



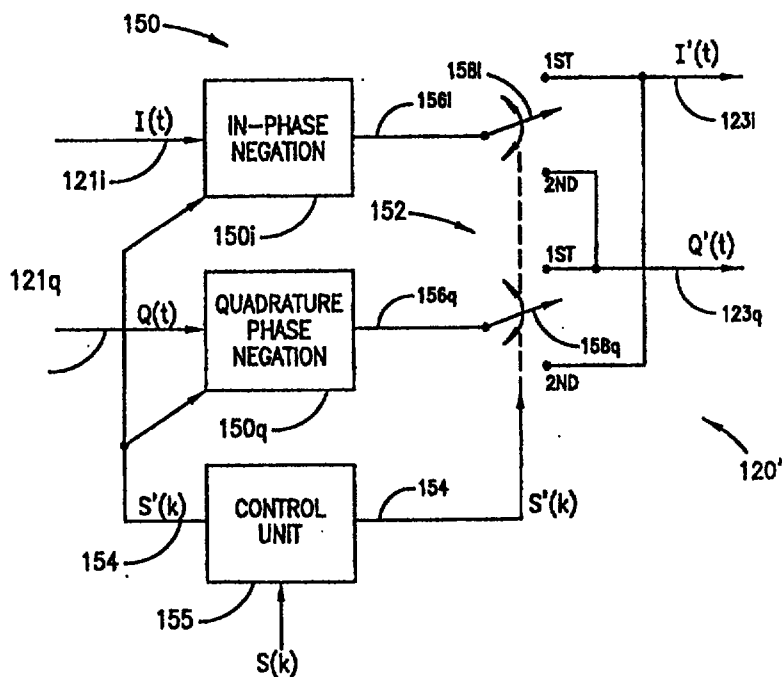
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(21) International Application Number: PCT/US97/19843 (22) International Filing Date: 12 November 1997 (12.11.97) (30) Priority Data: 08/748,755 14 November 1996 (14.11.96) US (71) Applicant: ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US). (72) Inventors: BOTTOMLEY, Gregory, E.; 100 Merlot Court, Cary, NC 27511 (US). RAMESH, Rajaram; 1226 F Hamilton Court, Cary, NC 27511 (US). DENT, Paul, W.; 637 Eaglepoint Road, Pittsboro, NC 27312 (US). CHENNAKESHU, Sandeep; 311 Glen Abbey Drive, Cary, NC 27513 (US). (74) Agents: MOORE, Stanley, R. et al.; Jenkins & Gilchrist, P.C., Suite 3200, 1445 Ross Avenue, Dallas, TX 75202 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>

(54) Title: DESPREADING OF DIRECT SEQUENCE SPREAD SPECTRUM COMMUNICATIONS SIGNALS

(57) Abstract

The disclosure presents a number of reduced complexity architectures for despreading direct sequence spread spectrum communications signals. In a first despreading architecture for a sequence removal unit, received chip-spaced complex samples are negated in accordance with the processed phase of a complex spreading sequence. Furthermore, the in-phase and quadrature phase sample values are switched for each other in accordance with the processed phase. In a second despreading architecture, in a sequence removal unit, received chip-spaced complex samples are processed in the logarithmic domain, with the phase of the complex spreading sequence added to the detected phase, and the resulting complex signal then converted back to Cartesian coordinates. In a third despreading architecture for a correlator, sequence removal and correlation are performed in the logarithmic domain with the amplitudes and phases for the resulting complex signal arithmetically averaged and then converted back to Cartesian coordinates. In a fourth despreading architecture also for a correlator, sequence removal and correlation are performed in the logarithmic domain using circular averaging. In a fifth despreading architecture also for a correlator, wherein multiple component sequences are combined together to form an overall sequence, and wherein one of the multiple component sequences is shared by all channels, a common sequence removal is provided for removal of the shared sequence from all channels. The resulting signals are then sent to a plurality of individual correlators for removal of channel specific sequences.



The disclosure presents a number of reduced complexity architectures for despreading direct sequence spread spectrum communications signals. In a first despreading architecture for a sequence removal unit, received chip-spaced complex samples are negated in accordance with the processed phase of a complex spreading sequence. Furthermore, the in-phase and quadrature phase sample values are switched for each other in accordance with the processed phase. In a second despreading architecture, in a sequence removal unit, received chip-spaced complex samples are processed in the logarithmic domain, with the phase of the complex spreading sequence added to the detected phase, and the resulting complex signal then converted back to Cartesian coordinates. In a third despreading architecture for a correlator, sequence removal and correlation are performed in the logarithmic domain with the amplitudes and phases for the resulting complex signal arithmetically averaged and then converted back to Cartesian coordinates. In a fourth despreading architecture also for a correlator, sequence removal and correlation are performed in the logarithmic domain using circular averaging. In a fifth despreading architecture also for a correlator, wherein multiple component sequences are combined together to form an overall sequence, and wherein one of the multiple component sequences is shared by all channels, a common sequence removal is provided for removal of the shared sequence from all channels. The resulting signals are then sent to a plurality of individual correlators for removal of channel specific sequences.