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History of Microphones and Their Usage in Theatrical Productions

Theatre is an evolutionary form of art. It has a romance for tradition, yet is not afraid to look forward to new horizons overcoming complex challenges in order to bring the best performance possible. In doing so, there has been a wide array of shifts to the theatre landscape since its genesis in Athens, Greece. One of its biggest developments has involved the aspect of sound. Specifically, the usage of microphones has created new avenues for both producers and performers to explore, growing from the low reach in constricted vocal capacity to amplification that strengthens the playwright's intention without compromising intimacy. Over the course of the 20th and 21st century, microphones have played a significant role in evolving the art of theatre in its audio accessibility and the development of new, creative ideas.

Author and Audio Engineering Society member Hugh Robjohns credits German physicist Johann Philipp Reiss as the inventor of the first microphone. "His design for a 'sound transmitter' [optimized around 1861], used a metallic strip resting on a membrane with a metal point contact completing an electrical circuit. It was Reis's theory that, as the membrane vibrated, the metal point bounced up and down 'producing intermittent contact and thus a varying current synchronous with the vibrations'"¹. This theory proved to be a crucial one, as attempts by Elisha

¹Robjohns, Hugh. "A Brief History of Microphones." Microphone-Data. 2001. Accessed November 15, 2016. <http://microphone-data.com/media/filestore/articles/History-10.pdf>.

Grey and Alexander Graham Bell proved that Reis' method had merit. Grey designed a "liquid transmitter" where the diaphragm was attached to a moveable conductive rod immersed in an acidic solution. Bell would develop a device similar to this, and David Edward Hughes took this concept a step further by using carbon granules loosely packed in an enclosed space. In response to varying pressure from a sound diaphragm, the electrical resistance through the carbon granules changed proportionally. Thomas Edison also developed a carbon granule microphone that was efficient and durable².

Further developments of condenser and RF microphones were taking place in the mid-1920s. Jesse Klapholz from Sound & Communications magazine notes that "in order to satisfy the high-quality microphone requirements of the rapidly growing radio broadcast and recording industries, Western Electric introduced the 394 condenser microphone. Subsequently, RCA came out with the 4AA condenser mic. With the introduction of condenser microphones, the problems of signal-to-noise ratio and frequency response associated with the carbon microphones, then in general use, were overcome"³. Another advancement during this time period was introduction of the Velocity Mic, credited to Harry F. Olson as the first high quality directional microphone. While microphones up to this point became paramount in the quality of production for broadcasting and recording, it wasn't until 1939 where Western Electric introduced the 639A unidirectional microphone and sound reinforcement became a focus of interest. Klapholz notes that "the 639A allowed for an ideal acoustical location of the mic and it

² Ibid.

³ Klapholz, Jesse. "Microphones: History and Development." Lloyd Microphone Classics. Accessed November 15, 2016. http://www.lloydmicrophoneclassics.com/mic_history.html.

was commented that the bass reproduction was much clearer than with other mics”⁴. Although electret microphones has its roots in wax plates in the 1920s, it wasn’t until the 1960’s where the diaphragm was composed of a metaled thin foil of Mylar or Teflon which was and was later commercialized by Sony in 1968. Throughout all of these developments of the microphone, the theatre landscape has grown alongside it, though it took some time for the industry to fully adapt.

The microphone method in theatrical productions can be considered complex from an outsider view, but it is explained well by Robert Trussell of The Kansas City Star. His article “Wireless Microphones are a Curse and a Blessing for Actors” takes a look how these devices are set up for modern productions. “The mic head, placed somewhere in the vicinity of the actor’s mouth, is attached by a thin wire to a transmitter pack hidden somewhere in the actor’s costume. The transmitter sends a signal to a central receiver, which then relays the sound to speakers in the theater”⁵. Although these microphones ensure a high quality sound and comfortability for the actors, it is still not the most popular method of projection. Ellen Gamerman of the Wall Street Journal states that “the theater community is divided over the growing manipulation of sound on stage,”⁶ presenting a conflict for those who prefer microphones on performers, and those who do not.

⁴ Klapholz, Jesse. "Microphones: History and Development." Lloyd Microphone Classics. Accessed November 15, 2016. http://www.lloydmicrophoneclassics.com/mic_history.html.

⁵ Trussell, Robert. "Wireless Microphones Are a Curse and a Blessing for Actors." The Kansas City Star. April 18, 2015. Accessed November 16, 2016. <http://www.kansascity.com/entertainment/performing-arts/article18681738.html>.

⁶ Gamerman, Ellen. "Broadway Turns Up the Volume." Wall Street Journal. October 23, 2009. Accessed November 16, 2016. <http://www.wsj.com/articles/SB10001424052748704597704574487153079350302>.

In 1966, theatrical producer Manny Azenberg allowed hidden mics to be used on stage for the production of “Brighton Beach”, but refused to put body mics on the actors, citing “you lose quality, you lose intimacy, you lose the reality of the theater.” Since the introduction of foot mics on stage in the 1950s, theatre admirers have been divisive whether or not microphones should be used in productions. Continuing with “Brighton Beach”, Gamerman states that “many people in the 1,223-seat Nederlander Theatre—likely to include elderly audiences—wouldn't be able to hear the play without amplification, so Fitz Patton, one of the sound designers, concealed nearly two dozen microphones around the set.”⁷ “Despite the fact that audiences could now hear the sounds emanating from the stage, the response to those changes became a subject of debate. “The synthetic sound a mic produces can end up as a disembodied, muffled effect” states Lawrence O’Toole of the New York Times. When these sounds are coupled with various effects and layers of instrumentation, it produces a noise that is “a piercing edge that's not quite human.”⁸ While microphones have become one of the most advanced tools in exhibiting the performance from an actor, its place in the realm of theater has been contested.

The issue stems not only from its amplified sound, but also its appearance. O’Toole cited renowned-actress Madeline Kahn about a then-recent production of “Show Boat”. According to Kahn, “you can see the wires on the actors' foreheads in this show.” Producer T. Richard Fitzgerald adds “When we did 'Show Boat' at the New York State Theater in 1966, there wasn't a

⁷ Ibid.

⁸ O’Toole, Lawrence. "THEATER; Musical Theater Is Discovering a New Voice." The New York Times. January 25, 1995. Accessed November 15, 2016. <http://www.nytimes.com/1995/01/22/theater/theater-musical-theater-is-discovering-a-new-voice.html?pagewanted=all>.

single mic used in the cast.”⁹ Other concerns include the natural phenomenon that comes from the actors mid-performance: moisture. “One of the biggest problems is sweat... it is so easy to sweat out your mic”. Journalists have noted that one of the best, albeit unorthodox solutions to not have the sweat affect the microphone performance is wrapping the mic pack with a condom.¹⁰ These unconventional methods to preserve the natural appearance of the microphone while ensuring its functionality raise the question of whether these transducers are truly worth the effort.

From its earliest days in classical Greek tragedies to the latest and most technologically advanced productions, the art of theater has evolved over many centuries in its audience accessibility and creative freedom. Microphones are but one aspect of this art form, and throughout the 20th and 21st century, there have been great strides in its development to enhance the performance experience. Although its role in theatre has been debated, there is no denying that microphones have had a significant impact on theatrical productions and will continue to evolve in innovative and exciting ways.

⁹ O’Toole, Lawrence. "THEATER; Musical Theater Is Discovering a New Voice." The New York Times. January 25, 1995. Accessed November 15, 2016. <http://www.nytimes.com/1995/01/22/theater/theater-musical-theater-is-discovering-a-new-voice.html?pagewanted=all>.

¹⁰ Trussell, Robert. "Wireless Microphones Are a Curse and a Blessing for Actors." The Kansas City Star. April 18, 2015. Accessed November 16, 2016. <http://www.kansascity.com/entertainment/performing-arts/article18681738.html>.

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