



(12) **United States Patent**
Walton et al.

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

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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

(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.

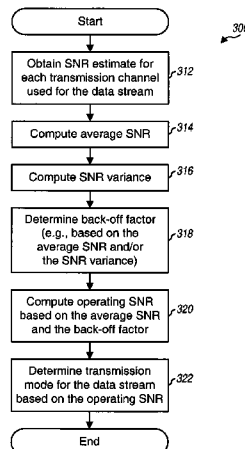
Techniques to select a suitable transmission mode for a data transmission in a multi-channel communication system with multiple transmission channels having varying SNRs. In one method, an SNR estimate is initially obtained for each of multiple transmission channels used to transmit a data stream. An 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.

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20 Claims, 11 Drawing Sheets



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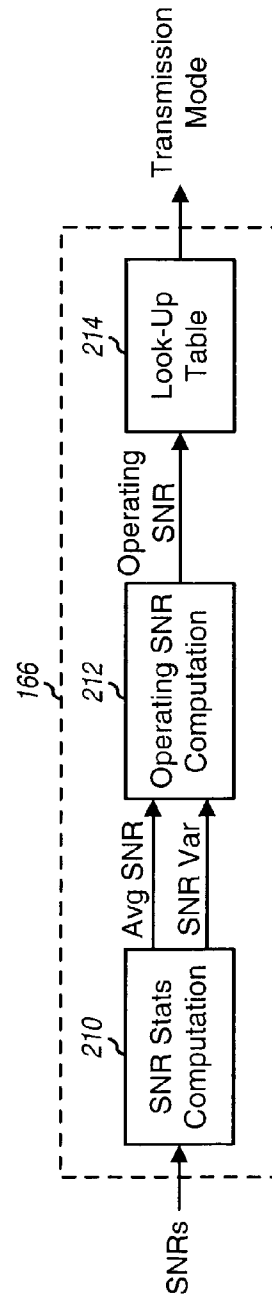
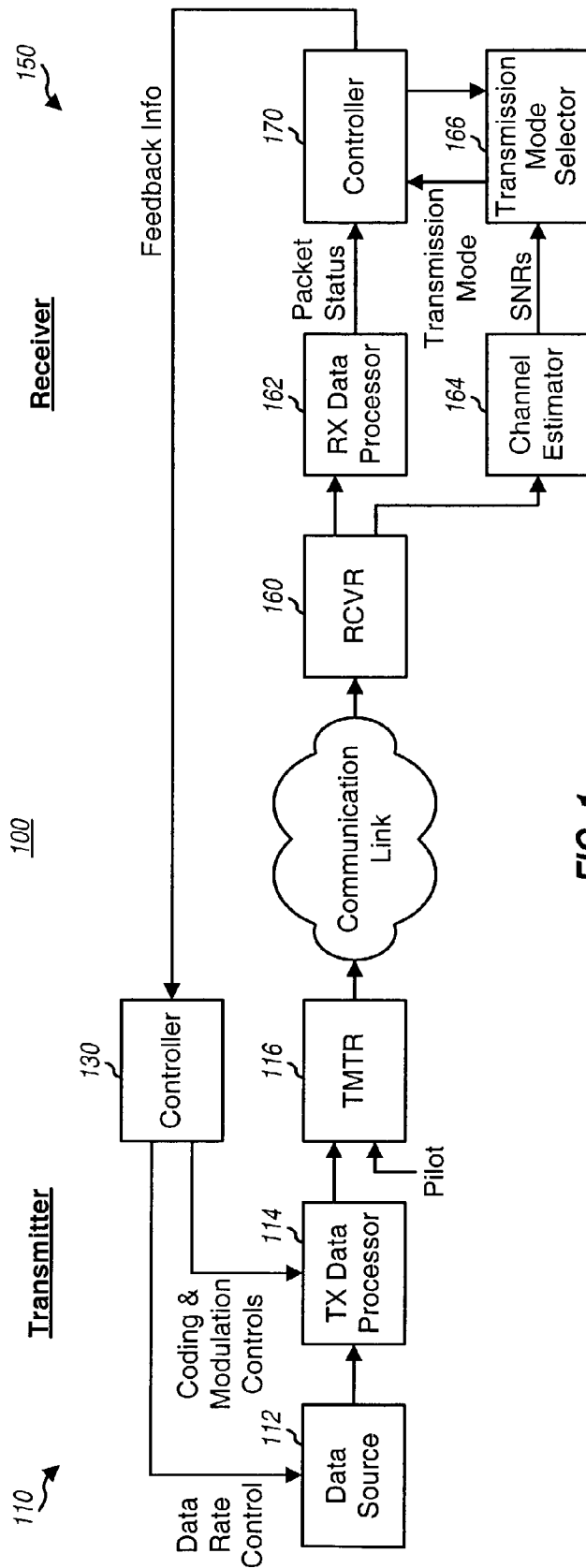
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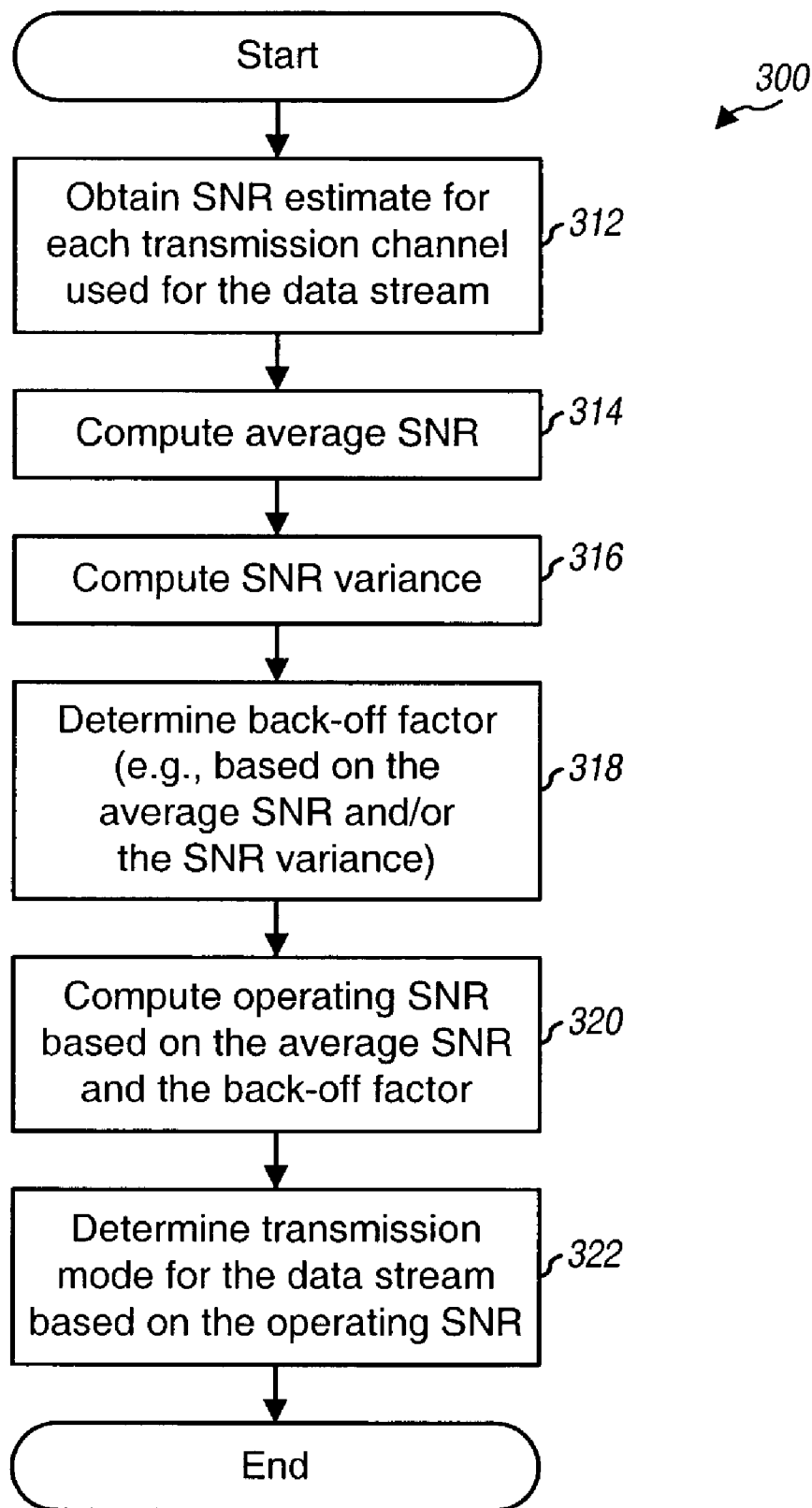
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**FIG. 3**

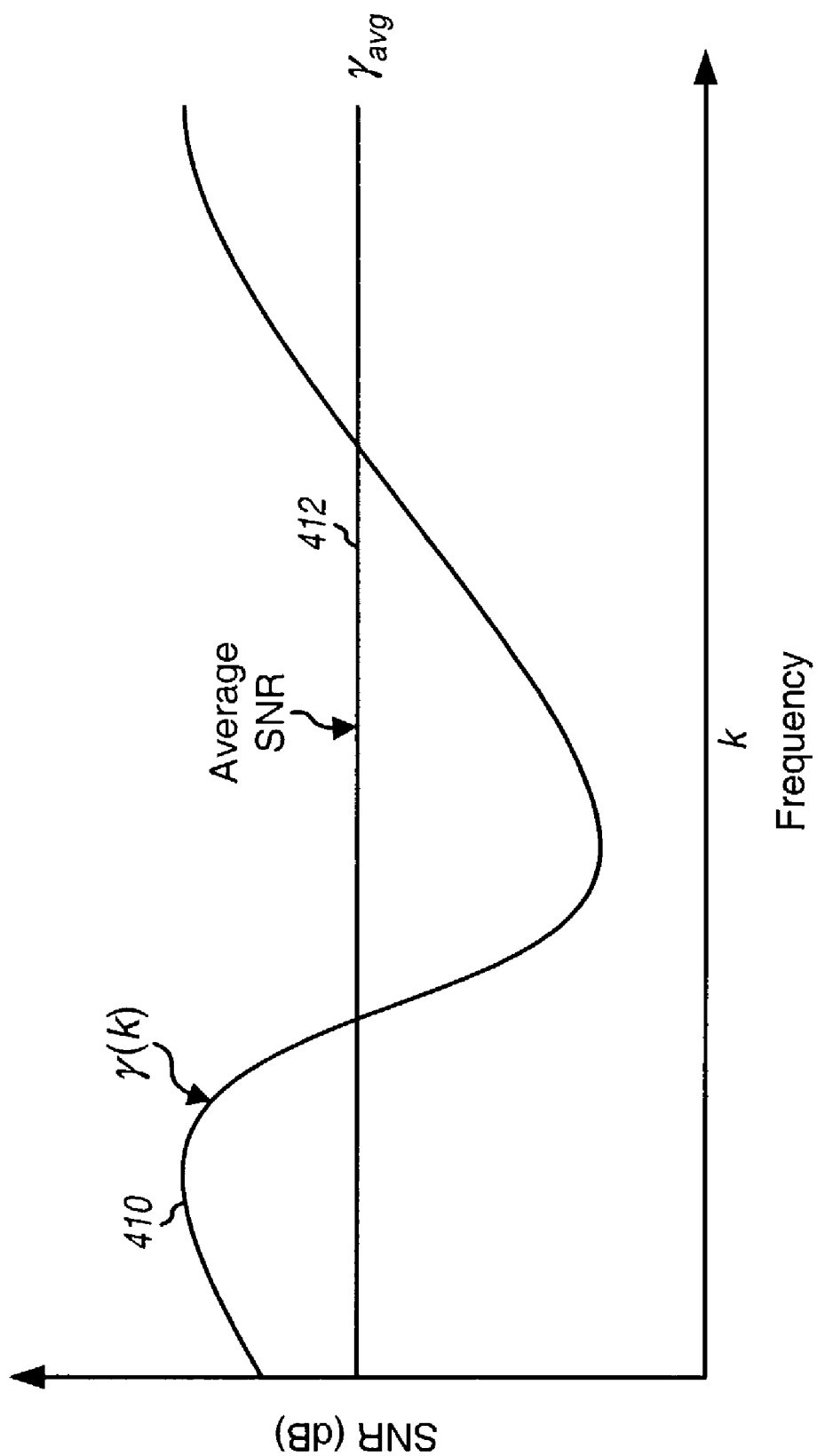


FIG. 4

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