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(54) Title: METHOD FOR POSITION ESTIMATION USING GENERALIZED ERROR DISTRIBUTIONS

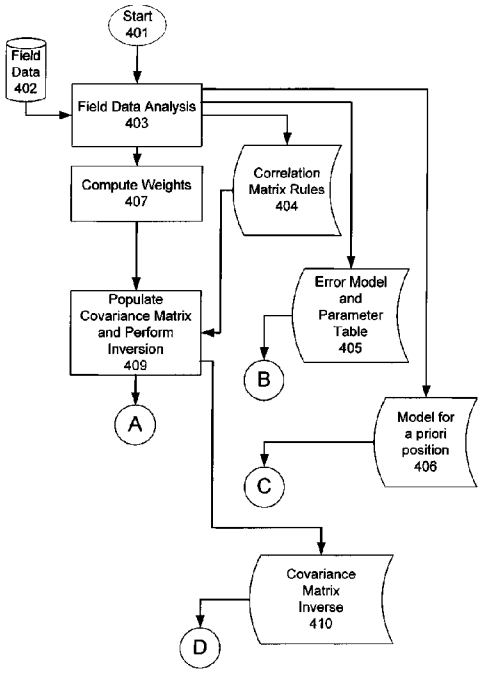

Figure 4a

(57) Abstract: A method for improving the results of radio location systems that incorporate weighted least squares optimization generalizes the weighted least squares method by using maximum a posteriori (MAP) probability metrics to incorporate characteristics of the specific positioning problem (e.g., UTDOA). Weighted least squares methods are typically used by TDOA and related location systems including TDOA/AOA and TDOA/GPS hybrid systems. The incorporated characteristics include empirical information about TDOA errors and the probability distribution of the mobile position relative to other network elements. A technique is provided for modeling the TDOA error distribution and the a priori mobile position. A method for computing a MAP decision metric is provided using the new probability distribution models. Testing with field data shows that this method yields significant improvement over existing weighted least squares methods.

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