
NAME

metpos — assign metric position indicators to sonorities

SYNOPSIS

metpos [-m *n/n*] [-t *n*] [*inputfile.tb ...*] [> *outputfile.met*]

DESCRIPTION

The **metpos** command is used to characterize the metric strength of successive sonorities in a musical passage. Specifically, **metpos** appends a Humdrum ***metpos* spine to a time-base (**tb*) input stream. The ***metpos* spine contains integer values indicating the position in the metric hierarchy for each data record — given some meter signature.

The highest position in any given metric hierarchy is given the value “1.” This value is assigned to the first event at the beginning of each measure. In duple and quadruple meters, the second level in the metric hierarchy occurs in the middle of the measure and is assigned the output value “2.” (In triple meters, the second and third beats in the measure will be assigned to the second level in the metric hierarchy.) All other metric positions in the measure (beats, sub-beats, sub-sub-beats, etc.) are assigned successively increasing numerical values according to their placement in the metric hierarchy. Larger ***metpos* values signify sonorities of lesser metric significance.

Input to **metpos** can be any Humdrum file that conforms to the *time-base* format — i.e. where each data record represents an equivalent duration of time. Each input measure will thus contain the same number of data records. For example, in 3/4 meter with an eighth-note time-base, each complete measure should contain 6 data records.

For correct operation, **metpos** must be informed of both the *meter signature* and the *time-base* for the given input passage. This information may be specified either via the command line, or as encoded interpretations in the input stream. The command line method of specification is illustrated below:

```
metpos -m 9/16 -t 32
```

This command establishes a meter of 9/16 and a time-base of a thirty-second duration for the input.

Alternatively, the meter signature and time-base duration can be made known through the presence of interpretation records in the encoded input. In the above case, the meter signature can be made known to **metpos** through the **M9/16* interpretation, while the time-base duration can be made known to through the **tb32* interpretation. A time-base and meter signature interpretation must appear in all spines of the input file prior to the occurrence of any data records. Note that once the initial meter is established, **metpos** is

able to adapt to encoded changes of meter within a given score or input stream. If meter or time-base information is not available to **metpos** an error message will be issued and execution terminated.

As noted above, metric hierarchies are represented through a series of integer values. The smallest numerical values represent events having the highest metric stress, whereas successively larger values represent positions of progressively weaker metric stress. For example, in the case of 2/4 meter with an 8th duration time-base, the metric hierarchy is: 1, 3, 2, 3. If the time-base is 16th durations, the metric hierarchy is: 1, 4, 3, 4, 2, 4, 3, 4. Metric hierarchies in compound meters are also possible. For example, in the case of 6/8 meter (16th durations) the metric hierarchy is: 1, 4, 3, 4, 3, 4, 2, 4, 3, 4, 3, 4.

Note that **metpos** is unable to deal with irregular meters. (See “LIMITS” below.)

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

OPTIONS

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

- h** displays a help screen summarizing the command syntax
- m *n/n*** set the initial meter signature to *n/n*
- t *n*** set the initial time-base duration to *n* (**recip value)

Options are specified in the command line.

SAMPLE OUTPUTS

The following extract from Bartók’s “Two-Part Study” No. 121 from *Mikrokosmos* demonstrates the effect of the **metpos** command. The two left-most columns show the original input; all three columns show the corresponding output from **metpos**:

**kern	**kern	**metpos
*tb8	*tb8	*tb8
=16	=16	=16
*M6/4	*M6/4	*M6/4
8Gn	8b-	1
8A	8ccn	4
8B-	8cc#}	3
8cn	{8f#	4
8c#}	8gn	3
{8F#	8a	4
8G	8b-	2
8A	8ccn	4

8B-	4b-	3
8cn	.	4
8c#}	8fn}	3
8r	8r	4
=17	=17	=17
*M4/4	*M4/4	*M4/4
8d	2r	1
4.d	.	4
.	.	3
.	.	4
{2d_	8dd	2
.	4.dd	4
.	.	3
.	.	4
=18	=18	=18
8d	{1dd_	1
8A	.	4
8F#	.	3
8E	.	4
8D	.	2
8BB	.	4
8D	.	3
8E}	.	4
=19	=19	=19
*M3/2	*M3/2	*M3/2
{8F#	8dd	1
8A	8ffn	4
8c#	8aa	3
8A	8ff	4
8F#	8dd	2
8A	8ff	4
8F#	8dd	3
8E	8ccn	4
8D	8b-	2
8BBn	8gn	4
8D	8b-	3
8E}	8cc	4
=20	=20	=20
*-	*-	*-

Notice that **metpos** adapts to changing meter signatures, and correctly distinguishes between metric accent patterns such as 6/4 (measure 16) and 3/2 (measure 19).

WARNINGS

It is possible to define a time-base that makes little sense with respect to the meter signature. For example, it is possible to set the time-base to a quarter duration (*tb4) in a 6/8 meter (*M6/8). The resulting metric heirarchy (1,3,3) will produce “hemiola” values.

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

****kern** (2), ****recip** (2), **timebase** (4)

LIMITS

In a number of meters, **metpos** is limited in the depth of permissible metric positions. These limitations are tabulated below:

compound duple	7 metric levels	96 metric positions/measure
compound triple	6 metric levels	108 metric positions/measure
compound quadruple	7 metric levels	96 metric positions/measure
simple triple	7 metric levels	96 metric positions/measure
simple duple	no limitation	no limitation
simple quadruple	no limitation	no limitation

By way of example, it is possible to process music in 6/8 meter in time-base divisions as small as a 256th-notes, or a passage in 6/2 meter in 64th-note divisions. Smaller time-base divisions are not handled.

The following meter signatures can be handled by **metpos**:

2/2,	3/2,	4/2,	6/2,	9/2,	12/2,
2/4,	3/4,	4/4,	6/4,	9/4,	12/4,
2/8,	3/8,	4/8,	6/8,	9/8,	12/8,
2/16,	3/16,	4/16,	6/16,	9/16,	12/16,
2/32,	3/32,	4/32,	6/32,	9/32,	12/32,
2/64,	3/64,	4/64,	6/64,	9/64,	12/64,

Some meter signatures containing dotted durations can also be handled:

2/2.(=6/4),	3/2.(=9/4),	4/2.(=12/4),
2/4.(=6/8),	3/4.(=9/8),	4/4.(=12/8),
2/8.(=6/16),	3/8.(=9/16),	4/8.(=12/16),

Meter signatures NOT handled by **metpos** include:

5/2,	7/2,	8/2,	10/2,	11/2,	13/2,	14/2,	15/2,	16/2,
5/4,	7/4,	8/4,	10/4,	11/4,	13/4,	14/4,	15/4,	16/4,

$5/8$, $7/8$, $8/8$, $10/8$, $11/8$, $13/8$, $14/8$, $15/8$, $16/8$,
 $5/16$, $7/16$, $8/16$, $10/16$, $11/16$, $13/16$, $14/16$, $15/16$, $16/16$,
 etc.

PROPOSED MODIFICATIONS

Irregular meters such as $5/4$ or $7/8$ should be acceptable provided the beat subdivisions are made explicit: e.g. $5/4$ as $(3+2)/4$ or $5/4$ as $(2+3)/4$ or $8/8$ $(3+3+2)/8$, etc. Alternatively, no sub-grouping of irregular meters into beats of 2's or 3's need be assumed. Thus, for example, all beats other than the first beat in $5/4$ could be assigned identical values in the metric hierarchy.