
Radio Broadcasting

INTERFACE 11/29/21
Sabrina Reguyal

What is Radio?

Spectrum Allocation

- 30 Hz-300 GHz
- Emission of radio waves regulated by national laws, coordinated by the International Telecommunication Union (ITU)
- Radio transmitters must be licensed by governments, under a variety of license classes depending on use, and restricted to certain frequencies and power levels
 - U.S. -- Federal Communications Commission (FCC)

UNITED STATES FREQUENCY ALLOCATIONS

THE RADIO SPECTRUM

RADIO SERVICES OR USE LEGEND

■ AMBULANCE SERVICE	■ AERIAL RADIOTELEVISION	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE
■ AMBULANCE SERVICE	■ AMBULANCE SERVICE	■ AIR FORCE SERVICE

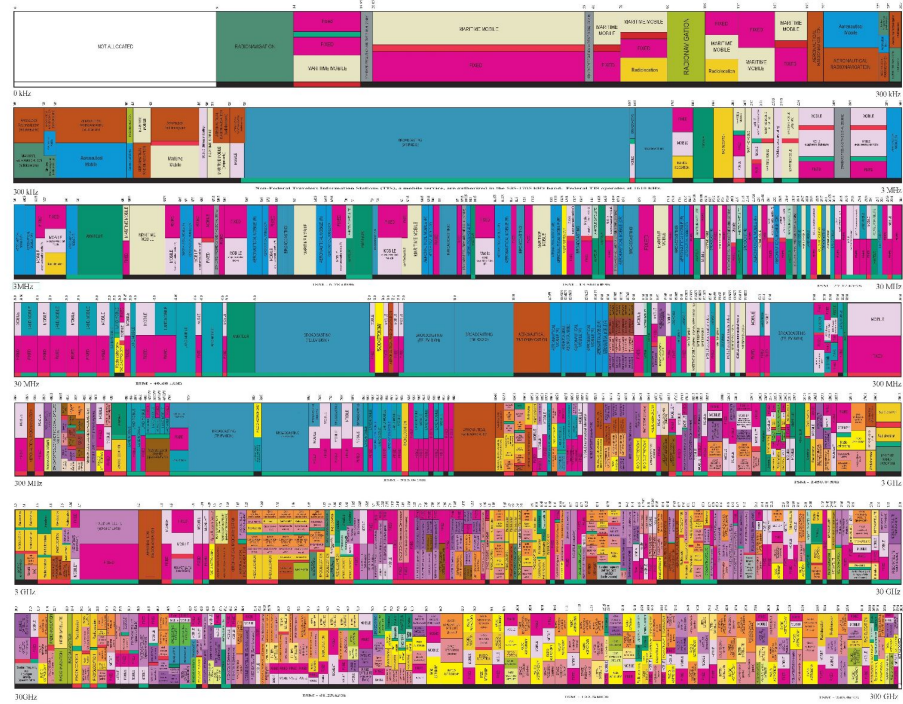
ACTIVITY CODES

■ FIXED SERVICE	■ MOBILE SERVICE
■ FIXED SERVICE	■ MOBILE SERVICE

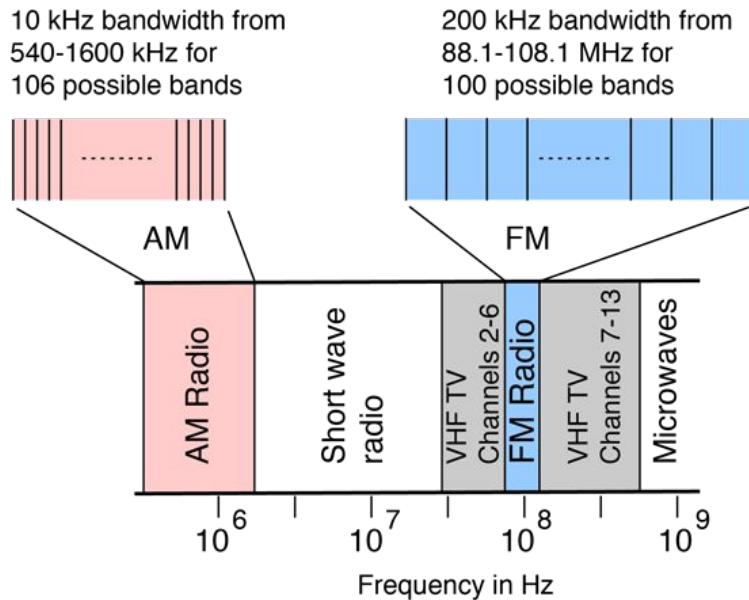
ALLOCATION USAGE DESIGNATION

CLASS	TYPE	OPERATION	MODE
F	FIXED	FIXED	FIXED
M	MOBILE	MOBILE	MOBILE
N	NAVIGATION	NAVIGATION	NAVIGATION
P	PERSONAL	PERSONAL	PERSONAL
R	RADIO	RADIO	RADIO
S	SATELLITE	SATELLITE	SATELLITE
T	TERRESTRIAL	TERRESTRIAL	TERRESTRIAL
V	VARIABLE	VARIABLE	VARIABLE
W	WIRELESS	WIRELESS	WIRELESS
X	EXPERIMENTAL	EXPERIMENTAL	EXPERIMENTAL
Y	YOUTH	YOUTH	YOUTH
Z	ZOOLOGICAL	ZOOLOGICAL	ZOOLOGICAL

U.S. DEPARTMENT OF COMMERCE
 NATIONAL BUREAU OF STANDARDS
 NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
 NATIONAL BUREAU OF METROLOGY
 NIST-100-100
 JANUARY 2004

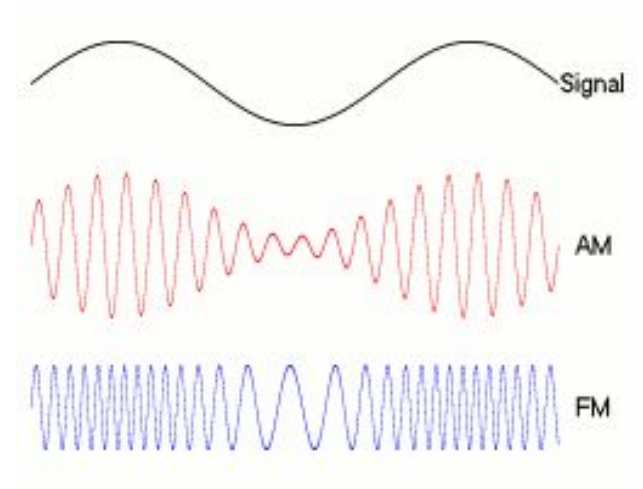


Closer Look at Radio Broadcast Spectrum

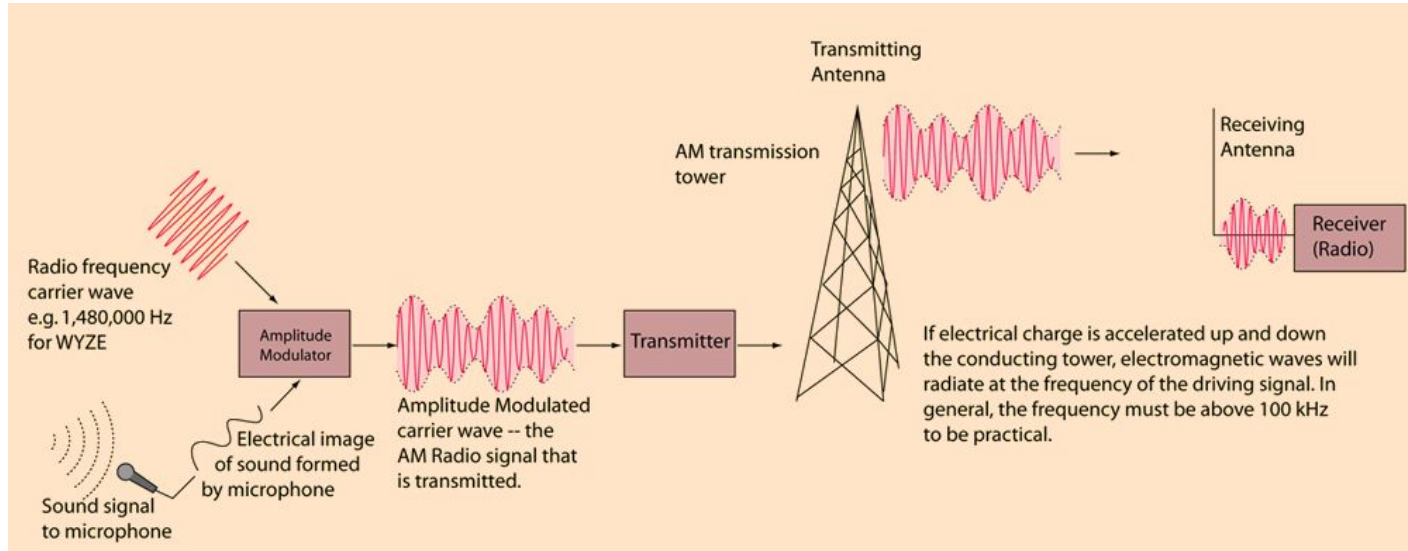


AM vs. FM Radio

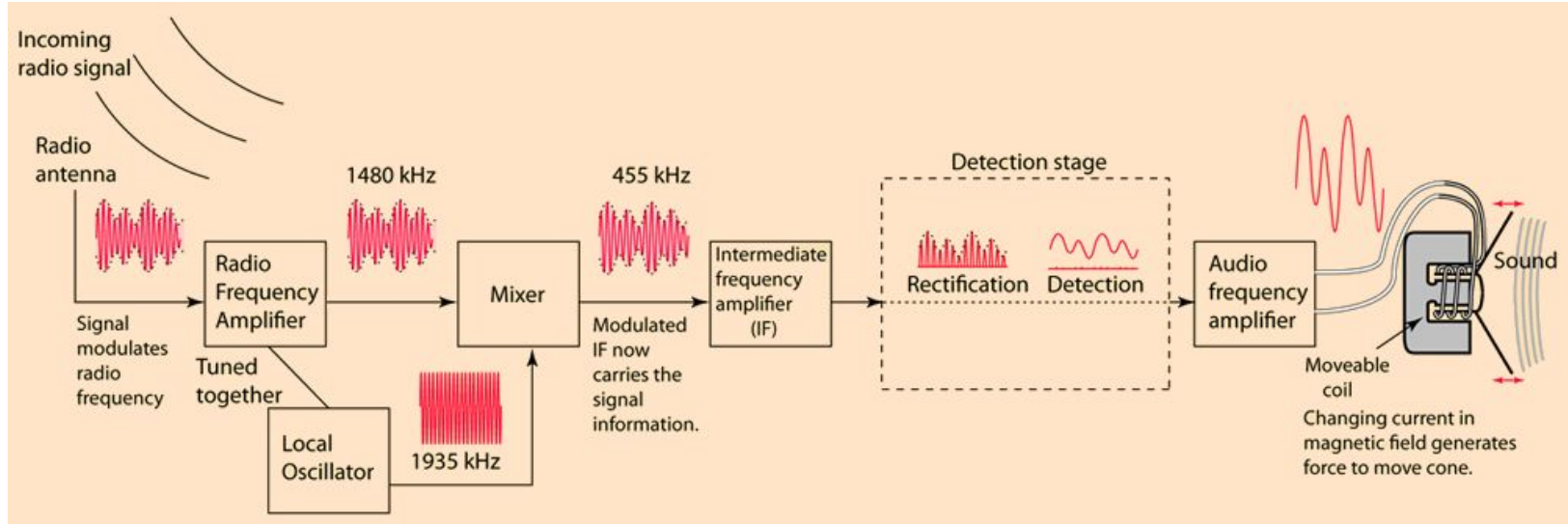
- AM: Amplitude Modulation
- FM: Frequency Modulation
- Other types of modulation exist, used in other applications



AM Radio Broadcast Example



AM Radio Receiving Example



Radio Technology History

1830 - Michael Faraday establishes principle of EM induction

1885 - Heinrich Hertz produces EM waves, confirms light speed travel

1893 - Nikola Tesla gives first public demonstration of radio in St. Louis

1900-1 - Guglielmo Marconi founds the Marconi Wireless Telegraph Company, Ltd. and transmits and receives signals across the Atlantic



More Radio Technology History

1906 - Reginald Fessenden sends the first long-distance transmission of human voice and music (MA -> VA)

1910 - Entertainment broadcasting begins, including radio pioneer Lee De Forest's program, based in the Met Opera House!

1918 - Edwin Armstrong invents the superheterodyne circuit

1920 - First commercial radio station -- an entertainment broadcasting venture called KDKA, based in Wilkinsburg, PA

1933 - Edwin Armstrong develops FM radio

Radio Broadcast History

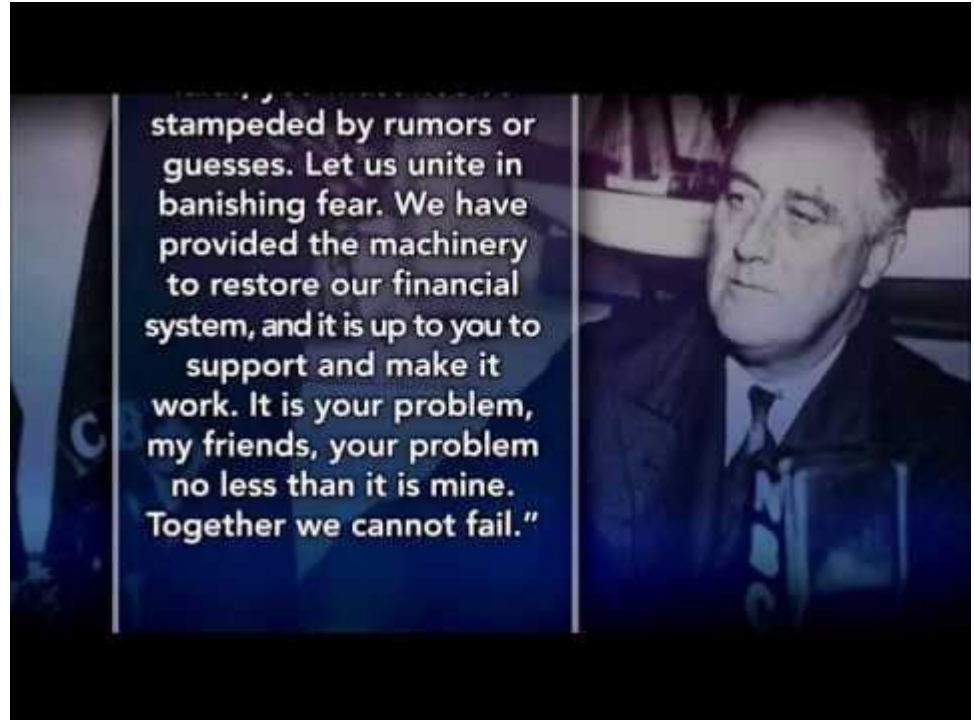
Great Depression



[w]hile movie houses closed, night clubs languished, and theatrical stock companies disappeared, radio boomed. [...] Thousands of families who had purchased much of their household equipment on credit gave up their vacuum cleaners, their cars, and their furniture, but kept up payments on their radios (Settel 68).

Fireside Chats

- Evening radio addresses given by FDR between 1933-1944
- Spoke with a familiar tone to millions of Americans about the Great Depression, New Deal, WWII...
- Quelled rumors, responded to newspaper criticism, explained policies directly to Americans





Nazi Germany

- Goebbels claimed that radio was the "eighth great power" in a 1933 speech
 - reference to Napoleon -- press as the "seventh great power"

Stadt-Land

Volks-empfangner VE 301

Volk und Regierung, Handel und Wandel, die Welt sind ganz verbunden. Dies ist die Aufgabe der Volksempfänger VE 301. Ein kleiner, großer, starker, billiger, gesunder, die Gesundheit fördert und glücklich macht. — Über die Grenzen der eigenen Heimat hinaus verbindet sie Radiohörer mit allen Völkern und Nationen. — Sie ist die erste, die den Weltfrieden fördert. — Sie ist die erste, die den Weltfrieden fördert. — Sie ist die erste, die den Weltfrieden fördert.

NORA RADIO GMBH
BERLIN · CHARLOTTENBURG 4

Das Volk der Reichsregierung, das Radio ist in der letzten deutschen Handhabung zu tragen, war die Funktion für die Schaffung des Volksempfängers VE 301. Somit ist der erste Radioapparat, der die Aufgabe des VE 301 in völlig gleichzeitiger Konstruktion und Ausführung. Seine Entwicklung ist das Ergebnis der Gemeinschaftsarbeit der deutschen Funkindustrie. Diese Gemeinschaft ermöglichte, dieses technische Vollwerkzeug mit größter Präzision zu entwickeln. —

Genau für elektrische und mechanische Zuverlässigkeit des Empfängers ist dadurch gesorgt, daß die Bauteile aus hochwertigem, kondensierendem, Spulen, Gehäuse usw., sowie auch die fertige Geräte von einer neutralen Sachverständigen-Kommission vorgeprüft und genehmigt werden müssen. — In dieser Kommission sind Fachleute, Ingenieur, Techniker und Facharbeiter tätig. Die Qualität des Empfängers wird durch die gleiche technische Kommission während der letzten Entwicklungsarbeiten ständig überwacht.

VE 301 W FÜR WECHSELSTROMEMPFAHNG

- wie VE 301 S
- Wechselstrom-Empfänger
- Empfänger
- Lautsprecher
- Magnetronen
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse

VE 301 B FÜR BATTERIEEMPFAHNG

- Wechselstrom-Empfänger
- Batterie-Empfänger
- Lautsprecher
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse

VE 301 G FÜR GLEICHSTROMEMPFAHNG

- wie VE 301 S
- Gleichstrom-Empfänger
- Empfänger
- Lautsprecher
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse
- Metallgehäuse

“We want a radio that reaches the people, a radio that works for the people, a radio that is an intermediary between the government and the nation, a radio that also reaches across our borders to give the world a picture of our character, our life, and our work,” Goebbels proclaimed.

Edward Murrow

Reported on the London
Blitz for American
audiences



Radio Free Europe + Radio Liberty

Founded in 1949/1953; merged in 1976

Anti-communist CIA front organization; moved towards funding from Congress in 1972

Widespread public support from Eisenhower's "Crusade for Freedom" campaign; contributions of ~\$1.6 million to expansion of RFE

Notable events: Chernobyl disaster, Czech Velvet Revolution, Glasnost, 1991 August Coup



Broadcast Regulation

Stuff

Radio Act of 1927 - Establishes Federal Radio Commission -- determine regulatory policy for broadcasting in the U.S.

Communications Act of 1934 - Establishes the FCC as the permanent body to determine regulatory policy of radio and TV in the U.S., subject to Congressional oversight. Fairness Doctrine

1987: Fairness Doctrine abolished

Commerce Clause; Title 47 of Code of Federal Regulations -- regulation of radio

Today

Abolishment of the Fairness Doctrine



Fireside Chats 2.0



Wires and Lights in a Box speech, RTDNA 1958

