$$x_{n+1} = x_n + h\,\frac{H(x_n,p_{n+1}) - H(x_n,p_n)}{p_{n+1}-p_n} = x_n + h\,\frac{\frac{p_{n+1}^2}{2} + V(x_n) - V(x_n) - \frac{p_n^2}{2}}{p_{n+1}-p_n} = x_n + \frac{h}{2}(p_{n+1}+p_n)$$

$$p_{n+1} = p_n - h\,\frac{H(x_{n+1},p_{n+1}) - H(x_{n+1},p_n)}{x_{n+1}-x_n} = p_n - h\,\frac{\frac{p_{n+1}^2}{2} + V(x_{n+1}) - V(x_n) - \frac{p_{n+1}^2}{2}}{x_{n+1}-x_n} = p_n - h\,\frac{V(x_{n+1})-V(x_n)}{x_{n+1}-x_n}$$

$$x_{n+1} = x_n + \frac{h}{2}\left(2p_n - h\,\frac{V(x_{n+1})-V(x_n)}{x_{n+1}-x_n}\right) = x_n + h\delta_n$$

$$= x_n + hp_n - \frac{h^2}{2}\,\frac{V(x_{n+1})-V(x_n)}{x_{n+1}-x_n}$$

$$\delta_n = p_n - \frac{h}{2}\,\frac{V(x_{n+1})-V(x_n)}{x_{n+1}-x_n} = p_n - \frac{1}{2}\,\frac{V(x_n+h\delta_n)-V(x_n)}{\delta_n}$$

$$F_n(\delta) = \delta - p_n + \frac{V(x_n+h\delta)-V(x_n)}{2\delta}$$

$$DF = I_n + \frac{h\delta DV(x_n+h\delta) - V(x_n+h\delta) + V(x_n)}{2\delta^2}$$