REPRESENTATION

****date** — absolute time representation (year, month, day, hour, minute, second ...)

DESCRIPTION

The ****date** representation provides a flexible means for specifying particular moments in historical time. The ****date** scheme is able to represent year, month, day, hour, minute, second, and fractional second information. In addition, various degrees of approximation and uncertainty may be represented. N.B. Time-*spans* are not represented by ****date**; see the ****dur (2), **time (2),** or ****Zeit (2)** representations.

In the ****date** representation, date information is encoded according to the following basic syntax:

year/month/day/hour:minute:second.decimal

Date information may be encoded in full, or may consist of isolated elements or parts. The following table shows the most succinct ways of encoding single date values within ****date**:

`.11`	eleven one-hundredths of a second
`11`	11th second
`11:`	11th minute
`11::`	11 o'clock
`11/`	the year 11 A.D.
`/11`	November
`//11`	11th day of the month

Examples of ****date** *components*

Notice that if a single numerical value appears, it is interpreted as *seconds*; if a single value appears followed by a slash, it is interpreted as a *year*; if a single value appears followed by a colon, it is interpreted as a *minutes*. Days and hours require two leading or two trailing delimiters respectively. In general, abbreviated forms of ****date** representations tend to favor the two extremes of time: seconds and years. These are the time frames that are typically of greatest interest to music scholars.

The ****date** representation makes use of the Gregorian calendar and the 24-hour clock; Dates prior to the year 1 A.D. can be specified by prepending the "at" sign (`@`) to the year.

The ****date** representation provides three distinct means for representing approximate moments. It also provides two independent means for representing uncertainty, as well as mechanisms for representing time boundaries (prior to ...; after ...).

If a date token is preceded by the tilde (`~`) signifier, the entire data token is taken to be *approximate*. Hence, the token `~1556/` represents the approximate year 1556, whereas the

token ~1901/9/1/ represents approximately September 1st, 1901. When the lower-case letter 'x' appears in a data token, it indicates that only the adjoining numerical value is approximate. Hence, the token 1921/6x// means approximately June in the year 1921, whereas the token 1921x/6// means the month of June in the approximate year 1921. The 'x' may precede or follow a given value — provided it is adjacent to the approximate value.

```
14:30x:
```

means *approximately 30 minutes* after 2 PM, rather than approximately 2:30 PM. In this case, only the value '30' is approximate.

A third method for representing temporal approximation employs the caret (^) to denote a range. For example, the ****date** token:

```
1554/^1557/
```

represents a moment somewhere between the years 1554 and 1557. Conceptually, ****date** is intended to represent *moments* rather than *periods* of time. In other words, the above token represents a moment sometime between 1554 and 1557; it is not intended to signify an event that spanned the years 1554 to 1557. ****date** does not presume how long a moment "lasts," so it is theoretically possible to interpret 1554 to 1557 as a "long moment." However, another representation — ****Zeit (2)** — is intended to represent *periods* of time, and so is better suited to the task of representing an ongoing state or condition. In ****date,** the caret (^) is meant merely to provide a more precise means for specifying the degree of approximation. The following ****date** tokens:

```
1954/6/1/^1954/6/2/
2.23^2.238
```

represent approximate times between June 1st and 2nd, 1954, and between 2.230 and 2.238 seconds respectively.

In addition to methods for representing approximation, ****date** also allows three methods for the encoding of uncertainty. General uncertainty is signified using the question-mark (?). A ****date** token preceded by a question-mark indicates that the date information is *uncertain* (rather than imprecise). For example, the ****date** token:

```
?1661/4//
```

represents the month of April, 1661 — but indicates that this date is uncertain. When the lower-case letter 'z' appears in a data token, it indicates that only the adjoining numerical value is uncertain. This allows the user to be more specific about what aspect of the date is uncertain. For example, a composer's letter might be dated 'September 17th,' but historians may be uncertain of the precise year. This date might be encoded as:

```
1840z/9/17/
```

Note that uncertainty is not the same as approximation. Consider, for example, the contents

of a letter dated simply "the 10th" that refers to especially hot summer temperatures. The letter is thought to have been written in 1932:

```
1932z/8x/10/
```

This representation indicates that the year 1932 is uncertain, that the month is approximately August, but that the date is definitely the tenth. As in the case of the 'x' signifier, the 'z' may precede or follow a given value — provided it is adjacent to the uncertain value.

A third method for representing uncertainty is provided by the ****date** logical OR signifier (|). As in the case of the logical BETWEEN (^), the OR signifier separates two component sub-dates. For example, the token `10:41:|11:41:` means "either 10:41 AM or 11:41 AM."

In addition to the approximation and uncertainty signifiers, ****date** also permits the encoding of time boundaries. The less-than sign (<) denotes "prior to" and the greater-than sign (>) denotes "after." For example, the data token `<1100/` means prior to 1100 A.D., whereas the token `>21::` means after 21 hours.

Time boundaries can be mixed with approximation and uncertainty operators. Hence, the data token `<5:30x:` represents a time prior to 5 minutes and approximately 30 seconds. Similarly, time boundaries can be mixed with time ranges. Thus, the data token `<1604/^1605/` means before some time between 1604 and 1605.

Note that > and < apply to entire date tokens (only one of > or < may appear in a given token). The signifiers ? and ~ can apply to subtokens (joined by the *BETWEEN* (^) or *OR* conjunction operators. The signifiers x and z apply to individual numerical values only.

FILE TYPE

It is recommended that files containing predominantly `**data` data should be given names with the distinguishing '.dte' extension.

SIGNIFIERS

The following table summarizes the ****date** mappings of signifiers and signifieds.

0-9	decimal values
@	year B.C. rather than A.D.
/	year-month, month-day and day-hour delimiter
:	hour-minute and minute-second delimiter
.	fractional second delimiter; null token
?	date uncertain
z	value uncertain
~	date approximate
x	value approximate
<	sometime prior to
>	sometime after
^	"between" conjunction
|	"or" conjunction

Summary of ****date** *Signifiers*

EXAMPLES

Several examples of ****date** data tokens are identified below:

**date tokens	meaning
1917/06/02/23:55:00.0	5 minutes before midnight on June 2nd, 1917.
1917/6/2/23:55:00.0	5 minutes before midnight on June 2nd, 1917.
///11:59:59	One second before noon (no day info. provided).
11:59:59	One second before noon (no day info. provided).
.001	Time of one millisecond.
23.8	Time of 23.8 seconds.
/1/1/	New Years' Day (January 1st).
1770/	The year 1770.
1983///.741	The year 1983; a time-point of 741 milliseconds.
<1300/	Sometime before the year 1300.
>1::	Sometime after 1 AM.
~14:30:	Approximately 2:30 PM.
14:30x:	Approximately 30 minutes past 2 PM.
?14:30:	Perhaps 2:30 PM.
14:30z:	Perhaps 30 minutes past 2 PM.
?1848/	Perhaps 1848.
~1848/	Approximately 1848.
1847/^1849/	Sometime between 1847 and 1849.
1847/|1848/|1849/	Either 1847, 1848, or 1849.
1848/4z//	1848; perhaps April.
1848x/4//	Approximately 1848; certainly April.
>~:1:30	After approximately a minute and a half.
//3/^~//5/3	Sometime between March and approximately May 3rd.
>?~1933/7/30z/	Perhaps sometime after about July 30(?) 1933.

Examples of ****date** *Tokens*

The following is a sample document:

```
**opus    **date
33#1      1864/
33#2      1864/3/31
33#3      1864/
34        1865/4z/
35#1      ?1865/
35#2      <1865/9/
*-        *-
```

PERTINENT COMMANDS

Currently, no special-purpose Humdrum commands produce ****date** as output, or process ****date** encoded data as input.

TANDEM INTERPRETATIONS

The following tandem interpretations can be used in conjunction with ****date**:

meter signatures	`*M6/8`
tempo	`*MM96.3`

Tandem interpretations for ****date**

SEE ALSO

****dur** (2), ****metpos** (2), ****ordo** (2), ****recip** (2), ****takt** (2), ****time** (2), ****Zeit** (2)