

ABSTRACT

A PSEUDORANDOM NOISE RANGING RECEIVER WHICH COMPENSATES FOR MULTIPATH DISTORTION BY DYNAMICALLY ADJUSTING THE TIME DELAY SPACING BETWEEN EARLY AND LATE CORRELATORS

A receiver for pseudorandom noise (PRN) encoded signals consisting of a sampling circuit, multiple carrier and code synchronizing circuits, and multiple digital autocorrelators. The sampling circuit provides digital samples of a received composite signal to each of the several receiver channel circuits. The synchronizing circuits are preferably non-coherent, in the sense that they track any phase shifts in the received signal and adjust the frequency and phase of a locally generated carrier reference signal accordingly, even in the presence of Doppler or ionospheric distortion. The autocorrelators in each channel form a delay lock loop (DLL) which correlates the digital samples of the composite signal with locally generated PRN code values to produce a plurality of (early, late), or (punctual, early-minus-late) correlation signals. Thus, during an initial acquisition mode, the delay spacing is relatively wide, on the order of approximately one PRN code chip time. However, once PRN code synchronism has been achieved, the code delay spacing is narrowed, to a fraction of a PRN code chip time. There are several advantages to this arrangement, especially in environments wherein multipath distortion in the received composite signal is of the same order of magnitude as a PRN code chip time.

This Sheet Has Been Replaced



N/P 22/1/93