

PHASE-SHIFT CALCULATION METHOD, AND SYSTEM
IMPLEMENTING IT, FOR A FINITE-IMPULSE-RESPOND (FIR)
FILTER

ABSTRACT

A method and system for performing a timing recovery acquisition of a sinusoidal preamble with reduced loop latency by effectively bypassing the FIR filter out of the timing loop. The method is implemented by estimating the FIR filter's (201) phase shift through knowing its coefficients *a priori* while also determining the phase error at the FIR filter's input. Because of the non-symmetric settings of the coefficients the phase shift through the FIR may not be zero. A preferred embodiment of the present invention reduces the latency of acquisition-mode timing loop by eliminating latency due to the FIR filter (201) itself. The coefficients can be either programmed in memory (205) or adapted as part of an LMS application. The estimate avoids the use of multiply operations, using add operations and a single divider. The estimated partial phase errors are then summed in a "FIR bypass-mode" phase detector (204) yielding total phase shift.

FIGURE 2