Abstracts

Digital communications using self-phased arrays (Apr. 2001, Part I [T-MTT])

L.D. DiDomenico and G.M. Rebeiz. "Digital communications using self-phased arrays." 2001 Transactions on Microwave Theory and Techniques 49.4 (Apr. 2001, Part I [T-MTT]): 677-684.

A new technique for full duplex digital communications using adaptive phase conjugation is presented in this paper. The technique is based on mixing the RF signal to an IF where it can be easily processed, and filtering the phase of the IF signal to separate the geometry phase and message phase. The retrodirective array automatically tracks communicating platforms and transmits a directive return signal without the use of phase shifters. A 6-GHz microstrip retrodirective antenna array was built, together with the signal IF processing needed for full duplex operation. The measured RCS values of a linear six-element array are in good agreement with theory and result in a 0- to -5-dB RCS for angles up to /spl plusmn/60/spl deg/. The measured RCS values of a circular array are much flatter and are 0 to -5 dB up to /spl plusmn/80/spl deg/. Two-way digital communications at a baud rate of 78 kb/s was also demonstrated with BER<10/sup -6/ for signal-to-noise ratios around 10 dB. The application areas are in high-performance digital mobile telecommunications for commercial and military applications.

❑ Return to main document.