In order to examine the performance of ultrasound Doppler systems under conditions more representative of the *in vivo* state, a phantom has been developed to better simulate physiologic small vessel flow. This phantom is a preserved kidney phantom (Holmes *et al.*, 1984 Advances in Bioengineering. R. L. Spiker. New York, Amer. Soc. Mech. Eng.**:** 9-10) that we have previously used in ultrasound imaging with contrast agents. Identifying appropriate scatterers for use in a perfusate with this phantom has been a challenge due to the small vessels and the need for blood equivalent scattering. Recent experiments have explored the use of albumin stabilized perfluorocarbon droplets in water. Trichlorotrifluoroethane (boiling point = 48°C) was prepared in the high speed shaking process to form droplets that are 10 microns and smaller in diameter with substantial numbers of the smaller size range. In initial tests in a simple flow tube phantom and a Diasonics Spectra VST scanner using 6 MHz Doppler, Doppler power was shown to be linear ($R^2$ = 0.995) as a function of droplet concentration. Mean Doppler power in comparison to that in the human carotid artery required a droplet concentration of $3.6 \times 10^5$ $ml^{-1}$. These droplets were used in measurements with the fixed kidney phantom for comparison of the Diasonics Gateway 2D and the GE Logiq 700. The slow flows generated in this phantom were a very effective test of the lower detection limits of each system, demonstrating the effects of the lower PRF settings available on the Diasonics scanner.