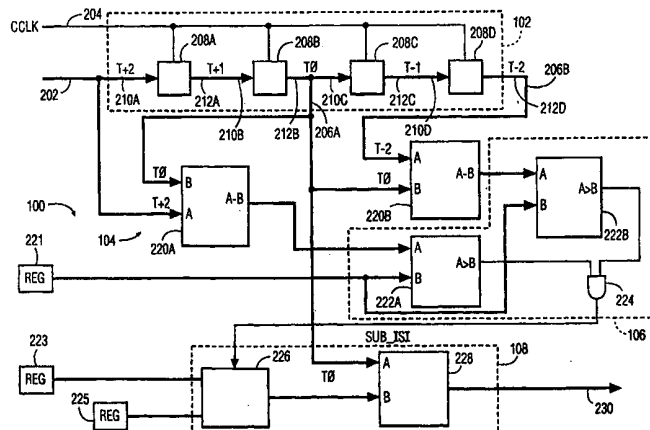




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/IB99/01039</p> <p>(22) International Filing Date: 7 June 1999 (07.06.99)</p> <p>(30) Priority Data: 09/105,856 26 June 1998 (26.06.98) US</p> <p>(71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).</p> <p>(71) Applicant (for SE only): PHILIPS AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE).</p> <p>(72) Inventor: VERBOOM, Johannes, J.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).</p> <p>(74) Agent: FAESSEN, Louis, M., H.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).</p>		<p>(81) Designated States: JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 13 April 2000 (13.04.00)</p>

(54) Title: ADAPTIVE AND SELECTIVE CANCELLATION OF INTER-SYMBOL INTERFERENCE OF A READ CHANNEL IN STORAGE TECHNOLOGIES



## (57) Abstract

A method, circuit and system for cancelling inter-symbol interference from samples of a read signal in storage technologies. A circuit embodying the present invention includes sample logic, arithmetic logic and cancellation logic. The sample logic receives samples and provides a main sample and one or more selected neighbor samples. The arithmetic logic compares the main sample to the neighbor samples toward determining satisfaction of selected cancellation criteria. If the selected cancellation criteria are satisfied, the cancellation logic selectively and adaptively effects ISI cancellation as to the main sample. A method embodying the present invention comprises obtaining an ISI cancellation value in association with a reference field of the read signal; sampling the read signal at channel bit locations to provide a plurality of samples; selecting a main sample from the plurality of samples; selecting one or more neighbor samples from the plurality of samples, the neighbor samples being disposed at predetermined distances, in channel bits, from the main sample; comparing the main sample to each of the neighbor samples to determine satisfaction of selected cancellation criteria; applying, where the cancellation criteria are determined to be satisfied, the ISI cancellation value to the main sample.

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB 99/01039

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
<b>IPC7: G11B 20/10</b> According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
<b>IPC7: G11B, H04L, H03M</b>		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
<b>SE,DK,FI,NO classes as above</b>		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<b>US 5331662 A (LYDIE DESPERBEN ET AL), 19 July 1994 (19.07.94), column 2, line 23 - column 3, line 26, abstract</b>  --	1-19
A	<b>US 4564952 A (PETER D. KARABINIS ET AL), 14 January 1986 (14.01.86), see the whole document</b>  --	1-19
A	<b>Proc. of the International Conference on Communication, 1995, page 647 - 651 "When Can Tentative Decisions be Used to Chanel (Linear or Nonlinear) Intersymbol Interference? (With Application to Magnetic Recording Channels)" Oscar E. Agazzi and Nambi Seshadri</b>  -- -----	1-19
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Information on patent family members

02/12/99

International application No.

PCT/IB 99/01039

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5331662 A	19/07/94	AT 149071 T	15/03/97
		AU 651472 B	21/07/94
		AU 1952392 A	28/01/93
		CA 2074277 A,C	23/01/93
		DE 69217518 D,T	05/06/97
		EP 0524597 A,B	27/01/93
		SE 0524597 T3	
		ES 2098397 T	01/05/97
		FI 923307 A	23/01/93
		FR 2679721 A,B	29/01/93
		JP 5199143 A	06/08/93
		NZ 243590 A	28/08/95
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US 4564952 A	14/01/86	CA 1211812 A	23/09/86
		JP 60141053 A	26/07/85
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