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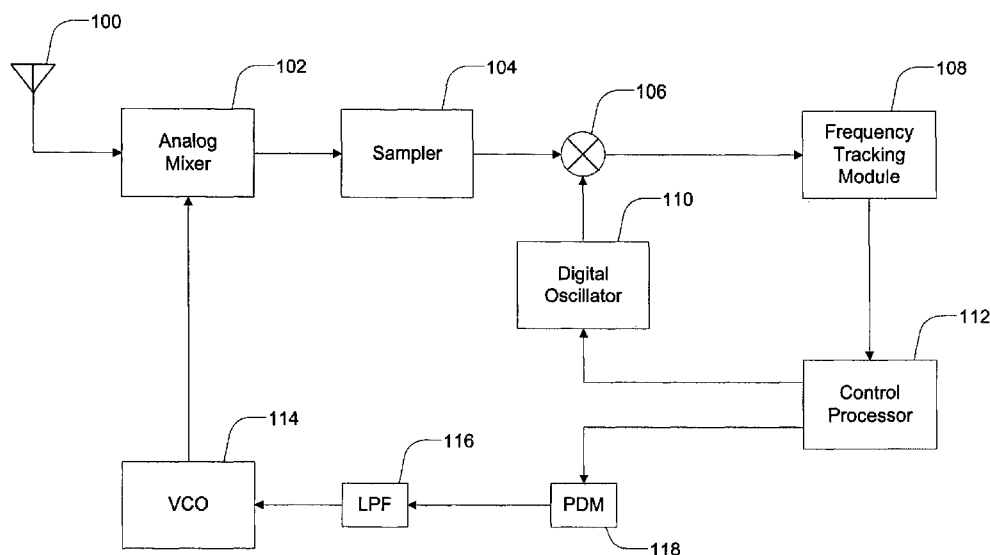
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- (71) Applicant: **QUALCOMM INCORPORATED** [US/US];
5775 Morehouse Drive, San Diego, CA 92121 (US).
- (72) Inventors: **FERNANDEZ-CORBATON, Ivan Jesus**;
1033 Diamond Street, San Diego, CA 92109 (US). **SMEE, John**;
5340 Toscana Way, #F406, San Diego, CA 92122 (US). **JAYARAMAN, Srikant**;
1254 Pacific Beach Drive, #1, San Diego, CA 92109 (US).
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(54) Title: MULTIPLE ANALOG AND DIGITAL DOWNCONVERSION



(57) Abstract: A carrier recovery method and apparatus using multiple stages of carrier frequency recovery are disclosed. A receiver uses multiple frequency generation sources to generate carrier signals used to downconvert a received signal. An analog frequency reference (114) having a wide frequency range and coarse frequency resolution is used in conjunction with a digital frequency reference (110) having a narrow frequency range and fine frequency resolution. The multiple carrier signals are multiplied by a received signal to effect a multi-stage downconversion, resulting in a baseband signal. A frequency tracking module (108) measures the residual frequency error present in the baseband signal. The measured residual frequency error is then used to adjust the frequencies of the carrier signals generated by the multiple frequency generation sources (114 and 110). through a processor.



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