

## Portable Low-Frequency Acoustic Sub-Bottom Seismic Systems

The HMS-620 Bubble Gun™ systems use low-frequency acoustic signals to provide superior signal penetration vertically through coarse sand, gravel tills, and other difficult-to-penetrate sediments

### HMS-620 Single Source

- Ideal for Small Boat or Inland Surveys

### HMS-620D Dual Source

- Higher Source Level, Greater Penetration

### HMS-620LF Low Frequency Source

- Wide 20 – 1700 Hz Energy Spectrum
- Ideal for Multi-Channel Reflection Surveys

## APPLICATIONS

- Offshore Wind Turbine and Dam Site Surveys
- Cross River Surveys for Bridge Construction
- Bedrock Investigation
- Pipeline Construction Surveys
- Geotechnical Site Investigation
- Coastal Engineering
- Shallow Gas Hazard Surveys

## FEATURES/BENEFITS

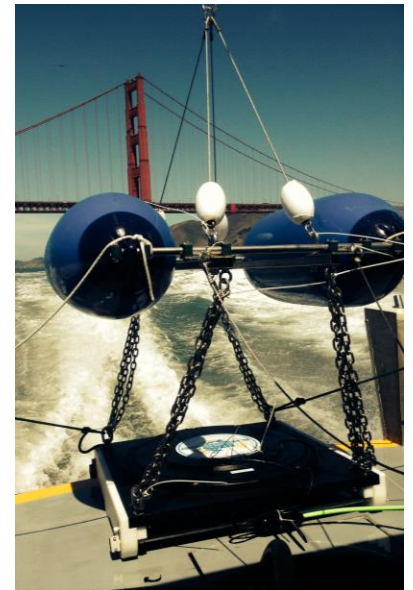
- Single and Dual Source Systems do not need heavy handling or deployment equipment
- **Wide-band 70 - 1700Hz** pulse provides bottom penetration through many sediment types
- **LF System Source Bandwidth 20Hz – 1700Hz**
- **Very stable and repeatable source pulse without the need for external timing controllers**
- Rugged, lightweight transducer platform provides stable operation in adverse sea-state conditions
  - Electromagnetic acoustic source; **Contained Air Volume (no air compressor needed)**
- **Minimal Electric Power Requirements**
  - Selectable 110 or 220 VAC source of less than 1 KWatt for Single Source, or 2 KWatt for Dual or LF Source
  - Optional 24 VDC powered system available (two 12V batteries; no generator needed)
- Flexible portable transceiver unit optimizes system for a wide range of sediments
  - Low-noise pre-amp with high/low pass filters and gain control
  - User-selectable trigger or external trigger
  - **Multiple Sources can be synchronized to a common trigger without need for external timing control**
  - **Repeatable Shot-to-Shot Phase and Amplitude Wavelet Correlation > 0.96**
- Oil-filled single channel hydrophone streamer cable incorporates a 7-meter multi-element active section
  - 35-meter deactivation switches on each hydrophone element enable exportation outside of USA
- Compatible with industry-standard data acquisition software & multi-channel streamers



The complete Single-Source Bubble Gun™ System includes transceiver, shipping case, tow cable, hydrophone streamer, and source vehicle (suspended on display frame)



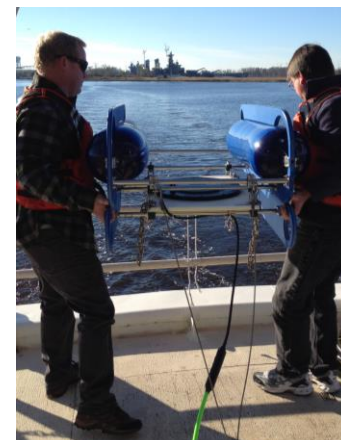
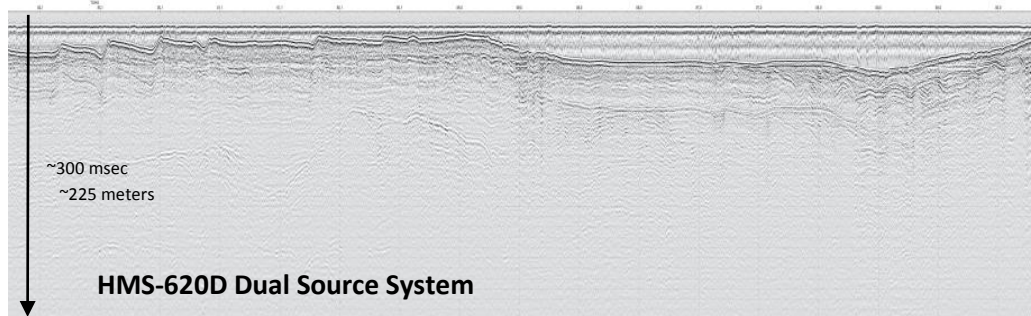
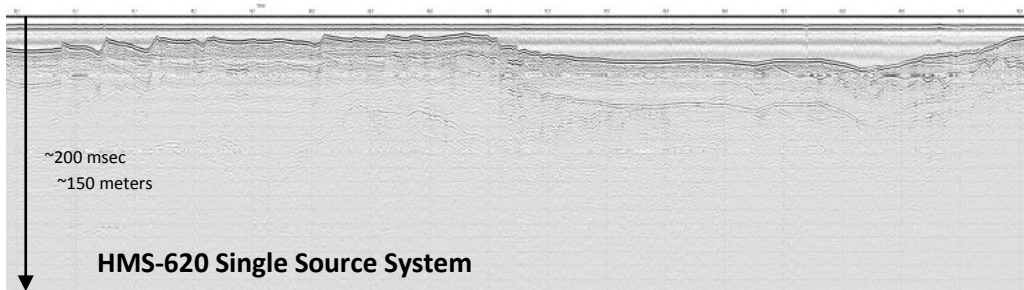
HMS-620D shown with Geometrics Geode and MicroEel multi-channel data acquisition system (courtesy Geometrics)



HMS-620LF Low Frequency Bubble Gun™ Source Vehicle

# HMS-620 Bubble Gun™ Systems

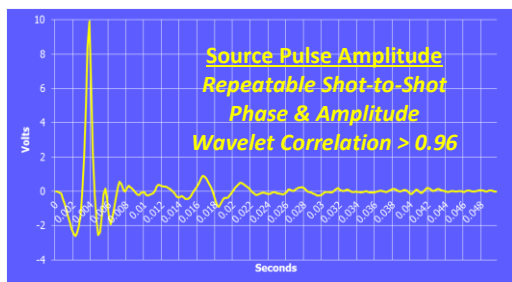
## HMS-620 Bubble Gun™ Data Examples



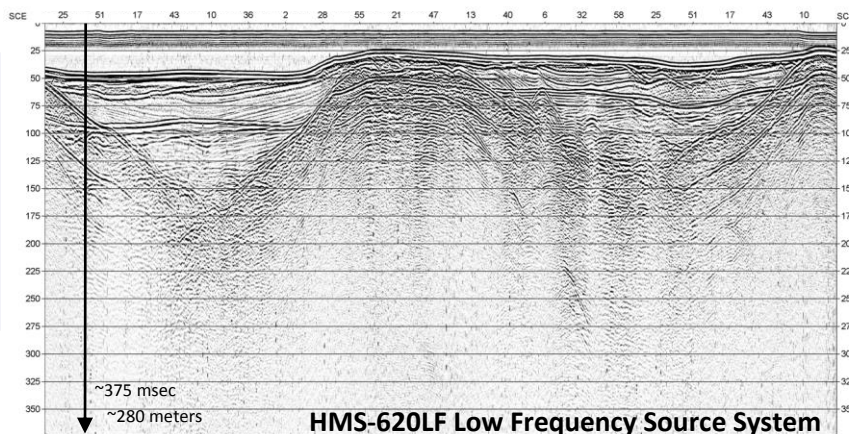
HMS-620 Source vehicle is compact and easy to deploy by hand

All survey data was collected with FSI's single channel hydrophone streamer sub-system

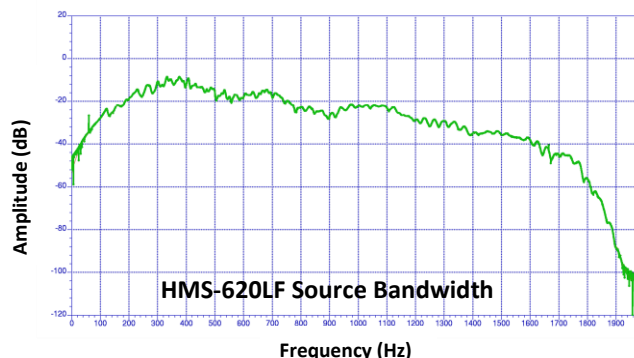
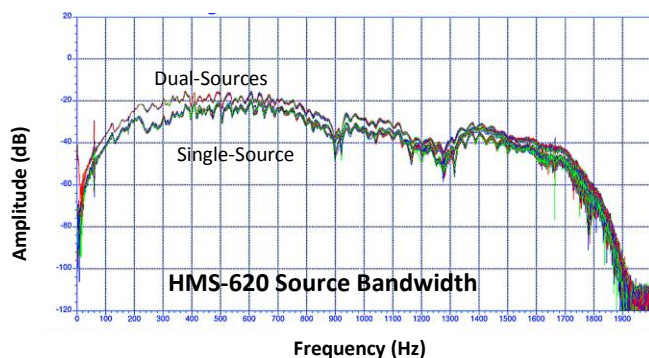
The above data sets collected in Vineyard Sound, MA in the same survey area (courtesy USGS)



**Source Pulse Amplitude**  
Stable – Repeatabe - Syncable  
No Timing Control Required



Data set collected in Narragansett Bay, Rhode Island (courtesy URI)



(Bandwidth Data Acquired at 4 KHz Sample Rate)

Specifications Subject to Change without Notice

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