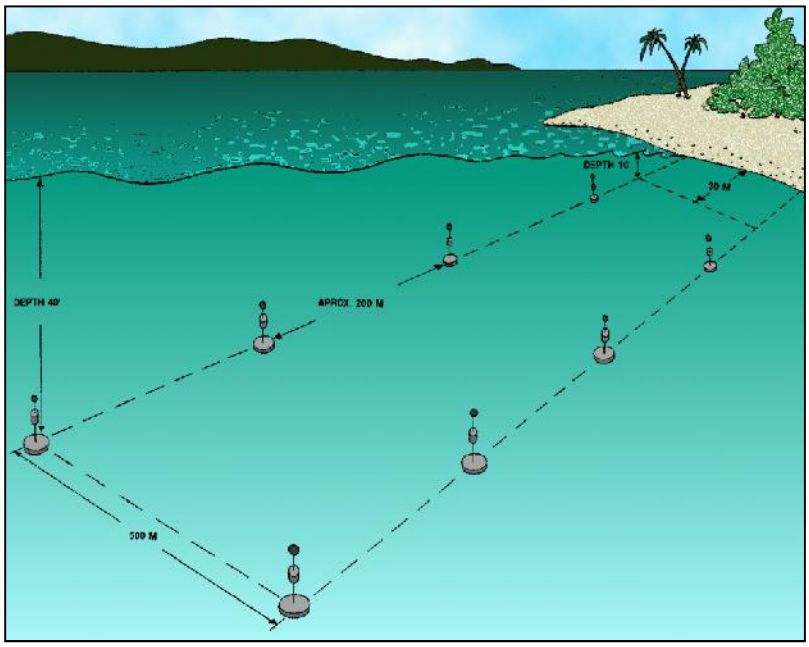
MASSA

GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

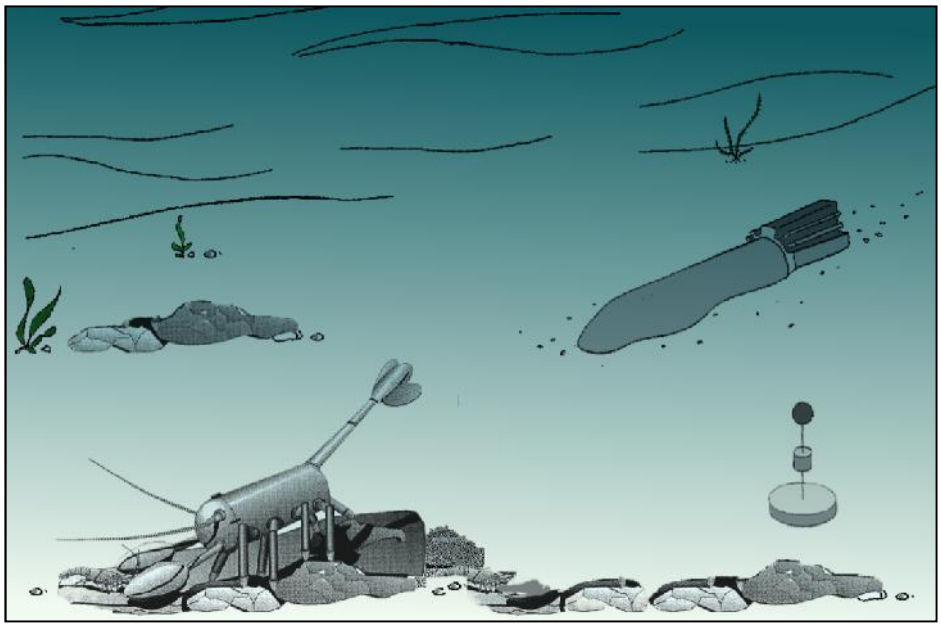
Very Shallow Water Acoustic Navigation, Communication, and Control System for Use with UUVs (Underwater Unmanned Vehicles) in Littoral (Coastal) Zone Mine Countermeasure Developed by Massa



Navigation/Communication Modules

- Modules mark lanes up to 500m wide & control UUVs
- Establish acoustic navigation grid
- UUVs can accurately determine position and conduct random or geometric search patterns
- Modules can acoustically activate explosive charges
- Uses simple, robust, high data rate acoustic comm. algorithms proven during in-situ tests
- UUV's communicate with each other and with Modules

PRINCIPAL INVESTIGATOR:
Donald P. Massa
Massa Products Corporation
Hingham, Massachusetts



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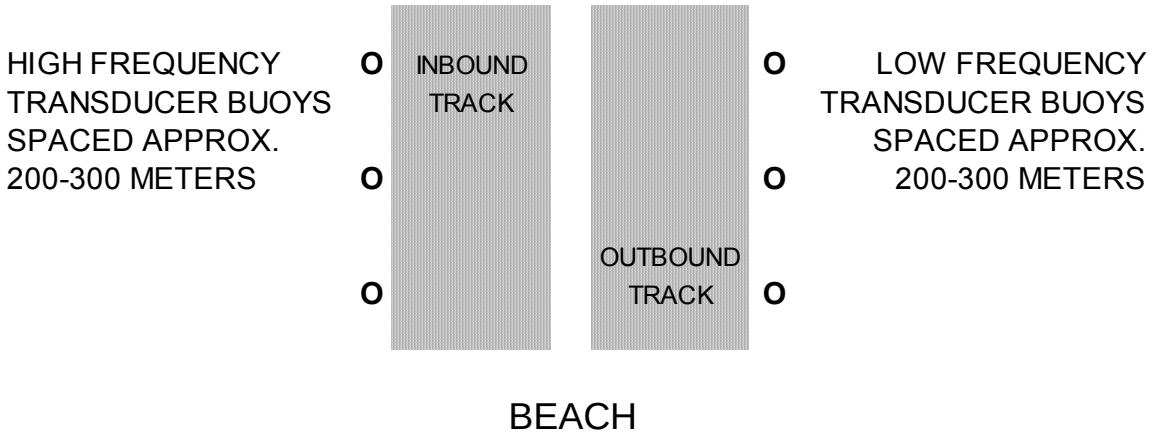
Stand-Off Mine Field Marking System



- Developed by Massa to provide navigation for landing craft in a cleared lane up to 500 meters wide
  - The system was successfully tested in the shallow water of Hingham Bay
- The system utilizes inexpensive ultrasonic transponders operating over the frequency range of 30-40 kHz
  - The transponders are placed on either side of the cleared lane at a spacing of approximately 200 to 300 meters
- The system accurately locates the exact position of landing craft within the cleared lane