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A TECHNIQUE FOR ANALYSING YAGI UDA ANTENNA ARRAYS

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A Yagi Uda array is a type of radio antenna characterized by high gain and sharp directivity. Analytical solutions giving the important antenna parameters such as gain and directivity are not available for this class of array. The various theoretical treatments that have been developed in the past have sought to take into account important factors such as the interelement interaction and current distribution along the elements by various approximate methods. The degree of accuracy of the results obtained by such methods has been difficult to estimate.

In this paper a method developed by Hallen for analysing linear antennas and a technique by Popovic for solving the associated integral equations have been extended and applied to solving the Yagi Uda antenna problem. The method depends on the use of numerical techniques for solving the relevant integral equations and is facilitated by the use of a digital computer. Noteworthy features claimed for this method are the relatively simple programming logic required for the computer solutions and the fact that the computer may be programmed to give successive solutions of increasing accuracy so that the overall accuracy of the results obtained may be more easily estimated.

The method developed has been applied to obtain the polar diagrams of two specific configurations of Yagi Uda arrays. The theoretical results obtained were found to be in good agreement with those obtained using laboratory models.