SEMIANNUAL TECHNICAL REPORT FOR
RESEARCH GRANT FOR
1 JAN 93 TO 30 JUN 93

Grant No: N0001492-J-1218

Grant Title: Exploitation of Cyclostationarity for Signal-Parameter Estimation and System Identification

Principal Investigator: William A. Gardner

Mailing Address: Department of Electrical and Computer Engineering University of California Davis, CA 95616-5294

Phone Number: 916-752-1951 (or -0583)
FAX: 916-752-8428
PROGRESS

There are three particularly notable accomplishments during the present reporting period. The first is the development of a substantial generalization of our SCORE algorithm for blind adaptive spatial filtering to the Programmable Canonical Correlation Analyzer (PCCA) which can exploit any of a number of signal properties to distinguish between signals of interest (to be beamformed on) and signals not of interest (to be nulled out). The second is a new algorithm for blind adaptive channel equalization for PAM and digital QAM signals, and for either single or multiple channels. These two developments are briefly described in [2] and a particularly attractive special case of the blind equalization algorithm for single channels is briefly described in [1]. The substantial performance improvements (acceleration of convergence) attainable with multicycle SCORE, which is one example of PCCA, are described in [3]. The substantial performance improvements (lower BER and lower admissible input SNR) of our blind channel equalizer relative to Tong, Xu, and Kailath's equalizer are described in [2].

The third notable achievement is the completion of the edited volume *Cyclostationarity in Communications and Signal Processing*, [4] being published by IEEE Press this Fall. A table of contents of this volume is enclosed.

In addition, we have continued our work, from earlier periods of support under this contract, on the application of blind adaptive spatio-temporal filtering to mobile cellular radio. We have proposed and simulated a new system concept that provides more capacity than any of its competitors [5]. We shall continue to evaluate this new system design while seeking refinements to further improve performance and/or reduce complexity.
PAPERS AND CHAPTERS PUBLISHED OR IN PRESS, OR SUBMITTED


