Model Documentation of the 'Multivariable servomechanism problem J-100 jet engine'

1 Nomenclature

1.1 Nomenclature for Model Equations

x	state vector
u	control input vector
w	noise vector
z	regulated output vector
y	measurement vector

2 Model Equations

State Vector and Input Vector:

$$x \in \mathbb{R}^3 0u \qquad \in \mathbb{R}^3 w \in \mathbb{R}^3 0z \qquad \in \mathbb{R}^8 y \in \mathbb{R}^5$$

System Equations:

$$\dot{x}(t) = Ax(t) + B_1 w(t) + Bu(t) \tag{1a}$$
$$z(t) = C_1 x(t) + D_{11} w(t) + D12u(t) \tag{1b}$$
$$y(t) = Cx(t) + D21w(t) \tag{1c}$$

Outputs: z

2.1 Exemplary parameter values

Parameters omitted due to large matrizes. See Source code.

3 Derivation and Explanation

This model is part of the "'COMPleib"' - library and wasautomatically imported into ACKREP.
The original description was:
JE1 Multivariable servomechanism problem J-100 jet engine E. J. Davison and W. Gesing, "The systematic design of control systems for for the multivariable servomechanism problem", Nat. Eng. Consortium Inc., Chicago, "Alternatives for Linear Multivariable Control", 1978

4 Simulation

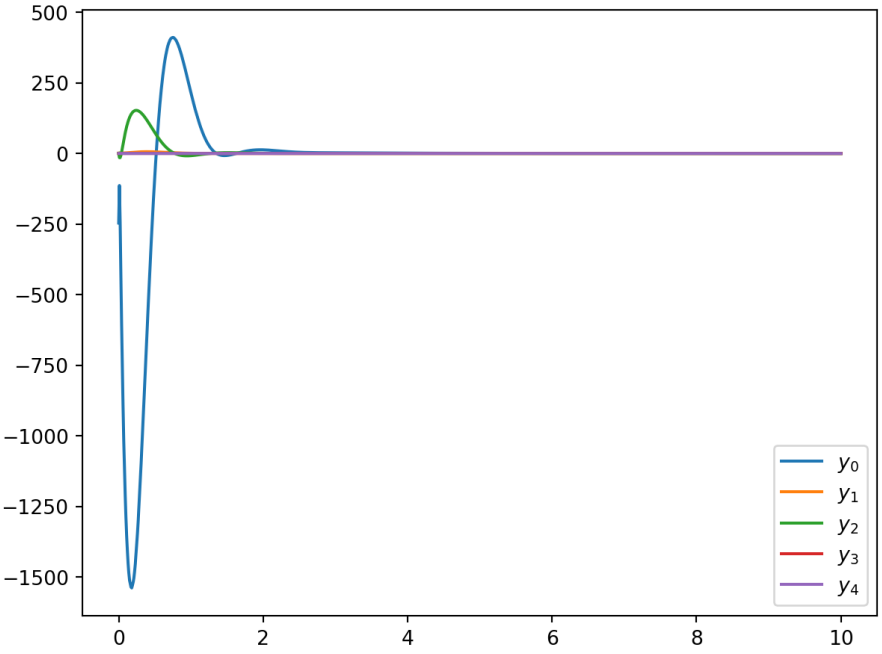

Figure 1: Simulation of the Multivariable servomechanism problem J-100 jet engine.

References

[1] . J. Davison and W. Gesing, "The systematic design of control systems for for the multivariable servomechanism problem", Nat. Eng. Consortium Inc., Chicago, "Alternatives for Linear Multivariable Control", 1978