Abstract. We consider a second order damped-vibrational system described by the equation $ M \ddot{x} + C(v) \dot{x}+ K x = 0 $, where $M$, $C(v)$, $K$ are real, symmetric matrices of order $n$. We assume that the undamped eigenfrequencies (eigenvalues of $(\lambda^2 M + K) x = 0$) $\omega_1, \omega_2, \ldots, \omega_n$, are multiple in the sense that $\omega_1 = \omega_2$, $\omega_3 = \omega_4$, \ldots, $\omega_{n-1} = \omega_n$, or are given in close pairs $\omega_1 \approx \omega_2$, $\omega_3 \approx \omega_4$, \ldots, $\omega_{n-1} \approx \omega_n$. We present a formula which gives the solution of the corresponding phase space Lyapunov equation, which then allows us to calculate the first and second derivatives of the trace of the solution, with no extra cost. This one can serve for the efficient trace minimization.