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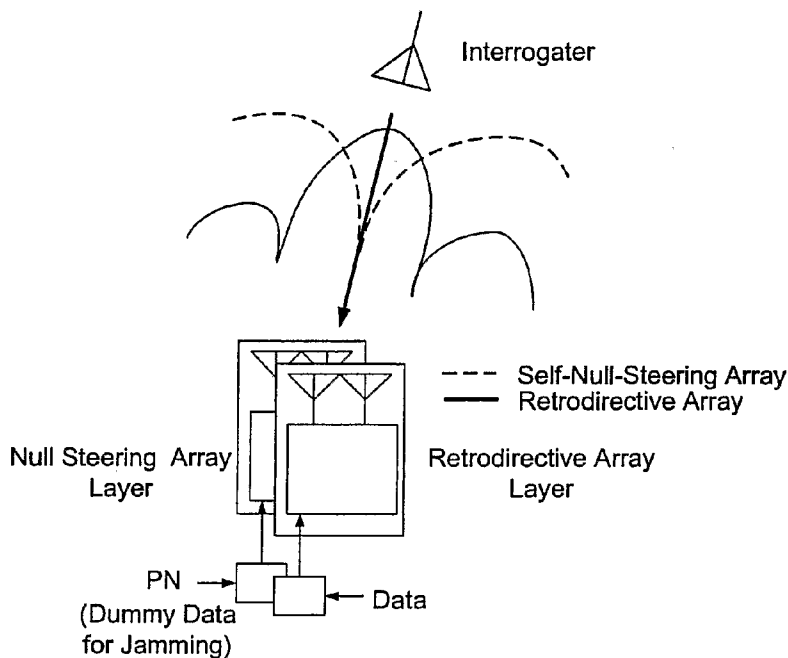
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(54) Title: MICROWAVE SELF-PHASING ANTENNA ARRAYS FOR SECURE DATA TRANSMISSION & SATELLITE NETWORK CROSSLINKS



(57) Abstract: A high-directivity transponder system uses a dual system of a retrodirective array transmitting a data signal peak toward an interrogator source, and a self-null-steering array transmitting a null toward the interrogator source and a jamming signal elsewhere, resulting in high S/N reception at the interrogator source and avoidance of interception. Integrating modulators would allow each array to transmit different data while the spectra of the transmitted signals are identical, thus disabling interception. The system enables secure point-to-point communications and can be used for short-distance wireless data transmission systems such as wireless LAN and RFID servers. As another aspect, self-steering signal transmission is employed for randomly oriented satellites using circularly polarized, two-dimensional retrodirective arrays. Quadruple subharmonic

mixing is used as an effective means of achieving phase conjugation when a high-frequency LO is not feasible or inapplicable. These features may be used for small-satellite communications, secure tactical communications, search and rescue, enemy location fixing and tracking, UAV command and control, forest fire detection, marine-based tracking, and many other applications requiring secure communications with high signal directivity.

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