United States Patent [19]

Crandall et al.

[54] **DC-FREE LINE CODE FOR ARBITRARY DATA TRANSMISSION**

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[57] **ABSTRACT**

Means and structure for encoding binary data ensures that, on average, the encoded data provides a balanced data stream having an equal number of logical one and logical zero bits. An indicator bit of known value is appended to N data bits, forming a group of N+1 bits. The polarity of this group is determined, i.e. whether the group contains more ones than zeros. The cumulative polarity of all bits sent over the communication link is also maintained. When the polarity of the group is the same as the cumulative polarity, all bits in the group are inverted and the inverted group is transmitted. Otherwise the bits in the group are transmitted in their original form. To decode the transmitted bits, the bit stream is framed to separate each series of N+1 bits. The value of the indicator bit on the receiver side of the communication link indicates whether the group has been inverted. If the group has been inverted, it is reinverted on the receiver side of the link to provide the N data bits in their original form. Conversely, if the group has not been inverted, it is not reinverted on the receiver side of the link to provide the N data bits in their original form. In alternative embodiments, additional bits are appended to the N data bits and the indicator bit in order to allow transmission of additional information.

18 Claims, 11 Drawing Sheets