

(12) **United States Patent**
Young

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(54) **METHOD AND APPARATUS PROVIDING SIMULTANEOUS DUAL MODE OPERATIONS FOR RADIOS IN THE SHARED SPECTRUM**

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(52) U.S. Cl. **455/552.1; 455/90.2; 455/422.1; 455/41.2**

(58) **Field of Search** **455/552, 553, 455/575, 550, 73, 422, 41, 78, 552.1, 90.2, 442.1, 41.2; 370/441, 442, 464, 335, 342, 344, 296, 465; 375/133, 141**

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(57) **ABSTRACT**

A dual mode RF radio includes a first transceiver operating under a first transmitter/receiver protocol, and having a first receiver portion and a first transmitter portion therein; and a second transceiver operating under a second transmitter/receiver protocol, and having a second receiver portion and a second transmitter portion therein; wherein both transmitter/receiver protocols are spread spectrum protocols; a shared antenna operatively connected to both said first transceiver and said second transceiver; and an isolation mechanism for isolating said first and second receiver portions from a transmitter portion while said transmitter portion is transmitting. A method of simultaneously operating a dual mode RF radio includes operating a first transceiver under a first transmitter/receiver protocol; operating a second transceiver under a second transmitter/receiver protocol, wherein both transmitter/receiver protocols are spread spectrum protocols; sharing an antenna between the first transceiver and the second transceiver; and isolating the receiver portions of the transceivers from the transmitter portion of the transceivers while a transmitter portion is transmitting, including providing a circulator for connecting the receiver portions and the transmitter portions to the shared antenna.

10 Claims, 6 Drawing Sheets

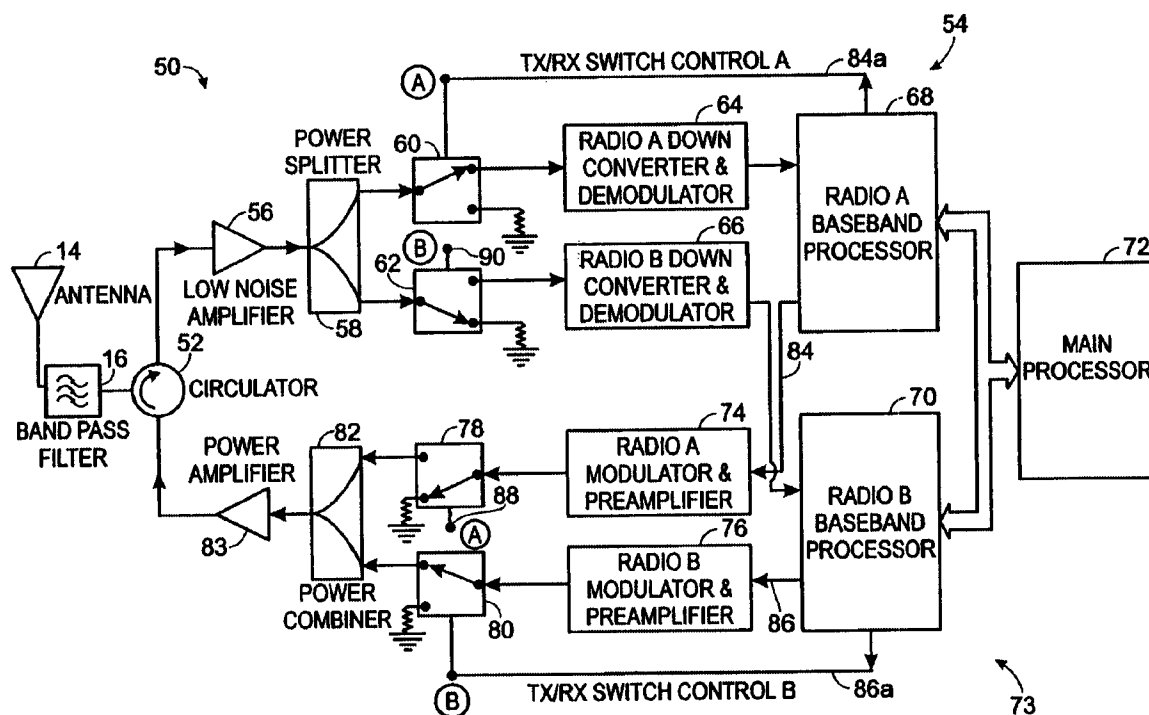


Fig. 1

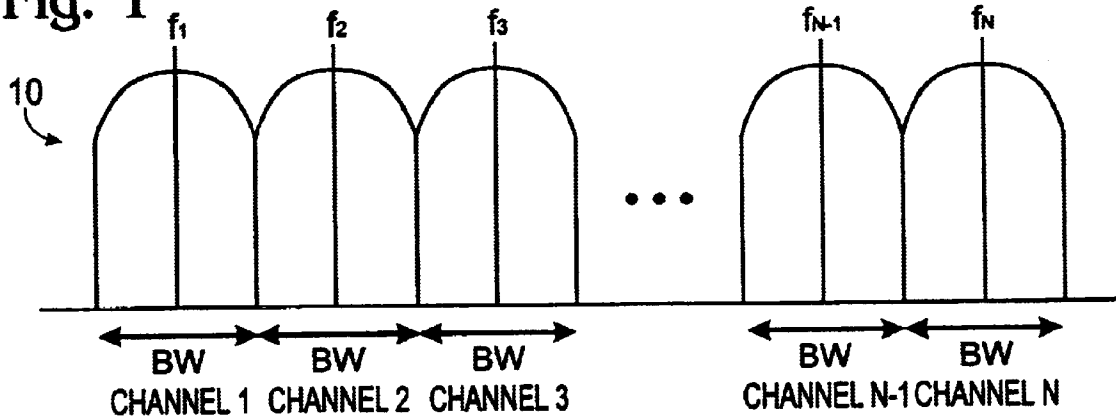


Fig. 2

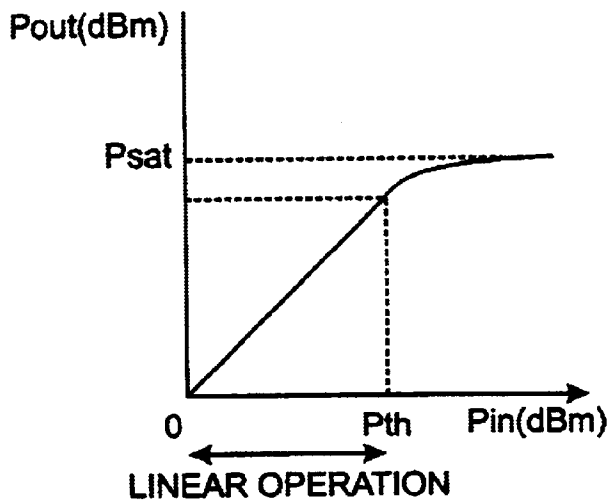
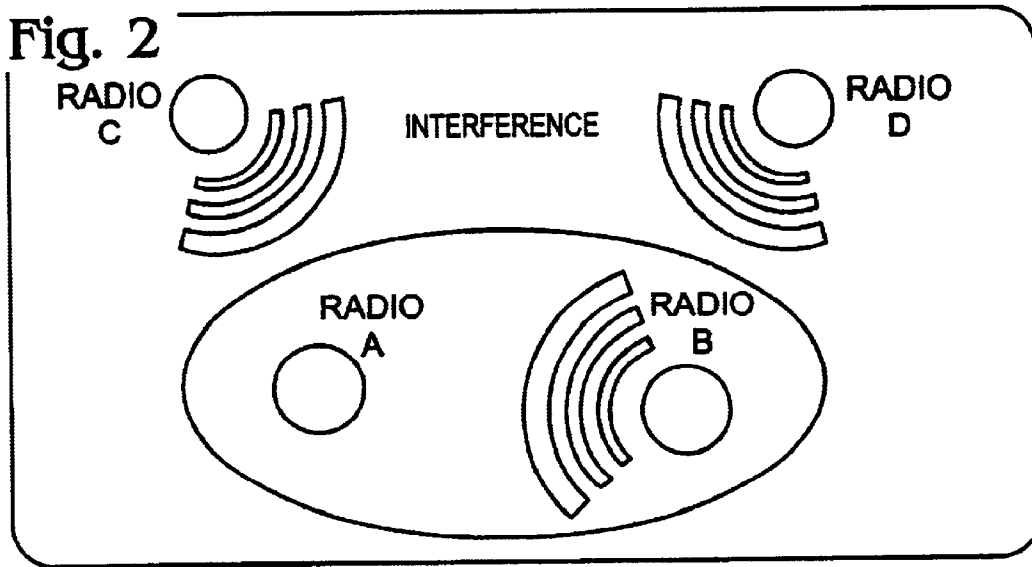
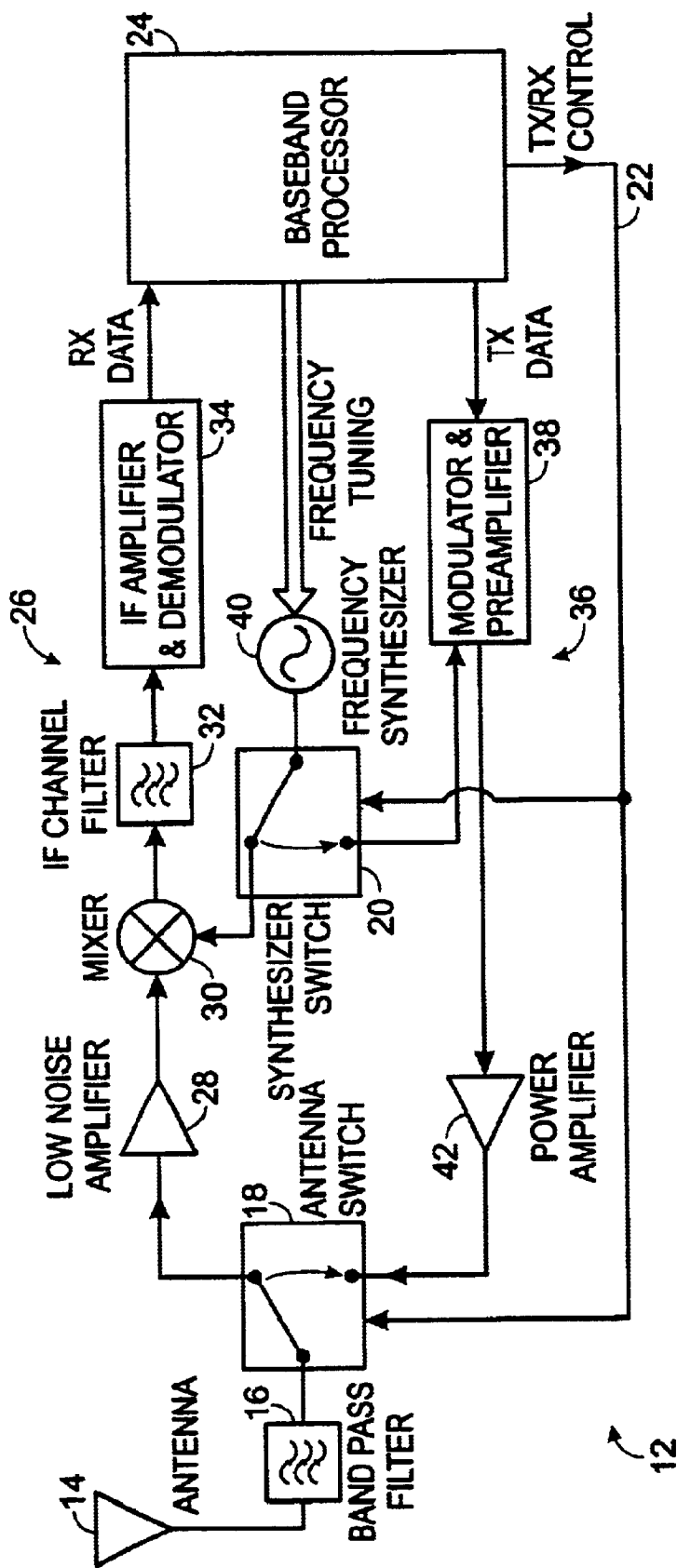


Fig. 3

Fig. 4
(PRIOR ART)



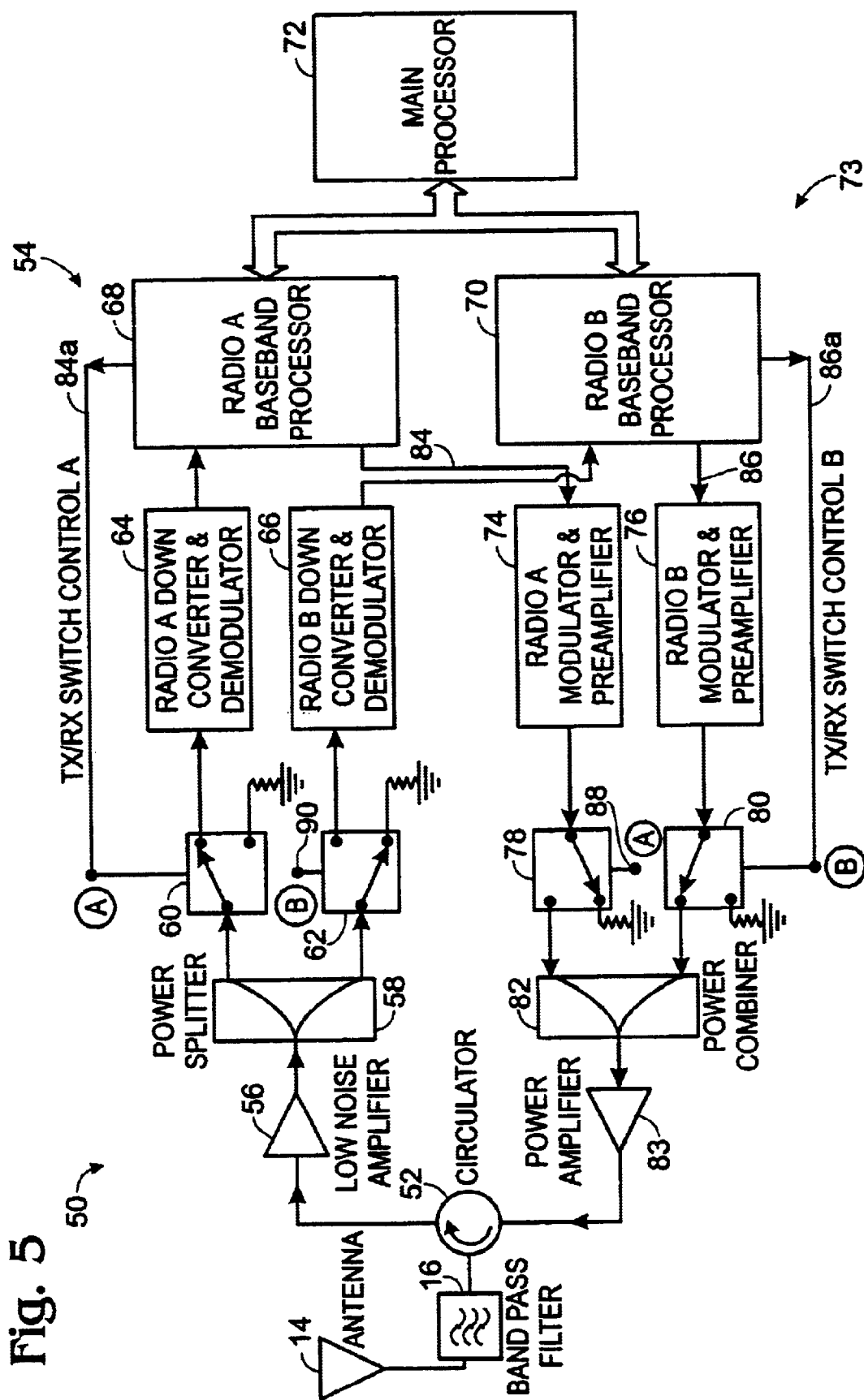


Fig. 5

Fig. 6

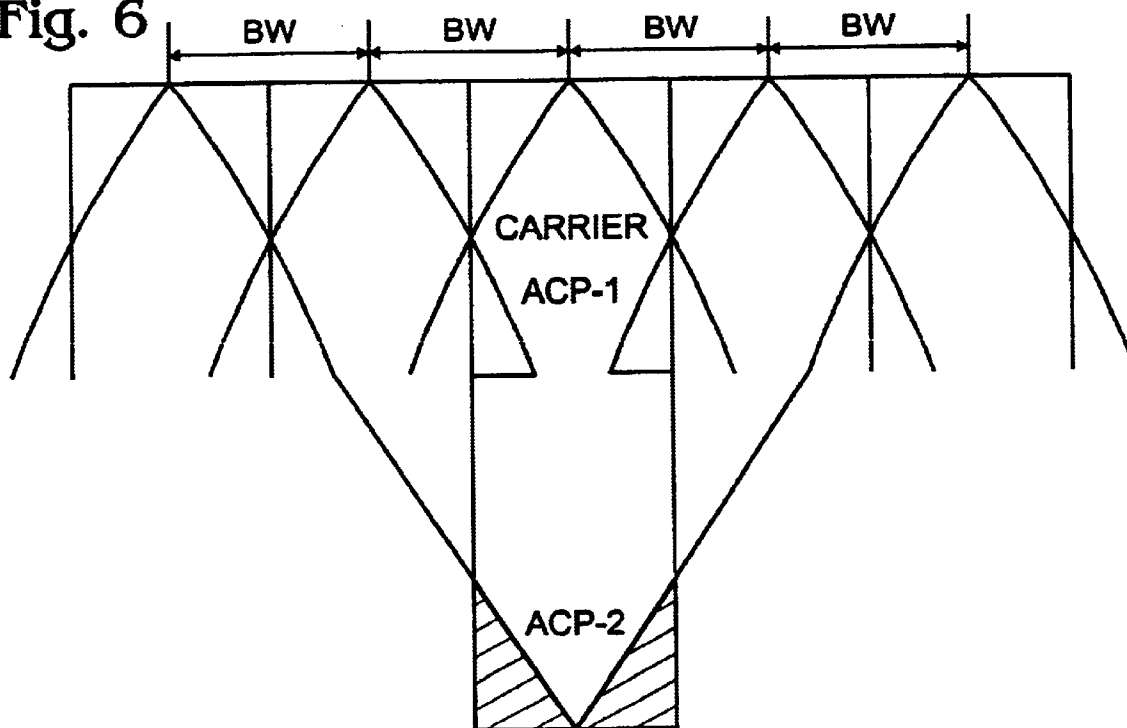
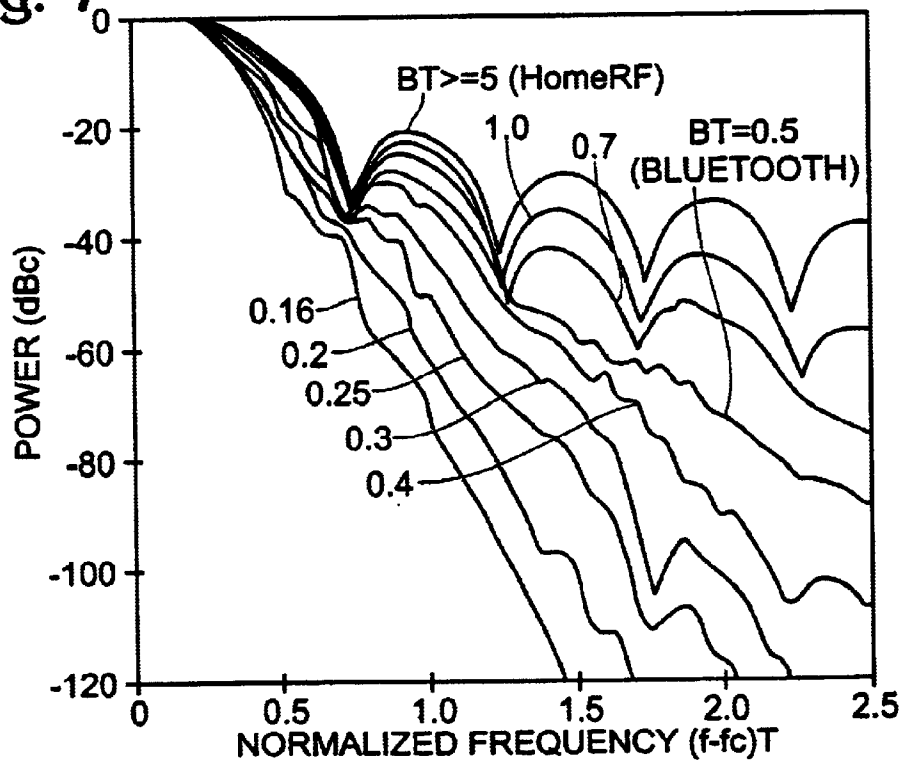


Fig. 7



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