
Hugo Gernsback: Predicting Radio Broadcasting, 1919–1924

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Abstract

Hugo Gernsback was a critical thinker. He understood the history of wireless communication beginning with Marconi, he knew about the early experiments with voice transmission by de Forest and others. He comprehended the needs of a growing audience of radio parts consumers and he marketed and sold them through his mail order company, Electro-Importing. Following WWI he began to synthesize several decades of technical content for a magazine he called *Radio Amateur News*, changed to *Radio News* a year later. His was the major voice predicting the transition from radio as code for young men with crystal sets and headphones, to a family medium that would actually broadcast entertainment into the home in a manner that all in the family could enjoy. His connection with inventors, programmers and manufacturers allowed him to know and publish monthly stories on the latest trends in radio. He was a strong voice against the possibility of government control of radio, he profited through advertising for the latest radio receiver and loudspeaker, and he became a trusted voice that united both creator and audience in that important period of time known as the “Radio Boom,” 1919–1923.

Hugo Gernsback: The Power of the Pen

Did early 20th Century publisher Hugo Gernsback predict or merely report the coming of radio broadcasting in the early 1920s? The evidence suggests that he was both an active student of wireless and radio history and a critical thinker concerning radio’s future as a public entertainment medium. Gernsback early on had one foot in a past of ham operators with crystal sets and headphones, and the other in a hazy future of music and news programming for a

citizen audience. Through his numerous electricity and radio-themed publications Gernsback often editorialized as a conservative scold, exhorting his readers to fight government control of radio, while at other times he served as a cheerleader who saw a radio boom with entertainment programs and sponsor support. And he wrote about and advertised the equipment for the reception of the evolving programming formats. In the modern context he was full service, both hardware and software.

So were his opinions original, the result of research and conclusions? Did he influence the creation of broadcasting by radio or did he just write about it after it had already taken place? Surely Gernsback was in the right place at the right time: The years between 1919 and 1923 were those in which America moved from war to peace, and from the use of radio by hams and commercial operators to an active audience seeking to dance, be informed, and consume. The explosion that was radio broadcasting could only have happened in a post-WWI social and economic environment. Hugo Gernsback primarily through *Radio News* helped make it happen.

As one who published articles for hams and radio hobbyists beginning with *Modern Electrics* in 1908, and who used his name to sell the parts for wireless construction, Gernsback



Fig.1. Hugo Gernsback

had to have known about and understood the importance of Edison and Marconi, and the significance of the early radiotelephone experiments of Fessenden, de Forest and others. This influence must have inspired his role as an opinion-leader in the new uses of radio through his mail order catalogues, magazines and the products that propelled his business.

Moreover, the evidence suggests that 1920 was radio's most important year. Prior to 1920, the words radio broadcasting were used less often than radiotelephone concerts or wireless concerts, and these were erratic events, far from the current 24 hour broadcast day. There were even a few learned definitions of what was an amateur experiment and what was radio broadcasting for the public. The influential George Clark, RCA historian, offered this definition. To be considered a "broadcast" it had to adhere to this criteria: it had to be regularly scheduled, it had to be pre-announced in the press, it had to be entertainment or information, and it had to be listened to by a citizen audience.¹ It was this last tenet that ruled out as "broadcasters" anyone who was on the air before 1920, as he believed correctly that prior to KDKA the audiences were almost entirely young boys who had to build their own radios. That was hardly a "citizen audience." A few years later Gernsback offered, post radio boom, this definition in his 1922 book: "By modern broadcasting is understood a radio intelligence that is sent out at a certain pre-determined schedule or program."²

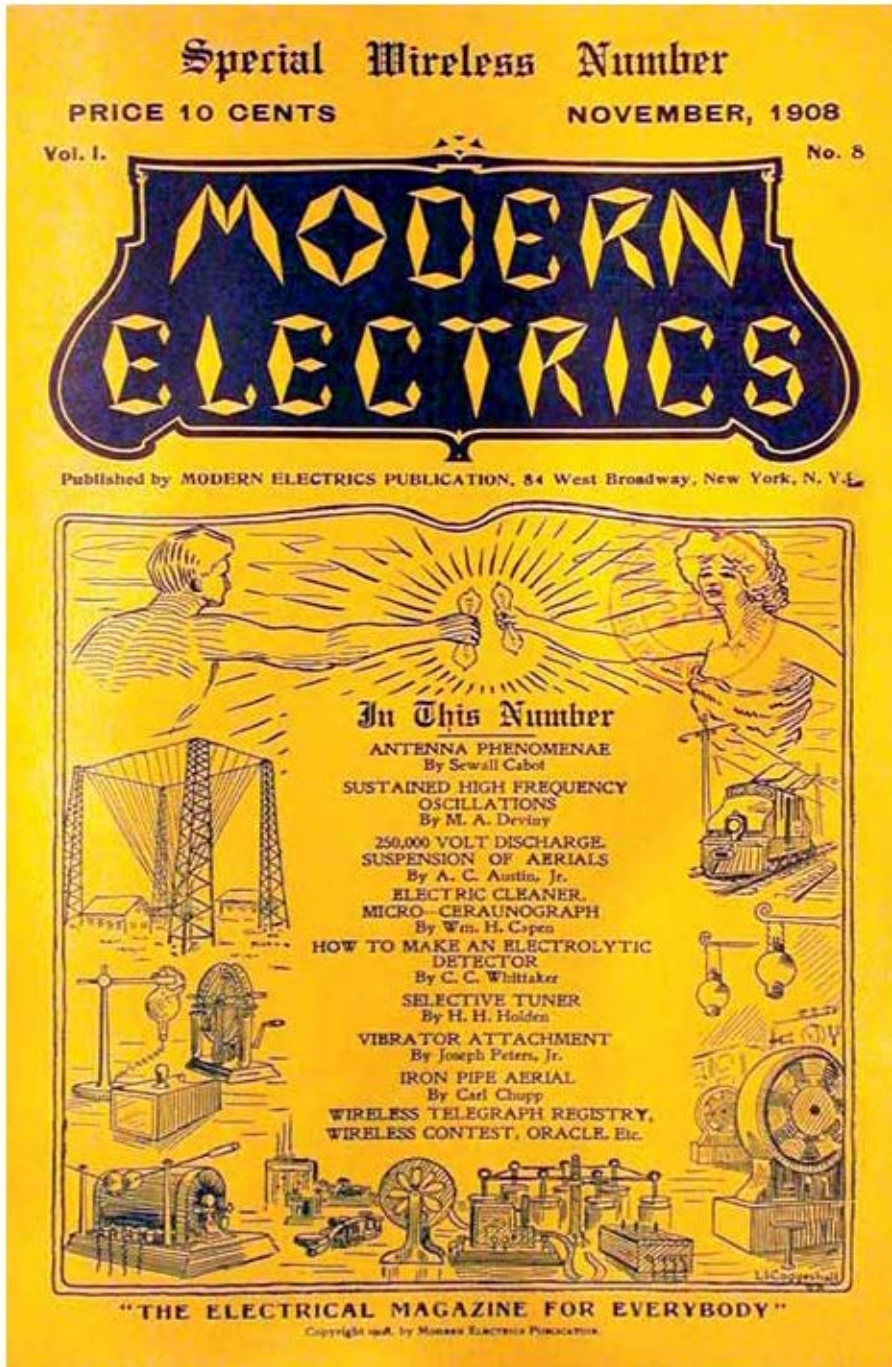


Fig.2. Pre-Radio News cover (credit: Franz Pichler).



Fig.3. Pre-Radio News cover (credit: Franz Pichler).

So while Hugo Gernsback is not a name immediately associated with the development of radio broadcasting, this prolific publisher predicted, promoted, and profited from what radio was to become in the years immediately following WWI. Beginning as the earliest publisher of amateur radio magazines, he both supported and wrote about the transition from all-wireless communication to radio as the most important media of the Twentieth Century. His major pre-war magazines were *Modern Electrics*, *Electrician and Mechanic*, and *Electrical Experimenter*. In the early years of the 20th Century Gernsback was the champion of the young boy radio hobbyist and set builder. He led the way by putting into print the triumphs of Edison, Marconi, de Forest and others engaged in the science of electricity.



Fig.4. Pre-Radio News cover (credit: Franz Pichler).

Not-So-Humble Beginnings

Born in Luxembourg in 1884 as Hugo Gernsbacher, he emigrated to the United States at age 19 and shortened his name to Gernsback. He was a curious person, fascinated by the science fiction and fantasy of H.G. Wells and Jules Verne. And while he was raised in Luxembourg, his parents were from the Baden and Karlsruhe areas of Southern Germany, significant because some of the early experiments by Heinrich Hertz took place in that area between 1886 and 1888. At least it can be speculated that the scientific legacy of his families' homeland may have had some small influence on the elder Gernsbachers as they raised their son Hugo. Perhaps knowing about Hertz, they may have encouraged his interest in electricity.

According to a new book by fellow AWA Review writer Franz Pichler, titled *Hugo Gernsback und Seine technischen Magazine*, Trauner Verlag, 2013, "Early on, Hugo Gernsback was interested in electricity," and having received a battery from his parents as an eighth birthday present, and seeing how it



Fig.5. Young Gernsback (credit: Franz Pichler)

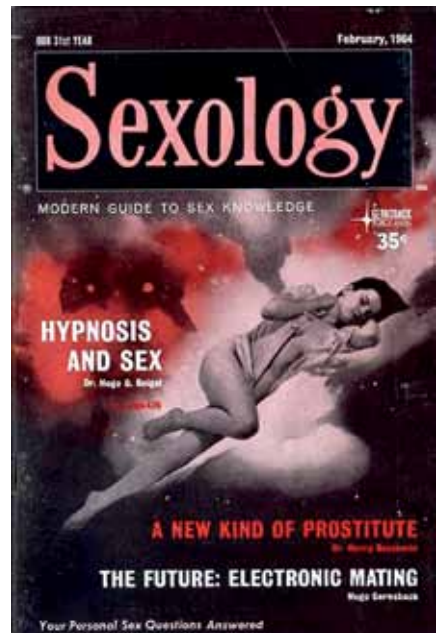
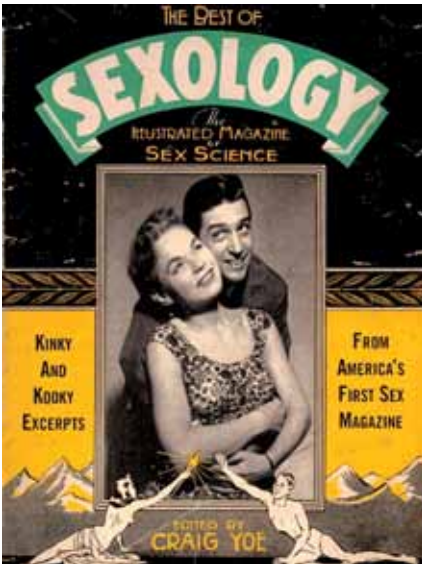
could be used to ring a bell, he was said to have marveled at seeing its effects, “The ‘green spark’ of the small self interrupting the contact of the bell.”³ And so influenced by that childhood experience, he relocated to America to become an electrical inventor and to no surprise, his first effort was the development of a new dry battery. He was able to create a business manufacturing starter batteries for the nascent automobile. Soon thereafter he was interested in the “companies in Germany and France, which supplied hobbyists and schools with physical instruments and components for experiments in the mail,” and this resulted in his Electro-Importing Company.⁴ This venture grabbed the attention of thousands of new radio amateurs who were eager to construct their new transmitting and receiving instruments. Even this author’s previous work was touched by Gernsback’s company. Early San Jose broadcaster and wireless school operator Charles Herrold was asked by Gernsback to endorse his products for his 1910 Electro Importing catalogue, and Herrold’s notarized statement is cited as “proof” of early broadcasting for an audience writing, “We have given wireless phone concerts to amateur wireless men throughout the Santa Clara Valley.”⁵

Along with catalogues, his wireless and electricity interests resulted in dozens of publications, starting with his April, 1908 *Modern Electrics*. In April, 1926 he published the first science fiction magazine, *Amazing Stories*, with articles contributed by



Fig.6. EI catalogue (credit: Franz Pichler).

Wells, Verne, and Edgar Allen Poe. We can also assume that he was interested in sex for in 1933 he introduced *Sexology*, promoted as the “Magazine of Sex Science,” which contained such articles as “Sex and Youth,” and “Petting is Dynamite.” In his lifetime he was credited with the publication of over 50 titles. One of his lasting legacies is the science fiction writer’s award named for him, the “Hugo Awards.” According to the official Hugo Awards Web: www.thehugoawards.com “The Hugo Awards are named after Hugo Gernsback, a famous magazine editor who did much to bring science fiction to a wider audience. Gernsback founded *Amazing Stories*, the first major American SF magazine, in 1926. He is widely credited with sparking a boom in interest in written SF. In addition to having the Hugo Awards named after him he



Figs.7–10. Various wireless and non-radio Gernsback magazine covers (Pichler, et.al.).

has been recognized as the “Father of Magazine SF” and has a crater on the Moon named after him.”⁶

Gernsback Finds His Métier

But it was his 1919 premiere of *Radio Amateur News*, later re-titled *Radio News*, that through editorial opinion and selection of writers and content he set out to document and influence the evolution of radio. During radio’s important development years, 1919 to 1924, he chronicled radio’s move from earphones to loudspeakers, from hams to citizen audiences, from crude home made devices to store-bought working radios, and from two-way communication to music and news programming. Part of this rapid change was due to the great improvement in the science of the

radio, much of it driven by the World War I patent pool, a government-forced “cooperation” of inventors and their patents for the allied war effort.

As the largest of the radio-themed consumer publications, *Radio Amateur News* began at a time when an eager audience of young men were returning from the war in Europe, many seeking their future careers. Gernsback would be their voice with a combination of articles, editorials and advertising. In an article in the July, 1919 issue, “The Audion and the Radio Amateur,” Lee de Forest promotes himself, his history as an inventor, and attempts to position himself as a friend of the ham. He touts the amateur hobby as “The most wonderful thing ever thought of by man.” What is left unsaid is that under a

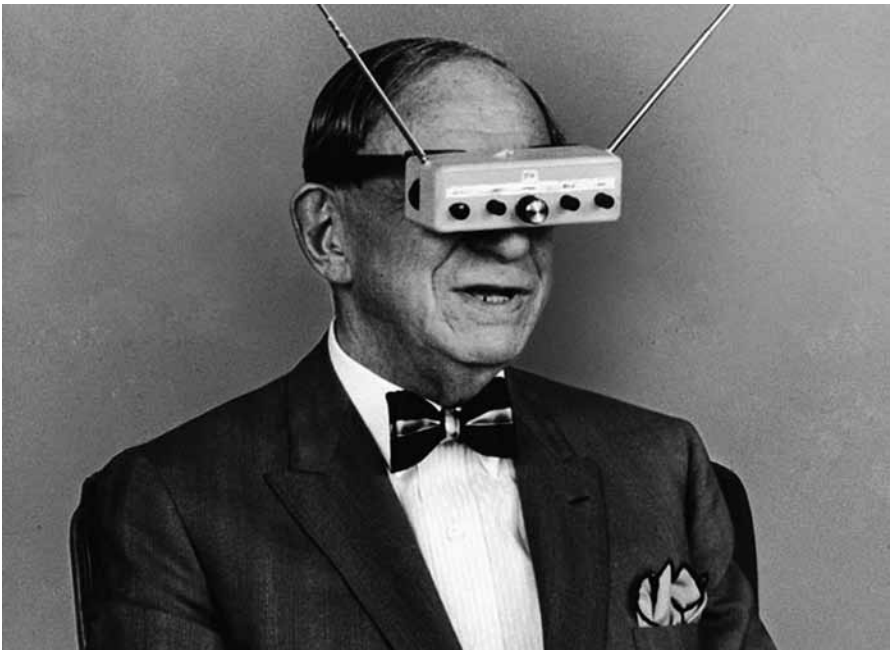


Fig.11. Gernsback with sci fi glasses (CHRS Library).

series of court rulings, de Forest is only allowed to sell his tubes and radios to the amateur, not the commercial user. So in this “amateur” publication, de Forest was writing for his market. That Gernsback respected, was even in awe of Lee de Forest, is evident in the many dozens of issues featuring de Forest, including his first serialized biography. De Forest was apparently allowed carte blanche by Gernsback to write and promote the de Forest products and inventions. Wrote de Forest in his July 1919 article about the benefits of his Audion, “forces of which Faraday himself never dreamed; etheric voices infinitely more delicate than the faintest sounds from Aeolian harps of the

fairies. Invisible messengers, speeding like light, through the darkness come whispering to him directly from the antenna of some gigantic station.”⁷

In the September, 1919 issue, a Gernsback editorial bordering on snarky introduces one of his frequent arguments against government control of radio: “We had thought that Government radio control was at a rest for a while when certain radio bills were defeated last year. It seems, however, to be a favorite pastime in Washington to sponsor Government Control of radio every month or so, at least that’s how it looks to us.”⁸ He went on to argue that the “Radio Act of 1912 has been found ample for all requirements, be

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RADIO AMATEUR NEWS
July, 1919

“The Audion and the Radio Amateur”

By DR. LEE DE FOREST
Written especially for “Radio Amateur News”

THE writer can lay claim to the honor of having been one of the original wireless amateurs in America. When he started experimenting in 1898 and '99 the Art itself was very amateurish, from the Rhumkoff coil transmitter to the coherer and trembler of the receiver; while the ranges that were then covered were small enough to have satisfied the most jealous guardian of governmental radio-regulations, had such a functionary then existed.

It was not until 1902 and by the introduction of the self-restoring detector and telephone receiver, the alternating current generator and transformer, and the tuned circuits at transmitter and receiver, that the infant art can be considered as placed on an engineering foundation.

The first two of these radical advances originated in America, and for some time distinguished the American designed apparatus from that of the British or the Boche.

The story of the original conception of the Audion idea, using heated electrodes and ionic or

forces of which Faraday himself never dreamed; etheric voices infinitely more delicate than the faintest sounds from Aeolian harps of the fairies. Invisible messengers, speeding like light, through the darkness come whispering to him directly from the antenna of some gigantic station

First, there are the plain detector arrangements, with and without a grid condenser, with or without a grid or C battery. In the old days when the lamps were exhausted with simple oil-pumps, we had the fascinating “blue glow” or halo around the plate or filling the bulb, when a too-high *B* voltage was applied. Gradually the pumping processes have been improved until now the ordinary well built audion contains too little gas to show this visible and beautiful evidence of ionization. With the blue glow, however, a host of fascinating experiments can be made, such as the effect of a magnetic field on the glow and on the sensitiveness and general behavior of the audion—the “squealing” condition, the unstable condition when a blue ball plays around a corner of the plate and comes and goes with each strong received Morse signal—like a veritable little blue imp dodging back and forth in instantaneous response to his mas-



A Picture to Make the Heart of Any Radio Man Swell. The Inventor of the Most Wonderful Thing Ever Thought of by Man, in His New York Laboratory. Look! Ye Radiobugs! The Instruments on the Tables About Dr. De Forest

Fig.12. de Forest article page, Radio Amateur News, 1919, (CHRS Library).

they Government, commercial or amateur.”⁹ It is a year after the war’s end, and it was the Navy and its Secretary Daniels who believed that their branch of the armed services used radio best in the allied victory and thus should retain control of radio in peacetime. It was fought over in Congress and quickly solved. Radio would become government licensed and regulated under the RCA agreements which specified which manufacturers would make radio transmitters and receivers, engage in “toll” and “chain” broadcasting. What was not clear was what radio would become beyond “a commercial service,” whatever that meant.

De Forest returned to the pages of this issue in an article, “Reviewing American Radio History.” In it he examines the great moments in invention and mentions the contributions of Fessenden, Marconi, Poulsen and himself. Missing from the list is E.H. Armstrong, de Forest’s lifetime nemesis. In the article he does credit the Wright Brothers for their role in aviation and contributions to the allied side of the war, and he cites the pre-broadcast contributions of Marconi, Fessenden, Stone and many others, and as in previous articles in *Radio Amateur News* he writes for the amateur reader: “Of course, the greater distances covered by our best apparatus in those early days, say in 1903, were very small compared to those which are covered today by many a smart amateur’s set. The average boy’s wireless set today contains a far more perfect instrument than the most elaborate station could boast of

in those pioneer days.”¹⁰ Here was de Forest writing in 1919 about the great leaps in technology since 1903, a mere 16 years! Think of where computers were 16 years ago with Windows 98 and AOL. Back then a tablet was something you wrote on with pen on yellow paper. A telephone you dialed.

Gernsback now begins, almost monthly, to proffer previews and prophecies of possible programming genres. In this same September, 1919 issue Gernsback wrote an article, “Grand Opera by Wireless.” In 1919 the older word “wireless” is still used interchangeably with the newer designation of “radio.” In this predictive article he suggests that opera music could be sent into homes using radio (not a new idea), and that the reason this is not being done now is that “no means has been found to reimburse the opera companies for allowing everyone to listen in.” He writes: “During the next few years it will be a common enough experience for an amateur to pick up *his receivers* between eight and eleven o’clock in the evening and listen not only to the voice of such stars as Caruso, Tetrizzini, McCormack and others, but also the orchestra music as well, which is picked up by the sensitive transmitters along with the voice of the stars.”¹¹

Whether or not he realizes it, it is by his choice of words that he completely describes the proverbial fence on which he is sitting at the end of 1919. On one side is the known world of wireless messaging and developing technology and on the other a radio



Fig.13. Radio News cover, Grand Opera by Wireless (CHRS Library).

future mostly unknown. To deconstruct this passage: First, he refers to the audience as “an amateur” because that is the 1919 frame of reference, and he also uses the pronoun “his” as wireless is still a hobby dominated by the young male. Next, he describes the listening device as “receivers,” as the state of the amateur technology in 1919 was the telephone earphone rather than the newly invented loudspeaker. It would be several years before the common crystal set would benefit from the amplification of the vacuum tube, allowing the horn-amplified headphone loudspeaker to come into common use. Sure, many inventors had already sent various forms of live and phonograph music over the air prior to 1919, but without technology that appeals to a consumer audience, and without the possibility, pre-war, of licensing new forms of commercial fare, it was not taken seriously. But you can see in the Gernsback article how his view of the past is influencing his interpretation of the future. He seems to be saying, “what if,” but his prediction is still clearly and firmly rooted in the current 1919 model, radio as an amateur boy’s hobby.

Then there is Gernsback the businessman musing editorially about what

a possible grand- opera-by-wireless model might resemble. As a man of both theoretical and practical bent he wonders: “But we must give a thought to the management, which cannot subsist on an empty opera house if everyone could listen into the actual rendering of the opera without paying for the privilege. Needless to say that the producers would soon find themselves bankrupt.”¹² He offers an idea which is a cross between to adopted by professional sports, originally called the blackout rule, and a Sirius-XM subscriber model: “Probably the only logical way out would be for the management of a grand opera company to advertise in the newspapers, stating that no grand opera via radio would be given unless a certain amount of revenue were guaranteed by radio subscribers before radio performance would be given.”¹³ As Gernsback is straddling the old way of wireless and the new way of radio for the masses, he is also keenly aware of what it takes to sustain a business when entering unknown markets. He will make this argument later about recorded music, purchase versus broadcast.

Gernsback continues his opera-as-programming predictions with these



Fig.14. Close up of crystal detector (author).

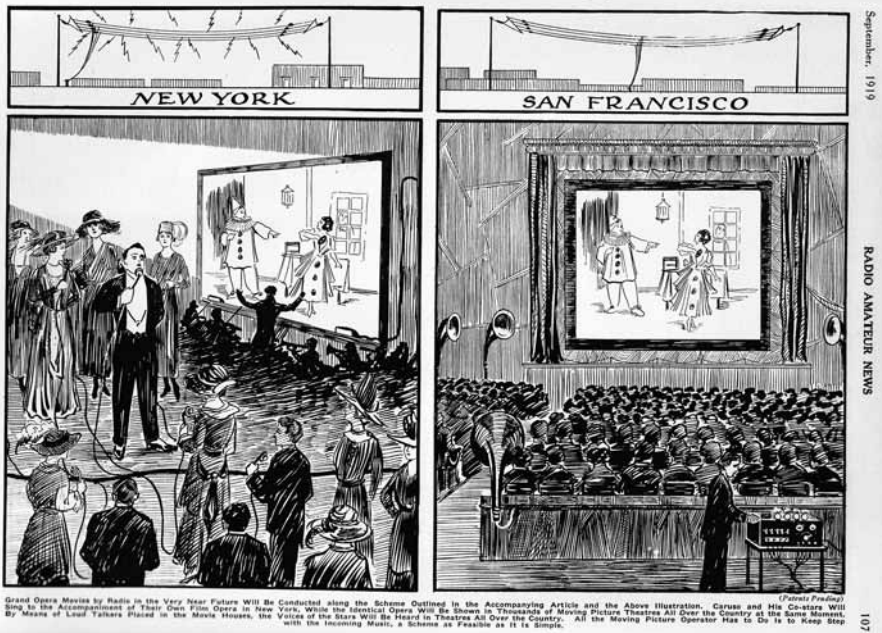


Fig.15. Opera drawings from RN article (CHRS Library).

illustrations of how it might work technically, again using the only model he knows, that of the existing media. And what he ends up with is a hybrid of radio and the silent film, suspiciously a television-like system, but in 1919. It is his idea that the opera company performing on a New York stage would have their performance filmed by the silent movie camera. The film would be processed and duplicated. A copy of it would then be screened on the opera stage while the opera singers and musicians would perform it in synchronization with the silent film. Read this slowly. The live performance would be picked up by radio microphones and broadcast to San Francisco where a radio receiver and loudspeaker would be set up next to a movie screen. On it

would be projected a copy of the opera silent film. This film would somehow have to be synchronized with the received live performance audio. Yes, it could work, and said Gernsback, "The underlying idea is not only to give grand opera by wireless, listen to the music and to the singers only, but to actually see the operatic stars on the screen as well." Television? The Talkies? Remember that Lee de Forest by 1919 had submitted a patent application for a sound-on-film process and had often written about opera as content for radio and film.

The Future of Radio is the title of the Gernsback editorial in the October, 1919 issue of the still-named *Radio Amateur News*. Make no mistake, this is all about the evils of Government

control and Publisher-Editor Gernsback pulls no punches in his loud voice in favor of getting Government off the backs of the radio suggesting: “a stupid and narrow humanity was ever ready to step in and command a threatening *Halt!* to scientific exploits . . . No sooner has the new art demonstrated its inconceivable boon to the world than some well-meaning but misguided official steps up and frantically tries to shackle it down, hands, body and feet. We ask ourselves with horror what would have happened to our telephones if our Government had taken control of them in the early eighties, as was the case in most European countries.”¹⁴ Clearly Gernsback is fuming and you can indeed see the steam pouring from his ears. He continues: “We are certain that if the men who now advocate Government Radio control were possessed of but a little vision as to the marvelous future and possibilities of Radio, they would recoil with horror at their preposterous suggestions.”¹⁵ Take that Washington! But in a “say goodnight and leave them wanting more Hugo,” he continues his editorial by promoting a certain future for Tesla’s Radio Power Transmission, “He was able to light lamps hundreds of feet away without the use of wires, using only a ground connection.”¹⁶ The next month’s issue brought news that the formerly-evil Government had indeed lifted the ban on transmitting by amateurs. The Government and Navy Department would not control radio after all.

In early 1920 the magazine still contains the word “amateur” in the title,

but there is yet another dichotomy on page 612 of the May issue. At the top of the page is an article, “Dancing by Radiotelephone,” describing how couples can now dance to concerts of radio music, something that might describe radio as it is known today, but with one major difference: “As will be noted, each young man and his dancing partner are equipt (sic) with a pair of radio receiving headphones and connecting cords suspended from various parts of the room, thus enabling them to cover a considerable part of the floor.”¹⁷ Dancing with headphones, while probably not practical due to the obvious cord entanglement, does demonstrate two things: First, it is a novel use of the technology and potential programming then available, but second, for the first time a radio activity lets in a heretofore ignored part of radio marketing, the “dancing partner,” a woman. This will be a necessary part of the new radio audience. The second article on the same page, “The Latest in Crystal Detectors,” shows that we remain, at least partly, in radio’s past.

The Transition is Complete

What a difference a masthead makes. Perhaps more than symbolism, by July, 1920, the title of the magazine is changed to reflect the now likely coming of the entertainment and information uses of radio by a non-amateur public. No longer only paying homage to the amateur, the magazine will remain as just *Radio News*. It is also a perfect time, thinks Gernsback, to predict the far radio future under the



Fig.16. April, 1920 cover with word "amateur" in title (CHRS Library).

editorial title, "Radio in 1945." His predictions are not very daring. About 1945 he writes, "We will no longer need an aerial and ground wire," and "We will have loudspeakers."¹⁸ Is that it? And as he continues to flail around for predictions of radio's technical future, his August, 1920 issue tells another story by its cover design. The theme, "Radio Music at Asbury," is illustrated by a strange three-wheeled wicker wagon being pushed by a uniformed porter along an ocean boardwalk (Atlantic City?). This image speaks volumes about the still confusing nature of broadcasting. In 1920, the radio takes up most of the space in the wagon, its giant loop antenna its prominent feature, and the listeners must still wear headphones. But the telling part of the image is not the technology but the audience: No longer will we see covers of young amateur boys creating sets, rather we will see as in this image the father, the mother and the child. In this picture it looks like broadcasting will arrive and it will be for the family.¹⁹

The editorial in that August, 1920 issue was a bit of deviation from radio concerts and broadcasting for the public. Titled "Radio Photography," it described a German experiment that was a precursor to the "wirephoto," a device that scans a picture and transmits it to a similar scanner at the receiving end: "At the sending end a picture or drawing is usually made upon tinfoil or any other conductive surface, the picture being printed in an insulating ink. We rotate the cylinder upon its axis while a metal stylus presses upon the

tinfoil."²⁰ He compares this process to a needle reading a phonograph record, but explains it in telegraph terms: "The stylus and the metal cylinder, upon which the tinfoil is wrapped, are connected to an electro-magnet and battery so that it will operate an ordinary telegraph key, then in that case the key will be depressed every time the stylus touches the tinfoil and will likewise be released every time the stylus travels over the insulating ink. From this it will be seen that short or long impulses are sent out from the radio station all depending upon the physical makeup of the picture."²¹ This would yield a very low resolution image, less than that of the 60 line "Felix the cat" of early Jenkins television. Even Gernsback admits that synchronization between transmitter and receiver would be nearly impossible. This is what he does through his magazine – reports and comments on possible new electronic technology.

But he does continue to give the reader solid predictions, like the September, 1920 editorial, "Radio Concerts." He tells the story of a British experiment, the sending of a performance by opera singer Madame Melba using radio. He is suggesting correctly that music might become the basis for the new service: "There is nothing that popularizes radio more than a concert by a famous singer, and it is to be hoped that our amateurs, as well as professionals, shall band together and try for some original ideas."²² Notice again that the rapidly changing audience is causing Gernsback to focus some of the magazine's content toward a broader



Fig.17. RN cover leaves out "Amateur," Radio Music at Asbury (CHRS Library).

non-amateur reader. He is straddling the past and future when he refers to “amateurs” and a not-quite-clear “professional,” as the originators of new programming ideas. He is not absolutely clear about the future role of the amateur operator, he does not want to leave them behind, and he probably sees music and news programming being developed by these unknown professionals. He does offer a caveat about an important part of this British experiment. The opera singers performance was captured by a receiver and recorded onto disc, he calls “the idea of catching the voice of a great opera singer by radio.”²³ But Gernsback warns: “The point we want to make here is that, although America is supposed to be a country bordering close to the radio millennium, and, although there are practically no restrictions and the law is all with the amateurs, progress, as far as radio telephony is concerned, is negligible.”²⁴ In this editorial he is exhorting America to come up with a form of music programming because we are behind, he says, the UK: “Of course there are many radiophone sets in the United States now, and these are growing all the time, but there are very few big ‘stunts’ that come to one’s notice.”²⁵

He continues throughout 1920 to try hard not to alienate his core amateur audience while he suggests some grown up ideas better handled by someone of experience and creativity, perhaps from print media, a businessman even: “Why cannot someone go after the Presidential candidates and invite

them to make a speech via radio thru a powerful telephone apparatus in the near future? With proper advertising and with the proper enterprise behind such a scheme, it certainly should not cost a great deal to do. The people of the United State, through the amateurs, would get a chance to listen to our candidates in a very novel manner.”²⁶ There is that reference again to “amateurs,” and surely Gernsback knows that they will not be the ones to drive the rapidly evolving future of radio programming. This is the most exciting time for radio. He summarizes with a call to action: “Of course, there are countless schemes and ideas of a similar nature, all of which make it possible to popularize radio, and that is what we are after. Now, why don’t we get together and do it?”²⁷ This is Gernsback the cheerleader, sensing an opening for a programming format that will appeal to the public—and therefore sell radios and radio magazines and magazine advertising.

Also consider the larger perspective here: Students of media history must have some vague image of the KDKA experiment, called in their textbooks the first commercial broadcast, of the election returns programming of November, 1920. But starting with *Radio Amateur News* in 1919 there was a constant stream of ideas and news about how a post-amateur radio service might operate. There were many stories about how unknown audiences might hear opera or presidential campaign speeches, all of this before KDKA. This is the larger perspective,



Fig.18. RN, Oct, 1920 cover (CHRS Library).

and it demonstrates through several years of publications like *Radio News*, that the transition from young men building crystal sets to broadcasting in America occurred over a two or three year period, surely not overnight. And the radio story must be layered over the story of the economic and social transition from the darkness of an all-consuming world war to the very bright and loud 1920s. This author suggests that the technical needed a receptive social milieu to succeed.

In the October, 1920 issue, there is an article featuring an idea that to the 21st Century reader/historian may seem like something it is not, and that is the idea of news by radio. Seeing the cover and reading the title, "Reporting News by Radio," you immediately see the intrepid reporter on the scene, in this illustration a fire, and you can picture the home listener leaning into the radio as the story unfolds. Right? Wrong. The reporting of news is still 100% the domain of the print industry, and as the story reports, "We may thus conjure a newspaperman reporting a big fire, or a big flood, or a railroad wreck or any other dire calamities, by pressing a button in his pocket and talking through a small mouthpiece with his city editor downtown."²⁸ This is not radio news as we know it, but it is a reporter using the radio to send content to a man with a typewriter who will write a story for a print "extra," and get it on the street quickly. We are still in the past, the known world, even as we contemplate the future of an unknown media format, broadcasting news by

radio. Also note another artifact of the past, the telephone microphone used by the reporter. That carbon microphone would remain a staple of radio broadcasting throughout the 1920s, just as the magnetic telephone earphone would be the basis for radio headphones and the horn speaker of the early 1920s.

The November, 1920 editorial is titled "Fool Ideas," and in this writing Gernsback tries to suggest that maybe the vacuum tube is not the last word in detection or amplification. He is asking readers to consider more advanced uses of an old friend: "Is it impossible to take a crystal detector and make an amplifier out of it? Is it not possible to devise some means whereby the sensitiveness of the crystal detector can be amplified similarly as the vacuum detector is amplified? This is, of course, only an idea, and the writer does not know how it can be brought about, but it certainly should be possible."²⁹ A slow news day? Perhaps, but while the reader of today might get a laugh out of this sort of technical pretzel, consider that the crystal diode is really just an early semi-conductor, and who today sees the vacuum tube as the future, save for its renaissance in high end high fidelity and guitar amplifiers. In Gernsback's world, it may be that he is engaging in "throw it against the wall and see what sticks" journalism.

In January, 1921, *Radio News* begins a series of profiles of radio stations, and in this issue, the experimental but never commercially-licensed de Forest California Theatre San Francisco station under 6XC is featured. De Forest had

been on the air since early 1920, at least six months before KDKA, which also started as the experimental station 8XK. Note that this issue features on its cover a photo of a young man operating a radio, “listening in” using headphones, while his grandma who is knitting nearby seems not to pay attention. And at the bottom of the cover it still says “The 100% Wireless Magazine.” Again, this is Hugo Gernsback with one foot in the past while trying to predict a future for radio. A year goes by, KDKA and hundreds of other stations are now on the air, and it is obvious that the radio is going to be an important part of post-war America.

By the December, 1921 issue he begins to put it all together in a cover story and editorial titled, “The Radiotrol,” a convenient marriage between the radio of amateur times past with the victrola now found in most homes. He writes: “To the careful observer, during the past six months it has become apparent that we are finally headed in the right direction as far as popularizing radio is concerned. We may say that we are right in the midst of a revolution, as far as radio and the great public are concerned.”³⁰ This is almost one year after the famous KDKA election broadcast on November, 1920. Gernsback now sees a revolution driven by music programming. He also sees that it will be more than his original audience, the young man as amateur operator and set builder, and he cites his mail as confirmation: “The editor’s desk is beginning to become flooded with letters, not from radio bugs alone, but

from the layman, who does not know the difference between a detector and a telephone receiver – all of which is a healthy sign, and we may say that radio is entering into its last and final stage, as far as the public at large is concerned.”³¹ Finally, the transition is complete, amateur to broadcasting. Advertising in this issue features a two-tube radiola for \$35 dollars, and a Radiola loudspeaker that is “clear as your headphones.”

Broadcasting Matures

By 1922 the radio business and its art was nearly fully formed, and these early years will become known as the “Boom Years” in radio. Gernsback is now urging radio manufacturers to quit making poor quality radios or risk a radio bust and loss of consumer trust and business. He is also suggesting that radios must become more consumer-friendly, a refrain heard about the personal computer: “Indeed, radio engineers, as well as the entire technical fraternity today, bend every effort towards simplifying every radio set to such an extent that it will come into the class of the phonograph or the automobile; that is, that the owner does not need to know anything of the radio whatsoever in order to operate his set.”³² This is likely an industrial model that is followed today, culminating in the smart phone or tablet computer that anyone can operate without a knowledge of the computer inside.

So now that programming ideas have been considered, tried, rejected or accepted, and the evolution of the radio from wireless and hobby to a consumer

must-have invention are nearly complete, there are other issues to be debated and decided upon. In August, 1922 Gernsback publishes this article by JC McQuiston, "Advertising by Radio, Can it and Should it be Done?" In this article, it is believed that advertising will ruin the radio business, and that ads will destroy the public service that radio can become. But the article's author, a publicity manager at Westinghouse, understands why it might happen: "Radio now takes the place of both weather and health as the chief subject of conversation, It is no wonder that just as soon as the public recognized the use of radio, advertisers gave consideration to this wonderful agency for spreading selling information."³³ Not necessarily an editorial viewpoint, the writer urges careful consideration of what we now accept as radio advertising. But in 1922, there were several schools of thought about advertising, with one of the earliest by the author's employer, Westinghouse. They believed that the sale of radio receivers would pay for the service much like the "Radio Music Box" idea advanced previously by David Sarnoff. Radio luminaries like Lee de Forest wanted radio to be operated purely as a public service, his goal to get great music into the homes of what he would call the common folk. So the question, "will radio advertising happen and will it be effective?" was asked and answered in many ways. It is a question that is still being asked today about every new media – how will we pay for it? Radio then was like Facebook and Twitter today, hugely popular but

with underlying questions about long term viability, and experimentation with various models of paying for it. Like radio, Facebook for many is a "public service," free to the user, and its ads are not always effective. Can this last? No one knows. In the 1920s radio, like Google today, quickly became a leader in the then new economy.

The June 1923 cover and main editorial was titled "Broadcast Listeners Number," and featured a young woman "tuning in" and wearing the still popular headphones. By now the future of radio was easy to predict, but Gernsback reminds us anyway: "The broadcast listener, as we all know, is in a distinct class by himself. He is not interested in the technicalities of either electricity or radio at all. He buys a radio set for one purpose only—to listen in."³⁴ In this editorial Gernsback raises a number of issues about the future of the radio. He prods manufacturers to make simpler sets. And while he could not predict it, by the mid 1920s, a listener could tune a radio by manipulating only three knobs, and because of the vacuum tube amplifier, your entire family could listen to it on a horn speaker, really an earphone acoustically enhanced by a plastic horn. By the end of the 1920s you could buy a radio with one knob tuning in a wood furniture-like cabinet, and the paper cone loudspeaker would give a truer reproduction of voice and music. Gernsback also alluded to the fact that in 1923 not all areas were served by a station, but this too was changing rapidly. Prior to the time the Radio Act of 1927 was passed, there were hundreds



Fig.19. RN June, 1923 cover, Broadcast Listener Number (CHRS Library).

of stations on just a few frequencies, all interfering with each other. Resolving the resulting cacophony was the main purpose of the Radio Act.

Lee de Forest makes one of his many visits to the pages of *Radio News*, and it was surely symbiotic for both him and Gernsback. De Forest was forever associated with the development of popular radio, and his name would surely sell magazines, just as de Forest was manufacturing radios to take advantage of the exploding mass entertainment media that was broadcasting. So with great fanfare in July, 1923 de Forest introduced radio fans to his Flame Microphone. This would have to be dangerous, a live gas flame, but he believed that it would solve one problem of the now aging and low quality carbon telephone microphone currently used in broadcasting. Wrote de Forest of the device: "Sound waves in air are translated directly into electrical energy through a flame, without vibrating diaphragm."³⁵ He makes the case for the problems of the diaphragm: "Efforts of telephone and phonograph engineers have been devoted to reducing as far as possible distortions thus introduced by the natural period of vibration of the diaphragm, or membrane, against which the sound waves impinge."³⁶ For this device he has used a Welsbach oxy-acetylene flame and inserted two heat resisting electrodes connected to an amplifier: "You will then have an extremely sensitive sound converter which gives an electric reproduction of the sound waves in the air enveloping the flame which is of an entirely

different order of fidelity from that ever obtained from any form of microphone device, using a diaphragm, whether this be of the carbon, electro-magnetic, or electro-static variety."³⁷

As a scientist de Forest always began with the theory and then attempted to translate it into practice and patent and profit. It can be imagined that the so-called "air talent" who would be speaking into this microphone would be wary of a live flame so close to the mouth. With this article he also solved another problem existing in the de Forest world. Since 1919 he had largely abandoned tubes and radios, all of these mired in various court cases, and for the past years he had spent all his inventing time on Phonofilm, his sound on film device that he hoped would change Hollywood. This article for *Radio News* mentions prominently that the flame microphone was developed for the Phonofilm, a fact he mentions three times in the opening paragraphs. The idea of a flame in an acoustic environment is not new. This author has found in the literature a story of an experiment using a Poulsen arc as a public address system, the carbon microphone and DC source coupled through a transformer to a DC arc, and the vibration of the arc being amplified using a large horn. The quality must have been marginal at best, likely unusable as it never surfaced again. Reports said it was loud.³⁸

By 1923, live and recorded music has become the content foundation of the new radio media, and just as the public and industry have witnessed throughout the years, the artists and publishers

fight broadcasters for copyrights and fees. In one corner is the new kid radio, believing that if it airs the music, live or recorded, the artists will sell more sheet music or records because of the exposure. In the other corner it is the artist who argues that if radio plays it for free, the public will not buy the music or records. Says Gernsback in his September, 1923 editorial, "Music vs. Radio," "The whole country has been watching with interest, and we believe with considerable annoyance as well, the fight between the music publishers and authors, conducted against radio broadcasting stations. The controversy in brief is that the music publishers and authors insist that the broadcasting stations pay them a royalty on their music compositions, and until this

payment is forthcoming, they refuse to let the broadcasters use their music. They claim this right under copyright law."³⁹ This issue was resolved then by a fee structure and recently re-litigated for streaming music via the Internet. That this argument took place in 1923 is evidence that radio had arrived, was popular, had great influence, and like all media must pay its way to remain in the consumer's life. These arguments over live and recorded music would be followed in the next decade over newspapers being read on the air with the same argument, will reading a paper over the air for free keep readers from purchasing the actual print edition? This issue is again alive as today the major newspapers started by giving away their paper on the Internet, and now they are trying to monetize their



Fig.20. Later Gernsback media magazine (Credit, Franz Pichler, CHRS).



Fig.21. Later Gernsback media magazine (Credit, Franz Pichler, CHRS).

journalism and make enough money to pay their reporters.

By 1924 Gernsback wrote that the radio boom was over. Radio was successful, and so was his most important publication, *Radio News*. He had brought his large audience of magazine readers the news and his opinions of what it might mean, beginning with his wireless publication *Modern Electrics* in 1908, leading to *Radio Amateur News* in 1919, changing that title to *Radio News* a year later. He was the major news force in the transition from the wireless hobby to broadcasting for the public. Into the 1930s and 1940s Gernsback introduced *Radio Craft*, *Short Wave Craft*, *The Experimenter*, *Television News*, *Science and Invention*, *Electrical Experimenter*, and later *Radio News* became *Radio and*

Television News, with the focus of that publication toward the manufacturer and dealer of radios and televisions. He loved to write, he lived to influence his audience, and beginning in 1919 he pointed all of his editorial capital to predictions of what broadcasting by radio should and could do best. More than any writer of the era, Gernsback did report about, guess, predict, and promote radio between 1919 and 1924, its most formative years. His influence was significant.

Notes

This article appeared in a much abridged version in the Fall, 2012 CHRS Journal, and was the basis for the Author's Banquet speech at the 2013 AWA Conference in Rochester, NY. The scans of the Gernsback magazines are from Franz Pichler's Gernsback book, the author's collection and the Maxwell Communications Library of the CHRS Museum and Radio History Center in Alameda, CA.

In my research, resulting in *Lee de Forest, King of Radio, Television, and Film* (Springer Science, 2012), I looked closely at the vacuum tube of de Forest and its important role as a detector, amplifier and transmitter. In my opinion, the tube was the most important single piece of technology responsible for modern radio, and Gernsback took advantage of that and used de Forest often in his publications.

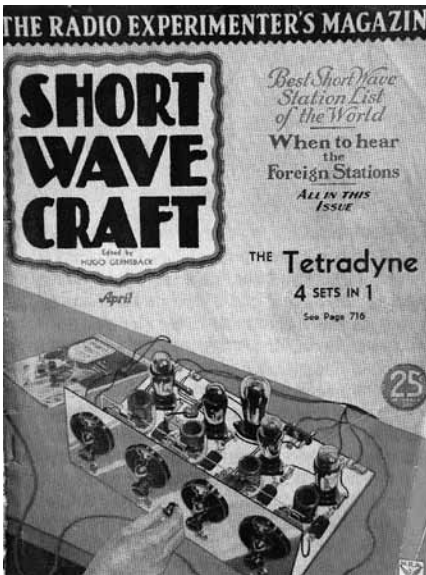


Fig.22. Later Gernsback media magazine (Credit, Franz Pichler, CHRS).

1. George H. Clark, Radioana Collection, 1880–1950, Washington, D.C., National Museum of American History, Smithsonian Institution.
2. Hugo Gernsback, *Radio for All*, J.B. Lipincott, 1922, Philadelphia.

3. Franz Pichler, *Hugo Gernsback und Seine technischen Magazine*, Trauner Verlag, 2013. (Professor Pichler sent me a copy of his very well illustrated book written in the German language. I scanned the relevant text sections, put them into a Web-based OCR program, then put the OCR German text into Google Translate for an English version. These programs were free and the work was completed almost instantly.)
4. *ibid.*
5. Gernsback Publishing, Electro-Importing Company, catalogue, 1910, New York
6. The Hugo Awards Web, www.thehugoawards.com
7. Lee de Forest, "The Audion and the Radio Amateur," *Radio Amateur News*, July 1919.
8. Gernsback editorial, *Radio Amateur News*, September, 1919.
9. *ibid.*
10. Lee de Forest, "Reviewing American Radio History," *Radio Amateur News*, September, 1919.
11. *ibid.*
12. *ibid.*
13. *ibid.*
14. Gernsback editorial, *Radio Amateur News*, October, 1919.
15. *ibid.*
16. *ibid.*
17. "Dancing by Radiotelephone," *Radio Amateur News*, May, 1920.
18. Gernsback editorial, *Radio News*, July, 1920.
19. *Radio News*, August, 1920.
20. *ibid.*
21. *ibid.*
22. Gernsback editorial, *Radio News*, September, 1920.
23. *ibid.*
24. *ibid.*
25. *ibid.*
26. *ibid.*
27. *ibid.*
28. "Reporting News by Radio," *Radio News*, September, 1920.
29. Gernsback editorial, *Radio News*, November, 1920.
30. Gernsback editorial, *Radio News*, December, 1921.
31. *ibid.*
32. Gernsback editorial, *Radio News*, July, 1922.
33. J.C. McQuiston, "Advertising by Radio, Can it and should it be done,?" *Radio News*, August, 1922.
34. *Radio News*, June, 1923.
35. Lee de Forest, "The Flame Microphone" *Radio News*, July, 1923.
36. *ibid.*
37. *ibid.*
38. see Mike Adams, *Lee de Forest, King of Radio, Television, and Film*, Springer Science, 2012 for the complete Phonofilm story.
39. Gernsback editorial, *Radio News*, September, 1923.

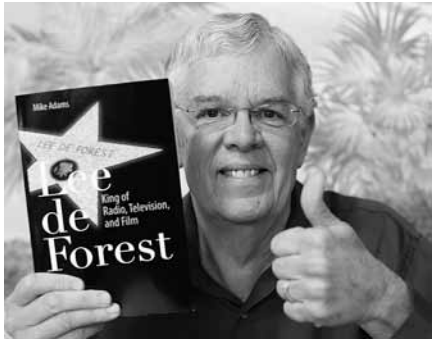
About the Author

Mike Adams has been a radio personality and a film maker. Currently he is an emeritus professor of radio, television, and film at San Jose State University, where he has been a department chair and an associate dean. In addition to his work at San Jose State, Adams continues to teach classes at the Shanghai Theatre Academy School of Television and Film. As a researcher and writer of broadcast and early technology history,

Hugo Gernsback

he created two award-winning documentaries for PBS, “Radio Collector,” and “Broadcasting’s Forgotten Father.” Mike is the Board Chair of the California Historical Radio Society/CHRS. For his service to historical radio he received the AWA Houck Award, the SCARS President’s Award, the RCA Ralph Batcher Award, the TCA Stokes Award, and he was named a CHRS History Fellow. He has had published numerous articles and four books, including *Charles Herrold, Inventor of Radio Broadcasting*, McFarland, 2003,

and *Lee de Forest, King of Radio, Television, and Film*, Springer Science, 2012.



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