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(54) **SYSTEM AND METHOD FOR PROVIDING AN ACCURATE ESTIMATION OF RECEIVED SIGNAL INTERFERENCE FOR USE IN WIRELESS COMMUNICATIONS SYSTEMS**

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(52) **U.S. Cl.** **375/144**; 375/148; 375/227; 370/342

(58) **Field of Search** 375/144, 147, 375/148, 224, 227, 346, 347; 370/320, 335, 342, 441; 455/63, 65, 67.1, 67.3, 135, 226.1, 226.2, 226.3, 296

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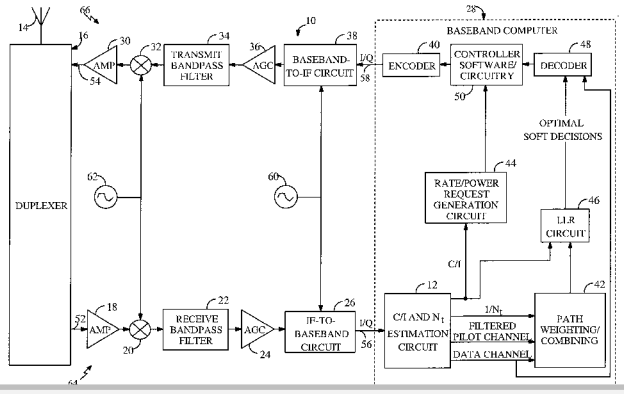
(57) **ABSTRACT**

A system for providing an accurate interference value signal received over a channel and transmitted by an external transceiver. The system includes a first receiver section for receiving the signal, which has a desired signal component and an interference component. A signal extracting circuit extracts an estimate of the desired signal component from the received signal. A noise estimation circuit provides the accurate interference value based on the estimate of the desired signal component and the received signal. A look-up table transforms the accurate noise and/or interference value to a normalization factor. A carrier signal-to interference ratio circuit employs the normalization factor and the received signal to compute an accurate carrier signal-to-interference ratio estimate. Path-combining circuitry generates optimal path-combining weights based on the received signal and the normalization factor. In the illustrative embodiment, the system further includes a circuit for employing the accurate interference value to compute a carrier signal-to-interference ratio. An optimal path-combining circuit computes optimal path-combining weights for multiple signal paths comprising the signal using the accurate interference value and provides optimally combined signal paths in response thereto. A log-likelihood ratio circuit computes a log-likelihood value based on the carrier signal-to-interference ratio and the optimally combined signal paths. A decoder decodes the received signal using the log-likelihood value. An additional circuit generates a rate and/or power control message and transmits the rate and/or power control message to the external transceiver.

36 Claims, 6 Drawing Sheets



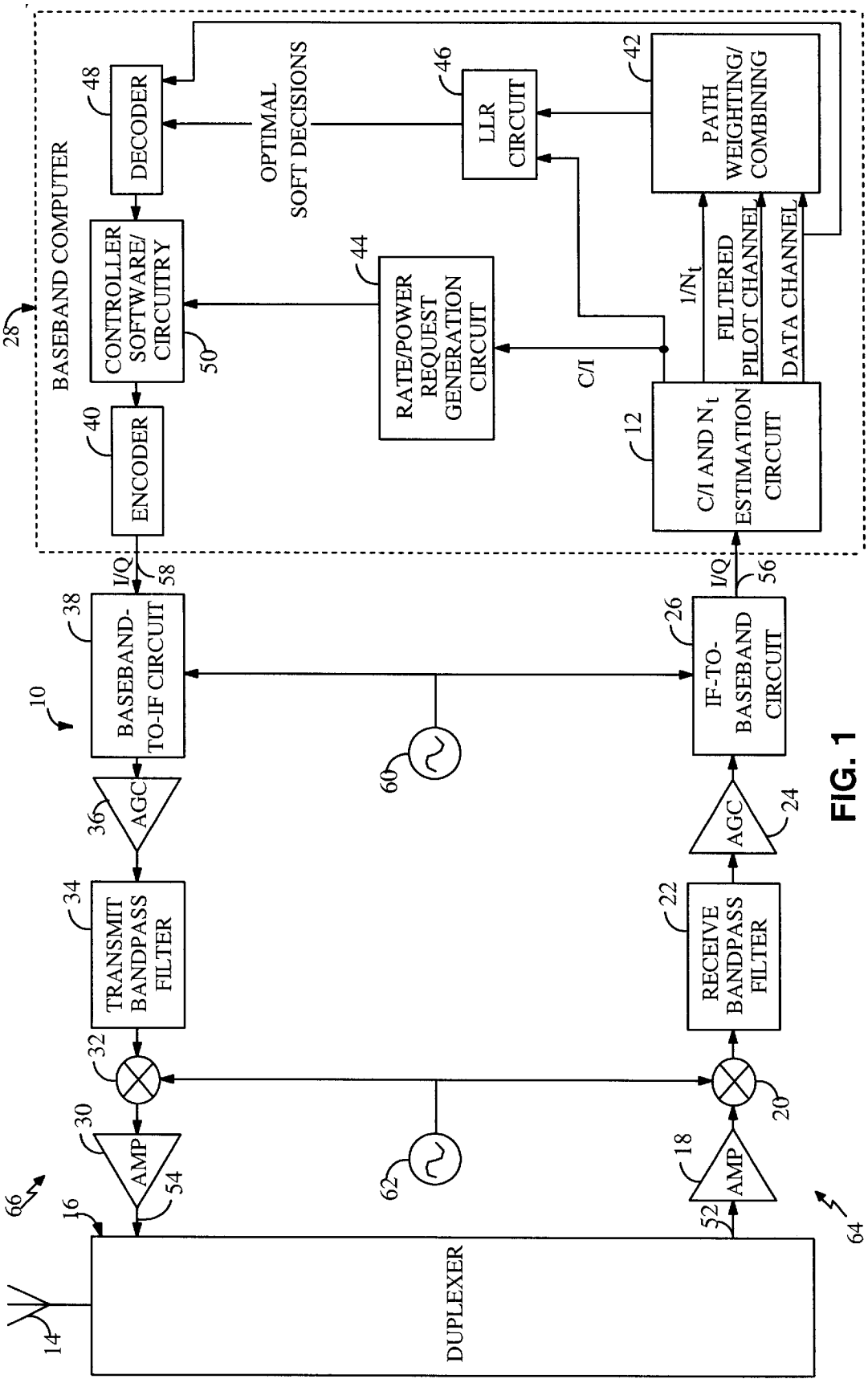


FIG. 1

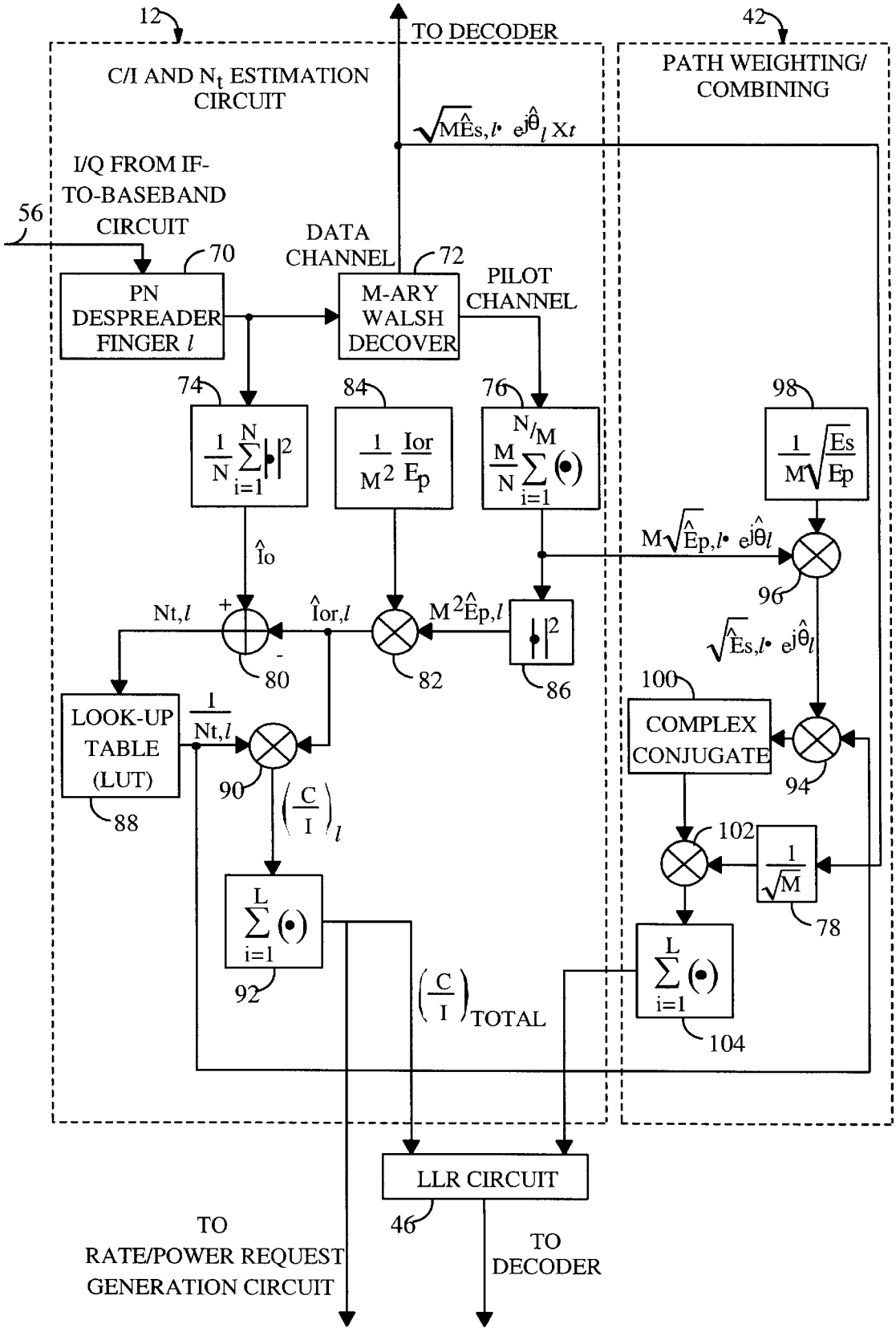


FIG. 2

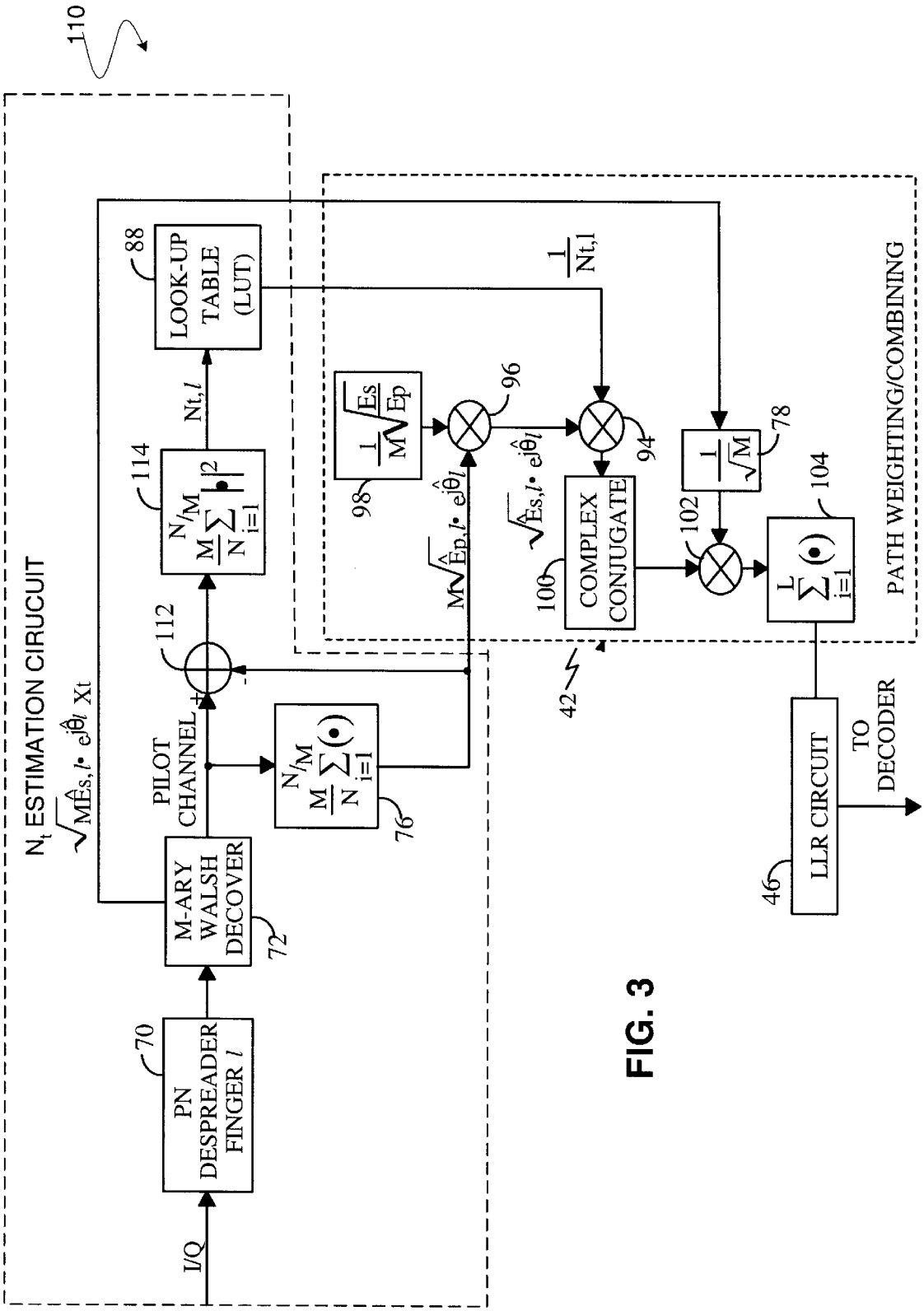


FIG. 3

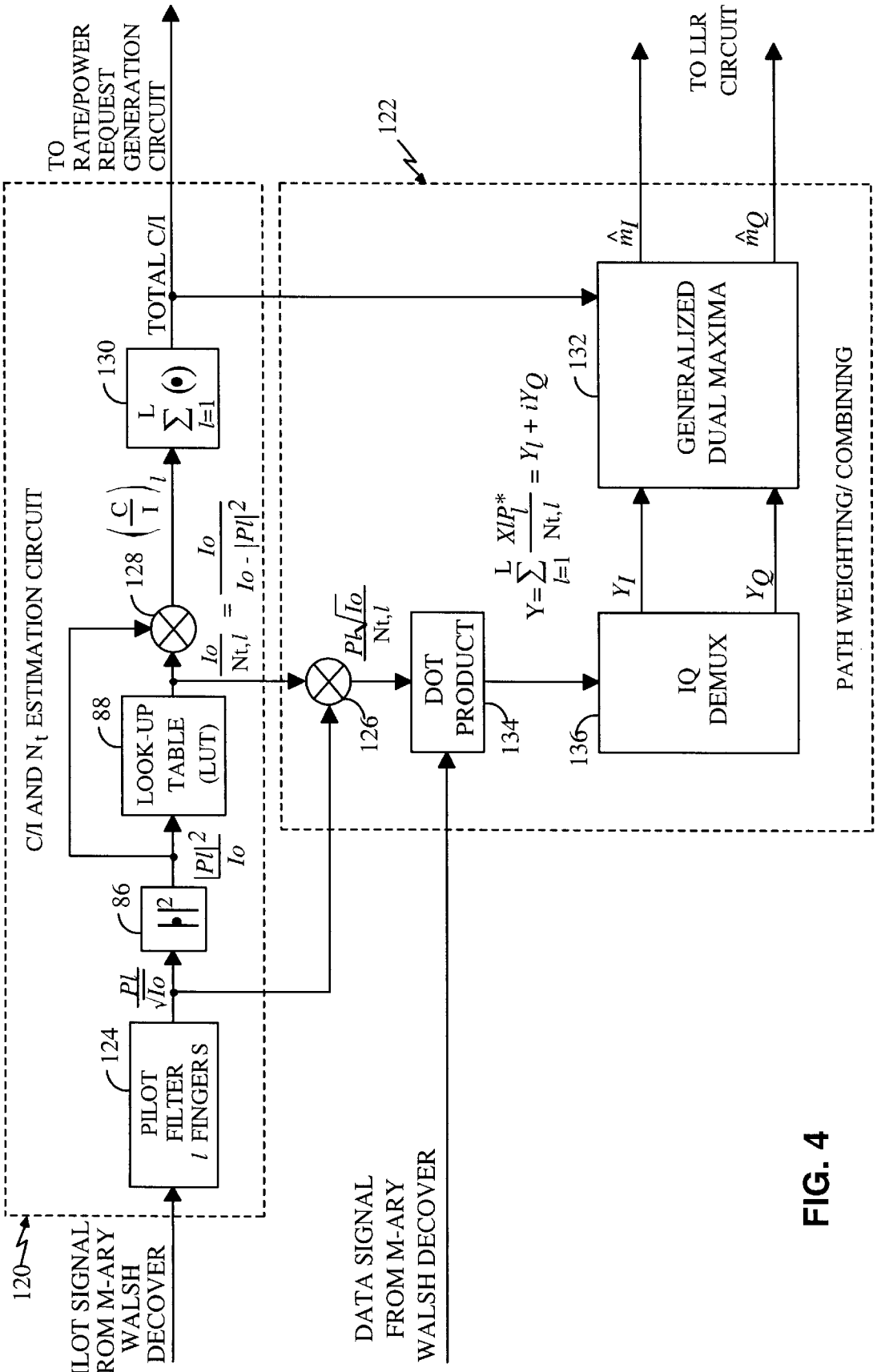


FIG. 4

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