



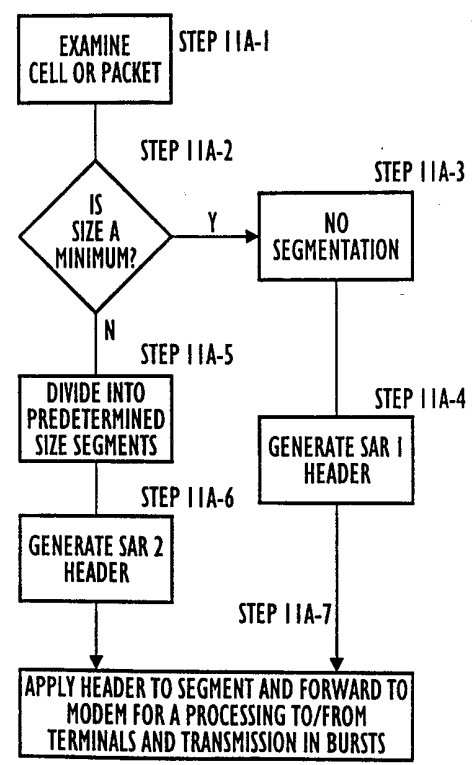
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>H04J 3/26, H04L 12/46, 12/56</b></p>	<p>A3</p>	<p>(11) International Publication Number: <b>WO 99/04521</b> (43) International Publication Date: 28 January 1999 (28.01.99)</p>
<p>(21) International Application Number: PCT/US98/14194 (22) International Filing Date: 15 July 1998 (15.07.98) (30) Priority Data: 60/052,539 15 July 1997 (15.07.97) US (71) Applicant (for all designated States except US): COMSAT CORPORATION [US/US]; 6560 Rock Spring Drive, Bethesda, MD 20817 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): AGARWAL, Anil, K. [US/US]; 409 Midsummer Drive, Gaithersburg, MD 20878 (US). BOKAR, Udayan, Narayan [IN/US]; Apartment 21, 19737 Crystal Rock Drive, Germantown, MD 20874 (US). HARIHARAN, Moorthy, N. [US/US]; 12109 Skip Jack Drive, Germantown, MD 20874 (US). PATANKAR, Shekhar, V. [IN/US]; 19252 Circle Gate Drive #203, Germantown, MD 20874 (US). (74) Agents: KASPER, Alan, J. et al.; Sughrue, Mion, Zinn, MacPeak &amp; Seas, PLLC, Suite 800, 2100 Pennsylvania Avenue, N.W., Washington, DC 20037-3202 (US).</p>	<p>(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, GM, HR, 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, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, 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. (88) Date of publication of the international search report: 8 April 1999 (08.04.99)</p>	

(54) **Titre:** A METHOD AND APPARATUS FOR SEGMENTATION AND REASSEMBLY OF PACKETS/CELLS OVER SATELLITE/WIRELESS NETWORKS

(57) **Abstract**

A method of transmitting information arranged in packets from one location to a second location via a wireless/satellite network, comprising: (a) examining each packet to determine whether its size is equal to a minimum (STEP 11A1) and (STEP 11A2); (b) if a minimum size, generating a first SAR header (STEP 11A4) and applying the header to packet to form a SAR segment (STEP 11A7); (c) if greater than a minimum size, dividing the packet into uniform sized segments (STEP 11A5), generating a second SAR header unique for each segment (STEP 11A6) and applying the header to respective segment to form SAR segments (STEP 11A7); (d) forwarding the SAR segments to modems for transmission to terminals at the second location (STEP 11A7).



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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/14194

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04J 3/26; H04L 12/46; 12/56  
US CL :370/338, 349, 395, 471, 474

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)

U.S. : 370/337, 338, 347, 349, 389, 392, 395, 400, 401, 458, 465, 466, 468, 470, 471, 474, 477

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,535,221 A (HIJIKATA ET AL) 09 July 1996, see col. 2, line 49 to col. 3, line 5, col. 3, lines 32-37.	18-20, 23, 24 ----- 1-17, 21, 22, 25-27
X --- Y	US 5,570,362 A (NISHIMURA) 29 October 1996, see col. 3, line 31 to col. 5, line 54, col. 6, line 32 to col. 7, line 49.	18-20, 23, 24 ----- 1-17, 21, 22, 25-27
Y	US 5,638,371 A (RAYCHAUDHURI ET AL) 10 June 1997, see col. 4, line 36 to col. 6, line 63.	1-17, 25-27

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	*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
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*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

04 DECEMBER 1998

Date of mailing of the international search report

26 JAN 1999

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

*Alpus H. Hsu*  
ALPUS H. HSU

Telephone No. (703) 305-4377

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/14194

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,490,140 A (ABENSOUR ET AL) 06 February 1996, see col. 3, line 14 to col. 5, line 15, col. 7, line 46 to col. 9, line 40.	21, 22
A	US 5,412,655 A (YAMADA ET AL) 02 May 1995, see entire document.	1-27
A	US 5,553,069 A (UENO ET AL) 03 September 1996, see entire document.	1-17, 25-27

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/14194**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/14194

**B. FIELDS SEARCHED**

Electronic data bases consulted (Name of data base and where practicable terms used):

APS search terms: satellite or wireless, local area network or lan, terminal#, packet# or cell#, header, frame(p)assembl?, (segment?(2w)reassembl? or sar), modem, segment#, (identity or identification or id), sequence number, source, destination

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING**

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-22, 25-27, drawn to method and apparatus for transmitting information signals formatted in variable sized packets/cells over satellite/wireless links.

Group II, claim(s) 23 and 24, drawn to a segmentation and reassembly cell data format.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Groups I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP 806.05(c)). In this case, the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and that the subcombination has utility by itself such as a data formatting device.