



Falmouth Scientific, Inc.

FSI Transducer Capabilities

FSI has been designing and manufacturing precision sensors, sonar systems, and transducers for the oceanographic community since it was founded in 1989, and has extensive experience in building complex transducer elements and arrays for government and commercial customers around the world.

Image Acoustics, Inc. was formed in 1974 to provide acoustical engineering services to both industry and government. The services range from theoretical studies to the development of practical designs, particularly in the area of acoustical transducers.

The combination of FSI and Image Acoustics, Inc. provides depth and breadth in custom transducer design and development, as well as practical experience, and manufacturing capabilities. The two companies have worked together numerous times in these capacities for various customers in government, public, and private sectors. Image Acoustics brings strength in acoustic transducer design, modeling, and analysis to the team. FSI offers engineering design experience and the state of the art manufacturing capability required to produce and test a variety of piezo electric transducer designs.

FSI Capabilities & Facilities

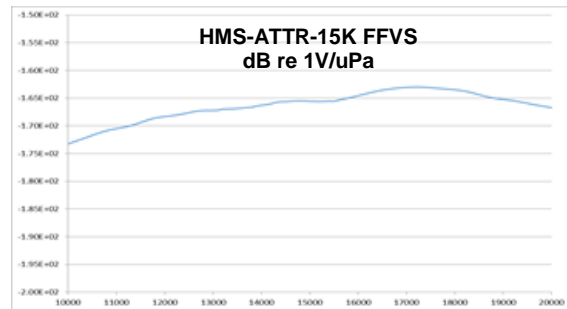
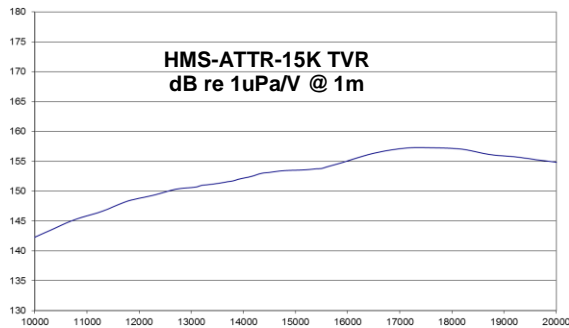
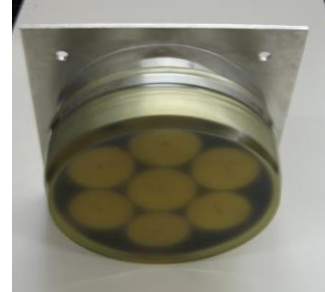
- Specialized transducer design, prototyping, manufacturing, calibration
- Electrical, Mechanical, and System design
- Assembly/Potting/Encapsulation
- Electrical & Acoustic Test
- Pressure & Environmental Test
- 10,000 psi pressure tank
- 12-ft acoustic test tank
- Company research vessel
- Close proximity to industry resources and open water test locations





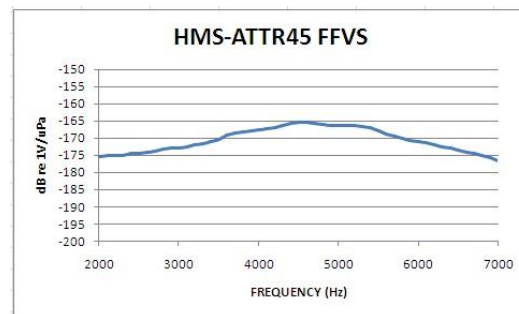
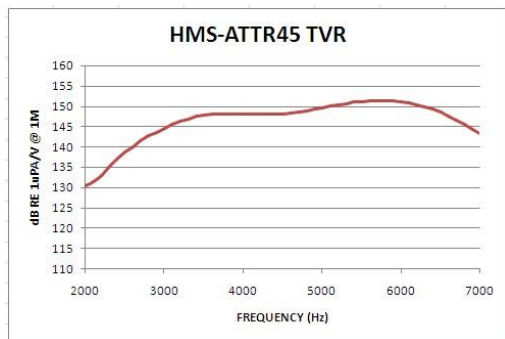
HF

The HMS-ATTR-15K is a very rugged, high power, underwater transducer specifically designed for marine sub-bottom profilers and echo-sounders in the 8 to 23 kHz frequency range. Single transducers can support a 1000W power level at a 30% duty cycle or 200W continuous.



LF

The HMS-ATTR-4.5K is a very rugged, high power, underwater transducer specifically designed for marine sub-bottom profilers and echo-sounders in the 2 to 7 kHz frequency range. Single transducers can support a 600W power level at a 30% duty cycle or 200W continuous. The transducers can be arranged in a multi-element array to support a wide variety of beam patterns and source level to suite most survey applications.

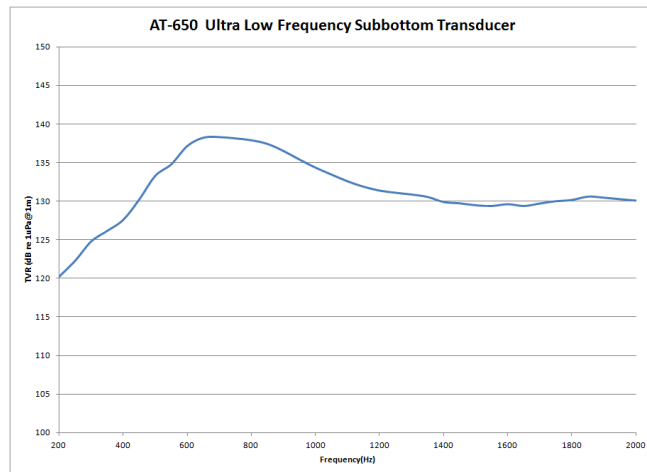




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ULF

The HMS-AT650 is a very rugged, high power, underwater transducer specifically designed for marine sub-bottom profilers and echo-sounders. The transducer is based on a high efficiency piston loaded flexensional design and operates in the 200 to 2,000 Hz ULF frequency range. Single transducers can support up to 3000W power levels at a 30% duty cycle (cavitation limited depending on the depth of operation, 300m max). The transducer is omnidirectional and can be arranged in multi-element arrays to support a wide variety of beam patterns and source levels.

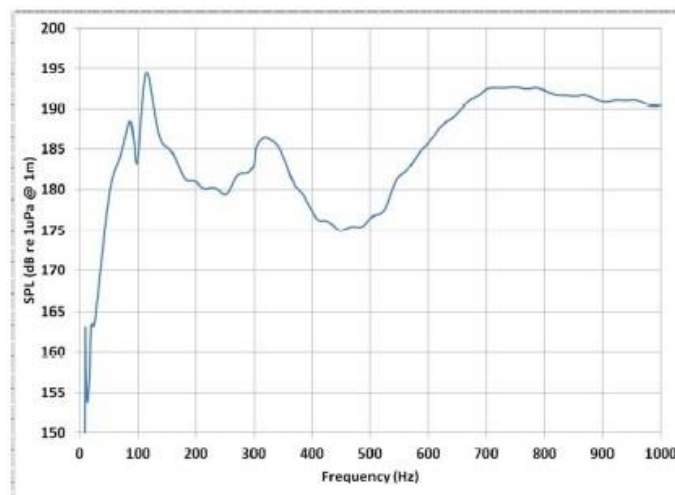
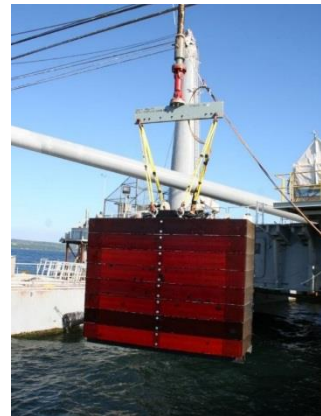
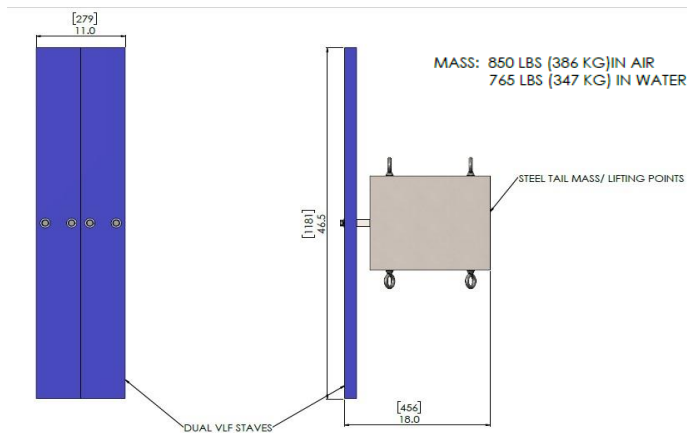




VLF

The VLF Very Low Frequency Sound Source is a high power underwater transducer specifically designed for tomography applications. The patented cantilevered bender design is capable of operating at full ocean depth. The broad band frequency response bandwidth is from 10 Hz to 1,000 Hz with usable energy up to approximately 10 KHz. The standard transducer includes two bender staves and power output level can be scaled by adding additional stave elements.

FSI and Image Acoustics, Inc. worked together on the original VLF Bender transducer development program for the US Navy. It has also been used on a joint project with the University of Rhode Island (URI) and the Woods Hole Oceanographic Institution (WHOI).



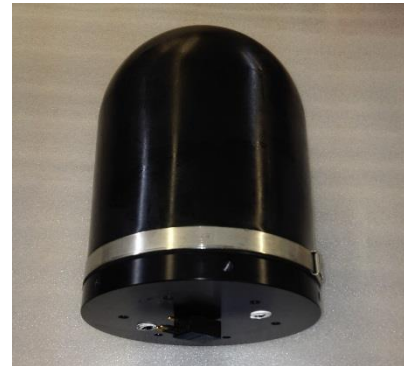
Array Sound Pressure Level (SPL) Response to 1000 Hz Drive Level 2000 Vrms (10 V/mil)



OTHER CUSTOMIZED TRANSDUCERS AND ARRAYS



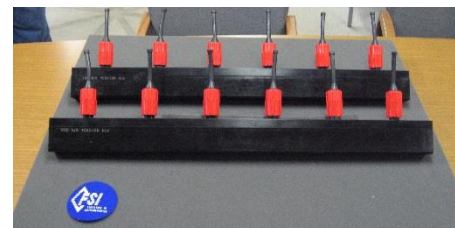
High Power Trioid Transducer Array



Spherical Mirror Transducer



Acoustic Transponders



Planar element projector array



Specialized Tonpilz Array



LF Transducer Array
With Hull Mount J-Boxes & Amps