

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 September 2000 (08.09.2000)

PCT

(10) International Publication Number
WO 00/52831 A3

(51) International Patent Classification⁷: G11B 20/18, H03M 13/35, H04L 1/00

(74) Agents: THIBODEAU, David, J., Jr. et al.; Hamilton, Brook, Smith & Reynolds, P.C., Two Militia Drive, Lexington, MA 02421 (US).

(21) International Application Number: PCT/US00/04580

(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, UZ, VN, YU, ZA, ZW.

(22) International Filing Date: 23 February 2000 (23.02.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/263,358 5 March 1999 (05.03.1999) US

(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).

(71) Applicant: TANTIVY COMMUNICATIONS, INC. [US/US]; Suite 300, 2200 Front Street, Melbourne, FL 32901 (US).

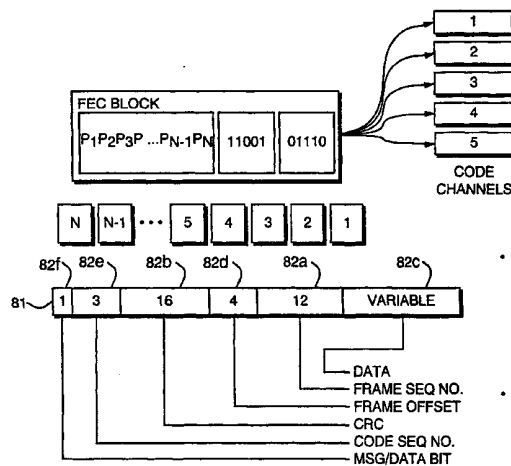
Published:
— With international search report.

(72) Inventors: FERGUSON, Dennis, D.; 315 Triton Court, Indian Harbour Beach, FL 32937 (US). PROCTOR, James, A., Jr.; 440 Mosswood Boulevard, Indialantic, FL 32903-4007 (US).

(88) Date of publication of the international search report:
21 December 2000

[Continued on next page]

(54) Title: FORWARD ERROR CORRECTION ON MULTIPLEXED CDMA CHANNELS ENABLING HIGH PERFORMANCE CODING



- EACH FRAME IS SLICED INTO SEGMENTS AND SEGMENTS CAN BE VARIABLE IN LENGTH ACCORDING TO THE FER. THE MINIMUM SIZE IS 2 BYTES AND THE MAXIMUM IS 512 BYTES. ALL SEGMENTS ACROSS A FRAME ARE EQUAL IN SIZE.

- THE FEC BLOCK IS 4096 BITS (1331 INFORMATION BITS FOR RATE 1/3 TPC) AND IS INDEPENDENT OF THE FRAME SIZE.

(57) Abstract: A protocol for optimizing the use of coded transmissions such as over wireless links. In this technique, interframes are first split into segments selected to be an optimum size according to transmission characteristics of the radio channel. Segments are assigned a position identifier and redundancy check sum. Segments are then assembled into blocks and a forward error correction algorithm is applied to the block to generate redundancy bits. The FEC block is then split up among available communication channels and forwarded to the receiver. The inverse process is applied at the receiver. Using this scheme, only segments containing erroneous data need to be resent. A large block size required for high performance forward error correction may therefore be used while at the same time minimizing latencies associated with the need to resend entire blocks when errors cannot be recovered.



WO 00/52831 A3



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.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/04580

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G11B20/18 H03M13/35 H04L1/00

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 H03M G11B 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, INSPEC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 98 59447 A (TANTIVY COMMUNICATIONS INC) 30 December 1998 (1998-12-30) cited in the application the whole document ---	1,5-8,10
Y	US 5 487 072 A (KANT KRISHNA) 23 January 1996 (1996-01-23) column 5, line 1 -column 9, line 18; figures 1-3 ---	1,5-8,10
A	WO 96 13914 A (POWER SPECTRUM TECH LTD ;SILBERSHATZ GIORA (IL); LUPU VALENTIN (IL) 9 May 1996 (1996-05-09) page 153, line 16 -page 157, line 26; claims 15,16; figures 78-81 --- -/--	1-3,5-7, 10

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

17 August 2000

Date of mailing of the international search report

25/08/2000

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

Devergranne, C

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/04580

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 266 389 A (TEXAS INSTRUMENTS INC) 24 October 1975 (1975-10-24) page 1, line 14 -page 2, line 2 page 61, line 1 -page 65, column 37	1-3,5
A	US 5 699 369 A (GUHA ALOKE) 16 December 1997 (1997-12-16)	

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 00/04580

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9859447 A	30-12-1998	AU 8259198 A	04-01-1999
		AU 8259998 A	04-01-1999
		EP 0990365 A	05-04-2000
		EP 0990354 A	05-04-2000
		NO 996273 A	17-02-2000
		WO 9859523 A	30-12-1998
US 5487072 A	23-01-1996	NONE	
WO 9613914 A	09-05-1996	IL 111340 A	16-08-1998
		AU 4004295 A	23-05-1996
		CA 2200978 A	09-05-1996
		EP 0787386 A	06-08-1997
		AU 4004195 A	23-05-1996
FR 2266389 A	24-10-1975	NONE	
US 5699369 A	16-12-1997	NONE	