

Symbols and Units

Owing to the broad scope and interdisciplinary nature of this book it is inevitable that symbols and units used by various authors whose work is cited conflict to a considerable extent. In the interests of uniformity the symbols used herein have been changed where necessary and possible. It is hoped that this procedure will aid the reader. Likewise SI units have been used where possible. For the reader's convenience there follows a list of the more commonly used symbols, a list of units used and a conversion chart from SI units to those commonly found in past literature.

COMMONLY USED SYMBOLS

$a A$	area (various)
b	atmospheric scattering coefficient (also special constants)
B	stimulus luminance
B'	background luminance
C_μ	refractive index structure function
C	psychometric contrast ($\equiv (B - B')/B'$)
d	displacement, distance of separation
$D_{(p)}$	wave structure function
E	illuminance
E_R	retinal illuminance
f_c	critical fusion frequency
f_t	temporal frequency
f_s	spatial frequency
F	flux
g	retinal point
$h H$	height
I	intensity
k_λ	wavenumber
l_0	inner scale of turbulence
L_0	outer scale of turbulence
m	number of glimpses
M	magnification
$M()$	modulation transfer function with respect to ()
n	number of retinal receptors
N_p	number of rare events
N_q	number of quanta
N_e	noise equivalent passband

N	number of particles, noise
p	probability
P	power
q	$(1 - p)$
Q	neural or sensory response
r	radius
R	range
s_R	receptor spacing
S	signal
$S(\phi)$	scattering coefficient
t	time
T	transmission
u	visual acuity
v	velocity
V	potential difference
Z	function of contrast (specific)
α	angular diameter
$\beta'(\phi)$	volume scattering coefficient
δ	vision modelling constant (specific)
$\theta \phi \psi$	angles
Φ	cumulative probability
λ	wavelength
η	efficiency
τ	time constant
$\Delta\tau$	volume element of the atmosphere
Π	product
Σ	sum
ω	angular velocity
Ω	solid angle
ρ	reflectance
ϵ	50% threshold contrast
σ	standard deviation (normal distribution)
σ_e	atmospheric extinction coefficient
κ	threshold signal/noise
\mathcal{R}	resolution

UNITS USED

<i>Physical quantity</i>	<i>Name of unit</i>	<i>Symbol</i>
Length	micrometre	μm
	millimetre	mm
	metre	m
	kilometre	km
Time	second	s
	minute	min
Luminous intensity	candela	cd
Luminance	candelas/metre ²	cd/m ²
Retinal illuminance	trolland	trol
	scotopic trolland	scot trol
Angle	milli radian	mrad
	radian	rad
Spatial frequency	cycles/milliradian	c/mrad
Temporal frequency	cycles/second (\equiv Hertz)	Hz

COMMONLY USED CONVERSIONS

1 millimetre	\equiv 0.0394 inches
1 metre	\equiv 3.28 feet
1 kilometre	\equiv 3280 feet \equiv 0.6214 miles
1 candela/metre ²	\equiv 0.292 foot lamberts \equiv 0.314 millilamberts
1 milliradian	\equiv 3.42 minutes of arc
1 radian	\equiv 57.3 degrees
1 cycle/milliradian {	\equiv 0.292 cycles/minute of arc
	\equiv 17.4 cycles/degree