THE INTERNATIONAL ENCYCLOPEDIA OF COMMUNICATION

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With several co-authors, Downing has studied the role(s) of radical media in different geographical, cultural, and political contexts that include radical radio and print media and the fall of the dictatorship in Portugal in the 1970s; the free radio movement in Italy from 1970 to 2000; the case of access television in the United States during the 1980s and 1990s; the case of samizdat in the former Soviet bloc; and the case of Free Radio Berkeley in the United States.

SEE ALSO: ▶ Activist Media ▶ Cartoons ▶ Civil Rights Movement and the Media ▶ Community Media ▶ Dance ▶ Graffiti ▶ Newspaper ▶ Poster ▶ Radio ▶ Social Movements and Communication ▶ Television ▶ Theatre ▶ Video

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Radio

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Radio is a media technology that permits one person or organization to communicate with many receivers over large distances via the electromagnetic spectrum and radiated electrons. Listening to radio is possible by modulating voice (→ Broadcast Talk) or music (→ Popular Music) onto a radio wave that transmits at a predetermined signal. A radio receiver is tuned to the modulated carrier wave broadcasting at that frequency and the radio circuitry amplifies the voice or music, after discarding the carrier frequency wave (→ Radio Technology; Information and Communication Technology, Development of).

Radio is a ubiquitous and inexpensive means of mass communication. Audiences need not be literate, making radio accessible to everyone with the most basic language skills, or in the case of music, no language at all (→ Exposure to Radio). Depending on the characteristics of the radio frequency, programs can be heard around the world (→ International Radio), but are typically limited to a small geographic area. The device that became known as the radio took its name from radio waves, the band of frequencies that made the technology possible. Before that, it was more commonly known as "the wireless" because it operated without a physical connection.

Radio was demonstrated by Guglielmo Marconi in 1895, in work based on the earlier theory of Heinrich Hertz and ideas by Nikola Tesla. Marconi's transmitter and receiver

used Morse code to communicate radiotelegraphy. The unmodulated carrier frequency was turned off and on, signaling a short or long (dot–dash) signal that could be interpreted by a trained receiver, making radio an effective means of point-to-point communication, especially from ship to shore.

Radio transformed into the first medium of live mass (point-to-many) communication when Reginald Fessenden and Lee de Forest demonstrated voice and music broadcasts in 1906 and 1907. David Sarnoff of the American Marconi Company first proposed a commercial enterprise in his "radio box" memo of 1916, although Charles Herrold had earlier begun regularly scheduled broadcasts in San Jose, California. The United States began licensing frequencies in 1920, when the necessary radio patents had been pooled by the Radio Corporation of America (RCA). By 1922, radio was a national craze in the US, with more broadcasters than available frequencies (→ Attending to the Mass Media). The Federal Radio Commission (FRC, later the FCC) was the government agency in the US that brought some order to the chaos by 1927 (→ Radio Broadcasting, Regulation of). The radio medium became advertiser-supported when one of the original RCA partners and patent-holders, AT&T, successfully experimented with "toll broadcasting" on its New York station WEAF in 1922 (→ Radio Networks).

Until the popularity of television grew after World War II, radio was the most widely used mass medium, from the 1920s through the late 1940s. Many of the program → genres that exist on television today (e.g., game shows, sitcoms, serialized dramas) were first conceived for radio. After television, radio stations switched to specialized music formats to attract a new audience that often stays loyal because of the unique content or the compelling on-air personality of the announcer (→ Audience Segmentation). In the US, public radio is a designated band of frequencies for noncommercial content.

Radio operates in different ways. AM (amplitude modulation) radio modulates the desired content onto the carrier wave using the vertical strength of the frequency. To combat audio interference from other sources of electromagnetic frequencies (e.g., thunderstorms), Edwin Armstrong developed FM (frequency modulation) radio, which modulated the frequency itself horizontally. Satellite radio (XM and Sirius) are federally licensed digital audio radio service (DARS) frequencies in the US that transmit signals from a high-power geostationary satellite to subscription-only receivers. Finally, HD radio is a method for allowing terrestrial (AM and FM) radio broadcasters to modulate digital (CD-quality) signals onto the same carrier wave used for analog signals, allowing radio content to be received by old and new radios alike on the same band and frequency. Signal compression will eventually allow more content per individual frequencies (called a channel).

Radio stations are *licensed* by individual countries, and radio frequencies are controlled by international treaties and agencies. In the United States, nearly 14,000 radio stations broadcast to over 300 million potential listeners. Radio audiences age 12 and above are measured by Arbitron to assist in the determination of advertising rates. The Radio Advertising Bureau and the National Association of Broadcasters are two important trade organizations. Ownership of radio stations was deregulated in the US by the Telecommunications Act of 1996, which allows a single company to own a limitless number of commercial stations as long as no market area designated by Arbitron has more than eight stations per owner. Clear Channel owns over 1,400 stations, making it the largest owner (→ Ownership in the Media).

Media effects research grew out of early studies of radio in → Paul Lazarsfeld's Office of Radio Research, with seminal studies of, for example, voting behavior as influenced by radio (→ Media Effects, History of). On the other hand, some researchers studied radio from a → uses-and-gratifications perspective. Among these, Herta Herzog examined why people listened to daytime dramas (i.e., soap operas). Hadley Cantril studied, for example, the panic that followed the 1938 Halloween broadcast (by Orson Welles and the Mercury Theatre) of H. G. Wells's epic *War of the Worlds*. Interviews with listeners were used to explain why one million of the six million listeners believed the fictional broadcast to be real.

After the introduction of television, many mass communication researchers and theorists turned their attention to the world of video, which exerts a potentially more powerful influence and consumes many more hours per day of public attention. Still, radio functions as the ultimate portable medium and continues to reach nearly everyone, especially in commuting automobiles. In publications such as the *Journal of Radio Studies*, some studies now focus on how broadcast radio competes with satellite radio and other forms of portable audio media.

SEE ALSO: ▶ Attending to the Mass Media ▶ Audience Research ▶ Audience Segmentation ▶ Broadcast Talk ▶ Exposure to Radio ▶ Genre ▶ Information and Communication Technology, Development of ▶ International Radio ▶ Lazarsfeld, Paul F. ▶ Media Effects, History of ▶ Ownership in the Media ▶ Popular Music ▶ Radio Broadcasting, Regulation of ▶ Radio for Development ▶ Radio Networks ▶ Radio Technology ▶ Uses and Gratifications

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Radio Broadcasting, Regulation of

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The radio spectrum is viewed as a natural and scarce resource available to all nations. Even though the rules establishing the allocation of bandwidth and assignment of frequencies vary, common principles apply to all countries. The *legal rationale for controls* over licensing is generally based on four principles: (1) recognition of spectrum as a valuable resource; (2) conservation of bandwidth due to spectrum scarcity; (3) prevention of technical interference between channels; and (4) radio broadcasting's potential to