

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. Introduction

The Radio Music Box Memo has contributed much to the persona of Sarnoff. Relying at the utmost upon statements of Sarnoff himself, for years it was widely assumed that he wrote in 1915 the RMBM which sets forth a rather detailed game plan for household radio. No such detailed memo with a 1915 date upon it exists at this current time. 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.

III. The *Saturday Evening Post* to Archer

There is good reason to think that a detailed, 1915 RMBM was written. 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 that 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.

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

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

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 Thus we essentially have Sarnoff himself dating a detailed RMBM at 1915. Given his exaggerations in the same article about his role in the Titanic rescue⁴, however, this isn't the most persuasive evidence.

The oft-cited source for the 1915 (or 1916, in this case) date is the *History of Radio to 1926* by Gleason Archer. 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 mentioned in the *SEP* article.⁶ The memo quoted from in the *SEP* is of the same detailed variety as the one found in Archer.

IV. Casting Doubt on Whether Archer's Source Was a Detailed, 1915 RMBM

Archer's claims do not come without criticism. Professor Louise Benjamin, who has done much research on the RMBM, believes that the likely source for the memo reprinted in

² Sarnoff, August 7, at 142,145.

³ *Id.* at 145.

⁴ *Id.* at 141.

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

⁶ *Id.* at 112-113.

Archer is not a 1915/16 memo, despite his claims, but a 1920 memo which was written by Sarnoff to Owen Young on January 31, 1920, shortly after the creation of RCA.⁷ Inside of a 28 page report to Young is found what is essentially the RMBM found in Archer, with modifications. Sarnoff begins that memo by stating that he presented such an idea to Nally in 1915. It is likely that Archer saw a copy of the 1920 memo and, because Sarnoff referred back to 1915, assumed that it was the same. There are two reasons, I think, for this to be likely.

First, as Prof. Benjamin explores in her paper, the differences seen between the reprint in Archer and the 1920 memo are largely grammatical and word choice edits. These edits are consistent with the idea that the memo was changed somewhere from 1920 to 1938 to be fit to be a company document. For example, certain punctuation used by Sarnoff to provide emphasis on one sentence was changed to ordinary type, or the removal of the word “propaganda” from Archer’s version, which fits with the negative connotation that word had derived between 1920 and 1938. Thus, it is entirely possible that the 1920 memo, with institutional 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 a letter found by Prof. Benjamin, which she reprints in her second article on the topic. The letter was a response to Sarnoff seeking 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.” and stated:

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

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 because the sentence “I have in mind a plan...” is from a detailed version of the memo as found in Archer. Thus, it is highly unlikely that Archer had such a memo for a source. Also, this letter sheds doubt onto Sarnoff’s claim made in the *SEP* article in which he claimed that he had a 1915 memo handy. T.N.B.’s letter suggests that Sarnoff didn’t have a copy before May 1925, and no evidence suggests that he obtained one between then and little over a year later outside of his statements.

V. What We Do Have: Nally’s Reply

In Prof. Benjamin’s second article on the subject, she discussed the finding of two memos, one sent from Sarnoff to Nally on November 8, 1916, and one from Nally to Sarnoff on the next day (which are also mentioned in the above letter). As she notes, this fits into the paradigm given by Archer:

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 of the detailed version of the RMBM, of which only the 1920’s version exists. The memo which Prof. 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.’ and contains the following handwritten addendum in David Sarnoff’s script:

Here’s an opportunity, too, to make a big thing out of the Marconi Publishing Co. as we can work in the Wireless Age on this proposition.

Again, this postscript is initialed ‘D.S.’¹¹

The reply of Nally, which is mentioned in Archer, was titled “Re: MUSIC BOX SCHEME”¹² 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.¹³

While the memo from Sarnoff to Nally isn’t the detailed RMBM found in Archer (and many latter books on Sarnoff), it still shows that he had in mind a scheme for household

¹⁰ Archer at 112.

¹¹ *Nally’s Reply* at 100.

¹² *Id.*

¹³ *Id.* at 100-01.

broadcast radio. Mr. Nally's reply, in mentioning the Gramophone agreement, shows that he saw the possibilities of broadcasting music through the new radio technologies.¹⁴ Sarnoff's memo refers back to having spoken to Nally about it earlier, but does not necessarily refer to a detailed RMBM from 1915.

IV. Conclusion

In light of the above, it seems two possible conclusions could be drawn. The first 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 1920 version to be essentially the same as a memo he wrote in 1915. We know that Sarnoff did not have a copy of a detailed 1915 memo in 1925, and therefore not likely 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 Archer likely never saw a detailed 1915 memo, but a copy of Sarnoff's 1920 RMBM, which he then assumed to be the same. 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, but only one survived. This is supported by the fact that Sarnoff treats them as the same multiple times. I think this possibility unlikely given Sarnoff's ability to exaggerate. Also, there does not seem to be any pre-1920 reference to a detailed RMBM.¹⁵ However, Sarnoff's multiple statements which point to

¹⁴ *Nally's Reply* at 103.

¹⁵ Alexander B. Magoun, "Pushing Technology: David Sarnoff and Wireless Communications, 1911-1921" Presented at IEEE 2001 Conference on the History of Telecommunications, St.

a 1915 version of the memo are somewhat persuasive. On the other hand, the only references to a 1915 memo are Sarnoff's, as there does not appear to be any replies from Nally regarding a 1915 memo, just the 1916 one.

John's, Newfoundland, July 26, 2001.

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

Threads: Wireless Telegraphy

1. KDKA model (pre-network model)
 - a. Establishment of a radio broadcast industry & consumer electronics business
 - b. Patent issues
 - c. AT&T's entry, attempted monopoly
 - d. RCA's role
2. Programs, Copyright
3. Spectrum, interference, regulation, public interest, Hoover, allocations, 1927 Act
4. Network broadcasting
 - a. AT&T's exit
 - b. Creation of NBC
 - c. Allocation of high-powered regional stations
5. Feasibility of only three networks
6. Advertising, entry of CBS, consolidation of the network model, program content evolution, 1934 Act

Pooling Patent

During World War I, the Navy took at least two major actions in the radio field. First, to control the airwaves the Navy took over operations of all high-power U.S. radio stations and closed amateur radio stations in 1917.¹ Second, it cleared the way for the production of vacuum tubes. Radio technology, including vacuum tubes, was the subject of many patents in the 1900s. These patents “tied most [vacuum-tube production] companies into knots” because of the risk of infringement.² The Navy was keen to use vacuum tubes for its wireless communications, but needed to resolve the patent conflict before manufacturers would supply the tubes. The Navy provided indemnity for manufacturers by assuming the risk of infringement suits by patent holders.³ Although this temporarily dealt with the problem during war-time, after WWI the patent problem returned.

Immediately after the war in 1919, American Marconi approached GE about exclusive rights to a powerful alternator made by GE and known to be the “best and most reliable transatlantic radio communication device” of the time.⁴ The Navy strongly opposed this deal as it gave a foreigner a monopoly on U.S.-Europe radio communications.⁵ The Navy still controlled American Marconi-owned high-power stations.⁶ Under pressure, British Marconi sold its stake in American Marconi to GE, which then bought out the American shareholders of

¹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 48, 56 (2002).

² CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 49 (2002).

³ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 49 (2002).

⁴ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 57 (2002).

⁵ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 57 (2002).

⁶ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 58 (2002). The Navy was ordered to return all stations to their owners by March 1, 1920. *Id.* at 57.

American Marconi.⁷ GE formed the Radio Corporation of America (RCA), and transferred the American Marconi assets over to it.⁸ The Navy released the American Marconi stations.⁹ GE and RCA cross-licensed each other for their radio patents.

On July 1, 1920, GE, RCA, and AT&T signed a patent pooling and cross-licensing agreement that allowed for the commercial sale of triodes, a component of the vacuum tube, to be sold legally.¹⁰ More patents came into the pool over time, including the Westinghouse radio portfolio by June 1921.¹¹

AT&T Gets Out of Radio

The patent pool, however, was not without restrictive language. AT&T claimed that under the pooling agreement it had the exclusive right to provide the communication links for chain (network) broadcasting.¹² AT&T owned station WEAJ and carried its affiliates on its own (Bell System) network, relegating the other stations to the inferior Western Union lines.¹³ On this dispute and others, AT&T, Westinghouse, GE, and RCA agreed to binding arbitration in 1925.¹⁴ AT&T threatened to withdraw from the patent pool, which would have set the entire industry back to the post-war production stalemate.¹⁵ In early 1926 the companies agreed that

⁷ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 58 (2002).

⁸ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 58 (2002).

⁹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 58 (2002).

¹⁰ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 59 (2002).

¹¹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 61-62 (2002)

¹² CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 75 (2002).

¹³ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 75 (2002).

¹⁴ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 76 (2002).

¹⁵ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 76 (2002).

AT&T could have a monopoly on the connections between stations, in exchange for getting out of station-ownership for eight years.¹⁶

[Anything about preferential rate structure for GE, RCA, and Westinghouse?] [NBC? CBS? Did they get into this agreement too?] [Congressional concern about AT&T?]

Radio Regulation & Allocations – The Rise of Localism

In 1927, shortly after the deal between AT&T, RCA, GE, and Westinghouse, the Congress created the Federal Radio Commission through the Radio Act.¹⁷ The Radio Act was “passed in response to congressional concern regarding the concentration of many radio licensees within small geographic areas around major cities, leaving the more remote and less populous communities without radio service.”¹⁸

The Radio Act carved the U.S. into five geographic zones [why?]. An amendment to the Radio Act, the Davis Amendment, required equality in the number of stations, power, and broadcasting time between each of the five zones.¹⁹ In 1928, the FRC adopted General Order 40, which allocated 40 channels to high-power broadcasting, 35 channels to regional stations with medium-power, and 21 channels for low-power local stations.²⁰ [Generally, it was the larger companies who owned the high-power stations, so General Order 40 cleared the air for dominance by [companies].]

This set the pattern for only a few high-power stations.

¹⁶ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 77 (2002).

¹⁷ Pub. L. No. 69-632, 44 Stat. 1162 (1927).

¹⁸ David M. Silverman & David N. Tobenkin, *The FCC's Main Studio Rule: Achieving Little for Localism at a Great Cost to Broadcasters*, 53 *FED. COMM. L.J.* 469, 474 (2001).

¹⁹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 143-44 (2002).

²⁰ FCC, General Order 40, Aug. 30, 1928; CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 144-45(2002).

History of Television Channel Allocations

Early television was managed by the Federal Radio Commission. It is not surprising therefore that spectrum allocation for television traces its roots to radio. [Summary of radio spectrum allocation.]

In 1928, the annual report of the Federal Radio Commission (FRC) indicated that experimentation was under way with “visual” broadcasting, but that it was “only a matter of speculation.”²¹ In 1929, the FRC allocated four channels for experimental visual broadcasting.²² Experimentation continued throughout the 1930s but the industry did not reach consensus on technical standards for television during that time.²³ At the same time, the Federal Communications Commission (FCC) was established by the Communications Act of 1934, and subsumed the work of the FRC.²⁴ The FCC, citing discord in the industry, declined to set technical standards.²⁵ However, the FCC increased the number of channels available to television—allocating 19 channels in 1937.²⁶ In 1939, the FCC began to receive its first applications for commercial broadcasting.²⁷ In late 1939, the FCC adopted rules that permitted limited commercial television.²⁸ The industry still lacked technical standards, and the FCC was torn between allowing experimentation and protecting the public from investing in technologies

²¹ **Get 1928 FRC Annual Report**; Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 10 (Sept. 13, 1948).

²² Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 12 (Sept. 13, 1948)

²³ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶¶ 13-15 (Sept. 13, 1948).

²⁴ Communications Act of 1934.

²⁵ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 17 (Sept. 13, 1948).

²⁶ **Get FCC Order 19**; Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 16 (Sept. 13, 1948).

²⁷ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 17 (Sept. 13, 1948).

²⁸ **Get Nov. 15, 1939 report**. Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 18 (Sept. 13, 1948).

that might quickly become obsolete.²⁹ In February 1940, the FCC warned that “nothing should be done to encourage a large public investment in television receivers.”³⁰

In March 20, 1940, RCA rolled out a marketing campaign aimed at encouraging sales of television receivers.³¹ Faced with the possibility of “large public investment” in television sets that might either become obsolete or lead to the establishment of a de facto technical standard, the FCC repealed its rules permitting limited commercial broadcasting.³²

Under pressure to set standards before the FCC would permit commercial television broadcasting, the Radio Manufacturers Association formed the National Television Systems Committee (NTSC) in 1941.³³ Although unable to set color television standards, the NTSC submitted standards to FCC for monochrome television.³⁴ In a single order in April 1941, the FCC approved the NTSC standards and opened 18 channels to commercial broadcasting.³⁵

Commercial stations began to pop up: two in New York City, one in Philadelphia, another in Schenectady, and a fifth in Chicago.³⁶ With only these five stations in operation, World War II intervened.³⁷ In April 1942, the War Production Board required manufacturers to stop producing civilian radio receivers; ordering them to produce military sets instead.³⁸ This expanded to include television manufacturers as well.³⁹ Even with a functioning receiver,

²⁹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 19 (Sept. 13, 1948).

³⁰ **Get Feb. 29, 1940 report.** Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 19 (Sept. 13, 1948).

³¹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 167 (2002); Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 19 (Sept. 13, 1948).

³² Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 19 (Sept. 13, 1948); **Get Report Repealing Rules.**

³³ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 20 (Sept. 13, 1948).

³⁴ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 20 (Sept. 13, 1948).

³⁵ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 21 (Sept. 13, 1948).

³⁶ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 22 (Sept. 13, 1948).

³⁷ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 22 (Sept. 13, 1948).

³⁸ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 245 (2002).

³⁹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 245 (2002).

television and programming was slim.⁴⁰ The five existing television stations were allowed to continue broadcasting, and they “kept the art alive during the war.”⁴¹

The FCC held spectrum allocation hearings in 1944, “the most comprehensive proceeding of its kind in the history of radio.”⁴² Shuffling around the various groups requiring spectrum, such as civil aviation and military, the FCC allocated 12 channels to television—a 6-channel reduction from the earlier allocation.⁴³ In a subsequent speech, Commissioner Coy remarked that this allocation was “not intended to represent a satisfaction of television’s requirement; 12 simply represented the most VHF spectrum space . . . which, on a relative basis, the Commission then believed was justifiable.”⁴⁴ Commissioner Coy noted that television was experiencing a demand for growth at that time, so the reduction of channels was particularly unfortunate.⁴⁵ At 12 channels, “a nationwide and competitive system of television broadcasting could not be established.”⁴⁶ Despite the reduction in the number of channels, the industry presented its opinion that 12 channels was enough to start with.⁴⁷ In June 1945, the FCC issued an allocation report which gave television 13 channels, 12 of which were to be shared with “fixed and mobile services.”⁴⁸

After this report, the FCC engineering staff, working with industry representatives, was given the task of equitably assigning the 13 channels to cities in the United States in a way that

⁴⁰ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 245 (2002).

⁴¹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 22 (Sept. 13, 1948).

⁴² Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 24 (Sept. 13, 1948).

⁴³ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 26 (Sept. 13, 1948).

⁴⁴ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 25 (Sept. 13, 1948).

⁴⁵ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 27 (Sept. 13, 1948).

⁴⁶ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 27 (Sept. 13, 1948).

⁴⁷ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 28 (Sept. 13, 1948).

⁴⁸ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 30 (Sept. 13, 1948).

minimized interference.⁴⁹ The engineers proposed to assign channels based on geographic distance.⁵⁰ Although antenna height and power were of interest, distance was the most important variable.⁵¹ The engineers considered two metrics in particular, the distance between co-channel assignments (the distance between Channel 2 in one city and Channel 2 in another city) and between adjacent assignments (the distance between Channels 2 and 3 in any area). The engineers proposed various distances between co-channel assignments—200 miles, 170 miles, 150 miles—but those would have restricted New York City and other major cities to fewer channels than were available.⁵² By reducing the spacing for “community stations”⁵³ the FCC was able to provide a few more channels to the big, congested cities—Washington and Philadelphia got three, Chicago got five, and New York City got four.⁵⁴

Shortly after the FCC released its assignment plan, the wartime construction ban was lifted. On October 7, 1945, the FCC rescinded its orders halting construction of new television stations, and the FCC began to sift through the 118 applications for new television facilities that piled up during the war.⁵⁵

On October 11, 1945, hearings were held on the allocation plan. The industry argued that the major cities needed more channels.⁵⁶ Proposing the use of directional antennae and closer

⁴⁹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 31 (Sept. 13, 1948); CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 319 (2002).

⁵⁰ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 319 (2002).

⁵¹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 320 (2002).

⁵² Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶¶ 32-34 (Sept. 13, 1948); CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 320 (2002).

⁵³ Community stations were lower-power assignments that operated on channels 1, 12 and 13. Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 35 (Sept. 13, 1948).

⁵⁴ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 35 (Sept. 13, 1948).

⁵⁵ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 23 (Sept. 13, 1948).

⁵⁶ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 37 (Sept. 13, 1948).

channel spacing, the industry submitted a new allocation plan to the FCC.⁵⁷ The FCC rejected this plan because of concerns voiced by the Civil Aeronautics Administration about the location of the directional antennae.⁵⁸ Instead, the FCC adjusted the allocation plan in November 1945 to meet industry's proposal, not using directional antennae but shrinking the distances between channels to 150 miles or less.⁵⁹ FCC ultimately assigned seven channels to New York City by removing two local channels from nearby towns.⁶⁰

[big gap – what was going on?]

In May 1948, the FCC eliminated channel 1 and reallocated that spectrum to public safety uses. The plan to “share” spectrum with public safety on 12 channels did not materialize, and out of concern for “stable allocations for the vital safety and protective services” the FCC shifted the allocations for channel 1 to the other 12 channels.⁶¹ To do this, the FCC had to reduce channel spacing.⁶²

In some smaller towns, channels allocated by the FCC were not being used. In larger cities, would-be licensees were asking the FCC to assign those unused channels in nearby towns to them. On May 8, 1948, the FCC released a proposed plan that attempted to address this situation by reallocating the channels to meet demand.⁶³ The FCC generally observed the 150-mile co-channel separation and 75-mile adjacent channel separations, but in some areas the distances were “drastically reduced.”⁶⁴

⁵⁷ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 38 (Sept. 13, 1948).

⁵⁸ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶¶ 38-39 (Sept. 13, 1948).

⁵⁹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 40 (Sept. 13, 1948).

⁶⁰ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* 320 (2002).

⁶¹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 42-43 (Sept. 13, 1948).

⁶² Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 42 (Sept. 13, 1948).

⁶³ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 43-45 (Sept. 13, 1948).

⁶⁴ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 45 (Sept. 13, 1948).

Throughout this time, growth in television was not confined to the United States. As more television stations came online in the United States, Canada, Mexico, and Cuba also experienced television growth in the late 1940s, which increased interference with U.S. channels.⁶⁵ The sunspot phenomenon, or tropospheric propagation, also increased interference.⁶⁶ By Fall 1948, “the shortcomings of the 1945 allocation table became unbearable.”⁶⁷ Indeed, in his September 13, 1948 speech, Chairman Coy noted that “[w]e have continually thrown away the ‘safety factor’ of greater mileage separations . . . and today the assignments on these 12 channels are exposed to interference.”⁶⁸ To make adequate changes to the plan, he argued, new applications would “necessarily need to be held up pending the . . . final plan.”⁶⁹

On September 20, 1948, the FCC called a freeze on the growth of television in the United States.⁷⁰ [Describe Freeze.] The Freeze lasted until 1952.⁷¹ Increasing co-channel separations the 1945 plan’s distance of 150 miles, the 1952 plan called for 190-mile separations in most areas.⁷² The 1952 plan increased the distance in the Gulf states to 220 miles, and shortened it to 170 miles in the Northeast.⁷³ Where stations interfered, the FCC shifted them to allocations on the VHF band where they would not conflict.⁷⁴

⁶⁵ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 321 (2002).

⁶⁶ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 321 (2002); Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 46 (Sept. 13, 1948).

⁶⁷ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 321 (2002).

⁶⁸ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 51(b) (Sept. 13, 1948).

⁶⁹ Chairman Coy, Remarks at the Allocation of Television Channels Conference ¶ 56 (Sept. 13, 1948).

⁷⁰ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 319 (2002).

⁷¹ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 324 (2002). [get the Sixth Report and Order]

⁷² CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 324 (2002).

⁷³ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 324 (2002).

⁷⁴ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 324 (2002). [I don’t follow this point...]

The effect of these geographic limits was to constrain the number of channels that could be viewed in any particular location. Those who already had licenses before the 1948 Freeze faced less competition under the 1952 plan.⁷⁵ Those who applied for licenses after the end of the 1948 Freeze complained that “a bit of interference was a small price to pay for healthy competition.”⁷⁶

⁷⁵ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 325 (2002).

⁷⁶ CHRISTOPHER H. STERLING & JOHN MICHAEL KITROSS, STAY TUNED: A HISTORY OF AMERICAN BROADCASTING 325 (2002).

The US Dept of Commerce issued a monthly periodical called the Radio Service Bulletin which will be found of considerable interest by every person engaged in radio communications.

Bibliography provided

Section dedicated to the Men of the Industry (present in each volume)

Charles G. Dubois: president of Western Electric Co.

Herbert Lloyd: Storage batteries

Elmer E. Bucher: sales manager of RCA

Harry Phillips Davis (picture): Vice-President of the Westinghouse Co.

Born in Somersworth, NH in 1869

Graduated from the Worcester Polytechnic Institute (BS in electrical engineering)

After a trip in Europe, entered the Detail engineering department at The Westinghouse Co. in 1891, elected Vice-President in 1911.

p. 29 New plant for Crosley

The Crosley Manufacturing Co. of Cincinnati, Ohio, of which Powell Crosley Jr is president is preparing to move into its new plant, where the output will be increased ten times. The most popular model the company manufactures is the Harko Senior, which coupled with a two-step amplifier seems to be giving excellent satisfaction.

Dr. De Forest, inventor of the vacuum tube, predicts 20 million radios. By 1927, there will be at least 20 million radio listeners in the United States. Today, it is estimated there are a million of radio listeners. De Forest thought the figure conservative. "I am positively certain that within two years there will be 5 million and by 1927, 20 million of radio receivers with antennae."

June 15, 1922—Vol. 1.2

p. 54 Reports coming into this office from all sections of the country clearly indicate that radio has not yet "struck its stride." Several million American homes will have to be equipped before radio will have reached the zenith of this phenomenal growth. It will take years for that. Radio is the first really scientific thing that has found its way into the home.

The radiophone is a dangerously important thing. It must be kept free from monopoly. Sooner or later the matter will have to come under strict government control. The people will do their own broadcasting.

Bringing the radio with you on vacation.

p. 57 Radio block party

A neighborhood radio block party was held in Schenectady, recently. Music for dancing was broadcasted by WGY, the GE Co. station. This is probably the first radio block

party. The article goes on suggesting that people that repeat that experiment in other locations.

Radio at the dentist

p. 68 Territorial reports for radio merchandising per big city. This is a survey by Radio Merchandising field correspondents about the perception and sales of radio in different large American cities.

p. 70 Radio market new to NJ farmers. Bureau of markets of the New Jersey Department of Agriculture. Daily information flashes to farmers on market condition in different cities.

Radio Merchandising July 1, 1922—Vol. 1.3

p. 88 The display value of radio is based on:
- the appeal of emotions (e.g., pride of ownership)
- educational value
- news value

Focus on how and why people purchase a radio

p. 94-5 Typical stock for a radio merchant
Brands represented: Westinghouse, De Forest, Paragon, Grebe, Tuska, Kennedy

p. 99 unable to dispose of a good but not modern house in Dallas, TX, a real estate operator equipped the old mansion with the very latest radio receiving set and so advertised in the leading paper. Replies came immediately and from dozens of offer he was able to dispose of the house at a good profit.

p. 106 Summer slump in the radio business

p. 110 Sheep herders equipped with radio in Colorado

Radio Merchandising July 15, 1922—Vol. 1.4

p. 128 Commercializing Radio Music
Latest report from the Department of Commerce shows 19,065 radio sending station licenses issued divided into four groups:

- 15,495 amateur
- 2,783 American ships
- 439 commercial
- 348 experimental

Musicians and artists boycott the radio leading to a decline in the quality of the programming and the wave of popularity is receding noticeably.

Possible solution: remuneration for programs.

p. 131 Summer radio slump boon in disguise

p. 132 Who first saw the radiophone broadcasting vision? Article by W.W. Rodgers about H.P. Davis

p. 134 Radio like the movies is already a great industry; like the movies, it threatens to become an art. In proof it need only be said that already there is talk of the need of censoring some broadcast programs. Tolstoy and others have asked, What is an art? The answer seems to be, An excuse for censorship.

Unless Congress passes the new legislation giving the Secretary of Commerce broad powers in regulating broadcasting, the country will be completely covered with radiophones (there were 300 stations at the time).

Radio Merchandising August 1, 1922—Vol. 1.5

p. 170 Radio telephony today and tomorrow. Article by Sarnoff

p. 175 M.C. Rypinski joins C. Brandes as Vice-President & Sales Manager
Article about Sarnoff

p. 180 Radio cartoons (cartoons reproduced from the *New York Globe* and the *New York Evening Mail*)

p. 189 Federal broadcasting begins. Government news

Radio Merchandising August 15, 1922—Vol. 1.6

p. 213 Summer radio slump

Radio Merchandising September 1, 1922—Vol. 1.7

p. 255 During the first rush of public buying, the word "radio" on the window was all that was necessary to bring customers into a store. Men bought in haste and repented at leisure, and those who repented were many. They were the victims either of their own enthusiasm or of some of the few inexperienced or unscrupulous vendors, but they have done much to destroy the public confidence in radio and radio dealers, and the coming season will no doubt find the buying public in a frame of mind more skeptical than credulous."

Establishment of a code of ethics

Radio Merchandising September 15, 1922—Vol. 1.8

Crosley's new broadcasting station

p. 310 Radio exports total \$1,164,514 for the first six months of the year (January to June)

Radio Merchandising

The magazine of the radio trade

October 22, 1922—Change of format (pocket size type of publication)

Claim that the magazine reaches 25,000 radio retailers

p. 43 Number of broadcasting stations on September 21, 1922

CA	66	OR	15	DC	8	AL	4	NM	2
OH	34	KS	15	OK	8	ME	4	ND	2
NY	28	MN	12	GA	7	UT	4	P. Rico	2
PA	27	IN	12	Ark	6	KY	4	SC	2
TX	25	MA	12	CO?	6	MT	4	HI	2
WA	23	MI	11	AL	5	MD	3	VT	2
MO	22	NJ	11	CO?	5	NC	3	VA	2
IL	20	LA	10	ID	5	SD	3	DE	1
IA	20	WI	10	RI	5	TN	3	MS	1
NE	17	FL	9	WVir	5	NV	2	NH	1
								WY	0

p. 54 Farmer Boy Radio Club

Radio Merchandising November 22, 1922

p. 9 Radio Show windows—Displays

p. 20 Radio cartoon service

p. 31 This is a Radio Christmas—National Radio Week being organized to stimulate radio trade. Proposal that president Harding would open the week.

First radio Christmas

Radio Merchandising December 22, 1922

p. 41 “radiolafs” the most remarkable thing about the rapid spread of radiophones is that it has occurred without a law forbidding it. Baltimore Sun

p. 50 National Radio Week to emphasize the educational value of radio broadcasting Movement to popularize the radio

Radio Merchandising January 23, 1923

p. 41 contribution to the stabilization of the broadcasting situation

p. 47 picture of a woman ironing (Crosley set?)

Grebe ads using Doctor Mu (Confucius citations)

Radio Merchandising August 23, 1923

Radio engineering and manufacturing
Radio merchandising reaches 20,000 dealers
Summer radio sales are being maintained.

Radio Merchandising October 23, 1923

Living up the ladies on your side

Radio Merchandising March 23, 1924

Crosley model 51—2-tubes @ \$18.50 Armstrong regenerative

Radio Merchandising April 24, 1924

Survey of retailers

The Industrial Arts Index—Sci. RR Z 7913.I7

1920-21 Basically nothing about radio → wireless
1922-23 pp. 1094 (radio antennae) to 1105 (radio waves)
1924-25 pp. 1330 to 1348

Advertising

How radio broadcasts its advertising. *Printers' Ink Monthly* 119:187 Ap 27 '22

How the radio corporation is using advertising to stabilize a new industry. *Printers' Ink Monthly* 120: 3-4 Ag 31 '22

Is it wise to advertise only a partial price; the American radio & research corp's complete set price listing. *Printers' Ink Monthly* 124: 133-4 J 15 '23

Wholesaler's advertising stirs up interest in new invention. *Printers' Ink Monthly* 118: 17-20 Ja 19'22

Broadcasting seen through RCA eyes. *Wireless Age* 10:45 My'23

Farm moves nearer the city. *Wireless Age* 10: 24-6 Ja'23

How large is the radio audience? *Wireless Age* 10: 23-6 S'23

New and music from the air. *Scientific American* 125 A:104-5 D'25

Permanency of broadcasting. *Wireless Age* 9:26-8 My'22

Radio audience decided programs are almost 100% perfect. *Wireless Age* 10:28-31 Ag'23

Radio revolution not yet here. *Wireless Age* 10:52-3 Ap'23

Radio telephone broadcasting boom. *Electrician* 88:684-5Je 9'22.

Radio, the musical educator, *Wireless Age* 10:39-40 S'23

Reporting baseball series to millions, *Wireless Age* 11:25-8 N'23

Summertime and radio, *Scientific American* 129:90-1 Ag'23
Westinghouse to cover country with radio entertainment, *Electrical Review* (London) 79:887 D 10'21
Will the great artists continue? All important phonograph companies except Victor and Brunswick are cooperating, *Wireless Age* 10:22-9 Je'23
Yes, the radiofan buys records! *Wireless Age* 10:23-6 Ag'23

Weather forecast

Hundreds of radio are used to broadcast weather for millions of persons, *Popular Mechanics Magazine* 40:535-7 O'23
Radio reports as well as predicts weather, *Wireless Age* 11:30 N'23
Reporting weather by radio, *Wireless Age* 10:51-3 Jan'23

Agricultural information

Radio does away with isolation of the farm, *Wireless Age* 10:35-6 F'23

Business applications

Mistake to broadcast advertising by radio, *Printers' Ink Monthly* 122:157 F 22'23
Radio as an advertising medium in competition with magazines and newspapers, *Printers' Ink Monthly* 123:85-6 My 10'23
Should radio be used to broadcast facts about the railroads? Views of railroad and supply men, *Railway Review* 72:898-900 My 26'23

Church services

KTW, a church which enfolds its widely scattered flock by radio, *Wireless Age* 10:30 Jan'23

Concerts

Copyright laws

Composers & publishers cut programs: owner of popular music copyrights demand fees from broadcasters, *Wireless Age* 10:31 Je'23

Educational applications

Educational facilities extended by radio: Columbia about to try radio in extending its correspondence school, *Wireless Age* 11:35-6 N'23
Radio school is practicable, *Wireless Age* 10:36-8 Je'23
University education by radio, *Wireless Age* 10:28-9 S'23

Police uses

Arrested by radio, *Wireless Age* 10:23-5 Mr'23

Radio broadcasting stations

KDKA how the nation's first regular broadcasting programs were started in East Pittsburgh, *Wireless Age* 9:40-1 Ag'22
Radio music from KDKA, *Electrical Journal* 19:242-5 Je'22

Radio communication

How the radio affects the language, *Wireless Age* 10:30 N'22

Radio for everybody, *Scientific American* NY'23

12 months of radio: reviewing the outstanding features of the remarkable radio year 1922, *Scientific American* 128:242+ Ap'23

Radio laws and regulations

Advertising through radio to be strictly regulated, *Printers' Ink Monthly* 119;10+ My 4'22

How can the broadcasting of advertising by radio be regulated, *Printers' Ink Monthly* 122:19-20 F 22'23

New radio regulations, *Wireless Age* 10:40-3 My'23

Policing the ether: radio bill now before Congress H. Hoover, *Scientific American* 127;80 Ag'22

More articles are available

Radio Signals

From the Bourse to Wall Street, *Scientific American* 127:308 N'22

Last year one of achievement in radio communications by Sarnoff, *Electrical World* 79:29-31 Jan 7'22

Radio telephone in hospitals

Boy scouts recruit radio, *Wireless Age* 10:37 N'22

Necessity of providing radio equipment for hospitals, *Wireless Age* 9:37 S'22

Radio aid for muddled minds, *Wireless Age* 9:35-6 S'22

Radio relief for the ailing, *Wireless Age* 9:35-36 Ag'22

Prisoners

How Atlanta prisoners listen in, *Wireless Age* 11:33 O'23

Radio advertising an intrusion says Westinghouse official, *Printers' Ink Monthly* 127:89-90 Ap 24'24

What the public think about advertising over the radio, *Printers' Ink Monthly* 131:113-16+ Ap 2'25

Radio World—TK 6540.R8

Vol 2 Sept 22 to March 23

Crystal D. Tector weekly chronicle about radio and the woman

National Radio Week—December 23-30/1922

Fans, amateurs, dealers, broadcasters, manufacturers, and the general public
are looking forward to
National Radio Week

December 23 to 30 inclusive
All interested in radio should help to make this event a smashing success

NRW executive committee J. Andrew White, Chairman
326 Broadway—New York
Be a National Radio Week Booster

Radio Manufacturer Monthly—TK 6540.R52 Vol. 1 1926-1928

Magazine of the Radio Manufacturers' Association

Herbert H. Frost	E.T.Cunningham	President
Carl D. Boyd	The Reichman Co.	Secretary
S.I Marks	Zenith Radio Corp.	Treasurer
Directors at large		
Powel Crosley, Jr.	Vice-President	
L.G. Baldwin	Willard Storage Battery Co.	
Harry L. Bradley	Allen Bradley Co.	
E.T.Cunningham	E.T.Cunningham	
Edward H. Jewett	Jewett Radio and Phonograph, Co.	

Notes from March 25, 2006

**Montgomery Ward Catalog 1922-23 Fall/Winter – Catalog #97
1872—1922 Golden Jubilee (reprinted in 1969)**

Your orders shipped in less than 48 hours.

Index (pp. 323 to 333)

p. 335 Special catalog to request (free)

Radio, wireless telephone, wireless telegraph equipment (three generations around a radio set).

p. 428 latest books on radio wireless (15 books total) → books for amateurs builders of radio sets

p. 539 Radio Book Free (catalog send for free to any person who request it)

The radio popularity is sweeping the country like wildfire. People everywhere—men, women, and children—are becoming radio “fans.” Everywhere people are talking about Radio—they know something about it—and want to learn more. It entertains, it fascinates.

The radiophone deserves your attention. It is one of the greatest marvels of the age. It does more than entertain and instruct. It is a valuable business help, too. With it you may hear not only concerts, sport records, sermons and lectures, but also Board of Trade and stock reports, news items, and weather forecasts. It serves the farmer, the professional man and the merchant. It entertains and instructs the housewife, the young

folk—the entire family. Radio equipment and accessories have been crowding the market for the past several months. It is now easy to select an outfit which will meet exactly your individual needs. Send now for our new FREE Radio Book. We offer splendid outfits at surprisingly low prices. Write to us—there is absolutely no obligation.

On the same page they are promoting the lighting fixture catalog.

Pictures on the page show: operas, musicals, sermons, national events (Congress, dad and child listening), sporting events (boxing), stock reports (cows).

p. 540 Our special complete Radio Receiving Outfit \$49.50

Wave length 180 to 600 meters

Tuner and detector, telephone headset, radio storage battery, one detector tube, one “B” battery, and antenna

Two-thirds of the page are dedicated to individual pieces

p. 541 electrical goods

Montgomery Ward Catalog 1926-27 Fall/Winter

Montgomery Ward business more than doubled in the past five years—8 million families served by Montgomery Ward & Co.

p. 437 Radio Books

- *35 Easy lessons in radio* by C.R. Smith \$0.35
- *The home radio*, Revised edition \$0.65
- *The wonder radio log* \$0.87
- The experimenter library (\$0.20 each)
 - *100 radio hook ups*
 - *The neutrodyne, all about it*
 - *How to locate trouble in your radio set*
 - *Reflex radio receivers*
 - *How to make practical radio receiving sets*
 - *Loud talkers—how to build them*
 - *Radio frequency amplification*

pp. 524-34 are dedicated to radio sets and other equipment as well as p. 724 (back cover, colored)

p. 724 All Airline sets are equipped with Nathaniel Baldwin concert speaking units.

Easiest to tune—6-tubes, single dial control—mahogany or walnut finish

\$91.50 without equipment (\$105.00 if credit)

\$119.50 with equipment (\$137.50 if credit)

Credit \$25 down, \$25 a month

Model E

\$127.75 without equipment (\$146.00 if credit)

\$154.75 with equipment (\$175.00 if credit)

p. 524 Image of parents and children in front of a radio set.

Now the whole world is our neighbor—we own an Airline Radio

Just a few years ago the wealth of kings could not have purchased one hundredth part of the entertainment that an Airline Radio Receiving Set brings into the home, **free**. Nothing else that money will buy can give you what radio does. With an Airline Radio set in your home, the whole world is your neighbor. Without leaving your easy chair you can hear the news of the world, or take your pick of the educational and entertaining programs that are broadcast nightly from hundred of stations some of them thousands of miles distant from you. Buy an Airline set NOW, and give yourself and family the enjoyment and the many benefits of radio.

Illustration: house under the snow

Radio has banished loneliness from the farm. "The old farm used to be a pretty lonesome place to live before radio came into our lives, but that time has passed. You city folks now have nothing on us when it comes to entertainment. We heard the President's speech, we heard John McCormack sing, and we get market and weather reports in addition to musical programs from coast to coast. In fact, now the whole world is our neighbor—we own an Airline Radio, and we consider it the best radio set of all."

Theodore F. Holtman, Mazomanie, WI (printed by permission)

Enjoy radio to the utmost with a guaranteed Airline Set

Nearly 600 Radio Broadcasting Stations in the United States alone are daily sending out news, musical programs, market reports, correct time, weather forecasts, sermons, speeches, and other features. Can you imagine anything more interesting or thrilling than to turn a little knob on your Airline Radio Set and suddenly hear the President of the United States speaking? Another slight twist and you hear a concert from some distant city, or your favorite church services. We have letters from hundreds of owners of Airline set who think nothing of tuning in 30 or 40 cities in one evening. Some of them enjoy concerts from South America, Mexico, and even Europe.

What others can do, you can do

Even the lowest priced set we sell will give you and your family a wealth of enjoyment and instructive information that you cannot measure in dollars and cents. Radio is not a luxury; it is not a pastime or a fad. It is a necessary part of American home life. You owe it to your family and yourself to enjoy radio right now. It is clean, wholesome, inspiring.

Every farmer needs a radio set

Even the most conservative bankers and economic experts now agree that no progressive farmer can afford to be without a good radio set. Radio offers more to the farmer than to anyone else, for several reasons. First of all, a radio set works much better on a farm than in the city, because there are no interferences. Therefore, the farmer can receive stations

at a greater distance with his set. It is a well known fact that radio reception is at its best at night in winter. That is the time when a farmer has the most leisure and wants to hear what is going on in the world outside. But one of the greatest reasons why the farmer should own a radio set is because of the market and weather forecast.

Government radio service

USDA and the Weather Bureau, through the Bureau of Marketing are sending out every day authentic live stock and grain market reports, weather forecasts and other information of great value to the farmer. This is broadcast at regular intervals each day from powerful stations scattered over the entire country so that no matter where you live, your radio set will usually give you daylight reception of market reports and weather forecasts.

For invalids and shut-ins

To the aged and those who are kept indoors a great deal, radio has opened a new world. Grandmothers and grandfathers tell us that since they received their Airline Radio Sets they now enjoy their Sunday church services at home. Busy housekeepers who spend a large part of their lives over the kitchen range, the ironing board or the sewing machine, tell us of their new interest in life since they installed their Airline sets. In many instances, people hard of hearing have found that by using ear phones they can enjoy music and speech.

p. 525 \$39.95 without equipment 5-tube radio set model F
\$66.50 with equipment
Airline enchanter

p. 529 letters sent by customers

Montgomery Ward Catalog 1927-28 Fall/Winter

p. 444 Books for children

The Radio Boys Series by Allen Chapman

- In Gold Valley (new 1927 title)
- First wireless
- At mountain pass
- Tailing a voice
- With the forest rangers
- With the iceberg patrol
- On signal island

p. 447 Radio books

Drake's Radio Encyclopedia by Harold P. Manly \$5.50 (advertised as a non-technical book)

Radio Simplified by Kendall and Koehler \$0.89

Thirty five easy lessons in radio by C.R. Smith \$0.35 (advertised as a non-technical book)

The home radio, new edition by A.H. Verrill \$0.68 (advertised as a non-technical book)

p. 605 Radio battery chargers

Service station battery charger \$45.95 (40 lbs)

Charging auto and radio batteries is a profitable business. Get your share of these profits.

pp. 459-67 Radio sets, supplies & equipment

In the index this section is boxed like the sections dedicated to auto, building material, Ford accessories, homes, monuments, wall paper, Wardway homes, wigs.

Brand produced by Montgomery Ward was Airline

Airline radio: quality, simplicity, and price

C.J. Manning—Manager Radio Department

“It is my honest belief that in QUALITY, Airline stands second to none. Airline Radio sets feature simplicity, tone reality and mechanical perfection. They are as trouble proof and trouble free as today’s engineering ability can make them.

Over half a million “listeners in” testify to Airline performance. With the Government Commission in charge of radio, reception will be better than ever.”

Airline → trial offer (30 days)

Easy to install

9:00 am erect antenna

9:30 am connect batteries

10:00 am tune in

p. 459 is dedicated to presentation of the radio (no price)

p. 460 6-tube one dial \$41.75 (\$12.00 down, 8 months to pay)

Users comments

New York to California—“I am more than satisfied with my Airline. It is not only an ideal set but a lovely piece of furniture. We have heard stations from New York to California and Florida to Canada. I would not sell it for twice the price, if I could not purchased another like it.” William Hoover, Wiconisco, PA

Running in one hour—“Received out Airline Radio set in fine shape. It was very easy to set up. Our 16-year old boy had it in running order one hour after it was brought home. It has never given us one minute of trouble.” Mr. and Mrs. J.D. Hardman, Danbury, IL

Saved at least \$40.00—Jos Loscherder, Golden Valley, ND

Beautiful furniture—“Some time ago we sent for a Tudor Console 6-tube set, and it certainly is all it is advertised. We get the finest results when so many people around us claim they cannot get anything. I always have to have the catalog handy to convince them

that all I paid for it was \$144.50. aside from being a radio, it is a beautiful piece of furniture." Mr. and Mrs. C. Adamson, Ellsworth, PA

Child could tune it—O.G. Snyder, Decatur, IL

(all letters printed by permission)

p. 461 Radio in five cabinet styles \$81.50 to \$107.00 (two models at \$101.75)

Floor console Model 6-tube radio set, 5-ply walnut cabinet \$81.50 to \$114.00 (with credit \$126.50)

Highboy model 6-tube radio set, 5-ply walnut veneer dark walnut finish \$107 to \$139.50 (with credit \$154.75)

Full size writing desk and 6-tube set \$101.75 to \$134.25 (with credit \$149.00)

Beautiful Tudor model 6-tube (radio set and console cabinet) walnut veneer \$101.75 to \$134.25 (with credit \$149.00)

p. 462 New 7-tube 2 dial Airline radio in six cabinet styles
Radio set only \$71.50 (\$20 down 8 months to pay)

p. 463 Highboy model 7-tube set \$126.00 (\$140.25 if credit) -- \$160.25 (\$178.00 credit)
The cadenza—our finest cabinet model 7-tube set
\$149.00 (\$165.50) without equipment -- \$183.00 (\$203.00) with complete equipment
(tubes, batteries, antenna)

pp. 464 to 467 individual pieces, tubes, cabinets, speakers, batteries,...

Montgomery Ward Catalog 1929-30 Fall/Winter--#111

pp. 439 to 445 and back cover dedicated to radio sets and equipment

back cover (color) \$121.50 without equipment/\$142.00 with equipment

p. 440 battery operated
\$48.75 without equipment/ \$92.45 with equipment
Console
\$84.95 without equipment/ \$118.70 with equipment
Credit: \$10 down, payment in 8 months

p. 441 All Electric Airline (built under the same patents of the RCA)
"There is a radio in every house in our block representing many different makes, but none equals my Airline." Ira Van Buren Sr. of Willard, OH

p. 442 Airline Radio Sensation 8-tube, all electric

\$98.50 without equipment (\$108.25 if credit)/ \$118.75 with equipment (\$130.50 if credit) credit \$10 with order, \$15.00 per month

The Radio Industry (1928)

1926 Introduction of RCA Radiola no batteries

Chapter by Sarnoff

Hysterical Background of Radio, R. P. Clarkson

NY: J.H. Sears & Co., 1927

The Airwaves of New York, Illustrated Histories of 156 AM stations in the Metropolitan Area, 1921-1996

Bill Jake, Frank Sulek, Peter Kanze

Jefferson, NC: McFarland & Co. Inc., 1998

Miracle of the Air Waves: A History of Radio, Edward A Henon, NY: Julian Messner, 1969 (the book has no footnotes and no bibliography)

Among the Pictures: The first studio at KDKA was a makeshift tent erected on the top of an 8-story building and used in the summer of 1921.

Police radios were first used in Europe in Paris in about 1923.

pp. 98 to 102

H.P. Davis credited with the first vision of a new radio industry and quoted "an idea of limitless opportunity" and "new public service"

"Ad Horne's Department Store calling attention to a stock of radio receivers which could be used to receive the programs sent out by Dr. Conrad."

Late in the fall of 1920 that station was ready.

Westinghouse enlisted the aid of local newspapers and a series of stories began to appear.

Spectacular event: the presidential election of 1920

The station would open on Nov. 2, 1920 broadcasting the election results. There was 30,000 amateur wireless operators in the United States at the beginning of 1920. Davis decided to nail down a captive audience. It revealed to be useless. After the announcement that the radio would broadcast the results, the city was caught in radio fever. The first broadcast started at 6:00 pm and lasted until 12:00 pm the next day.

p. 112 Hoover talked on KDKA on January 15, 1921, appealing for funds for European relief.

In April 1921, first baseball scores broadcast by KDKA

1921 radio sets from 30,000 to 60,000

1922 1.5 million (RCA estimated $\frac{3}{4}$ were built by people)

Story of the Radio (3 volumes) by W.M. Dalton (British book)

The Radio Trade Directory, November 1924, vol. 1.1

A classified directory of the radio and allied industries quarterly, McGraw Hill Co.

Sets, crystal (78 manufacturers)

Sets, Knockdown

Sets, Vacuum Tube (approximately 320 manufacturers)

February 1925

Sets, crystal (approximately 100 manufacturers)

Sets, Vacuum Tube (approximately 500 manufacturers)

Perpetual Trouble Shooter's Manual by John Francis Rider, NY: Radio treatise Co., Inc.
It covers 1919-1931

Radio News 1921

July: ad for summertime radio "no need for you to shut up when summer comes" Grebe
KTI Portable

March 1922—how to sell 10 million radio outfits, Stanley B Jones, p 817

p. 818 important new radio legislation

Jan 1922 amateurs cannot longer broadcast

August 1921, p. 98—Radio in a Country Town (Canton, PA) 2,500 people

Nobody had heard a radio signal before

KDKA was unavailable

\$100 a year savings in the country side

p. 103 radio at the New York Stock exchange.

September 1921

p. 196 Government to Broadcast news by radiophone

this new step by the government will probably do more than anything else to popularize
radio

November 1921

p. 378 Opera singer is heard 300 miles away

Concerts are common

p. 379 Farmers are show how to receive radio market report in Syracuse State Fair,
September 12 to 17, New York State Department of Farms and Markets. Fair aims to
arouse interest on the part of farmers and shippers.

p. 386 Let the average man know

radio is compared to amateur photography. Claim that radio is easier

Claim that there is a need for the equivalent of an Eastman Kodak

People still buy cameras rather than radio sets

Focus on radio advertisers—the author criticize them for not talking to the average man. He did a survey of *The American*, *The Atlantic Monthly*, and *Radio News*

Radio News
120 display ads related to the radio; among them

111 were technical

6 were school ads

2 were book ads

1 was a Boy Scout ad

The American magazine which is targeted at the average man had not one radio ad. Ads in the magazine tended to emphasize things that were simple and easy.

Radio advertisers have not been on the job

The Atlantic Monthly. Story of a woman who sat at a radio receiver, brought in various arc stations and combined their notes to make harmonies. The writer does not believe she was able to do it.

Radio advertisers should learn from telephone ads.

December 1921

The Radiotrola—Editorial “we are in the midst of a revolution”

The newspapers are becoming enthusiastic about radio

Radio is entering into its last and final stage as far as the public at large is concerned.

The progressive daily newspaper “Newark Call” now has a daily, as well as a Sunday section containing nothing but radio. All the various activities are truly reported in these pages.

The newspaper works in conjunction with Westinghouse broadcasting station (children story) was a huge success.

We are fast approaching the time when some enterprising company will manufacture precisely [a radio set]

p. 480

President Harding opens the world’s largest and most powerful radio station in Port Jefferson, Long Island.

p. 485

Radio in Department Stores

Radio for all, movement to popularize radio

Jan 1922

p. 592

Radio business is booming

“Today we find radio departments being established in the larger department stores, in electrical supply houses and even in the country general stores, where the storekeeper knows as little about radio as he does about the fourth dimension or relativity.”

Department stores sales and shelve space have increased (December)

The writer observed that in December, there was four times more people in the radio department than in any other department on the floor (toys). In a retail store, 18 sets had been sold in one day.

February 1922

p. 693

Do Insects "talk" by wireless?

p. 696

Radio on the ranch, portable station. "the cowboy type" radiophone (picture)

p. 710

Keeping boys at work

April May 1922

p. 944

The New Radio Legislation

Westinghouse Radio Telephone Conference (February 27)

Radiotelephone has brought a revolutionary change not only in radio itself but in out private lives as well.

June 1922

p. 1069 Radio and the beginner

"Thousands and thousands of people are becoming interested in this new art every day, nay, every hour...and nearly all of these people are, as a rule, lost in a wilderness of technicalities."

p. 1071 Radio in Chicago schools

p. 1076 Radio talking moving pictures

p. 1077 Advertising pays—Most prominent radio stations are those of Westinghouse Co. but of which the West coast has none.

p. 1081 Is Radio threatening the phonograph and theater?

p. 1088 Shall we put the brakes on radio?

p. 1094 Teaching by radio (Tufts College)

p. 1095 Delivering bread in radio equipped auto (Kolb's)

p. 1096 Radio for the farmer (service men → country)

p. 1097 Church services by radio

Bureau of standards pamphlet on crystal. The Bureau was swamped with inquiries

p. 1117 Reader wrote "I am married to Radio and always have and always will be."

WEAF and the Evolution of Direct Ads

Despite general opposition to the concept of advertising over radio, AT&T's experimental station WEAf in New York City initiated "toll broadcasting," whereby it invited paying customers to enter its radio "phone booth" to call the public.¹ WEAf broadcast the first radio commercial on August 28, 1922 – twelve days after it went on the air for the first time.² Harry Clinton Smith, an employee in AT&T's commercial department, thought of the idea and sold time to the Queensboro Corporation, a New York realty company, allowing one of its employees to make a ten-minute speech about Jackson Heights apartments for sale.³ Soon, other companies began paying to give ten minute talks over the air, and a 1923 AT&T memo noted that WEAf cost \$175,000 a year to operate and predicted that an "organized sales force" would produce revenue of \$330,000 in a year.⁴

Encouraged by advertising's revenue, but seeking to assuage the public's distaste for ads, WEAf adopted a form of indirect advertising whereby companies could lend their names to bands and orchestras, raising audiences' brand awareness every time that

¹ Marchand at 89 citing Sydney W. Head, Broadcasting in America (Boston 1972) at 146-47 and John W. Spalding, "1928: Radio Becomes a Mass Medium," Journal of Broadcasting 8 (1963-64):40; Starr at 336.

² Archer at 275.

³ Oslin at 284; Bergreen at 31; Archer at 276; Barnouw at 110, 158; Lichty & Topping at 196.

⁴ Bergreen at 32.

they played.⁵ Then in late 1923, WEAF hit on another advertising idea, allowing companies to sponsor an entire program.⁶ Within a year, advertisers selling products like toothpaste, batteries, ginger ale began sponsoring programs,⁷ and between 1923 and 1927, advertisers and businesses generally believed that ads should be limited to sponsorships that would build good will that would be destroyed by direct ads.⁸ Not only did the program sponsorship model change the way listeners perceived ads, it also satisfied listeners' desire for programs of dependable quality.⁹ WEAF's initial self-image as a common carrier, whereby anyone willing to pay to broadcast a message could do so,¹⁰ ignored its audience's demand for good programming, and WEAF became profitable only after AT&T began arranging high quality programming produced for sponsors.¹¹

According to Bergreen, WEAF's first sponsored program – The Everready Hour – launched in December, 1923 set another broadcasting precedent by being produced by an advertising agency rather than the network or sponsor.¹² Gradually, agency program

⁵ Id. at 33; Barnouw at 158 credits the same Harry Smith who negotiated the Queensboro Corporation's first ad with creating the idea for the "Browning King Orchestra"; Marchand at 93.

⁶ Bergreen at 33-34.

⁷ Oslin at 284.

⁸ Marchand at 90.

⁹ Id.

¹⁰ Starr at 336-37.

¹¹ Id.

¹² Bergreen at 34; Barnouw at 159.

production became the norm. Advertisers began blending editorial content with advertising information to try to preserve radio's tone of refinement and entertainment, believing listeners may be more receptive to sponsors' information if interwoven in the entertainment.¹³ Soon, it became standard practice to interweave products into the plot of a story, leading ad agencies to expand their radio departments and take greater control over program production and product,¹⁴ hiring the performers, finding sponsors, and presenting the shows to the networks as a complete package.¹⁵ Many agencies created new radio departments or expanding their staffs in 1927 and 1928.¹⁶ By 1929 advertising agencies were producing 33 percent of programs; individual sponsors, 20 percent; the networks, 28 percent; and special program builders, 19 percent.¹⁷ Within a few years, the agencies took over nearly all but the sustaining programs.¹⁸

In 1926, a few advertisers began experimenting with "direct advertising," but most were still concerned about offending their listeners.¹⁹ As agency radio departments expanded in the late twenties, however, advertisers began to realize that direct advertising could boost sales and need not be delicately interwoven with entertainment content.²⁰

¹³ Marchand at 105-06.

¹⁴ Id. at 106-07.

¹⁵ Starr at 355.

¹⁶ Marchand at 107.

¹⁷ Starr at 355.

¹⁸ Id. at 356.

¹⁹ Marchand at 94.

The American Tobacco Company tested the power of radio in 1928 by airing testimonials from its aggressive Lucky Strike print campaign and withholding almost all other advertising.²¹ When Lucky Strike sales increased by 47% in two months, Lucky Strike's ad agency proclaimed, "broadcasting is a profitable advertising medium when used frankly and fearlessly as such."²² By 1929 many advertisers no longer insisted on "sponsorship only." Roy Durstine, a leader in BBDO programming and advertising stated in June 1929 that consumers had "come to expect and accept infinitely more advertising in a program than would have been considered tolerable even a year or so ago."²³

According to Lichty & Topping, NBC broke the ban on direct advertising during daytime only in July 1932.²⁴ Then in September, both NBC and CBS broke the ban at night, with the September 12 A&P Gypsies program mentioning prices.²⁵ By the mid-thirties, some sponsors believed that in a publicity-saturated world, they "had to be direct, insistent, and intrusive to get their message across" as increasing numbers of companies

²⁰ Id. at 107.

²¹ Id.

²² Id. citing Spalding, "1928," p. 33; Printers' Ink, May 23, 1929 at 82-83.

²³ Marchand at 107-08 citing Durstine, "We're on the Air," at 627; Printers' Ink, June 6, 1929 at 121.

²⁴ Lawrence W. Lichty & Malachi C. Topping, American Broadcasting: A Source Book on the History of Radio and Television, New York, 1976 at 199 citing Broadcasting-Telecasting, October 15, 1956, p. 112.

²⁵ Id.

advertised on the radio to reach the growing number of American households with radios, which rose from 23.6 percent in 1927 to 65.2 percent in 1934.²⁶

Bergreen notes that, with WEAF, AT&T made several precedential programming decisions that the networks would follow when they were set up three years later. One decision was allowing companies to sponsor programs rather than just a band or orchestra, programs that eventually became created by advertising agencies, as explained above. Another fundamental precedent that AT&T set was performing the program at one station, while carrying it by AT&T lines to stations around the country for simultaneous broadcast.²⁷ AT&T first experimented with simultaneous broadcasting on January 4, 1923 when Boston station WNAC carried a music program performed at WEAF over AT&T long distance telephone lines.²⁸ AT&T immediately foresaw the positive business implications of simultaneous broadcasting and urged its engineers to work on developing telephone lines that would enable satisfactory long distance transmissions.²⁹ Together, these innovations created the format that the networks would follow when they were set up three years later: a broadcasting station owned by a large communications company hired out its facilities to a company that engaged an

²⁶ Starr at 355.

²⁷ Bergreen at 34.

²⁸ Archer at 286-87.

²⁹ Id.

advertising agency to package a program that would convey the company name to the largest possible audience.³⁰

³⁰ Bergreen at 34.