A new laser scanning system is then presented based on two wide-band paratellurite acousto-optic deflectors. Anisotropic interactions take place under two different tangential phase matching (TPM) configurations in such a way that the acousto-optic bandwidths add up. The optical arrangement of the two cascaded AODs is detailed. The feasibility of such a cascade deflection system has been demonstrated for the green wavelength $\lambda = 514$ nm of an argon laser. The total frequency bandwidth is $\Delta f_t = 100$ MHz, equally distributed between the two acousto-optic deflectors. The total angular scan at the output is $\Delta \theta_t = 4.5^\circ$ leading to more than 120 resolvable spots for a 1 mm truncated Gaussian beam and a short access time (as low as 1.5 $\mu$s).