B.11 AIRCRAFT 10—MCDONNELL DOUGLAS F-4

Table B10.1 Geometric Data for the McDonnell Douglas F-4 Aircraft

Wing Surface (ft^2)	S	530
Mean Aerodynamic Chord (MAC) (ft)	c	16
Wing Span (ft)	b	38.7

Table B10.2 Flight Conditions Data for the McDonnell Douglas F-4 Aircraft

		Approach	Cruise (mach < 1)	Cruise (mach > 1)
Altitude (ft)	h	0	35,000	55,000
Mach Number	M	0.206	0.90	1.80
True Airspeed (ft/sec)	V_{P_1}	230	876	1,742
Dynamic Pressure (lbs/ft^2)	q	62.9	283.2	434.5
Location of CG - % MAC	x_{CG}	0.29	0.29	0.29
Steady-state angle of attack (deg)	α_1	11.7	2.6	3.3

Table B10.3 Mass and Inertial Data for the McDonnell Douglas F-4 Aircraft

		Approach	Cruise (mach < 1)	Cruise (mach > 1)
Mass (lbs)	m	33,200	39,000	39,000
Moment of Inertia x-axis (slug ft^2)	I_{XX_B}	23,700	25,000	25,000
Moment of Inertia y-axis (slug ft^2)	I_{YY_B}	117,500	122,200	122,200
Moment of Inertia z-axis (slug ft^2)	I_{ZZ_B}	133,700	139,800	139,800
Product of inertia xz-plane (slug ft^2)	I_{XZ_B}	1,600	2,200	2,200

Table B10.4 Longitudinal Aerodynamic Coefficients for the McDonnell Douglas F-4 Aircraft

	Approach	Cruise (mach < 1)	Cruise (mach > 1)
Steady State			
c_{L_1}	1.0	0.26	0.17
c_{D_1}	0.20	0.030	0.0480
c_{m_1}	0	0	0
$c_{T_{X_1}}$	0.20	0.030	0.0480
$c_{m_{T_1}}$	0	0	0
Stability Derivatives			
c_{D_0}	0.0269	0.0205	0.0439
c_{D_u}	0	0.027	−0.054
c_{D_α}	0.555	0.30	0.40
$c_{T_{X_u}}$	−0.45	−0.064	−0.10
c_{L_0}	0.430	0.10	0.010
c_{L_u}	0	0.270	−0.180
c_{L_α}	2.80	3.75	2.80
$c_{L_{\dot{\alpha}}}$	0.63	0.86	0.17
c_{L_q}	1.33	1.80	1.30
c_{m_0}	0.02	0.025	−0.025
c_{m_u}	0	−0.117	0.054
c_{m_α}	−0.098	−0.40	−0.780
$c_{m_{\dot{\alpha}}}$	−0.95	−1.30	−0.25
c_{m_q}	−2.0	−2.70	−2.0
$c_{m_{T_u}}$	0	0	0
$c_{m_{T_\alpha}}$	0	0	0
Control Derivatives			
$c_{D_{i_H}}$	−0.14	−0.10	−0.15
$c_{L_{i_H}}$	0.24	0.40	0.25
$c_{m_{i_H}}$	−0.322	−0.580	−0.380