**Video Script**

**Lecture 14 – Origins of Radio**

**Fall 2020**

**Welcome**

We’ve spent five weeks so far this semester considering the history and development of film in the United States. And while film is important and wonderful and vital—I look out of my apartment window and gaze longingly at the Alamo Drafthouse every day, waiting to return to the movies—it’s not the totality of our course. Today we’ll be doing justice to the R in RTF, and thinking about the origins of radio.

**Key Terms**

Here are your key terms for today.

**Pause**

I usually don’t have you pause so early in the lecture, but I think shifting to such a different medium requires a little bit of reflection.

**[ANIMATION]** So, please take two or three minutes and free write, think, or chat with someone about radio. Do you listen to the radio? What are some of your memories of radio? If radio doesn’t play a big role in your life, does anyone you know listen to the radio?

**Headphones**

When I have students reflect on this in the classroom, the response I get is generally that most people *don’t* listen to a lot of radio in their everyday life. Perhaps you’re an exception to that rule—I don’t want to assume.

But in the past, what students tend to reflect on instead of radio is their on-demand listening habits, like streaming music, podcasts, audiobooks, and other audio content they mostly get through their phones. And I get that! Radio is an audio form of media, podcasts are an audio form of media, hence they must be kind of related.

**[ANIMATION]** And in a way, they are, a little. But on-demand curated digital media does not, on the whole, demonstrate some of the key characteristics of radio that you’ll be able to identify by the end of this lecture.

And, since these lectures are asynchronous and that makes it a little hard to chat with each other about our radio memories, let me share a few of mine.

**LeSabre**

Some of my very earliest memories of the radio are sitting in the back of my parents Buick LeSabre station wagon waiting for one of my first favorite songs to come on…

**Tears for Fears**

…which is, of course, **[PLAY SONG]** “Everybody Wants to Rule the World” by Tears for Fears.

A band whose 1985 album *Songs from the Big Chair* is as excellent as their hair was questionable.

Listen to those sweet, 1980s melodies. So majestic. So evocative.

It does, I must stress, sound even better bouncing off of the Naugahyde interior of a LeSabre station wagon.

This song still slaps. Okay, moving on…

**Snowy Day**

The radio was also a source of news for me. My family only ever listened to 100.7 WHUD, the local station, and that’s how I’d find out that my school was closed for a snow day.

**Delilah**

As I got older, my relationship with radio became more interactive.

In middle school and high school, I remember constantly calling to try to win concert tickets and free t-shirts or to request songs. I still remember the number for Z100, the big New York City pop radio station, because I dialed it so many times (1-800-242-0100). The radio demanded live and engaged listening. You had to be caller number 100 at exactly the right time in order to win your Bon Jovi backstage pass, or whatever.

I also listened to call-in talk shows like Dr. Drew’s *Love Lines*, where people asked for relationship advice, and also very a cheesy syndicated request show *Delilah*, where people would call in with weepy stories about their loved ones and Delilah would pick a soft rock slow jam to play for them. I should note that I was *floored* to find out this show was still on the air, and also, googling the image for this slide was the first time I have ever seen Delilah’s face in my entire life.

**KUT**

I still listen to the radio. I listen to our on-campus community radio station KUTX in the shower, and I listen to our on-campus NPR station KUT when I’m in the car. I mention this because sometimes we think about radio as dead or dying communication medium, but it’s still here. And in fact, it’s still *growing* in some areas of the industry.

**La Bronca**

One of those areas is Spanish language radio. This is a photograph of a small Oregon station, La Bronca, and I’ll link you to a little article about them. The vitality of Spanish-language radio is why I chose your reading for today, the introduction to a book called *Sounds of Belonging* by Dolores Ines Casillas.

Rather than giving you something to read about the origins of radio broadcast technology or the earliest nationwide broadcasters, I wanted to begin this unit by reflecting on how integral Spanish-language radio is *today* to Spanish-speaking listeners across the country. Your reading will help orient you to the idea that radio is a living broadcast medium that remains a lifeline for some communities, and that understanding will in turn help you to understand the vitality and excitement of radio’s earliest days.

**Historical (Television)**

So, all of this is to say that radio might conjure up an image like this for you—that it’s a technology of the past. But in addition to the continued importance of radio…

**Television**

…we also couldn’t get to television without the advances and inventions of the radio industry…

**Phones**

…and we couldn’t get here either. The programming, business models, technology, regulation, and infrastructure of radio forms the foundation of *so much* of our current media landscape.

**Radio (invention)**

Now, all that said, let’s start at the beginning. Knowing what we know about the history of film, you should be able to answer the question “Who invented radio?” with zero difficulty, even though we haven’t really dug in yet. Say it with me…**[ANIMATION]** lots of people. Just like no one person invented film, no one person invented the radio, either. But let’s take a look at a couple of folks who were instrumental.

**Hertz**

We’ll start with this fine gentleman, good ol’ Heinrich Hertz. A previous scholar had theorized the existence of electromagnetic waves, and Hertz decided to try to prove the existence of those waves. So, between 1886 and 1889 he does a bunch of experiments and succeeds. Electromagnetic waves—they’re real. Check. Done.

**Hertz (continued)**

When asked about the potential uses of these electromagnetic waves might be, Hertz reportedly said **[ANIMATION]** “It’s of no use whatsoever.” The founding figures of radio, folks! But people who followed after Hertz disagreed, obviously, and developed his ideas into a whole bunch of real-world applications.

**Spectrum**

For this class, we only care about one application **[ANMIMATION]** and that’s radio.

Radio waves are a specific chunk of the electromagnetic spectrum. What you’re looking at here is a segment of the U.S. radio frequency allocation chart that—in addition to being an aesthetically *very* pleasing thing to look at—shows which devices operate on which little slice of the radio spectrum.

**[ANIMATION]** Radio frequencies are used for all kinds of telecommunications. AM radio operates on a certain set of frequencies, FM radio on another, television channels on another, etc.

**[ANIMATION]** And I really mean *all kinds* of telecommunication. In the US frequency allocation chart, baby monitors, wildlife tracking collars, and the Mir space station all have their own specific frequencies assigned to them.

What I’d like you to take away from this chart is the idea that *the government assigns the frequency ranges.* We’ll come back to that point in a few minutes.

**Marconi**

But back to the dead, old guys. Marconi is one of the inventors who experimented with radio, and his contribution was the ability to transmit and receive information through radio waves.

**Transmitting station**

He invents the vertical antenna—pictured here, at one of his transmitting stations around 1900 and not on the set of *The Lighthouse*, I swear. From stations like these that he builds on both sides of the Atlantic, he can communicate with ships at sea. By 1901, he can send messages from England to Canada and radio-equipped ships at any point between.

By 1904, he’s turned this into a little business. Marconi set up a nightly news service for ships at sea. He transmits the news to a ship with a subscription to his service, who then the ship turns that transmission into an onboard newspaper for passengers.

This business, though, was not booming.

**Titanic**

But don’t ever think that the sinking of the Titanic was all bad! Marconi was perhaps the lone person to benefit from one of the biggest shipwrecks of the 20th century.

When the Titanic went down in 1912, the radio operators on board were Marconi employees. They were able to contact the HMS Carpathia, the ship that came to the rescue, and they maintained that line of communication between the ships for 72 hours.

When the Carpathia docked with survivors in New York City, Marconi and a New York Times reporter went on board to talk with the surviving operator. This story publicizes the use of radio as a critical means of point-to-point communication, particularly in an emergency.

**Lee DeForest**

In terms of technological inventions, we also couldn’t have radio without this odd bird, Lee DeForest. I mentioned his name in an earlier lecture because he also worked on sound-on-film technology.

I love this picture of Lee DeForest so much because he appears to be *utterly baffled* by his own invention, which is called the three-element vacuum tube. It’s not important that you understand exactly how it works, but rather that its an amplification device. This allows for microphones, telephones, radio, and so forth.

DeForest is a *character*. He called *himself* the Father of American Radio.

**DeForest**

And it’s true that he held a ton of patents for electronics and audio inventions. But he also, in his own words, “made and lost four fortunes” based on those inventions.

He also tried to finance his college tuition by winning essay contests, so, not the greatest financial planner Earth has ever known.

He formed companies, routinely oversold stock in them and then ran them into the ground. He did this so frequently and so poorly that he and the co-founders of one of his companies were tried mail fraud. DeForest got off, but the other three were convicted.

**DeForest (magazine)**

He took a dispute with another inventor, Edwin Armstrong, all the way to the Supreme Court *two times* over who discovered regeneration (a key process that makes microphones work).

DeForest *at most* sort of stumbled on regeneration during some experiments but had no idea what it meant or how to use it.

But he wouldn’t let that deter him! And even after a) DeForest won the patent and b) Armstrong literally *killed himself*, DeForest continued to write in and angrily respond to articles that spoke too favorably about Armstrong’s contributions to radio science.

**DeForest (memoir)**

Here’s another picture where he’s looking at his own invention like WHAT HATH I WROUGHT?

This self-proclaimed Father of American Radio was ultimately unhappy with the direction commercial radio took, writing to the National Association of Broadcasters in 1940 to say **[ANIMATION]**

*“What have you done with my child, the radio broadcast? You have debased this child, dressed him in rags of ragtime, tatters of jive and boogie-woogie."*

Not boogie-woogie! DeForest died, shall we say, “between fortunes,” with very little to his name.

**Questions**

Okay, so, now we know that, technologically speaking, we need radio waves, transmission via antennae, and amplification for a radio to function. And we know some of the li’l weirdos who brought those inventions to us.

But radio as an *industry*, not a *technology*, was faced with a number of questions in its early days.

Is radio a way to people to talk or to listen?

If the radio was for listening, what did audiences want to hear?

Should the radio industry be different than the film industry?

Could it be monetized?

Let’s start with the first question. Was radio a device anyone could use to talk to other people? Or was it a way for a few people to broadcast entertainment and news to a lot of people?

The weird thing about radio is that it’s *both,* though the government pretty quickly limits who has the right to do the transmitting.

**Radio communication**

Let’s think first about how the radio was used as a communication device.

**Radio communication (continued)**

**[ANIMATION]** In the early 20th century, most radios were built by amateurs. They weren’t very complicated machines, and they weren’t being broadly manufactured yet. Most of these early radios were able to both transmit and receive signals. So, from about 1905 to 1910, you get a bunch of radio nerds building their own machines to talk to each other, and they’re talking willy-nilly on any radio frequency they liked.

**[ANIMATION]** Marconi’s focus on using radios to communicate to and between ships led to the Wireless Ship Act of 1910, which said that ships must have radios on board in case of emergency, and that all radios must be able to communicate with each other, just like a PDF sent from a Mac to a Windows computer needs to be readable by both computers.

And as we already saw, the radio was a lifeline in 1912 when the Titanic went down—but that was despite signal interference from all of those amateur broadcasters.

**[ANIMATION]** So the government keeps regulating who can transmit on the radio waves.

**[ANIMATION]** The Radio Act of 1912 says that radio waves are an interstate natural resource that must be regulated federally, that the government gets to decide how the airwaves are allocated, that you need a license to broadcast anything, and that civilians can’t use military frequencies.

**[ANIMATION]** During WWI, the government suspends civilian use of the airwaves entirely, so they can communicate uninterrupted with ships and planes.

**[ANIMATION]** The Radio Act of 1927 establishes the Federal Radio Commission to deal with all that licensing. It says that licenses would be allocated based on the public interest, convenience and necessity. Remember the phrase “public interest,” because that will come back in a few weeks. In practice, it means that the government gives most licenses to corporations, not individuals or institutions like schools. *This is the moment our burgeoning broadcast system becomes a for-profit system, not a public one.*

**[ANIMATION]** The Communication Act of 1934 turns the Federal Radio Commission into

**[ANIMATION]** The FCC, the bureaucratic body we have today.

So what does all of this add up to?

**Spectrum**

Aside from a few years of radio free-for-all, **[ANIMATION]** increasing regulation puts the airwaves under federal control and divvies them up in a way that favors government/military uses and, most importantly, *corporations*.

**Radio broadcasting**

So civilian broadcasters are sequestered to a tiny slice of the radio spectrum and are only permitted transmit signals using radio waves in a limited number of ways. You can chat with truckers on a CB radio in your car, for example, but you can’t set up a giant antenna in your yard and start your own radio station.

So, beginning in the 1920s, corporations successfully get licenses for a slice of radio spectrum and begin to develop exciting new programs to send out to a ton of people at once. This is called *broadcasting.* And while people aren’t really allowed to be radio transmitters anymore, they’re encouraged by all this new programming to buy radio receivers—like the regular radio sets we still use today—and tune in.

**Radio broadcasting (continued)**

For the most part, radio broadcasting is synonymous with *entertainment* in the United States—though of course there’s news too, and we’ll talk about that in our next lecture.

One of the earliest broadcasts is by DeForest himself in 1910, when he transmits live music from the Metropolitan Opera in New York City.

WWI put a freeze on radio broadcasting just like it did civilian communication, but by 1922 the government was licensing broadcasters to transmit programming broadly, and corporations were snapping up those licenses to do just that.

From 1922 to1923 alone, the number of radio receivers owned by everyday Americans increases from about 60,000 to more than 1.5 million—and these are not machines that people are building on their own, anymore….

**RCA**

…they’re manufactured by companies like RCA and Atwater Kent. By 1924, the radio industry has responded to this obviously ravenous market and has grown from just 28 stations to more than 1400 across the US.

RCA also gets into the radio broadcasting game, and eventually into television—but that’s a story for another week.

**Caruso**

By now, you should know that I like to poke around in old newspapers and magazines to find something from the time period we’re looking at, and in this case, I was able to find the description published in the *New York Times* about the that first radio broadcast from the Metropolitan Opera in 1910. **[ANIMATION]** They said Caruso’s arias were

*“trapped and magnified by the dictograph directly from the stage and borne by wireless Hertzian waves over the turbulent waters of the sea to transcontinental and coastwise ships and over the mountainous peaks and undulating valleys of the country.”*

Which is kind of a poetic way to think about radio. We’re so accustomed it that we hardly think about it at all anymore, but the transmission of a live human voice from somewhere else to our ears is kind of an incredible thing.

**Comparison slides (x4)**

To close out this lecture, I want to take a few minutes to compare the formation of the film industry to the formation of the radio industry. We’ll talk about some more about radio over the next few lectures, but knowing film as well as we do now, it may help to use it as a counterpoint to understand the specific dimensions of this new broadcast medium

**[GO THROUGH ON-SCREEN COMPARISONS]**

**After “typical show”**

**[ANIMATION]** If you remember nothing else about the radio industry, remember this. It’s different from film in four key ways:

* *Scarcity,* meaning the airwaves are limited and the government allocates them, mostly to industry
* *Liveness,* meaning lots of people are hearing the same broadcast at the same time, which is a first in media history
* *Seriality*, meaning that the shows continue from one installment to the next, telling a story that unfolds and unfolds
* *Commerciality*, meaning that it is full. Of. Ads. Radio has sponsors, and it’s trying to sell you something. Film is only selling you itself.

So, this is just a sketch of the radio industry. You can see it’s a horse of a different color. We’ll talk more in the next lectures about what programming that’s live, serial, and highly commercial sounds like, as well as how the radio becomes a medium for politics and news, too.