

PUBLIC ADDRESS SYSTEM – BASICS

A **public address system (PA system)** is an electronic system comprising microphones, amplifiers, loudspeakers, and related equipment. It increases the apparent volume (loudness) of a human voice, musical instrument, or other acoustic sound source or recorded sound or music. PA systems are used in any public venue that requires that an announcer, performer, etc. be sufficiently audible at a distance or over a large area. A PA system may include multiple microphones or other sound sources, a mixing console to combine and modify multiple sources, and multiple amplifiers and loudspeakers for louder volume or wider distribution.

Simple PA systems are often used in small venues such as school auditoriums, churches, and small bars. PA systems with many speakers are widely used to make announcements in public, institutional and commercial buildings and locations—such as schools, stadiums, and passenger vessels and aircraft. Intercom systems, installed in many buildings, have both speakers throughout a building, and microphones in many rooms so occupants can respond to announcements. PA and Intercom systems are commonly used as part of an emergency communication system.

The term *sound reinforcement system* generally means a PA system used specifically for live music or other performances. In Britain any PA system is sometimes colloquially referred to as a Tannoy, after the company of that name, now owned by TC Electronic Group, which supplied many of the PA systems used previously in Britain.

Loudspeaker

Peter Jensen and Edwin Pridham of Magnavox began experimenting with sound reproduction in the 1910s. Working from a laboratory in Napa, California, they filed the first patent for a moving coil loudspeaker in 1911. Four years later, in 1915, they built a dynamic loudspeaker with a 1-inch (2.5 cm) voice coil, a 3-inch (7.6 cm) corrugated diaphragm and a horn measuring 34 inches (86 cm) with a 22-inch (56 cm) aperture. The electromagnet created a flux field of approximately 11,000 Gauss.

Marconi

By the early 1920s, Marconi had established a department dedicated to public address and began producing loudspeakers and amplifiers to match a growing demand. In 1925, George V used such a system at the British Empire Exhibition,

addressing 90,000 via six long-range loudspeakers.^[9] This public use of loudspeakers brought attention to the possibilities of such technology. The 1925 Royal Air Force Pageant at Hendon Aerodrome used a Marconi system to allow the announcer to address the crowds, as well as amplify the band.^[9] In 1929, the Schneider Trophy race at Calshot Spit used a public address system that had 200 horns, weighing a total of 20 tons.

Late 1920s-1930s

Engineers invented the first loud, powerful amplifier and speaker systems for public address systems and movie theaters. These large PA systems and movie theatre sound systems were very large and very expensive, and so they could not be used by most touring musicians. After 1927, smaller, portable AC mains-powered PA systems that could be plugged into a regular wall socket "quickly became popular with musicians"; indeed, "...Leon McAuliffe (with Bob Wills) still used a carbon mic and a portable PA as late as 1935." During the late 1920s to mid-1930s, small portable PA systems and guitar combo amplifiers were fairly similar. These early amps had a "single volume control and one or two input jacks, field coil speakers" and thin wooden cabinets; remarkably, these early amps did not have tone controls or even an on-off switch. Portable PA systems you could plug into wall sockets appeared in the early 1930s when the introduction of electrolytic capacitors and rectifier tubes enabled economical built-in power supplies that could plug into wall outlets. Previously, amplifiers required heavy multiple battery packs.

PA over IP refers to PA paging and intercom systems that use an Internet Protocol (IP) network, instead of a central amplifier, to distribute the audio signal to paging locations across a building or campus, or anywhere else in the reach of the IP network, including the Internet. Network-attached amplifiers and intercom units are used to provide the communication function. At the transmission end, a computer application transmits a digital audio stream via the local area network, using audio from the computer's sound card inputs or from stored audio recordings. At the receiving end, either specialized intercom modules (sometimes known as IP speakers) receive these network transmissions and reproduce the analog audio signal. These are small, specialized network appliances addressable by an IP address, just like any other computer on the network.