abstract Three observational constraints can be placed on a warm-hot intergalactic medium (WHIM) using PSPC pointed and survey data, the emission strength, the energy spectrum, and the fluctuation spectrum. The upper limit to the emission strength of the WHIM is $7.5 \pm 1.0 \text{ keV s}^{-1} \text{ cm}^{-2} \text{ sr}^{-1} \text{ keV}^{-1}$ in the band, an unknown portion of which value may be due to our own Galactic halo. The spectral shape of the WHIM emission can be described as thermal emission with $\log T = 6.42$, although the true spectrum is more likely to come from a range of temperatures. The values of emission strength and spectral shape are in reasonable agreement with hydrodynamical cosmological models. The autocorrelation function in the 0.44 keV $< E <$ 1.21 keV band range, $w(\theta)$, for the extragalactic soft X-ray background (SXRB) which includes both the WHIM and contributions due to point sources, is $\lesssim 0.002$ for $10' < \theta < 20'$ in the band. This value is lower than the cmdhkfw2000 cosmological model by a factor of $\sim 5$, but is still not inconsistent with cosmological models. It is also found that the normalization of the extragalactic power law component of the soft X-ray background spectrum must be $9.5 \pm 0.9 \text{ keV s}^{-1} \text{ cm}^{-2} \text{ sr}^{-1} \text{ keV}^{-1}$ to be consistent with the All-Sky Survey.