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**Walton et al.**

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(54) **TRANSMISSION MODE SELECTION FOR DATA TRANSMISSION IN A MULTI-CHANNEL COMMUNICATION SYSTEM**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1451 days.

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(51) **Int. Cl.**  
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**H04B 7/185** (2006.01)  
**H04M 1/00** (2006.01)  
**H04K 1/10** (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.** ..... **370/329**; 370/341; 455/226.3; 455/13.3; 455/562.1; 375/260

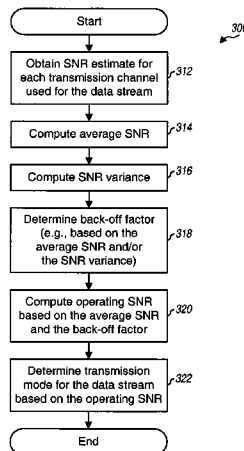
Techniques to select a suitable transmission mode for a data transmission in a multi-channel communication system with multiple transmission channels having varying SNRs. In one method, an SNR estimate is initially obtained for each of multiple transmission channels used to transmit a data stream. An average SNR and an unbiased variance are then computed for the SNR estimates for the multiple transmission channels. A back-off factor is determined, for example, based on the SNR variance and a scaling factor. An operating SNR for the transmission channels is next computed based on the average SNR and the back-off factor. The transmission mode is then selected for the data stream based on the operating SNR. The selected transmission mode is associated with a highest required SNR that is less than or equal to the operating SNR. The method may be used for any system with multiple transmission channels having varying SNRs.

(58) **Field of Classification Search** ..... 370/332, 370/329, 334, 437, 341; 455/226.3, 13.3, 455/277.2, 693, 63.1, 562.1; 375/260  
See application file for complete search history.

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**20 Claims, 11 Drawing Sheets**



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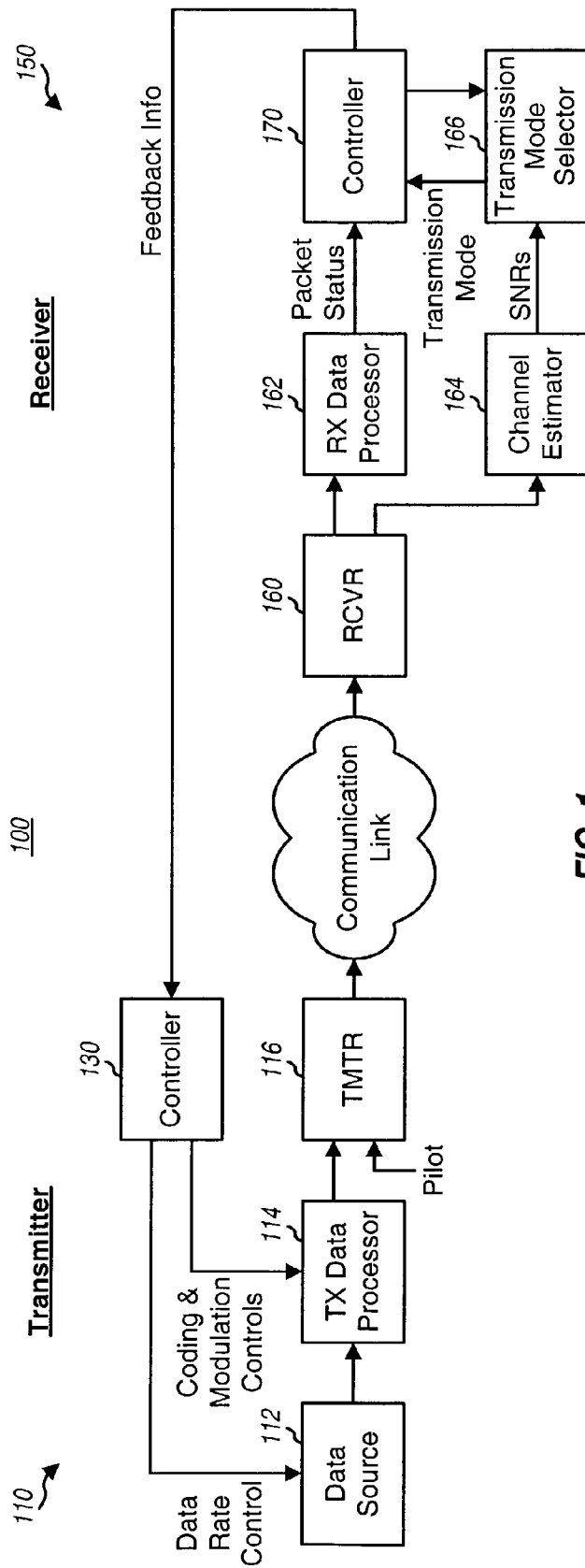


FIG. 1

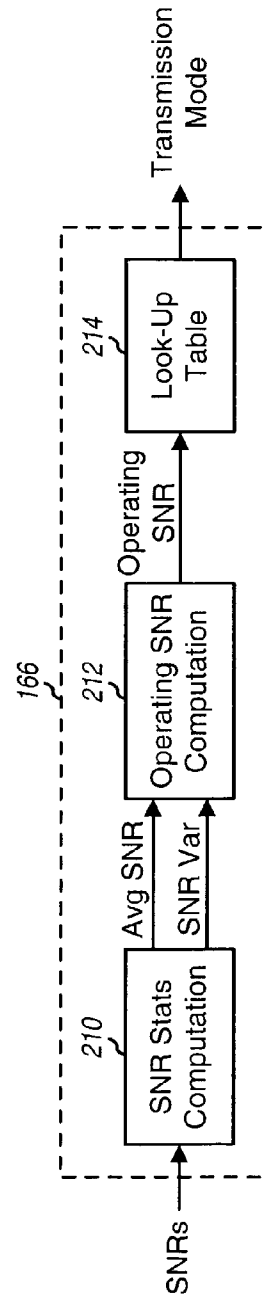
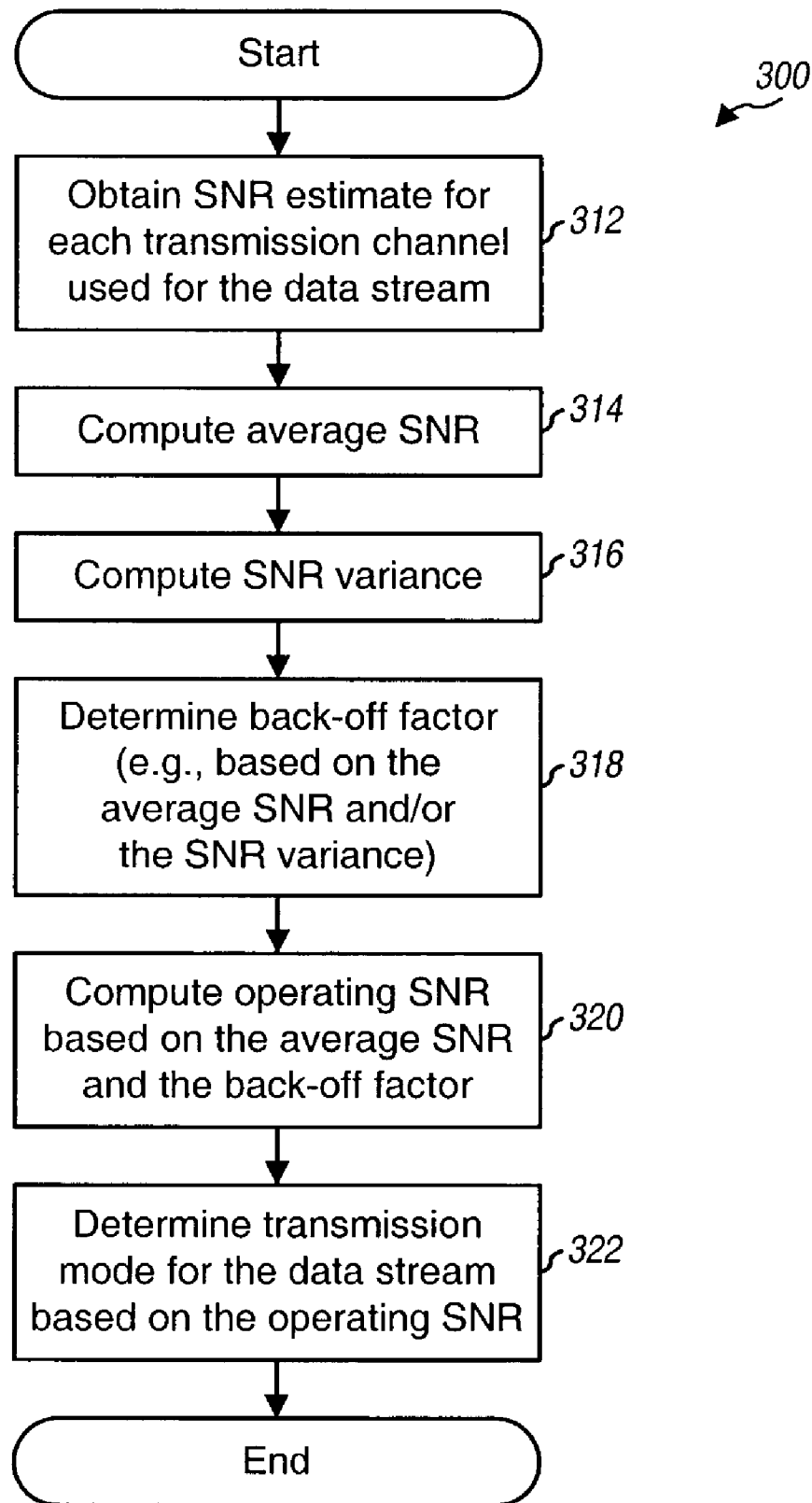


FIG. 2



**FIG. 3**

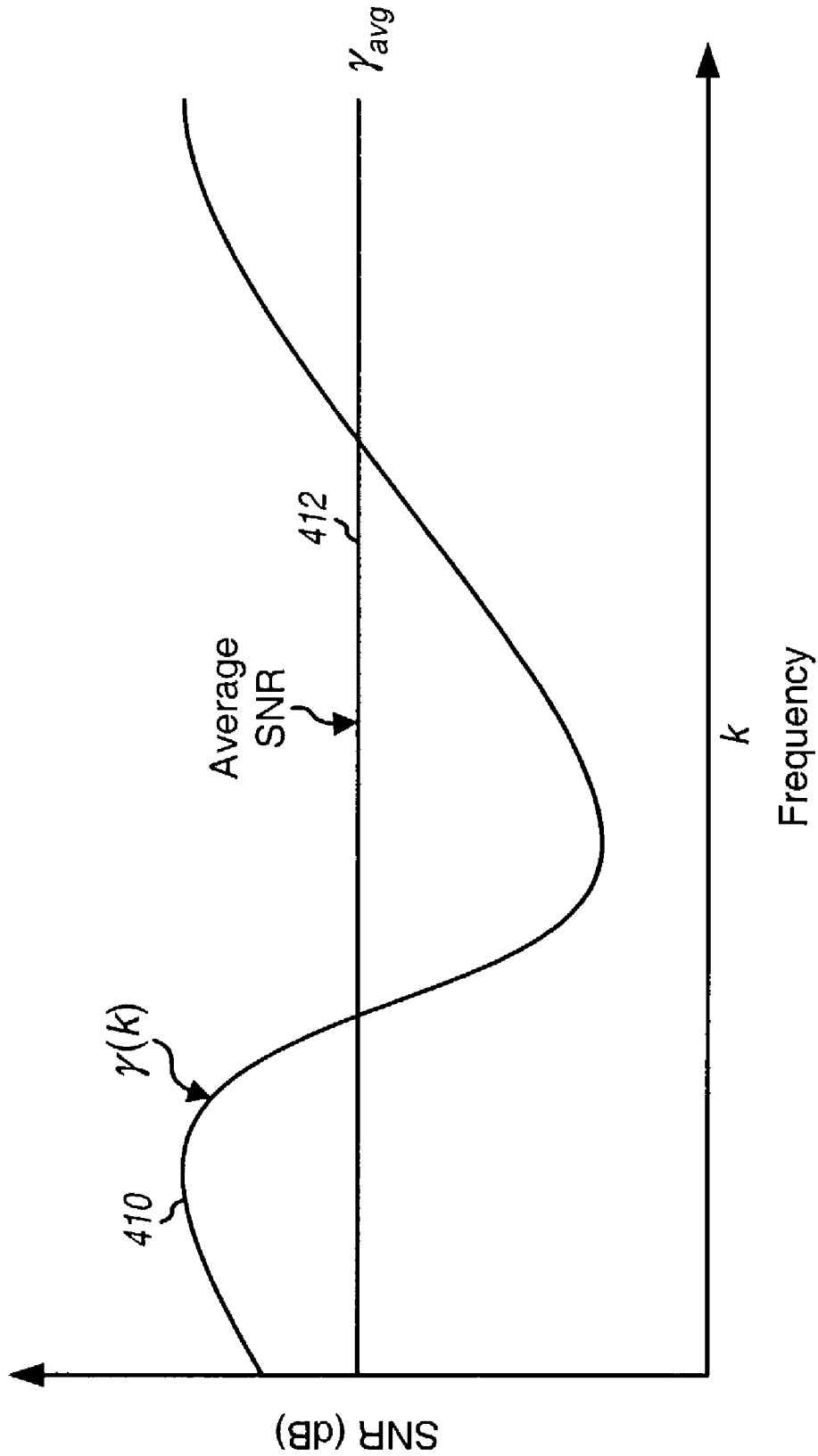


FIG. 4

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