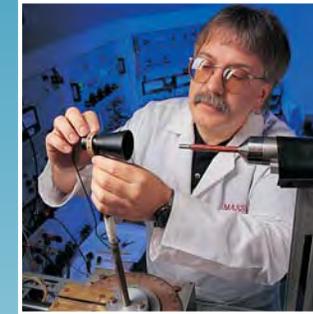


MASSA PRODUCTS CORPORATION

EXTENDING OUR COMMITMENT TO SONAR & ULTRASONIC DEVELOPMENT



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

MASSA PRODUCTS CORPORATION

280 Lincoln Street, Hingham, MA 02043 USA

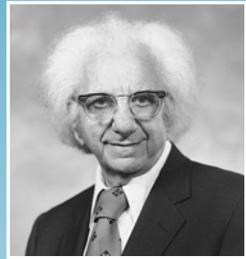
Tel: 781-749-4800 Fax: 781-740-2045

mpc@massa.com

www.massa.com

MASSA: THE FOREMOST NAME IN ELECTROACOUSTICS

In many technical fields, there is often an individual, like Thomas Alva Edison or Alexander Graham Bell, who develops the fundamental technology that becomes the foundation for the

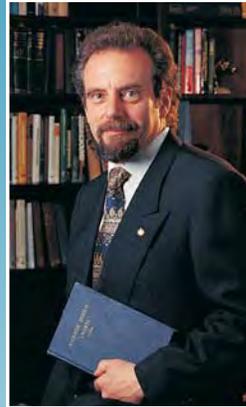


Frank Massa

1906 - 1990
Inventor, Technologist,
Entrepreneur...
Widely acknowledged
as the "father" of modern
electroacoustics.

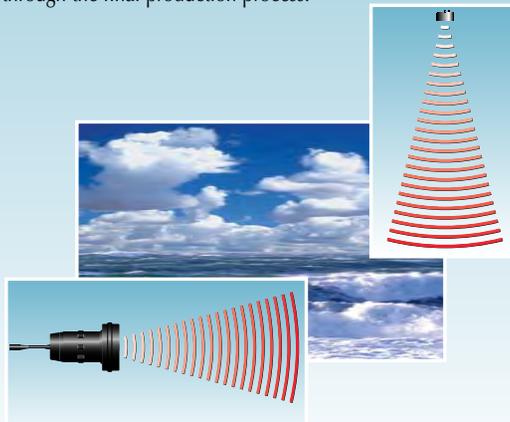
products that follow. In the field of electroacoustics, this person is Frank Massa, the founder of Massa Products Corporation. Considered by most to be the "father" of modern electroacoustics, Frank Massa is the recognized pioneer

in the design of transducers and systems for both air and underwater applications. Today, his legacy of innovation still exists throughout Massa, from initial design concepts through the final production process.



Don Massa

Continuing the legacy
in design, innovation,
and production



MASSA: GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

For seven decades, Massa Products Corporation has been the leading innovator in the design and manufacture of electroacoustic products for both air ultrasonic applications and underwater sonar systems. Hundreds of different types of

transducers and systems have been designed, and many millions have been mass-produced to the exacting performance and reliability requirements of military, industrial, and commercial markets.

This success is due to the basic design and production engineering philosophy instituted by Frank Massa that still defines the methodology for

the design, manufacturing, and testing of each product. Besides offering

our standard line of products, this expertise and experience gives Massa the capability to design and build electroacoustic transducers and systems custom-tailored to specific applications. Every day our technology base continues to expand through ongoing research and manufacturing innovation.

"Frank Massa's contributions and accomplishments... are well known... He was a true example of the best our country has to offer."

H. Lawrence Garrett, III,
Secretary of the Navy

"What is firmly established cannot be uprooted. What is firmly grasped cannot slip away. It will be honored from generation to generation."

Lao Tsu from the *Tao Te Ching*

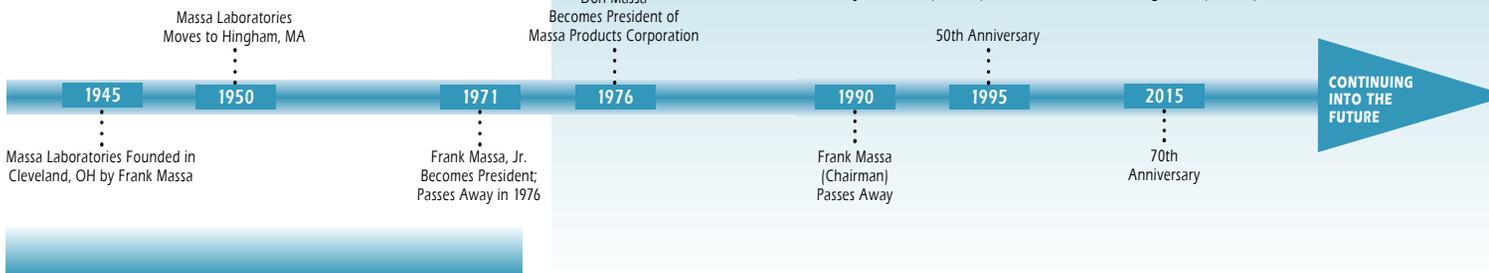
MASSA: A PROUD HERITAGE OF INVENTION AND INNOVATION

The major developments of Massa over the past 70 years in both air ultrasonic and underwater sonar transducers and systems are far too numerous to list. In air ultrasonics, Massa has many times redefined the industry, designing several hundred different

transducers and systems that have been mass produced at rates exceeding 40,000 transducers per week. In underwater sonar, Massa has created an equally impressive number of industry “firsts” while successfully completing over 650 design and production contracts for the U.S. and Allied Navies.

“[The US Navy] called on Frank Massa... to build the necessary gigantic transducer for creating sound. No such underwater transducer (noisemaker) had ever been built before, but the very first units were successful.”

Time Magazine from article on “Project Artemis”



Some of the many sonar transducers developed by Massa during the 1950's and early 1960's.



Massa TR-7, the world's first mass produced (>2,000,000) ultrasonic transducer (c. 1960).



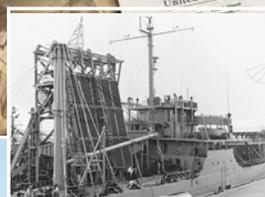
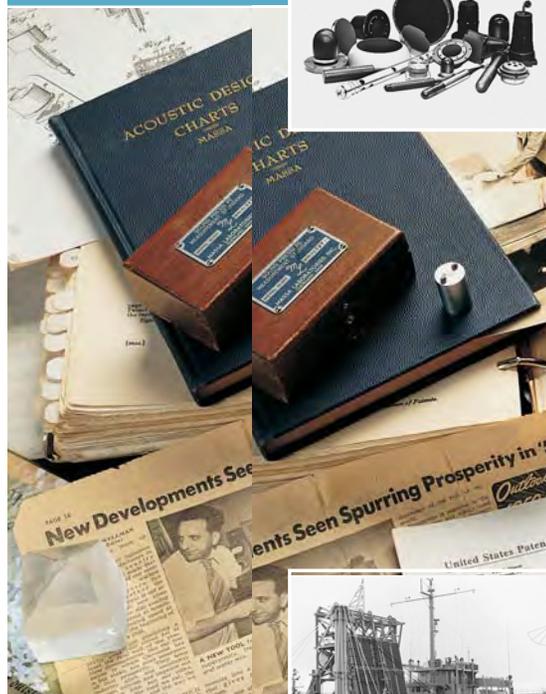
Massa transducer array and electronics assembly used for the AMF AccuScore™ Bowling Scoring System (c. 1985).



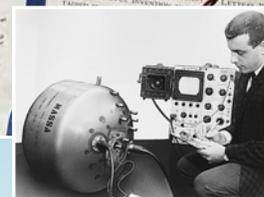
A few of the many ultrasonic transducers and systems developed by Massa during the 1990's.



Towed array containing transducers and electronics redesigned and manufactured by Massa for the U.S. Navy (c. 1990).

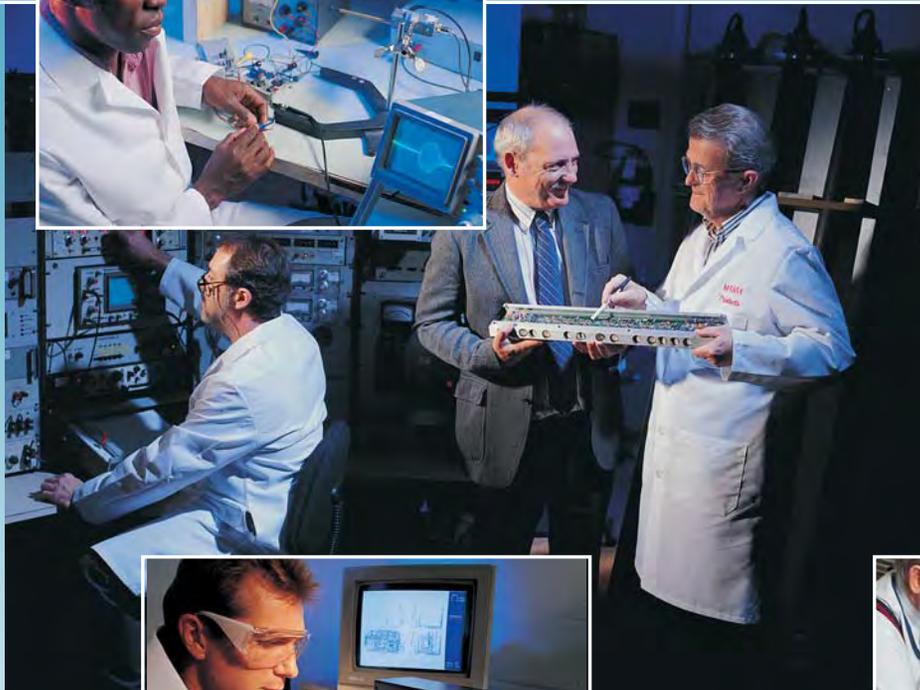


(The world's largest underwater transducer developed by Massa for Project Artemis (c. 1960).

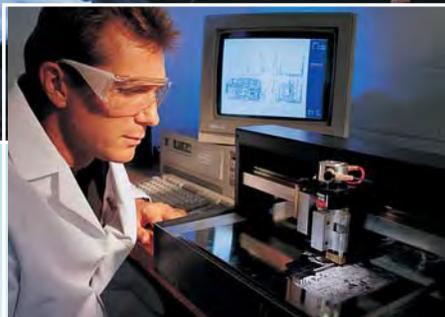


High-power, low-frequency (100-1,000 Hz), deep water (>20,000 ft.), sonar transducer being tested (c. 1970).

Testing in the Massa Engineering Department during the development of an Air Ultrasonic Echo-Ranging System.



Electroacoustic Specialists discuss the Massa Ultrasonic Array for the AMF AccuScore™ Bowling Scoring System.



Electronic Engineer operating the Massa PC Board Rapid Prototyping Machine.



Cross-functional team of development and production specialists conducting a Design Review on a Sonar Transducer Array.

MASSA: EXTENDING THE BOUNDARIES OF TECHNOLOGY

Massa has been setting the standard for electroacoustic technology for 70 years, resulting in hundreds of unique designs and over 170 patents. Today, that seven decades of technology development is being expanded by a group of highly talented electro-acoustic, electronic, mechanical, and production engineers. The Massa facility is a totally integrated 70,000 sq. ft. electroacoustic design, manufacturing, and test complex, with the primary purpose of advancing the state of the art of air ultrasonic and underwater acoustic systems.

"... (Don Massa) has been widely recognized for pioneering innovative electroacoustical products... for specialized air ultrasonic industrial control and underwater sonar applications."

Northeastern University on awarding **Don Massa** the *Outstanding Alumni Award for Science and Technology* at Commencement, 1997

MASSA: FLEXIBILITY IN VOLUME MANUFACTURING

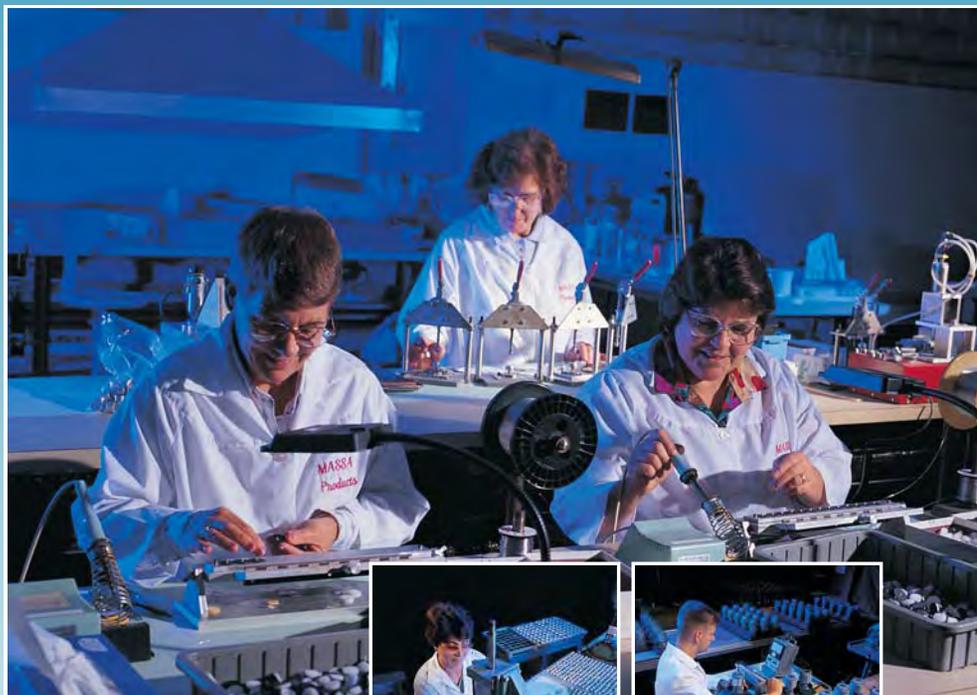
At Massa we take each product through a comprehensive Design-for-Manufacturing process, with special emphasis on critical tests during all design and manufacturing phases. A key factor in our approach is the use of cross-functional teams of design and production engineers. These Massa

teams possess the critical knowledge to design products that are reliable, manufacturable, and cost effective. This methodology results in the finest electroacoustic transducers and systems available today. Because the top managers of Massa are also design and production experts, effective interaction is ensured between the design and manufacturing engineering functions. This is accomplished without interposing the rigid hierarchy that often impedes such collaboration, as proved by the many millions of sensors that have been manufactured.

Massa's people, facilities, systems, and equipment are capable of producing the most technically challenging sensors and transducers our customers can specify, in conformance with the most stringent quality assurance standards of government and industry.

"It is an unfortunate fact that the design of many transducers... could be greatly improved. The key is to apply the specialized skills of competent engineers who have successful production design and manufacturing experience."

Frank Massa



Assembly of TR-89 Air Ultrasonic Transducers and TR-208A/SQS-23 Sonar Transducers.



Various stages of assembly for a specialized Sonar Transducer Array.

MASSA: EXCEEDING EXPECTATIONS IN BOTH QUALITY AND PERFORMANCE

The culmination of all of Massa's research, design, manufacturing, and testing is a transducer or system with unmatched performance and outstanding reliability, produced at a reasonable cost, and delivered on time.

To accomplish this task takes a combination of facilities, procedures, and people who are focused exclusively on product excellence and working in a team atmosphere that fosters continuous product improvement unconfined by traditional barriers between disciplines. Over 70 years ago, Frank Massa pioneered the design of electroacoustic transducers and the equipment to test them (much of which did not yet exist) to ensure unexcelled product quality. Today, the innovations of the company he founded continue to achieve extraordinary electroacoustic performance and quality in widely divergent applications. We at Massa Products Corporation invite you to utilize our expertise in electroacoustic technology.



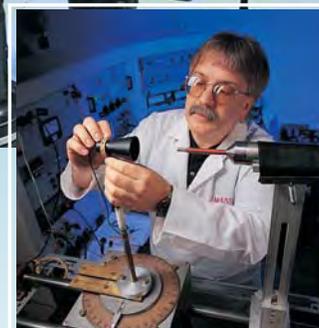
Electroacoustic Specialist checking preproduction assemblies of a Massa custom designed OEM Ultrasonic Control System.

"The Massa TR-208A/SQS-23 Element design has resulted in a more compact unit of much less weight, (and is) completely encapsulated with rubber to protect it from sea water... The ability to meet test and specification requirements on the first submission has been unprecedented."

U.S. Navy Test Report



Sonar Transducer testing in the Underwater Test Pond at the Massa Facility.



Air Ultrasonic Transducer testing using one of Massa's Air Ultrasonic Test Racks.

MASSA PRODUCTS CORPORATION



"Massa leads by
doing the impossible."

Sea *Technology* Magazine



MASSA DESIGN & MANUFACTURING FACILITY LOCATED IN HINGHAM, MASSACHUSETTS

70,000 sq. ft. Plant
Mil-Q-9858A Certified
ISO 9001:2008 Certified
Engineering Laboratory
Engineering Model Shop
Rubber Molding Facility
Plastic Molding Facility
Machine Shop
Clean Room
Acoustic Test Pond
Pressure Testing Facilities



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