


# Appendix C

## Units

The HP 49G contains a catalog of 127 units that you can use to create *unit objects*. A unit object is a real number linked to a unit expression by the underscore character. For example, **2\_in** is a unit object representing 2 inches.

The calculator’s units are based on the 7 base units of the International System of Units: *m* (meter), *kg* (kilogram), *s* (second), *A* (ampere), *K* (kelvin), *cd* (candela), and *mol* (mole). The HP 49G makes use of two additional base units: *r* (radian) and *sr* (steradian). The remaining 118 units are compound units, that is, units derived from the 9 base units.

You select a unit by pressing  **UNITS**, choosing the appropriate category from the Units menu—length, area, volume, etc.—and finally selecting the unit from the category submenu. You do this when creating a unit object or when converting one unit to another. You can also perform calculations using unit objects. (See *Advanced User’s Guide* at <http://www.hp.com/calculators/hp49> for more information.)

Unit (Full Name)	Value in SI Units
a (are)	100 m <sup>2</sup>
A (ampere)	1 A
acre (acre)	4046.87260987 m <sup>2</sup>
arcmin (minute of arc)	2.90888208666 × 10 <sup>-4</sup> r
arcs (second of arc)	4.8481368111 × 10 <sup>-6</sup> r
atm (atmosphere)	101325 kg/m·s <sup>2</sup>
au (astronomical unit)	1.495979 × 10 <sup>11</sup> m
Å (angstrom)	1 × 10 <sup>-10</sup> m
b (barn)	1 × 10 <sup>-28</sup> m <sup>2</sup>
bar (bar)	100000 kg/m·s <sup>2</sup>

Unit (Full Name) (Continued)	Value in SI Units
bbl (barrel)	0.158987294928 m <sup>3</sup>
Bq (becquerel)	1 s <sup>-1</sup>
Btu (British thermal unit)	1055.05585262 kg·m <sup>2</sup> /s <sup>2</sup>
bu (bushel)	0.03523907 m <sup>3</sup>
°C (degree Celsius)	274.15 K [°C + 273.15]
c (speed of light)	299792458 m/s
C (coulomb)	1 A·s
cal (calorie)	4.1868 kg·m <sup>2</sup> /s <sup>2</sup>
cd (candela)	1 cd
chain (chain)	20.1168402337 m
Ci (curie)	3.7 × 10 <sup>10</sup> s <sup>-1</sup>
ct (carat)	0.0002 kg
cu (US cup)	2.365882365 × 10 <sup>-4</sup> m <sup>3</sup>
° (degree)	1.74532925199 × 10 <sup>-2</sup> rad
d (day)	86400 s
dB (decibel)	1 dB
dyn (dyne)	0.00001 kg·m/s <sup>2</sup>
erg (erg)	0.0000001 kg·m <sup>2</sup> /s <sup>2</sup>
eV (electron volt)	1.60217733 × 10 <sup>-19</sup> kg·m <sup>2</sup> /s <sup>2</sup>
F (farad)	1 A <sup>2</sup> ·s <sup>4</sup> /kg·m <sup>2</sup>
°F (degrees Fahrenheit)	255.927777778 K
fath (fathom)	1.82880365761 m
fbm (board foot)	0.002359737216 m <sup>3</sup>
fc (foot-candle)	10.7639104167 cd·sr/m <sup>2</sup>

Unit (Full Name) (Continued)	Value in SI Units
Fdy (faraday)	96487 A·s
fermi (fermi)	$1 \times 10^{-15} \text{ m}$
flam (foot-lambert)	3.42625909964 $\text{cd/m}^2$
ft (international foot)	0.3048 m
ftUS (survey foot)	0.304800609601 m
g (gram)	0.001 kg
ga (standard freefall)	9.80665 $\text{m/s}^2$
gal (US gallon)	0.003785411784 $\text{m}^3$
galC (Canadian gallon)	0.00454609 $\text{m}^3$
galUK (UK gallon)	0.004546092 $\text{m}^3$
gf (gram-force)	0.00980665 $\text{kg}\cdot\text{m/s}^2$
gmol (gram-mole)	1 mol
grad (gradients)	$1.57079632679 \times 10^{-2} \text{ r}$
grain (grain)	0.00006479891 kg
Gy (gray)	1 $\text{m}^2/\text{s}^2$
H (henry)	1 $\text{kg}\cdot\text{m}^2/\text{A}^2\cdot\text{s}^2$
ha (hectare)	10000 $\text{m}^2$
h (hour)	3600 s
hp (horsepower)	745.699871582 $\text{kg}\cdot\text{m}^2/\text{s}^3$
Hz (hertz)	1 $\text{s}^{-1}$
in (inch)	0.0254 m
inHg (inches of mercury, 0°C)	3386.38815789 $\text{kg/m}\cdot\text{s}^2$
inH <sub>2</sub> O (inches of water, 60°F)	248.84 $\text{kg/m}\cdot\text{s}^2$
J (joule)	1 $\text{kg}\cdot\text{m}^2/\text{s}^2$

Unit (Full Name) (Continued)	Value in SI Units
K (kelvin)	1 K
kg (kilogram)	1 kg
kip (kilopound-force)	4448.22161526 kg·m/s <sup>2</sup>
knot (nautical miles per hour)	0.514444444444 m/s
kph (kilometers per hour)	0.2777777777778 m/s
l (liter)	0.001 m <sup>3</sup>
lm (lambert)	3183.09886184 cd/m <sup>2</sup>
lb (avoirdupois pound)	0.45359237 kg
lbf (pound-force)	4.44822161526 kg·m/s <sup>2</sup>
lbmol (pound-mole)	453.59237 mol
lbt (troy pound)	0.3732417216 kg
lm (lumen)	1 cd·sr
lx (lux)	1 cd·sr/m <sup>2</sup>
lyr (light year)	9.46052840488 × 10 <sup>15</sup> m
m (meter)	1 m
μ (micron)	1 × 10 <sup>-6</sup> m
mho (mho)	1 A <sup>2</sup> ·s <sup>3</sup> /kg·m <sup>2</sup>
mi (international mile)	1609.344 m
mil (mil)	0.0000254 m
min (minute)	60 s
miUS (US statute mile)	1609.34721869 m
mmHg (millimeter of mercury, or torr)	133.322368421 kg/m·s <sup>2</sup>
mol (mole)	1 mol
mph (miles per hour)	0.44704 m/s

Unit (Full Name) (Continued)	Value in SI Units
N (newton)	1 kg·m/s <sup>2</sup>
nmi (nautical mile)	1852 m
Ω (ohm)	1 kg·m <sup>2</sup> /A <sup>2</sup> ·s <sup>3</sup>
oz (ounce)	0.028349523125 kg
ozfl (US fluid ounce)	2.95735295625 × 10 <sup>-5</sup> m <sup>3</sup>
ozt (troy ounce)	0.03110341768 kg
ozUK (UK fluid ounce)	2.8413075 × 10 <sup>-5</sup> m <sup>3</sup>
P (poise)	0.1 kg/m·s
Pa (pascal)	1 kg/m·s <sup>2</sup>
pc (parsec)	3.08567818585 × 10 <sup>16</sup> m
pdl (poundal)	0.138254954376 kg·m/s <sup>2</sup>
ph (phot)	10000 cd·sr/m <sup>2</sup>
pk (peck)	0.0088097675 m <sup>3</sup>
psi (pounds per square inch)	6894.75729317 kg/m·s <sup>2</sup>
Pt (pint)	0.000473176473 m <sup>3</sup>
qt (quart)	0.000946352946 m <sup>3</sup>
r (radian)	1 r
R (röntgen)	0.000258 A·s/kg
°R (degrees Rankine)	0.555555555556 K
rad (rad)	0.01 m <sup>2</sup> /s <sup>2</sup>
rd (rod)	5.02921005842 m
rem (rem)	0.01 m <sup>2</sup> /s <sup>2</sup>
rpm (revolutions per minute)	0.0166666666667 s <sup>-1</sup>
s (second)	1 s

Unit (Full Name) (Continued)	Value in SI Units
S (siemens)	$1 \text{ A}^2 \cdot \text{s}^3 / \text{kg} \cdot \text{m}^2$
sb (stilb)	$10000 \text{ cd/m}^2$
slug (slug)	$14.5939029372 \text{ kg}$
sr (steradian)	$1 \text{ sr}$
st (stere)	$1 \text{ m}^3$
St (stokes)	$0.0001 \text{ m}^2/\text{s}$
Sv (sievert)	$1 \text{ m}^2/\text{s}^2$
t (metric ton, or tonne)	$1000 \text{ kg}$
T (tesla)	$1 \text{ kg/A} \cdot \text{s}^2$
tbsp (tablespoon)	$1.47867647813 \times 10^{-5} \text{ m}^3$
therm (EEC therm)	$105506000 \text{ kg} \cdot \text{m}^2/\text{s}^2$
ton (short ton)	$907.18474 \text{ kg}$
tonUK (long ton)	$1016.0469088 \text{ kg}$
torr (torr)	$133.322368421 \text{ kg/ms}^2$
tsp (teaspoon)	$4.92892159375 \times 10^{-6} \text{ m}^3$
u (unified atomic mass)	$1.6605402 \times 10^{-27} \text{ kg}$
V (volt)	$1 \text{ kg} \cdot \text{m}^2/\text{A} \cdot \text{s}^3$
W (watt)	$1 \text{ kg} \cdot \text{m}^2/\text{s}^3$
Wb (weber)	$1 \text{ kg} \cdot \text{m}^2/\text{A} \cdot \text{s}^2$
yd (international yard)	$0.9144 \text{ m}$
yr (year)	$31556925.9747 \text{ s}$