



Ralph Baer: Recovering the History of the Video Game

Ralph Baer is considered by many to be the "father of video games." In 1966, he transformed people's relationship to home television by inventing a way for them to interact with their sets, playing games like Ping-Pong, tennis, checkers, and more. His work led directly to the game Odyssey in 1972, the first home video game for the consumer market, and launched a million-dollar industry--though no one predicted that at the time. That same year, a young Nolan Bushnell played Odyssey at a trade show. Bushnell went on to found Atari and create the arcade version of Baer's Ping-Pong game, the now infamous Pong. Baer's groundbreaking work has shaped the leisure-time activities of a large segment of the world's population and spawned numerous businesses. But the historical record of his achievements very nearly disappeared. He recently told us the story of how his original documents and apparatus were lost ... and then found. They are now preserved in the Smithsonian's National Museum of American History.

In the late 1990s I became aware that there is a growing community of classic video-game enthusiasts in the U.S. and elsewhere and that collecting hardware (game consoles, accessories, etc.) is an ongoing, growing hobby. So I became very concerned about the fate of all of the TV game hardware, as well as its supporting documentation, that we had built at Sanders Associates in Nashua, N.H., from 1966 through 1969. Hence, I began to inquire into the whereabouts and recoverability of the developmental games and the many supporting documents which Bill Harrison, Bill Rusch, and I generated during that period.

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Notes From the Director

Robots are all the rage these days, already here or soon to come into our homes, our workplaces, our cities, and, of course, the military. *Science in American Life: Robots on the Road*, one of our newest exhibitions in the recently reopened National Museum of American History, looks at the role of military funding in designing robot cars of the future. The exhibit stars "Stanley," the driverless vehicle that won the 2005 Grand Challenge sponsored by DARPA, the Defense Advanced Research Projects Agency. Using artificial intelligence programs developed by the Stanford Racing Team, the modified VW Touareg won the coveted \$2-million prize. In bringing Stanley to the Museum, curator Carlene Stephens is helping us keep pace with invention in our digital age.

You might think that acquiring such artifacts is comparatively easy and that the toughest problems in preserving the history of invention are associated with older devices. While it is true that artifacts associated with a Benjamin Franklin or an Alexander Graham Bell have become rare and precious commodities, recent inventions, especially those at the leading edge, pose unique challenges to museum preservationists. I love the story about unearthing relics of Harvard's pioneering Mark III computer in a gully on a Virginia family farm. Told to me many years ago by computer historian J. A. N. Lee, it was later reported in the *Los Angeles Times* (August 7, 2000):

On a muggy autumn morning in 1985, computer scientist John Lee and a small band of researchers gathered on a farm in Virginia and began grubbing through a heap of rusted refrigerators, stoves and ancient radios tossed there decades ago by a scrap dealer.

Buried somewhere in this pile of junk lay pieces of the only Harvard Mark III computer ever built--a house-sized machine festooned with flashing lights and whirring tape reels that *Time* magazine put on its cover in 1950 as a 'thinking machine' that could have 'more effect on mankind than atomic energy.'

Lee and his comrades uncovered their first piece in moments--an aluminum arm with a dime-sized slug of steel that was used to read a Mark III memory device.

'All of us were mentally jumping for joy,' Lee said, recalling the excitement of their discovery.

Their joy, however, was short-lived. After a year in which they gathered a few boxes of Mark III pieces, the farm was sold and a house was built on top of the junk pile.

'Gone ... all gone,' said Lee from his office at Virginia Polytechnic Institute and State University as he gazed at the aluminum arm he had dug up years ago. 'Those people have no idea what is under their patio.' (Read the full article on the [Los Angeles Times](#) website.)

Had it a happier ending, I would have loved this story even more. The problem is that, in a cutting-edge area, invention labs routinely discard or cannibalize early prototypes to make way for the next improved version, often resulting in irretrievable losses to history. It is the lucky curator who jumps into the invention stream at exactly the right moment to grab an important artifact in passage. Fortunately, there are happier endings recounted in this issue of *Prototype*. For instance, in our feature story, video-game inventor Ralph Baer relates how he rescued his original video-game documentation that is now preserved in the Museum's Archives Center.

Documenting invention in the digital age poses a further challenge, clearly illustrated by the aforementioned Stanley. The Lemelson Center's MIND program works with the Museum's Archives Center to locate and collect inventors' historical materials. With Stanley, the accompanying technical and design records are not on paper but almost exclusively in the form of digital files, which are increasingly the norm with modern-day inventions. At the Lemelson Center, we are working hard to keep up with these changing documentary practices, which pose unique

problems of access and preservation.

Until next month,
Art Molella

Jerome and Dorothy Lemelson Director



Have You Seen?

Everybody can envision the "Eureka!" moment of invention, where the idea suddenly strikes and--BOOM--there's a new product ready to change the world. Spark!Lab, the newest hands-on space for families and others visiting the National Museum of American History, shows the *real* story behind an inventor's work.

Invention is a process, from creative ideas all the way to successful marketing, and the Lemelson Center's Spark!Lab uses fun activities to help kids and families learn about the history and process of invention. You can play games, conduct science experiments, explore inventors' notebooks, and even invent!

When children enter Spark!Lab, they receive an Inventor's Notebook that includes worksheets to complete as they participate in different activities throughout the lab. Much like inventors document their work as they go along, children can document their time and experience in Spark!Lab. The Notebook also includes simple at-home invention activities. [Download the Inventor's Notebook](#) and [check out the Spark!Lab website](#) for more activities!



Trivia Challenge

In each edition of *Prototype*, we offer a question about an invention or inventor that you and your friends and family can try to answer. Sometimes the answer can be found on the Lemelson Center's website, where you can also learn a little more about the subject. Email your answer to us at prototype@si.edu along with your name and mailing address. Each month we'll select winners randomly to receive a small prize from the Center.

Congratulations to Sherry S. of Fargo, North Dakota, and Joshua L. of Shakopee, Minnesota, who (among others) knew that Spencer Silver invented the adhesive and Art Fry invented the application of the semi-sticky glue to what became Post-it notes. Fry has said that the idea of using Silver's adhesive came to him in church, while he was daydreaming during the sermon about his fluttering hymnal scrap paper bookmarks. You can learn more about Art Fry on our [Invention at Play website](#) and [listen to a podcast](#) with him, too.

Sherry and Joshua will each receive a year's subscription to *Smithsonian* magazine. And thank you to everyone who entered.

This month's question: Nick Holonyak Jr.'s (pictured above) invention made people see red. What did he invent?



From the Archives

Ralph Baer's story highlights the Lemelson Center's efforts to document the rich history of invention through its Modern Inventors Documentation (MIND) Program. The MIND Program acts as a clearinghouse for inventors seeking to preserve and donate their historical materials; identifies and preserves the papers and other historical materials of living inventors; promotes access to and use of this documentary record by scholars, students, and the public; and identifies inventors whose papers and artifacts have particular significance to the research and educational goals of the National Museum of American History.

An important activity of the program is the MIND database that identifies the invention-related holdings of hundreds of archives across the United States and is the nation's first database devoted exclusively to such documents. This database is an ongoing project to gather and provide information about invention and technology collections in archives, libraries, historical societies, and museums. The database will assist scholars, inventors, teachers, and students. Additionally, it is enabling the Lemelson Center to identify gaps in the invention record, for example, the scarcity of papers of women and minority inventors.

The collections in the database cover a variety of subjects, with many from medical, consumer, scientific, household, and legal fields. With more than 2,000 records, it is continuing to grow daily as more archives, museums, libraries, and historical societies report the contents of their invention-related collections to the Smithsonian for inclusion. Users simply submit a keyword to search and if the invention is in the database it will note: what materials exist about the invention; which museum, archive, or library holds the collection; and how to contact them for more details. Where possible, there is also information on how to access the collection and a direct web link to the collection or its holder. Advanced search options allow the user to search by repository, inventor name, or collection title. Users can also search for inventions from a list of over sixty subjects.

Repositories or individuals with relevant collections are invited to contribute data about their holdings. We seek information about inventors (corporate, government, and independent), scientists, and industries in all areas associated with invention. We also seek information on the records of institutions such as academic departments and research laboratories. The database contains information from all time periods. If papers are held privately, but available for research, we welcome this information. Additionally, we would like to know if papers of significant inventors have been destroyed. Project staff members are now investigating Canadian holdings that are appropriate for inclusion in the database; additions from other countries are welcome as well. Translations into English are encouraged.

For further information on the expansion of the MIND database or to contribute information, visit <http://invention.smithsonian.org/MIND> or contact Alison Oswald

at oswalda@si.edu.

--Alison Oswald, archivist



Inventive Ideas for Schools and Families

A speaker is a device found in radios, telephones, and other electronic devices that converts electrical energy into sound energy. Most speakers utilize two magnets: an electromagnet and a permanent magnet. The electrical signals from the radio drive the electromagnet to create a fluctuating magnetic field.

This magnetic field pushes and pulls on the permanent magnet causing vibrations that create sound waves.

With the help of a parent or teacher, you can make your own speaker with these simple supplies:

- 4-6 yards of magnet wire (available at hobby shops or Radio Shack)
- an empty film canister
- one round magnet (a neodymium magnet works best)
- masking tape
- small piece of sandpaper
- scissors
- low-power portable radio

Create It

1. Carefully wind the magnet wire around the base of the canister.
2. Tape the coil of wire in place.
3. Using sandpaper, remove one inch of enamel insulation from both ends of the wire to expose copper metal.
4. Tape or glue the permanent magnet into the bottom of the canister.
5. Attach the two leads to the speaker connectors of a suitable low-power radio. The speaker connectors are usually located on the back of the radio.
6. Tune the radio to your favorite station and set the volume to mid-range.

Try It

Turn your radio on. Listen closely, you should hear sound coming from your speaker.

What to know more? [Download the entire experiment](#) to explore the world of sound further!

--Steven Madewell, interpretive exhibits coordinator, Spark!Lab



Our Podcast--Prototype Online: Inventive Voices

If the Wii, PlayStation, and Xbox traced their ancestry, the



family tree would lead to Ralph Baer. In the late 1960s, Ralph Baer designed some of the first home video games, pioneering systems that enabled video games to be played on your television. Nearly two decades later, in the early 1980s, Baer invented Simon, another popular electronic game. In our podcast interview, Baer talks about his long career as an inventor.

[Tune in!](#)

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Contact us at prototype@si.edu

General Smithsonian Visitor Information: 202-633-1000

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