

Optimal Measurement of Signal Data Parameters of Requesting Radar Systems

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Abstract—The presented work analyzes the effect of random loss of received signals due to the finite availability factor of aircraft responders of requesting radar surveillance systems on the optimal algorithm for processing response signals. It is shown that the optimal detection algorithm when the detector and the device for estimating the parameters of the received signal data work together is reduced to comparing the likelihood ratio averaged over the measured parameter with the threshold level. Its value is determined not only by the costs of errors of the first and second kind, but also by a priori data on the measured parameter, as well as by the results of processing the adopted implementation in the meter.

Keywords—Airspace Control Systems (ACS), Air Traffic Control (ATC), Secondary Surveillance Radar (SSR), Identification Friend or Foe (IFF), Air Object (AO)

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