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61/591,810 27 January 2012 (27.01.2012) US
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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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(54) **Title:** BEAM SWITCHING IN A BENT PIPE SATELLITE FOR REPLACING A FAILING GATEWAY BY A VIRTUAL UTILITY GATEWAY

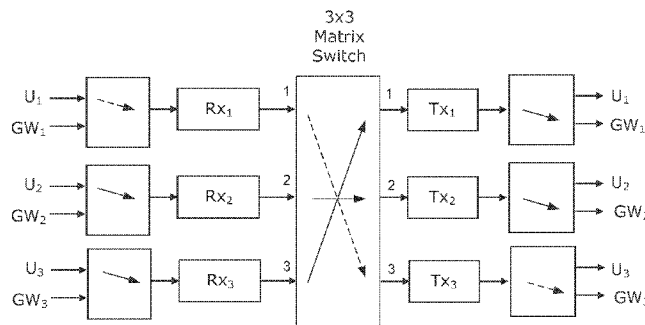
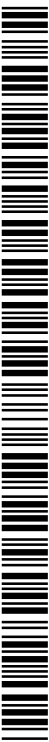


FIG. 7

(57) **Abstract:** A method for communicating includes utilizing a satellite comprising receivers, transmitters, transmit switches, and a gateway switch structure. Prior to a time T, each of at least P receivers are used to receive one of at least P signals from P gateway terminals. During one frame, the gateway switch structure is used to switch the at least P signals to the plurality of transmit switches. Each of the at least P signals are switched into fixed location beams. After time T and before a time T2, each of at least Q receivers are used to receive a different one of at least Q signals from Q gateway terminals. During one frame, the gateway switch structure is used to switch the at least Q signals to the plurality of transmit switches. Each of the at least Q signals are switched into fixed location beams. Q and P are non-zero positive integers and Q < P.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/068464

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04B7/185 H04B7/204
ADD.
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)
H04B

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 practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2008/027974 A2 (WILDBLUE COMMUNICATIONS INC [US]; HUDSON ERWIN C [US]; MARTIN REMBERTO) 6 March 2008 (2008-03-06) page 18, line 30 - page 25, line 21; figures 4-8	1-23
A	WO 2009/021238 A1 (VIASAT INC [US]; TREESH FREDERICK [US]; MILLER MARK J [US]) 12 February 2009 (2009-02-12) claims 1-22	1-23
A	EP 1 478 195 A1 (CIT ALCATEL [FR] ALCATEL LUCENT [FR]) 17 November 2004 (2004-11-17) claims 1-38	1-23
A	EP 1 328 073 A2 (TRW INC [US]) 16 July 2003 (2003-07-16) claims 1-12; figure 3	1-23
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Further documents are listed in the continuation of Box C.

See patent family 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 application or patent 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 9 April 2013	Date of mailing of the international search report 12/08/2013
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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, Fax: (+31-70) 340-3016	Authorized officer Bischof, Jean-Louis
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/068464

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional 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 fees, this Authority did not invite payment of additional fees.
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.:

1-23

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/068464

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 377 561 B1 (BLACK COLIN J [CA] ET AL) 23 April 2002 (2002-04-23) column 2, line 51 - column 4, line 8 -----	1-23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/068464

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO 2008027974	A2	06-03-2008	EP 2060024 A2	20-05-2009
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			US 2003134635 A1	17-07-2003

US 6377561	B1	23-04-2002	NONE	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23

A method, satellite communication system and a satellite for communicating using a satellite having a forward link capability.

2. claims: 24-26

A satellite for providing virtual utility gateway capability.
