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## NAME

**trans** — transpose pitch representations

## SYNOPSIS

**trans** -d [ $\pm$ ]n [-c [ $\pm$ ]n] [inputfile ...] [ > outputfile ]

## DESCRIPTION

The **trans** command is used to transpose various Humdrum pitch representations. Transposed outputs maintain proper pitch-interval spellings, except in modal transposition; **trans** might be used to transpose a work up a perfect fourth, or down an augmented third, or from major mode to Phrygian. A “transposition interpretation” is appended to the output to mark the score as having been transposed.

The **trans** command is able to process those pitch-related representations listed below. All other inputs are simply echoed in the output. For descriptions of the various input representations refer to Section 2 (*Representation Reference*) of this reference manual.

**kern	core absolute pitch representation
**pitch	American National Standards Institute pitch notation (e.g. “A#4”)
**solfg	French solfège system (fixed ‘doh’)
**Tonh	German pitch system

*Input representations processed by trans.*

Transpositions are transformations that shift all pitch-signifier values up or down by some amount. Transpositions are specified by defining a *diatonic offset* and a *chromatic offset*. The diatonic offset affects only the pitch-letter name used to spell a note. The chromatic offset affects only the number of semitones shifted from the original pitch height.

For typical transpositions, both diatonic and chromatic offsets will need to be specified. For example, in transposing up a minor third (e.g. from C to E-flat), the diatonic offset is ‘up two pitch-letter names,’ and the chromatic offset is ‘up three semitones.’ The appropriate command invocation would be:

```
trans -d +2 -c +3 input > output
```

The plus signs above are optional; in their absence, **trans** assumes an upward transposition. Note that negative offsets can be mixed with positive offsets. For example, `trans -d -1 -c +1` will transpose the pitch C to B double-sharp, and F flat to E sharp, etc. (i.e. down one letter name, yet up one semitone).

Modal transpositions are invoked by simply omitting the chromatic offset information. (See

EXAMPLES below.)

It is recommended that output files produced using the **trans** command should be given names with the distinguishing '.tr' extension.

## OPTIONS

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

- c** [ $\pm$ ]*n* transpose up(+) or down (-) *n* semitones
- d** [ $\pm$ ]*n* transpose up(+) or down (-) *n* diatonic letter names
- h** displays a help screen summarizing the command syntax

Options are specified in the command line.

Note that the **-d** "option" is mandatory rather than optional.

## EXAMPLES

The following examples illustrate the use of **trans**.

Transposition up a minor third differs from transposition up an augmented second:

```
trans -d +2 -c +3 milhaud
trans -d +1 -c +3 milhaud
```

Enharmonic transpositions can be accomplished by defining the chromatic offset as zero semitones. For example, the following command transposes up a diminished second. It might be used to transpose from the key of C-sharp to the key of D-flat.

```
trans -d +1 -c 0 moonlight
```

Transposition up or down an octave requires both a diatonic offset and a corresponding chromatic offset of plus or minus 12 semitones. e.g.

```
trans -d -7 -c -12 guitar
```

In addition to exact pitch transpositions, **trans** can also perform *modal* transpositions. Modal transpositions arise when the pitch letter names are modified without regard for the precise semitone offset. To invoke a modal transposition, simply omit the chromatic offset specification. The following transposition changes diatonic pitch-letter names (down by two pitch-letters) so that the pitch C will become A, etc.

```
trans -d -2 major > aeolian
```

For inputs in major keys, the corresponding outputs will be in Aeolian mode.

For some applications, two or more successive transpositions may be necessary. For example, the following pipeline modifies inputs in major keys so that they are in the tonic

Dorian mode.

```
trans -d +1 major | trans -d -1 -c -2 > dorian
```

The first **trans** carries out a modal transposition — up the interval of a diatonic second. Thus, a work in D major would be placed in E Dorian. The second **trans** returns the score down the precise interval of a major second. Together, both transpositions would cause an input in F major to be transformed to F Dorian; an input in B-flat major would be transformed to B-flat Dorian, etc.

Whenever **trans** is invoked, it adds a tandem interpretation to the output indicating that the output representation has been transposed and is no longer at the original pitch. *Transposition tandem interpretations* are similar in syntax to the **trans** command itself. For example, the following tandem interpretation indicates that the score has been transposed up a major second.

```
*Trdlc2
```

The tandem interpretation in effect echoes the operation of the original transposition. If a score has undergone more than one transposition, the associated tandem interpretations will be ordered beginning with the most recent transposition. For example, a work that was transposed down a perfect fourth, followed by up a diminished second:

```
trans -d -3 -c -5
trans -d +1 -c 0
```

would contain the tandem interpretation:

```
*Trdlc0
*Trd-3c-5
```

## SAMPLE OUTPUT

The following example illustrates the operation of **trans**. Given the following input:

**kern	**pitch	**Tonh	**solfg	**foo
=1	=1	=1	=1	.
c	C4	C4	do4	abc
c#	C#4	Cis4	do~d4	.
d-	Db4	Des4	re~b4	xyz
r	r	r	r	.
=2	=2	=2	=2	.
B-	Bb3	B3	si~b3	.
B--	Bbb3	Heses3	si~bb3	.
=3	=3	=3	=3	.
*-	*-	*-	*-	*-

the command



```
trans -d 1 -c 2
```

would produce the following output:

**kern	**pitch	**Tonh	**solfg	**foo
*Trdlc2	*Trdlc2	*Trdlc2	*Trdlc2	*
=1	=1	=1	=1	.
d	D4	D4	re4	abc
d#	D#4	Dis4	re~d4	.
e-	Eb4	Es4	mi~b4	xyz
r	r	r	r	.
=2	=2	=2	=2	.
c	C4	C4	do4	.
c-	Cb4	Ces4	do~b4	.
=3	=3	=3	=3	.
*-	*-	*-	*-	*-

## 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

**humsed** (4), **\*\*kern** (2), **kern** (4), **\*\*pitch** (2), **pitch** (4), **recode** (4), **\*\*solfg** (2), **solfg** (4), **\*\*Tonh** (2), **tonh** (4)

## WARNINGS

It is important not to confused transposed scores with notations of music for transposing instruments (such as the horn in F or the clarinet in B-flat). The **\*\*pitch**, **\*\*kern**, **\*\*Tonh**, and **\*\*solfg** representations are intended to represent absolute or concert pitch; transposed scores are deviate from this convention. The *transpose tandem interpretation* should not be used to indicate that an encoding is for a transposing instrument. A special tandem interpretation — beginning **\*ITr** — is reserved for such designations. The interpretation **\*Tr** means that the encoding no longer represents absolute or concert pitch. By contrast, the interpretation **\*ITr** means that the instrumentalist reads from a score whose pitches are notated differently from concert pitch; nevertheless, the ensuing data is encoded at concert pitch. For example, a trumpet in B-flat plays a B-flat by fingering the pitch C. The absolute pitch (B-flat) is the proper **\*\*kern**, **\*\*pitch**, **\*\*solfg**, or **\*\*Tonh** encoding. Since the instrumentalist's *notation* is transposed up 1 diatonic letter-name and 2 chromatic semitones from the absolute or concert pitch, the encoded score will contain the instrument's transposition tandem interpretation

```
*ITrdlc2
```

(even though the encoded data is at concert pitch). Note that it is possible subsequently to transpose such a score using the **trans** command.

Note also that key and key signature tandem interpretations are not modified by **trans** since **\*\*pitch**, **\*\*kern**, **\*\*solfg**, and **\*\*Tonh**, intended to encode the original key and key signature at absolute pitch.