

66th International Astronautical Congress 2015

49th IAA HISTORY OF ASTRONAUTICS SYMPOSIUM (E4)  
Scientific & technical histories (2)

Author: Dr. Michael Neufeld  
Smithsonian Institution, United States, neufeldm@si.edu

Dr. John Charles  
NASA Human Research Program, United States, john.b.charles@nasa.gov

THE INVENTION AND DIFFUSION OF NEUTRAL BUOYANCY TRAINING

**Abstract**

Training for EVA underwater is now normal technology; centers have been built in all of the major spacefaring countries and regions. But space historians have given very little attention to how this small technological system, as we term it, came into existence and spread internationally. Neutral buoyancy training was simultaneously invented in several places in the United States in 1963-1965, both within NASA and in large aerospace corporations. But the corporate activity did not survive beyond the end of the 1960s, whereas two training centers arose at the space agency in Houston and Huntsville. The Houston tank arose out of NASA Langley's funding of a small Maryland company, ERA, which trained Buzz Aldrin for the last Gemini mission after earlier inventing the basic techniques. The Huntsville tank came from homegrown underwater experiments for what eventually became Skylab. By 1969, facilities were in operation at both centers. NASA thus was the effective inventor, in two parallel cases, of neutral buoyancy training.

The technique spread internationally after 1980, when the Soviets completed their Hydrolab at Star City in Russia. The paper will conclude by briefly describing the process of diffusion to the Soviet Union/Russia, Europe, Japan and China.