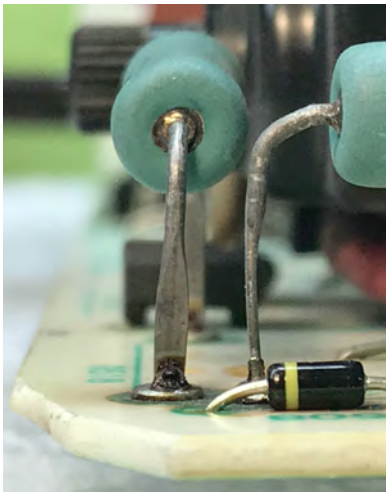
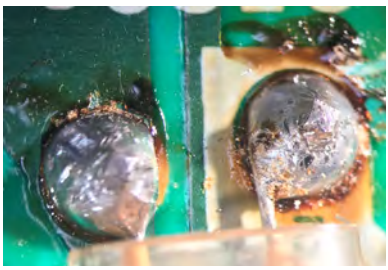
Art Conservation *and aging technologies*

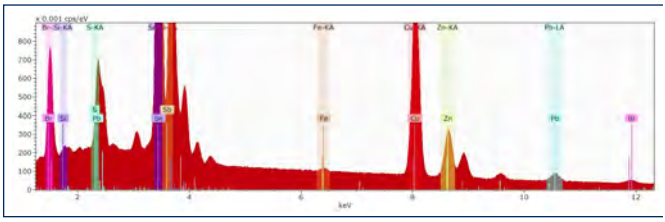
When Winterthur/University of Delaware Program in Art Conservation (WUDPAC) second-year Fellow Nicholas Kaplan wanted to use his technical study to learn more about the conservation of time-based media (TBM) by studying the component parts of a cathode ray tube (CRT) monitor, his first step was to acquire a 1985 Quasar™ CRT monitor from EBay. It was an important purchase, since TBM is a still developing focus in art conservation, and such an acquisition had yet to be included in the WUDPAC study collection.



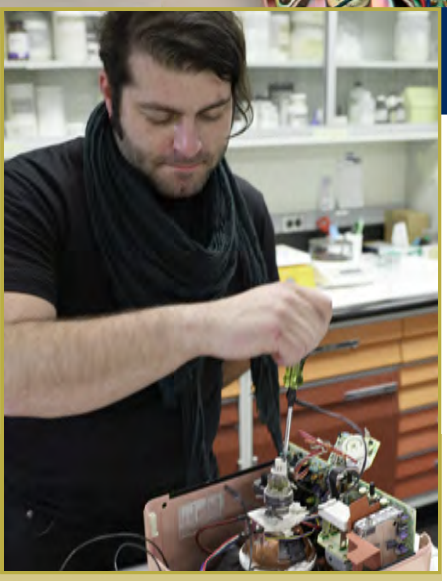


Time-based media artworks encompass a variety of media including video, film, audio, and computer-based technologies. The name refers to the fact that the artworks feature a durational component; such works exist experientially and unfold over a period of time. While the technological components are often essential to this art, they also contribute to its instability, as the technology can become obsolete within just a few years. One way museums collecting TBM art attempt to prepare for this inevitable obsolescence is by stockpiling at-risk equipment like CRT monitors.

Nick studied how environmental factors, manufacturing processes, and the operation of the CRT monitor can contribute to the degradation of its materials, and he identified a number of interactions that could result in the deterioration and potential failure of electrical components on the monitor's circuit boards. He found, for example, that migration of brominated flame-retardants, an additive within the monitor's plastic chassis, had likely contributed to the corrosion of internal metallic components. He observed that the heat generated by the monitor's operation was within the range known to accelerate such migration, and that resulting residues also exacerbated the impact of environmental pollutants.



Nick also found a brown, brittle, solid present on the circuit boards, which he identified as abietic acid, a principle constituent of pine rosin. Nick believes that this is explained by the use of pine-rosin flux, which would have been applied to electrical connections prior to soldering. At relatively low temperatures, pine-rosin melts into a viscous liquid. Nick found black accretions in the solidified flux that were identified as carbonized dust, which likely collected in the liquid rosin, burned, and now threaten to cause electrical shorts in nearby components. With the completion of his study, Nick hopes the issues he has identified will inform preventive strategies and help those conservators who must monitor and manage the changes TBM artworks undergo through every step of their lifecycle.



ARTC Spotlight—August 2018

The University of Delaware's Art Conservation Department educates and trains professional conservators who are well versed in the treatment, analysis, documentation, and preventive conservation of individual artifacts and entire collections. For more news about our students and other department activities visit our web site at www.artcons.udel.edu.

Top: Disassembled 1985 Quasar™ CRT Monitor prior to the examination of its printed circuit boards and internal components. Above: WUDPAC Fellow Nick Kaplan discharging the high voltage of the CRT in preparation for disassembly and examination. Right, top down: Detail of black accretions found on at the solders connections connections of the monitor's high voltage board and detail of flux residue found at soldered connections (10x magnification), and SEM-EDS X-ray spectra indicating the presence of elements at the soldered through hole. (Photos: Nick Kaplan, Haddon Dine, Dr. Judy Rudolph.)