

## NAME

**cents** — translate pitch-related representations to cents

## SYNOPSIS

**cents** [-p *n*] [-tx] [*inputfile* ...] [> *outputfile.cnt*]

## DESCRIPTION

The **cents** command transforms various pitch-related inputs to corresponding numerical values in hundredths of semitones. It outputs one or more Humdrum **\*\*cents** spines containing values corresponding to the cents distance from middle C for pitch-related input tokens. Pitches above middle C produce positive output values, whereas pitches below middle C produce negative output values. For example, the **\*\*pitch** token “C3” is transformed to -1200 (cents).

The **cents** command is able to translate any of the pitch-related representations listed below. In each case, a tuning standard of A4 equals 440 hertz is assumed. For descriptions of the various input representations (including **\*\*cents**) refer to Section 2 (*Representation Reference*) of this reference manual.

It is recommended that output files produced using the **cent** command should be given names with the distinguishing ‘.cnt’ extension.

<b>**cents</b>	hundredths of a semitone with respect to middle C=0
<b>**freq</b>	fundamental frequency (in hertz)
<b>**fret</b>	fretted-instrument pitch tablature
<b>**kern</b>	core pitch/duration representation
<b>**MIDI</b>	Music Instrument Digital Interface tablature
<b>**pitch</b>	American National Standards Institute pitch notation (e.g. “A#4”)
<b>**semit</b>	equal-tempered semitones with respect to middle C=0 (e.g. 12 equals C5)
<b>**solfg</b>	French solfège system (fixed ‘doh’)
<b>**specC</b>	spectral centroid (in hertz)
<b>**Tonh</b>	German pitch system

*Input representations processed by cents.*

## OPTIONS

The **cents** command provides the following options:

- h** displays a help screen summarizing the command syntax
- p *n*** output precision of *n* decimal places
- t** suppresses printing of all but the first note of a group of tied **\*\*kern** notes
- x** suppresses printing of non-cents signifiers

Options are specified in the command line.

The **-p** option can be used to set the precision of the output values to *n* decimal places. The default precision is integer values only (*n*=0). Note that **cents** is able to process **\*\*cents** as input; this feature allows the user to round-off existing **\*\*cents** data to a specified precision.

The **-t** ensures that only a single output value is given for tied **\*\*kern** notes; the output coincides with the first note of the tie.

In the default operation, **cents** outputs non-pitch-related signifiers in addition to the cents value. For example, the **\*\*pitch** token “A5zzz” will result in the output “2100zzz” — that is, after translating A5 to 2100 cents, the “zzz” signifiers are retained in the output. For some applications, echoing non-pitch-related signifiers in the output is useful. However, in other situations, the result can prove confusing — especially, when the non-pitch-related signifiers are numbers. Consider the case of the **\*\*kern** token “8aa”; after translating ‘aa’ to 2100 cents, the non-pitch-related signifier ‘8’ will also be output, hence the value 82100 — which will undoubtedly cause confusion. The **-x** option is useful for eliminating non-pitch-related signifiers from the output. For most **\*\*kern** inputs, the **-x** option is recommended.

## EXAMPLES

The following example illustrates the use of **cents**. The input contains six pitch-related spines — two of which (**\*\*deg** and **\*\*cocho**) cannot be processed by **cents**. In addition, there are two non-pitch-related spines (**\*\*embell** and **\*\*metpos**).

!! ‘cents’ example.

<b>**kern</b>	<b>**pitch</b>	<b>**MIDI</b>	<b>**deg</b>	<b>**metpos</b>	<b>**cocho</b>	<b>**Tonh</b>	<b>**embell</b>
*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4	*M2/4
*	*	*	*	*tb8	*	*	*
=1	=1	=1	=1	=1	=1	=1	=1
8ee-	G#4foo	/60/bar	1foo	1	r	Gis2	ct
.	.	/-60/	.	.	.	.	.
8ff	A3	/62/	2	3	9.89	H2	upt
.	.	/-62/	.	.	.	.	.
8dd-	Ab3	/70/	1	2	7.07	B2	ct
.	.	/-70/	.	.	.	.	.
8d-	C#4	/61/	6	3	7.135	Cis4	sus
.	.	/-61/	.	.	.	.	.
=2	=2	=2	=2	=2	=2	=2	=2
[4a-	r	.	5	1	r	r	.
.	.	.	7	3	5.5	Heses2	ct
4a-]	D4	/48/ /52/	1	2	8.11	C3	ct
.	.	/-48/	.	.	.	.	.
.	D4 F4	/-52/	2	3	7.33 6.4	C3 Es3	ct
=3	=3	=3	=3	=3	=3	=3	=3
r	G4	.	r	1	r	H2 D3	.
===	===	===	===	===	===	===	===
*_	*_	*_	*_	*_	*_	*_	*_

Executing the command

```
cents -tx input > output.cnt
```

produces the following result:

```
!! 'cents' example.
**cents **cents **cents **deg **metpos **cocho **cents **embell
*M2/4 *M2/4 *M2/4 *M2/4 *M2/4 *M2/4 *M2/4 *M2/4
* * * * *tb8 * * *
=1 =1 =1 =1 =1 =1 =1 =1
1500 800 0 1foo 1 r -1600 ct
. . . . .
1700 -300 200 2 3 9.89 -1300 upt
. . . . .
1300 -400 1000 1 2 7.07 -1400 ct
. . . . .
100 100 100 6 3 7.135 100 sus
. . . . .
=2 =2 =2 =2 =2 =2 =2 =2
800 r . 5 1 r r .
. . . 7 3 5.5 -1500 ct
. 200 -1200 -800 1 2 8.11 -1200 ct
. . . . .
. 200 500 . 2 3 7.33 6.4 -1200 -900 ct
=3 =3 =3 =3 =3 =3 =3 =3
r 700 . r 1 r -1300 -1000 .
=====
*- *- *- *- *- *- *-
```

Both processed and unprocessed spines are output. Notice that the tied note at the beginning of measure 2 in the **\*\*kern** spine has been rendered as a single note rather than as two notes (due to the **-t** option). Also notice that the non-pitch-related signifiers (e.g. foo) in the first notes of the **\*\*pitch**, **\*\*MIDI**, and **\*\*cocho** spines have been stripped away (due to the **-x** option).

## FILES

The file `x_option.awk` is used by this program when the **-x** option is invoked.

## PORTABILITY

DOS 2.0 and up, with the MKS Toolkit. OS/2 with the MKS Toolkit. UNIX systems supporting the *Korn* shell or *Bourne* shell command interpreters, and revised *awk* (1985).

## SEE ALSO

**\*\*cents** (2), **\*\*freq** (2), **freq** (4), **\*\*fret** (2), **\*\*kern** (2), **kern** (4), **\*\*MIDI** (2), **midi** (4), **\*\*pitch** (2), **pitch** (4), **\*\*semit** (2), **semit** (4), **\*\*solfg** (2), **solfg** (4), **\*\*specC** (2), **specC** (4), **\*\*Tonh** (2), **tonh** (4)