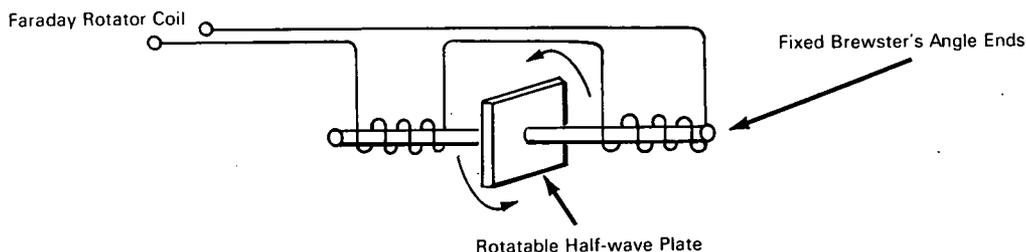


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Nonreciprocal Gain Control for Ring Laser



In a ring laser, the two contracirculating beams may have differing intensities because of the residual Faraday rotation and other secondary nonreciprocal effects. To correct such effects, or to deliberately emphasize them, a nonreciprocal gain control was designed as shown.

A crystal quartz half-wave retardation plate is contained in a rotatable mount. On either side of the half-wave plate are fused silica rods with Brewster's angle ends, and on them is wound a solenoid for producing nonreciprocal Faraday rotation.

In operation, a reciprocal loss is introduced into both beams by rotating the half-wave plate, which rotates the plane of polarization away from that established by the Brewster's angle surfaces elsewhere in the ring. By passing current through the coil, one beam is then rotated in the direction of better alignment to the Brewster surfaces, while the contracirculating beam is further misaligned.

Note:

Inquiries concerning this development may be made to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10653

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Paul Lee and Gordon Dueker
of Perkin-Elmer Corporation
under contract to
Marshall Space Flight Center

(MFS-14041)

Category 02



NASA TECH BRIEF

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Intercept-Beam-Only Optical-Only Relay



The diagram illustrates an intercept-beam-only optical relay system. It shows a transmitter on the left, a relay station in the middle, and a receiver on the right. The transmitter emits a beam that is intercepted by the relay station. The relay station then reflects the beam towards the receiver. The diagram includes various optical components such as lenses, mirrors, and beam splitters, and shows the path of the light beam through the system.

The relay station is positioned at a distance from the transmitter and receiver such that the beam is intercepted and reflected. The system is designed to provide a secure communication link between the transmitter and the receiver. The relay station is capable of intercepting the beam and reflecting it back to the receiver without the need for a direct line of sight between the transmitter and the receiver.

The system is particularly useful in situations where a direct line of sight is not possible or is insecure. It provides a reliable and secure means of communication between the transmitter and the receiver. The relay station is a key component of the system, and its performance is critical to the overall success of the communication link.