DIGITALLY FREQUENCY-LOCKING A RADIO TRANSCEIVER TO THE RECEIVED SIGNAL

Abstract of the Disclosure

A unique cellular telephone (100) digitally frequency locks to the received base station transmitter signal. The cellular telephone (100) includes a radio transceiver (106), a reference oscillator (104), and microcomputer (102) with memory therein for controlling the operation thereof. The radio transceiver (106) includes a phase-locked loop (PLL) synthesizer 120, a receiver mixer (122) followed by one or more gain stages (124), a phase detector (126), and a divider (128). The PLL synthesizer (120) generates a signal locked to the reference oscillator (104) that is mixed with the incoming base station transmitter signal in the receive mixer (122) to generate an intermediate frequency signal. The output of the reference oscillator (104) also feeds the divider (128), which divides the reference oscillator signal by an amount so as to generate the divided signal having a frequency substantially the same as the frequency of the intermediate frequency signal from the mixer (122). The output of the divider (128) and the amplified intermediate frequency signal from the amplifier (124) are both fed into the phase detector (126), which generates a binary error signal (110). The microcomputer (102) is responsive to the binary error signal (110) for frequency locking reference oscillator 104 to the received base station transmitter signal.

Fig. 1 accompanies this abstract.