Model Documentation of the 'ASTOVL Aircraft'

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:

$$x \in \mathbb{R}^2 8u \qquad \in \mathbb{R}^3 w \in \mathbb{R}^2 8z \qquad \in \mathbb{R}^2 8y \in \mathbb{R}^4$$

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

Symbol	Value						
	−314.26215	−158.24976	−34.0023935	−7.63343964	0	0	0
	512.0	0	0	0	0	0	0
	0	256.0	0	0	0	0	0
	0	0	128.0	0	0	0	0
	0	0	0	0	−314.26215	−158.24976	−34.002
	0	0	0	0	512.0	0	0
	0	0	0	0	0	256.0	0
	0	0	0	0	0	0	128.
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0

Symbol	Value		
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
B	0	0	0
	0	0	0
	0	0	0
	−0.000856241727	0.0559355396	−0.0357540528
	0	0	0
	4.5251223	−48.246024	−0.147305899
	0	0	0
	−4.95608633	−52.5796067	0.278490552
	0	0	0
	0.00684993381	−0.447484317	0.286032422
	−0.0137328	0.89712	−0.57344
	−36.2009784	385.968192	1.17844719
	72.576	−773.792	−2.36256
	39.6486906	420.636854	−2.22792441
	−79.488	−843.296	4.46656
	0	0	0

3 Derivation and Explanation

This model is part of the "'COMPleib"' - library and wasautomatically imported into ACKREP.
The original description was:
AC13 ASTOVL Aircraft, LARGE model save ASTOVL_aug A B1 B2 C1 C2 D11 D12 D21 D22 Ag Bg Cg Dg in ASTOVL.m /export/home/leibfr/Lipinski/matlab

4 Simulation

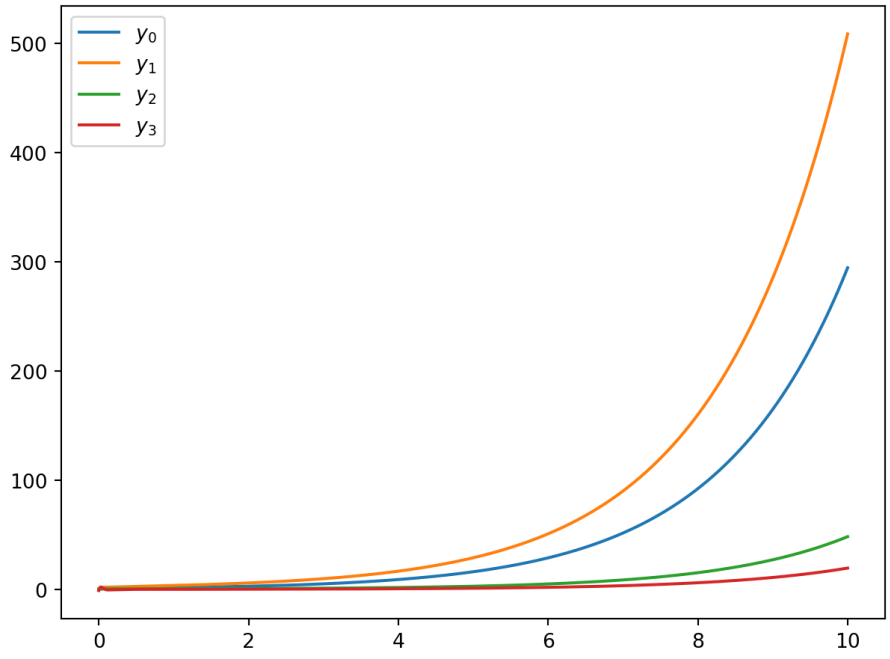

Figure 1: Simulation of the ASTOVL Aircraft.

References

[1] . Toffner-Clausen, "System Identification and Robust Control A Case Study Approach", Springer-Verlag, "Advances in Industrial Conrol", 1996 p. 274