Tail Design

Main Wing Reference

b	5.5	ft
m.a.c.	0.8	ft
S	6	ft²
M	0.04	
Λ_{LE}	0	deg
t/c	0.12	
λ	1.00	

Air Properties

Cruise Alt. (	300	ft
V	44.12	f/s
ρ	0.0758741	lbm/f^3
q	2.2933098	lbf/f^2
μ	0.0000107	lbm/(f-s)
ν (cruise)	0.000141	f^2/s

Vertical Tail

Design Parameters

Cvt	*0.04*	
Lvt	*2.6*	ft
Λ_{LE}	*0*	deg
t/c	*0.09*	
λ	*0.80*	
Avt	*1.50*	

Airfoil Data

Name	*NACA 0009*	
Cl_{max}	*1.1*	
Cl_α	*0.111*	1/deg
a.c.	*0.25*	c
α_{0L}	*0*	deg
Cd	*0.01*	

Calculations

Svt	0.5451	ft²
b	0.904	ft
c_r	0.670	ft
c_t	0.536	ft
m.a.c.	0.605	ft
β	1.00	
$C_{L\alpha}$	**0.037**	1/deg

Sweep Angles

	x/c	$\Lambda_{x/c}$ (deg)
LE	0.00	0.0
1/4 chord	0.25	-4.2
(t/c)max	0.35	-5.9
TE	1.00	-16.5

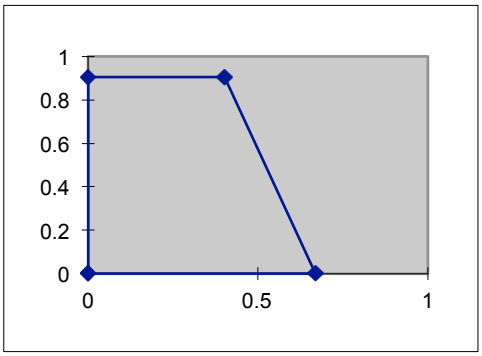
Viscous Drag

V_eff	44.1192	f/s
q_eff	2.2933098	lbf/f^2
M_eff	0.04	
Re_mac	189370.74	
sqrt(Re)	435.16748	
Cf	3.05E-03	
S_wet	1.1031717	ft²
F	0.9571781	
Q	1.05	
C_{D0}	**0.0062071**	

Total Drag	**0.008**	lbf

Spanwise View

x	y
0	0
0.7	0
0.4018841	0.9
0	0.9
0	0



Horizontal Tail

Design Parameters

Cht	0.50	
Lht	2.6	ft
Λ_{LE}	0	deg
t/c	0.09	
λ	1.00	
Aht	5.00	

Airfoil Data

Name	*NACA 64-004*	
Cl_{max}	*0.8*	
Cl_{α}	*0.111*	1/deg
a.c.	*0.258*	c
α_{0L}	*0*	deg
Cd	*0.004*	

Calculations

Sht	1	ft^2
b	2.2	ft
c_r	0.4	ft
c_t	0.4	ft
m.a.c.	0.4	ft
β	1.00	
$C_{L\alpha}$	**0.074**	1/deg
Total Drag	**0.016**	lbf

Sweep Angles

	x/c	$\Lambda_{x/c}$ (deg)
LE	0.00	0.0
1/4 chord	0.25	0.0
(t/c)max	0.35	0.0
TE	1.00	0.0

Viscous Drag

V_eff	44.1192	f/s
q_eff	2.2933098	lbf/f^2
M_eff	0.04	
Re_mac	138037.13	
sqrt(Re)	371.53349	
Cf	3.57E-03	
S_wet	1.9699495	ft^2
F	0.9586127	
Q	1.05	
C_{D0}	**0.0072812**	

Spanwise View

x	y
0	0
0.4	0
0.4412236	1.1
0	1.1
0	0