

Average gust frequencies. Subsonic transport aircraft

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 Dr R.N. Wilson — Royal Aircraft Establishment, Farnborough.

* Corresponding Member

The work on this Item was carried out in the Strength Analysis Group of ESDU. The members of staff who undertook the technical work involved in the initial assessment of the available information and the construction and subsequent development of the Item were

Mr M.B. Benoy — Senior Engineer
 Mr M.E. Grayley — Group Head.

AVERAGE GUST FREQUENCIES. SUBSONIC TRANSPORT AIRCRAFT

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AVERAGE GUST FREQUENCIES. SUBSONIC TRANSPORT AIRCRAFT

1. NOTATION

a	rate of change of wing lift coefficient with incidence, corrected for Mach number	rad^{-1}	rad^{-1}
A	aspect ratio		
b	wing span	m	ft
\bar{c}	geometric mean chord, S/b	m	ft
d	gust gradient distance for unswept wings	m	ft
d_e	effective gust gradient distance for swept wings given by $d_e = d + \frac{b}{2} \tan \Lambda$	m	ft
D	distance flown in a given flight stage	km	n miles
f_c	cumulative frequency		
f_1	natural frequency of wing in first bending mode	Hz	cycles/s
F_M	gust alleviation factor in compressible flow for ramp shaped gust defined in Section 2 (iv)		
F_0	gust alleviation factor in incompressible flow for ramp shaped gust defined in Section 2 (iv)		
g	gravitational acceleration	m/s^2	ft/s^2
H_p	pressure altitude	m	ft
k	ratio of up-gusts to down-gusts		
l_{10}	average distance flown to meet an up- or down-gust of $v_e \geq 10 \text{ ft/s (3.05 m/s)}$	km	n miles
M	bending moment	N m	lbf in
M_m	mean bending moment (1g level flight)	N m	lbf in
M_{max}, M_{min}	maximum and minimum bending moments, respectively	N m	lbf in
ΔM	change in bending moment, $(M_{max} - M_m)$ for an up-gust or $(M_m - M_{min})$ for a down-gust	N m	lbf in
$(\Delta M)_{10}$	value of ΔM arising from a 10 ft/s (3.05 m/s) up-gust	N m	lbf in

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