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***Abstract* - A new technique for sensing turbulence in single phase fluid flow by pulsed ultrasound is introduced. The velocity component of turbulence perpendicular to the flow axis is sensed by two ultrasonic transducers mounted diametrically opposite on the pipe. The technique facilitates detecting variations in time of flight of two ultrasonic pulses which are simultaneously transmitted in opposite directions and perpendicular to the flow axis. The flow velocity is obtained from the position of the peak in the cross correlation function of the turbulence signals sensed at two locations on the pipe. The paper presents the implementation details and the results obtained.**