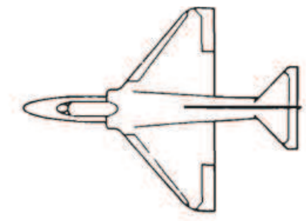
B.1 U.S. Navy A-4D Attack Aircraft

The data given in Tables B.1a–B.1d are for the normal cruise configuration, clean airplane, where $W = 17{,}578$ lb, mass $m = 546$ slugs, $S = 260$ ft², $b = 27.5$ ft, $\bar{c} = 10.8$ ft, and the c.g. is at $0.25\bar{c}$. Figure B.1 is a sketch of the aircraft.

Note that the absence of derivatives implies negligible values. The stability derivatives are relative to the stability axes. All angles are in radian measure.



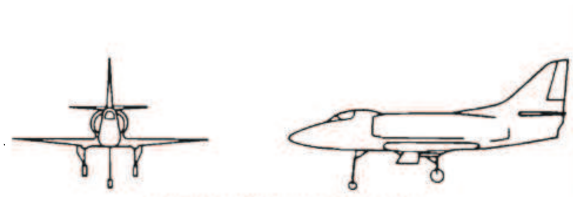


Fig. B.1 Sketch of A-4D aircraft.

Table B.1a Geometric data

Condition	1	2	3	4	5	6
h, ft	0(S/L)	15,000	15,000	15,000	35,000	35,000
M	0.4	0.4	0.6	0.9	0.6	0.9
V, ft/s	447	423	634	952	584	876
Q, lb/ft^2	237	134	301	677	126	283
I_x, slug-ft^2	8,020	8,200	8,010	8,060	8,190	8,010
I_y, slug-ft^2	25,900	25,900	25,900	25,900	25,900	25,900
I_z, slug-ft^2	29,270	29,090	29,280	29,230	29,100	29,280
I_{xz}, slug-ft^2	−441	−1,989	41	1,042	−1,952	227
α_{trim}, deg	4.7	8.9	3.4	0.7	8.8	2.9

Table B.1c Lateral-directional dimensional derivatives condition

Condition	1	2	3	4	5	6
h, ft	0(S/L)	15,000	15,000	15,000	35,000	35,000
M	0.4	0.4	0.6	0.9	0.6	0.9
Y_β, ft/s^2	−110.94	−62.42	−144.6	−345.2	−60.38	−139.8
L_β, s^{-2}	−27.67	−14.01	−35.00	−87.19	−14.24	−40.32
L_p, s^{-1}	−1.732	−0.988	−1.516	−2.492	−0.671	−1.134
L_r, s^{-1}	0.933	0.607	0.874	1.346	0.464	0.672
N_β, s^{-2}	15.16	8.223	18.78	46.43	7.864	19.65
N_p, s^{-1}	0.040	0.000	0.040	0.125	−0.004	0.041
N_r, s^{-1}	−0.639	−0.401	−0.566	−0.958	−0.291	−0.428
Y_{δ_r}, ft/s^2	19.65	10.83	25.09	52.24	10.46	21.78
L_{δ_r}, s^{-2}	7.305	2.802	9.961	24.05	2.739	8.568
N_{δ_r}, s^{-2}	−6.732	−3.651	−8.397	−17.41	−3.517	−7.241
Y_{δ_a}, ft/s^2	−2.599	−0.795	−2.409	−5.291	−0.478	−2.420
L_{δ_a}, s^{-2}	17.27	8.757	21.27	37.48	7.998	16.88
N_{δ_a}, s^{-2}	0.334	−0.246	0.479	1.462	−0.139	0.414
L'_β, s^{-2}	−28.53	−16.27	−34.90	−81.56	−16.38	−39.77
L'_p, s^{-1}	−1.736	−1.004	−1.516	−2.488	−0.681	−1.134
L'_r, s^{-1}	0.968	0.717	0.872	1.227	0.542	0.660
N'_β, s^{-2}	15.59	9.336	18.73	43.53	8.963	19.35
N'_p, s^{-1}	0.066	0.069	0.038	0.036	0.042	0.032
N'_r, s^{-1}	−0.653	−0.450	−0.565	−0.914	−0.327	−0.423
L'_{δ_r}, s^{-2}	7.682	3.750	9.918	21.90	3.635	8.365
N'_{δ_r}, s^{-2}	−6.848	−3.907	−8.383	−16.63	−3.760	−7.176
L'_{δ_a}, s^{-2}	17.26	8.965	21.27	37.84	8.162	16.90
N'_{δ_a}, s^{-2}	0.073	−0.859	0.508	2.811	−0.686	0.545