

QUESTIONS

In the early 1900s, several international radio conferences were held to attempt to regulate radio consistently worldwide. What dates were these international radio conferences held? Did the U.S. participate in any? What motivated these conferences and what were the results? What consequence did the radio conferences have on the U.S.?

SHORT ANSWERS

- (1) The conference dates were: 1903, 1906, 1912, 1927
- (2) The U.S. participated in each conference.
- (3) The first conference was motivated in part by signal interference and in part by the Marconi Company's refusal to interact with competing wireless systems. The second conference was called because the first conference didn't solve any problems. It is unclear precisely what instigated the third and fourth conferences.
- (4) The first conference impacted the U.S. by raising its awareness of the strategic importance of wireless. The U.S. did not, however, adopt any new regulations because of it. After the second conference, the U.S. adopted the resulting treaty, although it did so only after many years due to U.S. distrust of government regulation and reluctance to regulate a still-developing technology. The U.S. incorporated the treaty of the third wireless conference in its Radio Act of August 13, 1912. And the U.S. hosted the fourth international wireless conference in 1927, the resolutions of which went into effect in 1929.

how many when?

DISCUSSION

First international wireless conference – 1903

In 1903, Germany invited 7 nations to join it in an international wireless conference – the First International Radio Telegraphic Conference – Great Britain, France, Spain, Austria, Russia, Italy, and the U.S. Authors disagree about the main impetus for the conference. Douglas says that it was spurred when a ship carrying the German Kaiser's brother couldn't communicate with Marconi stations in Europe or the

7

who was the rival?

U.S. because it used a rival company's radio equipment.¹ Bensman, however, claims that this was only one reason behind the First Convention.² And Archer claims that the "intolerable condition" of signal interference that potentially blocked life-saving and emergency transmissions motivated the first conference.³

According to Douglas, although the Kaiser's invitation to the conference proposed a number of potential topics to be discussed, the only real issue was the Marconi Company's refusal to communicate with other systems. The U.S. sent three delegates. All countries but Italy and Great Britain favored compelling the Marconi Company to communicate with other systems because an invention that could save lives and property shouldn't be monopolized by one company.⁴

Though the conference came to a resolution – that wireless coast stations must receive and transmit ship messages regardless of the ship's wireless system – it wasn't legally binding, and the Marconi Company continued its monopolistic behavior. Despite this, the conference did impact the U.S. by impressing on the American delegation "the advantages and international importance of a strong military presence in the airwaves." The Americans witnessed how greatly other countries' navies valued wireless. Because Roosevelt was preoccupied with other issues at the time, the U.S. military was unable to act on this new awareness immediately. It wasn't until the Russo-Japanese War broke out in February 1904 that Roosevelt recognized the military importance of wireless and turned his attention to it.⁵

*Great White Fleet? Roosevelt
→ sent around world
12/16/07 - 2/22/09*

¹ Susan J. Douglas, *Inventing American Broadcasting*, 120-24.

² Marvin R. Bensman, *The Beginning of Broadcast Regulation in the Twentieth Century* at 4.

³ Gleason L. Archer, *History of Radio to 1926* at 64.

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Second international wireless conference – 1906

In 1906, the Germans called for a second conference – the International Wireless Telegraph Convention – because nothing was solved at the first one and the Russo-Japanese War generated new diplomatic problems. Twenty-seven countries including the U.S. attended. According to Douglas, the same issue dominated the discussions – whether the Marconi Company should be able to communicate only with its own stations. Three of the four American delegates were in the military and had strong anti-Marconi feelings. When they arrived at the conference, they moved for compulsory ship-to-ship intercommunication and held fast to this position. All countries other than Britain, Italy, and Japan joined them. To demonstrate the consequences should the Marconi Company continue its behavior, several countries ignored Italy's delegates whenever they tried to speak on that or other issues. Ultimately, the countries worked out a compromise – every public shore station was required to exchange wireless communication with each wirelessly equipped ship regardless of the wireless systems used.

The countries set out other regulations, including: (1) that ship stations had to be licensed by the country whose flag they sailed under; (2) shipboard operators had to pass an exam on signaling and apparatus construction and operation to be licensed; (3) ships would have a three letter call sign designated by their government; (4) distress messages had priority over all others, as did government messages about navigation and weather conditions at sea; (5) wireless operators were bound by an oath of secrecy; (6) SOS would be the international distress code.⁶ Also: (1) two wavelengths – 300 and 600 meters – were designated for public correspondence; (2) wavelengths over 1600 meters

1,000 kHz
- 500 kHz

190 kHz

⁶ Douglas 137-43, 216-17.

were for long distance communication with coastal stations; and (3) wavelengths between 600 and 1600 meters were for military and naval stations.⁷

Most governments ratified the treaty within a year and a half after the 1906 negotiations. The U.S., however, was not quick to ratify the treaty, despite that the American delegates had ardently favored many of the regulations. The country's reaction to the treaty was lukewarm because it was reluctant to hand over control of private industry to the government, particularly the military. The American press had a low opinion of the Kaiser, who sponsored the conference. And the treaty embodied solutions to European problems that didn't exist for the U.S., such as being surrounded by rival nations whose wireless transmissions posed interference problems and military vulnerability.

Moreover, wireless companies and amateurs successfully lobbied against wireless regulation in the U.S., objecting that the 1906 International Wireless Conference's treaty was premature, technically naïve and restrictive; exploitative of American inventors; and transformed wireless to a warfare instrument. Congress was not quick to regulate for several reasons: (1) it was preoccupied by other pressing legislation that was the heart of intense public scrutiny such as child labor laws, antitrust legislation, and the Pure Food and Drug Act; (2) wireless was a relatively undeveloped science that congressmen felt uncomfortable to act on without greater understanding; and (3) unlike in Europe, in the U.S., the telegraph was not government owned and therefore provided no regulatory model Congress could use to formulate wireless regulation.⁸

⁷ Bensman at 5.

⁸ Douglas 137-43, 216-17.

Consequently, the U.S. did not ratify the 1906 International Wireless Convention treaty until April 3, 1912, when it was informed that it would not be welcome at the third convention scheduled for June 1912 unless it did so.⁹

What did US do about concerns?

Third international wireless conference – 1912

In 1912, London held the third international wireless conference – the International Radio Telegraph Convention of 1912 – and the U.S. attended. The sources don't explain the impetus behind the third conference, but the U.S.'s Radio Act of August 13, 1912 incorporated its regulations. The Radio Act primarily regulated wireless telegraphy in Morse code and prohibited commercial radio transmission without a federal license from the Secretary of Commerce. The purpose of licensing was to prevent or minimize interference between stations. Under the Act, the Secretary of Commerce maintained authority over radio broadcasting until 1926, when an Attorney General ruling and two lower federal court decisions eviscerated this authority. At that point, orderly regulation ceased and chaotic interference ensued, with stations jumping to different frequencies at will.¹⁰ This confusion led to the Radio Act of 1927. The Radio Act of 1927 established the Federal Radio Commission and reimposed order on wireless communications by authorizing it to, among other duties, grant licenses of limited terms to broadcasters, assign frequencies, determine station locations, regulate apparatuses used, and classify radio stations.¹¹

Fourth international communications conference – 1927

The fourth international conference was held in October 1927 when seventy-nine countries met in Washington, D.C. to revise the 1912 International Radio Telegraph

⁹ Douglas 226.

¹⁰ Thomas Porter Robinson, Radio Networks and the Federal Government at 48-49.

¹¹ Id. at 53.

Conference regulations. The Conference concluded that, instead of dividing "the ether" into different channels for different countries, as had been previously proposed, the channels would be divided into groups, "each group being used for a particular variety in communication." The Conference also agreed to prohibit future installation of "spark sets" because they caused great interference and to require replacement of existing spark sets with continuous wave sets or other modern equipment that minimized interference.

The conference agreement went into effect January 1, 1929.¹²

The Conference adopted these frequency allocations:¹³

<u>Kilocycles</u> <u>(later kHz)</u>	<u>Services</u>
10-100	Fixed services
100-110	Fixed services and mobile services
110-125	Mobil services
125-150	Maritime mobile for public
150-160	Mobile services
	(a) Broadcasting
	(b) Fixed services
	(c) Mobile services
160-194	Regional differences allowed for all services within this range
194-285	Europe: air mobile services; Air fixed services
285-315	Radio beacons
315-350	Air mobile
350-360	Air mobile
360-390	Radio Compass
390-460	Mobile
460-485	Mobile, except radio-telephony
485-515	Distress call and mobile
515-1,500	Broadcasting
1,500-1,715	Mobile
1,715-60,000	Mobile, amateur, experimental

*How was this
different from what
Hoover had done?*

See Archer 350-57

¹² Bensman at 203-04

¹³ Taken from Bensman at 204-205.

To: Tom
From: Susan
Re: International Radio Conferences

QUESTIONS

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DISCUSSION

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impetus for the conference. Douglas says that it was spurred when a ship carrying the German Kaiser's brother couldn't communicate with Marconi stations in Europe or the U.S. because it used the radio equipment of a rival company, Telefunken and Manufacturing.¹ Bensman, however, claims that the Marconi Company's refusal to relay companies' radio signals was only one reason behind the First Convention.² And Archer claims that the "intolerable condition" of signal interference that potentially blocked life-saving and emergency transmissions motivated the first conference.³

According to Douglas, although the Kaiser's invitation to the conference proposed a number of potential topics to be discussed, the only real issue was the Marconi Company's refusal to communicate with other systems. The U.S. sent three delegates. All countries but Italy and Great Britain favored compelling the Marconi Company to communicate with other systems because an invention that could save lives and property shouldn't be monopolized by one company.⁴

Though the conference came to a resolution – that wireless coast stations must receive and transmit ship messages regardless of the ship's wireless system –it wasn't legally binding, and the Marconi Company continued its monopolistic behavior. Despite this, the conference did impact the U.S. by impressing on the American delegation "the advantages and international importance of a strong military presence in the airwaves." The Americans witnessed how greatly other countries' navies valued wireless. Because Roosevelt was preoccupied with other issues at the time, the U.S. military was unable to

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The countries set out other regulations, including: (1) that ship stations had to be licensed by the country whose flag they sailed under; (2) shipboard operators had to pass an exam on signaling and apparatus construction and operation to be licensed; (3) ships would have a three letter call sign designated by their government; (4) distress messages had priority over all others, as did government messages about navigation and weather conditions at sea; (5) wireless operators were bound by an oath of secrecy; (6) SOS

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would be the international distress code.⁶ Also: (1) two wavelengths – 300 and 600 meters – were designated for public correspondence; (2) wavelengths over 1600 meters were for long distance communication with coastal stations; and (3) wavelengths between 600 and 1600 meters were for military and naval stations.⁷

Most governments ratified the treaty within a year and a half after the 1906 negotiations. The U.S., however, was not quick to ratify the treaty, waiting until 1912 to do so, despite that the American delegates had ardently favored many of the regulations. The country's reaction to the treaty was lukewarm because it was reluctant to hand over control of private industry to the government, particularly the military. The American press had a low opinion of the Kaiser, who sponsored the conference. And the treaty embodied solutions to European problems that didn't exist for the U.S., such as being surrounded by rival nations whose wireless transmissions posed interference problems and military vulnerability.

Moreover, wireless companies and amateurs successfully lobbied against wireless regulation in the U.S., objecting that the 1906 International Wireless Conference's treaty was premature, technically naïve and restrictive; exploitative of American inventors; and transformed wireless to a warfare instrument. Congress was not quick to regulate for several reasons: (1) it was preoccupied by other pressing legislation that was the heart of intense public scrutiny such as child labor laws, antitrust legislation, and the Pure Food and Drug Act; (2) wireless was a relatively undeveloped science that congressmen felt uncomfortable to act on without greater understanding; and (3) unlike in Europe, in the

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U.S., the telegraph was not government owned and therefore provided no regulatory model Congress could use to formulate wireless regulation.⁸

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Third international wireless conference – 1912

In 1912, London held the third international wireless conference – the International Radio Telegraph Convention of 1912 – and the U.S. attended. The sources don't explain the impetus behind the third conference, but the U.S.'s Radio Act of August 13, 1912 incorporated its regulations. The Radio Act primarily regulated wireless telegraphy in Morse code and prohibited commercial radio transmission without a federal license from the Secretary of Commerce. The purpose of licensing was to prevent or minimize interference between stations. Under the Act, the Secretary of Commerce maintained authority over radio broadcasting until 1926, when an Attorney General ruling and two lower federal court decisions eviscerated this authority. At that point, orderly regulation ceased and chaotic interference ensued, with stations jumping to different frequencies at will.¹⁰ This confusion led to the Radio Act of 1927. The Radio Act of 1927 established the Federal Radio Commission and reimposed order on wireless communications by authorizing it to, among other duties, grant licenses of limited terms to broadcasters, assign frequencies, determine station locations, regulate apparatuses used, and classify radio stations.¹¹

⁸ Douglas 137-43, 216-17, 226.

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¹⁰ Thomas Porter Robinson, *Radio Networks and the Federal Government* at 48-51.

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Fourth international communications conference – 1927

The fourth international conference was held in October 1927 when seventy-nine countries met in Washington, D.C. to revise the 1912 International Radio Telegraph Conference regulations. Secretary Hoover, conference chairman, explained in his closing statements that the Conference had agreed that, instead of dividing “the ether” into different channels for different countries, as had been previously proposed, the channels would be divided into groups, “each group being used for a particular variety in communication.” Hoover explained that the Conference also agreed to prohibit future installation of “spark sets” because they caused great interference and to require replacement of existing spark sets with continuous wave sets or other modern equipment that minimized interference. The conference agreement went into effect January 1, 1929.¹²

The Conference adopted these frequency allocations:¹³

<u>Kilocycles (later kHz)</u>	<u>Services</u>
10-100	Fixed services
100-110	Fixed services and mobile services
110-125	Mobile services
125-150	Maritime mobile for public
150-160	Mobile services
	(a) Broadcasting
	(b) Fixed services
	(c) Mobile services
160-194	Regional differences allowed for all services within this range
194-285	Europe: air mobile services; Air fixed services
285-315	Radio beacons
315-350	Air mobile
350-360	Air mobile
360-390	Radio Compass
390-460	Mobile

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¹³ Taken from Bensman at 204-205.

460-485	Mobile, except radio-telephony
485-515	Distress call and mobile
515-1,500	Broadcasting
1,500-1,715	Mobile
1,715-60,000	Mobile, amateur, experimental

It is possible that fourth international conference drew some of its allocations from the allocations set forth by the United States in its Third National Radio Conference,¹⁴ though I have yet to find a definitive source on this issue. Similarities exist between the two tables, but notes from the U.S. Third National Radio Conference suggest that the international community may have already agreed how to allocate frequencies below 2000 kHz. The Third National Radio Conference subcommittee on frequency allocations specifically stated in its report that its allocation recommendation "must be considered to some extent temporary or experimental on account of the absence of an international agreement relative to frequencies above 2,000 kilocycles."¹⁵ None of the earlier international conferences, however, set forth a detailed table of frequency allocations. By 1928, the U.S. had already designated 550 – 1500 kHz for broadcasting, but further research is needed to determine whether the international community had also already set aside these frequencies for broadcasting.¹⁶ If this requires further follow up, the notes taken and reports made at the fourth international radio telegraph conference may demonstrate the extent to which the U.S. influenced the Conference's allocations table.

¹⁴ Captain Linwood S. Howeth, USN, History of Communications-Electronics in the United States Navy (1963) at 501-512; Recommendations for Regulation of Radio adopted by the Third National Radio Conference, Oct. 6-10, 1924.

¹⁵ Recommendations for Regulation of Radio adopted by the Third National Radio Conference, Oct. 6-10, 1924.

¹⁶ See General Order 40.

For comparison, here are the frequency allocations set out by the U.S. Third

National Radio Conference in 1927:

<u>Kilocycles (later kHz)</u>	<u>Services</u>
95-120	Government
120-157	Marine
157-190	Point-to-point and Marine
190-230	Government
230-235	University, college & experimental
235-250	Marine, phone
250	Government
250-275	Marine
275	Government
275-285	Marine
285-500	Marine & coastal (including 500 = distress calls & signals)
500-550	Aircraft
550-1500	Broadcasting, phone
1500-2000	Amateur, phone
2000-2250	Point-to-point
2250-2500	Aircraft
2500-2750	Mobile
2750-2850	Relay broadcasting
2850-3500	Public service
3500-4000	Amateur & army mobile
4000-4500	Public service & mobile
4500-5000	Relay broadcasting
5000-5500	Public service
5500-5700	Relay broadcasting
5700-7000	Public service
7000-8000	Amateur & army mobile
8000-9000	Public service & mobile
9000-10000	Relay broadcasting
10000-11000	Public service
11000-11400	Relay broadcasting
11400-14000	Public service
14000-18000	Amateur
16000-80000	Public service & mobile
18000-56000	Beam transmission
56000-64000	Amateur
64000-infinity	Beam transmission

*Highlighting shows which allocations designated by the Third National Radio Conference are similar to what was adopted by the Fourth International Radiotelegraph Conference. Comparison is difficult because the conferences use different categories.

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but: Telephones & msg.
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No

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150-160	Mobile services
	(a) Broadcasting
	(b) Fixed services
	(c) Mobile services
160-194	Regional differences allowed for all services within this range
194-285	Europe: air mobile services; Air fixed services

¹¹ Id. at 53.

¹² Bensman at 203-04

¹³ Taken from Bensman at 204-205.

285-315	Radio beacons
315-350	Air mobile
350-360	Air mobile
360-390	Radio Compass
390-460	Mobile
460-485	Mobile, except radio-telephony
485-515	Distress call and mobile
515-1,500	Broadcasting
1,500-1,715	Mobile
1,715-60,000	Mobile, amateur, experimental

→ US already had allocated
broadcast stations btw

550-1500 - 60 40

- not sure if other countries
had, too

9. 1. 25
7. 31. 26
8. 31. 28

4. 30. 28

1. 31. 29

9. 1. 25 - list of foreign broadcast stations - Range = 113-2500 kHz

~~265~~ m - ~~2400~~ wavelength (meters)

~~250~~ 2650

~~212~~
120

$$\text{freq.} = V = \frac{c}{\lambda} = \text{wavelength}$$

$$c = 3 \times 10^8 \text{ m/s}$$

$$V = \frac{3 \times 10^8}{120}$$

$$= 2,500 \text{ kHz}$$

$$2,500,000 \text{ Hz}$$

$$V = \frac{3 \times 10^8}{2650}$$

$$113,208 \text{ Hz} = 113 \text{ kHz}$$

7.31.26: Foreign broadcast stations

$$\frac{225}{195} = 90$$

$$\frac{2400}{2650}$$

$$\frac{3 \times 10^8}{90} = \boxed{3333 \text{ kHz}}$$

$$\frac{3 \times 10^8}{2650} = \boxed{113 \text{ kHz}}$$

4.30.28: 0-14 — 280 foreign short wave

8.31.28

US commercial high freq stations

$$\boxed{6710 \text{ kHz} \rightarrow 22670 \text{ kHz}}$$

Principal World Broadcasting Stations

Europe

$$4000 \text{ m} \rightarrow 15.5 \text{ m}$$

$$\boxed{75 \text{ kHz} - 19355 \text{ kHz}}$$

AU

$$1250 \text{ m} \rightarrow 28.5 \text{ m}$$

$$240 \text{ kHz} - 10526 \text{ kHz}$$

N.E. AF

$$1850 \text{ m} \rightarrow 42.8$$

$$162 \text{ kHz} - 7009 \text{ kHz}$$

South AF

$$443.5 \rightarrow 32$$

$$676 \text{ kHz} - 9375 \text{ kHz}$$

India

$$800 - 357$$

$$375 \text{ kHz} - 840 \text{ kHz}$$

Japan

$$400 - 37.5$$

$$750 \text{ kHz} - 8000 \text{ kHz}$$

S. Am.

$$380 - 210$$

$$789 \text{ kHz} - 1429 \text{ kHz}$$

1.31.29 Foreign Broadcast Stations

Canada

$$247.8 - 516.9 = 580 - 1210 \text{ UK } 24 - 1600$$

$$188 \text{ kHz} - 12500 \text{ kHz}$$

Cuba

$$192 - 368 = 815 - 1563$$

Russia 150-1450

$$207 - 20000 \text{ kHz}$$

Mexico

$$225 - 548 = 547 - 1333$$

Japan 37.5-380

$$789 - 8000 \text{ kHz}$$

France

$$15.5 - 750 \quad 400 - 19355$$

Germany

$$17.2 - 2900 \quad \boxed{103 - 17442 \text{ kHz}}$$

Susan Burgess

From: Susan Burgess
Sent: Monday, July 09, 2007 1:46 PM
To: Clay T. Whitehead
Subject: Memos from Wendell

Attachments: Tom_comments_-_construction_permits.doc; Tom_comments_-_FRC_effects.doc;
Tom_comments_-_GO_40+_Davis_amendment_effects_on_stations.doc;
Memo_Network_Building.doc



Tom_comments_-_cTom_comments_-_FTom_comments_-_Memo_Network_Buil
onstruction_pe... RC_effects.doc... GO_40+_Davis_a... ding.doc (62 ...

Tom,

Wendell updated his three memos to incorporate information that you asked for. They are attached for your review.

Wendell also wrote an additional memo titled "Network Building" concerning a 1941 FCC staff report that shows NBC and CBS's market dominance throughout the 20s and 30s and factors that led to this. This is also attached for your review. Wendell wonders if this memo may replace your need for a graphic analysis showing why so few national networks were feasible. I told him that I suspect not because the memo doesn't show how competitors were prevented from entering the market, but that I would it along for your feedback.

Let me know if you have further follow up questions, Susan

To: Clay T. Whitehead; Susan Burgess
From: Wendell Bartnick
Date: May 26, 2007
Re: Effects on Stations after Davis Amendment and General Order 40 reallocation

Question

Did the Federal Radio Commission/Federal Communications Commission respond to the Davis Amendment by adding more stations in the South and West while removing stations outside the South and West?

Answer

Partially, yes, many stations in the North and Midwest were terminated, but most of these were smaller non-profit stations. The Davis Amendment, passed on March 28, 1928, ordered the FRC to allocate a roughly equal number of broadcast licenses to each of the nation's five zones on the claim that the South and West were being cheated out of their fair share of radio stations.¹ More specifically, the FRC was first forced to equalize the number of assignments and broadcast stations' total power levels in each of the five zones covering the country.² Second, within the five zones, the FRC must consider each state, territory, and possession's population to make their final distribution, using the official census data.³ For example, a state with a fifth of the total population in a zone would receive one fifth of that zone's station assignment and power level allotments. Prior to the amendment, the FRC did not want to terminate any of the existing

¹ ROBERT W. MCCHESENEY, *TELECOMMUNICATIONS, MASS MEDIA, AND DEMOCRACY: THE BATTLE FOR THE CONTROL OF U.S. BROADCASTING, 1928-1935*, at 21 (1993); Thomas W. Hazlett, *The Rationality of U.S. Regulation of the Broadcast System*, 33 J.L. & ECON. 133, 161, 168 (1990).

² MCCHESENEY, *supra* note 1, at 21; Hazlett, *supra* note 1, at 161, 168.

³ 1928 Fed. Radio Comm'n 2d Ann. Rep. 11, [hereinafter "1928 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html; 1930 Fed. Radio Comm'n 4th Ann. Rep. 57, [hereinafter "1930 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

assignments,⁴ but the FRC was forced to terminate some to implement the equalization requirements.⁵

When the FRC was created in 1927, 732 licensed broadcast stations existed.⁶ On May 25, 1928 the FRC announced as General Order 32 that a number of station assignments would be reassessed, and throughout that summer the FRC held hearings before finally terminating sixty-two stations in late August 1928.⁷ This was the first significant FRC action pursuant to the Davis Amendment. At the end of the summer following the Davis Amendment enactment, 677 stations existed and on November 1, 1929, there were 584 stations.⁸ In 1929, twenty-eight had been added, but 121 had been terminated.⁹ Most of the terminated stations were located in the highly populated East and Midwest.¹⁰ No stations in the South were deleted.¹¹ However, the FRC did not terminate any stations pursuant to General Order 40, as that order simply reallocated stations to different frequencies and changed power levels to equalize the power levels in each region.¹² Most of the changes affected only educational and other non-commercial stations, so the commercial broadcasting industry was largely unaffected by the Davis Amendment and General Order 40.¹³ In the years after General Order 40 in 1928, the FRC made only minor adjustments to the reallocation completed pursuant to General

⁴ 1928 Report, *supra* note 3, at 218.

⁵ Fritz Messere, *The Davis Amendment and the Federal Radio Act of 1927*, in TRANSMITTING THE PAST 34, 46 (J. Emmett Winn & Susan L. Brinson eds., 2005), available at <http://www.oswego.edu/~messere/DavisAmend.pdf>.

⁶ 1929 Fed. Radio Comm'n 3d Ann. Rep. 15, [hereinafter "1929 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

⁷ 1928 Report, *supra* note 3, at 14-16.

⁸ 1929 Report, *supra* note 6, at 15-16.

⁹ *Id.* at 16.

¹⁰ Messere, *supra* note 5, at 46. See 1928 Report, *supra* note 3, at 151-52.

¹¹ Messere, *supra* note 5, at 46. See 1928 Report, *supra* note 3, at 152.

¹² 1929 Report, *supra* note 6, at 16; *Id.* at 12.

¹³ Messere, *supra* note 5, at 55.

Order 40.¹⁴ For example, in 1931, only 11 new stations were licensed and 20 were terminated.¹⁵ In 1932, only 8 new stations were licensed and 12 were terminated.¹⁶ The location of the stations was varied, with no clear trend of new stations in the South and terminated stations in the North.¹⁷ The FRC did reassign some stations, but that was due to interference issues, not an effort to equalize power and station numbers in regions.¹⁸ The FRC stopped applying the Davis Amendment's dictates in 1932.¹⁹

¹⁴ 1930 Report, *supra* note 3, at 56; 1931 Fed. Radio Comm'n 5th Ann. Rep. 19, [hereinafter "1931 REPORT"], *available at* http://www.fcc.gov/mb/audio/decdoc/annual_reports.html; 1932 Fed. Radio Comm'n 6th Ann. Rep. 25, [hereinafter "1932 REPORT"], *available at* http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

¹⁵ 1931 Report, *supra* note 14, at 7.

¹⁶ 1932 Report, *supra* note 14, at 7-8.

¹⁷ *See* 1931 Report, *supra* note 14, at 13; *Id.*

¹⁸ 1930 Report, *supra* note 3, at 56.

¹⁹ Messere, *supra* note 5, at 58.

To: Clay T. Whitehead; Susan Burgess
From: Wendell Bartnick
Date: June 11, 2007
Re: Effects of Federal Radio Commission Creation

Question

Did the creation of the Federal Radio Commission ("FRC") result in dramatic changes to the spectrum assignments that existed before its creation?

Answer

Somewhat. Changes did occur, but some believe that the changes that did occur were not fundamental as they were simply a continuation of previous practice. When the FRC was created, "it immediately grandfathered rights for major broadcasters, while eliminating marginal competitors and all new entry. . . . The FRC restored order out of chaos by ordering stations to 'return to their [original Commerce Department] assignments.'"¹ According to one scholar, the 1927 Radio Act cemented what was occurring before the legislation by creating the mechanisms to assure commercial broadcasters dominance of broadcasting.² Another scholar stated that "In spite of [the 1927 Radio Act's] impressive achievements, [it] perpetuated a state of affairs that had existed from the start of broadcasting."³

Examples these scholars point to include that the FRC decided not to widen the existing broadcasting band.⁴ Also, the FRC adopted the same standards, (e.g. priority-in-use rights), for determining which entities got which frequencies and power levels as the DOC used before the FRC was created.⁵

¹ Thomas W. Hazlett, *The Rationality of U.S. Regulation of the Broadcast System*, 33 J.L. & ECON. 133, 154 (1990).

² *Id.* at 173.

³ ERIK BARNOUW, *A TOWER IN BABEL* 200 (1966).

⁴ Hazlett, *supra* note 1, at 155.

⁵ *Id.* at 166.

But the FRC did act. In its first year, the FRC attempted to maintain the status quo while dealing with interference problems on a case-by-case basis.⁶ The FRC accomplished this by simply moving stations from congested to less congested areas rather than by reducing the number of stations.⁷ Later, after this proved largely unsuccessful, Congress passed the Davis Amendment⁸ and the FRC thinned out spectrum use by failing to renew 81 broadcast licenses in August 1928, in General Order 32, and gave reduced power and time assignments to others.⁹ With General Order 32, twelve were substantially reduced in power.¹⁰ As one scholar noted, "1928 was a bad [year] for educational stations. . . . In 1928 twenty-three gave up, in 1929 thirteen more followed."¹¹

The FRC denied charges of bias against small, local stations, saying "The charge is totally unfounded. . . . The commission was moved to its action largely by the deluge of complaints of poor service and interference from people living in the vicinity of such stations"¹² The FRC also said some of the terminated stations were negligently operated and used poor equipment.¹³ The FRC was also influenced by the character of the licensee.¹⁴ Licenses were revoked or power reduced on those stations that "seemed not to be worthy of the trust implied in his license" to render quality service to the community.¹⁵

⁶ Fritz Messere, *The Davis Amendment and the Federal Radio Act of 1927*, in TRANSMITTING THE PAST 34, 40 (J. Emmett Winn & Susan L. Brinson eds., 2005), available at <http://www.oswego.edu/~messere/DavisAmend.pdf>.

⁷ *Id.* at 39.

⁸ *Id.* at 40.

⁹ Hazlett, *supra* note 1, at 167.

¹⁰ 1928 Fed. Radio Comm'n 2d Ann. Rep. 16, [hereinafter "1928 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

¹¹ BARNOUW, *supra* note 2, at 218.

¹² 1928 Report, *supra* note 10, at 153 app. F (4).

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

So, the FRC did make some initial changes by terminating stations, but scholars seem to think this was simply legally enforcing the preexisting flow towards commercial broadcasting.

To: Clay T. Whitehead; Susan Burgess
From: Wendell Bartnick
Date: May 20, 2007
Re: Radio Station Construction Permits

Question

After the Davis Amendment, did the Federal Radio Commission approve any broadcasting station construction permits?

Answer

Yes, the FRC approved some construction permits. Since the timing is somewhat confusing, the data is grouped into two sets. The first documents the months between the Davis Amendment enactment on March 28, 1928 to the General Order 40 announcement on September, 10, 1928. The second set documents the construction permits granted pursuant to or soon after General Order 40.

Between March 15, 1927 and June 30, 1928, thirty-two construction permits were granted for new stations, mostly in the third zone (the South).¹ Table 4 shows this relatively large number of construction permits given to stations, most of which were built-out during 1928.² During that period, 120 were still pending and eighty-five were rejected.³ Notably, sixty-seven of the pending applications were in the third zone.⁴ None of the rejected station applications were located in the third zone.⁵ Based on the construction permit application dates, one can semi-accurately determine how many of these FRC decisions were made after the Davis Amendment was enacted.⁶ Summing the

¹ 1928 Fed. Radio Comm'n 2d Ann. Rep. 11, [hereinafter "1928 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

² *Id.* at 84-87 app. D (2).

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ This estimate will be lower than the true number since undoubtedly some applications were made before March 28, 1928 that were then ruled upon after that date. However, the data does not show the date of the FRC's decision on each of the applications.

number of applications in each category by their application date after March 28, 1928, one finds that three applications were approved (all in the third zone), seventy-four applications were pending (forty-two in zone 3), and only two were rejected.⁷

Importantly, a real possibility exists that none of these decisions were made based on the Davis Amendment since the FRC report discusses how the summer of 1928 was spent figuring out how to deal with the Davis Amendment.⁸ On the other hand, the Davis Amendment had to be in the back of the commissioner's minds when they made these decisions. The FRC provided another table that indicates that they were giving out construction permits to the South as shown in Table 3 below – it was the only area that added a net number of stations during that year July 1927-June 1928. However, this table is similarly unclear on when and why the construction permits were given.

Pursuant to and soon after General Order 40 “the commission proceeded to act upon the large number of applications for construction permits and for increases in power which it had from existing or prospective broadcasting stations.”⁹ “These were granted only in cases . . . accommodated under the [General Order 40] allocation and principles . . . adopted by the [FRC]”¹⁰ The FRC appears to have given construction permits/licenses to two new stations, listed in Table 1. The FRC also gave permits to some existing licensed stations allowing them to broadcast with more power and those stations are listed in Table 2.

⁷ 1928 Report, *supra* note 1, at 84-87 app. D (2).

⁸ *Id.* at 13-14.

⁹ *Id.* at 18.

¹⁰ *Id.*

To finish out 1928, the FRC accepted six construction permit applications (from various zones) and denied sixteen from October 1, 1928 to December 31, 1928.¹¹

After General Order 40

Table 1

The following stations have construction permits/licenses on September 10, 1928 pursuant to General Order 40.¹² However, these stations did not exist before this time.

Location	Station	Permit Power	Frequency
VA, Richmond	WTAZ	15	1210
WV, Clarksburg	WOBV	65	1200

Table 2

The following stations were in existence when General Order 40 was announced on September 10, 1928 and were issued construction permits/licenses allowing them to broadcast with more power pursuant to General Order 40.¹³

Location	Station	Power	Permit Power	Frequency
AL, Auburn	WJAX	1000	5000	1140
AR, Hot Springs	WBAP	1000	5000	800
CA, LA	KFI	5,000	50,000	640
CT, Hartford	WBAL	500	50,000	1060
GA, Atlanta	WSB	1000	5000	740
KY, Louisville	WHAS	5,000	10,000	1020
LA, New Orleans	WWL	500	5000	850
NC, Charlotte	WBT	5,000	10,000	1080
NC, Raleigh	WPTF	5,000	10,000	1080
TX, Dallas	KRLD	5,000	10,000	1040
TX, Dallas (part-time)	WFAA	5,000	50,000	1040
TX, Fort Worth	WBAP	5,000	50,000	800
UT, Salt Lake City	KSL	1130	5000	1130
VA, Richmond	WRVA	1000	5000	1110
WV, Wheeling	WWVA	250	5000	1020

¹¹ 1929 Fed. Radio Comm'n 3d Ann. Rep. 45-47, [hereinafter "1929 REPORT"], available at http://www.fcc.gov/mb/audio/decdoc/annual_reports.html.

¹² 1928 Report, *supra* note 1, at 170-91 app. G (1).

¹³ *Id.*

Prior to General Order 40

Table 3

Table showing number of broadcast stations in each zone, with total power in each zone as of July 1, 1927 and June 30, 1928. (before General Order 40 but an unknown amount after the Davis Amendment)¹⁴

	July 1, 1927		June 30, 1928	
	Stations	Total Power	Stations	Total Power
Zone 1	132	133,810	122	218,985
Zone 2	115	80,365	111	115,690
Zone 3 (South)	97	44,080	117	88,595
Zone 4	203	141,935	198	173,085
Zone 5	135	59,925	129	128,095

Table 4

List of construction permits/licenses granted to broadcasting stations between July 1, 1927 and June 30, 1928. (before General Order 40 but an unknown amount after the Davis Amendment)¹⁵

Zone	Location	Station	Permit Power	Frequency
1	NH, Manchester	WRBH	500	TBD
1	NY, Saranac Lake	WNBZ	10	1290
2	WV, Clarksburg	WQBJ	65	1250
2	VA, Roanoke	WRBX	1000	TBD
2	OH, Shelby (deleted soon after since this was portable)	WOBR	10	1470
3	FL, Tampa	WQBA	250	
3	AR, Little Rock	KGHI	15	1150
3	TX, Georgetown	KGKL	100	1290
3	TX, Goldthwaite	KGKB	50	1070
3	AR, Little Rock	KGJF	250	1080
3	TX, Richmond	KGHX	50	TBD
3	MS, Gulfport	WGCM	15	1350
3	TX, Wichita Falls	KGKO	250	TBD
3	MS, Utica	WQBC	100	1390
3	GA, Tifton	WRBI	20	1350
3	TX, Breckenridge	KFYO	15	1420

¹⁴ *Id.* at 65 app. C (1).

¹⁵ *Id.* at 84-100 app. D (2) – D (3).

3	NC, Gastonia	WRBU	50	TBD
3	AR, McGehee	KGHG	50	TBD
3	GA, Columbus	WRBL	50	1170
3	SC, Columbia	WRBW	15	TBD
3	MS, Greenville	WRBQ	100	1090
3	TN, Union City	WOBT	15	1460
3	NC, Wilmington	WRBT	50	1320
3	MS, Hattiesburg	WRBJ	10	1200
3	TX, El Paso	KGHO	50	
4	SD, Pierre	KGFX	200	1180
5	MT, Billings	KGHL	250	1350
5	CO, Pueblo	KGHF	250	1430
5	MT, Missoula	KGHD	5	1290
5	CA, Inglewood	KGGM	100	
5	HI, Honolulu	KGHB	250	1320
5	CO, Pueblo	KGHA	500	1430

To: Clay T. Whitehead; Susan Burgess
From: Wendell Bartnick
Date: July 8, 2007
Re: Building Radio Networks

Question

Were more than three national networks feasible during the late 1920's and early 1930's?

Short Answer

Likely not. According to the FCC in 1941, throughout the 1920's and 30's "NBC and CBS [came to] dominate this field; their ownership and operation of important radio stations and their restrictive long-term contracts with other stations enable them to maintain indefinitely their present monopolistic position. . . . Conditions prevent[ed NBC and CBS's] one existing competitor (Mutual) from seriously encroaching on their domain and practically foreclose the possibility of new competition" ¹ "The door is closed against new networks." ² "[In late 1930's] only a negligible proportion of the Nation's total nighttime broadcasting wattage [was] free to bargain in the network-station market." ³ Exclusive, long-term contracts with network affiliates meant that a new network could not steal away any affiliated station.

Long Answer

- In 1941, the FCC completed a staff report on Chain or Network Radio Broadcasting. ⁴
- FCC found that over those years developed "three organizations operating four network systems of national scope, and a number of organizations operating network systems of a regional character."
 - The three organizations were NBC (with two networks), CBS, and Mutual. ⁵

¹ FCC STAFF, REPORT ON CHAIN BROADCASTING 122-23 (1941), *available at* 1941 FCC LEXIS 2.

² *Id.* at 124-25.

³ *Id.* at 126.

⁴ *Id.* at 2.

⁵ *Id.* at 8-9.

- Station Control
 - Table 1 below shows the stations the two networks controlled in 1938, showing the obvious control over nearly all the powerful stations by the two networks.
 - NBC controlled two of the most powerful stations in each of New York City, Chicago, Washington D.C., and San Francisco.⁶
 - CBS controlled some of the most powerful stations in New York City, Boston, Washington D.C., Chicago, Minneapolis, St. Louis, and Los Angeles.⁷
 - In 1932, NBC controlled 14.2% of total stations.⁸ CBS controlled 15.4% of the total stations.⁹
- Power Control in 1938¹⁰
 - NBC – 119 stations with unlimited-time = 51.4% of watts of unlimited-time stations
 - CBS – 93 stations with unlimited-time = 35.2% of watts of unlimited-time stations.
 - Mutual – 55 stations with unlimited time = 6.3% of watts of unlimited-time stations
 - Affiliated with more than one of the three networks – 30 stations with unlimited time = 5% of watts of unlimited-time stations
 - TOTAL = 98% of watts of unlimited-time stations were with three networks
- Income
 - These two networks had millions in net income, while the biggest regional networks had income in the hundreds of thousands.¹¹
- One of the biggest reasons for the control was the affiliations contracts
 - 5 years – with staggered termination dates, so some contracts expired each year.¹²
 - Exclusivity – Affiliates could not make facilities available to any other network.¹³
- During this time, a station's affiliation with a network was often essential to its profitable operation.¹⁴ Logically, if every station wants to be in a network and only three networks existed, that must mean there were barriers keeping more networks from being created.
- FCC describing the dominance of these two networks:¹⁵
 - “[T]here are 45 cities with a population of more than 50,000 served by NBC or CBS or both to which Mutual cannot obtain any access whatever.

⁶ *Id.* at 41.

⁷ *Id.* at 60.

⁸ *Id.* at 40.

⁹ *Id.* at 60.

¹⁰ *Id.* at 77.

¹¹ *Id.* at 44, 61, 73.

¹² *Id.* at 86-87.

¹³ *Id.* at 88.

¹⁴ *Id.* at 122.

¹⁵ *Id.* at 132-34.

In over 20 more, including Cleveland, Indianapolis, Houston, Birmingham, Providence, Des Moines, Albany, Charlotte, and Harrisburg, it can obtain only limited access to facilities. The difficulties facing a new network under these circumstances would be well-nigh insurmountable. . . . Of the 92 cities of more than 100,000 population, less than 50 have 3 or more full-time stations, even including locals, and less than 30 have 4 or more. Since a national network must have outlets in the more important markets of the country, it is readily apparent that exclusive network affiliation contracts severely limit the number of national networks which may do business. . . . But figures on the limited number of stations outside the NBC and CBS domain do not fully show the extent of their present dominance. NBC and CBS have, by their exclusive contracts, tied up the largest stations in the most desirable markets."

Table 1: Power and Time Designations for NBC and CBS controlled stations in 1938.

Item	Class and Time Designation	Number of Stations in networks of CBS and NBC			In U.S.	% of total
		CBS	NBC	Total		
1	Clear channel (50 kw. or more) - unlimited time	11	17	28	30	93.3
2	Clear channel (50 kw. or more) - part time	0	4	4	4	100
3	Clear channel (5 kw. to 25 kw.) - unlimited time	5	9	14	14	100
4	Clear channel (5 kw. to 25 kw.) - part time	2	2	4	4	100
5	TOTAL CLEAR CHANNEL	18	32	50	52	96.2
6	Regional (high power) - unlimited time	4	4	8	8	100
7	Regional (1 kw. to 5 kw.) - unlimited time	58	80	138	196	70.4
8	Regional (250 w. to 5 kw.) - limited and daytime	2	3	5	68	7.4
9	Regional (250 w. to 5 kw.) part time	4	8	12	33	36.4
10	TOTAL REGIONAL	68	95	163	305	53.4
11	Local (50 w. to 250 w.) - unlimited time	20	33	53	227	23.3
12	Local (50 w. to 250 w.) - day and part time	1	0	1	76	1.3
13	TOTAL LOCAL	21	33	54	303	17.8
14	TOTAL	107	160	267	660	40.5

Susan Burgess

From: Susan Burgess
Sent: Tuesday, July 10, 2007 8:54 PM
To: Clay T. Whitehead
Subject: source for Wendell's recent memo

Attachments: FCC_chain_broadcasting_report.pdf



FCC_chain_broadcasting_report....

Tom,

I asked Wendell to forward me a copy of the source he used for his most recent memo to you concerning the networks. It's attached.

Susan

Susan Burgess

From: Susan Burgess
Sent: Thursday, July 05, 2007 11:31 AM
To: Clay T. Whitehead
Subject: draft bio and draft wikipedia entry

Attachments: Draft Wikipedia Entry.doc; Draft CTW Bio.doc



Draft Wikipedia
Entry.doc (28 ...



Draft CTW Bio.doc
(25 KB)

Tom,

I am attaching a draft biography (incorporating your suggested changes) and wikipedia entry for your review.

Since I know you and Brian Lamb feel similarly conscientious about not appearing egotistical, I used Brian's wikipedia entry as a model for yours - essentially, I kept it short and sweet. Please let me know what information you'd like me to expand.

You'll see I've highlighted a few notes about potential additional topics. But even if we cover additional issues, I think we want to keep this as succinct as possible to avoid appearing: (1) as if you've written it; and (2) boastful. Also, I think a more detailed entry would more likely draw criticism / contributions from folks who'd want to focus on OTP & public broadcasting.

Here's Brian's entry if you'd like to take a look at it:
http://en.wikipedia.org/wiki/Brian_Lamb

Draft Wikipedia Entry

Clay Thomas Whitehead (born November 13, 1938) led the implementation of the U.S.'s Open Skies policy towards satellites under President Nixon whom he served first as a Staff Assistant, then as Director of the Office of Telecommunication Policy (1970-1974). In 1979, Whitehead founded and became President of Hughes Communications, Inc. (1979-1983) through which he created the satellite system that became the model for distribution of cable and satellite television channels in the U.S. and around the world. He then went on to found Astra, the world's first commercial satellite TV broadcast business. Whitehead now teaches as a Distinguished Visiting Professor of Communications Policy at George Mason University.

[Highlight important issues that OTP addressed?]
[Explain Galaxy and Astra in more detail?]

Whitehead was born in [town?]. He received a B.S. and M.S. in electrical engineering from MIT and a Ph.D. in management and economics, also from MIT. He then served two years in the Army and worked as an analyst at the Rand Corporation on national security and economic policy issues before joining the Nixon administration. He is married and has two children.

[Potential] External Links

Whitehead biography:

<http://www.sspi.org/displaycommon.cfm?an=1&subarticlenbr=134>

Whitehead article on Presidents' use of television. Clay T. Whitehead, "Media Chic," Yale Law Journal: Vol. 83, No. 8 (Jul. 1974) pp. 1751-65:

<http://links.jstor.org/sici?sici=0044->

0094(197407)83%3A8%3C1751%3AMC%3E2.0.CO%3B2-6

"Hughes Aircraft Remembered," SatMagazine.com (April 2005). Bruce Elbert, President, Application Tehcnology Strategy, Inc.:

http://www.applicationstrategy.com/Hughes_Aircraft_Remembered.htm

Sidney Topol oral history, The Cable Center Oral History Collection:

<http://www.cablecenter.org/education/library/oralHistoryDetails.cfm?id=268#transcript>

Draft Bio

Clay T. Whitehead is Distinguished Visiting Professor of Communications Policy at George Mason University. Founder of Astra, the world's first commercial satellite TV broadcast business. Founder and former President (1979-1983) of Hughes Communications, Inc., a subsidiary of Hughes Aircraft Company, where he created the Galaxy satellite system the first system to distribute cable and satellite television channels in the U.S. and around the world. Served as Director of the U.S. Office of Telecommunications Policy (OTP) under President Nixon (1970-1974) after serving two years as Special Assistant to the President during which he led the development of the U.S. "open skies" satellite policy. After college, worked as an analyst at the Rand Corporation on national security and economic policy issues. Received his B.S. and Ph.D. from MIT.

To: Dr. Whitehead, Susan Burgess
From: Ben Haskins
Re: Radio Music Box Memo

I. Question Presented

David Sarnoff wrote a memo on the “radio music box,” in which he proposes the creation of this thing where Marconi would transmit music by radio and sell receivers to the public. Sarnoff claims that he wrote this memo in 1916, and that it marks the creation of radio. Later historians cast doubt on the authenticity of the memo’s date – they think it was written after 1920 – and there’s some evidence it was written after H.P. Davis created KDKA and, thus, that Sarnoff was just grandstanding. Were there any memos responding to Sarnoff’s 1916 memo? Summarize the evidence for and against the memo’s alleged 1916 creation date.

II. Short Answer

First, a 1916 David Sarnoff memo exists, but it is unlikely to be what has become known as the Radio Music Box Memo (“RMBM”) because it is very short and undetailed. Rather, the “real” RMBM memo was likely written in 1920.

The only evidence supporting the belief that Sarnoff wrote a very detailed RMBM in 1915 are Sarnoff’s own self-serving assertions, including a memo he wrote to an RCA researcher and a *Saturday Evening Post* article he authored. Most evidence weighs against the existence of such a memo.

First, Sarnoff seems to have had a penchant for exaggeration. Second, research reveals no pre-1920 references to a detailed 1915 RMBM. Third, and most significantly, no research has unearthed a version of the RMBM that is dated 1915 or even before 1920. Finally, evidence indicates that the oft-cited Sarnoff historian that claims to have relied on a pre-1920 RMBM for his work was likely working from a 1920 memo, as discussed below.

III. Discussion

A. Introduction

The Radio Music Box Memo has contributed much to Sarnoff's persona. For years, historians assumed that Sarnoff wrote a 1915 RMBM explaining a detailed game plan for household radio based solely on Sarnoff's own assertions, not on any documentation. No such detailed memo dated 1915 currently exists. The quandary this provides is that there is no way to say for sure whether the memo ever truly existed, in detailed form, in 1915. Recent research points to a reasonable conclusion that Sarnoff had some idea about household radio around 1915/16, but did not articulate it fully until 1920. As you will see, this contradicts statements made by Sarnoff himself, but given his penchant for exaggeration, this is hardly a surprise.

B. Sarnoff's *Saturday Evening Post* article is unreliable evidence of a 1915 memo.

The primary source for the belief that Sarnoff wrote a 1915 RMBM are Sarnoff's own statements. In 1926, Sarnoff wrote two articles in the *SEP*, entitled "Radio," in which he shared much of his experience in the radio business.¹ In the first article he stated:

So impressed was I with the work of the amateurs and the interest it was arousing everywhere that in 1915, as assistant traffic manager of the Marconi Company, I submitted a report urging the company to confine itself no longer to the ocean. Waxing prophetic, I visioned a radio music box arranged for several different wave lengths which should be changeable with the throwing of a single switch or the pressing of a single button.²

¹ Sarnoff, David. "Radio." *Saturday Evening Post* August 7, 14, 1926.

² Sarnoff, August 7, at 142,145.

He stated that he had a copy of the 1915 memo in front of him (he was dictating the article) and went on to give the details for which his 1915 RMBM became known, including its household utility and the possibilities of broadcasting lectures and baseball games.³

Sarnoff's self-serving statements in this article are unreliable, however, because there is no evidence Sarnoff had any such 1915 memo in front of him when he wrote the 1926 article. A 1925 letter from an RCA researcher indicates that, as of 1925, he could not locate a copy of his alleged 1915 RMBM and no evidence suggests that Sarnoff ever did locate the memo he sought.

Additionally, Sarnoff had a proven tendency to manipulate or exaggerate reality to improve his self-image. For instance, soon after the Titanic disaster, he made false claims about his role in relaying messages about the sinking ship. Despite evidence to the contrary, Sarnoff claimed to have remained on duty at the Wanamaker department store as a telegraph operator for 72 hours while all other area stations shut down, causing news sources to rely on him for information. His role, however, was much less heroic. Sarnoff could not have been on duty when the first messages from the Titanic disaster arrived because the store was closed on Sunday night when they came in. Further, Sarnoff's equipment could only have received the strongest ship signals, making it unlikely that he was in much direct contact with the rescue ships. And when Marconi closed all but four stations due to the radio traffic, Sarnoff's was one of those closed. While Sarnoff was one source of information about the disaster, his role was not as dramatic as he claimed.⁴

³ *Id.* at 145.

⁴ Lewis, Thomas, *Empire of the Air: The Men Who Made Radio*, HarperCollins P.: NY, 1991. p. 107.

C. Gleason Archer's reliance on an alleged 1915 RMBM is doubtful.

One other oft-cited source for the existence of a RMBM dated before 1920 is Gleason Archer's 1938 book *History of Radio to 1926*. Therein, Archer reprints what he claims to be a 1916 memo from Sarnoff to Edward Nally, which begins with "I have in mind a plan of development which would make radio a 'household utility' in the same sense as the piano or phonograph. The idea is to bring music into the house by wireless."⁵ It then goes on to discuss the possible design of the "Radio Music Box" and its possible range, and the possibility of using radio to broadcast lectures and baseball games into homes, just as was mentioned in Sarnoff's *SEP* article.⁶ The memo Archer reprinted is similar to the one Sarnoff quoted from in *SEP*.

Several pieces of evidence, however, indicate that Archer probably did not rely on a 1916 RMBM for his writing. Louise Benjamin, who has done much research on the RMBM, believes that the likely source for the memo reprinted in Archer is not a 1915/16 memo, but a 1920 memo Sarnoff wrote to Owen Young on January 31, 1920, shortly after the creation of RCA.⁷ Sarnoff's 1920 28-page report to Young contains two pages that are almost identical to the RMBM found in Archer. Two versions of the 1920 memo exist, the original and a copy found in Owen Young's papers. The later one matches Archer's reprint exactly.

Sarnoff begins the 1920 memo by stating that he presented the idea for a Radio Music Box to Nally in 1915. Archer probably saw a copy of this 1920 memo and, because Sarnoff referred back to 1915 in the memo's introduction, assumed that the 1920 memo was the same

⁵ Gleason, Archer L., *History of Radio to 1926*, The New York Historical Society, 1938, p. 112.

⁶ *Id.* at 112-113.

⁷ Louise Benjamin. *In Search of the Sarnoff "Radio Music Box" Memo*. 37 J. Broadcasting & Electronic Media 325, 327 (1993).

and just assumed that he was reviewing a copy of the alleged 1915 memo. There are two reasons for this to be likely.

First, as Benjamin explores in her paper, the differences between the memo Archer reprints in his book as the alleged 1915 memo and the original version of the 1920 memo are mostly minor details like grammatical changes and word choice edits. Benjamin postulates that it is unlikely that Sarnoff would have drafted near identical versions of the same memo five years apart. Rather, she theorizes, these edits are consistent with the idea that someone at RCA changed the memo some time between 1920 to 1938, the date Archer's book was published, to make it conform with company style, something that most likely happened when the memo was copied. For example, certain punctuation used by Sarnoff to provide emphasis on one sentence was changed to ordinary type. Also, the word "propaganda" was removed from Archer's version as if it had been conscientiously edited out to avoid the negative connotation that word had derived between 1920 and 1938. The striking similarities between the 1920 memo and Archer's reprint suggest that the 1920 memo, with modifications, was Archer's source, and not a detailed 1915 RMBM.⁸

The second reason to suspect that Archer did not have an actual 1915 RMBM for his source is that, in 1925, 13 years before Archer's book was published, an RCA researcher could not find such a memo. In her second article on the topic, Benjamin cites a letter written by an RCA researcher retained by Sarnoff to locate a copy of the original Music Box memo in preparation for his *Saturday Evening Post* articles. The letter, dated in May 1925, is from a researcher identified only as "T.N.B." says:

⁸ *Id.* at 332.

Some time ago you asked me about some early correspondence in connection with your "music box" scheme.

I have not, to date, been able to locate anything earlier than 1916, and enclose herewith the original of your memorandum of November 8 of that year to Mr. Nally and the carbon of Mr. Nally's reply of the 9th. Note that your memorandum carries file reference number "A-22." This may give you a clue to the correspondence.

In your letter of August 2, 1922, to Dr. Goldsmith on the subject of "Individual Radio (Radiolette)" of which you sent a carbon to Mr. Nally with the penned notation "Another brainstorm" you quote from a letter of 1915 to Mr. Nally [exact date not given] –

"I have in mind a plan of development which would make radio a household utility in the same sense as the piano or phonograph ***** [sic] The idea is to bring music into the house by wireless."

I have not, so far, been able to locate this letter of 1915 but shall continue my search.

Sincerely, [Initialed] T.N.B.9

The letter suggests that no detailed 1915 RMBM existed in the RCA archives in 1925.

First, the researcher couldn't locate any such memo. Second, the sentence "I have in mind a plan..." is identical to the phrasing in Sarnoff's 1920 memo to Owen. Third, this 1925 letter sheds doubt on Sarnoff's claim in his 1926 *SEP* article that he was quoting from a 1915 memo. T.N.B. indicates that Sarnoff didn't have a copy of the alleged 1915 memo by May 1925, and no evidence suggests that he obtained one between then and little over a year later outside of his own self-serving statements.

D. Edward Nally's correspondence suggests that Sarnoff had not yet fully developed his Radio Music Box idea by 1916.

In Benjamin's second article on the subject, she discusses the finding of two memos, one sent from Sarnoff to Edward Nally on November 8, 1916, and one from Nally to Sarnoff on the next day (which are also mentioned in the RCA researcher's letter above). As Benjamin notes, these memos conform with Archer's description of events:

9 Louise Benjamin. *In Search of the Sarnoff "Radio Music Box" Memo: Nally's Reply*. 9 *Journal of Radio Studies* 97, 101 (2002).

In 1916 Mr. Sarnoff embodied in a written recommendation to Edward J. Nally, the General Manager of the Marconi Company, the details of his proposed "Radio Music Box" scheme. Mr. Nally's reply, dated November 9, 1916, is in existence and has been examined by the author.¹⁰

In the preceding excerpt, Archer is clearly thinking that Sarnoff's "written recommendation to Edward J. Nally" was the detailed version of the RMBM, of which only the 1920's version exists. The memo that Benjamin uncovered from 1916, however, was not the detailed one described by Archer, but the following:

Mr. Nally,

This is a matter which I have given much thought during your absence. It involves my "music box scheme" about which I spoke to you sometime ago. I still believe in it and my faith is even stronger. It is one of the things I am saving up to talk over with you when your time will permit.

The note is initialed 'D.S.'

Nally's reply, which is mentioned in Archer, was titled "Re: MUSIC BOX SCHEME"¹¹ and stated:

With reference to the attached, I think we should at once take steps to protect our interests. I have some views along these lines and shall be glad to discuss them with you in connection with the Gramophone [sic] Company's agreement, which I am sending you separately.¹²

While Sarnoff's memo to Nally shows that he had in mind a scheme for household broadcast radio – a "music box scheme" – it isn't the detailed RMBM found in Archer (and many later books on Sarnoff).

In fact, the discussion in Nally and Sarnoff's 1916 memos suggests that a more detailed 1915 RMBM probably did not exist. The dialogue within these memos would likely have been

¹⁰ Archer at 112.

¹¹ *Id.*

¹² *Id.* at 100-01.

different had Sarnoff already proposed to Nally his detailed plan for the implementation of wireless entertainment radio before these 1916 memos. Why would he feel the need to discuss it again, or to re-present his ideas? Instead, these memos show that in 1916, a few men at American Marconi brainstormed about a revolutionary idea that had not taken full shape.

Some histories that accept the existence of Sarnoff's 1915 RMBM claim it was poorly received or outright ignored by Sarnoff's superiors. Nally's 1916 memo as General Manager of the Marconi Company, however, shows that interest was kindling. The idea was not entirely ignored, but was not yet strong enough to force a shift in company strategy either. The fact that the idea garnered little attention supports the idea that no detailed 1915 RMBM existed.

IV. Conclusion

In light of the above, it seems two possible conclusions could be drawn. The first, and more plausible, is that Sarnoff had an idea of household radio in 1915/16, and, after fully articulating the details in the 1920 memo to Young, later claimed that the 1920 memo was essentially the same as a memo he wrote in 1915. Sarnoff did not have a copy of a detailed 1915 memo in 1925, and no evidence indicates that he had one in 1926. This would be consistent with the idea that he was "grandstanding." This conclusion is also supported by the fact that an oft-cited historian who claims he saw a detailed 1915 memo probably did not. This would explain much of the post 1938 assumption that Sarnoff wrote the RMBM in 1915. The non-existence of any 1915, detailed RMBM obviously supports this conclusion as well.

The second possibility, opposite from the one above, is that the 1920 version of the memo actually had a 1915 brother that did not survive. This possibility is not likely, however, since the only support for this are Sarnoff's self-serving statements, which are

especially doubtful in light of his tendency to exaggerate, and the absence of any unbiased pre-1920 references to a detailed RMBM.¹³

¹³ Alexander B. Magoun, "Pushing Technology: David Sarnoff and Wireless Communications, 1911-1921" Presented at IEEE 2001 Conference on the History of Telecommunications, St. John's, Newfoundland, July 26, 2001.

http://www.ieee.org/portal/cms_docs_iportals/iportals/aboutus/history_center/magoun.pdf

Jackie Neff
July 5, 2007

Responses to Follow-Up Questions on Radio Memos

Q: In 1927 were there any important advances in radio receiver design that further helped tune out interference?

A:

I was unable to discover any "significant" 1927 inventions deterring interference in radio communication. I did find two patents issued on devices with at least a partial purpose of blocking wireless interference.¹ However, neither the patents nor the devices were ever mentioned in any of the many articles I read on point.² The general consensus appears to be that the Radio Act of 1927 was responsible for the diffusion of interference rather than technological advance.³ Additionally, there was scarcely any mention at all in any of this or any other literature surveyed that mentioned either of these or any 1920's inventions addressing interference. This leads me to believe that the inventions were not terribly significant and did not have a great impact on the functioning of the wireless system.

¹ Signaling System, U.S. Patent No. 1637404 (filed March 12, 1921)(issued Aug. 2, 1927); Wireless Receiving System, U.S. Patent No. 1633932 (filed April 26, 1923)(issued June 28, 1927).

² See Hugh G.J. Aiken, *Allocating the Spectrum: The Origins of Radio Regulation*, 34 Tech. and Culture 686, 705-08 (Oct. 1994); W. Jefferson Davis, *The Radio Act of 1927*, 13 Va. L. Rev. 611, 612-13 (Jun. 1927); Frederic P. Lee, *Federal Radio Regulation*, 142 Annals Am. Acad. Pol. & Soc. Sci., Supp.: Radio 36, 39 (Mar. 1929); Peter M. Lewis and Jerry Booth, *The Invisible Medium: Public Commercial and Community Radio* 40 (Howard Univ. Press 1990); Jora R. Minasian, *The Political Economy of Broadcasting in the 1920's*, 12 J. L. & Econ. 391, 400-03 (Oct. 1969); N.C.B., *Radio Broadcasting Under the Act of 1927: Status of Operators Licensed Under the Act of 1912*, 28 Mich. L. Rev. 1032, 1035 (Jun. 1930); Hugh Richard Slotten, *Radio Engineers, the Federal Radio Commission, and the Social Shaping of Broadcast Technology, Creating "Radio Paradise,"* 36 Tech. & Cult. 950, 953-57 (Oct. 1995); J. Willihnganz, *Debating Mass Communication During the Rise and Fall of the International Economy 4-7*, A White Paper, Univ. Cal. Berkely (1994).

³ See *id.*

Q: What happened after Crosley "had become the world's largest radio seller?" How long did Crosley's business thrive? Please explain Crosley's "efforts in high-power radio broadcasting," "Cincinnati," and "WLW"?

A: Intending to propel his success further, Crosley built his own transmitter in his home and procured a license from the Secretary of Commerce, Herbert Hoover on July 1, 1921.⁴ He commenced merely by playing the same record over and over in his "studio" with intermittent advertisements for Crosley's forthcoming radio set.⁵ These amateur advertisements propelled Crosely Manufacturing into the limelight as the number one radio producer in the world by 1922.⁶ Although faced with increased competition, the radio giant was still the fifth largest manufacturer of radio sets in 1954 and would remain a major industry player for the next thirty years.⁷

Verifying that his broadcasts were heard over the airwaves, Crosley began playing a variety of music and programs.⁸ However, the chaotic airwave mess mentioned above was commencing as more and more amateurs tried their hands at broadcasting.⁹ In 1922, Hoover ordered individual amateurs to cease all broadcasting and in response, Crosley applied for a commercial license.¹⁰ Crosley Manufacturing began broadcasting under the name "WLW."¹¹

⁴ Rusty McClure et al., *Crosley: Two Brothers and a Business Empire that Transformed the Nation* 129 (2006).

⁵ *Id.* at 129-30.

⁶ Lawrence W. Lichty, *WLW*, 3 Museum of Broadcasting Communications Encyclopedia of Radio 1538, 1539 (2004).

⁷ Lawrence W. Lichty, *Crosley, Powel: 1886-1961, U.S. Inventor, Manufacturer and Broadcaster*, 1 Museum of Broadcast Communications and Radio 420, 421-22 (2004).

⁸ *Id.*

⁹ *Supra*, note 4 at 135.

¹⁰ *Id.* at 136.

¹¹ *Id.*

Crosely's success in the sale of radios continued to improve as he used WLW as an advertising outlet.¹² Although WLW enjoyed wide listenership, its success was essentially restricted to the Cincinnati area because Crosley's mass production was based upon an inexpensive less sensitive radio receiver.¹³ To disseminate his programs further, Crosley increased WLW's power to 500 Watts in 1923 and to 1,000 Watts in 1924.¹⁴ When the FRC began intensely regulating licensing in 1927, Crosley applied for a high power license.¹⁵ The FRC assigned the 700 KHz band exclusively to Crosely, rendering WLW a "clear channel" station.¹⁶ WLW continued to expand and the FRC authorized the station to broadcast at 50 Kilowatts in 1928.¹⁷

In 1932, Crosley Broadcasting Co. argued to the FRC (Federal Radio Commission), that a license grant for transmission at a higher power level would lead to more penetration of rural areas.¹⁸ On the basis of this contention, the FRC conditionally approved a ten month experimental license for an additional 500 kilowatts of power to Crosley on April 17, 1934.¹⁹ As of 1937, the company was the first and only station broadcasting at this high-power level.²⁰ Although other stations caught on and began high-power broadcasts, WLW maintained its market domination through its quality programming, consistently rated higher by listeners than other high power stations.²¹

¹² *Supra*, note 6; *supra*, note 4 at 136.

¹³ *Supra*, note 6.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ Jeffrey H. Smulyan, *Power to Some People: The FCC's Clear Channel Allocation Policy*, 44 S. Cal. L. Rev. 811, 822 (1970-71).

¹⁹ *Id.*

²⁰ *Id.*; O.W. Riegel, *New Frontiers in Radio*, 1 Pub. Opinion Q. 136, 139 (Jan. 1937).

²¹ *Supra*, note 6 at 1540.

However, the wide-ranging broadcasts interfered with Canadian broadcasts leading the now FCC to warn Crosley that its license would not be renewed upon expiration.²² Persistent in its desire to continue broadcasting at high-power, the company created a “directionalized antenna” that reduced interference to a level deemed acceptable by the FCC and was allowed to continue superpower broadcasts.²³ In 1939 political concerns surfaced and the FCC revoked Crosley’s high-power license.²⁴ The Commission however gave a relatively opaque reason for denying renewal noting that the use of high-power did not result in “any substantial contribution to the radio art” and the “public interest convenience and necessity will not be served by the granting of the application.”²⁵ Crosely appealed the decision, but the case was dismissed on the grounds that the “experimental license” amounted to a contractual agreement revocable at will by the Commission.²⁶ It is generally seen as an anti-monopolistic tactic to quash Crosley’s overreaching market influence.²⁷ Despite this setback, WLW went on to found Mutual Broadcasting System, and to engage in short wave radio.²⁸

In 1934, Crosley purchased a controlling share of the Cincinnati Reds baseball team in order to keep them from fleeing the city.²⁹ The Reds’ playing field still holds the name Crosley Field.³⁰ Crosley led the team from a financial slump following the Great

²² *Id.*

²³ *Id.*

²⁴ *Id.*

²⁵ *Report of Committee on WLW’s Application for Renewal of Experimental Authority*, 3 Fed. Comm. B.J. 5 (1938-1939).

²⁶ Harry P. Warner, *Subjective Judicial Review of the Federal Communications Commission*, 38 Mich. L. Rev. 632, 662 (Mar. 1940); *Crosley Corp. v. FCC*, 106 F.2d 833 (App. D. C. 1939).

²⁷ *Supra*, note 6.

²⁸ *Supra*, note 7 at 422.

²⁹ *Supra*, note 4 at 279; Barry M. Horstman, *Powel Crosley, Jr.: Innovator, Sportsman Dreamed Big*, Cincinnati Post (Apr. 18, 1999), available at <http://www.cincypost.com/living/1999/pcros040999.html>

³⁰ Horstman, *supra* note 29.

Depression to economic success by implementing night games.³¹ WLW aired Cincinnati games while continuing to expand its programming to include country music and new talk shows.³² These and other programs initially earned WLW the title “The Nation’s Station” and later “Cradle of the Stars.”³³

The government confiscated the station in 1942 to broadcast wartime propaganda.³⁴ Post-war, however, WLW reclaimed its glory and continued to adapt to market demands as FM radio was introduced.³⁵ Its adaptability has led it to remain in the top twenty “full service radio stations,” in the United States.³⁶

³¹ *Supra*, note 4 at 289-98.

³² *Id.* at 301-04.

³³ *Id.*

³⁴ *Supra*, note 6 at 1540.

³⁵ *Id.*

³⁶ *Id.* at 1541.