



## Growing Our Future Podcast – Episode 10 Lesson Plan

**Lesson Title:** “Get on a Path ... Mission Matters”

**TEKs:** (c) Knowledge and skills.

- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
- (A) identify career and entrepreneurship opportunities related to agribusiness;
  - (D) demonstrate employers' expectations and appropriate work habits;
  - (E) demonstrate characteristics of good citizenship such as stewardship, advocacy, and community leadership; and
- (5) The student communicates effectively with groups and individuals. The student is expected to:
- (A) understand elements of communication such as accuracy, relevance, rhetoric, and organization in informal, group discussions; formal presentations; and business-related, technical communication;
  - (B) describe how the style and content of spoken language varies in different contexts and influences the listener's understanding;
- (6) The student identifies professional agricultural communications using appropriate spoken communication techniques and procedures. The student is expected to:
- (A) identify the importance of verbal and nonverbal communication;
  - (C) demonstrate speech preparation and delivery skills such as using presentation software and technology etiquette; and
  - (D) plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.
- (7) The student demonstrates the factors of group and individual efficiency. The student is expected to:
- (B) demonstrate leadership traits when solving a problem such as risk-taking, focusing on results, decision making, and empowering and investing in individuals when leading a group;
  - D) list the steps in the decision-making and problem-solving processes;
- (9) The student identifies and researches current agribusiness issues. The student is expected to:
- (A) compare and contrast the marketing of agricultural and non-agricultural products; and
  - (B) describe the effects of urbanization on traditional agriculture

***Note.** TEKs taken from the Professional Standards in Agribusiness Course. However, similar TEKs can be found within any of the AFNR courses.*

**Terminal Performance Objective:**

Through class instruction and the evaluation of the Growing Our Future podcast episode, students will create a podcast, according to the criteria outlined in the assignment.

**Enabling Objectives:**

1. Identify entrepreneurship.
2. Research historical periods of agriculture, radio broadcasting, and podcast development.
3. Create a timeline showing the historical overlap of agriculture, radio broadcasting, and podcasting.
4. Identify effective interview tactics and questioning strategies for the Growing Our Future Podcast episode.

	5. Develop a podcast focusing a local agricultural leader.
<p><b>Vocabulary:</b></p> <ul style="list-style-type: none"> <li>• <b>AM broadcasting</b> - is radio broadcasting using amplitude modulation (AM) transmissions.</li> <li>• <b>Competitive Edge</b> - it is that special “something” .. the “it” ... that gives an advantage to a person or business over their peers. Many times, we don’t know what “it” is, but we know they have it. Students involved in the agricultural education and FFA generally have a competitive edge over their peers who do not participate in the program. Their edge is evident in soft skills, work ethic, teamwork, problem solving, and communication.</li> <li>• <b>Entrepreneurship</b> - a person who <u>organizes</u> and operates a business or businesses, taking on greater than normal financial risks in order to do so.</li> <li>• <b>FM broadcasting</b> - is the method of radio broadcasting that uses frequency modulation (FM).</li> <li>• <b>Gratitude</b> - is strongly and consistently associated with greater happiness and joy. Gratitude helps people feel more positive emotions, relish good experiences, improve their health, deal with adversity, and build strong relationships.</li> <li>• <b>Measurable Goals</b> - identify exactly what it is you will see, hear, and feel when you reach your goal. It means breaking your goal down into measurable elements.</li> <li>• <b>Podcast</b> - a digital audio file made available on the internet for downloading to a computer or mobile device, typically available as a series, new <u>installments</u> of which can be received by subscribers automatically.</li> <li>• <b>Workforce</b> - the people engaged in or available for work, either in a country or area or in a particular company or industry.</li> </ul>	<p><b>Bell Work:</b></p> <p><i>Answer the following series of questions to the best of your ability:</i></p> <ol style="list-style-type: none"> <li>1. In your own words, define Entrepreneurship? <b>Answer:</b> A person who <u>organizes</u> and operates a business or businesses, taking on greater than normal financial risks in order to do so.</li> <li>2. Provide an example of an entrepreneur. <b>Answers will vary.</b></li> <li>3. Can an inventor be considered an entrepreneur? Explain why or why not. <b>Answers will vary.</b> Inventors create new products. Entrepreneurs create companies around those products. Henry Ford and Bill Gates didn’t invent something new; rather, they took what was already made and built organizations around them that could bring these inventions to scale. However, Mark Zuckerberg, Elon Musk, and Steve Jobs are all inventors who took their inventions and built multi-billion-dollar companies around their inventions.</li> <li>4. Provide names of great inventors. <b>Answer will vary.</b></li> </ol> <p><b>Give them a few minutes to answer the questions and then review the answers together as a class.</b></p>
<b>Preparation</b>	
<b>Instructor Notes</b>	<b>Activity Notes</b>
<p><b>Tell the class, “Speaking of inventors, let’s listen to this podcast story about a famous Hollywood actress of the 1930s, 40s, and 50s, Hedy Lamarr.”</b></p> <p><b>Have students listen to the podcast episode “The \$25 Million Kiss.”</b></p>	<p><b>Show a picture of Hedy Lamarr so the whole class can see. Play the following podcast link so the class can listen to the podcast while looking a picture of Hedy.</b></p>

**Ask the students:** *“Did you know this story about Hedi Lamarr, and how she invented WiFi?”*

**Allow for class discussion, and then explain,** *“Have you ever looked at the world around you and wondered... How did that happen? Who came up with that idea? How did one thing turn into what it is today?”*

**Ask the class,** *“What are some things you use today, that you wonder how they happened?”*

**Allow time for responses, and then ask,** *“What about being able to listen to music on our phones? Being able to talk on the phone? Being able to download information from the internet? ... Ever wondered who made it possible for all of us to be able to enjoy these things.”*

**Allow time for responses, and then explain,** *“Today, we are going to explore the advancement of technology throughout history. Not only are we going to focus on technologies in terms of the devices we see and use every day, but we are also going to look at the technologies that shaped agriculture as well.”*

**Read the assignment instructions to the class. Tell the class,** *“This assignment will be on paper, and will not be a digital creation. You will be provided materials and resources to help you complete the assignment successfully.”*



**Hedy Lamarr**

Podcast Link [HERE](#) or scan the QR Code to play on cellar device:



**Break the class up into groups of two to three students. Pass out the “Technology Timeline Project” assignment. Read the assignment aloud to the class.**

**Provide the following Materials and Resources to each group:**

- Extra-long, multi-colored packets of construction paper
- Colored Markers
- Crayons
- Colored Pencils

<p><b>Tell the class,</b> <i>“This assignment will be a major grade for your group, and you will be given two class periods to complete your timeline.”</i></p>	<p><b>Resources:</b></p> <ul style="list-style-type: none"> <li>• Radio History (Paper Version)</li> <li>• A Short History of Radio (Paper Version)</li> <li>• Agricultural History Website (Online) - <a href="https://growinganation.org/">https://growinganation.org/</a></li> </ul>
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**Presentation**

<b>Instructor Notes</b>	<b>Activity Notes</b>
<p><b>Tell the class,</b> <i>“Now that we have been researching and studying famous entrepreneurs and inventors, it’s time for us to hear from an entrepreneur who is revolutionizing the podcast industry.”</i></p> <p><i>Now, podcasting came into to play in 2004 when Adam Curry and Dave Winer invented the technology. The term podcasting is the combination of iPod plus Broadcasting to get Podcasting.”</i></p> <p><b>Ask the class,</b> <i>“Have any of you ever seen the old, original iPod?”</i></p> <p><b>Tell the class,</b> <i>“Let’s listen to podcaster, Adam Torres, co-founder of Mission Matters, a media company and podcast platform focused on championing mission-driven leaders across the world. Torres has produced over 40,000 pieces of content in the last five years, estimating he has spoken to over a thousand CEOs. His work has given him a valuable perspective on leadership, success, and the future of business.”</i></p> <p><i>Listen closely to this podcast episode because you we need to develop your series of podcast interview questions based on the content covered in the episode.”</i></p> <p><b>Following the podcast video, ask the class,</b> <i>“After listening to this podcast, if you were to interview an entrepreneur or famous inventor, what types of questions would you ask them?”</i></p>	<div data-bbox="808 430 998 850" data-label="Image"> </div> <p><b>If you have an old iPod, bring it to class to show the students. If you don’t have one, show a picture of one.</b></p> <p><b>Have students watch the Episode 10 of the Growing Our Future Podcast.</b></p> <ul style="list-style-type: none"> <li>• <a href="https://youtu.be/ZXxjIOjF93I">https://youtu.be/ZXxjIOjF93I</a></li> </ul> <p><b>Write the students responses on the board and divide the questions into three categories:</b></p> <ul style="list-style-type: none"> <li>• Career</li> <li>• Leadership</li> <li>• Workforce</li> </ul> <p><b>Possible questions developed from the podcast episode. Please list them on the board.</b></p> <p><b>Career Questions</b></p> <ul style="list-style-type: none"> <li>• <i>How would you best describe your job position?</i></li> </ul>

- *What are the core values of your company?*
  - *What do you look for in an employer?*
  - *What led you to your current career role?*
  - *How did you get started in your career?*
  - *What do you look for in an employee?*
- Leadership Questions**
- *What is the key to success?*
  - *What are three leadership principles you live by?*
  - *How can I gain and maintain a competitive edge as I enter the workforce?*
- Workforce Questions**
- *Where do you see the workforce in the next 5, 10, 15 years?*
  - *What skills do you think will be required? Admired?*
  - *What's your favorite interview question?*
  - *What advice would you give a person like myself?*

**Application**

**Instructor Notes**

**Tell the class,** *“Now that we have identified these interview questions from today’s podcast episode, let’s look at how some other podcast programs interview their guests.”*

**Tell the class,** *“I want each person to choose one podcast episode from two of the five podcast programs listed on the handout.*

*Chose an episode that speaks to you. Research through the various episodes they have recorded until you find two episode that you want to listen to.”*

**Explain to the class,** *“Once you have listened to the two episode you have chosen, you will write a one-page summary for each episode you chose.”*

**Tell the class,** *“Your summary should cover the following questions:*

- *Title of Podcast*
- *Title of Podcast Episode*
- *Who was the podcast director (host)?*
- *What content was covered in the podcast?*
- *What questions did the host ask their guest?”*

**Activity Notes**

**Pass out the “Agricultural Podcast Links” handout. to the class.**

**Write the following activity instructions on the board:**

- **Write a one-page summary for each podcast episode. Your summary should cover the following questions:**
  - **Title of Podcast**
  - **Title of Podcast Episode**
  - **Who was the podcast director (host)?**

	<ul style="list-style-type: none"> <li>○ What content was covered in the podcast?</li> <li>○ What questions did the host ask their guest?</li> <li>- Your document needs to abide by APA Styling <ul style="list-style-type: none"> <li>○ Title</li> <li>○ Double-spaced</li> <li>○ 12 Point Font</li> <li>○ Times New Roman Font</li> </ul> </li> </ul>
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**Evaluation / Summary**

<b>Instructor Notes</b>	<b>Activity Notes</b>
<p><b>Ask the class,</b> <i>“Why would a podcaster want to ask career and leadership-based interview questions?”</i></p> <p><b>Allow time for response, and then explain,</b> <i>“These questions give the listener of the podcast an insight to who the interviewee is, what they believe, and why they have chosen their career field.</i></p> <p><i>For your next assignment, using the questions we have written on the board, you are going to develop a podcast episode where you interview an agriculture expert about their career. You will work in groups of two to three on this assignment.”</i></p> <p><b>Tell the class,</b> <i>“You will have three class periods to complete the assignment. Afterwards, your group will present your podcast episode to the class. Your group will be graded based upon the criteria listed on the assignment handout.”</i></p>	<p><b>Break the class up into groups of two to three students per group.</b></p> <p><b>Introduce the “Agricultural Career Podcast” assignment to the class by passing out the associated handout. The assignment will be a major grade. Students should be given three class periods to complete the assignment.</b></p>





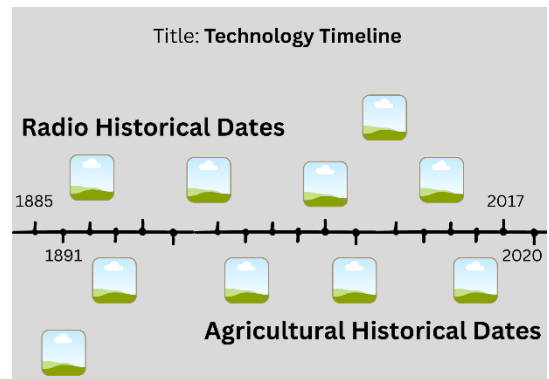
## Growing Our Future Podcast – Episode 10 The “Technology Timeline Project”

**Background:** For this assignment, you and your partner will discover the historical development and overlap of the world renowned technology, “radio”, and the technologies that shaped the face of agriculture. You will both be responsible for creating a timeline that correctly showcases what historical developments happened in these two fields between the years of 1880’s to 2023. Your team will be provided the following resources to help you gather your information for the assignment:

- Radio History (Paper Version)
- A Short History of Radio (Paper Version)
- Agricultural History Website (Online) - <https://growinganation.org/>

**Instructions:** Using the resources provided for the assignment, create a timeline that depicts the historical events that took place in both radio and agriculture during the years of 1880 to 2023. Your team will need to meet the following criteria for your timeline:

- Title of Timeline (*see example*)
- 30 dates within Radio History
- 30 dates within Agricultural History
- Minimum of 10 Photos depicting historical events



**Grading Rubric:** Does your timeline include the following?

ELEMENT	Point Value	Points Earned
An accurate description of the events that happened .....	50	_____
A corresponding picture for each decade .....	25	_____
Organization and neatness .....	10	_____
A Title and student name .....	5	_____
Includes proper use of color .....	5	_____
Spelling .....	5	_____
<b>TOTAL</b>	<b>100</b>	<b>_____</b>

Comments and Suggestions:

# RADIO HISTORY

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**YOUR RADIO  
FAVORITES REVEALED**

Is any Star Worth \$5,000 a Week?

**THE LIFE  
AND LOVE OF  
BURNS AND ALLEN**



# The Invention of Radio

Radio owes its development to two other inventions, the telegraph and the telephone, all three technologies are closely related. Radio technology began as “wireless telegraphy”.

Radio can refer to either the electronic appliance that we listen with or the content listened to. However, it all started with the discovery of “radio waves” - electromagnetic waves that have the capacity to transmit music, speech, pictures and other data invisibly through the air. Many devices work by using electromagnetic waves including: radio, microwaves, cordless phones, remote controlled toys, television broadcasts, and more.

## The Roots of Radio

During the 1860s, Scottish physicist, James Clerk Maxwell predicted the existence of radio waves; and in 1886, German physicist, Heinrich Rudolph Hertz demonstrated that rapid variations of electric current could be projected into space in the form of radio waves similar to those of light and heat.

In 1866, Mahlon Loomis, an American dentist, successfully demonstrated “wireless telegraphy.” Loomis was able to make a meter connected to one kite cause another one to move, marking the first known instance of wireless aerial communication.

## Guglielmo Marconi

Guglielmo Marconi, an Italian inventor, proved the feasibility of radio communication. He sent and received his first radio signal in Italy in 1895. By 1899 he flashed the first wireless signal across the English

Channel and two years later received the letter “S”, telegraphed from England to Newfoundland. This was the first successful transatlantic radiotelegraph message in 1902.

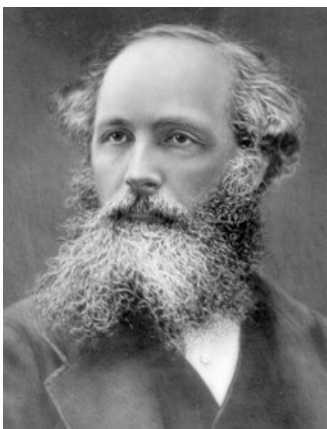
## Nikola Tesla

In addition to Marconi, two of his contemporaries Nikola Tesla and Nathan Stufflefield took out patents for wireless radio transmitters. Nikola Tesla is now credited with being the first person to patent radio technology; the Supreme Court overturned Marconi’s patent in 1943 in favor of Tesla.

## Growth of Radio - Radiotelegraph and Spark-Gap Transmitters

Radio-telegraphy is the sending by radio waves the same dot-dash message (morse code) used in a telegraph. Transmitters at that time were called spark-gap machines. It was developed mainly for ship-to-shore and ship-to-ship communication. This was a way of communicating between two points, however, it was not public radio broadcasting as we know it today.

Wireless signals proved effective in communication for rescue work when a sea disaster occurred. A number of ocean liners installed wireless equipment. In 1899 the United States Army established wireless communications with a lightship off Fire Island, New York. Two years later the Navy adopted a wireless system. Up to then, the Navy had been using visual signaling and homing pigeons for communication.



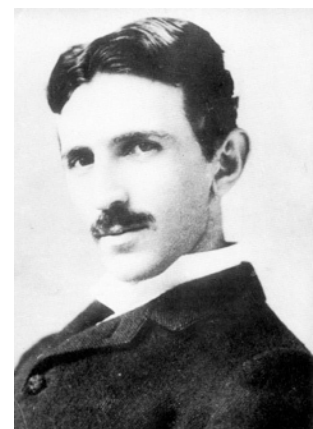
James Clerk Maxwell



Heinrich Hertz



Guglielmo Marconi



Nikola Tesla

In 1901, radiotelegraph service was instituted between five Hawaiian Islands. By 1903, a Marconi station located in Wellfleet, Massachusetts, carried an exchange of greetings between President Theodore Roosevelt and King Edward VII. In 1905 the naval battle of Port Arthur in the Russo-Japanese war was reported by wireless, and in 1906 the U.S. Weather Bureau experimented with radiotelegraphy to speed notice of weather conditions.

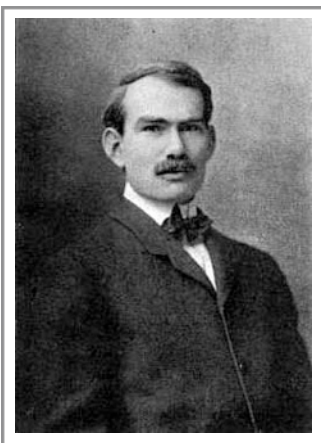
In 1909, Robert E. Peary, arctic explorer, radiotelegraphed: "I found the Pole". In 1910 Marconi opened regular American-European radiotelegraph service, which several months later, enabled an escaped British murderer to be apprehended on the high seas. In 1912, the first transpacific radiotelegraph service linked San Francisco with Hawaii.

### Improvements to Radio Transmitters

Overseas radiotelegraph service developed slowly, primarily because the initial radiotelegraph transmitter discharged electricity within the circuit and between the electrodes was unstable causing a high amount of interference. The Alexanderson high-frequency alternator and the De Forest tube resolved many of these early technical problems.

### Lee DeForest - AM Radio

Lee DeForest invented space telegraphy, the triode amplifier and the Audion. In the early 1900s, the



Lee DeForest

great requirement for further development of radio was an efficient and delicate detector of electromagnetic radiation. Lee De Forest provided that detector. It made it possible to amplify the radio frequency signal picked up by the antenna before application to the receiver detector; thus, much weaker signals could be utilized than had previously been possible. De Forest was also the

person who first used the word "radio".

The result of Lee DeForest's work was the invention of amplitude-modulated or AM radio that

allowed for a multitude of radio stations. The earlier spark-gap transmitters did not allow for this.



### Military Use and Patent Control

When the United States entered the first world war in 1917, all radio development was controlled by the U.S. Navy to prevent its possible use by enemy spies. The U.S. government took over control of all patents related to radio technology.

In 1919, after the government released its control of all patents, the Radio Corporation of America (RCA) was established with the purpose of distributing control of the radio patents that had been restricted during the war.

### Radio Speaks

The first time the human voice was transmitted by radio is debateable. Claims to that distinction range from the phrase, "Hello Rainey" spoken by Natan B. Stubblefield to a test partner near Murray, Kentucky, in 1892, to an experimental program of talk and music by Reginald A. Fessenden, in 1906, which was heard by radio-equipped ships within several hundred miles.

### Reginald A. Fessenden

Canadian, Reginald A. Fessenden is best known for his invention of the modulation of radio waves and the fathometer.

Fessenden worked as a chemist for Thomas Edison during the 1880s and later for Westinghouse. Fessenden started his own company where he invented the modulation of radio waves, the "heterodyne principle" which allowed the reception and transmission on the same aerial without interference.



Reginald Fessenden

### True Broadcasting Begins

In 1915, speech was first

transmitted across the continent from New York City to San Francisco and across the Atlantic Ocean from Naval radio station NAA at Arlington, Virginia, to the Eiffel Tower in Paris.

On November 2, 1920, Westinghouse's KDKA-Pittsburgh broadcast the Harding-Cox election returns and began a daily schedule of radio programs.

The first ship-to-shore two way radio conversation occurred in 1922, between Deal Beach, New Jersey, and the S.S. America, 400 miles at sea. However, it was not until 1929 that high seas public radiotelephone service was inaugurated. At that time telephone contact could be made only with ships within 1,500 miles of shore. Today there is the ability to telephone nearly every large ship wherever it may be on the globe.

Commercial radiotelephony linking North America with Europe was opened in 1927, and with South America three years later. In 1935 the first telephone call was made around the world, using a combination of wire and radio circuits.



*Edwin Armstrong*

## **FM Radio**

Edwin Howard Armstrong invented frequency-modulated or FM radio in 1933. FM improved the audio signal of radio by controlling the noise static caused by electrical equipment and the earth's atmosphere. Until 1936, all American transatlantic telephone communication had to be routed through England. In that year, a direct radiotelephone circuit was opened to Paris. Telephone connection by radio and cable is now accessible with 187 foreign points.

Radio technology has grown significantly since its early development. In 1947, Bell Labs scientists invented the transistor. In 1954, a then small Japanese company called Sony introduced the transistor radio.

## **FM Antenna System**

In 1965, the first Master FM Antenna system in the world designed to allow individual FM stations to broadcast simultaneously from one source was erected on the Empire State Building in NYC.



*Marconi with his radio*

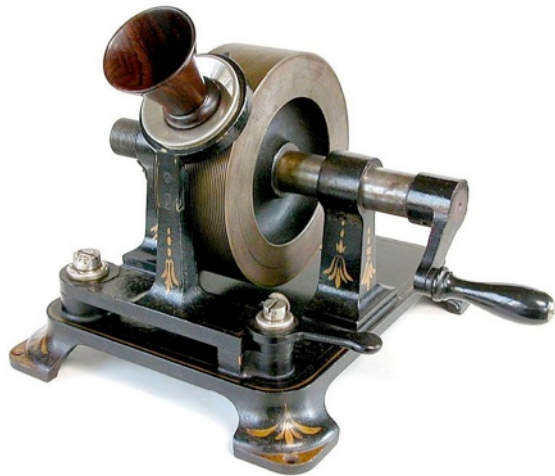


## Audio Recording Developed

In the early days of radio there was no way to record sound. Everything had to be done “live.”

Although the first sound recording device can be traced back to Leon Scott de Martinville, in 1855, it was some time before the concept came out of the laboratory and developed to the point of being a practical way to record and playback sound.

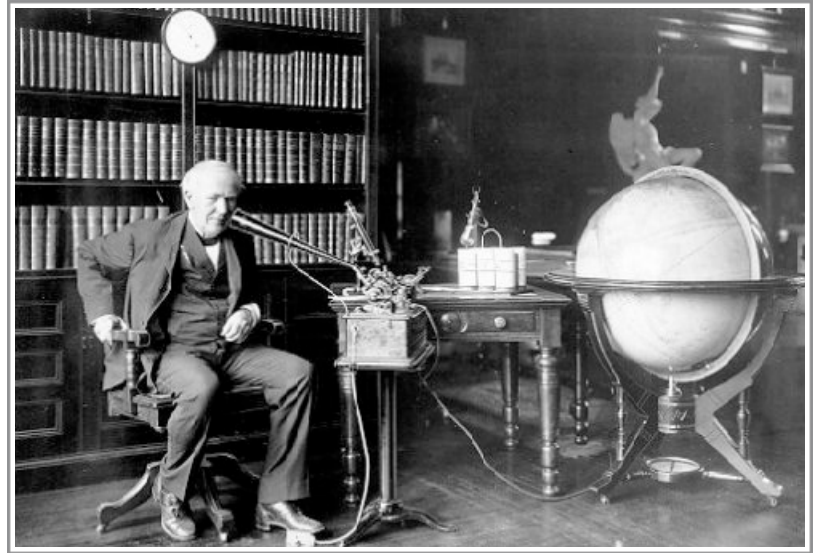
In 1877, Thomas Edison designed the “tin-foil phonograph,” which is credited with being the first practical device to record and playback sound. Edison’s phonograph consisted of a cylindrical drum wrapped in tinfoil and mounted on a threaded axle. He recited “Mary Had a Little Lamb” into the mouthpiece (horn) for the first demonstration. The horn served as both a microphone and a speaker.



*Edison's Tinfoil Phonograph*

Today, it's difficult to appreciate the impact that this recording device had. Despite the questionable quality, for the first time people could hear their own voice and could even hear music that wasn't being played live. In 1877, an amazed editor of the “The Scientific American,” wrote:

*It has been said that Science is never sensational; that it is intellectual, not emotional; but certainly nothing that can be conceived would be more likely to create the profoundest of sensations, to arouse the liveliest of human emotions, than once more to hear the familiar voices of the*

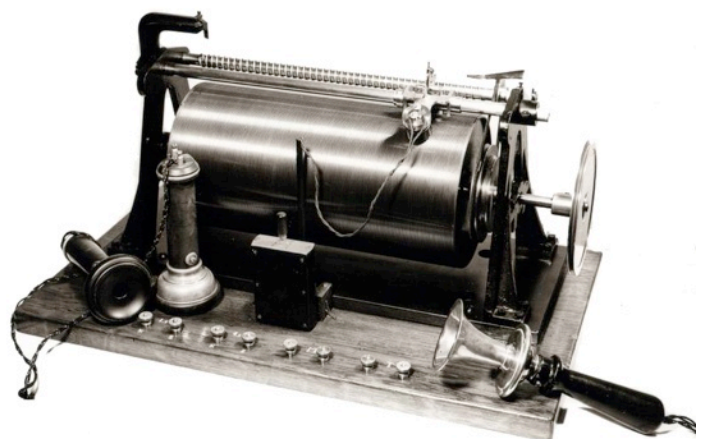


*Edison recording in his library*

*dead. Yet Science now announces that this is possible, and can be done.... Speech has become, as it were, immortal.*

Since there were no vacuum tube or transistor amplifiers the direct audio waves had to be relied upon to imprint the sound on the recording media. The first recordings were made on strips of tinfoil and on wax cylinders, both of which had a very limited life.

On December 1, 1898, Danish electrical engineer and inventor Valdemar Poulsen patented the telegraphone, the first practical magnetic sound recorder. Poulsen's recorder used magnetized steel piano wire as the recording medium.



*Poulsen's Telegraphone*



Soon, wire recorders begin to appear on the American market. They were sold as dictation machines and general purpose sound recorders. One of the best selling brands was the Webcor wire recorder shown on the left.

It was not until World War II that magnetic tape, common to tape recorders, was developed in Germany. Of course, today, even magnetic tape for audio recording is being replaced by newer technologies.

Frank Conrad, a Westinghouse engineer, started the first radio station to feature regular programming. Conrad initially played music by holding a microphone up to a phonograph. In a short while people were regularly trying to tune in, and Conrad became a mini-celebrity.

Westinghouse, who employed Conrad, took notice and decided they could sell a lot more radios at \$10 each if they expanded Conrad's operations, and by 1920, radio was officially on the scene in the United States.



*Frank Conrad "broadcasting"*

### **The Early History of Radio**

Once radio broadcasting was launched, people began to realize just how significant this new medium could be.

For starters, two radio stations broadcast the 1920 Harding-Cox presidential election returns — well in advance of the newspapers. People also took note of all the free music, information, and commentary that was suddenly available to anyone with a

radio set.

But, something else was going on at the same time. Scores of people were building their own personal radio stations, probably motivated in part by the ability to be widely heard by friends, neighbors, relatives, and even strangers.

That created a major problem. Soon there were too many stations for the number of frequencies available to separate them on the radio dial. You might be listening to "uncle Charlie's station," and all of a sudden someone else would turn on their transmitter and drown him out.

When uncle Charlie found out about this, he might decide to solve the problem by shifting to a new frequency — which, unfortunately, drowned out someone who had been using that frequency (not to mention make everyone wonder where Charlie had gone).

Some thought the solution was simply to use more power to drown out the competition. So it got to be a power battle too. A few stations jacked up the power to the point that they were using ten times today's legal limit.

### **The Dawn of Broadcast Advertising**

Then another element entered the picture — broadcast advertising.

In 1922, a station in New York, WEAJ, ran a 10-minute talk on the merits of some co-op apartments in Jackson Heights, N.Y — and charged \$50 for their effort.

That was deemed a toll broadcast — now better known as a commercial. At that point it was discovered that you could actually make money promoting products on radio — and, of course, things haven't been the same since.

Other countries had their own ideas about this new medium. Rather than let it be financed by commercials — maybe they could see ahead to what would happen if they did that — they decided it would be best to let the government pay for things.

In Great Britain this led to the establishment of the BBC (British Broadcasting Corporation) in 1923. The BBC used public taxes on radio receivers to pay for their broadcast system.

Later, the CBC (Canadian Broadcast System) was developed in Canada, patterned after the BBC. The problem in Canada was that a large percent of

the population spoke French. This meant that programming in both English and French had to be developed.

Although most countries of that era also adopted government sponsored radio broadcasting, the BBC and CBC are among the few that were able to insulate programming content from direct government influence. In other words, most countries used radio to further the political aims of those in power. Today, a great many still do.

There was also concern in the United States about government control if taxes were used to support broadcasting. And, of course, there was the issue of the money that could be made through advertising.

Even then the government responded to the political influence of big business. This influence included corporations like AT&T and Westinghouse, which had begun to see the profit potential in this new medium.

The omnipresent, intrusive nature of broadcast commercials has been a part of U.S. broadcasting ever since. But, at the same time, money that commercials generated stimulated the vigorous growth of both broadcasting and advertising during this era.

Plus, given the choice between commercials and the risk of government control over broadcast content — not to mention the need to dip into tax revenues to pay for it all — most people in the U.S. felt that commercials were the lesser of the evils.

## **Government Regulation**

With the advent of paid radio advertising in the United States, sponsors were, of course, insistent on having the commercials they paid for heard. But, with all the chaos in the airwaves at that time — remember uncle Charlie's problem? — that wasn't working out too well.

Stations and advertisers demanded that something be done.

So the U.S. Congress passed the Radio Act of 1927, which created the Federal Radio Commission (FRC). Its purpose was to organize the licensing of transmitters, including assigning radio station frequencies, call letters, and power limits.

In assigning call letters, the FRC saw that radio stations to the east of the Mississippi River started with "W," as in WNBC, WLS, etc., and stations

West of the Mississippi start with the letter "K." Since a few stations were licensed before this plan was put in to effect, there are a few exceptions to the "W" and "K" rule.

In 1934, the FRC was reorganized into the agency that now controls U.S. broadcasting, the Federal Communications Commission (FCC). The FCC's regulatory powers expanded to include telephone and telegraph — and some years later, television.

## **Noncommercial Radio**

One of the things the Federal Radio Commission did was reserve some frequencies for noncommercial radio — primarily stations representing educational and religious groups. But, the channels (frequencies) they were assigned were the least desirable, plus, they were limited in power — typically only 100 watts. (Major radio stations were operating on 50,000 watts of power.)

Many years later when FM (frequency modulated) radio came along, noncommercial stations were assigned to the low end of the RF (radio frequency) FM spectrum — an area with 20 different channels.

## **The Golden Age of Radio**

The golden age of radio — the period when radio reached its peak popularity with general audiences — was in the 1930s and 1940s.

Strangely, part of this period was during the great depression in North America when people were doing without most luxuries, and even a few seeming necessities.

Radio and its wide range of live music, comedy, variety shows, and dramatic programming served as a welcome escape from those troubled times.

Even though many people couldn't afford payments on their washing machines, vacuum cleaners, or Model A Fords, they desperately struggled to keep up payments on their radios. (Keep in mind that not only were all of these things relatively expensive in the 1930s, but a large percentage of people were out of work.)

Note in the drawing on the left that radios of that era weren't just small devices in plastic cases; they were built into large wooden cases that amounted to elaborate pieces of furniture.

The large size was due mostly to numerous (rather large) vacuum tubes in the circuitry. It was not until decades later that vacuum tubes were replaced by transistors and integrated circuits.

Typically, these early radios also had large speakers that provided rich bass, and large loops of wire wound around an internal drum that served as an adjustable antenna for receiving distant stations.

By 1935, more than 22 million American homes had radios, and automobiles were being sold with radios.

Except for one very important thing, radio networks, the stage was set for radio's golden era.

### **The Beginning of the Radio Networks**

Before programming could be recorded, radio stations had to produce all of their own programming "live," which was costly and demanded major resources.

In 1923, two AT&T stations, WEAJ and WNAC on the East Coast of the United States decided they could share the cost of originating certain programs by connecting the two stations with special, high-quality telephone lines and broadcasting the same program at the same time. Of course, their parent company, AT&T, owned the telephone lines, so that was no real problem.

Other stations then joined and this select group of stations became known as the "telephone group," or more officially, the Broadcasting Corporation of America (BCA). Thus, the concept of the radio network was born.

During the early days of radio AT&T tried to take control of this new medium. It claimed that radio was just a "wireless telephone service," and since they controlled telephone services, that meant that they should control radio too.

This, of course, created a bit of a problem for the radio stations that weren't owned by AT&T.

Eventually, the U.S. Justice Department got involved and AT&T sold its BCA radio network and stations to several companies, including RCA. Even so, AT&T maintained its lucrative monopoly on radio network lines.

Losing that battle, AT&T then tried to ban the stations they had sold from using their network lines. They were out to control radio one way or another.

In response, non-AT&T stations owned by GE,

Westinghouse and RCA networked their own stations; but they initially had to use inferior Western Union telegraph lines, which lowered sound quality.

To join the network radio stations had to sign a contract that required them to carry designated network programs. Since the programs included commercials, the stations received a share of the network revenue. At the same time, the affiliates could run their own local commercials around the network programs. This practice is still followed today by both radio and television network affiliates.

Then another major player in radio networks emerged, William Paley. Along with NBC President, David Sarnoff, he would become a corporate legend.

Paley's father, Sam Paley, owned a cigar company and William thought that by purchasing the struggling CBS radio network they could better sell their cigars. (The CBS radio network, which had just started, was having a hard time competing with NBC.)

Once he purchased CBS, it wasn't long before William Paley shifted his focus from selling cigars to building a strong rival to NBC.





After NBC ran into its own monopoly problems it was forced to split its network into two parts: NBC Red and NBC Blue. The latter was then sold to a group of businessmen who renamed it the ABC radio network.

Before we get too far ahead in our narrative, there's another radio "war story" we need to cover.



*An early Teletype machine*

### **The Press-Radio War**

When radio stations started broadcasting news, the newspapers yelled "foul," and tried to stop them — or at least badly cripple them.

Clearly, radio had a major advantage in being able to "be first with the news" (the motto of more than one radio station). Not only were radio stations scooping them on major stories, but they were siphoning off advertising revenue.

The newspapers, which had control of all the major news services, including the Associated Press (AP), the International News Service (INS), and the United Press (UP), launched a corporate war against the radio stations. This was quickly labeled the press-radio war.

News wire machines (teletypes) supplied the country's newspapers with regular summaries of news, feature stories, weather forecasts and bulletins.

Although the general flow and organization of the news was centrally controlled, individual newspapers could contribute their own stories using the keyboard shown.

Recognizing serious competition from the radio

stations, the newspapers threatened to cut off their flow of news. Seeing the consequences of that, Paley and CBS set up their own newsgathering agency.

That move also represented a threat to the newspapers, so they demanded that CBS totally shut down its newsgathering operations. As if that wasn't enough, the newspapers further said that NBC could only broadcast two, five-minute news summaries a day — and then only after the morning and afternoon newspapers hit the street.

But, even that wasn't enough for the newspapers. They further stipulated that the newscasts could not be sponsored, lest the stations cut into newspaper profits. Clearly, the newspaper empire of the day had a lot of power — or at least thought it did.

After some time the radio stations eventually won that battle. Sadly, the radio stations willfully abandoned their victory a few decades later. At that point most radio stations decided that playing music was a lot cheaper than supporting a news staff to find, write, and report news. Ratings also supported the fact that most listeners were more interested in hearing music than news.

Today, very few radio stations are involved in their own newsgathering. Most of those who have newscasts switch to an audio network on the hour for a short news summary. In a few cases they have a local announcer read copy from a news service or local news gathered from a newspaper.

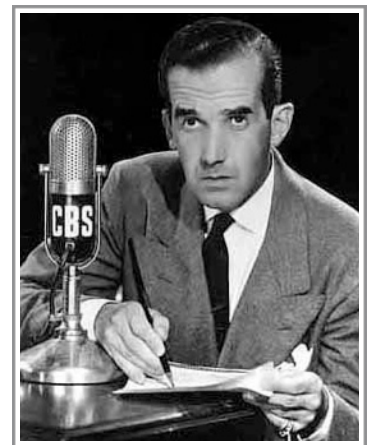
But while radio did actively cover news, it did it very well.

It did especially well at covering World War II. The most notable radio news personality of that era was Edward R. Murrow. He was an excellent writer and had a deep, dramatic voice.

Murrow made you feel as if you were a personal witness to the events that were taking place.

He did a live report once from London with the sounds of bombs falling around him (a particularly impressive feat in those days).

Murrow and oth-



*Edward R. Murrow*



ers like him during that era had an uncompromising sense of what constitutes legitimate news. They regularly battled with corporate executives who were prone to compromise news standards to lower costs, increase ratings, and protect advertising profits. (Much of this story is told in the highly praised film, *Good Night and Good Luck*, released in 2005.)

The Murrow radio era clearly represented the golden age of radio news.

## The Audience

Now, back to our story of how this medium could hold families around their radios night after night and hold women around their radios every weekday afternoon with soap operas (radio dramas that were typically sponsored by soap companies).

For one thing, radio in the 1930s wasn't just designed to appeal to specific musical and philosophical tastes as it is today. It was a family medium.

Families sat around the radio and listened to shows like "Amos 'n Andy," "Gunsmoke," "The Shadow," "Our Miss Brooks," "Superman," "Ellery Queen," "Dick Tracey," "Buck Rogers," and the "Sixty-Four Dollar Question." (Yes, \$64.00 was the top prize!)



Today's listeners, who use radio largely as a background to do other things, might wonder how radio could hold a listener's interest for several hours at a time. There's a one-word answer: imagination.

Not being "troubled" by the spelled out details in pictures, the people of the era could and did imag-

ine what the people and situations looked like.

For this reason radio was personally involving. Fact is, when some of these shows made the transition to television, audiences were disappointed. The images of the people and surroundings that listeners had held in their minds just couldn't measure up to what they were seeing on TV.

This transition wasn't helped by the fact that some radio personalities, although possessing rich and dramatic voices, didn't photograph well. One famous radio personality, who weighed close to 300 pounds, had to be replaced on the TV series by someone who sounded quite different.

Radio scripts were sprinkled with clues as to what was going on: "Emma, why are you going to the window?"; "I see that you are wearing your bright red dress, Clare."



*Early sound effect experts*

And then there were sound effects — the recorded or created sounds of footsteps, horse's hooves, doors being slammed, rain, thunder, car engines, dogs barking, babies crying, birds singing, fire crackling, etc. There were (scaled down) doors to slam, and telephone bells and door chimes to ring, etc.

But, some effects were a bit hard to bring into the studio and had to be created in other ways. For example, massaging a piece of cellophane next to a microphone created the sound of a crackling fire, and wiggling a large sheet of sheet metal created the sound of thunder. Strangely, many of these artificially created effects sounded "more real" than the sound of real thing.

## Regulations

Despite the depression, as radio moved through the decade of the 30s it was riding high on popularity.

President Franklin D. Roosevelt, using an informal radio approach and bringing to bear his paternal, reassuring style, helped maintain confidence in conditions in the United States with his “fireside chats” from the White House. This was the first time radio had been used in this way.

Roosevelt contributed something else to the history of broadcasting: the Federal Communications Commission (FCC).

By 1934, radio and the electronic media were developing too rapidly for the original Federal Radio Commission’s 1927 mandate.

Roosevelt then spurred Congress to pass the Communications Act of 1934, which set up a new governing body, the Federal Communications Commission.

Its purpose was to incorporate the powers of the FRC while expanding its mandate to regulate all of interstate electronic communications.

When it comes to broadcasting the FCC was (and is) the prime governing body. It’s primarily responsible for issuing broadcast licenses (and occasionally suspending them for misconduct), for regulating station frequency, station power, and for occasionally levying fines for broadcast content it deems objectionable. (Howard Stern and the late comedian, George Carlin, among others, found out first hand about this particular FCC power.)

The FCC’s prime directive is to see that broadcasting serves the public’s “interest, convenience and necessity.” However, since FCC members are appointed rather than elected, decisions tend to reflect political and business interests.

Today, the FCC still governs broadcasting, although its governing board was officially reduced from seven to five members in 1983, and its powers have been diminished by various “deregulation” measures. In 1996, the FCC’s areas of responsibility were further reduced with the passage of the Telecommunications Act.

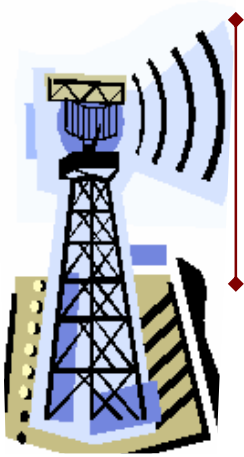


*Franklin Roosevelt broadcasting one of his Fireside Chats*

Sources:

*The Invention of Radio*, About.com, <http://inventors.about.com/od/rstartinventions/a/radio.htm>

Foundations of Radio, CyberCollege, <http://www.cybercollege.com/frtv/frtv015.htm>



# A Short History of Radio

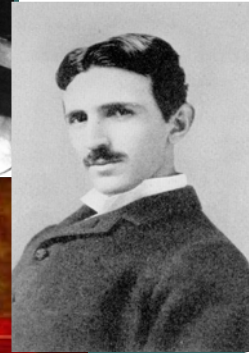
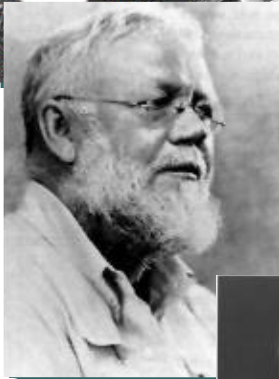
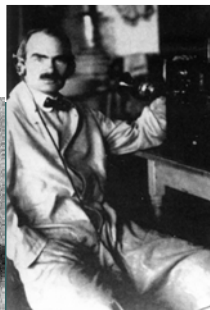
## With an Inside Focus on Mobile Radio

### PIONEERS OF RADIO

If success has many fathers, then radio is one of the world's greatest successes. Perhaps one simple way to sort out this multiple parentage is to place those who have been given credit for "fathering" radio into groups.

#### The Scientists:

- **Henrich Hertz**—this German physicist, who died of blood poisoning at age 37, was the first to prove that you could transmit and receive electric waves wirelessly. Although Hertz originally thought his work had no practical use, today it is recognized as the fundamental building block of radio and every frequency measurement is named after him (the Hertz).
- **Nikola Tesla**—was a Serbian-American inventor who discovered the basis for most alternating-current machinery. In 1884, a year after coming to the United States he sold the patent rights for his system of alternating-current dynamos, transformers, and motors to George Westinghouse. He then established his own lab where he invented, among other things, the Tesla coil, an induction coil widely used in radio.
- **Ernst Alexanderson**—born in Sweden, this remarkable inventor developed the first alternator to make transmission of speech (as opposed to the dots and dashes of telegraphs) possible. It is said that this holder of 344 patents "virtually invented everything General Electric did in the field of AM, FM, and TV."
- **Reginald Fessenden**—this Canadian spent much of his working life in the U.S. where he developed a way to combine sound and radio carrier waves. His first effort to transmit this mixed signal—to a receiver where the carrier wave would be removed and the listener could hear the original sound—failed. However, in 1906, using Alexanderson's Alternator, Fessenden made the first long-range transmission of voice from Brant Rock, MA.



- **Edwin Armstrong**—this WWI Army officer, Columbia University engineering professor, and creator of FM radio invented the regenerative circuit, the first amplifying receiver and reliable continuous-wave transmitter; and the superheterodyne circuit, a means of receiving, converting and amplifying weak, high-frequency electromagnetic waves. His inventions are considered by many to provide the foundation for cellular phones.

Clockwise from bottom—Ernst Alexanderson (1878-1975), Reginald Fessenden (1866-1932), Heinrich Hertz (1857-1894), Edwin Armstrong (1890-1954), Lee DeForest (1873-1961), and Nikola Tesla (1856-1943). Center color photo is Guglielmo Marconi (1874-1937).

#### The Businessmen:

- **Guglielmo Marconi**—this Italian creator spent most of his working life in England where he introduced many of the first uses of wireless telegraphy to European navies. His radio apparatus is widely considered to be the reason that over 700 people survived the Titanic disaster in 1912—instead of dying as they likely would have if ships at sea were still using carrier pigeons to communicate over great distances.
- **Lee DeForest**—credited with being the "father of American radio." DeForest was a direct competitor to Marconi at the turn of the century (1899), when he was the chief scientist at the U.S.'s first radio firm—American Wireless Telephone and Telegraph—until Marconi took over the company's assets in 1912 after a series of financial scandals. Although he held 300 patents, DeForest's greatest technological contribution is considered to be his 1906 "Audion" vacuum tube.





# MOBILE RADIO AT WORK

## GENERAL RADIO TIMELINE

1885	Heinrich Hertz proved that electricity can be transmitted in electromagnetic waves. He conducted experiments in sending and receiving these waves during the late 1880s.
1891	Radios (what we'd call wireless telegraphs today) began to appear on ships at sea. This reduced the isolation of the ships thus improving both reliability and safety.
1892 to 1893	Nikola Tesla wirelessly transmitted electromagnetic energy. He made the first public demonstration of radio in St. Louis in 1893.
1896 to 1897	Guglielmo Marconi filed for patent protection of his radio apparatus. He established the Wireless Telegraph and Signal Company in 1897.
1899	The R.F. Matthews was the first ship to request emergency assistance using a wireless apparatus (Marconi's system).
1901	First transAtlantic signal sent-by Marconi from Ireland to Canada.
1902	Amateur (today known as "ham") radio introduced to the U.S. via a <i>Scientific American</i> article on "How to Construct an Efficient Wireless Telegraphy Apparatus at Small Cost."

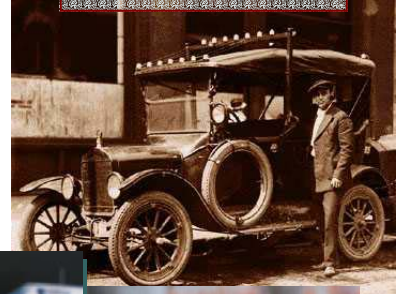
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**T**here are hundreds, if not thousands, of uses of radio spectrum and technology. Everything from baby monitors and broadcasting to radar and radio beacons are applications of radio. These two pages focus on the first historical use of radio—mobile radio.

Robert Loraine was the second pilot to demonstrate wireless transmission from a plane (1910).

But mobile radio isn't just for safety purposes today. Taxi drivers, tow truck dispatchers,

Detroit police radio car with antennas running across the roof (1921).



Technologies that underpin mobile radio were first put to work in the 1890s on behalf of ocean-going ships, which had previously relied on carrier pigeons and flags for their communications.

In 1910, Frederick Baldwin and John McCurdy were the first to trail an aerial behind their bi-plane to demonstrate radio's uses for aviation.

In 1921, Detroit police commissioner William Rutledge was the first public safety official to use radio equipped vehicles.

Today, maritime, aviation, and land-based mobile radio systems remain among the most important non-broadcast uses of the radio spectrum.



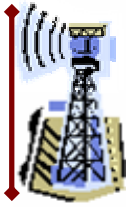
The Titanic, showing its radio antennas strung from bow to stern (1912).

and package delivery services are just a few of the businesses that make innovative use of mobile radio.

In fact, mobile radio has become such a key tool in all business communications that one of the FCC's major challenges is ensur-

ing efficient and effective use of the radio spectrum by business, while guaranteeing the reliability and interoperability of all public safety radio uses.

In finding a way to make this all work, the FCC helps make America a safer and better place to live.



## CELL PHONES—ONE OF TODAY’S MOST POPULAR USES OF MOBILE RADIO

Cellular phones, including Personal Communication Service devices, may seem like one of the newest land mobile services, but the idea of a mobile radio telephone has been around for quite a while.

In the early 1920s both the Marconi company and the Bell Laboratories were testing car-based telephone systems. Bell Labs believes its 1924 system was actually the first two-way, voice-based radio telephone.

Other predecessors to today’s cell phones included the radio telephones used by the military during both World Wars.

The science behind cell phones, as we know them today, was clearly known by 1945 as evidenced by a *Saturday Evening Post* article, “Phone Me by Air,” which quoted FCC Commissioner E.K. Jett on frequency reuse for “small zone systems.” He said, “In each zone, the...frequencies will provide from 70 to 100 different channels, half of which may be used simultaneously in the same area without overlapping.”

Although not yet a cellular system, in 1946 Bell initiated America’s first commercial mobile radio telephone system. Bell, as well as Ericsson, Nokia, and Motorola then went on to develop cell phone technologies throughout the 1950s and 1960s. The FCC approved a major allocation of spectrum for mobile radio systems in 1970. In 1973, Motorola’s Martin Cooper was credited with the invention of the first personal, handheld cellular radio telephone.

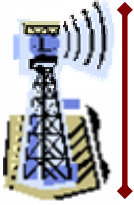
The year after the FCC made its final 1982 decision on spectrum for cellular systems, Ameritech Mobile Communications (Chicago) and CellularOne (Washington, D.C.) became the first operational commercial cellular providers in the United States.

Personal communications for people on-the-go, not just those in vehicles, evolved further in the 1990s and continues growing today.



Clockwise from top right—a WWI mobile military phone, of the type Edwin Armstrong used to develop his ground-breaking inventions; Marconi’s 1922 car phone system with receivers, amplifiers, and speakers mounted on the running boards; Martin Cooper with his 1973 cellular telephone; older and newer generations of mobile radio telephones; and Bell Labs’ 1924 test of a mobile radio telephone.





## WHERE TO LEARN MORE

Find out more about the history and technology of radio by visiting any of the following sites:

- Early Radio History—<http://earlyradiohistory.us>
- Engineering history—[http://www.ieee.org/organizations/history\\_center/](http://www.ieee.org/organizations/history_center/)
- Electromagnetic spectrum—  
[http://imagine.gsfc.nasa.gov/docs/science/known\\_11/emspectrum.html](http://imagine.gsfc.nasa.gov/docs/science/known_11/emspectrum.html)
- Radio History Society—<http://www.radiohistory.org/>
- Surfing the Aether—<http://www.northwinds.net/bchris/>
- Marconi Calling—<http://www.marconicalling.com/front.htm>
- Edwin Armstrong—<http://users.erols.com/oldradio/index.htm>
- Mobile Telephone History—<http://www.privateline.com/index.html>
- Mobile Services—  
[http://www.ntia.doc.gov/openness/sp\\_rqmnts/mobile1.html](http://www.ntia.doc.gov/openness/sp_rqmnts/mobile1.html)
- FCC Regulation of Wireless Services—<http://wireless.fcc.gov/services/>

## WIRELESS—ONE WORD, MANY MEANINGS

While a rose may smell the same regardless of what it's called, the term "wireless" has referred to distinctly different things throughout the past century. The one common characteristic among all these uses of the word is that they all describe a communication product that sends or receives information via electromagnetic waves.

- 1900s—sending a wireless meant you were aboard a ship sending a telegram to the home office to let them know when you'd arrive.
- 1920s—listening to the wireless meant you could hear the Navy's time and weather reports, USDA's crop and market news, as well as concerts, lectures, and sermons.
- 1980s—talking on your wireless unit meant you had a cellular or PCS telephone.
- 2003—using wireless likely means taking a picture using your digital 3G-enabled cell/PCS phone and sending it, along with a text message, to a friend's Internet email address.

Albert Einstein, when asked, in 1938, to explain radio, is widely reported to have said:

**"Y**ou see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat."



Marconi and Hertz used these devices in the 1880's and 1890's to transmit and detect radio waves.

### TIMELINE

Reginald Fessenden is the 1st to transmit a program of speech and music.	1906
Lee DeForest produces the "Audion," a triode vacuum tube that allowed for amplification of radio signals.	1906
First radio transmission from an airplane.	1910
Federal regulation of American airwaves begins. Amateurs had to be licensed; ships had to have a radio and trained operators.	1912
All U.S. radio stations not needed by the government are closed as WWI begins.	1917
Edwin Armstrong patented the Super Heterodyne Receiver based on work he did as an officer in the Army Signal Corp.	1918
The Federal Radio Commission established to bring order to chaotic airwaves.	1927
Cellular radio telephony, with call handoff and frequency reuse, was conceived at Bell Laboratories.	1947
The FCC reallocated TV channels 70-83 for mobile radio services.	1970
The FCC permitted spread spectrum, the technology of choice for many of today's digital, commercial cellular and PCS services.	1985
The FCC reallocated spectrum at 2 GHz for emerging digital mobile services.	1992
The first cellular system using digital CDMA technology was commercially launched by QUAL-COMM.	1995

Photos courtesy of: American Institute of Physics, Emilio Segrè Archives;

ArrayComm; AT&T History Collection; David Massey, Perce Cox collection; *Detroit Free Press*; IEEE Canada; IEEE History Center; John Jenkins and the Spark Museum; Mike Katzdorn; Marconi PLC; Tesla Memorial Society; Thinkstock; and Thomas White.



**Growing Our Future Podcast – Episode 10  
Agricultural Podcast Links**

Podcast Logo	URL:
	<p><a href="https://www.youtube.com/@MissionMattersBusiness/videos">https://www.youtube.com/@MissionMattersBusiness/videos</a></p>
	<p><a href="https://www.texasffa.org/podcast">https://www.texasffa.org/podcast</a></p>
	<p><a href="https://www.futureofag.com/podcast-1">https://www.futureofag.com/podcast-1</a></p>
	<p><a href="https://aglaw.libsyn.com/">https://aglaw.libsyn.com/</a></p>
	<p><a href="https://mikerowe.com/podcast/">https://mikerowe.com/podcast/</a></p>





## **Growing Our Future Podcast – Episode 10** **The “Agricultural Career Podcast” Assignment**

**Background:** Using the questions below you are going to develop a podcast episode where you interview an agriculture expert about their career. Your team shall consist of two to three members.

### ***Career Questions***

- How would you best describe your job position?
- What are the core values of your company?
- What do you look for in an employer?
- What led you to your current career role?
- How did you get started in your career?
- What do you look for in an employee?

### ***Leadership Questions***

- What is the key to success?
- What are three leadership principles you live by?
- How can I gain and maintain a competitive edge as I enter the workforce?

### ***Workforce Questions***

- Where do you see the workforce in the next 5, 10, 15 years?
- What skills do you think will be required? Admired?
- What’s your favorite interview question?
- What advice would you give a person like myself?

### **Instructions:**

#### **1. Research**

- Research local agriculture leaders and influencers in your community.
- Reach out to an individual by composing a professional email requesting them to appear on your podcast episode.
- Schedule a time to conduct your podcast interview with the individual. You may use class time to conduct your interview.
- Provide the individual the list of questions you are going to ask them and communicate your expectations of the podcast interview. The podcast episode must include three to five questions from the list above.

#### **2. Podcast Interview**

- The podcast shall not be less than 6 or more than 10 minutes. (Penalty for violation shall be 10 points per minute or major fraction thereof.) A major fraction of a minute is defined as 31 seconds.
- The podcast provides an announcer to introduce the program and to sign it off the air.
- One team member may serve as moderator or discussion leader but should not be designated as the podcast director.

Group Name: \_\_\_\_\_

Podcast Guest: \_\_\_\_\_

### PODCAST RUBRIC

<b>Part I. Subject Matter (250)</b>
A. Unity of organization (50)
B. Relevance to agriculture topic (50)
C. General effectiveness (150)
<b>Part II. Continuity (400)</b>
A. Exchange between students (pause) (100)
B. Volume of broadcast (100)
C. Participation by team members (100)
D. Background noises (100)
<b>Part III. Listener Importance (350)</b>
A. Student's ability to pronounce words properly (100)
B. Motivation of student's presentation (100)
C. Student's ability to hold audience (150)
<b>Penalty Deduction [10 points @ major fraction of a minute]</b>