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Ling et al.

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(54) **LOW-COMPLEXITY ANTENNA DIVERSITY RECEIVER**

(75) Inventors: **Curtis Chih-Shan Ling**, Kowloon (HK); **Justin C-I. Chuang**, Holmdel, NJ (US); **Zhang Chunning**, Clear Water Bay (HK)

(73) Assignee: **The Hong Kong University of Science and Technology** (HK)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

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(52) U.S. Cl. **370/347; 375/347; 455/277.2**

(58) **Field of Search** 370/347, 321; 375/345, 346, 347, 348, 349, 366; 455/133, 134, 135, 136, 137, 138, 139, 277.1, 277.2, 278.1, 273, 276.1, 304, 101, 67.1, 67.2, 67.3, 226.1–226.3

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Primary Examiner—Chi H. Pham

Assistant Examiner—Steven Nguyen

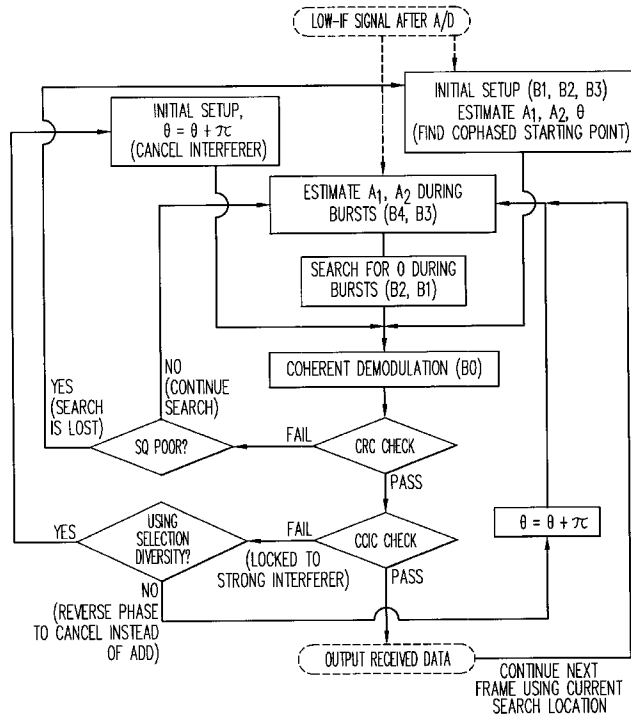
(74) *Attorney, Agent, or Firm*—Burns, Doane, Swecker & Mathis, L.L.P.

(57) **ABSTRACT**

A low-diversity antenna diversity receiver suitable for TDMA PCS handset implementation employing two diversity branches. The receiver is capable of selecting a diversity scheme which is anticipated to give optimum signal reception among a plurality of diversity schemes installed on the receiver. This receiver, more conveniently termed multi-diversity receiver comprises a single conventional wireless digital receiver chain augmented with a few additional low-cost passive RF components and minor control circuits. A plurality of diversity algorithms, for example, selection diversity (SD), equal-gain combining (EGC) or interference-reduction combining (IRC) scheme, which are suitable for implementing on this multi-diversity receiver are also described. Simulation results showing performance of this multi-diversity receiver are also presented.

16 Claims, 5 Drawing Sheets

THE IRC ALGORITHM WITH TWO ANTENNAS



BLOCK DIAGRAM OF THE TWO-BRANCH ANTENNA MULTI-DIVERSITY RECEIVER.

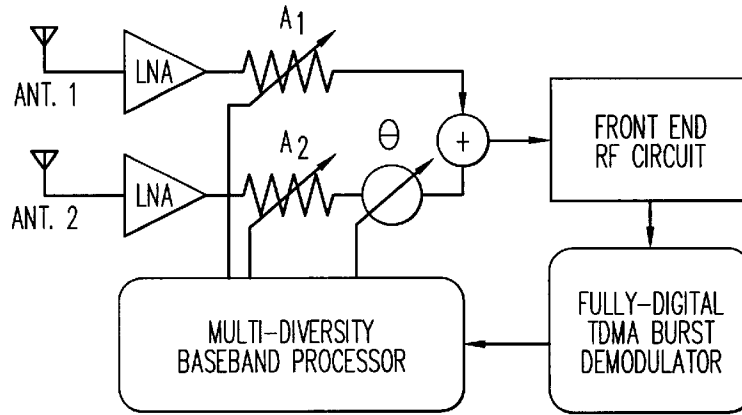
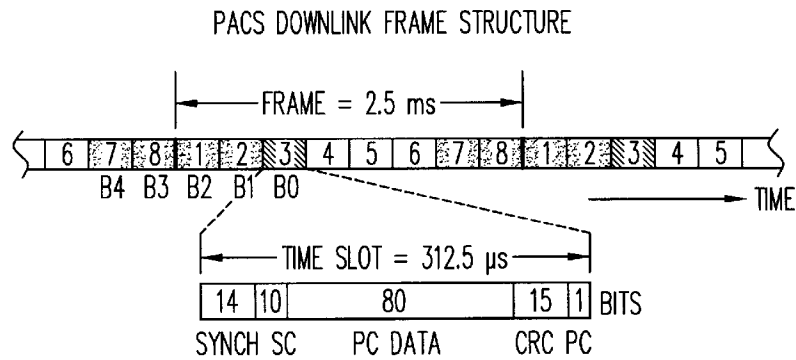


FIG. 1



SYNCH: SYNCHRONOUS BITS
CRC: ERROR DETECTION

SC: SYSTEM CONTROL AND SUPERVISORY BITS
PC: POWER CONTROL

FC: FAST CHANNEL DATA

FIG. 2

THE IRC ALGORITHM WITH TWO ANTENNAS

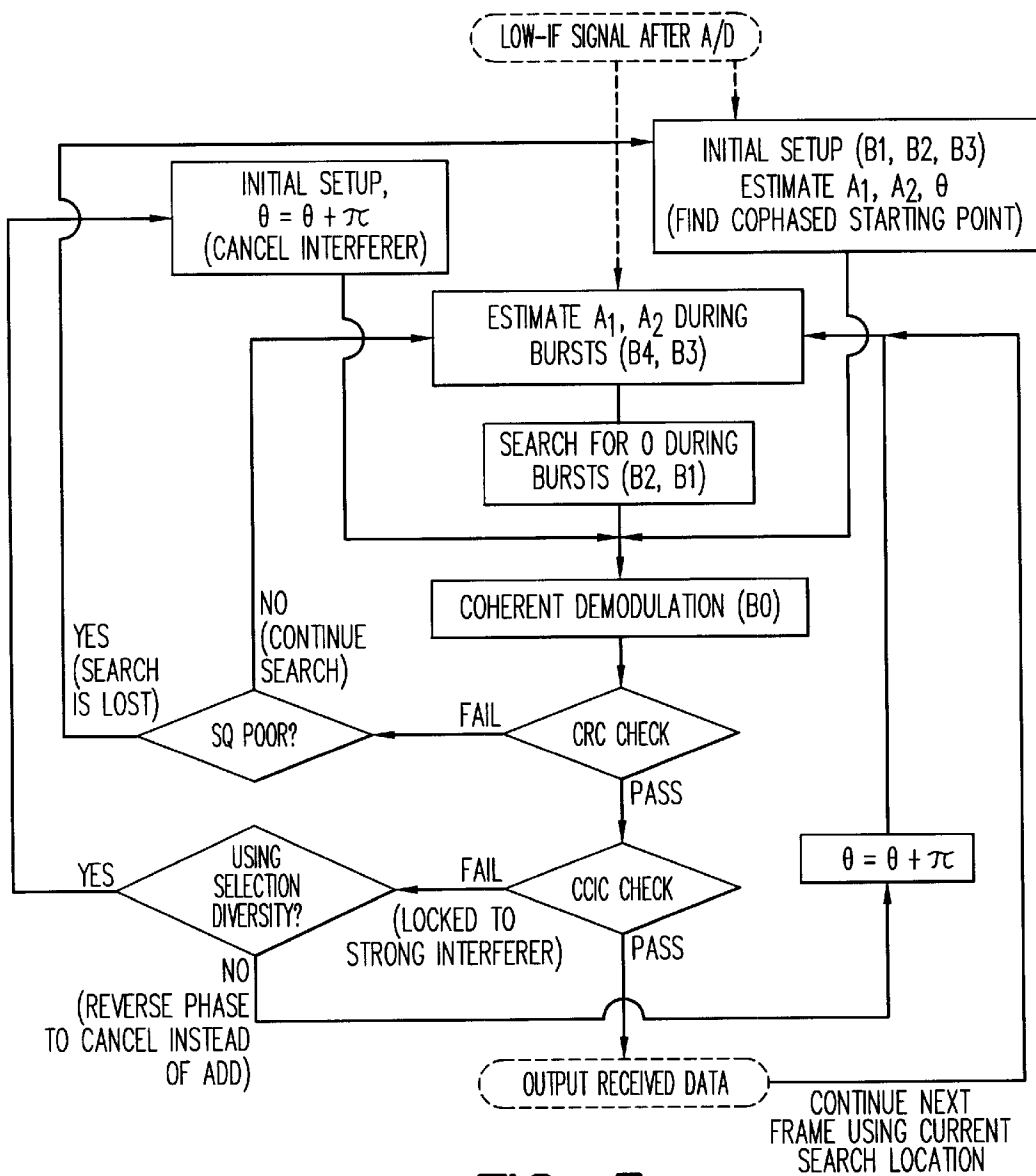


FIG. 3

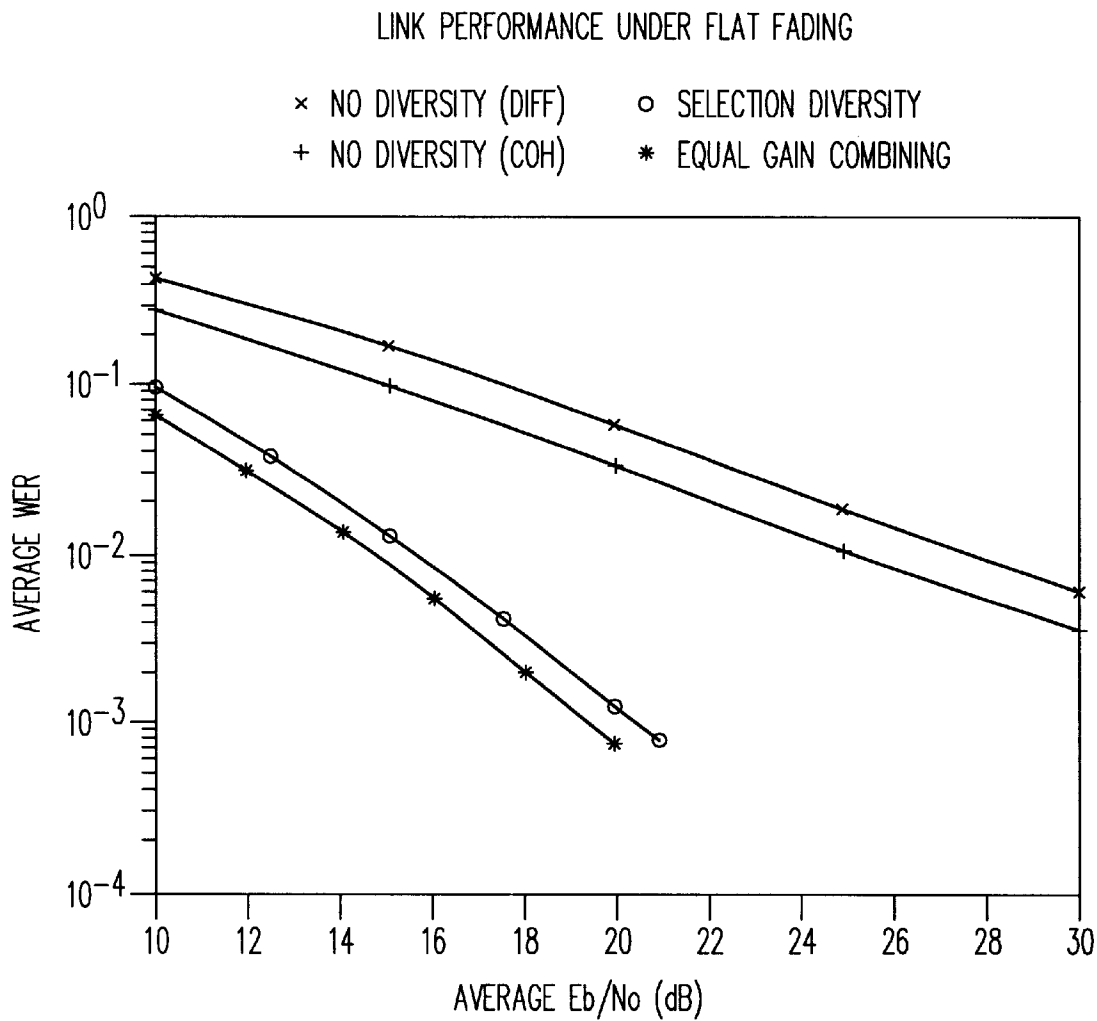


FIG. 4

LINK PERFORMANCE UNDER FLAT FADING WITH CO-CHANNEL INTERFERENCE

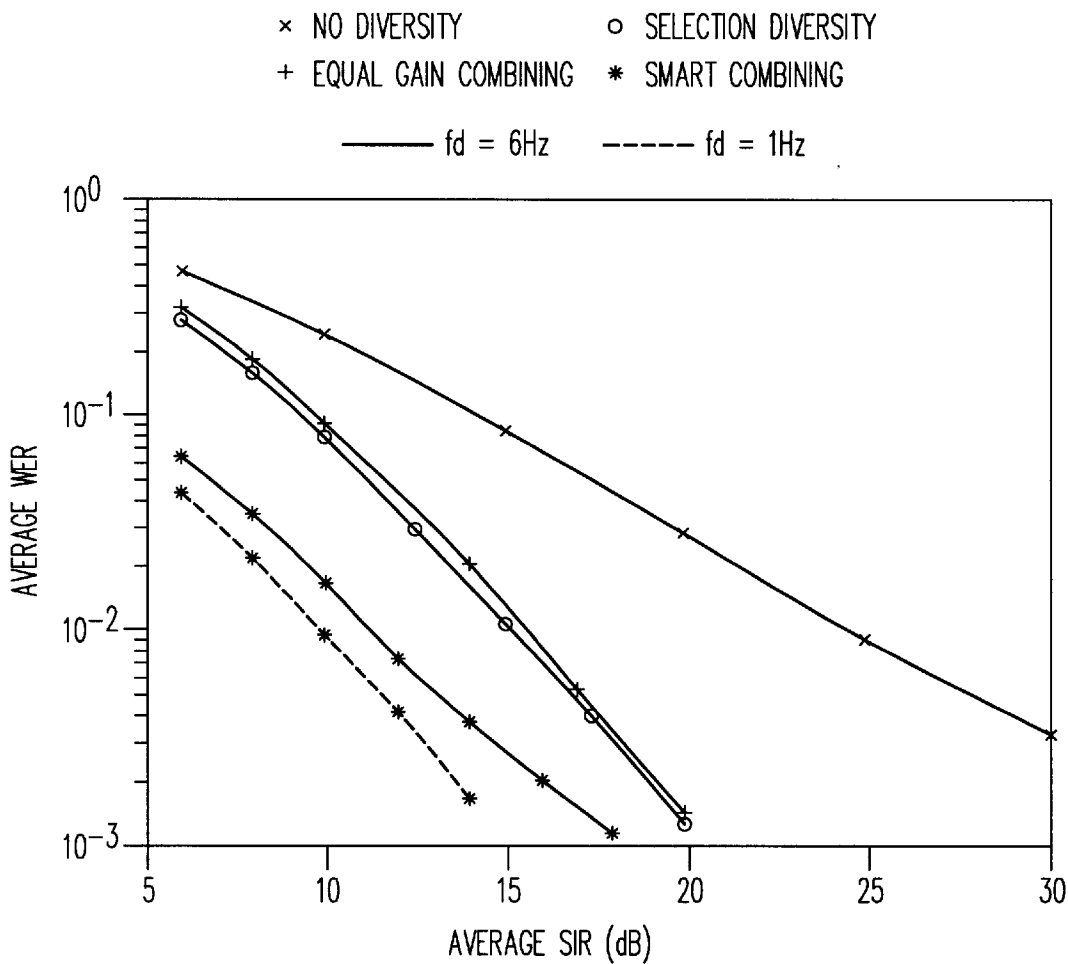


FIG. 5

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