

REVERSE LINK FOR A SATELLITE COMMUNICATION NETWORK

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The present invention is a return link for a satellite communication system. The return link described herein is suitable for use in any type of communications network such as networks used for Internet access purposes. The return link in combination with a forward link forms a complete two-way communication system via satellite. The return link comprises two separate communication schemes used in combination to implement the return link of the satellite system. The first communication scheme uses a random access method based on a non-synchronous frequency hopping code division multiple access technique (NS/FH/CDMA). The second communication scheme uses a channel assignment method based on a frequency division multiple access (FDMA) technique.; Data generated by a user is transmitted utilizing one of the two communication schemes in accordance with the content and amount of data generated. Messages requiring a relatively low transmission rate, such as short Sursty messages, utilize the random access transmission method. On the other hand, messages requiring a higher transmission rate, such as video conferencing utilize the channel assignment method.

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<p>(21) International Application Number: PCT/IL98/00542</p> <p>(22) International Filing Date: 8 November 1998 (08.11.98)</p> <p>(30) Priority Data: 08/970,922 14 November 1997 (14.11.97) US</p> <p>(71) Applicant (for all designated States except US): SHIRON SATELLITE COMMUNICATIONS (1996) LTD. [IL/IL]; Kiryat Sefer Street 14, 61520 Tel Aviv (IL).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): REICHMAN, Arie [IL/IL]; Bar Ilan Street 3, 44378 Kfar Saba (IL). LAUFER, Shaul [IL/IL]; Onkelus Street 7, 62916 Tel Aviv (IL). BARDA, Avi [IL/IL]; Magdiel Drive 56, 45342 Hod Hasharon (IL). GOLDENBERG, Sorin [IL/IL]; Shimoni Street 39, 92623 Jerusalem (IL).</p> <p>(74) Agent: EITAN, PEARL, LATZER &amp; COHEN-ZEDEK; Advocates, Notaries and Patent Attorneys, Gav Yam Center 2, Shenkar Street 7, 46725 Herzlia (IL).</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, GD, 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).</p> <p><b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i></p>
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<p>The diagram illustrates a satellite communication system. At the top, a satellite (17) is shown with multiple beams directed towards two ground stations (18 and 22). These ground stations are connected to two separate communication networks, NETWORK A and NETWORK B. NETWORK A includes a ground station (18) and several user terminals (20). NETWORK B includes a ground station (22) and several user terminals (24). Both networks are connected to the Internet (16) via a return link (12 and 14). The return link (12) connects NETWORK A to the Internet, and the return link (14) connects NETWORK B to the Internet. The satellite (17) is also connected to the Internet (16) via a return link (16).</p>		
<p>(57) Abstract</p> <p>The present invention is a return link for a satellite communication system. The return link described herein is suitable for use in any type of communications network such as networks used for Internet access purposes. The return link in combination with a forward link forms a complete two-way communication system via satellite. The return link comprises two separate communication schemes used in combination to implement the return link of the satellite system. The first communication scheme uses a random access method based on a non-synchronous frequency hopping code division multiple access technique (NS/FH/CDMA). The second communication scheme uses a channel assignment method based on a frequency division multiple access (FDMA) technique. Data generated by a user is transmitted utilizing one of the two communication schemes in accordance with the content and amount of data generated. Messages requiring a relatively low transmission rate, such as short Sursty messages, utilize the random access transmission method. On the other hand, messages requiring a higher transmission rate, such as video conferencing utilize the channel assignment method.</p>		

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## REVERSE LINK FOR A SATELLITE COMMUNICATION NETWORK

### FIELD OF THE INVENTION

5           The present invention relates generally to satellite communications and more particularly relates to a satellite based multiple access reverse communication link suitable for an Internet access network.

### BACKGROUND OF THE INVENTION

10           Currently, communication systems around the world are growing rapidly due to the increasing need for data communication bandwidth. In particular, satellite communication systems are currently experiencing rapid growth due to growing customer demand for satellite based data communications. Most of the current demand and estimated future demand will be for Internet and other network based data communication applications. A major factor in these  
15           communication systems is the bandwidth capacity demanded by the user. Applications in widespread use today, such as video conferencing, LAN/WAN and document delivery require high speed forward and return link data capacities. Currently, however, these capabilities are not provided by present day Internet via satellite systems.

20           It is currently estimated that there are approximately 13 million hosts and 25 million users on the Internet. The growth rate has been approximately 3 million new users a year for the past four years. At the same time, the number of Intranets (Internet network protocols applied within an enterprise or company for sharing information) are growing at an even faster rate. Currently, accessing the  
25           Internet via satellite has gained recognition as a fast and reliable solution for fast Internet access. Current commercially available Internet via satellite solutions such as DirecPC are based on an asymmetrical approach in which the data link to the user is via satellite while the return link from the user is via telephone lines

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