

# Background Study and Survey Planning for the Ascension Island Hydroacoustic Data Acquisition System

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**Abstract:** Ascension Island is a remote location and performing detailed pre-survey planning by researching available knowledge about the locale benefited logistics, field operations and engineering design for the HDAS program. Valuable research information included Ascension logistics and infrastructure, onshore geology, meteorology and oceanographic setting, shoreline processes, seafloor conditions, and environmental considerations. The engineering history of HDAS' predecessors was perhaps the most critical information gained in this planning study.

Historical information was gathered for clues that might indicate experience in adaptation to the island's terrain, or locations to avoid, since its discovery in 1501. Possible wrecks or UXO are examples of important historical information. We uncovered a woodcut showing Ascension Island from 1683 during the course of this research.

Island geology is important to provide background for assessing the feasibility of the proposed directional

drilling across the shoreline. Similarly, engineering history of past cables crossing this shore indicated the worth of this proposed engineering solution. However, understanding onshore and offshore subsurface and underwater conditions was needed to move ahead. Research helped to ask the right questions for this design element.

Seafloor conditions influence the selection of the listening array locations and design. Further, a pathway along the geologically very young and active volcanic terrain of the Mid-Atlantic Ridge had to be selected for the cables connecting the sensors with the island recording station. While this major feature of the earth is well studied in many locations, Ascension is not one of these locations.

An amalgam of seafloor survey data was merged to provide the basis for planning the offshore survey. These ranged greatly in resolution, and the regional data points helped to fill between some sparsely discontinuous but locally detailed modern survey data.

Environmental issues are a major factor in planning modern engineering projects. Ascension was no exception and ecological factors drove important engineering considerations.

The planning research resulted in a number of recommendations for moving this project into the field. One of the measures of the planning data is comparison with the conditions encountered during the project. This comparison forms the basis for the conclusions of this presentation.