

ACCURACY AND RESOLUTION CAPACITY
OF MRL-5(IS) RADAR ORNITHOLOGICAL STATION
AND ITS POTENTIAL DEVELOPMENT

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ABSTRACT

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The paper presents the comprehensive assessment of the resolution capacity of MRL-5(Is) radar ornithological station developed in Israel. Theoretical calculations, as well as experimental testing and field experience enable the authors to evaluate the station's performance and to suggest new directions of its potential development.

The computer-controlled system is able to select bird echoes and plot ornithological charts for distances up to 60 km. Under conditions of normal refraction at distances of 5-25 km, MRL-5(Is) is able to detect all the birds (undisguised by hills) at the horizon level. A bird as big as a stork flying 100 m higher than the radar location reflects an echo strong enough to be detected by the radar at the distance of 90 km. In the daytime, at the distance of up to 60 km from the radar, under conditions of the open horizon, the station detects 56-83% of migrating birds flying at the altitude of over 100 m above the radar location. At night, at the distance of up to 30 km from the radar, the station detects 74-89% of migrating birds flying at 150 m above the radar location. At the distances of 20 and 50 km, the resolution capacity of the station (*i.e.* detecting separated echoes of two or more birds flying at a distance from each other) are $\Delta r = 200$ m and $\Delta r = 400$ m, respectively; regarding the height and the tangential component; distance-wise, the capacity is 150 m regardless of the distance to the target.

Systematic observations of seasonal bird migration in the daytime and at night conducted during two autumn seasons and two spring seasons showed that the number of birds flying *via* Israel is significantly lower in spring than in autumn.

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