(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
3 May 2001 (03.05.2001)

PCT

(10) International Publication Number
WO 01/31868 A1

(51) International Patent Classification[7]: H04L 25/49

(21) International Application Number: PCT/IB99/01800

(22) International Filing Date: 28 October 1999 (28.10.1999)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except US)*: **THE NATIONAL UNIVERSITY OF SINGAPORE** [SG/SG]; 10 Kent Ridge Crescent, Singapore 119260 (SG).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **JOE, Jurianto** [ID/SG]; The Centre for Wireless Communications, 20 Science Park Road, #02-34/37, Tele Tech Park, Singapore Science Park II, Singapore 117674 (SG). **LYE, Kin, Mun** [SG/SG]; 335G Pasir Panjang Road, Singapore 118667 (SG).

(74) Agents: **KAZI, Ilya** et al.; Mathys & Squire, 100 Gray's Inn Road, London WC1X 8AL (GB).

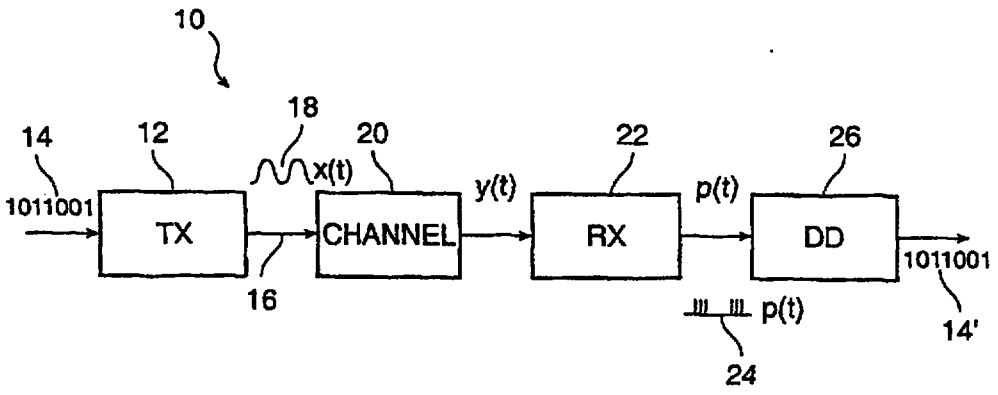
(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR COMMUNICATION USING PULSE DECODING



(57) Abstract: A signal of any physical form corresponding to an information character of an encoding alphabet, is transmitted as an analog waveform defining a symbol, the waveform being cyclical at the symbol rate, to a communication channel and then the signal when received by a receiver is converted to groups of pulses separated by silences, wherein each group of pulses maps to a count corresponding to a character of the encoding alphabet. The groups of pulses are separated by silences of arbitrary duration which are greater than the time between individual pulses. The pulses have a pulse rate greater than the frequency of the symbol. The system permits but does not require communication of relatively narrow bandwidth signals.

WO 01/31868 A1