NAME

gensky - generate a RADIANCE description of the sky

SYNOPSIS

gensky month day time [**options**]
gensky -ang altitude azimuth [**options**]
gensky -defaults

DESCRIPTION

Gensky produces a RADIANCE scene description for the CIE standard sky distribution at the given month, day and time. By default, the time is interpreted as local standard time on a 24-hour clock. The time value may be given either as decimal hours, or using a colon to separate hours and minutes. If the time is immediately followed (no white space) by a North American or European time zone designation, then this determines the standard meridian, which may be specified alternatively with the −*m* option. The following time zones are understood, with their corresponding hour differences from Greenwich Mean Time:

Standard time:
YST PST MST CST EST GMT
9 8 7 6 5 0

CET EET AST GST IST JST NZST
−1 −2 −3 −4 −5.5 −9 −12

Daylight savings time:
YDT PDT MDT CDT EDT BST
8 7 6 5 4 −1

CEST EEST ADT GDT IDT JDT NZDT
−2 −3 −4 −5 −6.5 −10 −13

If the time is preceded by a plus sign ('+'), then it is interpreted as local solar time instead. It is very important to specify the correct latitude and longitude (unless local solar time is given) using the −*a* and −*o* options to get the correct solar angles.

The second form gives the solar angles explicitly. The altitude is measured in degrees above the horizon, and the azimuth is measured in degrees west of South.

The third form prints the default option values.

The output sky distribution is given as a brightness function, *skyfunc*. Its value is in watts/steradian/meter2. The x axis points east, the y axis points north, and the z axis corresponds to the zenith. The actual material and surface(s) used for the sky is left up to the user. For a hemispherical blue sky, the description might be:

```
!gensky 4 1 14

skyfunc glow skyglow
0
0
4 .99 .99 1.1 0

skyglow source sky
0
0
4 0 0 1 180
```

Often, *skyfunc* will actually be used to characterize the light coming in from a window.

In addition to the specification of a sky distribution function, *gensky* suggests an ambient value in a comment at the beginning of the description to use with the −*av* option of the RADIANCE rendering programs.

(See rvu(1) and rpict(1).) This value is the cosine-weighted radiance of the sky in watts/steradian/meter2.

Gensky supports the following options.

−s Sunny sky without sun. The sky distribution will correspond to a standard CIE clear day.

+s Sunny sky with sun. In addition to the sky distribution function, a source description of the sun is generated.

−c Cloudy sky. The sky distribution will correspond to a standard CIE overcast day.

−i Intermediate sky without sun. The sky will correspond to a standard CIE intermediate day.

+i Intermediate sky with sun. In addition to the sky distribution, a (somewhat subdued) sun is generated.

−u Uniform cloudy sky. The sky distribution will be completely uniform.

-g *rfl* Average ground reflectance is *rfl*. This value is used to compute *skyfunc* when Dz is negative. Ground plane brightness is the same for *−s* as for *+s*. (Likewise for *−i* and *+i*, but see the *−r* option below.)

-b *brt* The zenith brightness is *brt*. Zenith radiance (in watts/steradian/meter2) is normally computed from the sun angle and sky turbidity (for sunny sky). It can be given directly instead, using this option.

-B *irrad* Same as *−b*, except zenith brightness is computed from the horizontal diffuse irradiance (in watts/meter2).

-r *rad* The solar radiance is *rad*. Solar radiance (in watts/steradian/meter2) is normally computed from the solar altitude. This option may be used to override the default calculation. If a value of zero is given, no sun description is produced, and the contribution of direct solar to ground brightness is neglected.

-R *irrad* Same as *−r*, except solar radiance is computed from the horizontal direct irradiance (in watts/meter2).

-t *trb* The turbidity factor is *trb*. Greater turbidity factors correspond to greater atmospheric scattering. A turbidity factor of 1.0 indicates an ideal clear atmosphere (i.e. a completely dark sky). Values less than 1.0 are physically impossible.

The following options do not apply when the solar altitude and azimuth are given explicitly.

-a *lat* The site latitude is *lat* degrees north. (Use negative angle for south latitude.) This is used in the calculation of sun angle.

-o *lon* The site longitude is *lon* degrees west. (Use negative angle for east longitude.) This is used in the calculation of solar time and sun angle. Be sure to give the corresponding standard meridian also! If solar time is given directly, then this option has no effect.

-m *mer* The site standard meridian is *mer* degrees west of Greenwich. (Use negative angle for east.) This is used in the calculation of solar time. Be sure to give the correct longitude also! If a time zone or solar time is given directly, then this option has no effect.

EXAMPLE

To produce a sunny sky for July 4th at 2:30pm Eastern daylight time at a site latitude of 42 degrees, 89 degrees west longitude:

```
gensky 7 4 14:30EDT +s −a 42 −o 89
```

To produce a sunny sky distribution for a specific sun position but without the sun description:

```
gensky −ang 23 −40 −s
```

FILES

/usr/local/lib/ray/skybright.cal

AUTHOR

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SEE ALSO

rpict(1), rvu(1), xform(1)