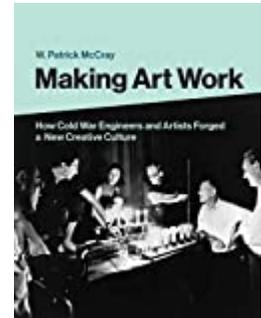




W. Patrick McCray. *Making Art Work: How Cold War Engineers and Artists Forged a New Creative Culture.* Cambridge: MIT Press, 2020. 344 pp. \$45.00, cloth, ISBN 978-0-262-04425-7.



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In the introduction to *Making Art Work*, W. Patrick McCray succinctly summarizes the thread that binds the book: “art can be technology and vice versa, complicating categorisations and boundaries” (p. 17). *Making Art Work* is an engaging, complex, and multilayered history of the art-and-technology movement in what scholars have termed the “long 1960s.” The book is, however, not a simple account of the myriad ways artists and engineers collaborated and the art objects they created. It is interested instead in the collaborative processes that brought such art objects into existence and the complex interactions between research, business, and culture that redefined creative practices, means of knowledge production, and professional communities. In doing so, *Making Art Work*, just like the subjects and actors it examines, complicates several categorizations and boundaries.

Through unconventionally titled chapters, McCray invites the reader to examine how artists and engineers began to force cracks and holes in the seemingly solid boundaries between art and tech-

nology. *Making Art Work* presents these complex stories by focusing on the creation of institutions that enabled and structured collaborations between engineers and artists, especially the art collective Experiments in Art and Technology (EAT), the Center for Advanced Visual Studies and Media Lab at the Massachusetts Institute of Technology (MIT), the Art and Technology Program at the Los Angeles County Museum of Art (LACMA), and Frank Malina’s journal *Leonardo*. These organizations are central to McCray’s book mainly because, as he explains, engineers “are less inclined to record their recollections and activities on paper” (p. 15). Thus, McCray recovers engineers’ stories, perspectives, and experiences from the archives and publications of these institutions. But while these archival and published records drive *Making Art Work*’s narrative, McCray’s chief protagonists are two figures central to the art-and-technology movement: Frank Malina and Billy Klüver.

Chapter 1, “Preamplifier” (a device that boosts a weaker signal to be strong enough for further

processing), recounts the engineering and artistic aspects of Malina's career. Malina started out in the 1930s as an aeronautical engineer and co-founded and directed Caltech's Jet Propulsion Laboratory (which later became a part of the National Aeronautics and Space Administration, NASA). He moved to Paris in 1947, where he first worked as an administrator at UNESCO, and then became a professional kinetic artist. In 1968, Malina founded the art journal *Leonardo* in an attempt to encourage artists to share their methods and aesthetics. Chapter 3, "Heterodyne (a signal frequency created by combining or mixing two other frequencies), follows the story of Klüver, who, as an electrical engineer at Bell Labs in the early 1960s, helped artists like Andy Warhol and Jasper Johns incorporate technologies, including neon lights and radio, into their works. He later went on to manage institutions like EAT and such projects as the Pepsi Pavilion.

Chapter 2, "Fluxes" (a measure of electric or magnetic fields through a given surface; also denotes change), is perhaps the most important in the book, for it is here that contemporary discussions and debates on the now battered and tired "two cultures" argument set forth by C. P. Snow in 1959 are fully addressed. Both artists and engineers, McCray shows, defined, challenged, and in many cases negotiated the real and imagined divides between their communities and practices. Although artists and engineers saw themselves as members of two distinct cultures, they were less interested in simply collaborating to create things than they were in the processes that allowed them to collaborate and introduce new interdisciplinary creative communities.

Chapters 4 through 7 form the crux of the book. Chapter 4, "Powering Up," details the early attempts by engineers like Klüver to collaborate with artists and also gather sponsors to fund these projects. Chapter 5, "Transducer" (a device that converts variations in a physical quantity, such as pressure or brightness, into electrical signals or

vice versa), explores how the growing community of artists and engineers kept their experiments going, especially through awards from philanthropic foundations and collaborations that sought "imaginative and innovative" solutions to contemporary social problems (p. 151). Chapter 6, "Surges," explores how the art and technology movement found new audiences through a surge of activity in publishing, institution building, and exhibitions. Chapter 7, "Parallel Processing," studies the collaborations between EAT and LACMA, two projects that were founded, managed, and funded as separate entities but that happened to exist at the same time "like a computer executing a series of related calculations at the same time" (p. 187). The existence of both these institutions, McCray shows, resulted in several exchanges of ideas. While each chapter tells its own story, they collectively trace the reasons why engineers and artists wanted to collaborate in the first place. The reasons, McCray tells us, were complex, varied, and, in several cases, rather personal. For several artists, such collaborations were a means to fulfill their desires to work with new and often inaccessible technologies, thereby opening new creative possibilities for them to make their art more relevant and commodifiable in a rapidly changing artistic culture. For engineers, pursuing collaborations with artists was a response to growing concerns about their profession. Facing criticisms for their involvement in the post-Second World War nuclear arms race, technologists and engineers funded by industrial firms promoted the idea that artists could reveal and sometimes change the character of technologies themselves, helping make modern technologies more familiar to the general public in the process.

While Malina, Klüver, and others involved in the art-and-technology movement saw their processes and art as a force for greater good inviting the public to engage with technologies, contemporary critics saw the initiative as a celebration of capitalism and war, especially with the growing involvement of the defense industry. The lack of wo-

men and people of color within the movement and within both the art and engineering communities was also a point of criticism. Through the 1970s, with the economy dwindling and companies involved in the movement laying off large percentages of their workforce, the movement was in a state of rapid decline (chapter 8, “Overload,” and chapter 9, “Amplitudes”).

However, while the story seems to end on a somewhat tragic note, McCray explains that the art-and-technology movement has survived in varied forms through the years. Initiatives with acronyms like STEAM (Science, Technology, Engineering, Art, and Mathematics) have become popular in the last decade as scientists and educators have sought to interest more students into pursuing careers in science. This has, in many ways, been achieved by incorporating the arts in science, especially with a growing number of arts and technology programs in major universities around the world. While the critics in the 1970s may have branded the art-and-technology movement as a failure, McCray says that collaborations between artists and engineers through the “long 1960s” laid the groundwork for present-day programs and initiatives.

Making Art Work is much more than art history or history of technology. Through archival research and working with oral history transcripts from varied public and private collections, McCray gives voice to several individuals with whom we are less familiar within histories of both art and technologies. In doing so, McCray makes an important move toward incurring our understanding of the changes in both the arts and science and technology in the long 1960s, but with a view toward the present. McCray’s analytical and methodological approach is, nevertheless, also significant for historians of science, technology, and the arts whose expertise lies in periods well before the 1960s. Art—mostly in the form of poetry and theater—provided technicians and scientists through the nineteenth and early twentieth centuries aven-

ues to publicly demonstrate and debate contemporary scientific and technological conceptions and ideas. Scientific and technological ideas, on the other hand, provided new material for artists to comment on the political and social events of their time. While historians have begun challenging the “two cultures” opposition between the arts and the sciences in the nineteenth century, highlighting the multifarious ways art and artists have been connected with technologies and technologists, much still remains to be explored in this context. *Making Art Work*, thus, will interest historians of art and of technology, as well as a general audience curious about interdisciplinary experiments.

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