

no ambition to build its own communications network.<sup>97</sup> Principally a manufacturer, GE viewed the alternator as a product to be marketed and sold to those interested in continuous wave transmission.<sup>98</sup> The end-use of its product was a matter of indifference to GE.

By 1915, American corporations owned the patents to continuous wave technology—the key to wireless voice transmission. Conspicuously absent from the group of companies pursuing continuous wave technology were American Marconi and its parent, British Marconi. In 1912, American Marconi dominated the U.S. wireless communication marketplace.<sup>99</sup> Its technological supremacy, however, was a different matter. Marconi failed to see until too late that the future of wireless transmission lay in continuous wave transmission.<sup>100</sup> Instead, American Marconi clung too long to its spark technology, which was effective in telegraphic transmissions but badly outmoded when used for wireless telephony.

The outbreak of World War I derailed Marconi's belated efforts to catch up, as the war effort increasingly absorbed the company's resources.<sup>101</sup> Negotiations by American Marconi to purchase GE's alternator-based continuous wave technology also were disrupted by the war, leaving the Marconi companies temporarily without access to the next generation of wireless technology.<sup>102</sup> As a result, despite American Marconi's market dominance, its technological position in 1915 was tenuous. The British and American Marconi companies for the first time found themselves at a technological disadvantage to the Americans.

97. *Id.* at 253.

98. *Id.*

99. *Id.*

100. *Id.* at 254.

101. *Id.* at 254–55.

102. *Id.* at 254.

THE ASCENT OF  
DANIELS AND HOOPER

During this same period, the U.S. Navy also underwent significant transformation both in its acceptance and integration of wireless. Beginning in 1912, two naval officers began to figure predominantly in the drive to integrate radio into the operations structure of the Navy: Josephus Daniels and Stanford C. Hooper. Daniels served as Woodrow Wilson's Secretary of the Navy from 1913 to 1921.<sup>103</sup> During his tenure, he tirelessly advocated not only the Navy's integration of wireless, but also the complete takeover of wireless by the Navy. Though never able to bring wireless under direct Navy control, Daniels played a critical role in the implementation of foreign ownership restrictions.

Stanford C. Hooper is widely considered the father of naval radio.<sup>104</sup> Tutored in the art of wireless communication since childhood, Hooper passionately advocated integrating wireless into the Navy.<sup>105</sup> Using ingenious methods and unflagging insistence, Hooper was ultimately able to overcome the Navy's institutional resistance to radio.<sup>106</sup> After successfully integrating radio communications into the fleet's operations between 1912 and 1914, he centralized and standardized the Navy's network of shore stations.<sup>107</sup> By the beginning of World War I, Daniels and, primarily, Hooper had transformed the Navy's wireless network from an ineffective hodgepodge to an integrated system that significantly enhanced the Navy's fighting capabilities. The Navy's monopolistic ambitions to control the radio spectrum, however, remained unrealized, though not

103. *Id.* at 258.

104. L. S. HOWETH, HISTORY OF COMMUNICATIONS—ELECTRONICS IN THE UNITED STATES NAVY xiv (Bureau of Ships and Office of Naval History 1963).

105. DOUGLAS, *supra* note 3, at 260.

106. *Id.* at 261-66.

107. *Id.* at 266.

forgotten.

The final element of transformation within the wireless industry in the critical period from 1910 to 1915 was the realignment of the relationship between the Navy and private enterprise. While wireless' first stage was characterized by mutual suspicion and antagonism between the clashing cultures of the Navy and the entrepreneurial inventors of radio technology, the second stage was marked by increased synergy and reliance. The corporate cultures of AT&T and GE had replaced the temperamental entrepreneurs such as De Forest and Fessenden. The Navy, for its part, had grown in its appreciation of wireless' potential. Hooper and Daniels symbolized a new generation of naval officer who was comfortable with radio and willing to work with industry to advance the technology, especially once World War I began.<sup>108</sup>

#### THE EFFECTS OF WORLD WAR I

World War I profoundly changed America's perception, both militarily and civilly, of the wireless industry, dramatically affecting the course of its regulation. To the American public, wireless was, before the war, a curious abstraction that had pervaded the society. As with all new technologies, there was a lag between its introduction and the subtle realization of its transformative impact. World War I made tangible the many uses of radio. From a civil perspective, wireless no longer was simply a novel form of communication, but a potential tool of propaganda and political influence.<sup>109</sup> Militarily, wireless' threat to national security became real. It had become possible to transmit from one continent to another vital information, such as ship movements; and if such information could be transmitted instantly across the Atlantic, it also could be transmitted

108. *Id.* at 267-68.

109. *Id.* at 268.

instantly to the newest and deadliest naval weapon prowling the Atlantic, the German *Unterseeboot*. In fact, U-boats possessed effective wireless systems used to communicate with their bases for orders and intelligence reports.<sup>110</sup>

This civil and military sensitivity to wireless' manifest strategic significance rose with America's desire to avoid the European war. Britain declared war on Germany on August 4, 1914. The next day, President Woodrow Wilson issued a proclamation of American neutrality, which included censorship and neutrality regulations on wireless stations operating within the continental U.S.<sup>111</sup> These regulations, authorized by the emergency powers granted the President two years earlier by the Radio Act of 1912,<sup>112</sup> prohibited private wireless licensees from transmitting or delivering any non-neutral messages or from acting with any bias towards a belligerent during the hostilities.<sup>113</sup> Wilson delegated responsibility for enforcing these restrictions to the Naval Radio Service, with the Secretary of the Navy empowered with broad discretion to enforce the neutrality regulations as he saw necessary.<sup>114</sup> It was a charge that Secretary Daniels and the Navy zealously pursued, for it was their opportunity at last to control the airwaves.<sup>115</sup> What began as a mandate for censorship, soon evolved into a concerted effort for complete naval control of wireless.

110. JOHN TERRAINE, *THE U-BOAT WARS, 1916-1945*, at 30-33 (G.P. Putnam's Sons 1989).

111. Exec. Order No. 2011 (Aug. 5, 1914), *reprinted in* 17 *A COMPILATION OF THE MESSAGES AND PAPERS OF THE PRESIDENTS, 1798-1915*, at 7962.

112. 37 Stat. 302, § 2.

113. Exec. Order No. 2011, *supra* note 111.

114. *Id.*

115. HOWETH, *supra* note 104, at 227.

NEUTRALITY, U-BOATS,  
AND THE BULLARD BILL

Wilson's imposition of these neutrality and censorship regulations was problematic from the start because two of the primary belligerents—Germany and Britain—operated several of the largest and most powerful radio stations on the Atlantic coast of the U.S.<sup>116</sup> These stations were powerful enough not only to communicate with military and merchant ships at sea, but also to reach their native lands to consult with diplomats and military leaders.<sup>117</sup> To ensure that Wilson's neutrality regulations were followed, the Navy barred the transmission of all coded messages and dispatched censors to foreign-controlled, long-distance stations to monitor all incoming and outgoing messages.<sup>118</sup>

For Germany, the neutrality restrictions were particularly onerous. Britain, at the outbreak of hostilities with Germany, dredged up the latter's transatlantic cables and severed them, leaving Germany with only wireless as a sovereign means of communication with the U.S.<sup>119</sup> Unlike Britain, Germany consequently had no way to communicate confidentially with its diplomats in the U.S. unless it was allowed to transmit in code. The U.S., acknowledging this unfair disadvantage, allowed Germany to transmit in code so long as the American censors were given copies of the code books and the encrypted messages did not concern military matters.<sup>120</sup>

Despite these measures, the foreign-controlled stations along the Atlantic generated suspicion within the U.S. military and civilian communities. Given the ability of these long-range

116. DOUGLAS, *supra* note 3, at 269.

117. *Id.* at 269.

118. *Id.* at 227-28.

119. BARBARA W. TUCHMAN, *THE ZIMMERMANN TELEGRAM* 10-11 (Macmillan Co. 1966).

120. DOUGLAS, *supra* note 3, at 270.

wireless stations to monitor ships leaving U.S. ports and to communicate this information to ships at sea, constant allegations surfaced that these stations, particularly the German ones, were eluding the censors through clever schemes that enabled the stations to transmit vital military information.<sup>121</sup> National paranoia concerning the mysterious Sayville station grew as Germany relied more on submarine warfare. On a single day in September 1914, Britain lost three cruisers and 1,400 sailors to attacks by one U-boat.<sup>122</sup> The following month, Britain lost another cruiser and a battleship.<sup>123</sup> Then Germany directed its submarine campaign on neutral and civilian vessels. On February 19, 1915, a Norwegian ship was sunk.<sup>124</sup> During this time, Telefunken's station at Sayville was particularly clouded in controversy and a prime suspect of having transmitted information concerning ship movements—if not directly to the U-boats, then indirectly to Germany. Adding to this suspicion, Telefunken upgraded the Sayville station in April 1915, trebling its power from a 35-kilowatt alternator to a 100-kilowatt one and constructing an aerial consisting of three 500-foot towers.<sup>125</sup>

Between April and May of 1915, the monthly gross tonnage of British merchant shipping lost to enemy action nearly quadrupled.<sup>126</sup> On May 1, an American ship was torpedoed.<sup>127</sup> Six days later, when the British liner *Lusitania* was sunk off Ireland, 1,198 on board, including 124 Americans, perished.<sup>128</sup> On August 19, another British liner, the *Arabic*, was sunk with four Americans on board; then, on September 1,

121. *Id.* at 270-72.

122. DUPUY & DUPUY, *supra* note 4, at 1035.

123. *Id.*

124. *Id.* at 1049-50.

125. DOUGLAS, *supra* note 3, at 272-73.

126. TERRAINE, *supra* note 110, at 766.

127. DUPUY & DUPUY, *supra* note 4, at 1049-50.

128. *Id.*

Germany announced a cessation of its unrestricted submarine war.<sup>129</sup> By February 21, 1916, however, Germany announced that it would extend its submarine campaign to armed merchantmen.<sup>130</sup> On March 24, a U-boat sank the *Sussex*, a French ferry on which a number of Americans were travelling across the English Channel.<sup>131</sup> On April 19, President Wilson gave Germany an ultimatum: The U.S. would sever diplomatic relations unless Germany were “immediately [to] declare and carry into effect its abandonment of the present method of warfare against passenger and freight carrying vessels.”<sup>132</sup> Germany response to the ultimatum, delivered on May 5 by wireless from Berlin to the Sayville station, was to order its submarines not to sink merchant ships “without warning and

129. *Id.* at 1050.

130. *Id.* at 1056.

131. *Id.* The depredations of the radio-equipped U-boats came to symbolize how, in the course of accomplishing their immediate military objectives, the new technologies of warfare, so powerfully indiscriminate in their carnage, threatened to destroy much of what European civilization had achieved. For example, one passenger on the *Sussex* was Spain’s greatest living composer, Enrique Granados. He had journeyed to New York for the Metropolitan Opera’s first performance of his masterpiece, the opera *Goyescas*. The composer was so acclaimed by American critics that President Wilson requested him to give a recital at the White House before returning to Spain. To meet the President’s request, Granados had to cancel a voyage that would have taken him directly to Spain. Instead, he sailed for England. Although a lifeboat plucked Granados from the frigid water of the English Channel, he dove back into the water to rescue his wife. The two were last seen clinging to a small raft. *Granados May Be Safe, Hope That Composer and His Wife Are on a Hospital Ship*, N.Y. TIMES, Apr. 1, 1916; *Sussex Survivor Returns*, N.Y. TIMES, May 23, 1916, at 2. Six weeks later, the Metropolitan Opera held an allstar performance to benefit the Granados’ six orphans, the youngest only three years old. *\$11,000 for the Granados, Six Great Artists at Benefit for Late Composer’s Children*, N.Y. TIMES, May 8, 1916, at 9.

132. Special Message (Apr. 19, 1916), *reprinted in* 17 A COMPILATION OF THE MESSAGES AND PAPERS OF THE PRESIDENTS 8121; Note to Germany on the Sinking of the French Steamship *Sussex* in the English Channel (Apr. 19, 1916), *reprinted in id.* at 8125.

without saving human lives unless the ship attempt to escape or offer resistance.”<sup>133</sup> In less than a year, this order would be rescinded.

Suspicion had turned to certainty in the public’s mind that the U-boats were receiving reports of ship movements from German-controlled wireless stations in the U.S. As an alternative response to the submarine war, an interdepartmental committee chaired by Navy Captain W.H.G. Bullard drafted a radio regulation bill, introduced in Congress on December 22, 1916, that proposed for the first time that the government restrict the ownership of the principals of domestic licensee corporations.<sup>134</sup> The proposed restrictions would prohibit alien officers and impose a maximum one-third limit on alien directors and stockholders.<sup>135</sup> In addition, the bill would prohibit the granting of radio licenses to foreign governments or their representatives.<sup>136</sup>

Congress held hearings on Bullard’s bill in January 1917. Congress did not reserve its hostility for German-controlled companies. American Marconi, which had an alien officer and was one-third British-owned, was questioned about the extent to which it was controlled from abroad.<sup>137</sup> American Marconi’s representatives, with good reason, believed the company to be the target of the proposed legislation.<sup>138</sup> American Marconi was the largest owner of American radio stations

133. Germany’s Reply to President Wilson’s Note on the Sinking of the *Sussex* (May 5, 1916), reprinted in *id.* at 8127, 8129.

134. H.R. 19350, §§ 7, 9, 64th Cong., 2d Sess. (1916).

135. *Id.* § 7.

136. *Id.* See also *Hearings on H.R. 19530 Hearings Before the House Comm. on Merchant Marine and Fisheries*, 65th Cong., 1st Sess. 77–78 (1917) (statement of Captain W.H.G. Bullard).

137. *Id.* at 369–70 (questioning of David Sarnoff, Commercial Manager, American Marconi Co., by Rep. Edmonds); see also *id.* at 346–48 (statement of Commander David W. Todd, U.S. Navy, regarding monopolistic practices of British Marconi, and alleging that American Marconi was its subsidiary).

138. *Id.* at 177 (statement of John W. Griggs, President, Marconi Wireless Co. of America).

and, therefore, the Navy's chief rival for dominance of American wireless. John W. Griggs, President of the Marconi Wireless Company of America, defended private enterprise in the wireless industry and denounced the Bullard bill as a coercive maneuver by the Navy to force American Marconi to sell out:

Let us see just what it is and what the effect of it is to be on the Marconi Co., and whether it is wise, whether it is necessary, and whether it is just. It has been admitted here by Commander Todd and Capt. Bullard—admitted, as I have read the statements here—that the object of this bill is to coerce the Marconi. Co. into letting go of its business, particularly its coastal stations. The proposition is to give the Navy Department unlimited authority to do commercial business in competition with these gentlemen who have put their money into a mercantile venture, and to so conduct the Government end of it that eventually in five years, we would be glad to sell out. Now, I am not making that charge against the Navy; that is what they say their purpose is.<sup>139</sup>

Congress never voted on Bullard's foreign ownership bill. World events in early 1917 soon overtook it. Nonetheless, the Bullard bill became the blueprint for eventual legislation restricting foreign ownership.

#### NAVY SEIZURES OF WIRELESS

139. *Id.* at 172.

## BEFORE APRIL 1917

In the environment of suspicion and paranoia before America's entry into World War I, Secretary Daniels seized upon any opportunity to bring wireless further under the Navy's control. At the war's outset, Daniels seized the German station at Tuckerton, New Jersey pursuant to President Wilson's executive order directing the Navy to take appropriate or more high-powered stations on the Atlantic coast to provide a terminal for a U.S. circuit with Europe.<sup>140</sup> Daniels also succeeded in September 1914 in temporarily shutting down American Marconi's most powerful and important station at Siasconset, on Nantucket Island, after the company refused to comply with the censorship restrictions and had its case thrown out of court.<sup>141</sup> Later, playing on the U-boat hysteria and growing reports of non-neutral German wireless transmissions from Sayville, the Navy on July 9, 1915—two months after the sinking of the *Lusitania*—took control of that German station and began operating it under Navy direction.<sup>142</sup> The Germans were no longer allowed to transmit or receive radio messages except through stations that the Navy controlled.

Daniels seized upon the alleged treachery of the Germans at Sayville as evidence of the perils of allowing control of wireless to remain outside direct government control. In the *Annual Report of the Secretary of the Navy* in 1916, Daniels argued:

It is becoming increasingly evident that no censorship of radio stations can be absolutely effective outside of complete government operation and control . . . . The government must in the end follow the lead of almost all other govern-

140. HOWETH, *supra* note 104, at 229.

141. DOUGLAS, *supra* note 3, at 271.

142. *Id.* at 273.

ments and obtain control of all coast radio stations and operate them, in conjunction with naval stations, for commercial work in times of peace.<sup>143</sup>

Daniels would have to wait until the outbreak of World War I to get his wish.

The events at Sayville, however, were already exposing the flawed predicate of Daniel's argument—namely, that if the government controls the hardware, it necessarily can control the content of what is transmitted. At Sayville, the Navy effectively controlled the station and even the content of its transmissions, but was apparently still unable to prevent the Germans from transmitting vital military information. Considerable suspicion and circumstantial evidence suggests that the Germans were able, through ingenious transmissions techniques, to elude the American censors and transmit strategically sensitive information.<sup>144</sup> Indeed, the monthly loss of merchant tonnage to U-boat attacks immediately *rose* after the Navy's seizure of the Sayville station. In July 1915, Britain lost merchant vessels totaling 52,847 tons; but in August, after the U.S. Navy took control of the Sayville station, Britain lost 148,464 tons.<sup>145</sup>

In addition, nationalized control over radio stations was no guarantee against the wireless dissemination of information into the country that would be harmful to national security. Immediately upon the outbreak of World War I, Germany began transmitting its version of the war to anyone with a receiver who cared to listen, be they amateurs, press, or government.<sup>146</sup> As the Germans demonstrated, wireless provided an

143. 1916 ANNUAL REPORT OF THE SECRETARY OF THE NAVY at 27.

144. DOUGLAS, *supra* note 3, at 269-75.

145. TERRAINE, *supra* note 110, at 766. The world total figures for lost merchant tonnage also rose sharply, from 109,640 in July to 185,866 in August. *Id.*

146. DOUGLAS, *supra* note 3, at 275.

effective means of propaganda over which other nations had virtually no control. Ultimately, control over the airwaves in the name of national security proved more difficult to achieve than merely seizing control of the hardware. The true danger to national security lay in the *content* of the transmissions, a far more difficult element of wireless to regulate and one which legislation to that point had not addressed.

NATIONALIZATION OF WIRELESS  
DURING WORLD WAR I

In early 1917, despite Woodrow Wilson's commitment to neutrality, American relations with Germany deteriorated rapidly. On January 31, 1917, Germany announced its resumption of unrestricted submarine warfare.<sup>147</sup> In reaction to this renewed threat to neutral ships and U.S. passengers, President Wilson addressed a joint session of Congress on February 3 and, reminding its members of a U-boat's sinking of the *Sussex* without warning the year before, announced that he would break diplomatic relations with Germany.<sup>148</sup> Additionally, all employees of German extraction employed at the Tuckerton and Sayville radio stations were dismissed.<sup>149</sup> Several months later they were arrested along with Dr. Karl Frank, head of the Telefunken's U.S. subsidiary, Atlantic Communication, in a wartime sweep of alleged German spy rings.<sup>150</sup> Still Wilson adhered to his increasingly untenable policy of neutrality. Even Wilson's February 26 request for Congress to enact the Armed Ship Bill, enabling American ships to carry arms for protection in their neutral activities on the high seas, was more an effort

147. DUPUY & DUPUY, *supra* note 4, at 1060.

148. Diplomatic Relations with Germany Severed (Feb. 3, 1917), *reprinted in* 17 A COMPILATION OF THE MESSAGES AND PAPERS OF THE PRESIDENTS 8206.

149. DOUGLAS, *supra* note 3, at 274.

150. *Id.*

to deter Germany from engaging in an "overt act" that would force America into the war than to protect U.S. maritime interests.<sup>151</sup>

Wilson's policy of neutrality suffered a devastating blow by the uncovering of the "Zimmermann Telegram." Intercepted by the British, the Zimmermann Telegram detailed a proposed German defensive alliance with Mexico and Japan in the event of America's entry into the war.<sup>152</sup> Though Wilson received the telegram on February 24, he did not release it to American newspapers until March 1, when it sparked national outrage.<sup>153</sup> Compounding the Germans' diplomatic perfidy in Wilson's eyes was the knowledge that German Foreign Minister Zimmermann used the U.S. State Department cable to transmit the encoded telegram to Ambassador Bernstorff in the U.S., a cable that Wilson had naïvely allowed Germany to use in the hopes of negotiating a diplomatic end to the war.<sup>154</sup> This incident illustrates again the necessity of controlling not so much the transmission medium itself, but its content, which would be only imperfectly addressed when Congress eventually imposed foreign ownership restrictions on wireless companies.

On April 6, 1917, the U.S. entered the Great War. Empowered by section 2 of the Radio Act of 1912 to shut down any radio station "in time of war or public peril or disaster" or to "authorize the use or control of any such station or apparatus by any department of the government,"<sup>155</sup> Wilson the same day authorized the Navy to commandeer *all* domestic radio stations.<sup>156</sup> In other words, even though the U.S. had just declared

151. Letter Asking Congress for Authority to Supply Merchant Ships with Defensive Arms (Feb. 26, 1917), *reprinted in* 17 A COMPILATION OF THE MESSAGES AND PAPERS OF THE PRESIDENTS 8209; *see also* TUCHMAN, *supra* note 119, at 170.

152. *Id.* at 175.

153. *Id.* at 175-76.

154. *Id.* at 172.

155. 37 Stat. 302, § 2 (1912).

156. Exec. Order (Apr. 6, 1917), *reprinted in* 17 A COMPILATION OF THE

war against Germany and would shortly send soldiers to reinforce the British Army, the U.S. Navy was to seize British-controlled radio stations as well as German-controlled stations. On April 7, the Navy acted, taking over fifty-three commercial stations, most of them owned by American Marconi, and shutting down an additional twenty-eight.<sup>157</sup>

The Navy proved an adept steward of wireless during wartime. The Navy dedicated its formidable resources to the integration, technological development, and standardization of wireless communications in the U.S.<sup>158</sup> By the end of the war, the Navy's wireless strategy had dramatically improved the U.S. wireless communication network and established the Navy's complete control over radio—not only over its hardware, but also over access and content.<sup>159</sup> Under naval control, radio also proved itself to be an invaluable tool in advancing America's diplomatic, political, and ideological interests, both nationally and internationally.<sup>160</sup> Daniels and others believed that they had built a compelling case to keep wireless under naval control after the war. But again, the Navy badly misjudged the attitudes of the American people and Congress.

#### THE NAVY'S INFLUENCE

MESSAGES AND PAPERS OF THE PRESIDENTS 8241; Exec. Order (Apr. 30, 1917), reprinted in *id.* at 8254. See also *Emergency Control of Systems of Communications: Hearings on H.J. Res. 309 before the House Comm. on Interstate and Foreign Commerce*, 65th Cong., 2d Sess. 7-9 (1918) (additional statement of Josephus Daniels, Secretary of the Navy) (more than fifty stations taken over by the Navy).

157. *Government Control of Radio Communication: Hearings on H.R. 13159 Before the House Comm. on the Merchant Marine and Fisheries*, 65th Cong., 3d Sess. 7-9 (1918) (statement of Secretary Daniels) [hereinafter *H.R. 13159 Hearings*]. See also 1917 ANNUAL REPORT OF THE SECRETARY OF THE NAVY 44.

158. HOWETH, *supra* note 104, at 237-59.

159. *Id.*; see also DOUGLAS, *supra* note 3, at 279-80.

160. *Id.* at 288.

AFTER WORLD WAR I

As World War I drew to a close, the Navy lobbied Congress to nationalize ownership of all radio in peacetime, arguing that the government could handle commercial business as it had during the war.<sup>161</sup> Leading the argument to maintain the government monopoly of wireless after the war was Commander Hooper. Hooper asserted that radio "is a natural monopoly; either the government must exercise that monopoly by owning the stations or it must place the ownership of these stations in the hands of some one commercial concern and let the government keep out of it."<sup>162</sup> The statement presaged the Navy's role in forming, after its failed attempts at keeping radio under its direct control, the Radio Corporation of America. RCA's creation would provide the Navy with the surrogate means by which to keep radio not only under monopoly control, but also under its own indirect influence.

The Navy's arguments found some receptivity in Congress. Representative Joshua Alexander introduced a bill in 1918, vigorously supported by the Navy and Secretary Daniels, that would nationalize all radio transmitters and give the Navy permanent control over their use and licensing.<sup>163</sup> The public opposed the bill, as it had President Theodore Roosevelt's efforts to bring wireless under government control more than a decade earlier. Although the Navy had achieved admirable success during the war in managing wireless, the same could not be said for the government's control over other industries

161. *H.R. 13159 Hearings*, *supra* note 157, at 5, 9-10 (testimony of Secretary Daniels). *See also Authorizing Use of Radio Stations Under Control of Navy Department for Commercial Purposes: Hearings [on H.R. 8783] Before the Comm. on the Merchant Marine and Fisheries*, 66th Cong., 1st Sess. 38-41 (1919) (statement of Secretary Daniels).

162. E. BARNOUW, *supra* note 3, at 53 (quoting *Government Control of Radio Communication: Hearings Before the House Comm. on Merchant Marine and Fisheries*, 65th Cong., 3d Sess. 10-11 (1918)).

163. *See* POOL, *supra* note 88, at 111.

such as telephone and other utilities. Long-distance telephone rates increased dramatically under government wartime control, yet AT&T still lost money.<sup>164</sup> Government control over America's railroads fared no better.<sup>165</sup> The *New York Times* editorialized:

Not for any temporary and not for any permanent cause, or merely assumed cause, should the government be allowed to put its bungling and paralyzing hand upon private business . . . . [T]he country does not pine for nationalization.<sup>166</sup>

When Congress balked at Alexander's bill and rebuffed Daniels' other efforts to establish naval control over wireless, the Navy was forced to explore alternative means of dominating wireless.

#### THE FORMATION OF RCA

The Navy's failure to establish postwar control over the wireless industry left the door open to its rivals—most significantly, American Marconi. Seizing upon the opportunity to reestablish itself in the marketplace, American Marconi resumed its negotiations with GE, interrupted by the war, to purchase Alexanderson alternators and thereby obtain the continuous wave technology that it needed for long-distance voice transmission.<sup>167</sup> Although GE refused to assign to American Marconi exclusive rights to the alternator, the tentative agreement provided for the purchase of twenty-four alternators, a purchase order that would occupy GE production capacity for several years and thereby produce in effect an exclusive supply agree-

164. DOUGLAS, *supra* note 3, at 281.

165. *Id.*

166. *Id.* at 284 (quoting N.Y. TIMES, July 25, 1919, at 10).

167. *Id.* at 285.

ment.<sup>168</sup>

The execution of such an agreement raised two intolerable possibilities for the Navy. First, it would end their control over the wireless industry in the U.S. Second, and more dangerously from the Navy's perspective, significant control over American airwaves would be exercised by a foreign-owned U.S. subsidiary. The Alexanderson alternator was widely regarded as the most powerful and best radio system available.<sup>169</sup> It was unthinkable in terms of national security that such valuable technology developed in the U.S. should fall under the control of a company largely owned and subsidized by the British government.<sup>170</sup> Consequently, the Navy moved decisively in early 1919 to preempt this threat to its mission of ensuring American dominance over domestic wireless communications.

Interceding on the Navy's behalf were W.H.G. Bullard, who had been promoted to admiral since drafting the pre-war bill attempting to restrict foreign ownership, and Commander Stanford C. Hooper. On April 8, 1919, Bullard and Hooper privately urged GE to end its negotiations with American Marconi, stressing the critical importance that the postwar wireless communications network remain under American control. GE's proposed contract with American Marconi, they warned, would enable Britain to create a worldwide radio monopoly comparable to what Britain had already achieved in submarine cables.<sup>171</sup> If GE went through with their sale to the Marconi companies, Britain would dominate radio communications to and from the U.S.<sup>172</sup>

168. *Id.*

169. TOM LEWIS, *EMPIRE OF THE AIR: THE MEN WHO MADE RADIO* 141-42 (Edward Burlingame Books 1991).

170. *Id.*

171. 67 CONG. REC. 5489, 5493-94 (1926) (statement of Rep. Free).

172. *Cable-Landing Licenses: Hearings on S. 4301 Before a Subcomm. of the Sen. Comm. on Interstate Commerce*, 66th Cong., 3d Sess. 333-34 (1920)

Appeals to nationalism, however, were not the only tool that Bullard and Hooper used to persuade GE to forgo its agreement with American Marconi. Faced with the futility of trying to retain control over wireless, the Navy struck upon an alternative means to keep wireless not only under U.S. sovereignty, but under indirect naval control: the formation of a new, all-American company. Bolstering the possibilities of this new company was the fact that the Navy during the war had acquired licenses to valuable radio patents.<sup>173</sup> The Navy's patents in conjunction with those controlled by GE alone would be sufficient to form an American company that could exercise significant, if not yet exclusive, control over wireless in the U.S.<sup>174</sup> Through a buyout of American Marconi, this new radio company could control America's long-distance and point-to-point wireless networks.<sup>175</sup> The implication being, of course, that this new company would, in place of American Marconi, buy GE's alternators and generally provide an attractive new venture in which GE would have a significant stake.<sup>176</sup> GE, however, still wavered.

Finally, Bullard played his trump card. Taking Owen Young, GE's president, aside, Bullard told him that President Wilson, struggling to preserve his Fourteen Points, had himself asked for Young's help in blunting the British drive for domination of global wireless communication.<sup>177</sup> The Navy's appeal was not to be understood simply as a business transaction, but as a patriotic act to preserve a resource of vital national interest. Young realized the strategic importance of wireless and

(statement of Owen Young, Chairman of the Board, Radio Corporation of America) [hereinafter *S. 4301 Hearings*].

173. LEWIS, *supra* note 169, at 142-43.

174. *Id.*

175. DOUGLAS, *supra* note 3, at 285.

176. JOSEPHINE YOUNG CASE & EVERETT NEEDHAM CASE, OWEN D. YOUNG AND AMERICAN ENTERPRISE 176 (David R. Grodine 1982).

177. LEWIS, *supra* note 169, at 143.

agreed to the Navy's plan.<sup>178</sup> On April 9, GE informed American Marconi that negotiations between the two companies were formally terminated.<sup>179</sup>

Young then handled the more delicate task of convincing American Marconi that it was in its best interests to sell out to the all-American corporation that GE and the Navy were forming. The unspoken threat behind these overtures to American Marconi was that, if it remained independent and chose instead to compete with the new GE-Navy corporation, the federal government would make it difficult for such a foreign-influenced company to compete with an all-American one.<sup>180</sup> As Young delphically put it to E.J. Nally, American Marconi's vice president, in response to the latter's query as to the Washington's attitude if American Marconi continued to operate as a foreign owned subsidiary:

I cannot say, but I will say this, Mr Nally: the American Marconi interests are greatly menaced because of the English holdings in the Company and the attitude of the Government toward such holdings . . . .<sup>181</sup>

It became apparent that American Marconi's best course was to allow GE to acquire its American operations—including its patent licenses—and fuse them into one corporation with those already owned or controlled by GE and the Navy.<sup>182</sup> British Marconi found itself checkmated: If it did not agree to the buyout of American Marconi, it would not be able to purchase the Alexanderson alternators that it needed for its own British

178. *Id.*

179. DOUGLAS, *supra* note 3, at 286.

180. LEWIS, *supra* note 169, at 144.

181. CASE & CASE, *supra* note 176, at 183.

182. *Id.*

and continental operations.<sup>183</sup> On September 5, 1919, the British Marconi Company reluctantly consented to sell its American interests—364,826 shares of American Marconi stock.<sup>184</sup>

In retrospect, the Navy's asserted threat of a potential British monopoly of wireless was naïve, if not disingenuous. The U.S. could have responded to this hypothetical British monopoly simply by licensing more radio spectrum for international wireless telephony and telegraphy. Furthermore, as a legal matter, the Sherman Act not only had by then been on the statute books for twenty-nine years,<sup>185</sup> but also had been used by the Supreme Court on a single day in 1911 to break up both the Standard Oil and American Tobacco trusts.<sup>186</sup> Then, three years later, Congress supplemented the Sherman Act by enacting the Clayton Act of 1914,<sup>187</sup> which addressed incipient diminutions in competition caused by mergers or acquisitions. Finally, if there was any doubt about the extraterritorial scope of antitrust subject matter jurisdiction under either the Sherman or Clayton Act,<sup>188</sup> that doubt was removed by a new statute. Concern in 1915 about the possibility of international predatory pricing by European firms following the end of the war<sup>189</sup> prompted

183. *Id.* at 146.

184. ARCHER, *supra* note 3, at 173.

185. 26 Stat. 209 (1890).

186. *Standard Oil Co. of N.J. v. United States*, 221 U.S. 1 (1911); *United States v. American Tobacco Co.*, 221 U.S. 106 (1911). See ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 33–41 (Free Press 1978; rev. ed. 1993).

187. 38 Stat. 730 (1914).

188. *American Banana Co. v. United Fruit Co.*, 213 U.S. 347 (1909). The Supreme Court broadened the extraterritoriality of American antitrust laws eighteen years later. *United States v. Sisal Sales Corp.*, 274 U.S. 268 (1927).

189. 1915 SEC'Y OF COMMERCE ANN. REP. 42; Henry C. Emery, *The Problem of Anti-Dumping Legislation*, in OFFICIAL REPORT OF THE THIRD NATIONAL FOREIGN TRADE CONVENTION 73, 81 (1916); see also JACOB VINER, *DUMPING: A PROBLEM IN INTERNATIONAL TRADE* 242–46 (1923); WILLIAM SMITH CULBERTSON, *COMMERCIAL POLICY IN WAR TIME AND AFTER* (D. Appleton & Co. 1923) (1919).

Congress to enact the Antidumping Act of 1916.<sup>190</sup>

#### THE CONSOLIDATION OF RCA

On October 17, 1919, the Radio Corporation of America, with the patents of GE and Marconi, was incorporated in the state of Delaware.<sup>191</sup> GE purchased the assets of the American Marconi company on behalf of RCA, a merger that put American Marconi out of business.<sup>192</sup> The Navy, for its part, managed to insert into RCA's articles of incorporation three provisions that not only restricted alien ownership, but also guaranteed continued naval involvement and influence over radio in the U.S. One prohibited the appointment or election of a corporate officer or director who was not a U.S. citizen.<sup>193</sup> A second provision limited foreign equity ownership and voting rights to 20 percent of the outstanding shares.<sup>194</sup> The third permitted participation in the administration of its affairs by the U.S. government, as the directors might vote advisable.<sup>195</sup> In essence, the Navy succeeded through RCA in achieving what it could not achieve for itself: an American controlled institution with a monopoly over domestic wireless operations and under tangible, albeit indirect, Navy influence.

Control over the patents of American Marconi and GE, however, was not sufficient to provide RCA with universal

190. Formally enacted as part of the Revenue Act of 1916, ch. 463, § 803, 39 Stat. 798 (1916) (codified at 15 U.S.C. § 72). The 1916 legislation is analyzed in J. Gregory Sidak, *A Framework for Administering the 1916 Antidumping Act: Lessons from Antitrust Economics*, 18 STAN. J. INT'L L. 377 (1982).

191. LEWIS, *supra* note 169, at 146.

192. S. 4301 Hearings, *supra* note 172, at 335-36 (statement of Owen Young).

193. FEDERAL TRADE COMMISSION, REPORT ON THE RADIO INDUSTRY 19 (Government Printing Office 1924) [hereinafter FTC RADIO REPORT].

194. *Id.*

195. *Id.*

dominion over wireless. Although foreign hegemony had been eliminated from the U.S. radio industry, no American company had enough patents to provide a complete, integrated radio network. The myriad of inventors and the frenetic purchase of patents by various corporations produced a technological interdependence whereby one company's patented technology required the use of another's to operate.<sup>196</sup> Thus, RCA's ultimate success grew from its ability to construct an interlocking technology network with other corporations through extensive cross-licensing and market recognition agreements. To this end, the patents "were used to clarify the boundaries of industries and licenses were granted for particular uses rather than particular patents."<sup>197</sup> The first such agreement was between AT&T and RCA.

AT&T controlled the patent rights to De Forest's audion—the vacuum tube that enabled long-distance voice transmission—and thus the technological linchpin of any wireless network.<sup>198</sup> However, use of the audion depended upon another invention, the Fleming valve, to which RCA held the rights.<sup>199</sup> Aware of the futility of noncooperation, both companies agreed to cross-license their patents and divide the market into their respective spheres of influence.<sup>200</sup> RCA established exclusive rights to use the pooled patent licenses for international wireless telegraphy and ship-to-shore communication.<sup>201</sup> AT&T retained control over wireless telephony, including exclusive rights to "all land radio telephony for toll purposes."<sup>202</sup> These exclusionary rights addressed manufacturing as

196. DOUGLAS, *supra* note 3, at 289.

197. GERALD W. BROCK, *THE TELECOMMUNICATIONS INDUSTRY: THE DYNAMICS OF MARKET STRUCTURE* 166 (Harvard University Press 1981).

198. DOUGLAS, *supra* note 3, at 289.

199. *Id.*

200. BROCK, *supra* note 197, at 166.

201. *Id.*

202. *Id.*

well. GE established control over the manufacture of amateur apparatus, vacuum tubes, and radio receivers.<sup>203</sup> AT&T exercised exclusive rights to manufacture wireless telephone transmitters.<sup>204</sup>

Westinghouse presented a second obstacle to RCA's efforts to consolidate control over wireless. After the war, Westinghouse devised an aggressive strategy and vision for the development of the radio market, one that placed it squarely in competition with RCA.<sup>205</sup> Though outflanked by RCA in gaining control over many crucial technology licenses, Westinghouse acquired a company that possessed the exclusive rights to crucial broadcasting technology—most notably, Howard Armstrong's regeneration and superheterodyne inventions that amplified and filtered weak incoming signals.<sup>206</sup> But Westinghouse's control over such vital patents was not enough. It still had only a tenuous hold on many inventions that it was using, including the vacuum tube technology now licensed to RCA.<sup>207</sup> RCA's position was little better. Its plans to develop and market the radiola—a home radio receiver—hinged on getting access to Westinghouse's regeneration and superheterodyne patents.<sup>208</sup> Again, as with the AT&T licensing and manufacturing agreements, RCA and Westinghouse came together out of mutual necessity. In the end, through cross-licensing agreements, RCA gained use of Westinghouse's patents in return for one million shares of RCA stock<sup>209</sup> and 40 percent of RCA's orders for radio components.<sup>210</sup>

Subsequent agreements with other companies solidified

203. DOUGLAS, *supra* note 3, at 289.

204. *Id.*

205. LEWIS, *supra* note 169, at 151–52

206. *Id.*

207. *Id.* at 154.

208. *Id.*

209. *Id.*

210. DOUGLAS, *supra* note 3, at 290.

RCA's position. Two years after its formation, RCA had successfully shifted control over wireless technology, and the ether itself, away from military control to corporate. In pooling patent rights through cross-licensing agreements and then dividing them by market, these agreements provided all the parties with an effective barrier to entry into their respective markets and a unified monopoly of patents that would make it nearly impossible for an outside company to compete.<sup>211</sup> Through such interlocking corporate licenses and agreements, the RCA corporate trust possessed the means to control access not only to the technology of wireless communication, but also to the ether itself. RCA's mandate was to create world leadership for the U.S. in the manufacture and sale of radio apparatus. By 1921, it had succeeded in doing so.<sup>212</sup>

For the Navy, RCA was a triumph as well. In essence, RCA was a corporate reincarnation of the military monopoly that existed during the war. It preserved the monopoly that the Navy believed essential to managing radio in the postwar environment, and it ensured that radio technology remained owned and controlled by Americans. Perhaps even more importantly, the Navy managed to preserve some influence over radio, writing into the RCA's corporate charter the allowance that at least one Navy officer would sit "by invitation" on the board of directors.<sup>213</sup> Indeed, one of the first actions of the board of directors was to invite President Wilson to nominate a naval officer of a rank superior to captain to sit on the board and represent the government's views concerning the manage-

211. BROCK, *supra* note 197, at 167.

212. S. 4301 Hearings, *supra* note 172, at 336; *To Regulate Radio Communication: Hearings on H.R. 7357 Before the House Comm. on the Merchant Marine and Fisheries*, 68th Cong., 1st Sess. 162-63, 165, 170 (1924) (statement of David Sarnoff, Vice President and General Manager, Radio Corporation of America) [hereinafter *H.R. 7357 Hearings*].

213. FTC RADIO REPORT, *supra* note 193, at 19.

ment of radio in the U.S.<sup>214</sup> The Navy responded by nominating Admiral Bullard, who served on RCA's board from 1920 to 1931.<sup>215</sup>

After the end of World War I, the Navy restored all high-power radio stations to their private owners. In early 1920, a Senate bill proposed stringent alien-control provisions.<sup>216</sup> The bill authorized a Navy officer to attend licensees' board and stockholder meetings, where he could challenge votes exceeding a proposed 20 percent alien-ownership limitation. A radio licensee could have no alien officers or directors, nor could aliens, their representatives, or companies "dominated or controlled by alien interests" hold radio licenses.<sup>217</sup> The bill, plainly patterned after RCA's corporate charter, was not enacted, though its influence on the present section 310(b) is evident. In particular, this 1920 bill was the first to use the term "representative of an alien."

#### THE BOOM IN RADIO LICENSEES

Although the cross-licensing agreements that created RCA succeeded in delineating spheres of interests among the competing powers in the radio industry in the postwar era, they were structured according to limited pre-war conceptions of radio's use. The agreements presumed that radio's primary purpose was to establish long-distance, point-to-point communication between specific senders and receivers. Consequently, they dealt only with pooling patents and dividing markets according to narrowly defined corporate interests. Even as RCA was being formed, however, amateurs across America were already expanding radio into a new frontier of vast potential: broadcasting.

214. HOWETH, *supra* note 104, at 359.

215. *Id.*

216. S. 4038, § 6, 66th Cong., 2d Sess. (1920).

217. *Id.*