

**ON REDUCING THE PHASE ERRORS IN THE
APERTURE OF A RADIAL WAVEGUIDE PIN-FED
NON-RESONANT ARRAY ANTENNA**

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Abstract—With a proper design, the aperture field of a conventional radial waveguide pin-fed non-resonant array antenna (RWPF AA) can be rendered equiphase at a given central frequency. However, when the operating frequency deviates from this central frequency, the aperture field will exhibit an undesired conical phase error. To alleviate this problem, we propose a novel design in which the frequency-dependent aperture phase error distribution is rendered serrated. The gain and side-lobes of an RWPF AA with serrated phase error distributions are studied by resorting a simple model of a line source as well as a more representative model of a circular aperture. The theoretical results are supplemented by numerical data. Schemes of RWPF AAs comprising two and three sections, which render the phase error distribution in the antenna aperture serrated, are suggested.