



Smithsonian

*National Museum of American History Kenneth E. Behring Center*

## Guide to Massie/McLurkin Innovative Lives Presentation and Interviews

NMAH.AC.0603

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## Table of Contents

Collection Overview .....	
Administrative Information .....	1
Biographical / Historical .....	2
Scope and Contents .....	2
Arrangement .....	2
Names and Subjects .....	
Container Listing .....	
Series 1: Original Videos, 1995-10-27 .....	4
Series 2: Master Videos, 1995-10-27 .....	5
Series 3: Reference Videos, 1995-10-27 .....	9
Series 4: Photographs, 1995-10-27 .....	10

## Collection Overview

<b>Repository:</b>	Archives Center, National Museum of American History
<b>Title:</b>	Massie/McLurkin Innovative Lives Presentation and Interviews
<b>Date:</b>	1995; 1997.
<b>Identifier:</b>	NMAH.AC.0603
<b>Creator:</b>	Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation. (Creator) Massie, Thomas (Inventor) McLurkin, James (Inventor)
<b>Extent:</b>	1 Cubic foot (3 boxes; 5 hours)
<b>Language:</b>	English .

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## Administrative Information

### Immediate Source of Acquisition

This collection was created by the Innovative Lives Program of The Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation on October 27, 1995. The Innovative Lives series brings young people and American inventors together to discuss inventions and the creative process and to experiment and play with hands-on activities related to each inventor's product.

### Provenance

The collection was transferred from the Lemelson Center to the Archives Center on July 8, 1997.

### Processing Information

Collection processed by Alison Oswald, February 1999.

### Preferred Citation

Massie/McLurkin Innovative Lives Presentation and Interviews, Archives Center, National Museum of American History.

### Restrictions

Collection is open for research but the original videos are stored off-site and special arrangements must be made to work with it. Contact the Archives Center for information at [archivescenter@si.edu](mailto:archivescenter@si.edu) or 202-633-3270.

### Terms Governing Use and Reproduction

Collection items available for reproduction, but the Archives Center makes no guarantees concerning copyright restrictions. Other intellectual property rights may apply. Archives Center cost-recovery and use fees may apply when requesting reproductions.

Signed releases on file, but releases not available for Western School students.

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## Biographical / Historical

Thomas Massie was born in West Virginia in 1969 and grew up in Vanceburg, Kentucky. He graduated from Massachusetts Institute of Technology (MIT) in 1993 with a Bachelors of Science in Electrical Engineering and a masters in Mechanical Engineering in 1995. AT MIT's Artificial Intelligence (AI) Laboratory Massie developed, with his adviser J. Kenneth Salisbury, a principal research scientist at the AI Lab, and later built, a prototype system that provides users with surprisingly vivid tactile impressions of nonexistent virtual objects. Massie's invention is called the Phantom Haptic Interface. In August of 1993, Massie and Salisbury established SensAble Devices Inc., in Cambridge, MA to manufacture the arm. Massie later changed the name of the company to SensAble Technologies.

James McLurkin was raised in Baldwin, New York and graduated from the Massachusetts Institute of Technology (MIT) in 1995 with a Bachelors degree in Electrical Engineering and Computer Science. McLurkin built upon the earlier work of robot communities. Each robot is essentially identical to Cleo, a micro-robot he designed that was once considered as a basis for a remote-controlled colon surgery device. Each robot ant has a pair of tiny treads powered by a battery and two motors taken from vibrating beepers. The robots are guided away from the objects they hit and toward illumination sources by antennae and light sensors, and they also have mandibles powered by a third motor to pick up bits of food--quarter inch balls of crumpled brass.

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## Scope and Contents

This collection consists of approximately 5 hours of original, master and reference video footage and photographs, documenting Thomas H. Massie and James McLurkin in 1995 and 1997. Massie invented the Phantom Haptic Interface, an electronic device giving existing computer technology the ability to simulate the sense of touch. James McLurkin invented a community of microrobotic ants that detect food, pass messages, and pick up small objects. Both inventors discuss their inventions and potential applications, as well as their backgrounds and experience as student inventors.

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## Arrangement

The collection is divided into four series.

Series 1: Original Videos

Series 2: Master Videos

Series 3: Reference Videos

Series 4: Photographs

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## Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

- Artificial intelligence -- 20th century
- Computer science
- Electronic engineers -- 20th century
- Electronics -- 20th century
- Inventions -- 20th century

Inventors -- 20th century  
Microrobotics  
Photographs  
Remote-control -- 20th century  
Robotics -- 20th century  
Slides (Photography)

Types of Materials:

Interviews -- 1980-2000  
Oral history -- 1990-2000  
Videotapes -- 1990-2000

Names:

Judd, Michael  
Massachusetts Institute of Technology  
SensAble Technologies (formerly SensAble Devices, Inc.)

Preferred Titles:

*Innovative Lives Program (NMAH public program series)*

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## Container Listing

### Series 1: Original Videos, 1995-10-27

*Box 1*

[Return to Table of Contents](#)

## Series 2: Master Videos, 1995-10-27

*Box 2 (moving images)*

*Box 3 (moving images)*

Massie/McLurkin Innovative Lives Program, MV 603.1, 1995-10-27

Notes: Massie/McLurkin Innovative Lives Program

TRT: 60:00

Begins with students shouting "attitude is altitude." Introductory remarks by Art Molella, Director of the Lemelson Center. Welcome to Thomas Massie and James McLurkin, both from Massachusetts Institute of Technology (MIT). McLurkin opens the program by explaining his microrobots and robotic communities. The idea is to get the robots to work like ants communicating with each other and having complex behaviors. Students join McLurkin at work tables to have the "ants" move forward, move toward the light, and move from a bump. The objective is to get the ants to move through checkpoints using a flash light and blocks. The applications for these microrobots are: surgical, use in nuclear piping to check for cracks, and as cameras for the Central Intelligence Agency. Massie begins his presentation telling students to think about inventors and inventions that surround us. Shows a videotape of how he got interested in inventing. Massie and McLurkin assisted the students in an exercise to take apart a radio and find certain parts. The students are asked what else they might invent with these parts. Students join Massie and learn to use the Phantom.

Massie/McLurkin Innovative Lives Program, MV 603.2, 1995-10-27

Notes: Massie/McLurkin Innovative Lives Program

TRT: 47:00

Introductory remarks by Arthur Molella. McLurkin opens the program by explaining his microrobots and robotic communities. The idea is to get the robots to work like ants communicating with each other and having complex behaviors. Massie presents his work with the Phantom, a device that lets you feel imaginary objects as the computer generates a force field. Students participate in taking apart radios and using the Phantom. Several students speak to the camera, but there is no audio and the when there is audio, it does not match the images. Question and answer period with students: how long does it take to make a robot? Have you ever taken something apart and not been able to get it back together? Why did you choose ants? Do you make your own batteries? Did you always build things? What is the cost of one ant? How small can you make an ant? How much does the Phantom cost?

Massie/McLurkin Innovative Lives Program, MV 603.3, 1995-10-27

Notes: Interview with Thomas Massie

TRT: 60:00

Massie grew up in Eastern Kentucky. His mother is a nurse and his father a beer distributor. They allowed him to explore everything and his favorite subjects were math and science. Massie attended MIT where he majored in engineering. He attended MIT because he felt he could get involved in lab work from the beginning as a freshman. He later formed a company, SensAble Devices, based on his invention the Phantom. Massie built the Phantom in the lab in 3 months and it required programming, circuits, and pulleys. The Phantom works by placing your finger in the thimble and moving it forward to touch the wall where a force field is created. The computer tracks where the finger is and a red line indicates the progress. Massie uses the example of inserting a needle into a brain tumor. The Phantom's applications include training surgeons, enable the blind to use computers, and permit engineers to create virtual prototypes and feel the models. Massie's favorite invention is the car and his hobbies include radio controlled cars, boats and planes.

Interview with James McLurkin McLurkin was born in Baldwin, New York. His mother is a speech therapist and his father works for AT & T. McLurkin comes from a strong technical background and enjoyed playing with erector sets, tinker toys, and Lincoln logs. While in high school, McLurkin built a robot and liked science. He would like to remain in "academia" to conduct research and would like to sell his ants. Concludes interview with a demonstration of ants playing "tag."

James McLurkin Footage, MV 603.4, 1997-05

Notes: James McLurkin Footage

TRT: 30:00

Footage of McLurkin at MIT lab using equipment in the machine shop and building ants. McLurkin's latest project is to build robots for exploring the planet Mars called "rockettes." Working in conjunction with NASA's Jet Propulsion Lab, the rockette's would bring back rock samples and collect other types of data that could be transmitted by video or sent to a main rover that could then transmit to Earth. Describes how rockette's differ from his microrobots. Discusses his work with "hopping" robots that would hop over obstacles. The goal is to have the robots hop at least a foot. McLurkin is studying nature to better understand how insects—such as dragon flies and crickets — work and how it can inform his work. The next step in McLurkin's career is to go to graduate school at the University of California at Berkley to study electrical engineering as well as additional course work in physics, biology, science and math.

James McLurkin Footage, MV 603.4, 1997-05

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James McLurkin Footage, MV 603.5, 1997-05

Notes: James McLurkin Footage

TRT: 06:32

James McLurkin working at computer in lab.

James McLurkin Footage, MV 603.6, 1997-05

Notes: James McLurkin Footage

TRT: 17:05

McLurkin is building robotic ants and discussing the disadvantages to the size—power supply, small motors and batteries. Explains how he got the idea for his ants from NASA's Rockettes which are grand robots proposed for MARS. Shots of McKlurkin working at computer.

Thomas Massie Interview, MV 603.7, 1997-05

Notes: Thomas Massie Interview

TRT: 50:26

Massie discusses how his company, formerly SensAble Devices, now SensAble Technologies, has grown to 19 full time employees occupying a 3,000 to 4,000 square foot office space. A new development is the hiring of software engineers for the company to develop the software "Ghost." Ghost allows other programmers to help build applications for the Phantom. Massie discusses the three sizes of Phantoms—wrist size, elbow centered and shoulder centered. The Phantom is being distributed and sold in Japan, Germany, Canada and other European countries. Demonstration of the Phantom with Massie explaining the differences from 1995 to 1997. Inventing is fun when he gets the chance to. As the company grows, more work is generated for Massie and he finds less time for exploring other ideas.

Thomas Massie Interview, MV 603.8, 1997-05

Notes: Thomas Massie Interview

TRT: 26:27

Footage opens with Massie in the machine shop with his brother troubleshooting a problem and testing a Phantom. Demonstrate machining a part. Tour of the company offices featuring some employees. Views of the Western School, shots of children in

the classroom and library. Two students from the Western School describe their invention of the Parking Meter and Change machine.

Thomas Massie Interview, MV 603.9, 1997-05

Notes: Thomas Massie Interview

TRT: 05:00

Massie demonstrates several programs for the Phantom--grab a cube and place it, digital clay, and painting.

[Return to Table of Contents](#)

## Series 3: Reference Videos, 1995-10-27

*Box 4*

[\*Return to Table of Contents\*](#)

## Series 4: Photographs, 1995-10-27

*Box 4*

[Image\(s\)](#)

[Return to Table of Contents](#)