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Tong et al.

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(54) **MULTI-BIT POWER CONTROL AND POWER CONTROL COMMAND SUB-CHANNEL DESIGN**

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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 0 days.

This patent is subject to a terminal disclaimer.

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(52) **U.S. Cl.** **455/522**; 455/13.4; 370/318

(58) **Field of Search** 455/68, 69, 70, 455/522, 127, 13.4; 370/342, 318, 320, 468; 375/244, 312, 329, 330, 308

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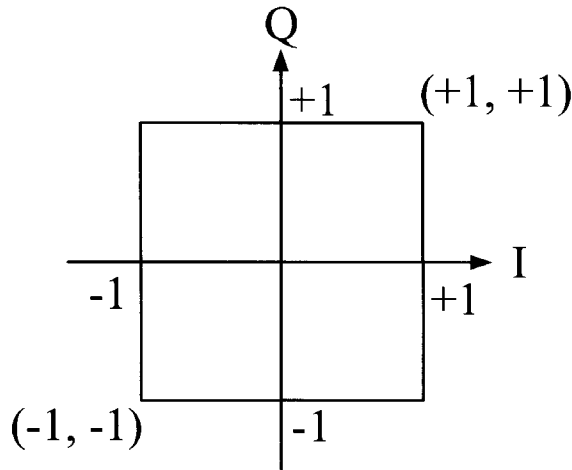
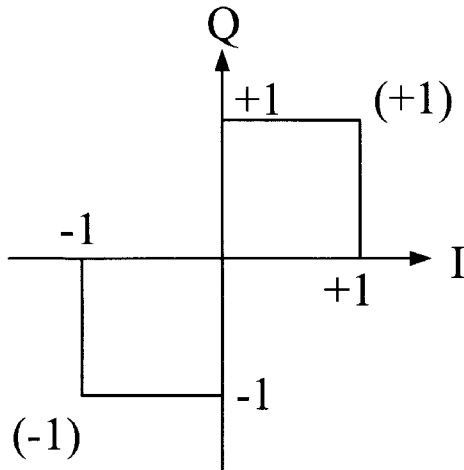
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(57) **ABSTRACT**

The invention provides a system and method for controlling transmission power of a mobile unit in a wireless communication system which minimizes transmission power overshoot caused by counteracting the effects of deep fading. Sets of power control bits are transmitted from the base station to the mobile unit using $\pi/4$ DQPSK modulation. A first set of the bits indicates to the mobile unit a request to increase the mobile units transmission power by a predetermined amount. A second set of the bits indicates to the mobile unit that the mobile unit should increase its transmission power by an amount which is greater than the predetermined amount. A third set of the bits indicates to the mobile unit a request to decrease the mobile units transmission power by the predetermined amount. A fourth set of the bits indicates to the mobile unit that the mobile unit should decrease its transmission power by the amount which is greater than the predetermined amount.

23 Claims, 4 Drawing Sheets



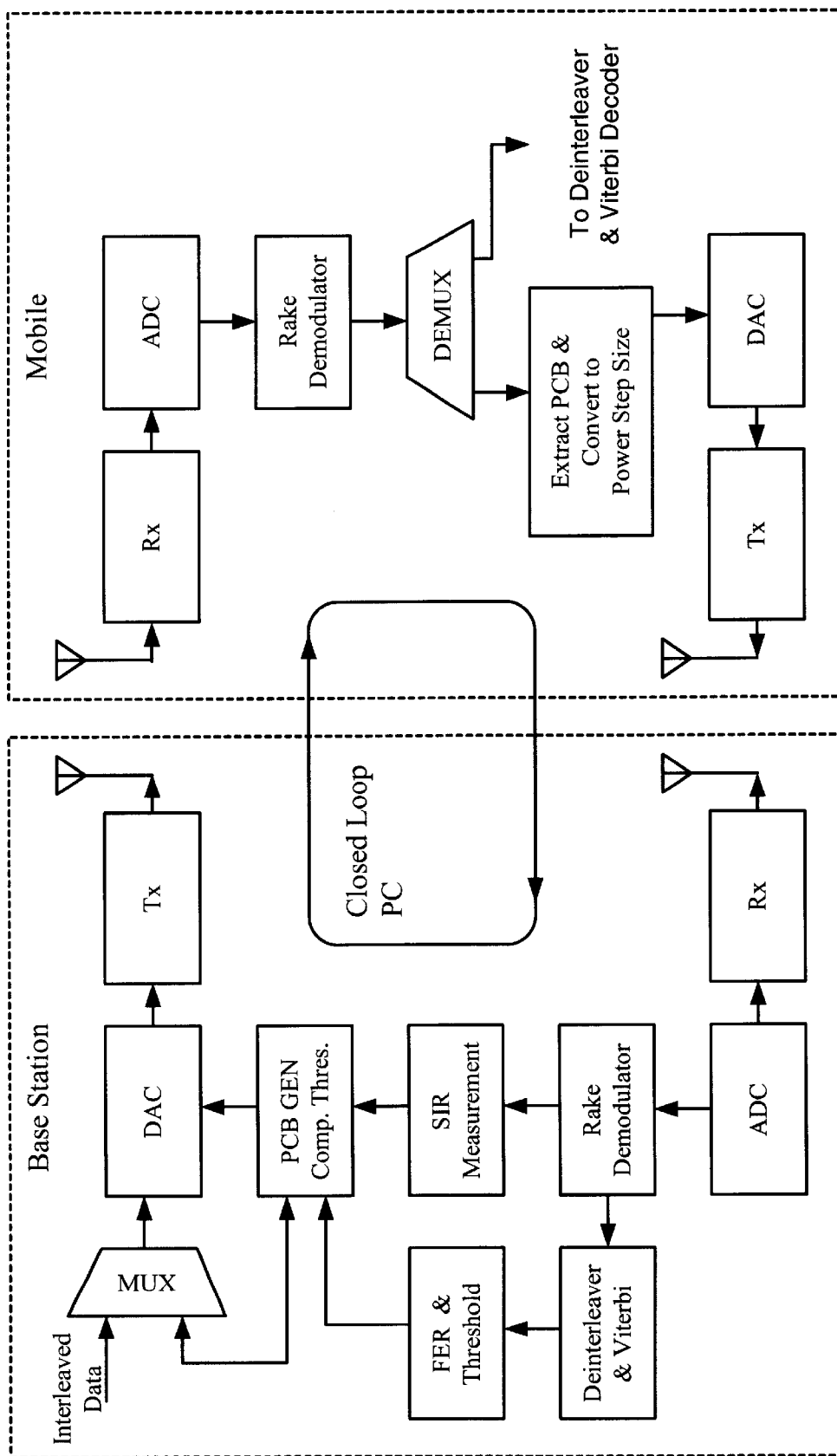
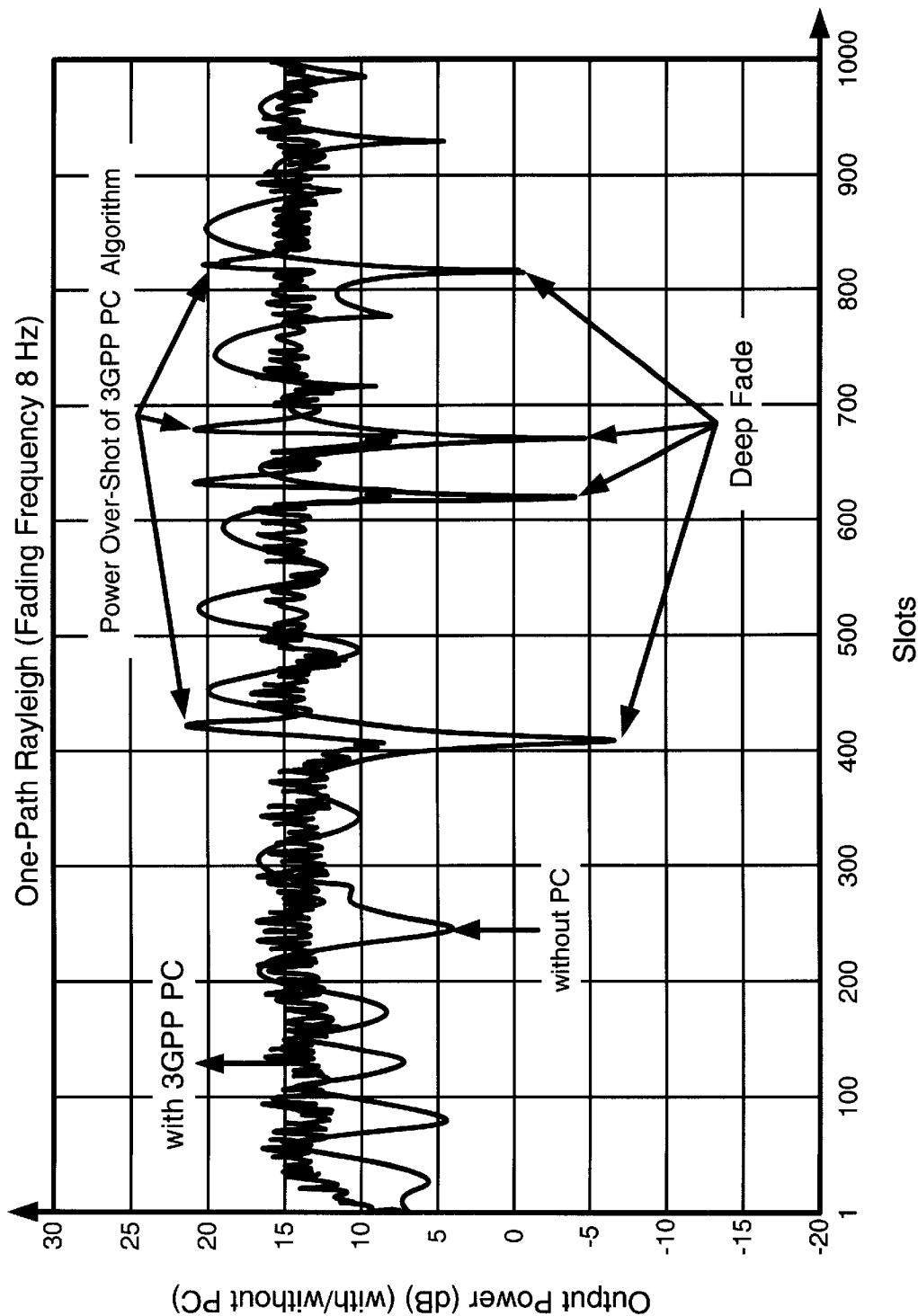


FIG. 1 (PRIOR ART)

Figure 2. 3GPP Closed Loop Power Control Algorithm



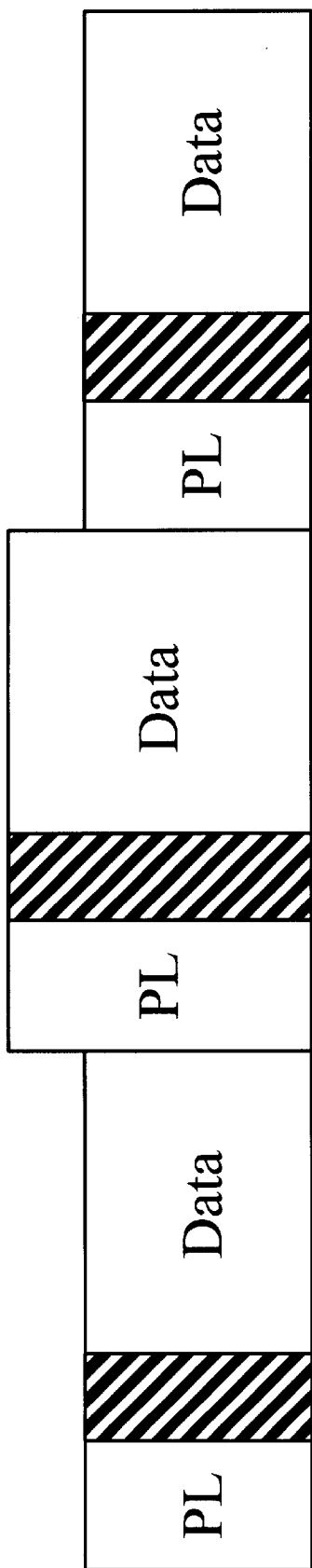


FIG. 3a
(Prior Art)

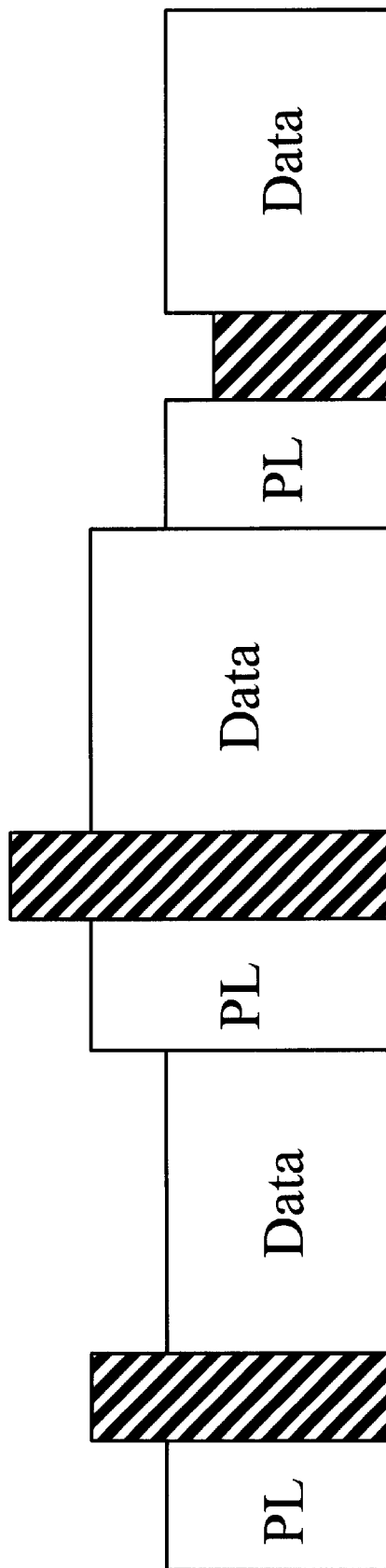


FIG. 3b
(Prior Art)

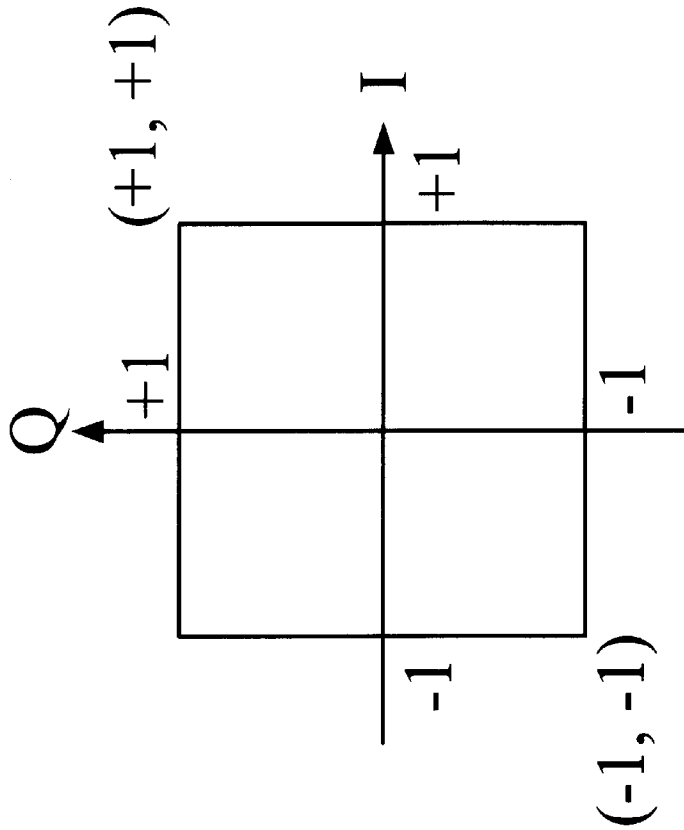


FIG 4b

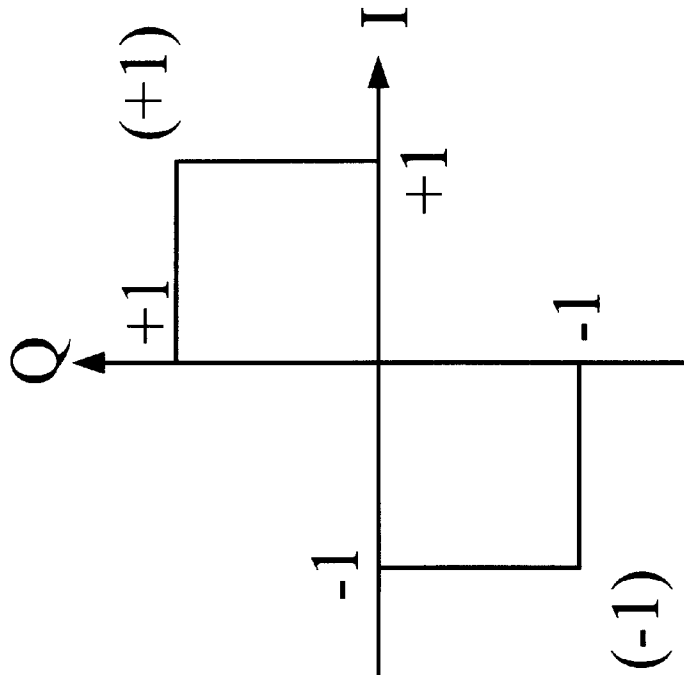


FIG 4a

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