

MAXIMUM LIKELIHOOD PROCESSING OF EXPERIMENTAL RETRANSMITTED FOUR FREQUENCY OMEGA

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ABSTRACT: The Global Rescue Alarm Net (GRAN) System utilizes the Omega navigation signals and geosynchronous satellites for a world-wide search and rescue system. A series of tests was conducted by the Naval Air Test Center, Patuxent River, Maryland, during September and October 1974, to demonstrate the position locating potential of four frequency Omega. In these tests four-frequency-Omega data was retransmitted from seven remote sites through Lincoln Experimental Satellite 6 (LES-6) to a ground station in Dallas, Texas, where it was recorded on magnetic tape. This paper will describe the equipment used to receive the Omega signals and retransmit them to the satellite, the satellite linkage and the ground station reception and recording of the phase data. It will also describe the processing of the collected data using a maximum likelihood estimator and the results of the processing. Finally, the paper will present the conclusions and recommendations drawn from these tests for the use of four frequency Omega in a world-wide search and rescue system.