Four-Way Ka-Band Power Combiner

A prior X-band design has been adapted to Ka band.

A waveguide structure for combining the outputs of four amplifiers operating at 35 GHz (Ka band) is based on a similar prior structure used in the X band. The structure is designed to function with low combining loss and low total reflected power at a center frequency of 35 GHz with a 160 MHz bandwidth.

The structure (see figure) comprises mainly a junction of five rectangular waveguides in a radial waveguide. The outputs of the four amplifiers can be coupled in through any four of the five waveguide ports. Provided that these four signals are properly phased, they combine and come out through the fifth waveguide port.

This work was done by Raul Perez and Samuel Li of Caltech for NASA’s Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

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Loss-of-Control-Inhibitor Systems for Aircraft

Excessive commands are resisted by feedback in the form of damping forces.

Systems to provide improved tactile feedback to aircraft pilots are being developed to help the pilots maintain harmony between their control actions and the positions of aircraft control surfaces, thereby helping to prevent loss of control. A system of this type, denoted a loss-of-control-inhibitor system (LOCIS) can be implemented as a relatively simple addition to almost any pre-existing flight-control system. The LOCIS concept offers at least a partial solution to the problem of (1) keeping a pilot aware of the state of the control system and the aircraft and (2) maintaining sufficient control under conditions that, as described below, have been known to lead to loss of control.