Articulatory KENematics: Revisiting the Stevens cineradiograph. Kevin G. Munhall¹, Mark Tiede²³, Joseph S. Perkell³, Andrew Doucette⁴, Eric Vatikiotis-Bateson⁵. ¹Queen's University, Kingston, Ontario, Canada, ²Haskins Laboratories, New Haven, CT, ³MIT, Cambridge, MA, ⁴Industrial Light & Magic, CA, USA, ⁵University of British Columbia, Canada.

The ability to visualize the vocal tract in motion is one of the significant advances in speech production research of the past 50 years. The use of X-ray techniques to film talkers produced remarkable images of the articulators during speech that to this day provide the best overall view of the speech production mechanism in action. At the Stockholm Wenner-Gren Research Laboratory in 1962, a high speed X-ray film was recorded that played a special role in this history. The subject of this film was Ken Stevens and its analysis and subsequent distribution have made it one of the most important recording sessions in the history of speech production research. In this paper, we will reprise this film and some of the research that it has inspired. We will revisit some of the key kinematic analyses of the image sequences (e.g., Perkell, 1969) and present a replication of the original corpus with the same subject using EMMA carried out more than 30 years after the original experiment. Comparison of data from the two sessions supports the robustness of the patterns of speech coordination as well as the robustness of the subject. The recent preservation and distribution of the images in the film has allowed its continued use by researchers. Digital processing of the film's images has replaced early manual tracing and the film's images have found new and sometimes surprising applications.