

[54] METHOD AND APPARATUS FOR MAXIMIZING THE TRANSMISSION CAPACITY OF A MULTI-CHANNEL BIDIRECTIONAL COMMUNICATIONS LINK

[75] Inventors: Wayne D. Grover; Tommy Fong, both of Edmonton; Joe P. Dubuc, Sherwood Park; Witold A. Krzymien, Edmonton; George D. Fraser, Sherwood Park, all of Canada

[73] Assignee: Alberta Telecommunications Research Centre, Edmonton, Canada

[21] Appl. No.: 329,271

[22] Filed: Mar. 27, 1989

[51] Int. Cl.⁵ H04J 3/22; H04J 3/12

[52] U.S. Cl. 370/84; 370/118; 370/13

[58] Field of Search 370/84, 13, 118; 375/7, 375/8, 10

[56] References Cited

U.S. PATENT DOCUMENTS

4,756,007 7/1988 Qureshi et al. 370/84
4,902,189 1/1989 Wedler 370/84

FOREIGN PATENT DOCUMENTS

0112953 12/1982 European Pat. Off. 370/84

OTHER PUBLICATIONS

Bingham, John A. C., The Theory and Practice of Modem Design, Wiley Interscience.
Ohashi et al., Development of a Variable Rate Syndrome Sequential Decoder Based on a Stack Algorithm, Globecom 1988.
Otani et al., Development of Variable-Rate Digital

Modem for Digital Satellite Communication Systems, Globecom 1988.

Kamisaka et al., A Digital Modulator VLSI Covering Various Modulation Techniques and Wide Range Data Speeds, Globecom 1988.

Stuber et al., An Adaptive Rate Algorithm for FH/BFSK Signaling, IEEE Transactions on Communications, vol. 36, No. 12, Dec. 1988.

Maseng, Torleiv and Trandem, Odd, Adaptive Digital Phase Modulation, Nordic NTA Proceedings, Oct. 14-16, 1986.

Literature and Patent Search for ATRC "Turbo-Loop", project, Conducted on Apr. 22, 1988 by Erick Eid, Ven-Tel Pathfinder 18K brochure.

Primary Examiner—Douglas W. Olms
Assistant Examiner—Min Jung
Attorney, Agent, or Firm—Hayes, Soloway, Hennessey & Hage

[57] ABSTRACT

A method for determining the highest, common bi-directional transmission rate between two stations of an ISDN communications link includes the steps of a) selecting a candidate transmission rate from a range of candidate transmission rates, b) transmitting a test signal at the candidate transmission rate through an attenuator along the link from one of the stations to the other of the stations for a first predetermined time interval, c) determining whether a return signal transmitted by the other station over the link and at the candidate transmission rate has been correctly received at the one station, d) repeating steps a), b) and c) until predetermined criteria have been satisfied; and e) storing the highest candidate transmission rate for which a return signal at that rate was correctly received within the first time interval; and f) removing the attenuator for final verification of operation.

18 Claims, 8 Drawing Sheets

