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INVESTIGATION OF A VECTOR-SCALAR RECEIVER PRACTICAL APPLICATION IN PASSIVE MODE

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The purpose of the work is to consider aspects of the practical application of combined (vector-scalar) receivers (CP) in distributed hydroacoustic underwater surveillance systems when they operate in the passive mode. The noise immunity of the CP in an isotropic noise field is evaluated. The choice of the most informative frequency range was made for detecting low-noise underwater objects (LNUO). The width of the directional characteristic of the CP and the root-mean-square error of the bearing of the local source are estimated when using the Bartlett and Capon spatial processing algorithms. An algorithm for detecting and classifying LNUO is presented, based on the detection and analysis of roller-blade sound patterns of discrete components in the infrasound frequency range. It is shown that this algorithm also makes it possible to detect LNUO when the input of the CP is exposed to the noise of extraneous objects. An algorithm for detecting LNUO in the audio frequency range under conditions of exposure to powerful local interference at the input of the CP is considered, which consists in correcting the spectral correlation matrix of signals at the output of the receiving channels of the CP by reducing the value of its highest eigenvalue.

Keywords: combined (vector-scalar) receiver, noise reduction, spatial processing, detection and classification algorithms.

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