

ternational standards and that involve minimal additions to pre-existing manufacturing processes and facilities.

- RFID chips should not contain batteries: instead, they should derive power from interrogating RF fields.

This work was done by Thomas Jedrey and Eric Archer of Caltech for NASA's Jet Propul-

sion Laboratory. Further information is contained in a TSP (see page 1).

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

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Refer to NPO-42633, volume and number of this NASA Tech Briefs issue, and the page number.*

Cup Cylindrical Waveguide Antenna

This antenna is used in wireless networks and telemetry.

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The cup cylindrical waveguide antenna (CCWA) is a short backfire microwave antenna capable of simultaneously supporting the transmission or reception of two distinct signals having opposite circular polarizations. Short backfire antennas are widely used in mobile/satellite communications,

tracking, telemetry, and wireless local area networks because of their compactness and excellent radiation characteristics.

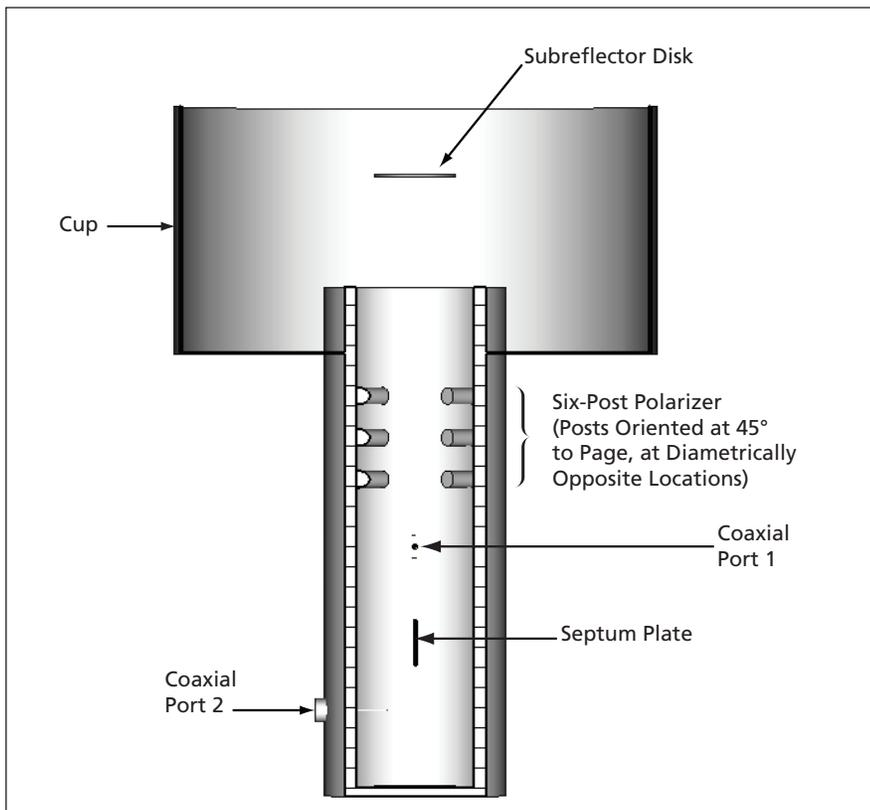
A typical prior short backfire antenna contains a half-wavelength dipole excitation element for linear polarization or crossed half-wavelength dipole ele-

ments for circular polarization. In order to achieve simultaneous dual circular polarization, it would be necessary to integrate, into the antenna feed structure, a network of hybrid components, which would introduce significant losses. The CCWA embodies an alternate approach that entails relatively low losses and affords the additional advantage of compactness.

The CCWA (see figure) includes a circular cylindrical cup, a circular disk subreflector, and a circular waveguide that serves as the excitation element. The components that make it possible to obtain simultaneous dual circular polarization are integrated into the circular waveguide. These components are a six-post polarizer and an orthomode transducer (OMT) with two orthogonal coaxial ports. The overall length of the OMT and polarizer (for the nominal middle design frequency of 2.25 GHz) is about 11 in. (≈ 28 cm), whereas the length of a commercially available OMT and polarizer for the same frequency is about 32 in. (≈ 81 cm).

This work was done by Roberto J. Acosta and William G. Darby of Glenn Research Center and Carol L. Kory, Kevin M. Lambert, and Daniel P. Breen of Analex Corp. Further information is contained in a TSP (see page 1).

Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steve Fedor, Mail Stop 4-8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-18089-1.



The Cup Cylindrical Waveguide Antenna features a compact combination of a polarizer and an orthomode transducer with two coaxial ports integrated into a circular waveguide.