."[88] Significant progress had been made, but the vast majority of rural Mexicans remained unreached.

The Department of Agriculture also ventured into radio. Indeed, officials had proposed using wireless for meteorological messages to small farmers since at least 1922. In the summer of 1923 the department put forward an ambitious plan to build radio stations in its offices in Monterrey, Chihuahua, Hermosillo, Guadalajara, Mérida, and Mexico City. These were not only to receive reports but to transmit news across the entire country. Subsecretary Ramón P. de Negri proposed the plan, aspiring to build a rapid communications network between Mexico's farming zones in order to provide important information on the weather, market conditions, and agricultural advice. Although originally approved by the president, the plan ultimately faltered because of its cost. Building radio stations was not cheap. The fact the CYL and the Department

[86] Elías Calles, "Informe rendido por el C. General Plutarco Elias Calles," 245; George I. Sánchez, *Mexico: A Revolution by Education* (New York: The Viking Press, 1936), 67.

[87] "Pronto llegarán los aparatos de radio pedidos a los Estados Unidos," *El Demócrata*, 30 Dec. 1924, 12.

[88] Alvaro Obregón, "El Gral. Alvaro Obregón, al abrir las sesiones ordinarias el Congreso el 1 septiembre de 1924," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 638.

of Aviation were already broadcasting the time, meteorological forecasts, and market data may have also made the project appear redundant and unnecessary.[89]

As mentioned earlier, the military operated its own radio stations. The week before the 1921 centennial celebrations the Department of Aviation announced its acquisition of six radiotelephone devices. Its station, CZA, transmitted both military operations and cultural broadcasts. In fact, under the direction of engineers Ricardo S. Bravo and Fernando Ortiz Monasterio, it was the only station that transmitted every day of 1924.[90] JH was the first military station, directly supervised by the Secretary of War and Marine. José de la Herrán—whose initials provided the name for the station—designed and built the station. De la Herrán had just returned from studying radio at John Hopkins University in Baltimore, Maryland, in the United States. He, along with military radio enthusiast and Colonel of the General Staff, José Fernando Ramírez, placed the device in Ramirez's house. According to De la Herrán's grandson, they inaugurated the station on March 19, 1923 with music from the "band of the General Staff of the Secretariat of War and Marine," among other artists. The station, which played a prominent role in the 1923 radio fair, reached the United States, much of Mexico, and the far reaches of the Arctic, where an expedition of Donald Baxter MacMillan picked up the station on one of his radios.[91] The young military officer Guillermo Garza Ramos joined them in their broadcasting endeavors, and all three of

[89] "Mexico to Help Small Farmers," *New York Times*, 1 Jul. 1922, 3; "Mexican Radio May Aid Farms," *Los Angeles Times*, 13 Jul. 1923, 5.

[90] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 97.

[91] J. de la Herrán, "La radiocomunicación en México; Enteleridas de sus comienzos," unpublished document (1995): 3, personal collection of the author.

them helped build the most important commercial stations of the day.[92] Likewise, the military station VPD, of the National Military Manufacturing and Establishments, possessed its own broadcasting station. It too participated in the radio fair and continued to provide occasional musical radiocasts and lectures.[93]

The Obregón administration used radio to further incorporate military and other labor. The president had made labor leader Luis N. Morones head of the National Military Manufacturing and Establishments. This department not only operated VPD, but also expanded their radio operations among different factories. Under Morones's direction in 1923, the *Fábrica Nacional de Vestuario y Equipo* acquired broadcasting station 1-R and radiotelegraph station 1-Z.[94] The head of CROM and a legislator during the early 1920s, Morones had a history of working with communications employees and he enthusiastically took to radio. He had previous organized telephone and telegraph operators. In August 1923, Morones sent a letter to the renowned confidant to the leaders, Soledad Gonzáles, in Nuevo León stating that he was sending engineer Víctor Pérez Taylor to install a radiotelephone device and to provide instructions on its management for her.[95]

González, the private secretary of Obregón and close friend and later secretary to General Plutarco Elías Calles, was already one of Mexico's most powerful and capable women. She played an important role in Calles's electoral campaign in 1923-1924 and continued to possess influence and power in political and social circles throughout the

[92] Secretaría de Comunicaciones y Transportes and the Colegio de Ingenieros Mecánicos y Electricistas, *Gral. Guillermo Garza Ramos y Trillo: Ejemplo de honor, lealtad y patriotismo* (México: IMC/CIME, 1994), 74-75.

[93] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 102.

[94] John W. F. Dulles, *Yesterday in Mexico: A Chronicle of the Revolution, 1919-1936* (Austin: University of Texas Press, 1961), 276.

[95] Luis Morones to Soledad González to General Terán, Mexico City to Nuevo León, 10 Aug. 1923, exp. 101, inv. 3883, leg. 1/9, Archivo Plutarco Elías Calles, FAPECFT.

decade and beyond. According to the Mexico City newspaper *El Universal*, CROM received a number of radio devices to receive and transmit lectures and concerts that November. Towns where the government provided equipment included Pachuca, Hidalgo; Puebla, Puebla; Orizaba, Veracruz; Torreón, Chihuahua, "Jalisco and other places in the Republic."[96] CROM and the associated *Federación Obrera Hidalguense de Pachuca* and *Centro Obrera Progresistas de Jérez* used radio equipment during the last year of Obregón's presidency, and so too did some agrarian groups.[97]

**The Lingering Shadow of Civil War: The De la Huerta Revolt**

These groups proved critical to Obregón and Calles when the latter's opponent for the presidency, Adolf de la Huerta, violently rebelled against the very government he had helped establish. The rebellion was a mix of genuine concerns about the future of democracy in Mexico and greedy ambition for power. Calles had obtained the official support of Obregón, making him the favorite to become the next president. Feeling disregarded and upset at the unfair influence of the president, De la Huerta obtained the support of military leaders disgruntled about Obregón's reduction of the armed forces or possessing their own ambitions for power. On December 7, 1924, they rebelled against the "impositionists."[98]

Radio proved crucial to the rebellion and its suppression. As when the Revolution first placed De la Huerta into the provisional presidency, radio technology remained, and indeed grew more important, as a tool of espionage and military communications.

[96] "Propaganda obrera por medio de estaciones radiofónicas," *El Universal*, 16 Nov. 1923, 1.
[97] Manuel Azamar to Gral. P. E. Calles, Tuxtla, Veracruz to General Terán, 12 Apr. 1924, exp. 215, inv. 456, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.
[98] "Rebels Say They Hold the Oil Fields," *New York Times*, 17 Feb. 1924, 6.

Radio was no longer auxiliary, but essential. By 1924, radio had also become a much greater force for spreading propaganda. Radios were no longer a rare tool mostly used by militaries and government officials. There were now thousands—an estimated 15,000 in Mexico City alone—of receivers dispersed across the country and even more in the neighboring United States.[99] Radio allowed De la Huerta to spread word of his cause and to counter government stories printed in the press or spread via their own radio messaging. In turn, jamming and intercepting De la Huerta's wireless correspondence was a constant goal of government forces, which then spread their own propaganda on an even larger scale.

On December 5, 1924, De la Huerta, and his close supporter, *Partido Cooperatista Nacional* president Jorge Prieto Laurens, arrived in the port of Veracruz. According to the local paper *El Dictamen*, they planned on relaxing at the Hotel Imperial before heading north to continue his presidential campaign to the north. But as events revealed two days later, they were actually establishing a base of operations for an armed insurrection against the government. Declaring that the Obregón administration was imposing Calles as the next president and had unjustly obtruded others into governorships, De la Huerta incited another massive armed conflict. He then imposed his own choice, José Pereyra Carbonell, as provisional governor of the state of Veracruz in place of the radical *obregonista* Adalberto Tejada. De la Huerta then called on rebel forces to move on Mexico City. In response, Tejada rallied peasants and workers.[100]

[99] Ornelas Herrera, "La radiodifusión mexicana," 213.

[100] Pedro Castro, *Álvaro Obregón: Fuego y cenizas de la Revolución Mexicana* (Mexico City: Biblioteca Era, 2009), 274-275; Andrew Grant Wood, *Revolution in the Street: Women, Workers, and Urban Protest in Veracruz, 1870-1927* (Wilmington, DL: SR Books, 2001), 175; Enrique Plasencia de la

The De la Huerta Rebellion posed a serious threat to the Obregón government and quickly became a full-scale civil war. Nearly half of the military rose against the president, rebels controlled many of the important ports and radio stations, and the initial drive on the capital caught the government off guard. In western Mexico, General Enrique Estrada, along with a number of other high-ranking military officers, four regiments, and three battalions, mutinied, seizing control of Guadalajara and much of the Jalisco countryside. In the state of Tabasco, General Ferrara Vega joined the rebellion along with much of the army under his command. General Fortunato Maycotte, after persuading Obregón to give him 200,000 pesos and war supplies to suppress the rebellion, immediately switched sides, rallying insurrectionist in Oaxaca.[101] In the east, *delahuertistas* captured the state capitals of Xalapa and Puebla, quickly moving nearer to Mexico City. Many residents believed that Obregón was going to abandon the capital in order to fight from another location.[102] Momentum was on the rebel side. The revolt, however, stalled after distrust and disagreements along the leadership halted the advance on Mexico City, which allowed Obregón to launch a successful counter attack.[103]

Radio espionage provoked a strong fear and public response from the Obregón administration. Immediately following the declaration of rebellion, the government ordered the suspension of all internal wireless communication with rebel controlled

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Parra, *Personajes y escenarios de la Rebelión Delahuertista, 1923-1924* (Mexico City: UNAM, 1998), 38.

[101] Stephen Haber, Armando Razo, and Noel Maurer, *The Politics of Property Rights: Political Instability, Credible Commitments, and Economic Growth, 1876-1929* (Cambridge, MA: Cambridge University Press, 2003), 68-72.

[102] "Evacuation of Puebla Reported," *New York Times*, 14 Dec. 1924, 2.

[103] Although there are several works that specifically address the De la Huerta Rebellion, a thorough study of the conflict is still lacking. The best publications to date are: Dulles, *Yesterday in Mexico*; Plasencia de la Parra, *Personajes y escenarios*; Pedro Castro Martínez, *Adolfo de la Huerta y la Revolución Mexicana* (México: INEHRM/UAM, 1990).

areas, including Túxpan, Veracruz, and Campeche.[104] In order to uncover insurrectionary operatives in Mexico City, they used special agents to search the urban airwaves for renegade messages and to locate their bases of operation. José Soto worked as one of these spies. One of his missions included searching for broadcasters in the affluent neighborhood of Santa María la Ribera. In mid-January 1924, he listed thirty-nine households with receptors in an eight street area.[105] But Soto worked hardest at discovering the meeting place of a group of subversives who aided the *delahuertista* cause.[106] His superiors, including commander of the Federal District General Arnulfo Gómez, specifically targeted Jorge Carregha, "a known conspirator":

> There is knowledge that individuals meet in a house situated between Alamo Street and Chopo Street, among them Lic. Carregha, a conspirator against the government. Likewise it is known that in the same house a radio station with a transmitter and receptor exists for communicating with the rebels. It would serve you to conduct investigations to locate the house cited.[107]

Soto also vigilantly watched the house of Ignacio Flores, a suspect connected to Carregha who lived on Flores Street and owned a "very well mounted" transmitter. E also had visitors who came and left frequently in automobiles during the night.[108]

To compliment Soto's work, the government put in place new restrictions on radio use in the capital. This led the paper *El Universal-Gráfico* to publish a headline

[104] P. A. del D. Zarate, "A los inspectores de división y radio en toda la red," Mexico City, 8 Dec. 1923, exp. 16, inv. 1341, leg 3/4, Archivo Plutarco Elías Calles, FAPECFT.

[105] José Soto to El Jefe del Departamento Confidencial de esta Secretaría, 16 Jan. 1924, Mexico City, Secretaría de Gobernación, caja 5, exp. 44, AGN.

[106] Ibid.

[107] El Jefe del Departamento to José Soto, 14 Jan. 1924, Mexico City, Secretaría de Gobernación, caja 5, exp. 44, AGN.

[108] José Soto to El Jefe del Departamento Confidencial de esta Secretaría, 16 Jan. 1924, Mexico City, Secretaria de Gobernación, c. 5, exp. 44, AGN.

"Formal Raid against Radio Apparatuses."[109] After intercepting a number of insurrectionary messages transmitted from the capital, Gómez restricted all transmissions to licensed commercial stations and those under direct approval and surveillance of the armed forces. Aficionado radio stations had to stop their operations, others had already been shut down by state officials. The military further ordered all residents with radio receivers to register their names and equipment with the government. Those that failed to do so were condemned as spies and enemies of the state. Radio providers had to inform the *Jefatura de la Guranición* or Garrison Commander of any sales, providing the required information before the transaction could be completed. The government outright forbid the sale of radio transmitters.[110]

This was not mere paranoia. Rebels did rely heavily on radio to communicate with spies and different regional commanders. The revolt was widespread. Radio became a regular means of communication between leaders in Veracruz (and then later in Frontera, Tabasco) andco-conspirators in Jalisco, Oaxaca, and the Yucatán peninsula. Estrada not only communicated his entrance into the rebellion and the strength of his forces via radio, he also transmitted regularly to other generals, including Maycotte in Oaxaca via the Salina Cruz station. In late December 1923, rebel general Rómulo Figueroa used wireless to discuss the movement of his forces from the state of Guerrero to Morelos. In Mérida, Yucatán, rebel forces under Ricárdez Broca took possession of a number of radio sets used by aficionados. They also took over the government

[109] "Formal batida contra los aparatos radiotelefónicos," *El Universal Gráfico*, 16 Jan. 1924, 2.
[110] Ibid; El acuerdo del General Gómez, *Excélsior*, 16 Jan. 1924, 1; Cual es la situación real de los receptores de radio," *El Universal Gráfico*, 17 Jan. 1924, 3.

radiotelegraph station, murdering Remigio Ortegón, the station chief.[111] Controlling radio communications was an early goal of the various *delahuertista* forces and crucial to De la Huerta's ability to keep in contact with the rebellion's leaders in other parts of the country.[112]

But more often than not, these wireless links so crucial to *delahuertista* operations worked against them. Government officials regularly intercepted messages that provided much of the intelligence on rebel forces and movements. In mid-January, as a significant battle over the city of Puebla neared, military radio specialists overheard a conversation between Generals Maycotte and Estrada about *delahuertista* forces abandoning the area around Tehuacán, Puebla, and moving in the direction of Esperanza to the north. After the fall of Puebla, during the march on Veracruz, military radio bulletins stated that "wireless messages exchanged between [Gen. Guadalupe] Sánchez from Veracruz and various rebel commanders, which were intercepted at the Chapultepec station, indicated that Adolfo de la Huerta was making a desperate effort to recapture San Marcos [Veracruz?]."[113] Government stations also picked up on the widespread disagreements between Jorge Prieto Laurens and other important rebel leaders, and that De la Huerta had requested a hundred men from Villahermosa to act as his personal escort. In response to the news that Figueroa had moved into Morelos, the Department of War sent General Gómez and a column of "1,500 infantry, cavalry,

[111] Gaspar Gómez Chacón, "Carrillo Puerto y la radio en Yucatán," in *La revolución en Yucatán: Nuevos ensayos*, ed. Gaspar Gómez Chacón, (Mérida: Secretaría de Educación, CESPA Editorial, 2012), 190.

[112] "Rebel Reinforcements Called Up," *New York Times*, 20 Dec. 1923, 1; "Obregon Prepares Drive on Vera Cruz," *New York Times*, 25 Dec. 1923, 5; "Un radiograma interceptado," *El Universal Gráfico*, 18 Jan. 1924, 2; Figueroa had rebelled prior to de la Huerta on November 30, 1923, but then after joined the larger rebellion.

[113] "Rebel Reinforcements Called Up," *New York Times*, 20 Dec. 1923, 1.

artillery, and two airplanes" to reverse the rebel advance."[114] Similar radio interceptions and subsequent responses continued throughout the conflict.[115]

In February and March of 1924, Otilio González stepped up the rebel wireless propaganda campaign as their military situation worsened. From his newly established headquarters in Frontera, Tabasco, De la Huerta sent out a radio "Manifesto to the Nation" on February 20. From New Orleans, Arturo M. Elías relayed the speech in its entirety to his half brother, Calles. Elías obtained the information from the crew of the warship *Bravo*, who overheard the speech while the vessel was being refitted there in New Orleans. The radio address touched on all the grievances set out in his original declaration of rebellion before arguing that the Obregón government had violently expanded the war across the nation and had sold out to Americans in exchange "for ships of war, airplanes, rifles, projectiles, and money."[116] González and rebel radio operators in Mérida sent regular messages to the U.S. Associated Press in Dallas, Texas, which newsmen subsequently spread to America's largest papers, including the *New York Times*. González strived ardently to paint a picture of rebel victories, with some success, even in the face of a horribly deteriorating situation from late February through April.[117]

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[114] "Obregon Prepares Drive on Vera Cruz," *New York Times*, 25 Dec. 1923, 5.

[115] For more examples, see Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX," 195-224.

[116] Arturo M. Elías to Plutarco Elías Calles, New Orleans to Torreón, 4 Feb. 1924, exp. 56, inv. 1379, leg. 10/10, Archivo Plutarco Elías Calles, FAPECFT.

[117] F. L. Pineda to Gral. de Div. P. E. Calles, Torreón to Mexico City, 8 Mar. 1924, exp. 56, inv. 1379, leg. 10/10, Archivo Plutarco Elías Calles, FAPECFT; "Fortín fue ocupado ayer tras un sangriento combate, *El Demócrata*, 5 Feb. 1924, 1924, 1; Rebels Predict Assault on the Capital," *New York Times*, 22 Feb. 1924, 4; El General Serrano llego ayer procedente de Puerto Mexico, *El Demócrata*, 4 Apr. 1924, 6; Quieren echar a pique los barcos, *El Demócrata*, 13 Apr. 1924, 16; Obregon Regains Yucatan," *New York Times*, 22 Apr. 1924, 11; "De La Huerta Still Claims Successes," *New York Times*, 3 Mar. 1924, 3.

The worsening situation inspired De la Huerta to flee Mexico on March 11. Departing in a small boat, he stopped briefly in Carmen, Campeche, where he met Prieto Laurens who gave him 14,000 silver pesos. Telling Prieto Laurens that he was heading to Campeche and then to Yucatán, De la Huerta actually boarded the steamer *Tabasco*. On board he bought the loyalty of the crew with his recently acquired pesos, who in turn, refused to answer the calls from the sailors of the modified corvette *Zaragoza*, whose loyalty to the rebellion had become suspect.[118]

Of course, the Obregón administration had its own radio operations. Although the vast majority of the Gulf Coast fleet joined the rebellion, the four cruisers obtained from the United States were equipped with radio stations. As aforementioned, Americans also refurbished the cañonero *Bravo*. These ships helped secure the government's victory in Tabasco, Campeche, and Yucatán. Airplane squadron commander Captain Rafael Ponce de León used a radio device in his plane to relay information on the location, numbers, and movement of enemy forces—information that was immensely valuable. SCOP officials had recently installed an impressive radio car in the presidential train, an accommodation that Obregón converted into his moving military quarters during the war. The president's own personal telegraph corps operated the wireless equipment, including DGTN employees Manuel Serrano and Federico W. Kreush y Arce.[119]

Colonel José Fernando Ramírez and Captain Guillermo Garza Ramos, who both helped build JH, CYL, CYB, and radio station *El Mundo*, constructed receiving towers

[118] Dulles, *Yesterday in Mexico*, 260-61.

[119] ". . . embarazado las operaciones," *El Universal Gráfico*, 6 Feb. 1924, 1; F. Estévez to Luis G. Zepeda, Celaya, Guanajuato, 25 Jan. 1924, exp. 115, inv., 1521, leg. 1, Fondo Fernando Torreblanca, FAPCEFT.

"in all the military camps" to pick up long distance wireless messages, speeding up communications from Obregón and other top generals to the field and allowing for a greater coherence during mobilizations. These devices also intercepted enemy messages. Ramírez and Garza Ramos not only set up the equipment but additionally trained field operators on how to use it.[120]

As historian Roberto Ornelas Herrera has brought to light, the memoirs of General Donato Bravo Izquierdo provides a number of important insights in how government forces incorporated radio in Chiapas. Using a radio set up by Lieutenant Pedro Ríos in a small brewery, the general was able to hear messages about the war front in Veracruz, including the defeat of Guadalupe Sánchez in Esperanza. Using the recently donated stations in Guatemala and El Salvador, Bravo Izquierdo relayed messages to Mexico City and receivers in Veracruz. These countries also provided ammunition to his forces.[121]

Obregón's SGM aired its own propaganda, highlighting its victories, but also mentioning some of its setbacks.[122] From Mexico City, the department sent out bulletins on its own stations, as well as all other government stations. The Chapultepec transmitter sent these reports across the hemisphere and to Western Europe. The

[120] F. Estévez to Luis G. Zepeda, Celaya, Guanajuato, 25 Jan. 1924, exp. 115, inv., 1521, leg. 1, Fondo Fernando Torreblanca, FAPCEFT; "Mensaje del Gral. Estrada interceptado," *Excélsior*, 17 Dec. 1923, 5; Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX," 196.

[121] Donato Bravo Izquierdo, *Un soldado del pueblo* (Mexico City: publisher not stated, 1964), 155, 173, 208, 253; Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX, 209-10.

[122] "La tripulación completa de los barcos esta lista en Filadelfia y Nuevo Orleans," *El Demócrata*, 5 Feb. 1924, 1; "El radio y la milicia," *El Demócrata*, 7 Mar. 1924, 6.; "Rebels Lose 116 in Pachuca Battle," *New York Times*, 13 Jan. 1924, S8; Rebels Proclaim Tampico Blockade, *New York Times*, 15 Jan. 1924, 8; "Warships Ordered Back to Veracruz," *New York Times*, 31 Jan. 1924, 1.

receivers in CROM and government factories spread government propaganda among urban laborers.[123]

The commercial stations also became embroiled in the conflict. Immediately before the official outbreak of the rebellion, Martín Luis Guzmán, a *cooperatista* member and De la Huerta supporter who had planned to use his station *El Mundo* in support of De la Huerta's campaign, abandoned the operation, and his newspaper of the same name, for exile abroad.[124] The government also briefly shut down CYL. Shortly thereafter it reopened, airing daily war bulletins provided by the SGM, which listeners picked up across Mexico, United States, and Canada.[125] CYB continued to broadcast performances by the National Conservatory of Music and Theatre, apparently posing no threat.[126] The rebellion sent a clear message to radio operators: if you go against the government you will be shut down, but if you support the government, it will support you. In Mexico City, questions of loyalty had largely been determined before the end of January. Once the Obregón administration decided that a station would help and not hinder its military operations, officials allowed, even encouraged, allied commercial broadcasts as a means of building support and further advancing the private broadcasting initiatives began the year before. For almost the entire conflict, commercial stations continued to operate.

[123] "La radiografía utilizaren en operaciones militares," *Excélsior*, 7 Jan. 1924. 1.
[124] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 104.
[125] Ornelas Herrera, "La radiodifusión mexicana a principios del siglo XX," 211, 213.
[126] "Anoche se hizo verdadero arte frente al poderosos aparato transmisor radiotelefónico de 'el Buen Tono, S.A.'," *El Demócrata*, 9 Mar. 1924, 8.

**Returning to the New Normal**

By late April, a month after De la Huerta fled, the revolt had mostly subsided, and radio development continued much as it had before. According to *El Demócrata*, intercepted wireless messages showed the remaining rebels lacking any cohesion and evacuating their remaining strongholds in the south. The landing of government forces in the Yucatán peninsula on April 21 put an end to the last serious bastion of rebel support. [127] Although pockets of insurrectionists continued to operate for a number of months, they received less attention in Mexico City and abroad. The rebels had done significant damage to important radio stations, including in Veracruz, Mérida, and Salina Cruz, but government workers were already in the process of repairing them.[128] During the preceding month, the LCMR began to redouble its efforts to expand radio construction and use, providing a series of lectures, broadcasts, and conferences.[129] Commercial stations once again expanded in number during the last half of 1924. The Inter-American Committee on Electronic Communications, held in Mexico City in June, re-established Mexico as a leading Latin American country in communications development. However, the rebellion had instigated one important new change: political speech became solidly monopolized by a single political faction and commercial stations toned down any dissidence.

While the military was delivering its final blows to the rebels, Calles and his supporters returned to the campaign trail, giving the first radio address by a presidential

[127] "Querían echar a pique los barcos rebeldes," *El Demócrata*, 13 Apr. 1924, 16; "Obregon Regains Yucatan," *New York Times*, 22 Apr. 1924, 11. Interestingly, and perhaps not surprising, after the rebels sabotaged the Mérida radio station, U.S. warships allowed "American interests" to use the navy's radios, especially the USS *Cleveland*.

[128] "Las comunicaciones telegráficas y ferrocarrileras con Huajuapan, Oaxaca, quedaron reparadas en su totalidad," *El Demócrata*, 29 Mar. 1924, 6.

[129] "La interesante conferencia-concierto de hoy de la Liga Central Mexicana de Radio," *El Demócrata*, 27 Mar. 1924, 2;

candidate on April 12. Showing their continued cooperation with the state, the Azcárraga brothers, via CYL, transmitted the program. The Progressive Civic Party (PCP), "the Party of the Middle Class" planned the event. Architect Guillermo Zárraga, the party's president, worked with the Azcárraga brothers on designing the program. It consisted of the national anthem, military bands, classical music—both foreign and nationalist—and *canciones mexicanos* or Mexican popular, squeezed in between the speeches of Calles and two leaders of the PCP.[130]

Interestingly, and importantly, Calles and the PCP aimed their speeches at the United States as much as Mexico, "to the entire country and to the foreign countries where this powerful station reaches."[131] They addressed U.S. fears that Calles was "absurdly radical." The PCP justified Calles's proposed policies by connecting them to the ideas of social justice that U.S. president Woodrow Wilson espoused following World War I. They also argued that Calles would expand education and incorporate rural campesinos, urban workers, and the middle class, exhibiting the government's escalation of populist politics. The PCP also painted Calles as countering the previous wrongs of the landed aristocracy and Catholic Church (though they did not address the Church by name). But the PCP attempted to make these plans more acceptable to U.S. officials by emphasizing that Calles would rule democratically and by the law: that he was practical, compassionate, "more human and more scientific." Following the Spanish-delivered speeches, a translator provided them in English.[132]

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[130] "El viernes será el mitin político del Cívico Progresista," *El Demócrata*, 10 Apr. 1924, 1, 14.

[131] Transcript of the Calles CYL radio address, exp. 118, inv. 1583, leg. 1/4, Archivo Plutarco Elías Calles, FAPECFT.

[132] "El viernes será el mitin político del Cívico Progresista," *El Demócrata*, 10 Apr. 1924, 1, 14; "El Gral. Calles envió anoche de viva voz a la nación un mensaje de alta transcendencia," *El Demócrata*, 12 Apr. 1924, 1, 3, 4.

The radio address was one component of a larger campaign that Calles carried out to ease the fears of Americans that saw Calles as representing the "Danger of Bolshevism Under the Coming Regime."[133] U.S. officials had grown impatient with talks of revolution. Calles, like Obregón, walked a tightrope, arguing that he supported the Revolution, workers, and Mexican autonomy, but also that he was not the enemy of foreigners, foreign capital, and the sacredness of contract.[134]

Although CYL did reach portions of the United States, the American press and government appear to have had little reaction to the Calles-PCP radio event. The *New York Times* never mentioned the address; instead, the editors gave more attention to Calles's speech to farmers in Morelos the following day, where the candidate paid lip service to the legacy of Emiliano Zapata, giving the paper another opportunity to paint Calles as a radical.[135] Calles's overall campaign to appear more moderate to Americans did, however, have some effect when during the following month other newspapers began publishing articles on his increased moderation towards American capitalists.[136]

Although it is hard to judge how much affect the speeches had on the Mexican public, they do appear to have had some influence. But just in case Mexico City residents missed the address, the pro-Calles newspaper *El Demócrata* dedicated a total of five pages over a two day period discussing the event. The paper called the radio address "a great success" and that it was heard clearly throughout the capital.[137]

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[133] Dr. Frank Bohn, "Calles and Anti-Calles in Mexico," 7 Apr. 1924, *New York Times*, 7 Apr. 1924, 16.

[134] Plutarco Elías Calles, "To All the World," exp. 215, inv. 456, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

[135] "Calles for Zapata Plan," *New York Times*, 13 Apr. 1924, E 1.

[136] John Coryn, "Original Mexico Red Decides to Back Up Capital," *Chicago Daily Tribune*, 15 May, 1924, 12.

[137] "El Gral. Calles envió anoche de viva voz a la nación un mensaje de alta transcendencia," *El Demócrata*, 12 Apr. 1924, 1.

Following the event, the agrarian group Partido Rojo del Sur Vercruzano—who had fought against the De la Huerta Rebellion in Veracruz—sent the presidential aspirant a letter praising his defense of campesino rights, offering their support to his campaign, and stating that they heard his address clearly on their radio.[138] Indeed, if anything changed during the time immediately following the rebellion, was the drive of government leaders to use radio to directly communicate with the people of Mexico as a means to solidify their power. The rebellion reminded Obregón, Calles, and their supporters that their grasp was fragile and that the country remained divided. After weeding out some of their greatest adversaries during the revolt, state officials gave more impetus to expanding direct radio communication with those that supported them, to the rest of the nation, and to the world abroad.

**Conclusion: Crucial Years**

The years during Obregón's presidency proved crucial in both technological development and the course of post-Revolution government—developments that were, in fact, very much interrelated. Airplanes were becoming a common component of the military. Engineers and construction workers erected large buildings of grey reinforced concrete. Camaras, cars, and typewriters continued to find their ways into the hands of people in towns across the republic. Articles in newspapers and magazines argued about the merits and pitfalls of technology while a new group of radical poets—the *estridentistas*—praised the new modern and metropolitan world that Mexico was

[138] Manuel Azamar to Gral. P. E. Calles, Tuxtla, Veracruz to Mexico City, 12 Apr. 1924, exp. 215, inv. 456, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

entering. The Obregón administration wrestled with these fast-paced changes while struggling to maintain and expand its power.

The evolution of radio is a good example of the significant changes underway. Despite the still limited reach of the newly established field of broadcasting, wireless technology was becoming a more component of government and society. Radio became a more crucial component of foreign relations and the measuring of time. The military also equipped its first airplanes with wireless devices and the Department of Agriculture worked on using radio technology to spread farming and meteorological information.

The most significant change, of course, was the initiation of broadcasting operations. Radio amateurs, many of whom had been operating illegally, expanded in number and became some of the most significant developers and promoters of the medium. Indeed, they were responsible for organizing many of the earliest broadcasting events and for the first radiocasting regulations in the country. The military commenced its own broadcasting station, and so to did the SEP. It was also during the Obregón administration that commercial radio became a facet of society, especially in Mexico City, Monterrey, Guadalajara, and other urban areas. A number of events, but especially the Firpo-Dempsey boxing match, the Mexico City Grand Radio Fair, and the speech by presidential candidate Calles provoked greater interest in the technology and increased radio sales among tose tat could afford them. Throngs of people crowded around shops that aimed their receivers towards city streets.

Obregón's decision to let commercial enterprises take the lead in radio broadcasting signaled a new opening in radio use, recognizing the limits of the

government to develop an adequate broadcasting chain, but also the capitalist leanings of the Sonoran leadership. However, the government did not give these stations free reign. The 1924 election and the resulting De la Huerta Rebellion made the administration much more hesitant about what private stations aired. Military officials closed down stations, permanently dismantling the one station that supported De la Huerta. During the uprising, the government demanded that all radio owners register their devices. Surely not everyone abided by these orders, but many did, and the decree shows the willingness of the Obregón administration to hinder democratic trends in radio development in the name of state security. The rebellion also had other significant ramifications for wireless development. It ultimately led to the increased dominance of military radio by the armed forces that remained loyal to the state. And most importantly, it cemented the relationship between the Azcárraga family, their station—CYL—and the revolutionary state that the Obregón administration helped stabilize and that Calles and his allies built upon. This is exemplified not only by CYL's willingness to broadcast pro-government messages during the De la Huerta Rebellion, but also by the fact that Calles chose the station to air the first-ever broadcast in Mexico by a presidential candidate.

# Chapter Six

## Military Operations, Structural Development, and Foreign Relations, 1924-1934

Man may make a perfect machine, but it
still will depend on man himself as to
whether the machine shall be an instrument
of understanding or misunderstanding.
—Dwight Morrow, 1930[1]

The diversification of radio continued with force during the years in which Calles held the presidency and during the subsequent "Maximato," when Calles still possessed considerable influence on national politics from behind the scenes. And it was in these years that the technology and the revolutionary state began to mature. The biggest change in wireless trends was undoubtedly the expanding commercial and state broadcasting operations, but broadcasting was only one of the fields of radio that interested leaders. The central government continued to invest in radiotelephony and radiotelegraphy for use in the military, foreign relations, and internal communications more generally. It was during the Calles and Maximato years that the military professionalized and more securely dominated radio communications, which greatly reduced the chances of rebellions to succeed. Private enterprises also became involved in radio outside of broadcasting. Radiotelegraphy and radiotelephone services increased dramatically in the transportation sector. Although most aspects of radio prior to the Lázaro Cárdenas presidency have been underexplored, these components of wireless development in Mexico have received even less attention although they played

[1] "Morrow Voices Plea Via Radio," *Los Angeles Times*, 15 Sept. 1930, 7.

a significant part in transportation and communications development, the suppression of rebellions, and the expansion of state power.

**Continuing Military Developments**

Under the leadership of Minister Joaquín Amaro, the SGM advanced radio in the armed forces while managing to temporarily decrease overall costs.[2] The military not only continued to incorporate the technology for combat and administrative communications, but also along with cinema and print media for "culturization" projects.[3] Radio was an important aspect of army reforms and was included in nearly every arm of the military. Ground and air forces used radio equipment in all of the important campaigns of the era, including the Yaqui uprising (1926-27), the Cristero Rebellion (1926-29), and the political revolts of Arnulfo Gómez and Francisco Serrano in 1927 and of José Gonzalo Escobar in 1929. Unlike the preceding De la Huerta Rebellion, these insurrections against the federal government failed to gain the popular support of the majority of the military, a testament to the success of weeding out discontented officials and the building of a more loyal army under Amaro's leadership. The greater cohesion of the military also allowed the state to control radio communications to a much greater extent, lessoning the dangers of the medium while strengthening intelligence gathering practices.

Like other radio stations, military stations had specific call names. By 1925 most started with the letter "XC," though some still maintained "XB" names, an earlier designation. During the fiscal year 1924-25, the military transmitted 979 radiograms

[2] Lieuwin, *Mexican Militarism*, 86.

[3] Joaquín Amaro, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1924 al 31 de junio de 1925* (Mexico City: Talleres Gráficos de la Nación, 1925), 10.

and received 895. In addition to the broadcasting station JH, the SGM possessed XC1, a station in the offices of the Secretariat in Mexico City, XC2, in Bahía de Magdalena in the Northern District of Baja California, the aviation department's station, and XC3, which was still under construction in Campeche. The Xcalak and Payo Obispo stations were still operational and in use. By mid-1925, *Excélsior* pointed out that there were military stations operating in Mexico City, Guadalajara, Mazatlán, in addition to others in the states of Sonora and Chihuahua.[4] The paper correctly noted the continuing interest in radio by members of the military. However, it failed to recognize the large number of other stations that had been previously completed before and during the Revolution. In fact, the army already had access to radio offices across much of the country. It also possessed a small number of portable devices and a scattering of receivers used for both military matters and entertainment.[5] As can be seen by the location of these stations, the armed forces used radio in central Mexico but also in more remote areas of the country, building from precedents established during the Porfiriato and the Revolution.

The air force also built another station in the Guadalajara vicinity, where a new airbase was under construction. Used for communications between pilots, ground forces, and military bases, General Gustavo Salinas led the aviation and radio projects. Accompanying Salinas were "all the technical engineers of the Department of Radio and Telephones."[6] Still needing to increase the number of experts in radio technology, the military relied on a handful of specialists who often moved from location to location

[4] "Estación radiotelefónica que se instalará en Guadalajara," *Excélsior*, 21 May 1925, exp. 103, inv. 456, leg. 3/15, Fondo Joaquín Amaro, FAPECFT; "Estaciones de radio en toda la República," *Excélsior*, 6 Jun. 1925, exp. 103, inv. 456, leg. 3/15, Fondo Joaquín Amaro, FAPECFT.

[5] Amaro, *Memoria . . . 1924-1925*, 10, 19, 91-92.

[6] "Estación radiotelefónica que se instalará en Guadalajara," *Excélsior*, 21 May 1925, exp. 103, inv. 456, leg. 3/15, Fondo Joaquín Amaro, FAPECFT.

and project to project, making work on multiple simultaneous inniatives difficult. But progress was underway.

From 1926 to 1933 the military's expansion of radio use grew significantly under the continued leadership of Amaro, and then during the brief directorships of generals Abelardo Rodríguez and Pablo Quiroga. During the fiscal year 1926-27, the SGM received 10,950 radio messages and transmitted 15,620. Amaro noted that seven new "fixed" stations had been erected, which were in communication with fourteen portable radios in the field.[7] In 1927 the secretariat increased its training programs and the construction of transmitters and receivers. By the following year, the SGM had expanded its operations to seventeen fixed stations and thirty-three portable sets. In 1929, the number of combined SGM and SCOP stations combined reached sixty-seven.[8] For the fiscal year 1930-31, Amaro reported that there were fifty-two transmitters, including portable devices, operated specifically by the military, dispersed among twenty-four *jefaturas* or military headquarters.[9] In 1933 army engineers constructed ten new stations.[10]

The armed forces trained more operators to work the new equipment. On New Year's Day 1930, Amaro inaugurated the *Escuela de Transmisiones Militares*, which had existed in a more experimental form as the *Escuela Telegráfica Militar*. By 1931 the school had sixty soldiers studying military communications. The following year, during the SGM directorship of Abelardo L. Rodríguez, officials once again changed

[7] Joaquín Amaro, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1926 al 31 de junio de julio1927* (Mexico City: Talleres Gráficos de la Nación, 1927), 16, 135-46.

[8] "Sesenta y siete escuelas de radio tiene el ejército," *El Universal*, 9 Jan. 1929, exp. 95, inv. 406, leg. 8/52, Fondo Joaquín Amaro, FAPECFT.

[9] Joaquín Amaro, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1930 al de julio de 1931* (Mexico City: Talleres Gráficos de la Nación, 1931), 42.

[10] Pablo Quiroga, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1932 al 31 de julio de 1933* (Mexico City: Talleres Gráficos de la Nación, 1933), 72.

the school's name, this time to the *Escuela de Enlances y Transmisiones*. Naval and aviation officials also increased the number of sailors and airmen undergoing training in their own radio communication programs.[11] In 1932 the SGM possessed eighty-five officers and thirty-one soldiers specifically designated for military transmissions. Every major military outpost possessed at least two radio operators. The nation was divided into eight radio zones and new stations were established in the Northern Territory of Baja California, Hidalgo, Michoacán, Chiapas, and the Territory of Quintana Roo. The secretariat also began developing new "backpack" radios, which weighed 28.5 pounds, in addition to importing similar equipment from Britain and France.[12] Indeed, plans were underway to provide radio devices to the majority of military units, similar to practices in the United States and Europe. Built in army workshops, the first fifty radios were to be sent to infantry battalions, to be followed by sixty more devices slotted for Mexican cavalry regiments.[13]

In the navy, meanwhile, officials worked to rebuild their small flotillas following the mass defection during the De la Huerta Rebellion. In the process, they upgraded or installed long and short-wave radios on a number of their vessels. During the summer of 1927, the U.S. company Johnson Iron Works installed the most advanced RCA long and short-wave radio equipment on the cruiser *Anáhuac*, bought in the United States during the De la Huerta Rebellion. Other ships with wireless devices

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[11] Joaquín Amaro, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1929 al 1 de julio de 1930* (Mexico City: Talleres Gráficos de la Nación, 1930), 35, 143; Amaro, *Memoria . . . 1930-1931* (Mexico City: Talleres Gráficos de la Nación, 1931), 42, 122, Secretaría de la Defensa Nacional, "Historia de la Escuela," http://www.sedena.gob.mx/index.php/educacion-militar/planteles-militares/escuela-militar-de-transmisiones/historia-emt?device=iphone, accessed 25 Jul. 2012.

[12] Abelardo Rodríguez, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1931 al 1 de julio de 1932* (Mexico City: Talleres Gráficos de la Nación, 1932), 28-29, 181.

[13] "Todos los cuerpos del ejército van a tener estaciones de radio," *Excélsior*, 22 Feb. 1931, exp. 255, inv. 566, leg. 1, Fondo Joaquín Amaro, FAPECFT.

included the *Bravo*, *Guaymas*, *Acapulco*, *Agua Prieta*, and the *Tampico*. Like other departments within the military, the navy began building its own equipment in addition to acquiring imports and training its own team of radio technicians and operators.[14]

Radio became more popular in the air force because it increased military surveillance capabilities and because it allowed leaders to expand a professionalization campaign via broadcasting. During the Calles years, the Department of Aviation operated its own 2,250-watt broadcasting station and had built and distributed a number of receivers. The military built radio stations at the Balbuena, Mexicali, and Guadalajara air fields. The head of aviation also hoped to install more radios on its growing number of planes. The amount of imported and domestically constructed planes had increased significantly. There were thirty-six aircraft in 1925, six of them built or at least put together in Mexico.[15] Officials at Balbuena clocked 3,304 flights for a total of 470 hours. The SCOP helped build hangers. It has to be noted, however, that the military never had all of its planes in working order. Amaro noted in 1927 that the air force possessed forty-nine planes (an increase of thirteen in two years), but that only eighteen were in actual service. Twenty-two were in repair, and nine were still under construction.[16] The SGM had bought eight of those planes from the United States. Following yet another U.S. embargo on Mexico, the army bought twelve aircraft from England in 1928.[17] In 1930 over sixty planes were receiving repairs and government engineers and builders were constructing multiple "Aztatl" bi-planes. The following

[14] Warren Johnson to Arturo M. Elías, New York City, 30 Jul. 1927, exp. 233, inv. 185, leg. 5/7, Fondo Presidentes, FAPECFT; Amaro, *Memoria . . . 1926-1927* (Mexico City: Talleres Gráficos de la Nación, 1927), 16, 99; Amaro, *Memoria . . . 1929-1930* (Mexico City: Talleres Gráficos de la Nación, 1930), 131; Amaro, *Memoria . . . 1930-1931*, 112.

[15] Amaro, *Memoria . . . 1924-1925*, 91-94.

[16] Amaro, *Memoria . . . 1926-1927*, 98.

[17] Enrique Plasencia de la Perra, *Historia y organización de las fuerzas armadas en México, 1917-1937* (Mexico City: UNAM, 2010), 163-64.

year the department increased radio and signal education as a regular part of aviator training.[18] Documents from 1929 and 1933, however, state that only two planes had working radios, only one more than existed in 1921, and the same number that existed during the De la Huerta Rebellion. The pilots of these planes apparently divided their time between the different conflicts further diluting their impact on the course of the Cristero Rebellion and the military revolts of the late 1920s.[19]

The emphasis on modern war machinery was a global trend, but it was also fueled by events within Mexico. Rebellions continued to plague the country during the last half of the 1920s. The army's leadership believed that in conjunction with airplanes and ships of war, radio communications provided a valuable asset in combating rebel groups, which were mostly based in the mountains of western and northern Mexico. For example, the transport ship *Progreso,* which had been active during the Revolution and the De la Huerta Rebellion helped in the defense of Acapulco during attacks by insurrectionary forces. The rebels, led by brothers and merchants Baldomero and Amadeo Vidales, called for the redistribution of lands in Guerrero and against the Spanish merchants along the Pacific coast in that state and Oaxaca.[20] The military put down the movement quickly, though the Vidales brothers survived and continued to influence government policy in Guerrero. In 1926 General Enrique Estrada, among other *delahuertista* rebels from western Mexico in exile in California, plotted to renew their uprising. They also caused "agitation" in the Northern District of Baja California.

[18] Amaro, *Memoria . . . 1929-1930*, 143.

[19] Estado Mayor Presidencial, "Informe de la Comisión Intersecretarial de Radio," May 1933, Mexico City, exp. 95, inv. 1926, leg. 1, Archivo Plutarco Elías Calles, FAPECFT; "Sesenta y siete escuelas de radio tiene el ejército," *El Universal*, 9 Jan. 1929, exp. 95, inv. 406, leg. 8/52, Fondo Joaquín Amaro, FAPECFT.

[20] Amaro, *Memoria . . . 1925-1926*, 72; Vicente Fuentes Díaz, *Historia de la Revolución en el Estado de Guerrero* (Mexico City: Instituto Nacional de Estudios Históricos de la Revolución Mexicana, 1983), 155-56.

In response, the military in the region, under the command of General Abelardo Rodríguez—*Jefe de los Operaciones Militares*—stocked up on war materials and put in place a "strict and effective vigilance along the border . . . establishing an active service of international information and espionage." Shortly thereafter U.S. law enforcement agents arrested the would-be invaders for violating neutrality laws.[21]

The insurrections that worried political and military officials the most were the Yaqui Uprising and the Cristero Rebellion. Many leading state agents considered them interrelated reactionary movements to government policies by misguided "fanatics." Although the Cristero Rebellion has received much more attention from scholars, it was the Yaqui Uprising that initially worried Amaro more. The result of a train holdup and years of contention over land invasions and autonomy, the revolt was their last to date. The renewed attacks against the Yaqui began when a contingent of Yaqui men led by Luis Matus detained a train aboard which Obregón had been riding on September 12, 1926. Calles and the Chamber of Deputies enthusiastically embraced the idea of teaching the indigenous group a final lesson, providing a million pesos to "forever" put down the Yaqui.[22]

Amaro hurled a mass of troops at the Yaqui hideouts in the mountains of Sonora. He sent eight infantry battalions and ten cavalry regiments. Along with President Calles, Amaro worked with General Francisco R. Manzo, chief of operations in Sonora, and General Román Yocupicio Valenzuela, a Mayo Indian who rose in the ranks of the federal military. Yocupicio would join the failed *escobarista* rebellion two

[21] Amaro, *Secretaría de Guerra y Marina: Memoria . . . 1925-1926*, 108.
[22] Dulles, *Yesterday in Mexico*, 312, Buchenau, *Plutarco Elías Calles and the Mexican Revolution* (Lanham, MD: Rowman & Littlefield Publishers, 2006), 124-26.

years later, surviving to later rule Sonora during the late 1930s.[23] Estimates of the federal forces range from 15,000 to 20,000 soldiers, whereas as Matus led much of his 2,500 followers into the Bacatete Mountains in the Sierra Occidental. Only 1,200 of them were fighters.[24]

The campaign incorporated radio on an unprecedented scale. The army set up three fixed stations in Sonora at Estación Ortiz, Cajeme, and Guaymas. In conjunction with this equipment, six portable radio sets accompanied soldiers in the field. They were used in conjunction with at least one of the planes with a radio device, providing information for reconnaissance, bombing, strafing, and propaganda assignments. Amaro noted that the air force clocked two hundred and eighty-five hours on these missions, one hundred of them "bombing and machine-gunning."[25] Surrounded by government soldiers, Yaqui combatants and their family members were driven out of their mountain hideouts by the aerial campaigns. Subsequently, the Mexican military dealt the demoralized rebels a critical blow at the battle of Cerro del Gallo in late 1927, more or less ending the rebellion and armed Yaqui resistance.[26]

Similarly, federal soldiers incorporated radio in their response to the Cristero Rebellion. A fixed station and three backpack radios were operating in Michoacán. Another fixed station operated in Zacatecas, which was connected to four other portable devices. Amaro noted in 1928 that there were eleven 7.5-watt portable stations used in

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[23] Adrian A. Bantjes, *As if Jesus Walked on Earth: Cardenismo, Sonora, and the Mexican Revolution* (Lanham, MD: SR Books), 62-25.

[24] Shawn Louis England, "The Curse of Huitzilopochtli: Origins, Process, and Legacy of Mexico's Military Reforms, 1920-1946," PhD diss., Dec., 2008, Arizona State University, Tempe, Arizona, 230-32; Edward H. Spicer, *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1933-1960* (Tucson: The University of Arizona Press, 1967), 83.

[25] Amaro, *Memoria . . . 1926-1927*, 89.

[26] René de la Pendraja, *Wars of Latin America, 1899-1941* (Jefferson, NC: McFarland and Company, 2006), 289; England, "The Curse of Huitzilopochtli," 232.

operations against the *cristeros*, not only in Michoacán and Zacatecas, but also in Durango, Jalisco, Guanajuato, and San Luis Potosí. That year the military established another fixed station in San Luis Potosí and built another in Tepic. The station at the Guadalajara airbase and a number of SCOP stations in the northwest also collaborated with the armed forces.[27]

During the middle of the Cristero Rebellion, a revolt by Generals Francisco Serrano, Arnulfo Gómez, and Héctor Almada over the imposition of a second Obregón presidency showed the world that the Mexican government still faced problems of presidential succession and a military of questionable loyalties. The insurrection, albeit relatively brief, also forced Amaro to pull thousands of soldiers and nine aircraft from the *cristero* campaign to search for Gómez, who had fled to the mountains of Veracruz in hopes of rallying a more significant force. This, in turn, prolonged the *cristero* conflict. However, Serrano and Gómez failed to gain a substantial following from within the military, exhibiting, perhaps, that Amaro's re-education program had actually led to greater allegiance to the state among an increasing amount of soldiers. Learning of the rebellion in advance from loose-lipped participants, Calles, Amaro, and Obregón moved quickly to crush the revolt. Immediately Amaro and Calles "installed their headquarters at Chapultepec castle, where direct wire and radio communications kept them constantly informed." They stayed up late into the night during the first three days of October "snapping" orders.[28] Soldiers captured and shortly thereafter executed Serrano in Morelia on October 3. Gómez survived until early November. By then federal troops under the command of General José Gonzalo Escobar had already

[27] Amaro, *Memoria . . . 1927-1928*, 16; Amaro, *Memoria . . .1926-1927*, 37.

[28] Carelton Beals, "The Indian Who Sways Mexican Destiny," *New York Times Magazine*, 7 Dec. 1930, 8-9, 19, APS.

defeated his forces. They found Gómez, along with his nephew, hiding in a cave near the city of Xalapa. They too were executed. Almada, who had earlier joined Gómez's forces, escaped to the United States.[29]

Despite the horrible failure of the Serrano-Gómez Revolt, Escobar and a number of other generals revolted on March 3, 1929. Once again, the issue was the presidential succession. They protested what they saw as the imposition of Pascual Ortiz Rubio's presidency, guaranteed by Calles and his partners within the PNR. This time the process had been further complicated by the assassination of Obregón, which a number of the generals incorrectly blamed on Calles. This insurrection also proved more dangerous, since approximately 28 percent of the armed forces defected to the side of the rebels.[30]

Of course, radio being a regular component of the military and insurrections, continued as an important communications tool during the Escobarista Rebellion. When the uprising first broke out, Portes Gil and Calles learned that General Jesús M. Aguirre, who originally feigned allegiance, was actually in rebellion when José María Dorantos, head of the Seventh Calvary Regiment, and member of the navy still loyal to the government, sent a radio message to Mexico City stating that Aguirre was actually organizing the revolt in Veracruz.[31] In speeches and publications Portes Gil praised this wireless message as crucial to the government's response. Military leaders used field radios and military stations in similar ways as they had in the prior conflicts, they also

[29] De la Pendraja, *Wars of Latin America*, 295.

[30] Ibid; Tzvi Medin, *El minimito presidencial: Historia politica del Maximato, 1928-1935* (Mexico City: Ediciones Era, 1982), 39-40, 50; Plasencia de la Perra, *Historia y organización*, 341-42.

[31] Emilio Portes Gil, "Sobre la rebelión 'escobarista'," in *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966*, eds. xlvi Legislatura de la Cámara de Diputados, vol. v, *manifestos y documentos*, 1821-1966 (Mexico City: Cámara de Diputados, 1966), 698.

used broadcasting. With the approval of President Emilio Portes Gil, Julio Tren's Trens News Agency provided bulletins about the "the march of military operations against the subversives" on commercial, military, and other government stations. All programs were "favorable to the government and our institutions" and were heard over home receivers but also portable and fixed army radios.[32]

As a military tool, radios were useful but they had their limitations. Disruptions and interference were still common. Devices broke. A number of them were second-hand. According to a military attaché to the U.S. Embassy who was in contact with a "reliable informant, unusually well situated to acquire the data requested," Mexican agents who purchased radio equipment in the United States in late 1926 were corrupt and bought on the cheap. One such buyer named "Bravo" acquired enough equipment from a military surplus store in New Jersey to piece together twenty-seven transmitters. He bought used so he could pocket money that was provided to him based on the costs of new devices. However, the attaché admitted that the equipment, even if used and older, should work and that sets could be built from the materials that reach up to 1,000 miles.[33] Officer arrogance also offset the technological advantages of the federal army on more than one occasion, for example, during General Eulogio Ortiz's campaign against the *cristeros* in Colima in May and June 1929.[34] Another limitation was the lack of equipment in the air force. Although military officials talked often about

[32] Julio Trens to Joaquín Amaro, México DF, 18 Sept. 1929, exp. 3, inv. 306, leg. 02/66, Fondo Joaquín Amaro, FAPECFT.

[33] Edward Davis to A. C. of S., G-2W. D., Mexico City to Washington, DC, 9 Dec. 1926, exp. 4, inv. 1516, leg. 1, Fondo Elías Calles, FAPECFT.

[34] Ben Fallaw, "Eulogio Ortiz: The Army and the Antipolitics of Postrevolutionary State Formation," in *Forced Marches: Soldiers and Military Caciques in Modern Mexico*, ed. by Ben Fallaw and Terry Rugeley (Tucson: University of Arizona Press, 2012), 143.

equipping more planes with radios, and pilots received more training on wireless use, the task for some reason proved difficult.

As exemplified by the Trens reports, broadcasts aimed at the general public were another component of state propaganda on military affairs. Commercial stations regularly broadcast war bulletins filled with government reports since 1924. The Azcárraga's station, CYL, broadcast anti-*delahuertista* news. The military provided musical programming and lectures, which were not only played on SGM stations but also on the SEP transmitter and commercial stations. In December 1925, J. M. Puig Casauranc, Secretary of Public Education, told Amaro that he could use the SEP's station to air propaganda and military orders whenever he needed.[35] In 1928 the SGM reported that it operated two 2,000-watt stations "on commercial waves" for communication with boats, planes, and transmitting programs.[36] Assisted by the military's most renowned radio specialist, José Fernández Ramírez, the Trens Agency continued reporting on state and military matters into the 1930s, though it was not popular among all military leaders. One officer, Ramón Cortes Gonzales, complained to Amaro in late 1929 that the messages sent out from Balbuena airfield reached Havana and Guatemala, jeopardizing military operations.[37]

Amaro also used broadcasting to shape the culture within the armed forces. One of the first subjects addressed by Amaro when he gave his report to congress in 1925 was his use of radiocasts and receivers as part of a "culturization" program. Similar to a project underway by the SEP, military leaders used radio, along with cinema and

[35] J. M. Puig Casauranc to Joaquín Amaro, Mexico City, 17 Dec. 1925, exp. 9, inv. 297, leg. 17/62, Fondo Joaquín Amaro, FAPECFT.

[36] Amaro, *Memoria . . . 1927-1928*, 38.

[37] Ramón Cortes González to the Secretario de Guerra y Marina, Mexico City, 21 Sept. 1929, exp. 18, inv. 248, leg. 1, Fondo Joaquín Amaro, FAPECFT.

magazines, to bring expert lecturers to soldiers.[38] Army leaders also hoped that broadcasting would entertain soldiers and raise morale. Station JH operated during 1923 and 1924. During 1925 and the first half of 1926, the Department of Communications and Signals played music and military conferences each Monday via a 6,000-watt transmitter. The station operators temporarily ended their broadcasts on June 1, 1926, in order to help expand radio operations in other parts of the country.[39] In 1929 and 1930, military technicians constructed four short-wave transmitters for military news, educational classes, and general orders.[40] In 1933 the Interdepartmental Radio Commission, a committee comprised of specialists who were reviewing the state of radio development in the country, noted that there were two SGM broadcasting stations, XFG and XFH, which aired programs for the armed forces and the public at large.[41]

In addition to promoting radio within the military, Amaro befriended a number of radio equipment providers. He not only bought radios for himself but he also introduced salesmen to other prominent government officials. In early 1928, Amaro bought two radios, one for himself and one for his wife, from Emilio Azcárraga, the brother of the co-owners of commercial station CYL, and the owner of the Mexican Music Company, a subsidiary of RCA. These devices were not run-of-the-mill radios; they were top of the line. Amaro's machine cost one thousand pesos. His wife's cost three and a half thousand pesos (a thousand pesos less than what Azcárraga said he normally charged). Amaro was not the only government official to buy from

[38] Amaro, *Memoria . . . 1924-1925*, 10.
[39] Amaro, *Memoria . . . 1925-1926*, 66.
[40] Amaro, *Memoria . . . 1929-1930*, 30.
[41] Estado Mayor Presidencial, "Informe de la Comisión Intersecretarial de Radio," May 1933, Mexico City, exp. 95, inv. 1926, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

Azcárraga, and his relationship with state and party leaders grew substantially when he opened his own powerful commercial station—XEW—in 1930.[42] Amaro also introduced "his friend" Hernegildo Robles, a representative of Zenith Radio Corporation of Chicago, to President Portes Gil while pushing the president to help the army obtain more apparatuses.[43]

A testament to how important radio was to top military officials, these leaders sent agents abroad to study the medium and to examine how it was used by other governments and armed forces. In fact, the army was sending an unprecedented number of people to foreign countries to gain insights into a myriad of subjects pertaining to military modernization.[44] Most of these student representatives went to Europe, but others went to the United States and South America. For example, in 1928 one mid-level officer—almost all of these officials abroad were young majors or lieutenants—went to Brazil specifically to report on how that country used radio communications. He sent reports back to the SGM, providing information on the developmental history of the medium, personnel, costs, the number of stations, and the number of messages sent and received.[45] Similarly, in 1930 and 1931, another officer sent to Argentina to learn methods for improving Mexico's radio services wrote about transatlantic wireless services between Europe and Argentina, radio in Buenos Aires,

[42] The Mexican Music Company to the Secretario del Guerra y Marina, Mexico City, 21 Feb. 1928, exp. 1, inv. 286, leg. 58/63, Archivo Joaquín Amaro, FAPECFT; The Mexican Music Company to Elisa L. de Amaro, 21 Feb. 1928, exp. 1, inv. 286, leg. 58/63, Archivo Joaquín Amaro, FAPECFT.

[43] Joaquín Amaro to E. Portes Gil, Mexico City, 1 Aug. 1929, exp. 2, inv. 290, leg. 1/3, Archivo Joaquín Amaro, FAPECFT.

[44] Martha Beatriz Loyo Camacho, *Joaquín Amaro y el proceso de institucionalización del ejército mexicano, 1917-1930* (Mexico City: Fondo de Cultura Económica, 2003), 143.

[45] José R. Campos, "Remite informe con la visita efectuada a la sección de radio-telegrafia del ejército brasileño," Jul. 1928, exp. 15, inv. 245, leg. 10/19, Archivo Joaquín Amaro, FAPECFT.

Argentine-made devices, and communications in Argentina's armed forces.[46] At the same time, the SGM sent officials to the Second Meeting of the International Technical Consultative Committee on Radioelectronic Communications held in Copenhagen, Denmark.[47] In August of 1934 the military had other officers training on radio advancements and uses in England and Spain while back home the SGM had formed a new transmissions battalion.[48]

Military radio was one of a number of examples in which Amaro and his successors implemented a serious program of military reform and modernization. Although built on the work done by preceding administrations, Amaro instilled a sense of loyalty to a much greater extent, especially after the failed rebellions of other generals from 1927 to 1929. But even then, it was a testament to Amaro's policies and, perhaps the weariness of war, that the vast majority of soldiers remained loyal to the government during these insurrections. Radio played an important role in building this new military culture, putting down the rebellions of the 1920s, and in spreading state propaganda to the public, troops, rebels, and foreign audiences.

**Public Communications: The SCOP and Private Enterprise**

Armed forces dominated wireless use during the Revolution, but as addressed in the previous chapter, radio communications expanded in a number of commercial enterprises and other state agencies during the Obregón and Calles years. Indeed, radio use among commercial aviators and merchant sea vessels outpaced the military by the

[46] Ezequiel Ruiz V., "Informes del Mayo de Infantería Ezequiel Ruiz V., comisionado en la Republica Argentina, para efectuar de radiotelegrafía, 1930-1931," exp. 43, inv. 23, leg. 1, Archivo Joaquín Amaro, FAPECFT.

[47] Amaro, *Memoria . . . 1930-1931*, 45, 88.

[48] Andrés Figueroa, *Secretaría de Guerra y Marina: Memoria . . . 1 de agosto de 1934 al 31 de julio de 1935* (Mexico City: Talleres Gráficos de la Nación, 1935), 36-40, 64.

early 1930s. Radio messaging from trains, first started by factional leaders during the Revolution, became more commonplace on regular passenger services and, of course, on the presidential train. As a result, radio became an integral part of communication in transportation, advancing the practice of using the medium to interlink the various parts of the country. The SCOP, which had been a major player in Mexican radio development from the beginning, oversaw these developments and provided permissions to businesses interested in using wireless technology. Additionally, the SCOP itself continued to expand radio as a vital part of internal government and public communications, as well as communications with foreign powers.

The number of state radiotelegraph stations fluctuated. In 1925 the DGTN operated twenty-five offices for government and public use.[49] By 1926 the number of working SCOP stations dropped to twenty-four, though by 1935 the number of operations had increased to twenty-eight. From 1926 to 1935 SCOP agents reported that the percentage of all electronic communication messages that were wireless rose from 8 percent to over 14 percent. From its workshop in Chapultepec, the DGTN built and repaired wireless devices, providing most of the parts for government stations. [50]

The DGTN also continued to direct much of Mexico's radio communications with foreign nations. Mexico's influence in Central America continued under the Calles administration. Stations gifted to the region during the Obregón years kept the governmental leaders of El Salvador, Guatemala, and Costa Rica in direct contact with

[49] Plutarco Elías Calles, "El Gral. Plutarco Elías Calles, al abrir las sesiones ordinarias el congreso, el 1 de septiembre de 1925," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 690-91.

[50] Secretaría de Comunicaciones y Obras Públicas, *Memoria . . . por el Secretario de Estado y del Despacho de Comunicaciones y Obras Públicas . . . del 1 de agosto de 1927 al 31 de julio de 1928* (Mexico City: Imprenta Galas, 1928), 14; Secretaría de Comunicaciones y Obras Públicas, *Memoria . . . de septiembre de 1935 a agosto de 1936* (Mexico City: Multígrafos SCOP, 1936), 44.

Mexico City. In 1926 the Mexican government worked out a number of new wire and wireless contracts between Central American and Caribbean countries.[51] The DGTN also expanded its communications with nations in Europe, Asia, and South America. The Chapultepec radio towers continued to beam government newscasts throughout the latter half of the 1920s and the 1930s to domestic and foreign stations. Indeed, the station increased its power dramatically. In 1928 the SCOP reported that the station operators were in regular communications with Germany, "Paris, England, Argentina, Italy, Japan, and others." In 1929 the SCOP completed a massive receiver in its newly founded Palo Alto station in the Lomas de Santa Fe region of the Federal District. The operation picked up radio messages from around the entire globe.[52] In addition to radiotelegraphy DGTN employees began to regularly use international radiotelephone services starting in the early 1930s. In January 1931, SCOP director Juan Andreu Almazán, later to play a leading role in galvanizing much of the Mexican right against Cárdenas, first talked via wireless phone with Primo Villa Michel the Mexican ambassador to Germany.[53]

During the presidency of Pascual Ortiz Rubio, the SCOP allowed a number of U.S. providers to start wireless operations in Mexico. These agreements, however, had a large number of stipulations, put in place to help alleviate fears of foreign domination. For example, in 1931 the SCOP signed a deal with the Montgomery Company, a subsidiary of Frutera Transcontinental, which was in turn controlled by United Fruit.

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[51] "Importante servicio telegráfico," *Diario de Campeche*, 23 Aug. 1926, 4.

[52] Javier Sánchez Mejorada, *Memoria . . . por el Secretario . . . de Comunicaciones y Obras Públicas . . . 1 de agosto de 1928 al 31 de julio de 1929* (Mexico City: Imprenta Galas, 1929), 10; "Comunicación por radio con otras naciones," *El Nacional*, 3 Jun. 1929, 5.

[53] Cámara Nacional de la Industria de la Radio y Televisión, *Cápsulas culturales: Espacios abiertos en radio y televisión a las raíces de México* (Mexico City: Cámara Nacional de la Industria de la Radio y Televisión, 1985), 250.

The concession allowed for the Montgomery Company to start a wireless office in Ixtapa, Jalisco, close to the business' banana plantations in the vicinity of Balderas Bay, 200 miles south of Mazatlán. United Fruit had long been one of the main radio innovators and developers in Latin America, but it had to concede to a number of strict stipulations in order to operate in Mexico. For one, the station had to be accessible to the public and interlinked with the national communications network, though preference was to be given to the company's messages. The station also had to hire and pay for a Mexican staff, including the operator, a mechanic, and a messenger. The government retained the right to close the operation at any time and to buy the station if it chose to do so after ten years. Additionally, the company agreed "not to invoke the aid of their diplomatic representative" or the contract would become null and void and the installation would become "property of the nation." Agreeing to the terms, the Montgomery Company used the station mostly to communicate with sea vessels involved in transporting their products or with other ships and stations connected to United Fruit. It appears that the operation also kept in touch with certain SCOP stations. Indeed, the Mexican government specified which stations it could contact, including the offices in Chapultepec and Mérida within Mexico; Barrios, Guatemala; Tela and Tegucigalpa, Honduras; Managua, Nicaragua; and New Orleans and Miami in the United States.[54]

On January 14, 1932, the SCOP and RCA signed a ten-year contract creating "Radiomex, R.C.A.," which provided more wireless connections to New York, Berlin, Madrid, Havana, and starting in1934, Tokyo, among others. Both RCA and the

[54] Document File Note Regarding the Montgomery Company, 22 Jun. 1931, 812.76/69, RG 59, USNA.

government shared in the profits and costs. SCOP officials operated the Mexican end of the communication link via Chapultepec, and RCA employees operated traffic to and through the United States via their operation on Long Island. The agreement, decreed into law by Ortiz Rubio on June 17, 1932, exhibits the decision by top government officials to allow foreign companies a larger role in international communications to and from Mexico, conceding the United States' dominant role in global wireless technology and knowhow. [55] This trend continued during the Cárdenas administration.

The state and local governments also operated their own radio stations. In 1924 Chihuahua's Department of Telegraphs started XICE, a small operation that broadcast every Wednesday and Friday.[56] In 1925 D. Javier M. Eroza, the Mayor of Mérida, Yucatán, installed a radio station on property controlled by the Liga Central de Resistencia.[57] While governor of Veracruz, General Heriberto Jara inaugurated the state's own station in the capital city of Xalapa in late 1926.[58] According to one 1933 report, the state government of San Luis Potosí operated four radio stations, Tabasco had two, and Chiapas relied on one.[59]

In the late 1920s and 1930s, passenger and mail aviation services took off, both figuratively and literally. Of course, the SCOP had to approve them all. Many of the pilots were also former or active military aviators. In January 1927, pilots of the

[55] "Decreto por medio del cual se reglamenta el servicio radiotelegráfico internacional que se transmita por la vía 'Radiomex, R. C. A.," 17 Jun. 1932, Mexico City, Archivos Económicos, Biblioteca Miguel Lerdo de Tejada**;** "New Wireless to Mexico," *New York Times*, 7 Jan, 1932, 37; All Radiomex telegrams listed the locations, prices, etc… on the back of the telegrams. See, for example, José M. Puig to Koki Hirota, Mexico City to Tokyo, 24 Oct. 1934, exp. III-297-14, ASRE.

[56] "Estación transmisora de radio en la ciudad de Chihuahua," *El Universal*, 13 Dec. 1923, II 7.

[57] "Una amplia labor administriva desarrollada por el H. Ayuntamiento de Mérida, Yuc.," *Excélsior*, 16 Sept. 1925, sección de rotograbado.

[58] Gral. Calles to Gral. H. Jara, Mexico City to Xalapa, 22 Sept. 1926, exp. 11, inv. 2960, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

[59] Estado Mayor Presidencial, "Informe de la Comisión Intersecretarial de Radio," May 1933, Mexico City, exp. 95, inv. 1926, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

National Air Force scouted out routes that could be used for government and commercial purposes.[60] In April the SCOP approved the first postal air route from Mexico City to Túxpan to Tampico. Another route began that year between Mexico City, Veracruz, Puerto México (today, Coatzacoalcos), Salina Cruz, and, finally, Tapachula, Chiapas.[61] The same year the SCOP also approved eighteen other permissions for aerial navigation, including three to *Compañía Mexicana de Aviación*. One of its owners was none other than Enrique Schöndube, the German immigrant and agent of AEG (Telefunken) that engineered Mexico's first public wireless stations.[62] Over the next few years, a number of companies began domestic and international services, especially to the United States. The most successful air services relied on radio for communications. In 1933 The Mexican Aviation Company possessed twelve radio stations: Tampico, Tamaulipas; Rancho Méndez, Hidalgo; Mexico City, DF; Túxpan, Veracruz; Tejeria, Veracruz; Minatitlán, Veracruz; Villahermosa, Tabasco; Ciudad de Carmen, Quintana Roo; Campeche, Campeche; Mérida, Yucatán; Payo Obispo, Quintana Roo; and Tapachula, Chiapas. The Central Air-Ways Company had stations in Mexico City, DF; León, Guanajuato; and Torreón, Coahuila.[63]

Like military aviation stations, the commercial radiotelephone services were not only confined to communicating with planes. The Mexican Aviation Company spread word of a Salvadoran coup that it overheard on its receivers. In fact, some of the first reports of murders, the disposal of President Arturo Araujo, and the otherwise "calm

[60] "Las cartas de rutas aéreas," *El Universal*, 17 Jan. 1927, 1.

[61] "Una ruta aérea entre la ciudad de México y Tapachula, Chiapas," *El Universal*, 12 Apr. 1927, II 1.

[62] Secretaría de Comunicaciones y Obras Públicas, *Memoria . . . 1927-1928*, 5.

[63] Estado Mayor Presidencial, "Informe de la Comisión Intersecretarial de Radio," May 1933, Mexico City, exp. 95, inv. 1926, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.

situation" heard in Mexico and the United States came from the company.[64] Again, this shows how radio messages entered and influenced nations outside of their place of origin, and the importance of the medium to the foreign relations of nations.

Other transportation sectors incorporated radio for public use. Starting in 1928, the DGTN established equipment and personnel to provide wireless services aboard a number of passenger trains that serviced the states of Coahuila, Chihuahua, San Luis Potosí, Tamaulipas, Nuevo León, Queretaro, Guanajuato, Aguascalientes, Sonora, Sinaloa, and Jalisco. According to one Mexico City newspaper, passengers needed only to grab the attention of a DGTN agent while on the locomotive and to make a request.[65]

In addition to public railway services, SCOP officials made sure that the presidential train had working radio equipment. The "Yellow Train" used by Obregón and Calles possessed wireless equipment, much like those Villa used during the Revolution. In 1927 a number of government officials decided that a new train was in order. Through Arturo M. Elías, the president's half brother and the "Mexican Consul-General" in New York, the government purchased a truly opulent train from Chicago's renowned Pullman Company. The "Olive Train" consisted of five luxurious coaches for Calles and his staff and another coach specifically for the SGM. The machine cost well over half a million dollars and possessed "every conceivable necessity," including bullet- proof cladding and "the most modern radio sets," which were in every coach excepting the baggage and escort cars. The *Los Angeles Times* called it the "most

[64] Rebel Coup Triumphs," *Los Angeles Times*, 4 Dec. 1931, 1.
[65] "Servicio telegráfico a bordo de los ferrocarriles," *Excélsior*, 12 Feb. 1928, 3.

palatial train in the world."[66] A year later the SCOP added a new short-wave radio built in the Chapultepec workshop.[67]

**Foreign Relations and Legislation**

As radio became more prominent, executive officials and congressmen signed new legislation regulating the medium. Diplomats also made new agreements on communications with a number of other countries, while arguing with the United States over the role of the state in broadcasting, the allocation of radio frequencies, and interference caused by each other's transmissions. Debates over these issues, which increased during the last year of the Obregón presidency, continued with even greater frequency during the last half of the 1920s and the 1930s.

As stated in the previous chapter, the Obregón administration took up a prominent role in the international debate about radio development when it hosted the Inter-American Committee on Electronic Communications in Mexico City in the summer of 1924. The event became a showdown between the United States and Latin America over the role of states in radio development in the Western Hemisphere. Mexican officials, who had striven to increase their own influence in Latin America, especially Central America, had attempted with some success to convince many of the region's leaders that they should build nationalist wireless systems, operated by their respective governments, and not to rely on U.S. companies like RCA to provide the service. South American countries, including Brazil and Argentina, pushed similar views, as they had

[66] "Mexico's Head Gets Fine Train," *Los Angeles Times*, 15 May 1927, 6.
[67] Secretaría de Comunicaciones y Obras Públicas, *Memoria . . . 1927-1928*, 10.

already shown in the inter-American communications conference held in Santiago, Chile, the year before.

A number of conferences, both global and regional—Mexico, United States, Canada, and Cuba—followed over the next decade. The 1927 International Radiotelegraph Convention of Washington, DC, and the 1932 International Telegraphic and Radio Telegraphic Conference in Madrid were significant, but other bilateral agreements and smaller regional meetings proved just as important. Most Latin American countries, including Mexico, continued to operate a number of their radiotelegraphic service through the government, many Latin American representatives, however, became more willing to cooperate with U.S. private businesses, which dominated radio manufacturing and technological innovation. Delegates as these conferences worked out the details for radiotelegraphic and radiotelephonic messages for maritime and airplane communications, meteorology, experimental investigation, warfare, and commercial and state broadcasting. The 1927 conference delegates also agreed to change the call letters of the participating countries, providing Mexico's final XAA-XFZ designation.[68]

One direct and significant impact of these international agreements is that they prompted Mexican officials to increase and modify their own legislation. For example, the 1924 Mexico City meeting set the foundations for the 1926 Law of Electronic Communications.[69] The main components of the law came directly from the positions offered by the Mexican delegation at the Mexico City conference. These included strict

[68] *International Radiotelegraph Conference of Washington, 1927* (Washington, DC: Government Printing Office, 1928).

[69] Secretaría de Comunicaciones y Obras Públicas, *Ley de Comunicaciones Eléctricas* (Mexico City: "Diario Official," 1926; Mejía Barquera, *La industria de la radio*, 30-31; Hayes, *Radio Nation*, 37.

government supervision over private wireless operators, and the requirement of citizenship for all radio-station owners. Both the conference and the subsequent national legislation also exhibited the fact that national security risks stemming from the Revolution and the De la Huerta Rebellion remained a prominent concern of communications officials. Delegates ardently pushed for the state's "right to seize such stations or suspend their service in case of local or international disturbance" and that "all parties concerned keep secrecy in respect to all messages or information intercepted by receiving apparatus not intended for the general public or for the party or parties hearing the same."[70] The 1926 law also made it illegal to report news contrary to the security of the state, international harmony, public order, good customs, decent language, or "attacks of any form against government or individuals." However, showing the growing acceptance and outright promotion of commercial broadcasting stations, government officials increased the possible length of a station concession to fifty years.[71] In other words, Mexico pursued a mixed commercial-government system that promoted private broadcasting but with strict state oversight and influence.

The focus of most of the discussion between the Mexican government and U.S., Canadian, and Cuban officials revolved around wave frequency allocations and the related issue of interference. Radio transmissions broadcast from different locations that share the same or similar wavelength interfere with each other, often making signals unintelligible; a well known fact that was used to jam signals during World War I and the Revolution. The expanding number of commercial and amateur broadcasters

[70] "Proposals Offered by the Mexican Delegation on the Subject of the Agenda," 11 Jun. 1924, RG 59, box 574, D4/179, USNA.

[71] Article 10 of the *Ley de Comunicaciones Eléctricas*, in Medina Ávila and Vargas Arana, *Nuestra es la voz*, 83.

in the hemisphere crowded the airwaves, causing constant interference with programming. Certain wavelengths also carry sound clearer and for longer than others. Broadcasting businessmen who operated powerful transmitters coveted these frequencies, known as clear channels.

During the 1927 Washington, DC, conference, American delegates and businessmen introduced and obtained legislation on wavelength allocation and interference in articles five and ten of the resulting document. The measures stated that people should open new stations only if they do not interfere with others. Since the United States operated the vast majority of stations, including those on clear channels, they, by means of earlier and quicker development, dominated the airwaves, legally leaving few to others.[72]

American representatives not only worried about interference with U.S. commercial stations, but also with military operations. As discussed in chapter four, U.S. army officials complained that *carrancista* radio operators were sending out messages to interfere directly with transmissions sent and received by the Pershing Expedition. In turn, Carranza complained of American warships purposefully interrupting Mexican wireless messages. As Mexican stations, especially powerful border blasters, interfered with a larger number of U.S. stations, some Americans feared that the Mexican operations would jam military communications, endangering the lives of soldiers. American journalists continued to blame Mexican stations for intentionally breaking up American military messages. For example, while U.S. Marines were trying to quell the rebellion of Augusto César Sandino in Nicaragua, the *Washington Post*

[72] *International Radiotelegraph Convention of Washington, 1927* (London: His Majesty's Stationary Office, 1928), 16-17, 35.

reported that Mexican radio officials "redoubled their signals as the [U.S.] fleet left Mexican waters." These messages cluttered the airwaves, making American transmission more difficult. However, this was not likely the reason for the increase in wireless messages. As the article later contends, these radiotelegraphers could have been "signaling ammunition runners for the Nicaraguan rebel forces," or at least warning boats and Central American allies about the movement of the U.S. vessels.[73] Calles vocally denounced U.S. intervention in Nicaragua. Nevertheless, the Mexican legislature agreed to the stipulations of the 1927 conference two years later.

Despite agreeing to not allow new stations to use frequencies that would interfere with already established American broadcasters, the Mexican government, starting in 1930, allowed the construction of massively powerful radio stations along the U.S. border that operated on frequencies extremely close to commercial operations in the United States.[74] In fact, the government even assisted their construction.[75] Medical charlatans and other ostracized Americans chased off the airwaves in the United States operated these stations, transmitting a motley assortment of Latin American and U.S. music, fortune tellers, and advertisements for outrageous medical cures. The most notorious "border blasters" of the 1930s were John R. Brinkley—known as the "goat-gland doctor" for his procedure of rejuvenating male sexual performance and fertility through sewing pieces of goat testicles into men's testicles—and Norman Baker, who

[73] "Mexican Radio Busy as U.S. Fleet Approaches," *Washington Post*, 28 Feb. 1927, 3; For another complaint against Mexican radio interference with U.S. military operations five years later, see Harry Carr, "The Lancer," *Los Angeles Times*, 11 Oct. 1932, A1.

[74] Ortiz Garza, *Una radio entre dos reinos*, 22

[75] See the telegrams between the governor of Coahuila to the Mexican Secretary of Communications, July 3-8, 1931, caja 69, exp.8/4652, Ramo Presidentes Obregón-Calles, AGN.

peddled false cures for cancer.[76] Understandably, their operations infuriated a large number of U.S. radio-station owners and listeners whose programming suffered from terrible interference. They also infuriated U.S. medical professionals who had worked hard to delegitimize Brinkley and Baker. However, others enjoyed the eccentric and eclectic entertainment they provided. Brinkley's station received hundreds of thousands of positive letters from all over the United States especially from the Midwest. Indeed, the rise of American folk and hillbilly music in the United States starting in the mid-1930s owes much to these powerful frontier stations that aired live transmissions of Woody Guthrie, the Carter Family, and other musicians. Sadly, thousands of seriously ill people also believed in their false cures.[77]

A number of prominent Mexicans, in addition to Americans, opposed these stations. Just as in the United States, many medical professionals, especially those involved in the Department of Public Health, despised Brinkley and Baker's quackery. Lawyer Manuel Ruíz Sandoval protested to Coahuila's Governor Nazario S. Ortiz Garza that Brinkley and the other American broadcasters operating in Mexico were agents of U.S. imperialism. Indeed, Mexican and American newspapers reported on these "imperialist" objections. Americans found the claims ridiculous. One opinion piece in the *Los Angeles Times* facetiously quipped that "according to all photographs,

[76] While operating the station in Villa Acuña, Coahuila, Brinkley changed his focus to colon procedures.

[77] Ed Kahn, "The Carter Family on Border Radio, "*American Music* 14, no. 2 (Summer 1996): 205-17. For more works on border radio see Sonia Robles, "Shaping *México Lindo*: Radio, Music, and Gender in Greater Mexico, 1923-1946," PhD Diss., Michigan State University, Lansing, Michigan, 2012; Anthony Rudel, *Hello, Everybody! The Dawn of American Radio* (Orlando: Harcourt, Inc., 2008); Gene Fowler and Bill Crawford, *Border Radio: Quacks, Yodelers, Pitchmen, And Other Amazing Broadcasters of the American Airwaves* (Austin: University of Texas Press, 2002); Tom Miller, *On the Border: Portraits of America's Southwestern Frontier* (New York: Harpers & Row, 1981).

the doctor's hirsute embellishment is a Vandyke not an imperialist."[78] Apparently to this opinion writer, Brinkley's facial hair showed that he was more selfish and pompous than imperial. But too some Mexicans who took the jingoist campaigns of the newly formed PNR seriously, these stations, approved by members of the very same party, flew in the face of their own touted nationalist policies.[79]

But to many PNR and government members—and the distinction between the two was increasingly slim—these stations proved useful. Although not exactly intuitive, the stations, by blanketing other North American countries, became the biggest and most effective advertisers of Mexican tourism and culture, which had become in vogue among administrators as a way to increase the struggling economy already in the pangs of depression. Indeed, some stations offered free air time to the Mexican government to promote their "nationalist" tourism campaigns. And there was no doubt that these American radio rebels were stimulating the border economy and lining the pockets of local and national officials. Radio performers and family members spent money in local stores, Brinkley bought the Villa Acuña police new uniforms, station managers hired locals for construction jobs, and inspectors and politicians obtained kickbacks via fees, fines, and bribes. The radio charlatans, local businesses, and government officials alike cashed in on America's growing obsession with auto travel and "all things Mexican."[80] As communications scholar José Luis Ortiz Garza

[78] "Maybe it's a Goatee," *Los Angeles Times*, 2 Jan. 1932, A4. A Van Dyke beard, named after a seventeenth-century painter Anthony van Dyke, consists of any growth of both a moustache and chin hair on the cheeks shaven. According to some nineteenth and twentieth-century newspaper columnists, it indicated a selfish, sinister, or pompous man. See Allan Peterkin, *One Thousand Beards* (Vancouver: Arsenal Pulp Press, 2001), 172-73.

[79] Ibid; "Fight Radio Station in Mexican Border," *New York Times*, 28 December 1931, 13.

[80] Helen Delpar, *The Enormous Vogue of Things Mexican: Cultural Relations between the United States and Mexico, 1920-1935* (Tuscaloosa: University of Alabama Press, 1995); J. C. Delgadillo to the

has pointed out, these stations also became the government's greatest weapon in the war to obtain more of the clear channels that U.S. stations hoarded and jealously guarded.

State legislators, however, did try to counter the criticisms levied against the border blasters by introducing new laws. Of course, this legislation also grew out of other important issues stemming from international conferences and revolutionary ideologies. Some of the most considerable components of these laws show the government's increased demands of commercial-sector cooperation in promoting revolutionary credos and state-sponsored culture. Under new laws created in the 1931 *Leyes de Vías Generales de Comunicaciones y Medios de Transporte* and the 1932 *Vías Generales de Comunicación*, commercial stations had to provide air time to the Department of Public Health and other state agencies. Broadcasting religious messages—and fortune tellers—became illegal, and the same national security caveats were reinforced. Nationalist elements also figured prominently. Eighty percent of all station employees had to be Mexican. Another article, aimed at border stations, outlawed the practice of having operations in foreign countries telephone or radio in shows to be re-broadcast from Mexican stations without government permission. Additionally, broadcasters had to speak in Spanish, unless they obtained permission to do otherwise. The 1932 law went so far as to make it illegal to use consistently bad grammar that insulted the "purity" of the Spanish language. Any violation of these or other infractions resulted in fines added to the already existing 5 percent tax that the government took from all station profits. In 1933 new regulations made it legal to broadcast in another language without government permission as long as the programs

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Secretaría de Comunicaciones y Obras Públicas, Nuevo Laredo to Mexico City, 22 Jun. 1933, caja 144, exp. 22/131.6-(721.1), Ramo Gobernación, AGN; Ortiz Garza, *Una radio entre dos reinos*, 49-87, 124.

were provided in Spanish first and then translated. Something border blasters still regularly failed to do.[81]

In international circles, the issue of awarding wave frequencies based on primacy of use arose again in the 1932 International Telegraphic and Radio Telegraphic Conference in Madrid. Hoping to avoid the issue while remaining an active participant in the conference, the Mexican delegates approached the Americans on the first day of the conference and put forward a plan to work out their differences on clear channels during a smaller regional meeting the following year. Eager to retain their dominant position in communications in the Western Hemisphere and to limit the influence of Europe, the Americans agreed. In fact, U.S. officials worked out a bilateral agreement over clear channels with Canada just before the conference in Madrid.[82]

The 1933 North and Central American Regional Radio Conference took place in Mexico City. As its name suggests, it included other nations in addition to the United States and Mexico; Canada, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, and Nicaragua also sent delegates. The issues of clear channel distribution, border blasters, and interference in general dominated the convention. Immediately preceding the gathering, observers in Mexico and the United States believed that some agreement over frequency redistribution and the border stations would be reached. As a sign of cooperation, Mexican officials enacted the 1933 regulations, aimed largely at the border blasters, just before the meeting. The SCOP also hit Brinkley's operation with a new

[81] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 148-49; Ortiz Garza, *Una radio entre dos reinos*, 138; Mariano Moctezuma to Julio Santoscoy, Mexico City, 19 Feb. 1934, caja 151, exp. 22/131.6 (721.3) 11; Ramo Gobernación, AGN; "Pen Points," *Los Angeles Times*, 20 Jul. 1933, A4; Ortiz Garza, *Una radio entre dos reinos*, 144-47.

[82] "Mexico to Discuss Radio Pact with Us," *New York Times*, 4 Sept. 1932, 15; "Named for Radio Parley," *New York Times*, 7 Feb. 1933, 23.

round of fines that reached upward of $150,000 dollars.[83] However, the American delegation responded in Mexico City with arrogance. According to Josephus Daniels, the former U.S. Secretary of Navy involved with previous radio disputes,

> The Americans came down with an impossible ultimatum which the Mexicans understood as an attempt to dictate what they should do with stations in their country. The Americans virtually demanded that Dr. Brinkley be put off the air and insisted that Mexico should have no stations on the border that could carry messages into the United States. This demand made failure certain from the beginning.[84]

In response, Mexican delegates discussed upping the power of Brinkley's station with former U.S. Vice President Charles Curtis, who worked in the interest of XER. They also considered granting permits to establish two more frontier stations.[85]

Most American broadcasting company executives sighed with relief as the discussions broke down. They feared any redistribution of the coveted frequencies, of which Americans possessed ninety of the ninety-six available wavelengths. Mexican representatives had wanted six of the channels, the same number that the Americans had provided to Canada in their bilateral agreement the year before. The U.S. delegates offered three and the conversation stalled. The Americans also refused to give any of the contested wavelengths to the other participants, who also clamored for what they considered their fair share of the radio spectrum. Similarly, the delegates failed to come to any agreement over the border stations. The conference did, however, make progress

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[83] Miller, *On the Border*, 78.

[84] Josephus Daniels, *Shirt Sleeve Diplomat* (Chapel Hill: University of North Carolina Press, 1947), 373-75; Also see R. Alton Lee, *The Bizarre Careers of John R. Brinkley* (Louisville: University of Kentucky Press, 2002) 169.

[85] Robert D. Hienl, "Mexican Radio Parley is Still in Deadlock," *The Washington Post*, 7 Aug. 1933, 7; C.B. Joliffe, "Statement of C. B. Joliffe, Chief Engineer Federal Radio Commission," U.S. Congress, House, Committee on Merchant Marine, Radio, and Fisheries, *Remote Control Border Stations—H.R. 7800*, 73rd Congress, 2nd Session, Washington, DC, February 15, 1934, 14.

on eliminating interference on point-to-point radio communications, which operated in a different frequency range.[86]

By 1934 U.S. radiomen in Mexico had erected at least five powerful stations along the border. On top of those five, Americans citizens were in the process of having more built. That year, however, the Abelardo Rodríguez administration moved in the other direction and shut down Brinkley's station XER for grievous violations of the 1932 and 1933 rules on language and religion. The government took over the station, making it a part of its own national chain. Once again state leaders used these border stations, built with American capital, to their advantage. The other stations continued, despite breaking the same rules. U.S. legislators tried to impede these operations by enacting the 1934 Communications Act, creating the Federal Communications Commission (FCC) and banning the use of transnational remote control radio operations. The FCC became a permanent fixture in the United States but the law did little to slow the frontier operations. Indeed, high-powered "outlaw" stations operated on the Mexican side of the border into the 1980s, when the Mexican and U.S. governments finally came to an agreement on clear channels.

**Conclusion: Radio Control**

One thing that is clear is that despite the massive changes in radio technology during the 1920s and 1930s, control remained the prominent issue among state leaders. While commercial broadcasting became a firmly established part of Mexican society,

[86] "Radio Conference Opens in Mexico," *New York Times*, 11 Jul. 1933, 6; "Broadcasters Feel Secure," *New York Times*, 20 Aug. 1933, X7; Harry Nicholas, "Channels Baffle Radio Conference," *New York Times*, 13 Aug. 1933, B3; Robert D. Hienl, "Mexican Radio Parley is still in Deadlock," *The Washington Post*, 7 Aug. 1933, 7.

the military continued to use radio to combat a number of rebellions, culminating in the Escobarista Rebellion of 1929. Unlike the previous De la Huerta Rebellion, these revolts mostly failed to seriously jeopardize the state's grasp over the national wireless network. In conjunction with an ever-increasing number of field radios, the armed forces under Calles, Amaro, and the PNR monopolized military communications and used them extensively against their enemies. Radio an important tool that, in addition to new weaponry and airplanes, allowed the post-1930 military to maintain power, and just importantly, to raise the level of allegiance to the president and the governing party within its ranks. Radio proved useful on the battlefield, in the barracks, and in the home.

In addition to radio's importance to the military's ability to suppress, or at least contain, revolts, the technology proved crucial to the country's structural development. Although little discussed in the current literature on Mexican radio, wireless devices significantly increased the efficiency and service of passenger airplanes and railways in the late 1920s and early 1930s. They also became a more common form of public communications within the nation, bringing some alleviation to the over-burdened wire services. By the mid 1930s, radio had become a regular component in international communications for the state, commercial enterprises, and private citizens. To keep up with the fast pace of technological change and to improve the utility of radio services, the SCOP increasingly turned to foreign companies, especially RCA, in order to provide new wireless services. The SCOP also continued the practice of allowing foreign companies to use radio for their business endeavors as long as they met the country's strict guidelines. At the height of Mexican nationalism in the 1930s, radio had

surprisingly become less state-controlled than ever despite the government's increased involvement in broadcasting. Nevertheless, state leaders kept in place a large number of nationalist restrictions and the SCOP continued to control the vast majority of the internal communications network.

The privatization of certain aspects of radio communication correlates with the decision first made by the Obregón administration to pursue a mixed state-private broadcasting system. While state officials in a number of departments pursued and eventually started their own operations, the government focused just as much of its attention on protecting domestic commercial radiocasters. They did this with considerable success, restricting the dominance of American radio corporations, which even when affiliated with Mexican companies, controlled little in regards to content and day-to-day operations. The border blasters provide the one glaring exception. Government leaders tolerated these renegade American-Mexican operations as long as they proved useful as a bargaining chip in international communications forums and for promoting tourism and economic development. But as the Brinkley station exemplified, government toleration of abuses was limited, especially when state broadcasters could subsequently take control of massively high-power stations. The reliance on commercial and especially foreign businesses for radio equipment while restricting outside control of communications services remained a prominent aspect of Mexico's wireless policies, a fact that shows a great deal of consistency with previous decisions made during the Porfiriato and the Revolution. However, within Mexico, government leaders reinforced their relationships with wealthy commercial broadcasters as a means of amplifying nationalism and allegiance to the one-party system established

in the early 1930s. This, in turn, reinforced monopolistic tendencies in political and commercial broadcasting, curtailing and co-opting the more democratic tendencies of amateur radiocasters, which possessed much weaker equipment.[87]

[87] For a discussion on how mass media mediums tend to start open and democratic and then become more authoritarian and closed, see Wu, *Master Switch*, 5-39.

Chapter Seven

# Broadcasting State Culture and Populist Politics

Think like a wise man but communicate in
the language of the people.
—William Butler Yeats

On November 30, 1924, people filled the streets of Mexico City. Sounds of cars and carriages shared the air with the aromas of food vendors and human settlement. Fifty thousand eager spectators had packed themselves into the National Stadium to witness a historic event, the first peaceful transfer of the presidency since 1884. In honor of the incoming and outgoing presidents, a folkloric ballet, including five hundred different couples, danced *jarabes tapatíos* or hat dances.[1] Calles, with Obregón at his side, not only addressed their gathered countrymen and assembled politicians, but also the entire country. The occasion provided the first ever broadcast of a presidential inauguration in Mexican history, marking the beginning of a new era of presidential broadcasting.

As radio became more popular, government leaders increasingly depended on it to spread populist and nationalist messages that equated state institutions—and starting in 1929, the single-party, the PNR—as the culmination of the ideals fought for during the Revolution. In the city and the country, among the wealthy and the poor, broadcasting provided the perfect medium for building a wide base of support. It also allowed for a partnership between members of the often adversarial commercial and government elites. In exchange for carrying political messages and complying with state regulations, government leaders rewarded the owners of the largest commercial

[1] Rosalía Velázquez Estrada, "La radiodifusión mexicana," 294.

broadcasting stations with favoritism and protection. By involving wealthy capitalists in the development and profits of radio, state officials were able to use the medium to incorporate a segment of the economic elite in addition to members of the working and middle classes. Radio helped facilitate a loose though genuine cross-class alliance.

To put it succinctly, broadcasting became an essential component of the controlled incorporation of the general population into politics. The medium amplified the reach of populist politics and helped establish single-party rule. Building on Alan Knight's argument that populism is essentially a political style, this chapter provides additional substance to Jürgen Buchenau's more refined definition of the term: "a discourse that appeals to 'the people' and 'the nation' by mass media."[2] In the case of Mexico, state officials used radio to help solidify a larger, more corporate and cross-class base of political support. The mass-media component was critical to the rise of this political approach, and in the 1920s and 1930s Mexico, where most of the residents were illiterate, that meant radio. Government stations provided a crucial component of this outreach, but so too did commercial stations, whose owners, managers, and operators partnered with the dominant political leadership in exchange for favoritism and protection.

Just as the historiography of Mexican populism understates the Calles era, U.S. scholarship on broadcasting's role in expanding nation building understates the influence of broadcasting during Calles's presidency (1924-28) and the subsequent Maximato (1928-35), when Calles still held considerable power behind the scenes.

[2] Alan Knight, "Populism and Neo-populism in Latin America, Especially Mexico," *Journal of Latin American Studies* 30, no. 2 (May 1998): 223-48; Jürgen Buchenau, *Plutarco Elías Calles and the Mexican Revolution* (Lanham, MD: Rowman & Littlefield Publishers, 2007), xxi-xxvii; Jürgen Buchenau, "Plutarco Elías Calles and Revolutionary-Era Populism in Mexico," in *Populism in Twentieth Century Mexico: The Presidencies of Lázaro Cárdenas and Luis Echeverría*, eds. Amelia M. Kiddle and María L. O. Muñoz (Tucson: University of Arizona Press, 2010), 38-57.

Cárdenas brought the presidential radio address to new heights when he forced Calles into exile in April 1936 and during the oil expropriation of March 18, 1938, but his administration built squarely on radio policies and traditions started by previous presidents and political leaders.[3] In other words, Cárdenas's use of broadcasting and populist politics was not particularly unique, even if his policies were more radical.

During the Calles era, state agencies expanded their direct involvement in broadcasting to drum up greater public support for the administration at home and to influence audiences abroad. In a country with a high illiteracy rate and rocky international relations with its neighboring countries, radio especially appealed to revolutionary propagandists. In a time when legitimacy was associated with the keeping of longstanding promises to "the people," broadcasting provided a way for the government to interact with and persuade members of the nation. Through radio stations—especially CZE/XFX—of the SEP, CZI/XEFI of the Secretary of Industry, Commerce, and Labor (SICT), and XEO/XEFO and XEUZ of the PNR—the Calles administration, and the subsequent governments that ruled under Calles's influence, established the medium as a pillar of populist politics and the one-party system established in 1929. Presidential addresses and political events became commonplace over the airwaves and government radiocasters transmitted "cultural" programs to teachers, children, farmers, housewives, union laborers, and a growing urban middle class. Through radio these leaders reached out to the groups that formed the mass mobilizations that fueled the Revolution, trying to incorporate them into a sturdy base of support. Listeners too influenced these broadcasts because state officials had to cater to the interests of audience members and the work hours of laborers and campesinos.

[3] Hayes, *Radio Nation*, 86-87.

But all-in-all the programming was a top-down affair, increasing the authoritarian nature of post-revolutionary politics.

### *Radio Instrucción Pública*

The government's greatest direct effort in broadcasting from 1924 to 1931 was through the SEP, created in 1921 by President Obregón and José Vasconcelos, the renowned scholar and the department's first director. SEP station CZE (changed to XFX in late 1928) reached thousands of Mexicans in addition to listeners abroad. During an address to the national congress in September 1924, Obregón laid out the goal of this new endeavor: "teachers will meet somewhere near the ranches and neighborhoods of their students to transmit, on a predetermined day and time, a lesson about a useful theme, music, and news to arouse their interest so they can participate in the life of our country."[4] In 1925 President Calles built up the program further by creating a specific department—*Extensión Educativa por Radio* or Educational Extension by Radio—to tackle the daunting task of getting receivers into rural schools. Its members often traveled miles on the backs of horses and burros through rough terrain, though more so in regions closer to the capital than in the country's remote corners.[5]

The use of radio coincided with the SEP's cultural missionary program. State leaders hoped that these secularizing evangelists would educate Mexico's rural and indigenous populations while modernizing Mexico, and as a result, create more

[4] Alvaro Obregón, "El Gral. Alvaro Obregón, al abrir las sesiones ordinarias el Congreso el 1 septiembre de 1924," *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (México: Cámara de Diputados, 1966), 638.

[5] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 100.

productive citizens with a stronger allegiance to the nation and the state. SEP officials strived to incorporate rural farmers, along with their wives and children, through federally trained educators. Indeed, the increase in the central government's control of provincial education was one of the hallmarks of the SEP, just as mass politics became a consequence of the Revolution in general. Radios and broadcasting were important tools in this modernizing effort, a fact little recognized by scholars who have studied schools during this period.[6] In fact, prominent educational leaders believed radio to be "one of the best modern advances to diffuse education and culture."[7] And this was undoubtedly true, even is its actual implementation was initially less resounding.

Despite intellectual prejudices passed down from Porfirian positivists, educators consistently worked on incorporating rural indigenous communities to end "Isolation, unstable and uncertain government control, a precarious existence, peonage, and the circumstances which made rural Mexico a forgotten Mexico."[8] Foreign philosophers who questioned racist notions of intelligence influenced Mexican intellectuals in greater numbers. For example, a number of prominent thinkers followed German scholar Max Scheler, who argued that inherent differences in intelligence by races was questionable if not completely false.[9] The examples of countries like Japan seemed to provide proof

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[6] One exception is Elena Jackson Albarrán, *Children of the Revolution: Constructing the Mexican Citizen, 1921-1940*," (Lincoln: University of Nebraska Press, forthcoming), which dedicates a chapter to the SEP's radio programs for children in the late 1920s and especially the 1930s. Another dissertation, Marvin Alisky, "Educational Aspects of Broadcasting in Mexico," PhD diss., University of Texas, Austin, Texas, 1953, was the trailblazing work on educational broadcasting, but Alisky failed to obtain the source material needed for a thorough study of the subject. Although a work focusing more on radio and nationalism, Joy Elizabeth Hayes, "National Imaginings on the Air: Radio in Mexico, 1920-1950," in *The Eagle and the Serpent: National and Culture in Mexico, 1920-1940*, ed. by Mary Kay Vaughn and Stephen E. Lewis (Lanham: Duke University Press, 2006), 243-58, does a fair but brief job on the topic.

[7] "Las ideas fundamentales de la Secretaría de Educación Pública en materia educativa," *El Universal*, 1 Jan. 1926, IV 3.

[8] George C. Booth, *Mexico's School-Made Society* (Stanford: Stanford University Press, 1941), 28.

[9] Ibid, 9-10.

of the ability of different ethnicities to adapt and learn from other societies. By the 1930s anthropologists, folklorists, and politicians worldwide were promoting indigenous nationalism. In Mexico, like Brazil, the idea of a mixed-race or ethnic society increasingly became a point of pride instead of a stigma. And even though intellectuals embraced these ideas selectively, government leaders aspired to create a more homogeneous and all-encompassing form of nationalism.

Of all outside influences, American philosopher John Dewey had the greatest impact on Mexican educational experts in the late 1920s and early 1930s. SEP leaders used his example in their talks to missionary teachers in Mexico City and in their lectures over the radio.[10] Revolutionary educators also differed from their Porfirian predecessors in their increased emphasis on political participation and hands-on learning. This too was derived from trends in the United States and Europe, where "the pedagogy of action education" had come into vogue. In place of an innate inability to achieve higher education, the perceived problem with incorporating rural populations became a lack a sufficient communication and transportation, a problem educational leaders hoped cultural missionaries and radio would help remedy.[11]

Cultural missionaries and broadcasting intertwined in this campaign to build schools for rural and indigenous populations in order to make the provincial poor into Mexican citizens aligned with the government. SEP directors sent teachers to remote communities to train local villagers and educators about revolutionary nationalism and modernity. Although originally limited to states close to the capital, such as México,

[10] J. M. Casauranc, "Como son y porque son así nuestras escuelas rurales—Platica . . . a los miembros de las misiones culturales, el 25 de febrero de 1927" (Mexico City: Talleres Gráficos de la Nación, 1927), 10.

[11] Vaughn, *Cultural Politics*, 27-29; Claude Fell, *José Vasconcelos: Los años del águila* (Mexico City: UNAM, 1989), 268.

Hidalgo, Puebla, Tlaxcala, and Morelos, Calles had expanded the program to other areas by 1926. By the end of the Calles era the program had reached at least twenty states.[12]

The SEP's broadcasting station, CZE, commenced regular transmissions during the last month of 1924, though it did not make any headway on providing radios to the countryside until the following year when SEP leaders imported over a hundred receivers from the United States.[13] A U.S. newspaper later reported that there were "115 large and small schools in Mexico" receiving CZE programming, including regular lessons for students, a weekly program for teachers, and twice weekly broadcast for very young children. But the SEP only placed a minority of the radios in the countryside: twenty-five in the states of México, Hidalgo, and Puebla; and fifteen in Guerrero. The other seventy-five devices actually went to "larger towns and cities in [the state of] México."[14] Perhaps the decision to place the receivers in larger population centers first stemmed from the fact that substantial portions of the rural population did not speak Spanish. Basic logistics also likely entered into any considerations.

Over the course of the decade, SEP officials streamlined the programming to fit their targeted audiences. The station's early broadcasts mirrored the agendas of the SEP leadership, starting out conservative and elitist, and then becoming broader in scope throughout the Calles era as policies changed and community input influenced programming. Transmissions originally included classical music and scholars who

[12] Booth, *Mexico's School-Made Society*, 145; Fell, *José Vasconcelos*, 257.
[13] "Pronto llegarán los aparatos de radio pedidos a los Estados Unidos," *El Demócrata*, 30 Dec. 1924, 12.
[14] "Mexico Pupils Study by Radio," paper uknown, c. 1920s, caja 9474, exp. 28, AHSEP.

discussed a myriad of academic topics in a "simple and plain language."[15] The department's first directors—José Vasconcelos, Bernardo J. Gastélum, and José Manuel Puig Casauranc—hoped to bring good European tastes, nationalist composers, and the best Mexican experts into people's homes and schools.[16]

A number of institutions of higher learning assisted the SEP's radio endeavors. Participating schools included the National School of Fine Arts, the School of Biological Studies, the National University of Agriculture and Veterinary Studies, the School of Anthropology, and the National School for Teachers. These colleges provided much of the material aired by the station. The major sources of music for the SEP included the National School of Music, the Chopin Academy of Piano, the Academy of J. S. Bach, the Italy Academy of Song, the Popular Night Conservatory of Music, and the National School of the Blind.[17]

Other government departments also contributed programs and music for CZE. The Department of Public Health provided regular talks on hygiene. The Ministry of Industry, Commerce, and Labor, which also had its own broadcasting station, aired economic bulletins first thing in the morning on CZE and then later on XFX. The Department of Fine Arts produced a number of classical music performances, including pieces from Schubert and renditions of "Madame Butterfly." The Secretariat of War and Marine furnished music from military and police bands, which played renditions of popular Mexican songs, "Taps," and the national anthem.[18]

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[15] "Mexico Radios Culture," *Los Angeles Times*, 7 Mar. 1926, F11.
[16] "Una gran estación de radio de la Sria. de Educación," *El Universal*, 21 Jun. 1924, II 1, 8.
[17] Ibid.
[18] Plutarco Elías Calles, "El Gral. Plutarco Elías Calles, al abrir las sesiones ordinarias el Congreso, el 1 de septiembre de 1925, *Los presidentes de México ante la nación: Informes, manifestos y documentos de 1821 a 1966* (Mexico City: Cámara de Diputados, 1966), 703.

CZE also provided programs designed to specifically "arouse the interest of the Indian . . . native orchestras playing ancient native airs and songs in native dialects." Of course, no record of "ancient native airs" existed, so the directors of these ensembles surely had a lot of creative leeway. Lectures followed the songs, sometimes in indigenous languages, "dealing with the needs, aspirations, and opportunities of the Indian races."[19] Topics included geography, natural resources, hygiene, family finances, and home improvement. Ethnographic discussions about Indians themselves were also fairly commonplace, providing metropolitan perspectives on the lives of the radio recipients and their neighboring communities, whom they had just recently studied. Indeed, the growing influence of anthropologists in the country had a significant impact on the cultural missionaries, who also often acted as amateur ethnographers, providing material for later radio programs. A couple of the 1926 broadcasts included "The Indigenous Tribes in Mexico," "Our Archeological Riches," and "Natural Hygiene in Rural Villages."[20]

During the late 1920s, the station managers strove to expand the listenership to all "radiofiles" in Mexico, competing directly with commercial and amateur stations. This was likely the result of the popularity of commercial broadcasting operations. In order to persuade villagers to listen to CZE/XFX, the SEP began locking the tuning dials of donated radios to the station's wave frequency. However, radio inspectors regularly found that villagers broke the seals and listened to domestic and foreign commercial programming.[21] By 1928—the year CZE became XFX—the station diversified its programming. In addition to educational talks, weather reports, and Chopin, the station

[19] "Teach Indians with Radio," *Los Angeles Times*, 22 Nov. 1925, 1.
[20] "Mexico Radios Culture," *Los Angeles Times*, 7 Mar. 1926, F11.
[21] Hayes, "National Imaginings on the Air," 243.

started providing a variety of *canciones mexicanas*, and even blues and jazz. The Jazz Band of the Traffic Department, a regular fixture in 1928, played songs including "Mi Regular Gal" and "Weary Blues."[22] Guty Cárdenas, one of Mexico's first international popular music stars, played his increasingly famous pieces in addition to renditions of songs from his home state of Yucatán. Other music celebrities, such as Alfonso Esparza Oteo and Guillermo Posadas, played popular Mexican folk songs put into big band arrangements and Hawaiian guitar compositions.[23] As commercial stations were vying for government support by producing nationalist programming, the SEP station competed with the private broadcasters by incorporating more popular music. However, in 1930, Alejandro Michel, the Director of Educational Extension by Radio, reported that as part of a "nationalist labor" campaign—a joint endeavor of the SEP and the newly formed PNR—he wanted "to counteract the effects of American jazz" by playing Mexican regional and popular music in a show that aired every Thursday and ended with the national anthem.[24]

Most villagers introduced to radios found them amazing. For many people it was the first time they had heard a voice transmitted through a machine. In November 1925, SEP director Puig Casauranc described the reaction of first time rural radio listeners to an American journalist:

> imagine a tribe of Indians which has defied 300 years of paleface domination and still clings to its ancient tribal language and tribal customs, still maintains the village around the burial mound and has only such dealing with the outside world as necessary—people who have never read a newspaper or heard of radio—

[22] "Radioconiertos," *Excélsior*, 18 Jan. 1928, II 3.

[23] Ibid; "Radioconciertos," *Excélsior*, 25 Jun. 1928, II 3; "Conciertos," *El Nacional*, 15 Jun. 1929, 5.

[24] Alejandro Michel, "Programa de acción de la obra de Extensión Educativa por Radio de la Secretaría de Educación Pública," Mexico City, 2 Jul. 1930, caja 9478, exp. 4, AHSEP.

> being called together to hear a message from the great 'jefes' (chiefs) who sit in Ciudad Mexico, and suddenly hearing their own language, their own tribal music, coming miraculously out of the bodyless air.[25]

Couched in racist language, Puig Casauranc's statement mirrors other comments made by SEP missionaries. They explained that Indians and campesinos, young and old, reacted enthusiastically to the "mysterious" and "magical" devices.[26] When educators brought the receivers to villages, the community usually put on a large celebration. In Acatlán, Puebla, one such party included orquestral performances, poem recitations, a tango, an inauguration speech by community *padrinos*, an address by SEP zone inspector C. E. Sansalvador, and then, lastly, a group listening to the radio.[27] In other words, it was more often than not the technology itself that awed rural residents, not any specific message or program.

Journalist and author Manuel Santander, who often used the pen name, Jacobo Dalevuelta, made a similar statement about his experiences in small pueblos with radio receivers: "it is very curious to observe the small town away from the metropolis where they have a receiver, the enthusiasm with which every night around the apparatus the young and old wait for the remote and mysterious words that magically comes from the loudspeakers."[28] Much the same as Mexico City urbanites who encountered radio for the first time at the 1924 Mexico City Radio Fair, most campesinos introduced to broadcasting found the medium, and the devices that carried such messages, captivating.

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[25] "Teach Indians with Radio," *Los Angeles Times*, 22 Nov. 1925, 1.

[26] "La radio como vocero de la alegría," *El Universal*, 6 Feb. 1926, 5.

[27] C. E. Sansalvador, "Programa que se desarrolló en la escuela federal "Emilio Carranza" con motivo de la inauguración de un aparato de radio," 11 Apr. 1929, caja 9474, exp. 25, AHSEP.

[28] Jacobo Dalevuelta, "El radio como vocero de la alegría del Carnaval," *El Universal*, 7 Feb. 1926, 1.

Many rural community members paid attention to the messages of government educators; others resented the cultural missionaries and the intrusion of the federal government. As one author noted, sometimes teachers "found it necessary to wear side arms and to sleep with a rifle next to the bed" because of stiff resistance to state education and government policies against the Catholic Church.[29] Some teachers were killed, especially during the widespread *cristero* rebellion. Even afterwards, violence continued into the 1930s. In 1933, in the small town of Tonantzintla, Puebla, radio inspector Luis F. Rodríguez found that the donated device worked perfectly, that teachers used it to listen to XFX, and that the station was having an appreciable impact by influencing teaching curriculum. However, half of the town's residents refused to listen to the machine because of disagreements over the policies of the government, causing a rift in the community.[30]

During the late 1920s and early 1930s, XFX offered a number of transmissions specifically for children. According to historian Elena Jackson Albarrán, "children's programming on the SEP radio station XFX complemented the agency's project to revise history so as to make it more relevant to children and inspire social action."[31] These programs included regular academic subjects that federal teachers had been trained to teach, as in the radio series *Periódico Infantil*, which broadcast once in the morning and once in the afternoon starting in 1930. The first section began with a brief lesson on the history of the Revolution; it was followed by short lectures on zoology,

[29] Sánchez, *Mexico*, 85-86; David G. Tovey, "The Role of the Music Educator in Mexico's Cultural Missions," *Bulletin of the Council for Research in Music Education* 139 (Winter 1999): 3-4; Carlos Alberto Torres, ed., *Education and Social Change in Latin America* (Albert Park, Australia: James Nichols Publishing, 1995), 100.

[30] Luis F. Rodríguez to the Jefe del Departamento de Enseñanza Rural y Primaria Foránea, 18 Mar. 1923, Mexico City, caja 9482, exp. 78, AHSEP.

[31] Albarrán, chapter three, *Children of the Revolution*, forthcoming, University of Nebraska Press.

botany, physics, history, geography, or the "national language." Afterwards XFX broadcast something on physical fitness or children's games, then math, and finally, a talk about either hygiene, civics, or the evils of alcohol. The afternoon program started with "What do You Think?" when the broadcasters offered "simple questions" to be answered over the following days. Children were subsequently encouraged to write in to the program. This was followed by a story, a discussion on manual labor, contests, and then a final program on literature.[32] XFX's singing lessons proved to be one of the station's more popular programs in schools. In the villages and communities with functioning receivers, inspectors reported the teachers often used the show in their classes.[33] Another program developed in the early 1930s included "*Troka el Poderoso*" or "Troka the Powerful," created by *estridentista* writer and artist Germán Liszt Arzubide. It taught children the benefits of machines and modernization through the narration of an animated robot figure. Yet another show, "*Antena Campesina*," focused similarly on the benefits of modernization. It, however, was directed more specifically at indigenous children and their mothers.[34]

One of CZE/XFX's biggest non-student targets was mothers and housewives. In 1929, SEP officials bragged that the station reached over three thousand housewives daily, who listened to productions including "How to Make a Practical and Economical Menu" and "How to Become a Good Housewife."[35] In the 1930s, the station regularly

[32] Alejandro Michel, "Informe de la labores desarrolladas por la obra de Extensión Educativa por Radio de la Secretaría de Educación Pública, durante el mes de marzo de 1930," Mexico City, Mar. 1930, caja 9478, exp. 11, AHSEP.

[33] Luis F. Rodríguez, "Informe de la inspección hecha en la zona de Texcoco, 13 May 1933, Mexico City, caja 9482, exp. 78, AHSEP.

[34] Elena Jackson Albarrán discusses these 1930s children's radio programs in detail in chapter three of *Children of the Revolution*.

[35] "La obra cultural de la estación XFX de la Secretaría Educación Pública," *El Universal* 12 Dec. 1929, IV 9.

carried a program called "The Home Hour." Much of the early hours broadcasting focused on cooking, beauty, budgeting, and general "domestic science" issues. As communications scholar Joy Elizabeth Hayes aptly put it: "educators saw radio as an effective way to penetrate the home: to consolidate the modern, secular housewife and mother and the developmentalist state."[36] Or in the words of SEP leaders: "to better the social education of women."[37] As the disseminator of family values in the home, state officials hoped that mothers would help create a greater allegiance to the revolutionary state among children and their husbands.

CZE tried to appeal to rural fathers as well. This was largely done through evening broadcasts, which focused more on agriculture, livestock, small industries, geography, travel shows, the weather, music, and history lessons.[38] In 1931 XFX broadcast a program specifically on manual labor for rural males.[39] As Undersecretary of Public Education Moisés Sáenz stated in *Mexican Folkways* in 1928, the SEP wanted to make "the school the home of the village," the new church, the new community center.[40] Along with other educational leaders in Mexico City, he partnered with allied municipal officers to get *campesinos* into schools to listen to radio broadcasts in hopes of improving their crop yields and their abilities as manual laborers. Sáenz additionally

[36] Hayes, "National Imaginings," 249.

[37] "La obra cultural de la estación XFX de la Secretaría Educación Pública," *El Universal* 12 Dec. 1929, IV 9.

[38] María Luisa Ross, "Estación C.Z.E.: Obra de extensión educativa por radio de la Secretaría de Educación Pública—programa," Apr. 1927, Mexico City, exp. 9, inv. 297, leg. 15/62, Fondo Joaquín Amara Camaro, FPECTFT; Alejandro Michel, "programa de acción de la obra de Extensión Educativa por Radio de la Secretaría de Educación Pública, Mexico City, 2 Jul. 1930, caja 9478, exp. 4, AHSEP; Velázquez Estrada, "La radiodifusión mexicana," 177.

[39] María Luisa Ross, "Informe de las labores desarrolladas por la Obra de Extensión Educativa por Radio de la Secretaría de Educación Pública, durante el mes de marzo de 1931, Mexico City, Mar. 1931, caja 9478, exp. 4, AHSEP.

[40] Sáenz, "Las escuelas rurales," 74

hoped that rural residents would learn the basics of economics and align themselves with the government.

But did Indians and campesinos actually listen to these programs? There exists no golden list of all the radios donated or sold to schools. It is clear that the SEP imported over a hundred radios in 1925 from the United States. The ministry also prided itself on providing domestically built radios, fashioned by educators, students, and employees of the SEP's Technical Section. In fact, a number of the radios used in SEP's rural school campaigns were Mexican-made "*Titlanti*" models. This coincided with an increase in the manufacture of radio parts in Mexico in general.[41] Originally, SEP officials donated these apparatuses at no cost to the schools. By the late 1920s, however, they charged forty pesos—more or less the production cost—which members of villages had to pool together in order to acquire the apparatus.[42] It is unclear how many of these devices were made, but at least dozens, possibly more.

Donations were another source of radios. Multiple companies gave the SEP receivers, especially after the ministry's radio department began a campaign that traded air time for commercial advertisements in exchange for the devices. In the last half of 1928 alone the SEP obtained twenty-five radios by this method.[43] By 1933, however, the Office of Cultural Radiotelephony was turning down requests from rural schools for radios. Budget cuts resulting from the Great Depression had halted the spread of the

[41] María Luisa Ross, "Informe de las labores desarrolladas por la Obra de Extensión Educativa por Radio de la Secretaría de Educación Pública, durante el mes de junio de 1929," Mexico City, Jun. 1929, caja 9474, exp. 25, AHSEP; "Conferencias educativas serán transmitidos por radio," *El Universal*, 12 Jan. 1924, 8; "Habrá una fábrica de válvulas electrónicas," *El Universal*, 2 Feb. 1927, 1.

[42] R. Gandanedo to the Jefe del Departamento, Cuacuila, Puebla to Mexico City, 17 Jun. 1929, caja 9474, exp. 25, AHSEP.

[43] "Lista de aparatos receptores adquiridos . . . a cambio de anuncios por la estación X.F.X., Dec. 1928, caja 9476, exp. 45; Fco. Javier Stávoli, 7 Mar. 1929, caja 9474, exp. 25, AHSEP.

program. Instead, officials worked on repairing and maximizing the use of the radios already in operation.

When Calles took office, he commented that the government had succeeded in placing radios in the majority of federal schools, which numbered approximately one thousand.[44] But Calles and the officials informing him surely exaggerated. Over the next five years other government representatives continued to talk of placing thousands of radios in schools as well. In Veracruz in late 1929, radical governor Adalberto Tejada and Director of the Department of Universities Dr. Genaro Angeles partnered their efforts through Jalapa station XFC with the SEP in order to expand political and educational programming in their state. They too hoped to build a greater alliance with the peasantry and urban workers. According to SEP officials, this collaboration allowed the "poor people of the state of Veracruz, part of Tamaulipas, Puebla, Zacatecas, and Aguascalientes" to benefit from educational broadcasting.[45] Tejada and Angeles told federal officials and the Veracruz newspaper *El Informador* that they were going to equip all of the approximate two thousand schools in their state.[46] But even with the help of local Pro-Radio Committees in small towns including Coatepec, Tecelo, and Xico, it appears that they never come close to their mark.[47] After receiving a substantial increase in federal funding in1928, Minister of Public Education Ezequiel Padilla also claimed that he would significantly increase the amount of receivers in the growing

[44] Elías Calles, "Informe rendido por el C. General Plutarco Elías Calles," 245; George I. Sánchez, *Mexico: A Revolution by Education* (New York: The Viking Press, 1936), 67.

[45] "La obra cultural de la estación XFX de la Secretaría Educación Pública," *El Universal* 12 Dec. 1929, IV 9.

[46] "Aparatos de radio para las escuelas primarias," *El Informador* (Jalapa), 19 Sept. 1929, caja 9474, exp. 25, AHSEP; José Suárez G. to María Luisa Ross, Mexico City, 24 Sept. 1929, caja 9474, exp. 25, AHSEP.

[47] José Suárez G. to María Luis Ross, Mexico City, 22 Oct. 1929, caja 9474, exp. 25, AHSEP.

number of public education institutions.[48] Despite all the claims about thousands of radios, it remains difficult to get an accurate count on the exact number of the devices donated or sold by the SEP to schools. According to information obtained from the current records in the Archivo Histórico de la SEP, the *Memorias* of SEP, newspapers, accounts from the U.S. Department of Commerce, and lists by other scholars, it appears the number was probably in the low thousands for the entire ten year period of 1924 to 1934.[49] The biggest year for radio placement looks to have been 1930, when the U.S. Commerce Department stated that seven hundred receivers had been given out to schools across Mexico.[50]

Some Mexican rural schools came into contact with broadcasting and XFX without a radio provided by the SEP. In 1933 the thirteen traveling SEP missionary groups brought radios along with other essential tools including agricultural and carpentry equipment, cooking utensils, and movie projectors.[51] These educational tours visited multiple communities, but took their radios with them when they left. Apparently, a very small number of villagers bought their own radios for their community centers and schools. According to one radio inspector, the school in La

[48] "$28, 000,000 más para la educación," *La Prensa*, 8 Dec. 1928, exp. cccxii. 7. 566, Fondo Recortes de Periódico Oficialía Mayor de Hacienda, CEHM. Over 6,100 rural schools existed in 1929; Booth, *Mexico's School-Made Society*, 114.

[49] In addition to the Archivo Histórico de la SEP and U.S. and Mexican newspapers, see *Las misiones culturales en 1927: Las escuelas rurales* (Mexico City: Publicaciones de la Secretaría de Educación Pública, 1928); Ivonne Grethel Chávez Ortiz, "La radio educativa en el México revolucionario," tesis de licenciatura, Universidad Autónoma Metropolitana, Iztapalapa, DF, 2001; and Enrique E. Sánchez Ruíz, *Orígenes de la radiodifusión en México: Desarrollo capitalista y el estado* (Mexico, DF: ITESO, 1984), 22.

[50] U.S. Department of Commerce, quoted in Sánchez Ruíz, *Orígenes de la radiodifusión*, 22.

[51] Max H. Miñano Garcia, *La educación rural en México* (Mexico City: Ediciones de la Secretaría de Educación Pública, 1945), 211; Sánchez, *Mexico*, 72, 92. Sánchez put the number of cultural missions in 1932 at fourteen.

Estancia, Hidalgo, was already in possession of a fully functional and "magnificent Radiola" receiver.[52]

In the beginning CZE only aired for a short period of time, six days of the week. Soon thereafter the station expanded its air play, providing much longer hours of service. For example, in 1925, the station's Monday through Saturday transmissions totaled forty-five minutes per day. By 1927, CZE played eight hours per day. Although some authors have claimed that the station broadcasted as much as ten hours per day by the 1930s, SEP reports indicate that the average daily broadcast time was actually less than in 1927, ranging from four to five hours.[53]

Another important factor in obtaining at least a qualitative conclusion on the reach of these programs in rural areas is to determine if people in communities with radios actually listened to them. All evidence shows that the results were mixed. The largest obstacles to CZE/XFX were a lack of reliable electricity, interference from other stations, and the popularity of commercial programming. Nevertheless, the station did reach thousands of people, and for every story of failure there is another of success. By the end of the Calles era, radio and state broadcasting were known entities in many parts of Mexico, and through radio, many residents became more connected with the state and the post-1928 state party, the PNR.

The biggest difficulty in establishing rural radio audiences was electricity. Many villages did not have it, and in communities that did, school teachers—the usual recipients of the radios—did not always pay their electric bill. In other communities, an

[52] Luis F. Rodríguez, "Informa de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Hidalgo," Mexico City, 22 Apr. 1933, caja 9482, exp. 78, AHSEP.

[53] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 99; María Luisa Ross, "Estación C.Z.E.: Obra de extensión educativa por radio de la Secretaría de Educación Pública—programa," Apr. 1927, Mexico City, exp. 9, inv. 297, leg. 15/62, Fondo Joaquín Amara Camaro, FPECTFT.

electric line existed and bills were paid, but service still proved irregular. In 1933 Professor Luis F. Rodríguez inspected seventy-one of the seventy-five communities where the SEP had donated relatively cheap, U.S.-made Atwater Kent receivers. He traveled, usually by himself, though sometimes accompanied by a local educational administrator, through the states of Puebla, Tlaxcala, Hidalgo, and México. Out of the schools visited, twenty-one lacked electricity, five had not paid their electric bills, and one only obtained power after the owner of a small corn mill provided a current while the inspector was there. Radios could operate on batteries, side-stepping the electricity problem, but batteries did not last long, and it could take months before someone would obtain replacements in towns large enough to carry them.[54]

Another major problem for the SEP radio program was other stations. A large proportion of the schools in Puebla and Tlaxcala reported that they could only receive XFX during certain hours of the day, stating that oftentimes the commercial station in Puebla—XIAJ—overpowered the SEP signal. Some teachers and community members openly admitted that they enjoyed the other channels, though many still listened to XFX on occasion or for a certain program. SEP officials themselves tuned in different channels for villagers. In the small town of Acatlán, Puebla, inspector C. E. Sansalvador wrote to Ross that during the inauguration of the radio he played programs

[54] Luis F. Rodríguez, "Informe de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Puebla, Mexico City, 18 Mar. 1933, caja 9482, exp. 78, AHSEP; Luis F. Rodríguez, "Informe de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Tlaxcala, Mexico City, 25 Mar. 1933, caja 9482, exp. 78, AHSEP; Luis F. Rodríguez, "Informe de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Hidalgo," Mexico City, 22 Apr. 1933, caja 9482, exp. 78, AHSEP; Luis F. Rodríguez, "Informe de la visita de inspección a la Zona de Tlalnepantla, Méx.," Mexico City, 24 Apr. 1933, caja 9482, exp. 78, AHSEP; Luis F. Rodríguez, "Informe de la visita de inspección a la Zona de Texcoco, Mexico City, 13 May 1933, caja 9482, exp. 78, AHSEP.

broadcast from American stations in San Antonio and Chicago because he had difficulty picking up the SEP's "bulletins of the revolution."[55]

But scholars have curiously failed to acknowledge the success stories. A number of teachers in the state of México said that they used the XFX singing program in their classes. Rodríguez reported that in Puebla, the school in the community of Moyotzingo was "without a doubt the school where they make the best use of the radio." He continued that over two hundred locals regularly gathered to listen to XFX, using the programs to better their agrarian skills. All of the villages with radios in Tlaxcala reported listening to XFX in the mornings before the Puebla station took over.[56] In each community where the radios worked—about half—hundreds or thousands of people, depending on the location, came into contact with the devices and the broadcasts they trumpeted. When they worked, these radios were well used. It cannot be accurately said that listeners always listened to the SEP station, but neither was it completely ignored.

All in all the SEP brought thousands of rural people into contact with broadcasting, including state, commercial, and foreign stations. Despite the many on-going problems of creating a state-radio listenership in the countryside, the SEP did build a closer relationship between the federal government and a number of communities. In this regard, radio was only one of a number of important tools cultural missionaries applied in their endeavors. Movie projectors, farm equipment, cooking utensils, and a number of other objects also help SEP employees win the hearts and

[55] Ibid; C. E. Sansalvador to Ma. Luisa Ross, Acatlán, Puebla to Mexico City, 13 Apr. 1929, caja 9474, exp. 25, AHSEP.

[56] Luis F. Rodríguez, "Informe de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Puebla, Mexico City, 18 Mar. 1933, caja 9482, exp. 78, AHSEP; Luis F. Rodríguez, "Informe de la visita hecha a las escuelas rurales dotadas de aparato de radio, del Edo. de Tlaxcala, Mexico City, 25 Mar. 1933, caja 9482, exp. 78, AHSEP.

minds of *campesinos*. But villagers especially prized the radios as a source of education, entertainment, and modernity. The SEP focused more on the central region of Mexico, but states including Guerrero, Nayarit, Oaxaca, Durango, Nuevo León, and even the Territory of Quintana Roo, also received SEP radios. Nevertheless, it must be recognized that the reach of this particular program alone was still limited, serving a small if expanding fraction of Mexico's rural populace by the time that Lázaro Cárdenas took power during the end of 1934.

**SEP Radio Beyond the Schools**

It would paint an inaccurate picture of SEP broadcasting to discus only the work done with schools. In addition to its educational endeavors, CZE, and then XFX, became the government's most successful medium for communicating political events to the nation and to foreigners abroad, at least until the PNR station became well established in 1931. The educational department itself was political. Its members eschewed speeches on secularizing education and building a nationwide allegiance to the historical and ideological narrative espoused by some of the more socialist and communist members of the revolutionary leadership.

Starting from its first broadcast, the SEP station transmitted programs that directly relayed political messages and events. Not only did the station air presidential inaugurations but also presidential addresses to the national congress. In September 1929 the XFX's coverage of President Emilio Portes Gil's address to congress included not only the state of the union, but also the ceremonial events before and after that commemorated Mexican independence and the nation's heroes. Employees placed

microphones for the station in the towers of the national cathedral in the Zócalo, at the door of the entrance of the Chamber of Deputies, and within the congressional building itself. XFX broadcasted the military marches and music that accompanied the president along his brief trip from the executive offices to the legislative house. This was immediately followed by a transmission of the traditional *grito de independencia*, which the station picked up with microphones in the Plaza de Armas and on the balcony of the National Palace. According to María Luisa Ross, the influential manager of the SEP station, the program was well-received across the country and in parts of the United States. Residents from a multitude of states, including Puebla, Veracruz, Hidalgo, Guanajuato, Morelos, and Campeche sent in letters. She received similar correspondences from radio listeners in the Federal District. A man in Brownsville, Texas, wrote that he had even heard the bells of the cathedral with perfect clarity.[57]

The SEP station also broadcast sessions of congress. In her monthly report for September 1929, Ross stated that it had been regular practice to transmit from the congress in the afternoon.[58] The previous year, when a correspondent for the *New York Times* published an article on what Mexican stations were most likely to be heard in the United States, he stated that CZE, despite its relatively weak strength, could be heard in "Southern and Central United States and in some parts of Central Canada." In addition to providing a typical airplay list of CZE—cooking, exercise, domestic science, music, bed time stories—it also discussed the wide variety of political programming on the stations, including:

[57] María Luisa Ross, "Informe de las labores desarrolladas por la Obra de Extensión Educativa por Radio de la Secretaría de Educación Pública, durante el mes de septiembre 1929, Mexico City, caja 9474, exp. 25, AHSEP.

[58] Ibid.

> . . .the Mexican Congress, Cámara de Diputados . . . the night of the 'Grito," Sept. 15, which is the most important national celebration and when the President is present and takes part, the Mexican Independence ceremonies are broadcast by remote control. Also, remote control is extended to the Presidential palace at times for the special use of the president.[59]

The same article also noted that CZI of the Department of Industry, Commerce, and Labor, was also regularly heard, reporting "crop reports, price quotations," and other matters of economic importance.

In addition to reaching an audience within Mexico, CZE managers stressed early on their desire to get their signal heard abroad. In fact, the station claimed to be the first to officially reach "the heart of Europe." After government officials agreed to take place in a "worldwide exchange of radio programs" in January 1926, they selected CZE to represent Mexico. Including nations from all across the Americas and Europe, each respective country agreed to halt radio transmissions except for during a specific allotted time when they were to broadcast a special program. The goal was to create a truly global broadcasting exchange in order to increase interest and sales in radio and to better familiarize people to the cultures of the participating nations.[60] As a result, Ross proudly brought to the attention of radio listeners and Mexico City newspaper readers that CZE had become the first Mexican station picked up by a European listener. In early February, Jean Maurier, a radio aficionado in Switzerland, had written to the station, stating that he briefly picked up CZE on January 30, though he could not keep

[59] "Radio Stations in Mexico," *New York Times*, 11 Mar. 1928, 14.

[60] H.S. Fraine to the Mexican Consul in New York, New York, 16 Dec. 1925, exp. 11-30-60, ASRE; "Worldwide Exchange of Radio Programs," *El Universal*, 10 Jan. 1926, English section 1; "México en la semana de radio," *El Universal*, 17 Jan. 1926, II 1, 9.

the station for long.[61] Still, it was an impressive feat for a 500-watt station. However, a radio experimenter had actually beat CZE to the distinction of first radio broadcast to be heard in Europe. In May 1924 engineer Manuel Pesqueira was heard in London from his experimental station in the neighborhood of Poptla, Mexico City.[62]

At home XFX played an important role in diffusing fear about the assassination of once-again president-elect Alvaro Obregón on July 12, 1928. For the first time, XFX and a number of other stations interrupted their broadcasts to give news of the caudillo's death.[63] XFX continued by providing updates on political decisions. It also broadcast the full trial of the assassin, José de León Toral, with the goal of showing that justice was served and to calm the public. Station employees placed a microphone before the judge's table.[64] Indeed, some SEP officials used the trial, along with the SEP broadcasts of war bulletins, to justify a proposal for building a more powerful government broadcasting station to expand these specific effects and to reduce "fanaticism."[65] The proposal floundered, however, after the creation of the more powerful station built by the PNR in 1931. Calles used his radio address during his annual speech to the congress in September 1928 to declare the restructuring of the executive office, and that the era of caudillos had ended. In its place would rise a new era of institutional politics, that of the single-party.[66] On September 25th Calles and his

[61] Jacobo Dalevuelta, "El radio como vocero de la alegría del Carnaval," *El Universal*, 7 Feb. 1926, 1.

[62] Rosalía Velázquez Estrada, "La radiodifusión mexicana: encuentro con su espada (1923-1945)," in *Miradas sobre la nación liberal: 1848-1948: Proyectos, debates y desafíos*, Libro 2, *Formar e informar: la diversidad cultural* (Mexico City: UNAM, 2010,), 297.

[63] Ibid, 296.

[64] "Obregon Slayer on Trial," *Los Angeles Times*, 3 Nov. 1928, 1.

[65] F. Javier Stavoli and Alejandro Michel, "Proyecto para la adquisición de una estación de gran potencia para el gobierno de México," Mexico City, 29 Apr. 1930, caja 9475, exp. 29, AHSEP.

[66] Rosalía Velázquez Estrada, "La radiodifusión mexicana," 296-97; Buchenau, *The Last Caudillo*, 165.

supporters, and those of Obregón, chose Emilio Portes Gil, in a compromise decision on the provisional president until new elections would be held in 1930.

The SEP radio station was far and away the most important government station during the 1920s, and it continued to play a vital role in the early 1930s. Calles and SEP bureaucrats used broadcasting to not only influence rural farmers, housewives, and children, but also as the direct mouthpiece for government proclamations, speeches, and events, at least until the formation of the PNR radio station in January 1931. It was, however, not the only government station tasked with building a popular base for the revolutionary state.

**Radio and Mexican Labor**

Labor, like agrarian groups, constituted another arm of the ascending populist coalition. It is no surprise then, that government leaders also focused radio programming to take advantage of this growing portion of the population. Of course, the incorporation of workers into the political system predates the Calles presidency and broadcasting; it was a direct result of the Revolution itself. During the conflict, the leadership of all the fighting factions espoused some form of populist rhetoric. In an attempt to gain greater support from peasants and urban workers, Carranza issued a number of decrees, most notably the Agrarian Law of 1915, which cast the Constitutionalists as agents of social change. This legislation was more than a simple gimmick. Some *carrancistas* were genuine in their desire for significant labor and land reforms, albeit in different ways than Zapata and other agrarian leaders.

Obregón, then a leading general in Carranza's forces, capitalized on this shift towards greater social reform. He appealed to *campesinos* to join his forces, who, in turn, came in large numbers just as they did for other factions promising change. Obregón is better known for his appeal to urban workers and the city's destitute when he occupied Mexico City in late January 1915, organizing the Revolutionary Committee for the Relief of the Poor. He additionally aligned himself with the *Casa del Obrero Mundial* (COM), whose members made up Obregón's well-known Red Battalions in exchange for the promise of increased benefits. Constitutionalists built similar relationships in Orizaba and Tampico as well. The general further solidified his populist credentials at the constitutional convention in Querétaro in 1917. There, he positioned himself as more radical than Carranza, especially in matters of social justice. The resulting document, much more extreme than Carranza had desired, forced subsequent political contenders to show themselves as aligned to the constitution, to the greater inclusion of the people, and to greater social reforms.[67]

During Obregón's candidacy for high office in 1919 and 1920, the general promoted himself as a uniter of the various "liberal" factions: small farmers, urban professionals, campesinos, and workers—a charismatic compromiser who could work across social divisions. It was during this initial run for the presidency that Obregón cemented his partnership with labor leader Luis Morones and the *Confederación Regional Obrera Mexicana* (CROM), the successor of COM. Morones, the former head of Mexico's telephone and telegraph union, understood the power of communications. In 1923 and 1924, he and his affiliates provided radios to CROM-

[67] John Lear, *Workers, Neighbors, and Citizens: The Revolution in Mexico City* (Lincoln: University of Nebraska Press, 2001), 270-92; Buchenau, *The Last Caudillo*, 75-78.

connected labor groups in Pachuca, Hidalgo; Puebla, Puebla; Orizaba, Veracruz; Torreón, Chihuahua, Jérez, Zacatecas; and "Jalisco and other places in the Republic."[68] One "*sindicato moronista*" established a radio station in Etla, Oaxaca, which operators shortly thereafter moved to Oaxaca City. It provided pro-Calles propaganda during his candidacy for high office.[69] In the summer of 1923, Morones provided radio equipment to Soledad González, one of Mexico's most powerful women. Then working in Nuevo León, she was the private secretary of Obregón. She was also a close friend and, later, secretary to General Plutarco Elías Calles. She played an important role in Calles's electoral campaign in 1923-1924 and continued to possess influence and power in political and social circles throughout the decade and beyond. Politicians, secretaries, and unions all received over-the-air lectures and concerts via 1-R, an experimental broadcasting station under the direction of Morones's *Fábrica Nacional de Vestuario y Equipo* or National Factory of Clothing and Equipment. Morones was also associated with the military manufacturing station VPD. In addition, he used a small group of operators to run radiotelegraph station 1-Z.[70]

Although Morones was the most important labor leader to take up radio in the early 1920s, he was not the only one. Vicente Lombardo Toledano, who would succeed Morones as the leading icon of the labor movement, was a member of one of the first radio interest groups in the early 1920s before becoming interim governor of Puebla in 1923. José Allen, one of the founding members of the Mexican communist party, was

[68] "Propaganda obrera por medio de estaciones radiofónicas," *El Universal*, 16 Nov. 1923, 1; Manuel Azamar to Gral. P. E. Calles, Tuxtla, Veracruz to Mexico City, 12 Apr. 1924, exp. 215, inv. 456, leg. 1, Archivo Plutarco Elías Calles, FAPECFT. Two of these groups were the *Federación Obrera Hidalguense de Pachuca* and the *Centro Obrera Progresistas de Jérez*.

[69] Rosalía Velázquez Estrada, "La radiodifusión mexicana: encuentro con su espada (1923-1945)," in *Miradas sobre la nación liberal: 1848-1948: Proyectos, debates y desafíos*, Libro 2, *Formar e informar: la diversidad cultural* (Mexico City: UNAM, 2010), 281.

[70] Dulles, *Yesterday in Mexico*, 276.

an early radio experimenter and worked on some of the first commercial radio stations. Labor leaders, like other politicians, understood the potential that this new technology possessed for providing propaganda and building allegiances. [71]

During the Calles years, radio listenership among labor grew. Under Morones's leadership the SICT started its own "cultural" station under the call letters CZI in 1927. The following year Morones resigned. In 1929 the station became XEFI, following new international protocols. According to communications historian Rosalía Velázquez Estrada, "all union groups affiliated with the CROM possessed a receiver and radio horn speaker in their gathering places."[72] The scant available data, however, fails to confirm this statement. But we do know that this was the goal, and that state and labor organizers had made significant headway by 1934. The U.S. Department of Commerce, for example, made special note that in 1930 the SICT had been placing radios among various labor organizations in Mexico.[73] And we know from aforementioned accounts that the gifting and selling of radios to similar groups had been under way since late 1923.

The SEP also donated a large number of radios to labor groups in Tamaulipas in February 1930, the same month that Portes Gil turned the reigns of the presidency over to Pascual Ortiz Rubio. In fact, the order to ship the devices occurred the day before Portes Gil left office. This is an interesting fact not only because it occurred upon Portes Gil's departure from the presidency, but also because his greatest political support came from Tamaulipas, his home state. In that month alone, SEP officials, on

[71] "La estación radiofónica de "El Mundo" se encuentra a cargo de los más expertos técnicos del República," *El Mundo*, 7 Nov. 1923, 1; Fernando Mejía Barquera, "Historia mínima de la radio."

[72] Rosalía Velázquez Estrada, "La radiodifusión mexicana durante los gobiernos de Alvaro Obregón y Plutarco Elías Calles," tesis de licenciatura, Universidad Nacional Autónoma de México, Mexico City, 1980, 156.

[73] U.S. Department of Commerce, quoted in Sánchez Ruíz, *Orígenes de la radiodifusión*, 22.

behalf of Portes Gil, sent radio receivers to the *Partido Socialista Fronterizo*, the *Liga de Comunidades Agrarias*, the *Gremio de Alijadores*, the *Sindicato de Campesinos*, and the *Sindicato de Obreros de la Cía. México de Petróleo "El Aguila,"* all of them in Tamaulipas. They also sent another device to a school in the state's capital Ciudad Victoria.[74]

Beyond the tie to Portes Gil, reasons for this sudden shipment of radios to Tamaulipas organizations are unclear. Relations between the government and foreign oil interests in Tamaulipas had been tense during the Calles years. Morones, Calles, and the congress had pushed ahead stiffer laws that further restricted foreign land ownership in Mexico in 1925 and 1926. At the same time CROM provided declarations to the press that *El Aguila*, the largest petroleum company in the country, was waging a fearless and infamous campaign against Mexican workers, provoking conflicts in Tampico, Puerto México, and Minatitlan.[75] During Portes Gil's last year in office there had been a fight in the congress over a new labor code and over a slight raise in taxes on foreign oil interests.[76] Building a stronger connection between political and labor organizations in a state with a large presence of foreign companies made sense, even if relations with foreign oil companies had eased some in the late 1920s and early 1930s.[77]

It is also noteworthy that these radio shipments occurred shortly after the formation of the PNR, of which Portes Gil became a leader. The *Partido Socialista Fronterizo* had originally been formed to promote Portes Gil as a candidate for

[74] Ing. Miguel Fonesca to the Jefe del Departamento, 4 Feb. 1930, Mexico City, caja 9475, exp. 29, AHSEP.

[75] "El conflicto de 'El Aguila' tiene seria resonancia en Tampico," *El Universal*, 1 Jan. 1926, 10.

[76] "Petroleum Tax Up Slightly in Mexico," *New York Times*, 29 Jan. 1930, 41; "Mexico Oil Sky Clearing," *Los Angeles Times*, 27 Feb. 1928, 16.

[77] Lorenzo Meyer, *México y los Estados Unidos en el conflicto petróleo, 1917-1942* (Mexico City: Colegio de México, 1972), 270-75; Myrna I. Santiago, *The Ecology of Oil: Environment, Labor, and the Mexican Revolution, 1900-1938* (Cambridge: Cambridge University Press, 2006), 282-83.

gubernatorial office in Tamaulipas, but the party was quickly subsumed by the more national PNR after 1929. The timing of these gifts, the year after the PNR's formation, appears to show the increased unification of political parties under the newly emerging one-party system. Or perhaps they were nothing more than gifts from Portes Gil to groups that had supported him. The SEP similarly gave Ortiz Rubio, the incoming president, one radio for personal use and three others to give away to whomever he saw fit.[78]

Whatever the reason for the initial gifting of the Tamaulipas radios, federal agencies were giving out receivers to a myriad of different labor, political, and campesino groups. In addition to the Tamaulipas organizations, the SEP also sent a radio to the *Casa del Partido Socialista* in Iguala, Guerrero. The *Partido Rojo del Sur Veracruzano* had also possessed a radio since before Calles took office. Veracruz governor Tejada also used radios for communication with labor and campesino groups in that state. The SEP provided eight radios to the National Commission of Highways.[79]

What exactly did I-R, CZI, and XEFI broadcast? In many regards programming on the labor radio stations was similar to commercial programming with the exception that the labor stations had political propaganda and economic news in between the music. A program listed in *Excélsior*, October 26, 1926, shows that there was a variety of song styles: fox trots, *canciones yucatecas*—some sung by Guty Cárdenas—tangos,

[78] María Luisa Ross, untitled document, Feb. 1930, Mexico City, caja 9475, exp. 29, AHSEP.

[79] Ing. Miguel Fonesca to the Jefe del Departamento, 4 Feb. 1930, Mexico City, caja 9475, exp. 29, AHSEP; Manuel Azamar to Gral. P. E. Calles, Tuxtla, Veracruz to Mexico City, 12 Apr. 1924, exp. 215, inv. 456, leg. 1, Archivo Plutarco Elías Calles, FAPECFT; José Suárez G. to María Luisa Ross, Mexico City, 24 Sept. 1929, caja 9474 exp. 25, AHSEP; José Suárez G. to María Luisa Ross, Mexico City, 22 Oct. 1929, caja 9474 exp. 25, AHSEP; "Asunto: Lista del material recibido de la Comisión Nacional de Caminos," caja 9475, exp. 25, AHSEP.

danzon, and *corridos* including "El Ferrocarril" ("The Railroad").[80] The latter genre, Mexican folk ballads, appears to have been slightly more common on CZI than on commercial stations such as CYL, CYB, and CYJ. But opera and classical compositions were common on CZI and XEFI, as with the other stations. The SICT also broadcast regular news on the economic market, especially commodity prices, crop reports, and programs on foreign demands.

In 1930 Froylán C. Manjarrez, then head of the Department of Publications and Propaganda, contacted Joaquín Amaro, the Secretary of War and Marine, proposing to "give new organization to the radio service you provide via the broadcasting station 'XEFI' of the Secretariat of Industry, Commerce, and Labor." Manjarrez wanted to incorporate more professional economists into the programming to discuss the various problems within Mexico's economy—then in a serious downturn—and to provide propaganda that ensured laborers that the PNR was making a strong effort towards economic and social progress. He proposed to Amaro a stronger collaboration between the two agencies "to wake the public to this positive interest."[81] The letter insinuates that the Secretariat of War had considerable influence on XEFI programming.

The following year, XEFI, under the direction of station managers Carlos del Pozo and Jorge Peredo—the latter had previously operated an experimental radio station in 1925—also worked with other stations to send the message of President Ortiz Rubio during "Pan-American Day." The speech, which promoted unity, peace, and

[80] "Radioconciertos," *Excélsior,* 26 Oct. 1928, II 3.

[81] Froylán C. Manjarrez to Joaquín Amaro, Mexico City, 6 Mar. 1930, exp. 9, inv. 297, leg. 31, Archivo Joaquín Amaro**,** FPTCFT.

respect for national sovereignty was heard in the far corners of Mexico and in many parts of the Western Hemisphere.[82]

Although government stations helped relay political messages across Mexico, labor and campesino groups surely faced the same electric and reception problems that plagued the SEP's radio program in rural schools. Electricity was more accessible in urban centers and factories but not in rural communities. Little documentation exists about whether laborers and campesino groups actually listened to SICT. Surely, they sometimes tuned in to foreign and local commercial programming. We do know that groups listened to addresses from presidential candidates and presidents. Perhaps at times labor leadership enforced a greater adherence to state radio.

Regional leaders, such as Felipe Carrillo Puerto, radical governor of Yucatán, also used broadcasting to reach labor groups. As discussed in chapter three, this southern state already possessed a history of radio experimentation. Carrillo Puerto used the medium extensively for his intertwined work with the Socialist Party of the Southeast and the *Liga Central de Resistencia*. In the Yucatán, the main political party and the government had already become one and the same thing by 1923. The governor and his supporters established a radio station near Mérida, CYY of the Grand Socialist Party from the Southeast. They also bought and distributed sixteen receivers to strategic locations throughout the state. Through these radios party members spread educational lectures and music. On October 31, 1923, CYY aired music and a talk given by Professor Eligio Erosa Sierra in Maya, broadcast from a restaurant attended by the governor and his family. Carrillo Puerto was assassinated the following year during the De la Huerta Rebellion, but the station continued to provide similar programming. In

[82] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 163.

1925 station broadcasters transmitted a program in honor of Carrillo Puerto for the re-inauguration of the station under the new call letters of CCY. The Mexico City commercial station CYB-*El Buen Tono* rebroadcast the event "to all of the republic and beyond the frontiers." By the early 1930s CCY was relaying PNR speeches and events, as well as commercial programming, from Mexico City stations.[83]

**XE del Partido Nacional Revolucionario**

In addition to the SEP and the SICT, the PNR, became an important state presence on the airwaves. Just as the PNR incorporated a number of regional parties, its station, XEO (later XEFO, and XEUZ short wave), became the dominant political voice on radio. With the assistance of government and commercial stations PNR messages resonated throughout the country.

Following Obregón's assassination, Calles, his supporters, and a number of prominent *obregonistas* worked out an agreement to smooth over political complications. As a result, Calles gained his place as *Jefe Máximo* of the Revolution in exchange for compromising with *obregonistas* on the selection of Emilio Portes Gil to fill the presidency until new elections in 1930. Another result of this process, Calles and allied political leaders formed the PNR to further incorporate and institutionalize revolutionary factions. By 1929 distinguished party members were giving political speeches for the new agreed upon candidate—Pascual Ortiz Rubio—over the radio. To

[83] Gaspar Gómez Chacón, "Carillo Puerto y la radio en Yucatán," in *La Revolución en Yucatán: Nuevos ensayos* (Mérida: Secretaria de Educación, CESPA Editorial, 2012), 163-201; Medina Ávila and Vargas Arana, *Nuestra es la voz*, 144; "Mensaje del Gral. Lázaro Cárdenas," *El Universal*, 1 Jul. 1934, 1, 3.

accomplish its goals, the PNR, like some government agencies and regional leaders, distributed a large number of receivers to various organizations.[84]

Before PNR members had their own radio equipment, the proprietors of *Excélsior* ran political speeches for them from their station starting in June 1929. It also appears that the party transmitted from its own equipment shortly thereafter, doing so without an official name or permission from the SCOP.[85] The formal inauguration of XE-Partido Nacional Revolucionario-XEO was on New Year's Day 1931.

As the official station of the PNR, XEO was the only specifically political station in operation. Congress had officially banned all oppositional radio in laws dating back to 1926. As a result, the station, and Mexican radio in general, reinforced the one-party system. In 1931 the station operated with 5,000 watts of power, but government officials elevated its strength to 50,000 watts in 1933, making it as potent as the most dominant commercial stations and more powerful than all of the state broadcasting stations with the exception of those at Chapultepec and Palo Alto. With the rise of XEO, the SEP's station XFX continued to broadcast political events and work in partnership with the PNR, but starting in 1931, XEO became the flagship of party broadcasting.

Some notable attempts at anti-government radio programming did occur from 1924 to 1935, but all met with repression from state officials. As mentioned in chapter five, government agents shut down Martín Luis Guzmán's radio station *El Mundo* during the De la Huerta Rebellion. CYL was also briefly shut down. General Arnulfo

[84] "Seguirá el descuento a los empleados para el P.N.R.," *La Prensa*, 9 Oct. 1930, cccxii. 24. 231, CEHM.

[85] Mejía Prieto, *Historia de la radio y la t. v.*, 55; "Resultó un éxito el radio-concierto," *El Nacional*, 29 Jun. 1929, 1, 6.

Gómez used radio during his brief revolt in late 1927. He hoped to achieve popular American support and to persuade U.S. leaders to withdraw recognition of Calles by broadcasting to various newspapers "from several of the border cities in Texas and Arizona."[86] Of course, he was not in Mexico. During another anti-Calles protest on November 7, 1931, a small group of three

> alleged Communists, pistols in hand, entered the [commercial] radio station XEW, 'the voice of Latin America' . . . tied up the operator José Piña and proceeded to broadcast insults to President Ortiz Rubio, Minister of War Calles and Ambassador Clark, as well as accusations that American imperialism was attempting to provoke war on the part of China and Russia against Japan . . .The incident occurred after the conclusion of a concert in memory of the noted Mexican musician, Carlos Menéndez, given under the auspices of the Department of Public Education.[87]

Another account provided in the communist paper *El Machete* states that members of the Communist Party took control of the station as a celebration of the anniversary of the Russian Revolution. According to this article, the rebel air-wave invaders defended the Soviet Union, railed against U.S. imperialism, and argued that Calles's repressive regime was responsible for Mexico's misery.[88] Later, in January 1935, shortly after the inauguration of Lázaro Cárdenas, commercial station XXX, associated with the Mexico City newspaper *La Prensa*, broadcast a program by the "Three Wise Men" which criticized the politicization of the youth and the weak attendance of children at events celebrating Three Kings' Day.[89]

[86] B. R. Armstrong, "Propagandists in Mexico Busy," *Los Angeles Times*, 9 Oct. 1929, 2.
[87] "Reds Seize Radio Station," *New York Times*, 9 Nov. 1931, 37.
[88] Hayes, *Radio Nation*, 39.
[89] Jackson Albarrán, *Children of the Revolution*, chapter 3.

On the other hand, almost all broadcast stations played programming that supported the revolutionary government. No anti-government or anti-PNR operation ever aired long. Commercial stations did not always agree with government policies but they generally worked in partnership with the state. They played a wide variety of "national" pieces and agreed to government supervision and airtime for state programming and guest lecturers. Some of the most powerful radio operations, such as the chain of stations being built by XEW's founder Emilio Azcárraga, worked closely with the PNR since the party's inception.

Some businesses and government employees briefly resisted XEO-PNR. In mid-January 1932, a disagreement within SCOP broke out about whether the PNR station could air as an "official" and "public" operation, or if it had to be taxed and labeled as a commercial station. SCOP officials citing the fact that the PNR station aired commercials stated that it could not, according to the law, be a public operation. And with that reasoning, officials within the DGTN rejected requests from XEO's management to be changed to XFO—that is, from a commercial to public station. Other station owners were outraged over what they saw as a flagrant abuse of the laws and favoritism by the government. However, the matter was ultimately settled in favor of the PNR the following month. The SCOP leadership decided that XEO in and of itself could not be a commercial station and that all should be done "within the law" to help the station succeed. The undersecretary further proclaimed that since XEO was not providing commercial information, the fees for commercial stations would not apply.[90]

[90] Mariano Cabrera to the Director General de Telégrafos, 16 feb. 1932, Mexico City, exp. 525, caja 16, Ramo Secretaría de Comunicaciones y Transportes, AGN; "Memorandum," Director General of the DGTN to the Subsecretario de SCOP, 15 Jan. 1932, Mexico City, exp. 525, caja 16, Ramo Secretaría de Comunicaciones y Transportes, AGN; "Memorandum," Miguel M. Acosta to the Dirección de

The station did, however, retain an XE instead of an XF name, a call sign supposedly reserved for commercial stations. But for that matter, so did Secretary of Industry, Commerce, and Labor station XEFI. It was not rare for the lines between commercial and public to blur.

XEO worked with commercial entities but it also collaborated with government stations, especially SEP station XFX. Before the commencement of XEO in 1931, the PNR had already turned to XFX to help propagate the party's messages. XFX collaborated with the leadership of the newly formed party in political campaigns including the *campaña nacionalista*, which argued for the consumption of Mexican-made products and promoted domestic over foreign arts and music. During the 1930s, XFX began not only to push regional folk music and classical compositions by national authors over American jazz but also to avidly promote the PNR's economic goals by reaching out to state governors, businesses, and unions for them. The station also broadcast PNR bulletins, which usually consisted of newspaper reports that showed the party in a positive light. XFX broadcast other PNR-provided programs, including "The Conquest of the Mexican Revolution."[91] The PNR moved to present itself as the sole political representation of the Revolution. XFX became one of its most useful platforms.

After the PNR created its own broadcasting station, the party's leadership continued to work closely with XFX on programming.[92] For example, J. M. Puig Casauranc and María Luisa Ross communicated frequently with Senator Silvestre

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Telégrafos, 28 Jan. 1932, Mexico City, exp. 525, caja 16, Ramo Secretaría de Comunicaciones y Transportes, AGN.

[91] Alejandro Michel, "Recopilación detallada de los servicios que presta la obra de Extensión Educativa por Radio de la SEP," Mexico City, 29 Oct. 1930, caja 9478, exp. 4, AHSEP.

[92] Departamento de Prensa y Publicidad, "Partido Nacional Revolucionario," Mexico City, 1933, caja 9485, exp. 63, AHSEP.

Guerrero, the Secretary General of the PNR, "to immediately make an intense labor of communication between both stations." Ross stated that she enthusiastically supported the collaboration and scheduled meetings between the managers.[93] The operations worked together to spread party-approved notions of Mexican culture and state propaganda, creating the foundation for a PNR-government-private broadcasting chain for political speeches. But the XEO operators took on the leadership role in this partnership.

XEO's usual programming consisted of political messages in between musical pieces, and, at times, commercials. The station's managers consistently demanded top notch performers for their broadcasts, whether for a specific program of music, or for coverage of live political events. Regular XEO performers included famed composer Miguel Lerdo de Tejada, Pedro Vargas, later called the "Nightingale of the Americas," and Alfonso Esparza Oteo, perhaps the most famous foxtrot performer in Mexico City. Talks aimed at "the popular masses" included "Revolutionary Concepts" and "News of General Interest." [94]

The PNR's first broadcasts were in the service of Pascual Ortiz Rubio's presidential campaign. PNR-affiliated congressmen, generals, and journalists gave special addresses. Journalist Joaquín Piña gave a speech titled "Ortiz Rubio, a President for All Mexicans."[95] They also included operettas, Yucatecan songs, piano pieces, and a variety of domestic and foreign numbers. Some of the congressmen who spoke included Federico Medrano, head of the *obregonista* block in congress, doctor and

[93] Dr. J. M. Puig Casauranc to Senador Don Silvestre Guerrero, Mexico City, 19 Jan 1931, caja 9480, exp. 35, AHSEP; María Luisa Ross to Silvestre Guerrero, Mexico City, 21 Jan. 1931, caja 9480, exp. 35, AHSEP.

[94] Mejía Prieto, *Historia de la radio y t. v.*, 57.

[95] "Resultó un éxito el radio-concierto," *El Nacional*, 29 Jun. 1929, 1, 6.

Congressman Alejandro Cerisola, and a representative from Oaxaca. Occasionally an actor would talk and do a bit of radio-theater.

Ortiz's Rubio's first radio addresses as president was a testament to the growing influence of political broadcasting in Mexico. As was already a tradition since Calles was sworn into office six years before, Ortiz Rubio broadcast his inaugural address across the nation on state and commercial stations. The speech carried much of the same populist rhetoric that his three predecessors had espoused. It was heard in thousands of communities in Mexico and by certain state officials and inquisitive listeners in the United States. But it was an event shortly thereafter that became more memorable. Almost immediately following the presidential address, Daniel Flores, a twenty-three year old man, fired six bullets at the president. One of them struck Ortiz Rubio in the jaw after first cutting through his wife's ear. Although the assassination attempt would rattle the president, leading to timidity and health problems, his radio address to the nation nineteen days later was reported in the United States to have had "the double effect of reassuring the country [Mexico] as to his recovery from the bullet and to the constructive policy he plans to adopt."[96] The same report stated that another reaction to the broadcast was the "calming today of foreign exchange. The quotation for the peso rose and stocks and securities also showed unusual movement compared with previous days." Broadcasting, especially in times of anxiety, proved influential in calming or exciting nationals and foreigners.

Ortiz Rubio extended his approval of PNR radio by inaugurating the official XEO station with a New Year's address— "A Message of Best Wishes to the People of the Nation." Subsequent presidents built on this tradition. The principal stations of the

[96] "Ortiz Rubio Speaks on Radio to Mexico," *New York Times*, 27 Feb. 1930, 6.

country also retransmitted the event, exhibiting another development that would continue to grow over the next decades**,** the collaboration of the owners of increasingly monopolistic commercial radio station chains with the official single party of Mexico.[97] In addition to Ortiz Rubio, Secretary General of the PNR Silvestre Guerrero and other members of the party's National Executive Committee attended the event. Manuel Jasso, the PNR's Secretary of Propaganda and Culture gave a speech that laid out the goals of "XE del PNR."

> With the installation of its broadcasting station, the PNR puts to the service of ideological renovation the most effective form of media that we have today.
>
> The effort that this represents for the party is explained by the huge necessity to create a national cohesion of an unprecedented organizational strength and in which those politically represented understand in actuality the integrity of public power; that maintains a daily and constant contact with the collectives that invigorate the body and still others that constitute our nationality.
>
> The diffusion of the party's doctrine, the daily information of its management and of the governments, the spiritual incorporation of the proletarian masses by means of art, literature, and music; comprehension and solidarity between the inhabitants of the country; in sum, a detailed registry of the everyday palpitations of national life, is the work that will serve the XE del P.N.R. into the most remote places of the Republic and far beyond the borders.[98]

Jasso's speech clearly defined the station as a tool to build mass allegiance to the state and the party, which were equated as essentially the same thing. Although Jasso stated that this was to be done through artistic endeavors, the station mainly used artists to gain the attention of listeners whom the PNR leadership wanted to receive party

[97] "Un mensaje de buenos deseos para el pueblo de la nación," *Excélsior*, 1 Jan. 1931, 1,3, exp. 103, inv. 414, leg 9/15, Fondo Joaquín Amara Camaro, FAPECFT.

[98] Manuel Jasso, quoted in Mejía Prieto, *Historia de la radio y t. v.*, 56.

messaging. It was a multipronged approach that spread "political, cultural, and social" programming across the (trans) national soundscape.[99]

Ortiz Rubio, and the PNR during his presidency, used radio skillfully. According to SEP radio director María Luisa Ross, the previously discussed 1931 Ortiz Rubio speech for Pan American Day was one of the most popular broadcasts of the department's fiscal year. XFX received "innumerable" letters from within Mexico, the United States, and Canada in appreciation of the president's address.[100] The speech exemplifies how the Maximato presidents capitalized on the increased regularity of the broadcasting industry and the rising number of receiver sets in the country.

Radio as a political tool continued to grow during the campaigns and presidencies of Abelardo Rodríguez and Lázaro Cárdenas. Former XFX technical manager engineer Javier Stavoli switched over to station XEFO, finally able to work with a 50,000-watt station like he had asked for when he worked in the SEP. His transition to XEFO is one of the more important markers of the decline of the SEP station at the expense of party radio. In January 1934, President Rodríguez "broadcast an explanation of Mexico's new minimum wage law of four pesos a day and pleaded for public support to make it a universal application."[101] Rodríguez used the medium regularly, not only to popularize this policy but also the image of the Mexican government in general. The collaborations between the PNR and commercial radiocasters continued to grow. When Rodríguez gave his last address to congress in September 1934, XEFO had partnered with nineteen other stations to amplify the message. Many of the participating commercial

[99] "Seguirá el descuento a los empleados para el P.N.R.," *La Prensa*, 22 Oct. 1930, ccxii. 24. 231., CEHM.

[100] María Luisa Ross, "Informe de las labores . . . durante el periodo comprendido del 1 de agosto de 1930 al 21 de Julio de 1931, Mexico City, 31 Jul. 1931, caja 9478, exp. 4, AHSEP.

[101] "New Radio Voice," *Los Angeles Times*, 11 Jan. 1934, A4.

broadcasters were located within Mexico City, like Azcárraga's XEW, but other stations—some affiliated with Emilio Azcárraga, some not—were located in Tamaulipas, Nuevo Leon, San Luis Potosí, Coahuila, Durango, Jalisco, and Veracruz.[102]

As a candidate, Cárdenas spoke regularly over XEFO and its commercial and state broadcasting partners in the capital, Mérida, Tampico, Veracruz, Monterey, Saltillo, Nuevo Laredo, Querétaro, Torreón, Guadalajara, and San Luis Potosí. Even the border blaster XENT in Laredo, Nuevo León—owned by the famed gringo "cancer-curing" quack Norman Baker—transmitted PNR broadcasts of the Cárdenas campaign, providing another interesting dynamic in the relationship between these American broadcasters in Mexico's northern borderlands and the political leadership of the nation.[103] The Mexican Telephone and Telegraph Company and Erickson Telephones also aided the PNR-Cárdenas campaign, providing over 3,000 kilometers in cable.[104] In between presidential campaigns XEO directors kept Calles informed of their programming, especially those involving the "Calles Doctrine and the economic progress of Mexico."[105]

According to Hayes, Cárdenas "distributed hundreds of radios to his supporters in rural villages and working-class neighborhoods" during his fabled *gira* or campaign trek across the country in 1934. Hayes also notes that Cárdenas used a "radio train" to contact city officials and party members, among others, which "signaled his

[102] "Transmisión del informe a toda la Republica," *Excélsior*, 1 Sept. 1934, 4.
[103] Norman Baker to Plutarco Elías Calles, Mexico City, 23 Apr. 1934, exp. 7, inv. 458, leg. 1, Archivo Plutarco Elías Calles, FAPECFT.
[104] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 144; "Mensaje del Gral. Lázaro Cárdenas," *El Universal*, 1 Jul. 1934, 1, 3.
[105] Alfonso Patiño to P. Elías Calles, Mexico City, 24 Sept. 1933, exp. 20 inv. 576, leg. 4/7, Fondo Plutarco Elías Calles, FAPECFT.

commitment to the new medium." [106] The use of radio by the PNR had definitely increased. But as with the gifting of radios to labor groups and campesinos, Cárdenas's use of radio trains was not a new innovation. As discussed in chapter three and six, rebel leaders and earlier presidents used radios on locomotives. During the De la Huerta Rebellion, aboard President Obregón's recently revamped presidential train in Guanajuato, political ally Fernando Torreblanca sent wireless messages to his wife in Mexico City, giving "*mucho, mucho, mucho, cariñosos recuerdos*," and making sure that his son brushed his teeth.[107] The following year journalists were invited to ride on the presidential train to see where "grand irrigation works" were soon to be built in Chihuahua. The SCOP operators helped them send reports via radio back to their respective newspapers in Mexico City.[108] Technicians provided presidents with radio on other modes of transportation as well. In 1929 President Portes Gil talked via radiotelephone on his "presidential plane" during Mexico's Air Week celebrations. In addition to speaking to the president of the Mexican Aviation Company, which operated an important airplane mail service, the president sent a message to his wife: "From an altitude of 23,000 feet, as we are now over the crater of El Popo the volcano and enjoying the gorgeous beauties of nature, to you, to mother, and to Chacha, our little

[106] Hayes, *Radio Nation*, 86.

[107] "many, many, many, loving memories." F. Estévez to Luis G. Zepeda, Celaya, 25 Jan. 1924, exp. 21 inv. 788, leg. 1, Fondo Fernando Torreblanca, FAPECFT; Fernando Torreblanca to Hortensia E. C. de Torreblanca, presidential train, Celaya to Mexico City, 26 Jan. 1926, exp. 21 inv. 788, leg. 1, Fondo Fernando Torreblanca, FAPECFT; Fernando Torreblanca to Hortensia E. C. de Torreblanca, presidential train, Celaya to Mexico City, 30 Jan. 1926, exp. 21 inv. 788, leg. 1, Fondo Fernando Torreblanca, FAPECFT.

[108] "Grandes obras de irrigación que van a construirse en breve en Chihuahua," *Excélsior*, 15 Nov. 1925, exp. 165, inv. 456, leg. 10/12, Fondo Joaquín Amara Camaro, FAPECFT.

girl, loving greetings. — Emilio."[109] Radio had become a norm in presidential travels by the late 1920s.

None of this detracts from Cárdenas's skill in political broadcasting. Cárdenas—along with Portes Gil who had acquired the land for the station—had been instrumental in the foundation of XEO as the president of the PNR in 1930.[110] He had become familiar with the medium's strengths and weaknesses well before he took office in late 1934. During his presidential campaign he used radio abundantly to further the reach of his call to increase social reforms and state cooperation with the common people. In one speech, "carried by all the radio stations in the Republic," he emphasized the rights of workers, and that a genuine cooperatist system would rein supreme; he stressed the need to incorporate men and women and the need to end the exploitation of man by other men and by machines. He renewed a call for the "organization of the workers across the entire Republic."[111] The oil expropriation speech he gave in 1938 electrified people from every nook and cranny of the country, elevating Mexican nationalism to an all time high. Although some of this can be attributed to Cárdenas's own intelligent use of the medium, the simple fact that stations—including government, but mostly private operations—expanded rapidly and abundantly during his presidency provided Cárdenas the essential tool. In other words, his ability to rally the populace stemmed directly from the maturation of radio technology and the Mexican broadcasting industry.

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[109] Emilio Portes Gil, quoted in "Mexican President Flies Over Volcano," *New York Times*, 12 Dec. 1929, 14. The translation is from the original article.

[110] "Seguirá el descuento a los empleados para el P.N.R.," *La Prensa*, 22 Oct. 1930, ccxii. 24. 231, CEHM.

[111] Lázaro Cárdenas, "El Sr. Gral de División Lázaro Cárdenas: Candidato a la Presidencia de la Republica por el P.N.R., hace profesión de fe cooperativista," (Mexico City: Liga Nacional de Acción Cooperativa, 1931): 1-4, exp. 5, inv. 803, leg.1, Fondo Presidentes, FAPECFT.

When Cárdenas took office, presidents had been using broadcasting for over a decade, and wireless telegraphy for thirty-five years. The traditions of using radio to broadcast inaugural address, speeches to and by the congress, New Year's Day speeches, presidential campaigns, and in other moments deemed nationally important, had all been a part of the government broadcasting system built by state agencies during the Calles presidency and, starting in 1929, in partnership with the PNR. By the time that Cárdenas forced Calles's exile in April 1936, the PNR had constructed an impressive broadcasting operation. Giving the first radio address by a Mexican presidential candidate, Calles initiated direct political broadcasting in 1924. Ten years later most of the powerful stations across the country aired political and government messages.

Broadcasting opened up a new era of populist and nationalist politics. Government leaders used the medium to incorporate rural societies, laborers, businessmen, and urban middle-class urbanites into state allies, with some success. Although many areas remained out of constant reach of the government, or stood opposed to their intrusion, the voice of state leaders reached greater audiences than ever before. Cárdenas masterfully built upon these foundations during his presidency.

In addition to constructing a populist and corporatist coalition, Calles and top leaders of the PNR, including Cárdenas, used radio to incorporate and dominate over smaller regional parties. By monopolizing political speech over the airwaves, the party consistently provided the furthest reaching propaganda, reinforcing its prominent position. This was done by party members who provided radios to targeted labor

unions and rural community centers, by incorporating state broadcasting into education, and the cooperation of regional state stations.

Cárdenas pushed for greater state intervention, but the radio system was already in place and in working order. The SEP, Chapultepec, the army, the SICT, the SCOP, and the PNR all transmitted regular messages and programming. Other government departments would create their own operations, reaching a high of fourteen stations.[112] Agencies also broadcast on commercial stations, which had to allow air time for state bulletins by law. The relationship between state leaders and commercial broadcasters was firmly established, if not always smooth. Government directors allowed flexibility in how private companies built their programming in exchange for their commitment to relay state and political messages, and for playing a certain percentage of "nationalist" music. The PNR in particular gained the cooperation of the most dominant commercial broadcasters, building a close relationship between media moguls and the one-party system that would evolve for generations.

**The Maturation of Radio**

The first four years of the Cárdenas administration were tumultuous and exciting. The president had exiled Calles and a number of his allies in 1936, nationalized the oil industry in 1938, fought a rebellion by San Luis Potosí strongman Saturnino Cedillo that broke out days later, and faced serious obstacles in implementing his radical land and labor reforms. But unlike the 1920s, the Cárdenas administration faced much less risk of rebellion from within the military. The state had much more firmly secured its position. And though definitively not loved by all, Cárdenas had garnered more popular

[112] Hayes, *Radio Nation*, 77.

support than his revolutionary predecessors. He not only appeared more genuine in his efforts to reach out to people across the nation, he had better means to do so, and subsequently his words did not go unnoticed or without weight.

Radio development and use increased dramatically during the Cárdenas years. Simultaneously, state and party broadcasting stations reached their pinnacle while massive commercial broadcasting chains solidified their dominant position on the airwaves. In 1937 eighty-nine broadcasting stations operated across Mexico, thirteen official, and three "cultural."[113] By 1940, 113 broadcasting stations aired across, and many beyond, the nation.[114] In order to maintain a strong presence in the face of the expanding private-sector operations, the government upped state messaging on commercial stations. Beginning in 1937, all large stations retransmitted the government's *La Hora Nacional*, and a number of those aired additional official messages and speeches. By 1943 approximately sixty of those stations were affiliated with Emilio Azcárraga, who, along with his brothers, had been cooperating with revolutionary governments for the preceding twenty years.[115]

By the early 1930s radios had become common and loud enough in Mexico City that government health officials called for bans and limitations on the use of the devices in public. In 1931 the agents officially prohibited the common practice of blasting loudspeakers from storefronts, and city officials likewise ordered saloons to turn off their radios by 9:00 pm. Not stopping there, they began enforcing noise ordinances against private residences where inhabitants played phonographs and radios too

[113] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 138-40.

[114] Arturo Melgar, "El desarrollo de la radiodifusión en México," *El Telegrafista* 2, no. 8 (1 Feb. 1954): 25-26.

[115] "Sees S.A. Broadcasts Bolstered by U.S. Ties," *Radio Daily*, 15 Apr. 1943, box 112, fold. 12, Royal Papers, NBC Collections, Wisconsin Historical Society, hereafter cited as WHS; "Pan-American Network (La Cadena Panamericana)," 1944, box 110, fold. 17, Royal Papers, NBC Collections, WHS.

loudly.[116] According to certain members of the Department of Public Health, all the noise caused serious health issues. They received a number of complaints. One woman told them that "radio noise had driven her mad." A Mexico City lawyer argued that his client died because radios prevented her from sleeping while ill.[117] By the end of 1935 there were well over 300,000 receivers in Mexico and by the end of 1940 there were over 700,000.[118]

In a number of other areas radio developed along lines established during the Calles era. The SCOP and Mexican military continued to use radio to suppress rebellions and to consolidate a stronger presidency throughout the nation. Interestingly, much of the SCOP's efforts—and with the outbreak of World War II, the armed forces'—attention remained focused on the frontiers and coasts. The military, however, also increased the number of radio schools and devices in bases across much of the interior. Commercial and state broadcasters continued to broadcast abroad and to build closers ties with Central America. Emilio Azcárraga expanded his partnership with NBC in the United States, and Mexican stations continued to broadcast speeches from the president and other top party figures, also providing English translations, exhibiting the continued transnational goals of Mexican political radio.

The armed forces under Cárdenas continued to professionalize and increase its technological capabilities. In addition to importing tanks and new planes, the SGM

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[116] "Mexico City Adopts Hush Regulation," *Los Angeles Times*, 20 Dec. 1931, 1.

[117] "Mexico City Acts to Cut Noise, Aiming especially at Radio, "*New York Times*, 23 Mar. 1931, 8.

[118] Hayes states that there were 100,000 sets in 1930, 250,000 in 1935, and 450, 000 in 1940, *Radio Nation*, 33. I use Hayes's estimate for 1930 and then add the figures for U.S. radio sales to Mexico in the U.S. Commerce Department's, *The Foreign Commerce and Navigation of the United States* (1930-35) (Washington, DC: Government Printing Office, 1931-40). For most of this time the United States made up approximately 90 percent of radio sales to Mexico. The numbers for Mexican manufactured radios has not been calculated, though it only made up a comparatively miniscule percentage of radios in the country.

established new radiotelegraph and radiotelephone offices and built new devices. During the fiscal year of 1935-36, the SGM reported that it had built sixty portable radios, two receptors, and two transmitters. The military sent and received just over 388,000 messages. The military established new transmission schools among a number of military camps spread across the country; pictures of them fill the pages of the SGM *Memorias* provided to congress. After becoming Secretary of War and Marine in 1937, future president Manuel Avila Camacho praised a regional commander in Aguascalientes who convinced the manager of local commercial station XEBI —with strong cooperation with the local authorities—to broadcast the *Hora Cultural Militar*. Two years later, General Edmundo M. Sánchez gave a radio address as Secretary of Militar Action of the PRM in favor of Avila Camacho's candidacy for president. In 1937 the SGM graduated over forty radio specialists, and the SCOP graduated similar numbers. The navy also had bases under construction in the Southern Territory of Baja California and the state of Guerrero. [119] Military professionalization and technological advancement increased further with U.S. aid and cooperation during World War II as fears of German espionage in Mexico once again filled newspapers in both countries.

The SCOP continued to work at interconnecting central Mexico and the frontiers. Indeed, Secretary of SCOP Francisco J. Mújica stated in 1938 that the department was giving special attention to linking the Baja California Peninsula and the Territory of Quintana Roo to Mexico City "in cooperation with the general plan of the government

[119] Andrés Figueroa, *Memoria . . . por el Secretario de Guerra y Marina . . .1935-1936* (Mexico City: Talleres Gráficos de la Nación, 1936), 89; Manuel Avila Camacho, *Memoria. . . por el Secretario de Guerra y Marina . . .1937-1938* (Mexico City: D.A.P.P, 1938), 5, 110; Melquiades Angulo, *Memoria de la Secretaría de Comunicaciones y Obras Publicas 1de septiembre de 1939 - 31 de agosto de 1940* (Mexico City: DAPP, 1940), 118.

to incorporate these territories into national activities."[120] In early January 1936 it eliminated fees for official radio and wire communications between the territories of Quintana Roo and Northern and Southern Baja California with authorities in other parts of the mainland. SCOP employees revamped the radio stations in Xcalak and Carrillo Puerto, Quintana Roo. They also built two 500-watt stations in Tuxtla Gutiérrez, Chiapas, and Oaxaca, Oaxaca. The department's workshop in Chapultepec was constructing two similar stations for Mérida, Yucatán, and Ensenada, Northern Territory of Baja California.[121] The following year they placed new Mexican-built transmitters for the stations in Guaymas, Hermosillo, La Paz, Mérida, Tapachula, and another for Coahuayana, Michoacán, "to keep the local public informed."[122]

The SCOP also increased its international communications capabilities with its longtime partners. Between 1936 and 1940, the department initiated radiotelephone—radio voice—communications with El Salvador, Cuba, and Guatemala. The Chapultepec station increased the efficiency of its radiotelephone communications with the United States, Europe, and Japan. Likewise, XEFO/XEUZ and other stations affiliated with the PRM station, and commercial stations including XEW and XEQ, participated in a number of Panamerican projects, adding a more cooperative transnational element to their broadcasts during the U.S. Good Neighbor era and World War II. In 1939 the party station regularly broadcast the "Hora de Difusión Panamericana," during which they transmitted programs influenced by, and sometimes

[120] Francisco J. Mújica, *Memoria de la Secretaría de Comunicaciones y Obras Publicas de septiembre de* 1937 - *agosto de 1938* (Mexico City: D.A.P.P, 1938), 13, 25

[121] Francisco J. Mújica, *Memoria de la Secretaría de Comunicaciones y Obras Publicas de septiembre de 1936 a agosto de 1937* (Mexico City: DAPP, 1937), 23-27; Mújica, *Memoria . . . 1937-1938*, 28.

[122] Angulo, *Memoria . . . 1939-1940*, 117.

played by, artists from other Latin American nations.[123] International partners XEW and NBC, in addition to the Canadian Broadcasting Corporation, exchanged programs that spread both Mexican and American programs across much of North America, the Caribbean, and parts of Central and South America.[124]

Although the numbers of radio specialists continued to grow, the innovators of Mexican wireless continued to serve in prominent state and commercial communications positions. The Azcárragas' broadcasting franchise continued to expand, including not only the chain affiliated with NBC, but another, headed by XEQ, affiliated with CBS. They also maintained a cozy relationship with members of the ruling party, a relationship that has lasted to this day. José R. de la Herran, who co-founded SGM station JH, built radio installations for the Mexican air force in the mid 1920s, and who had helped construct stations for CYB and CYL in 1923, the Oaxacan Light and Power Company station in Oaxaca in 1924, and Monterrey's XET in 1930, installed XEW and XEQ's powerful transmitters from 1934 to 1940.[125] General Guillermo Garza Ramos y Trillo, who had worked with De la Herran in the private and government sectors, worked in a number of high ranking positions in the Escuela Militar de Transmisiones during the Cárdenas years. He would serve as the Comandante General de Transmisiones for Baja California during World War II starting in 1942, and by 1955 he had become director of the military school he had worked for

[123] "Hora de Difusión Panamericana," *El Nacional*, 24 Nov. 1939, 6; "XEFO XEUZ," *El Nacional*, 28 Nov. 1939, 6.

[124] "Una importante transmisión de la XEW a Norte Americana y Canada, *El Nacional*, 29 Nov. 1939, 7; "Un acontecimiento internacional en México," *El Nacional*, 29 Nov. 1939, 7.

[125] Instituto Politecnico Nacional, Generación 70-74, "Don José R. de la Herran, Pionero de la Radiodifusión mexicana," (Mexico City: Asociación Mexicana de Periodismo Cientifico, 1983), 9-13.

during the late 1930s.[126] Former *carrancista* communications official and former president of the LCMR, Modesto C. Rolland, became Cárdenas's Undersecretary of the SCOP. Felix Palavicini, the former *carrancista* official, editor of *El Universal*, and CYL partner founded XEN-*Radio Mundial*, a state-approved commercial station that provided international and national news in addition to popular and classical music concerts aired in tandem with state and commercial stations. He would subsequently go on to become a popular XEW commentator in the 1940s.[127] Radio specialists tended to have long professional lives despite changes in administration and policy, and along with their careers, the radio industry they helped create was maturing.

**Conclusion: Radio and the Making of Modern Mexico**

It was during the Calles years, including the Maximato, that broadcasting became an essential component of state planning and propaganda. Although Carranza, and especially Obregón, had promoted their own strain of populist politics before—a necessary requirement for any leader of the Revolution—Calles brought populism to a whole new level, solidifying cross-class and corporatist alliances that brought larger numbers of people in contact with the Mexican state. Broadcasting was crucial to this endeavor. Government officials helped expand the number of radios to schools, labor groups, and government agencies, while middle-class and wealthy residents increasingly bought their own devices. Bars and other businesses also acquired their own receivers to play for patrons and employees. State stations, including the PNR

[126] Eugenio Méndez Docurro, *Gral. Guillermo Garza Ramos y Trillo*: *Ejemplo de honor, lealtad y patriotismo* (Mexico City: IMC/IME, 1994),

[127] Medina Ávila and Vargas Arana, *Nuestra es la voz*, 132; Herbert Cerwin to John C. Royal, Mexico City to New York City, c. 1943, box 111, fold. 48, Royal Papers, NBC Collection, WHS.

operation, were not the favorite channels of most Mexicans, and efforts to get radio into rural communities faced numerous problems, not least of which was a lack of electricity. But even facing these seemingly unsurpassable barriers, radio reached larger and larger numbers of people in the late 1920s and early 1930s. And many people did listen to the SEP and PNR stations, especially important political events and speeches. In order to make sure that government messaging was reaching public audiences, PNR legislators produced laws that forced commercial stations to air pro-government propaganda, and that restricted messages contrary to the desires of the state. Government officials and the owners of prominent stations also collaborated on the airing of music that was "Mexican" in an attempt to build a stronger national culture, one that was more loyal to the revolutionary state and to Mexican commercial products. This partnership, and more importantly, the technology of radio broadcasting, allowed for this expansion of populist politics and nationalist sentiment, both of which Cárdenas built upon as he brought the political use of radio to new heights during the expulsion of Calles from Mexico in 1936 and the oil expropriation of 1938. Broadcasting had become a permanent part of government and Mexican culture.

# Conclusion

## Forty Years of Radio Technology

On the night of March 18, 1938, an important state message interrupted regular radio broadcasting. At 10:00 p.m. President Cárdenas approached a government microphone and declared that a number of foreign petroleum companies had consistently and blatantly defied the laws of the nation and, for that, the state and workers were taking over their operations. Mexicans high and low celebrated the *grito* while U.S. and British oilmen, some of whom listened to the English translation, steamed in disbelief. The British recalled their diplomat and a number of American entrepreneurs clamored for swift retribution. Although Cárdenas, before and after, attempted to calm U.S. sentiments in other radio addresses, some residents of Mexico and the United States feared another rebellion or intervention.[1]

They got the former when longtime San Luis Potosí strongman General Saturnino Cedillo launched an insurrection just days after the oil declaration. Angered over Cárdenas's agrarian policies and efforts to weaken the general's grip on power in his home state, Cedillo hoped to capitalize on animosities by persuading other generals, together with U.S. businessmen, to join him.[2] And like so many prominent rebels against the Mexican political order, he attempted to incorporate radio as a tool in his movement. Indeed, he had been involved in a previous scandal involving radio

[1] Lázaro Cárdenas, "Expropiación de la industria petrolera: El Sr. Presidente dirige transcendental mensaje al pueblo de la república," *El Nacional*, 19 Mar. 1938, 1; Stephen R. Niblo, *War, Diplomacy, and Development: The United States and Mexico*, 1938-1954 (Wilmington, DE: SR Books, 1995), 36; Hayes, *Radio Nation*, 83-85; Santiago, *The Ecology of Oil*, 338.

[2] For more on Cedillo, see Dudley Ankerson, *Agrarian Warlord: Saturnino Cedillo and the Mexican Revolution in San Luis Potosí* (DeKalb: Northern Illinois University Press, 1984). See also the conclusion of Navarro, *Political Intelligence*, 262-65.

messages and a plot to kidnap President Ortiz Rubio. At one point Cedillo managed to broadcast from a U.S. border station in McAllen, Texas, just across the Rio Bravo from Reynosa, accusing Cárdenas of orchestrating a "communist dictatorship."[3] But within Mexico, federal operatives quickly discovered his wireless operations; worse for Cedillo, few people outside of a smattering of foreign businessmen and residents in San Luis Potosí genuinely supported the uprising, which the army quickly put down. [4]

In terms of wireless development, the oil expropriation and the Cedillo rebellion show the complicated growth and evolution through which Mexican radio had passed in the preceding forty years. Cárdenas amped up his broadcasts on both the rebellion and the expropriation, appealing to a larger audience than preceding presidents and with much greater means. Responses to Cárdenas's oil expropriation broadcast came from every region of Mexico. And more than any previous point in Mexican history, it was clear that a professional army dominated military radio, and that party leaders and aligned businessmen controlled broadcasting. These trends stemmed directly from the policies of Porfirio Díaz and the actions of preceding revolutionary leaders.

Since the days of the Díaz administration, officials had used radio as a military tool and as a way of increasing state presence throughout the country. Connecting the frontier territories to the center of the nation loomed as an especially important goal, and it remained so throughout the revolutionary era. Outside of experiments off the coast of Veracruz and in Chapultepec at the turn of the twentieth century, German specialists, SCOP employees, and military officers had built the first radiotelegraph towers in the Baja California peninsula and the Territory of Quintana Roo. Although

[3] Niblo, *War, Diplomacy, and Development*, 45-47.

[4] "Como se comunicaba el General Cedillo," *El Universal*, 21 May 1938, 1, 10; Medina Ávila and Vargas Arana, *Nuestra es la voz*, 176-77.

briefly interrupted by the Revolution, especially after the assassination of Madero, every single group of rebel victors, from Madero to Cárdenas, expanded wireless endeavors in the fringe territories and further increased Mexico's radio capabilities in Central America. Carranza used World War I as a means to gather more powerful equipment from Germany, fueling unstable relations with the United States, but greatly expanding his administration's reach via electronic communications. When World War II broke out in 1939, fears of German spies and poorly defended frontiers continued to worry the presses and governments of both Mexico and the United States. But by this time the Mexican state was more firmly behind the United States, and Mexico's communications system was more advanced, even if it paled in comparison to that of the Northern Colossus. Still, the drive for national unification and state expansion, and the use of radio to accomplish these goals, were ongoing processes.

Radio had a significant impact on the Mexican Revolution, and, in turn, the Revolution dramatically affected wireless development in Mexico. Following the onset of violence in 1910, the technology in question had become an important component of rebel and state communications, increasing correspondence capabilities between leaders and with foreign businessmen and government officials. Radio also became a common component of military intelligence gathering. Messages sent and overheard over the airwaves changed the course of some of the Revolution's most significant battles. All sides of the conflict used wireless, and it became an essential component of Constitutionalist control as they attempted to consolidate their power and influence from 1915 to 1920. Venustiano Carranza and his cadre of advisors propagated new decrees and legislation that provided a stringent nationalist framework for radio, a

response to the Revolution and U.S. military interventions during the invasion of Veracruz and the Pershing Expedition. The laws provided a legal framework for confiscating illegally operating foreign stations and those of their domestic enemies.

Despite attempts to control wireless, insurrectionists from Adolfo de la Huerta in 1924 to Saturnino Cedillo in 1938 found ways to use the technology to help organize their movements. However, the Mexican army, which increasingly became more professionalized during the 1920s, dominated the military use of radio following the De la Huerta rebellion. The increased technological superiority together with an ever consolidating state hegemony, even if far from complete, helped presidents including Calles, Portes Gil, Ortiz Rubio, Rodríguez, and Cárdenas, put down armed challenges to their authority. Although divisions and conspiracies remained a common component of politics, radio became an important tool that helped maintain the Sonoran Dynasty and the subsequent single-party system.

Broadcasting became another essential component in building government support, amplifying state propaganda, and consolidating control. State leaders and wealthy entrepreneurs understood the value of controlling the airwaves, especially in a society that had survived years of civil war and factionalism, and they compromised to establish a form of shared power. What better way to funnel a chaotic and popular revolution than with broadcasting—the world's greatest megaphone? More people were incorporated into the governing project, but voices of political dissent and religious proselytizing more often than not found their operations quashed. The revolutionary leaders in the national arena shaped these authoritarian tendencies, using force, favors, and legislation. They constructed their own broadcasting operations and

then increasingly turned to more successful commercial-station owners to carry their messages.

When broadcasting became a reality during the presidency of former *carrancista* general Alvaro Obregón, the president opened up the medium to private development, but with serious restrictions on what could be aired. He also initiated state broadcasting, which became a major component of radio from 1924 to 1938. Continuing rebellion forced state leaders to ban all radiocasts that attacked the government, increasing authoritarian trends in the name of stability and patriotism. The partnership between the government and the most prominent radio station owners emerged as a key component of modern broadcasting in Mexico and reinforced the post 1929 one-party system and the monopolization of commercial broadcasting, trends that have continued to have a significant impact on Mexican society.

This consolidating and authoritarian strain in Mexican radio should not be surprising. The technology evolved in a period when revolution had fractured the state and when the victors raced to put it back together while incorporating larger bases of support. To figures including Calles and Cárdenas, broadcasting had to be subjugated to the state's terms for matters of national security, national development, and political need, even while these presidents promoted the growth of the commercial sector. Even without revolutions, most forms of mass media have tended to start out relatively open and democratic, and then become more authoritarian and closed over time.[5] In the United States, for example, three corporations—the National Broadcasting Company, Columbia Broadcasting System, and the American Broadcasting Company—dominated radio broadcasting and television for decades. A handful of corporations still controlled

[5] Wu, *Master Switch*, 5-6.

the most powerful U.S. media networks as of 2013.[6] Radio proved especially prone to state and corporate control. As journalist and technology specialist Timothy Wu recently wrote about U.S. broadcasting, "radio becomes the clearest example of a technology that has grown into a feebler, rather than stronger, facilitator of public discourse."[7] This conclusion holds true for Mexico as well, albeit under different, and even more limiting, circumstances. After a violent revolution, powerful state and corporate transmitters quickly drowned out their amateur counterparts, which grew in number, but waned in influence. As most people contented themselves with owning a receiver to hear the news, advertisements, and entertainment programs, the proportion of listeners to transmitters dramatically increased. In comparison to their American counterparts in the north, or even their Argentine counterparts to the south, the democratic tendency—think of amateur or HAM operators communicating with each other within and across political boundaries—in radio had a smaller window in which to establish itself because it was interrupted by warfare and a revolutionary state bent on reconsolidating control.

The first forty years of radio development in Mexico displays similarities and differences with other nations and empires. Using wireless offices to connect frontier regions greatly mirrored how agents from Great Britain, France, and Germany relied on radio to build links with their own island possessions and far-flung colonies. The United States government similarly incorporated radio devices to place frontier

[6] Renown linguist and media critic Noam Chomsky has addressed this subject of media consolidation in the United States for years, see Edward S. Herman and Noam Chomsky, *Manufacturing Consent: The Political Economy of the Mass Media* (New York: Pantheon Books, 1988); Noam Chomsky, *Necessary Illusions: Thought Control in Democratic Societies* (Boston: South End Press, 1989); Noam Chomsky and David Barsamian, *Propaganda and the Public Mind: Conversations with Noam Chomsky* (Cambridge, MA: South End Press, 2001).

[7] Wu, *Master Switch*, 39.

territories under its political control, including Alaska and Hawaii. U.S. military officers and businessmen also established stations in the Philippines, Central America, Cuba, and Puerto Rico. Unlike these other powers, however, Mexico consistently relied on foreign specialists and technology. Its education and manufacturing institutions paled in comparison to the more industrialized nations. All of the aforementioned countries also used wireless to advance their navies, of which Mexico had by far the smallest. But, in comparison to Central America and many other parts of Latin America, Mexico was economically powerful and technologically advanced.

World War I caused all states involved to place radio under strict government supervision. In the United States, radio was largely a commercial and private affair, but as with other nations, wireless activities were greatly restricted, supervised, and largely taken over by the state during the conflict. Even when the U.S. congress returned radio to the hands of businesses and hobbyists, it worked to create new stringent codes, guidelines, and state oversight. The government also supported the formation of large private corporations that could informally spread American political, as well as economical, interests. Britain and Germany subsequently made radio a state-directed medium. But a lack of serious studies about the effects of early wireless developments around the world still makes any sort of global comparison difficult.

Like its French, Austrian, Argentine, and Brazilian counterparts, Mexican broadcasting was a mixed system.[8] That is to say, the government promoted both state and private stations. Obregón's decision to allow commercial stations was influenced by a number of factors. He himself was an inventor and capitalist and supported such

[8] See Neulander, *Programming national Identity*; Claxton, *From Parsifal to Perón*; McCann, *Hello, Hello Brazil*. Britain and Germany followed more state-controlled approaches to broadcasting, whereas the United States pushed a private-enterprise system.

endeavors, a number of his most important advisors backed the idea, the government had little money to establish a successful radio network, private experimental operations were hard to stop and had advanced the field, and the state was still fragile with other important tasks at hand. Another likely reason was the increasing presence of U.S. broadcasting and radio equipment. Receivers already started pouring southward over the lengthy U.S. border in 1923 and 1924, and Mexican listeners could pick up dozens of American stations. If the government was going to successfully establish its own cultural programs to counter U.S. programming, it would need the assistance, money, and connections of Mexico City and Monterrey capitalists. A similar argument has been made about the reasoning behind why the administration of Getúlio Vargas turned to commercial broadcasters in Brazil, except that in this case, the threat came from radio-savvy Argentina.[9]

But until the last year of Cárdenas's presidency, state agents kept a strong and direct presence in broadcasting. At its height, the government operated fourteen stations and often worked in partnership with the largest commercial broadcasters. Unlike Argentina and Brazil, Mexico had government broadcasting stations that not only operated but that were influential in the 1920s, a result of Mexico's unique revolutionary circumstance and the correlating rise of populist and corporatist politics, which also came to Mexico earlier. Like state official in France, Brazil, and Argentina, Mexican intellectuals and bureaucrats attempted to use radio to educate and bring "high culture" to the greater population. Many of these educators disliked the popular music broadcasts on stations like CYB or CYL, but some intellectuals and radio specialists were less critical; and Government broadcasting incorporated regional, popular, and

[9] McCann, *Hello, Hello Brazil*, 23.

even foreign music, as much, if not more, than the original commercial stations. Classical music dominated almost all stations in the 1920s, even if intermixed with corridos, canciones yucatecos or trios, tangos, jazz, and fox-trots. But by the 1930s Azcárraga, with the assistance of NBC and CBS, came to monopolize more of the popular musicians, largely by providing better facilities and out paying what the competition could offer. State stations relied on advertising at times, but it was never their main source of income, and the government, unlike in France, could not successfully implement a tax to fund the government stations. Since the Azcárraga family had proved a longtime and successful partner of the government since 1923, and recognizing the huge success and reach their operations had obtained, the PNR, together with its successors, the PRM and PRI, decided to cooperate with them instead of competing with them.

That partnership continues to the present day. Indeed, Emilio Azcárraga, his son Emilio Azcárraga Milmo, and grandson Emilio Azcárraga Jean became the most successful electronic media owners in Latin America, only recently surpassed in wealth and influence by Carlo Slim, who has come to dominate private telecommunications in Mexico. The Azcárraga family not only retained its prominent position in commercial radio during the 1940s but also in television from the 1950s to the 1990s as owners of Televisa. They possessed approximately 80 percent of television viewership in Mexico and a similar percentage of advertising revenue, in addition to state funding.[10] The family did not always agree with the policies of reigning presidents, whether it was Calles's war against the cristeros, or attempts to tax and regulate television, but they still remained stalwart allies of the party. Azcárraga Milmo won notoriety for his

[10] Lawson, *Building the Fourth Estate*, 18.

blatant support of the PRI in the 1990s, stating that Televisa was a "part of the government system," and that he himself was the "number two *priista* in the country."[11]

Nonetheless, the media became more open in the late twentieth and early twenty-first century than it was in the mid-1900s. Following the 1985 earthquake, which killed over ten thousand people in Mexico, radio shows, reflecting an overall trend in Mexico City society, more openly chastised the government. Critical talk shows obtained larger audiences and, in turn, greater revenues. These stations forced government-aligned operations to rethink their strategies. Political reforms in the 1990s and the death of Emilio Azcárraga, Jr., also opened up radio and media in general.[12] Still, complaints continue. The election of Enrique Peña Nieto in 2012 was mired by stories that argued that Televisa, led by Azcárraga Milmo's son and namesake, had unethically partnered with the candidate.[13] If so, this partnership between the Azcárragas and government officials began in the 1920s when CYL aired Calles's address to the nation as a presidential candidate after the station proved its loyalty during the De la Huerta Rebellion.

The Mexican broadcasting industry originally sprang from the merger of Constitutionalist radio specialists with educated private experimenters and businessmen influenced by U.S. broadcasting trends. However, the state remained an important

[11] Ibid, 30. A priista is a supporter of the PRI.

[12] Ibid.

[13] Jo Tuckman, "WikiLeaks reveals US Concerns over Televisa-Peña Nieto Links in 2009," *The Guardian*, 11 Jun. 2012, http://www.guardian.co.uk/world/2012/jun/11/wikileaks-us-concerns-televisa-pena-nieto, accessed 28 Dec. 2012; Jo Tuckman, "Mexican Media Scandal," *The Guardian*, 26 Jun. 2012, http://www.guardian.co.uk/world/2012/jun/26/mexican-media-scandal-televisa-pri-nieto, accessed 28 Dec. 2012; Jenaro Villamil, "Proyecto Jorge: El plan Televisa-Peña Nieto para alcanzar la presidencia," *Proceso*, 8 Sept. 2012, http://www.proceso.com.mx/?p=319353, accessed 28 Dec. 2012. There were numerous other reasons for Peña Nieto's victory, including security concerns, growing animosity towards the rule of the rightist Partido Acción Nacional (PAN), and fears that the leftist candidate Andrés Manuel López Obrador would be destabilizing if in presidential office.

participant, mostly because of the continued (and not altogether erroneous) perception of radio as a security risk, and because of the history of state-controlled radiotelegraphy operations in matters of governance and the building of consensus. A number of state officials also feared the domination of the airwaves by the country's northern radio provider, at least until a bilateral move toward accommodation between the United States and Mexico followed the oil nationalization, continuing financial difficulties, and the start of World War II.[14] Not all state involvement was shunned by Mexican station owners. Many of them embraced, if reluctantly at times, political participation, government collaboration, and state protectionism. Likewise, the official party favored the creation of vast commercial broadcasting chains, which greatly expanded the reach of government discourse.[15] As the single-party system became more firmly entrenched under the PRM and the PRI, and as Mexico rebuilt stronger partnerships with the United States during the Good Neighbor and World War II eras, the state reduced its direct broadcasting operations. But the partnership first constructed in the 1920s remained. Built upon decades of communications development, Mexico, the modern nation born of corn, eagles, serpents, cacti, silver, blood—and radio—had begun.

[14] Niblo, *War, Diplomacy, and Development*, 35-57.
[15] "Comentemos el 'encadenamiento'," *El Nacional*, 13 Dec. 1939, 7.

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AGN Archivo General de la Nación de México
- Gobernación
- Hemeroteca
- Particulares
- Presidentes

AHDF Archivo Histórico del Distrito Federal
- Ayuntamiento

AHSDN Archivo Histórico de la Secretaría de la Defensa Nacional
- Biblioteca
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AHSR Archivo Histórico Genaro Estrada de la Secretaría de Relaciones Exteriores
- Diplomático
- Consular

AHUNAM Archivo Histórico Universidad Nacional Autónoma de México
- Amado Aguirre
- Hemeroteca Nacional
- Biblioteca Nacional

BTTSCT Biblioteca Telecomunicaciones y Telegrafía de la Secretaría de Comunicaciones y Transportes
- Manuscritos
- Revistas
- Memorias por el Secretario de Comunicaciones y Obras Públicas

CEHM Centro de Estudios de Historia de México, CARSO
- Fondo Manuscritos del Primer Jefe del Ejército Constitucionalista, 1889-1920
- Fondo Recortes de Periódico Oficialía Mayor de Hacienda

FAPECFT Fideicomiso Archivos Plutarco Elías Calles y Fernando Torreblanca

Archivo Plutarco Elías Calles
Fondo Plutarco Elías Calles
Fondo Elías Calles
Fondo Presidentes
Archivo Fernando Torreblanco
Fondo Espías
Fondo Fernando Torreblanco
Archivo Joaquín Amara Camaro

NLBL Nettie Lee Benson Library, University of Texas at Austin
Mexican Revolution Newspaper Collection

UI Universidad Iberoamericana, Acervos Históricos
Colección Porfirio Díaz

USNA U.S. National Archives
Record Group 59

WHS Wisconsin Historical Society
National Broadcasting Company Records

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