



$$\dot{x} = Ax + Bu$$

$$u = [F_s]$$

$$x = \begin{bmatrix} x_{k_1} \\ x_{k_2} \\ v_{m_1} \\ v_{m_2} \\ v_{m_3} \end{bmatrix}$$

$$\frac{d^5 v_{m_3}}{dt^5} + a_4 \frac{d^4 v_{m_3}}{dt^4} + a_3 \frac{d^3 v_{m_3}}{dt^3} + a_2 \frac{d^2 v_{m_3}}{dt^2} + a_1 \frac{d v_{m_3}}{dt} + a_0 v_{m_3} = b_0 F_s$$