A New Demodulation Method Improving FM System Interference Imunity

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References:

Abstract:
As a result of investigation of interference into FM systems, a new algorithm for the process of demodulation is proposed. When compared to the method using the conventional limiter-discriminator, it offers better immunity against the baseband interference noise. Desired signal processing is performed by the functional devices added to the conventional limiter-discriminator in such a way that this new demodulator can be optimized in the sense of the minimum baseband interference noise. The statistics of the wanted and interfering signals must be known. Several examples involving interference problems in FDM-FM radio-relay systems carrying multichannel telephone signals are elaborated to illustrate the performances of the proposed demodulator. FDM-FM, PSK, or FSK systems are considered the cause of the interference. The noise power ratio (NPR) at the output of the conventional limiter-discriminator and the improvement factor offered by the new demodulator, obtained on digital computer, are presented versus baseband frequency in the form of diagrams. Different IF filters in FUM-FM receiver and transmit filters in the interfering systems are taken into account. The improvement offered by the proposed demodulator is of such a degree that some of the important restrictions in planning different radio systems could be relaxed.

Keywords:
FM, Interference