

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
21 February 2002 (21.02.2002)

PCT

(10) International Publication Number  
WO 02/015503 A3

- (51) International Patent Classification<sup>7</sup>: **H04L 25/03**
- (21) International Application Number: PCT/US01/25434
- (22) International Filing Date: 13 August 2001 (13.08.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
09/639,515 15 August 2000 (15.08.2000) US
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- (81) Designated States (national): CN, JP, US.
- (84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).
- Published:  
— with international search report
- (88) Date of publication of the international search report:  
16 January 2003
- (15) Information about Correction:  
**Previous Correction:**  
see PCT Gazette No. 35/2002 of 29 August 2002, Section II

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: EQUALISER WHICH USES THE LEAST SQUARED ERROR CRITERION

Step	Update Equation	# of Mul
1	$e \leftarrow eps_2 + A_f^T X_f$	$mN$
2	$A_f \leftarrow A_f - K_f e^T$	$mN$
3	$e_p \leftarrow e(1 - K_f^T X_f)$	$N+m$
4	$F_f \leftarrow \lambda F_f + e_p^T$	$m^2$
5	$c_n \leftarrow F_f + e^T F_f e_p$	$2m(m+1)$
6	$F_f \leftarrow F_f - c_n e^T F_f$	$m(m+1)$
7	$b_n \leftarrow K_f + A_f c_n$	$mN$
8	$m \leftarrow [c_n(1:2); b_n(1:N_{ff}-2); t_3(3); b_n(N_{ff}+1:N-1)]$	0
9	$\mu \leftarrow [b_n(N_{ff}-1:N_{ff}); b_n(N)]$	0
10	$X_f \leftarrow [eps_2(1:2); X_f(1:N_{ff}-2); eps_2(3); X_f(N_{ff}+1:N-1)]$	0
11	$\eta \leftarrow \rho_3 + D_f^T X_f$	$mN$
12	$K_f \leftarrow (m - (D_f \mu)) / (1 - \eta^T \mu)$	$(m+1)N+m$
13	$D_f \leftarrow D_f - K_f \eta^T$	$mN$
14	$x_{est} \leftarrow C_f X_f$	$N$
15	$error \leftarrow decision - x_{est}$	0
16	$C_f \leftarrow C_f + error K_f$	$N$
Total complexity		$(6m+4)N+4m^2+5m$

(57) Abstract: A high-speed, broadband wireline modem equaliser is described, which uses the least squared error criterion, rather than the least mean squares criterion.

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INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/25434

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04L25/03

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 581 585 A (EVERITT JAMES W ET AL) 3 December 1996 (1996-12-03) abstract column 2, line 1 - line 11 column 4, line 44 - line 54 claim 1 figure 6	1
Y		2-4, 6, 11
A		5, 7-10, 12-14

Further documents are listed in the continuation of box C.  Patent family members are listed in annex.

° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed
- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search <b>5 August 2002</b>	Date of mailing of the international search report <b>13/08/2002</b>
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer <b>Reilly, D</b>
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## INTERNATIONAL SEARCH REPORT

Intel<sup>®</sup> International Application No  
PCT/US 01/25434

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 428 129 A (TOKYO SHIBAURA ELECTRIC CO) 22 May 1991 (1991-05-22) column 2, line 15 - line 41 column 3, line 27 - line 47 column 6, line 40 -column 7, line 15	2-4, 6, 11
A	---	1, 5, 7-10, 12-14
A	EP 0 880 253 A (LUCENT TECHNOLOGIES INC) 25 November 1998 (1998-11-25) abstract page 3, line 5 - line 21 claims 1-5	1-14
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A	WO 99 39443 A (FEVRIER IAN J ;FITZ MICHAEL P (US); GELFAND SAUL B (US); PURDUE RE) 5 August 1999 (1999-08-05) abstract page 3, line 1 - line 17 page 16, line 17 -page 17, line 6	1-14
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int: International Application No  
PCT/US 01/25434

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