Section 3

Tandem Interpretation Reference

Documentation Style

This section of the *Reference Manual* describes various pre-defined tandem interpretations that are used in conjunction with some of the representations described in Section 2. Tandem interpretations provide additional contextual information for a given representation. Tandem interpretations are denoted by a single leading asterisk character (beginning in the first column of a line and spine) followed immediately by an interpretation *keyword*. (By contrast, *exclusive interpretations* are denoted by two leading asterisks.) Although only one exclusive interpretation can be active at a given moment for a given spine, several tandem interpretations may be active concurrently in a given spine. Tandem interpretations may appear at any point in a file, but they must be preceded by an exclusive interpretation specifying the type of representation encoded.

Each entry in this section of the documentation includes a description of the scope of the tandem representation, a syntax for the interpretation, and examples of use. Descriptions of the corresponding representations may be found in Section 2 of this *Reference Manual*.

Each reference entry contains information identifying the name and purpose of the tandem interpretation and a summary description of mappings between signifiers and signifieds. The standard order of documentation sections is as follows: (1) representation, (2) description, (3) signifiers, (4) examples, (5) see also, (6) warnings, (7) note, (8) reference, and (9) proposed modifications

REPRESENTATION

all intervals — all harmonic intervals designator

DESCRIPTION

The **all intervals** tandem interpretation is used in conjunction with the `**hint` harmonic interval representation to indicate that the representation includes all possible permuted intervals. For example, a sonority consisting of the pitches C4, E4, G4, and C5 would produce an exhaustive interval content including M3, m3, P4, P4, m6 and P8.

The `*all` tandem interpretations consist simply of a single asterisk, followed by the keyword `all`.

EXAMPLES

An example of the use of `*all` is given below:

```
**pitch        **hint      **hint
*              *           *all
C4             -           -
C4 E4          M3          M3
C4 E4 G4       M3 m3       M3 m3 P5
C4 E4 G4 C5    M3 m3 P4    M3 m3 P4 P5 m6 P8
*-             *-          *-
```

SEE ALSO

****hint** (2), **hint** (4)

REPRESENTATION

clefs — clef designation

DESCRIPTION

The **clef** tandem interpretation permits the encoding of notated clefs for a Humdrum representation.

Three types of clefs can be represented: G-clefs, F-clefs, and C-clefs. Each clef may be placed on any line in a multi-line staff. The common treble staff locates the G-clef on the second line from the bottom, while the common bass staff locates the F-clef on the fourth line from the bottom. In addition, octave and double-octave transpositions can be represented.

Clef tandem interpretations consist of a single asterisk, followed by the keyword `clef`, followed by an upper-case letter indicating the type of clef, followed by one or more octave transposition signifiers (`^` or `v`), followed by a number indicating the designated line. followed by a number indicating the staff-line designated by the clef. Line numbers are counted beginning at the bottom of the staff. The absence of any clef indication may be explicitly represented by the 'X' clef designator — as in `clefX`. Notice that clef tandem interpretations do not assume the number of lines in the staff. Hence a C-clef appearing on the third line (from the bottom) of a four-line staff would be encoded as `*clefC3`.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for clefs.

`clef`	clef keyword
`C`	C-clef signifier
`F`	F-clef signifier
`G`	G-clef signifier
`X`	no clef signifier
`1-9`	line number designators
`^`	8va treble
`v`	8va bassa
`^^`	double octave treble
`vv`	double octave bass

Summary of **clef** *Signifiers*

EXAMPLES

Several examples of clef indications are given below:

`*clefG2`	treble clef
`*clefF4`	bass clef
`*clefC3`	alto clef
`*clefC4`	tenor clef
`*clefG1`	soprano clef
`*clefX`	no clef
`*clefGv2`	treble clef, 8va bassa

Examples of **clef** *Interpretations*

SEE ALSO

staff (3), **staff lining** (3)

REPRESENTATION

ensemble — designation of the number of instruments/voices

DESCRIPTION

The **ensemble** tandem interpretation permits the encoding of the number of musical instruments of voices performing a given Humdrum spine.

Five types of ensemble interpretations are distinguished. The `*solo` interpretation indicates that a given spine is to be performed by a single instrument or voice, and that the part is of a *foreground* character. The `*ensemb` interpretation indicates that a given spine is to be performed by several instruments or voices. The `*ripien` interpretation indicates that a given spine is performed by an instrument of the *ripieno*. The `*conct` interpretation indicates that a given spine is performed by an instrument of the *concertino*. The fifth type of ensemble-related interpretation allows the precise specification of the number of instruments or voices. This tandem interpretation consists of a single asterisk, followed by the lower-case letter 'a', followed by a number. For example, `*a2` represents an ensemble indication of two instruments or voices. Similarly, the tandem interpretation `*a6` indicates six concurrent instruments performing the specific spine. Approximation can be indicated by appending the tilde character, such as `*a12~` — meaning approximately 12 instruments.

EXAMPLES

Several examples of ensemble indications are given below:

`*solo`	single instrument or voice
`*ensemb`	multiple instruments or voices
`*a1`	single instrument or voice
`*a2`	two instruments or voices
`*a14`	fourteen instruments or voices
`*conct`	instrument of the concertino
`*ripien`	instrument of the ripieno

Examples of **ensemble** *Interpretations*

SEE ALSO

instrument (3)

REPRESENTATION

expansion lists — expansion list designations

DESCRIPTION

An **expansion list** is a tandem interpretation that indicates how an *abbreviated format* Humdrum file may be rearranged or expanded to a full-length or *through-composed format.*

Expansion lists are found only in abbreviated format files. An expansion list contains an ordered list of Humdrum section labels identifying the order (including possible repetitions) of sections when the file is passed to the **thru** command. Expansion lists are useful for encoding Da Capo, Dal Segnos, and other repetition notational devices. Expansion list are also useful for encoding alternative versions of the organization of a work.

Expansion lists consist of a single asterisk, followed by the greater-than sign (>), followed by an optional keyword, followed by an open square bracket, followed by a list of section labels (each separated by a comma), followed by a closed square bracket. Consider the following expansion list:

```
*>[verse1,refrain,verse2,refrain]
```

This list indicates that the file in which it is embedded is an abbreviated format Humdrum file that contains (at least) three sections, labelled `verse1`, `verse2`, and `refrain`. When the file is expanded using the **thru** command, the `refrain` section will be repeated following each verse.

The following example illustrates two expansion lists, each of which is labelled. Expansion-list labels are called *versions.* In this example, the first and second versions are `Gould82` and `Landowska` respectively.

```
*>Gould82[A,A,B]
*>Landowska[A,A,B,B]
```

These expansion lists might encode different interpretations of the repeats in a rounded binary form. (When the **thru** command is invoked, the user can specify which *version* is required, and the appropriate through-composed expansion will be output.)

SIGNIFIERS

The *version* keywords for expansion lists may contain any sequence of zero or more printable ASCII characters with the exception of the tab character and the open square bracket. Immediately following the version keyword is an open square bracket. An expansion list must end with a square bracket. Within the square brackets zero or more section labels may be encoded, separated by commas.

EXAMPLES

Several examples of expansion list tandem interpretations are given below:

```
*>sonata allegro[intro,exposition,development,recapitulation]
*>[minuet,trio,minuet]
*>Rondo[A,B,A,C,A,D,A,B,A]
*>rehearsal order[mm. 218-252,mm. 184-191,mm. 1-48]
*>concert[Stamitz,Martinu,Alkan,De Falla]
*>subject18[stimulus7,stimulus9,stimulus4,stimulus2]
```

Examples of **expansion list** *Interpretations*

SEE ALSO

section labels (3), **thru** (3), **thru** (4), **yank** (4)

REPRESENTATION

fret tuning — fretted isntrument tuning information

DESCRIPTION

Three tandem interpretations permit the detailed encoding of tuning information for fretted instruments.

The absolute tuning is specified using the `*AT:` tandem interpretation. The relative tuning of the open strings is specified using the `*RT:` tandem interpretation. The tuning of the fret positions is specified using the `*FT:` tandem interpretation.

The `*AT:` interpretation uses `**pitch`-type pitch designations (including cents deviation) to encode the absolute pitch of the lowest string. (See EXAMPLES.)

The `*RT:` interpretation encodes the relative tuning of each open string by specifying the number of semitones above the lowest string. Successive courses are delineated by colons, and strings within courses are delineated by a comma. In addition to unbounded *scordatura* tuning, non-integer semitones may be encoded, thus permitting unorthodox temperaments. (See EXAMPLES.)

The `*FT:` interpretation encodes the relative tuning of successive frets along the fret-board, in semitones. Once again, non-integer semitones are permitted.

For a more detailed description of fretted instrument tuning interpretations, refer to the entry for `**fret` (Section 2).

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for fret tuning.

`AT`	absolute tuning keyword
`RT`	relative tuning keyword
`FT`	fret-board tuning keyword
`:`	course delimiter
`,`	string delimiter
`A-G`	pitch of lowest string (for `*AT:` only)
`#`	sharp accidental, for pitch of lowest string (for `*AT:` only)
`b`	flat accidental, for pitch of lowest string (for `*AT:` only)
`0-9`	semitone numbers; octave number; cents deviation
`.`	decimal point
`-`	cents deviation (for `*AT:` only)
`+`	cents deviation (for `*AT:` only)

Summary of **fret tuning** *Signifiers*

EXAMPLES

A number of examples of fret tuning indications are given in Section 2; refer to the entry for the `**fret` representation.

SEE ALSO

****fret** (2), ****pitch** (2)

REPRESENTATION

harmonic number — harmonic number designation

DESCRIPTION

The **harmonic number** tandem interpretation allows the encoding of given harmonic number for a Humdrum representation.

Harmonic number tandem interpretations consist of a single asterisk, followed by the keyword letter `H`, followed by an upper-case letter indicating the type of clef, followed by a whole number indicating the harmonic number. Harmonic 'zero' is illegal.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for harmonic number.

H	harmonic number keyword
0-9	number designators

Summary of **harmonic number** *Signifiers*

EXAMPLES

Several examples of harmonic number indications are given below:

`*H2`	second harmonic
`*H20`	twentieth harmonic
`*H02`	second harmonic

Examples of **harmonic number** *Interpretations*

SEE ALSO

****freq** (2), ****spect** (2)

REPRESENTATION

instrument — instrument or voice designation

DESCRIPTION

Instrument tandem interpretations are used to identify the instrumentation pertaining to a specified spine. The word "instrument" is used in a broad sense and embraces vocal qualities and types as well as mechanical sound makers.

Instrument tandem interpretations consist of a single asterisk, followed by the single upper-case letter '`I`', followed by a lower-case instrument keyword.

Separate spines may be encoded for each instrument in a score, but it is common for two or more instruments to perform precisely the same line — such as the contrabass and violoncello parts. Instrument tandem interpretations are normally encoded "cumulatively;" that is, if more than one tandem interpretation appears in a spine, then this instrument is added to any existing instruments performing the spine.

SIGNIFIERS

The following set of tables list currently defined instrument tandem interpretations according to instrument category or type. Where appropriate, instrument names are also given for selected non-English languages.

Voice Range

`*Isoprn`	soprano
`*Imezzo`	mezzo soprano
`*Icalto`	contralto
`*Itenor`	tenor
`*Ibarit`	baritone
`*Ibass`	bass

Voice Quality

`*Ivox`	generic (undesignated) voice
`*Ifeme`	female voice
`*Imale`	male voice
`*Infant`	child's voice

`*Irecit`	recitativo
`*Ilyrsp`	lyric soprano
`*Idrmsp`	dramatic soprano
`*Icolsp`	coloratura soprano
`*Ialto`	alto
`*Ictenor`	counter-tenor
`*Iheltn`	Heldentenor, tenore robusto
`*Ilyrtn`	lyric tenor
`*Ibspro`	basso profondo
`*Ibscan`	basso cantante
`*Ifalse`	falsetto
`*Icastr`	castrato

String Instruments

`*Iarchl`	archlute; *archiluth* (Fr.); *liuto attiorbato/arcileuto/arciliuto* (It.)
`*Iarpa`	harp; *arpa* (It.), *arpa* (Span.)
`*Ibanjo`	banjo
`*Ibiwa`	biwa
`*Ibguit`	electric bass guitar
`*Icbass`	contrabass
`*Icello`	violoncello
`*Icemba`	harpsichord; *clavecin* (Fr.); *Cembalo* (Ger.); *cembalo* (It.)
`*Icetra`	cittern; *cistre/sistre* (Fr.); *Cither/Zitter* (Ger.); *cetra/cetera* (It.)
`*Iclavi`	clavichord; *clavicordium* (Lat.); *clavicorde* (Fr.)
`*Idulc`	dulcimer
`*Ieguit`	electric guitar
`*Iforte`	fortepiano
`*Iguitr`	guitar; *guitarra* (Span.); *guitare* (Fr.); *Gitarre* (Ger.); *chitarra* (It.)
`*Ihurdy`	hurdy-gurdy; variously named in other languages
`*Iliuto`	lute; *lauto, liuto leuto* (It.); *luth* (Fr.); *Laute* (Ger.)
`*Ikit`	kit; variously named in other languages
`*Ikokyu`	kokyū (Japanese spike fiddle)
`*Ikomun`	kŏmun'go (Korean long zither)
`*Ikoto`	koto (Japanese long zither)
`*Imando`	mandolin; *mandolino* (It.); *mandoline* (Fr.); *Mandoline* (Ger.)
`*Ipiano`	pianoforte
`*Ipipa`	Chinese lute
`*Ipsalt`	psaltery (box zither)
`*Iqin`	qin, ch'in (Chinese zither)
`*Iquitr`	gittern (short-necked lute); *quitarre* (Fr.); *Quinterne* (Ger.)
`*Irebec`	rebec; *rebeca* (Lat.); *rebec* (Fr.); *Rebec* (Ger.)
`*Isarod`	sarod

`*Ishami`	shamisen (Japanese fretless lute)
`*Isitar`	sitar
`*Itambu`	tambūrā
`*Itanbr`	tanbur
`*Itiorb`	theorbo; *tiorba* (It.); *tèorbe* (Fr.); *Theorb* (Ger.)
`*Iud`	ūd
`*Iukule`	ukulele
`*Ivina`	vīnā
`*Iviola`	viola; *alto* (Fr.); *Bratsche* (Ger.)
`*Iviolb`	bass viola da gamba; *viole* (Fr.); *Gambe* (Ger.)
`*Iviold`	viola d'amore; *viole d'amour* (Fr.); *Liebesgeige* (Ger.)
`*Ivioln`	violin; *violon* (Fr.); *Violine* (Ger.); *violino* (It.)
`*Iviols`	treble viola da gamba; *viole* (Fr.); *Gambe* (Ger.)
`*Iviolt`	tenor viola da gamba; *viole (Fr.); Gambe (Ger.)*
`*Izithr`	zither; *Zither* (Ger.); *cithare* (Fr.); *cetra da tavola* (It.)

Wind Instruments

`*Iaccor`	accordion; *accordéon* (Fr.); *Akkordeon* (Ger.)
`*Iarmon`	harmonica; *armonica* (It.)
`*IbagpS`	bagpipe (Scottish)
`*IbagpI`	bagpipe (Irish)
`*Icalam`	chalumeau; *calamus* (Lat.); *kalamos* (Gk.)
`*Icalpe`	calliope
`*Icangl`	english horn; *cor anglais* (Fr.)
`*Ichlms`	soprano shawm, chalmeye, shalme, etc.; *chalemie* (Fr.); *ciaramella* (It.)
`*Ichlma`	alto shawm, chalmeye, shalme, etc.
`*Ichlmt`	tenor shawm, chalmeye, shalme, etc.
`*Iclars`	soprano clarinet (in either B-flat or A); *clarinetto* (It.)
`*Iclarp`	piccolo clarinet
`*Iclara`	alto clarinet
`*Iclarb`	bass clarinet (in B-flat)
`*Icor`	horn; *cor* (Fr.); *corno* (It.); *Horn* (Ger.)
`*Icornm`	cornemuse; French bagpipe
`*Icorno`	cornett (woodwind instr.); *cornetto* (It.); *cornaboux* (Fr.); *Zink* (Ger.)
`*Icornt`	cornet (brass instr.); *cornetta* (It.); *cornet à pistons* (Fr.); *Cornett* (Ger.)
`*Ictina`	concertina; *concertina* (Fr.); *Konzertina* (Ger.)
`*Ifagot`	bassoon; *fagotto* (It.)
`*Ifag_c`	contrabassoon; *contrafagotto* (It.)
`*Ifife`	fife
`*Iflt`	flute; *flauto* (It.); *Flöte* (Ger.); *flûte* (Fr.)
`*Iflt_a`	alto flute
`*Iflt_b`	bass flute
`*Ifltds`	soprano recorder; *flûte à bec, flûte douce* (Fr.); *Blockflöte* (Ger.); *flauto dolce* (It.)

`*Ifltdn`	sopranino recorder
`*Ifltda`	alto recorder
`*Ifltdt`	tenor recorder
`*Ifltdb`	bass recorder
`*Iflugh`	flugelhorn
`*Ihichi`	hichiriki (Japanese double reed used in gagaku)
`*Ikrums`	soprano crumhorn; *Krummhorn*/*Krumbhorn* (Ger.); *tournebout* (Fr.)
`*Ikruma`	alto crumhorn
`*Ikrumt`	tenor crumhorn
`*Ikrumb`	bass crumhorn
`*Inokan`	nōkan (Japanese flute for the nō theatre)
`*Ioboe`	oboe; *hautbois* (Fr.); *Hoboe*, *Oboe* (Ger.): *oboe* (It.)
`*IoboeD`	oboe d'amore
`*Iocari`	ocarina
`*Iorgan`	pipe organ; *organum* (Lat.); *organo* (It.); *orgue* (Fr.); *Orgel* (Ger.)
`*Ipanpi`	panpipe
`*Ipicco`	piccolo
`*Iporta`	portative organ
`*Irackt`	racket; *Rackett* (Ger.); *cervelas* (Fr.)
`*Ireedo`	reed organ
`*Isarus`	sarrusophone
`*IsaxN`	sopranino saxophone (in E-flat)
`*IsaxS`	soprano saxophone (in B-flat)
`*IsaxA`	alto saxophone (in E-flat)
`*IsaxT`	tenor saxophone (in B-flat)
`*IsaxR`	baritone saxophone (in E-flat)
`*IsaxB`	bass saxophone (in B-flat)
`*IsaxC`	contrabass saxophone (in E-flat)
`*Ishaku`	shakuhachi
`*Isheng`	mouth organ (Chinese)
`*Isho`	mouth organ (Japanese)
`*IsxhS`	soprano saxhorn (in B-flat)
`*IsxhA`	alto saxhorn (in E-flat)
`*IsxhT`	tenor saxhorn (in B-flat)
`*IsxhR`	baritone saxhorn (in E-flat)
`*IsxhB`	bass saxhorn (in B-flat)
`*IsxhC`	contrabass saxhorn (in E-flat)
`*Itromt`	tenor trombone; *trombone* (It.); *trombone* (Fr.); *Posaune* (Ger.)
`*Itromb`	bass trombone
`*Itromp`	trumpet; *tromba* (It.); *trompette* (Fr.); *Trompete* (Ger.)
`*Ituba`	tuba
`*Izurna`	zūrnā

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Percussion Instruments

`*Ibdrum`	bass drum (kit)
`*Icampn`	bell; *campana* (It.); *cloche* (Fr.); *campana* (Span.)
`*Icaril`	carillon
`*Icasts`	castanets; *castañetas* (Span.); *castagnette* (It.)
`*Ichime`	chimes
`*Iclest`	celesta; *céleste* (Fr.)
`*Icrshc`	crash cymbal (kit)
`*Ifingc`	finger cymbal
`*Iglock`	glockenspiel
`*Igong`	gong
`*Imarac`	maracas
`*Imarim`	marimba
`*Ipiatt`	cymbals; *piatti* (It.); *cymbales* (Fr.); *Becken* (Ger.); *kymbos* (Gk.)
`*Iridec`	ride cymbal (kit)
`*Isdrum`	snare drum (kit)
`*Ispshc`	splash cymbal (kit)
`*Isteel`	steel-drum, tinpanny
`*Itabla`	tablā
`*Itambn`	tambourine, timbrel; *tamburino* (It.); *Tamburin* (Ger.)
`*Itimpa`	timpani; *timpani* (It.); *timbales* (Fr.); *Pauken* (Ger.)
`*Itom`	tom-tom drum
`*Itrngl`	triangle; *triangle* (Fr.); *Triangel* (Ger.); *triangolo* (It.)
`*Ivibra`	vibraphone
`*Ixylo`	xylophone; *xylophone* (Fr.); *silofono* (It.)

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Keyboard Instruments

`*Iaccor`	accordion; *accordéon* (Fr.); *Akkordeon* (Ger.)
`*Icaril`	carillon
`*Icemba`	harpsichord; *clavecin* (Fr.); *Cembalo* (Ger.); *cembalo* (It.)
`*Iclavi`	clavichord; *clavicordium* (Lat.); *clavicorde* (Fr.)
`*Iclest`	celesta; *céleste* (Fr.)
`*Iforte`	fortepiano
`*Ihammd`	Hammond electronic organ
`*Iorgan`	pipe organ; *orgue* (Fr.); *Orgel* (Ger.); *organo* (It.); *organo* (Span.); *organum* (Lat.)
`*Ipiano`	pianoforte
`*Iporta`	portative organ
`*Ireedo`	reed organ
`*Irhode`	Fender-Rhodes electric piano

`*Isynth` keyboard synthesizer

SEE ALSO

instrument class (3)

REPRESENTATION

instrument class — instrument class designation

DESCRIPTION

Instruments (or voices) may be represented according to the type or class of instrument or voice. There exist a wide variety of ways of classifying instrumental resources — each of which has advantages and disadvantages. The *instrument class* tandem interpretation echoes the most common distinctions made by practising musicians: voices, stringed instruments, woodwind instruments, brass instruments, keyboard instruments, and percussion instruments. The 'keyboard' class may be deemed redundant, since keyboard instruments may be variously classified as percussion instruments (e.g. piano), wind instruments (e.g. organ), or stringed instruments (e.g. harpsichord). Despite this overlap, the separate keyboard class has been retained since it is a natural way for musicians to refer to a group of instruments. The **instrument class** tandem interpretation can be used to identify explicitly the class of instrument employed.

SIGNIFIERS

The following table identifies six pre-defined instrument classes.

`*ICstr`	string instrument
`*ICww`	woodwind instrument
`*ICbras`	brass instrument
`*ICklav`	keyboard instrument
`*ICidio`	percussion instrument (idiophone)
`*ICvox`	voice

Summary of **instrument class** *Signifiers*

SEE ALSO

instrument (3)

REPRESENTATION

key — major/minor key designation

DESCRIPTION

For many tasks it is helpful to identify explicitly the prevailing key of a passage or work. The **key** tandem interpretation permits an explicit analytic judgement of key to be encoded in a Humdrum representation.

Key tandem interpretations consist of a single asterisk, followed by a single upper- or lower-case letter (A-G), followed by one or more sharps (#) or flats (-), followed by a colon character. Upper-case letters are designate major keys whereas lower-case letters designate minor keys. (No other modes can be encoded using this tandem interpretation for key indications.) By way of example, the following tandem interpretation specifies the key of F-sharp minor:

```
*f#:
```

Successive key interpretations supercede one other. That is, if a key of C major is indicated, followed some measures later by a key of G major tandem interpretation, then the preceding C major designation is considered to be entirely superceded.

The key tandem interpretation also permits the explicit encoding of undefined or unknown keys (`*?:`) and key-less or atonal passages (`*X:`).

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for keys.

A-G	major diatonic key signifiers
a-g	minor diatonic key signifiers
#	sharp key signifier
–	flat key signifier
X	atonal key signifier
?	unknown key signifier
:	end of key interpretation delimiter

Summary of **key** *Signifiers*

EXAMPLES

Several examples of key indications are given below:

`*C:`	key of C major
`*c:`	key of C minor
`*F#:`	key of F-sharp major
`*B--:`	key of B double-flat major
`*X:`	atonal passage
`*?:`	key unknown or undefined

Examples of **key** *Interpretations*

SEE ALSO

key signature (3)

REPRESENTATION

key signature — key signature designation

DESCRIPTION

Key signatures indicate the prevailing arrangement of global accidentals throughout a musical passage. Two forms of key signature interpretations can be distinguished: *pitch-class* signatures in which the accidentals modify all pitches of a given pitch class, and *pitch-height* signatures in which the accidentals modify only certain pitches of a specific pitch height.

Key signature interpretations consist of a single asterisk, followed by either a single upper- or lower-case letter 'K', followed by an open square bracket, followed by a list of pitches, followed by a closed square bracket. Pitches listed within the square brackets indicate the modified pitches or pitch-classes. The lower-case `*k` designates a (common) pitch-class key signature; The upper-case `*K` designates a (rare) pitch-height key signature;

In a pitch-class key signature, the pitch list specifies the recipe of sharps, flats, and/or naturals given in the key signature. Diatonic pitch are identified by lower-case pitch letter names. Each pitch is followed by one or more sharps, or flats, or a natural. For example, the key signature for three sharps (F,C,G) would be: `*k[f#c#g#]`. The order of the accidentals within the accidental list corresponds to the order in which they would be printed in a visual rendering of the score. Double- and triple- sharps and flats are represented by repetition of the octothrope (#) or minus sign (-). It is possible to mix sharps and flats within a single signature, to encode unconventional orderings, and to encode precautionary key signatures (such as those consisting only of naturals). It is not permitted to mix sharps/flats/naturals for a single pitch.

In very rare cases, key signatures modify only those pitches at a specific pitch height. For example, it may be that a composer wishes only some B's to be flat. These "pitch height" key signatures are designated by the upper-case key-letter 'K'. The corresponding pitch list uses `**pitch`-like representations to identify the modified pitches. For example, the following key signature:

```
*K[B3-C4#F4#B4nE5-]
```

specifies that B3 and E5 are lowered, and that C4 and F4 are raised. In addition, this key signature includes an explicit natural on B4 to remind readers that this pitch remains unaltered.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for key signatures.

k	pitch-class signifier
K	pitch-height signifier
a-g	pitch signifiers (pitch-class key signatures only)
A-G	pitch signifiers (pitch-height key signatures only)
0-9	octave indicators (pitch-height key signatures only)
#	sharp signifier
##	double sharp
–	flat signifier
n	natural signifier

Summary of **key signature** *Signifiers*

EXAMPLES

Several examples of key signatures are given below:

`*k[f#c#]`	regular key signature containing F-sharp and C-sharp
`*k[b-e-a-]`	regular key signature containing three flats
`*k[bnenan]`	precaution key signature using naturals only
`*k[]`	key signature containing no sharps or flats
`*k[b-e-f#]`	mixed key signature containing both sharps and flats
`*k[f##]`	key signature containing a single double sharp
`*k[c#f#]`	key signature encoding an unorthodox ordering of sharps
`*K[C#4B-4]`	pitch-height key signature identify C4 and B4 as modified
`*K[C#5B-5]`	pitch-height key signature identify C5 and B5 as modified

Examples of **key signature** *Interpretations*

SEE ALSO

key (3)

REPRESENTATION

language — language designation

DESCRIPTION

The **language** tandem interpretation permits the identification of the language for a given textual or phonetic Humdrum representation.

Language tandem interpretations consist of a single asterisk, followed by the upper-case letter `L`, followed by a language keyword designator. Several pre-defined language tandem interpretations are illustrated in below.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for language designations.

A-Z	upper-case Roman letters
a-z	lower-case Roman letters

Summary of **language** *Signifiers*

EXAMPLES

Examples of pre-defined language designations are given below:

Bengali	*LBengali
Croatian	*LHrvatski
Czech	*LCecha
Danish	*LDansk
Dutch	*LNederlands
English	*LEnglish
Finnish	*LSuomi
French	*LFrancais
German	*LDeutsch
Hindi	*LHindi
Italian	*LItaliano
Japanese	*LNihongo
Latin	*LLatin
Mandarin	*LPinying
Norwegian	*LNorsk

Polish	*LPolski
Portugese	*LPortugues
Romanian	*LRomana
Russian	*LRusski
Serbian	*LSrbski
Spanish	*LEspanol
Swahili	*LSwahili
Swedish	*LSvenska
Urdu	*LUrdu
Xhosa	*LIsixhosa
Zulu	*LIsizulu

SEE ALSO

****IPA** (2), ****text** (2)

REPRESENTATION

meter signatures — meter signature designation

DESCRIPTION

The **meter signature** tandem interpretation permits the encoding of meter signatures for a Humdrum representation.

Meter signature tandem interpretations consist of a single asterisk, followed by the upper-case letter `M`, followed by a meter indication. Meter indications consist of a top ("numerator") portion and a bottom ("denominator") portion. These portions are separated by a slash character (/). The numerator portion of the meter signature must be an integer value (greater than zero) — with no fractional part. The numerator may be split into two or more integers separated by the plus sign (+) in order to specify the grouping of beats within the measure. The denominator portion must be conform to `**recip` duration designations (8=eighth, 2.=dotted half, 0=breve, 6=eighth note triplet, etc.). Sample meter signatures are shown in the following table:

`*M2/4`	simple duple (quarter duration)
`*M3/2`	simple triple (half duration)
`*M4/0`	simple quadruple (breve duration)
`*M6/8`	compound duple (six-eight meter)
`*M2/4.`	compound duple (dotted quarter beat)
`*M9/16`	compound triple (nine-sixteen)
`*M12/4`	compound quadruple (twelve-four)
`*M4/2.`	compound quadruple (dotted half beat)
`*M5/4`	irregular quintuple (quarter duration)
`*M3+2/4`	irregular quintuple (three plus two beats)
`*M2+2+3/8`	irregular septuple (two plus two plus three beats)
`*M3+3+2/8`	irregular octuple (three plus three plus two)
`*M19/6`	nineteen eighth-duration triplets per measure
`*M21/8..`	twenty-one doubly-dotted eighths per measure
`*M?`	meter unknown
`*MX`	ametric passage (no meter)

Examples of **meter signature** *interpretations.*

Note that it is possible to represent *ametric* passages (*MX) and passages with *unknown* meters (*M?). These representations are useful, for example, when encoding Gregorian chant or African and other non-western rhythms.

Occasionally, musical scores will contain an alternating pair of meters (such as 3/4, 6/8, 3/4, 6/8, etc.). Such alternating meters are often represented in printed scores by a single meter signature — such as 3/4 (6/8). The meter signature tandem interpretation does

not cater to such shorthands since the representation is intended to be *local* in its effect. This means that each change of meter must be labelled individually.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for meter signatures.

`0-9`	number signifiers
`.`	augmentation dot
`/`	numerator-denominator delimiter
`M`	meter signature keyword letter
`X`	ametric indicator
`?`	unknown meter indicator
`+`	grouping indicator (numerator only)

Summary of **meter signature** *Signifiers*

SEE ALSO

key signature (3), **metpos** (3), **metpos** (4), **timebase** (3), **timebase** (4)

REPRESENTATION

MIDI channel — MIDI channel designation

DESCRIPTION

The **MIDI channel** tandem interpretation permits the encoding of notated MIDI channel for a Humdrum representation.

MIDI channel tandem interpretations consist of a single asterisk, followed by the keyword `Ch`, followed by an interger indicating the channel number.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for MIDI channel indicators.

0-9	integer numbers representing the channel

Summary of **MIDI channel** *Signifiers*

EXAMPLES

Several examples of MIDI channel indications are given below:

`*Ch4`	MIDI channel 4
`*Ch1`	MIDI channel 1

Examples of **MIDI channel** *Interpretations*

SEE ALSO

****MIDI** (2), **midi** (4), **perform** (4), **smf** (4)

REPRESENTATION

overlay/underlay — overlay/underlay designation

DESCRIPTION

The **overlay/underlay** tandem interpretations are used to indicate whether the information encoded in a given spine is printed above (overlay) or below (underlay) a given staff.

Overlay and underlay tandem interpretations consist of a single asterisk, followed by either the keyword `ueber` or `unter` respectively. Following one of these keywords is a staff number — where staff number 1 corresponds to the first staff at the top of the system. There may follow optional positioning information; this information consists of a number preceded by a colon, and followed by a unit indication. The letter 'c' indicates centimeters, the letter 'p' indicates points, the letter 'i' indicates inches, and the percent sign indicates spacing as a percentage of the staff width.

EXAMPLES

Several examples of overlay and underlay indications are given below:

`*ueber3:1i`	overlay positioned 1 inch above the center of the third staff in the system
`*ueber8:3.4c`	overlay positioned 3.4 cm above the center of the eighths staff in the system
`*unter1:82p`	overlay positioned 82 points above the center of the first staff in the system
`*unter2:50%`	overlay positioned 50 percent of the staff width above the center of the first staff in the system

Examples of **overlay/underlay** *Tandem Interpretations*

SEE ALSO

staff (3), **staff lining** (3), ****text** (2)

REPRESENTATION

section labels — section label designations

DESCRIPTION

Section labels are tandem interpretation that are used to identify segments or sections of some Humdrum representation. Section labels are useful for identifying logical divisions or passages, such as expositions, codas, second endings, rehearsal segments, etc. Section labels provide useful markers for extracting passages using the Humdrum **yank** command. Section labels are also used in conjunction with Humdrum **expansion lists** to permit the encoding of "abbreviated format" files. (See the **thru (4)** command.)

Section labels consist of a single asterisk, followed by the greater-than sign (>), followed by a keyword (or label) that names the section. Note that labels may contain spaces, hence `*>1st ending` is a legitimate section label. In abbreviated format files, each section must be designated by a unique name.

Humdrum sections formally begin with a section label. Sections end when either another section label is encountered, or when all spines are assigned new exclusive interpretations, or when all spines terminate. Sections cannot be nested. Whenever a section label is encoded, the identical label must be repeated across all concurrent spines. That is, all tokens in any given data record must belong to the same section — without regard for the spines.

SIGNIFIERS

Section labels may contain any sequence of the following ASCII characters: the upper- or lower-case letters `A-Z`, the numbers `0` to `9`, the underscore (_), dash (-), period (.), plus sign (+), octothorpe (#), tilde (~), at-sign (@), or space. All other characters are forbidden.

EXAMPLES

Several examples of section labels indications are given below:

```
*>CODA
*>refrain
*>Dal Segno
*>Verse #3
*>Rehearsal Marking J
*>E
```

Examples of **section label** *Interpretations*

SEE ALSO

expansion lists (3), **thru** (3), **thru** (4), **yank** (4)

REPRESENTATION

spine paths — spine path indicators

DESCRIPTION

Spine path indicators are special types of tandem interpretations that permit the encoding of potentially complex spine-path changes in a Humdrum representation.

Humdrum spines may be terminated, added, split, joined, or exchanged. Spine-path indicators consist of a single asterisk, followed by one of five key-letters: the plus sign, the minus sign, the carret, the lower-case letter 'v', or the lower-case letter 'x'.

Note that spine-path indicators cannot appear on the same line with non-spine-path interpretations — such as key signatures or clefs. That is, spine-path indicators cannot be mixed with other tandem or exclusive interpretations on the same records. Several spine-path indicators may share the same record, however.

SIGNIFIERS

The following table identifies all five spine path indicators.

`*+`	add a new spine
`*-`	terminate a current spine
`*^`	split a spine (into two)
`*v`	join (two or more) spines into one
`*x`	exchange the position of two spines

Summary of **spine paths** *Signifiers*

EXAMPLES

A number of examples of the use of spine path indicators are given in the discussion entitled "Spine Paths" in Section 1 of this manual.

SEE ALSO

humdrum (4)

REPRESENTATION

staff — staff designation

DESCRIPTION

The **staff** tandem interpretation can be used to assign a given spine to a particular staff within a system.

Staff tandem interpretations consist of a single asterisk, followed by the keyword `staff`, followed by an integer identifying a staff, where `staff1` corresponds to the first staff at the top of the system. See EXAMPLES below.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for staff.

staff	staff lining keyword
0-9	numbers

Summary of **staff** *Signifiers*

EXAMPLES

Several examples of staff indications are given below:

`*staff1`	top-most staff in the system
`*staff12`	twelfth staff from the top of the system
`*staff0`	no meaning

Examples of **staff** *Interpretations*

SEE ALSO

staff lining (3)

REPRESENTATION

staff lining — staff lining designation

DESCRIPTION

The **staff lining** tandem interpretation permits the detailed encoding of the number of lines in a staff, and also whether individual lines are dotted, colored, or invisible.

Staff lining tandem interpretations consist of a single asterisk, followed by a keyword consisting of the vertical bar followed by a period (i.e. '*|.'), followed by one or more signifiers characterizing successive lines beginning at the bottom of the staff. See EXAMPLES below.

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for staff lining.

|.	staff lining keyword
|	black line indicator
:	dotted line indicator
R	*ruber*, red line
V	*viridis*, green line
C	*caeruleus*, blue line
X	invisible line
0	(zero) no staff lines indicator

Summary of **staff lining** *Signifiers*

EXAMPLES

Several examples of staff lining indications are given below:

`*|.||||`	five-line staff
`*|.|||`	four-line staff
`*|.|`	single-line staff
`*|.0`	no staff lines
`*|.|X|`	three-line staff with middle line invisible
`*|.||R|`	four-line staff with the third line colored red

Examples of **staff lining** *Interpretations*

SEE ALSO

clef (3), **staff** (3)

REPRESENTATION

strophe — strophic passage designators

DESCRIPTION

The **strophe** tandem interpretations are used to encode alternative parallel paths of sequential information. Strophic representations are useful for such tasks as representing texts for different verses of a song, or for indicating alternative interpretations of a sequence of notes — such as *ossia* passages.

Strophic passages begin from a single spine that splits into several "alternative" spines — which later rejoin to form a single spine again. Four different tandem interpretations are involved in the encoding of strophic passages. These include the *strophic passage initiator*, the *strophic passage terminator*, the *strophe labels*, and the *strophe end indicators*.

Each strophic passage begins with a *strophic passage initiator*. This consists simply of a single asterisk followed by the keyword "strophe" (i.e.`*strophe`). This tandem interpretation marks a single spine that is about to be split into alternative parallel paths. When the alternative spines are ultimately rejoined, a *strophic passage terminator* marks the end of the strophic passage. This terminator consists simply of a single asterisk followed by the upper-case letter 'S', followed by a minus sign (i.e.`*S-`).

Following a strophic passage initiator, the spine is split into the required number of alternative spines using the Humdrum split interpretation (see spine paths). Each spine is then identified using a strophe label. Strophe labels are tandem interpretations that begin with a single asterisk, followed by the upper-case letter 'S', followed by a slash (/), followed by a unique name consisting of numbers and/or alphabetic letters. For example, where a composer has notated an alternative way of performing a passage ("*ossia*"), two strophe labels may be defined:

```
*S/sic   *S/ossia
```

If the strophic data imply some sort of order (such as verses in a song), simple numerical labels should be used:

```
*S/1   *S/2   *S/3   *S/4
```

The use of numbers is important when the file is expanded using the **thru** and **strophe** commands.

Following the strophic data records, each strophic spine is ended using the strophe end indicator. This tandem interpretation consists of an asterisk, followed by the upper-case letter 'S', followed by a slash, followed by the keyword 'fin' (i.e.`*S/fin`).

SIGNIFIERS

The following table summarizes the four types of tandem interpretations used for strophic passages.

`*strophe`	strophic passage initiator
`*S/`*n.n*	numerical strophe label
`*S/`*name*	named strophe label
`*S/fin`	strophe end indicator
`*S-`	strophic passage terminator

Summary of **strophe** *Tandem Interpretations*

EXAMPLES

For examples of strophic passages, see the **strophe** command description in Section 4 of this manual.

SEE ALSO

expansion lists (3), **strophe** (4)

REPRESENTATION

tempo — tempo designation

DESCRIPTION

The **tempo** tandem interpretation permits the encoding of gross overall tempo for a Humdrum representation.

Tempo tandem interpretations consist of a single asterisk, followed by the keyword `MM`, followed by one of four possible types of tempo indications. Tempo indications may consist of a single real or integer value specifying the the number of quarter-durations per minute, such as `*MM96`. Alternatively, tempo *ranges* may be encoded by interposing a hyphen between two numerical values, such as `*MM55.5-56.3`. Once again, the numerical values pertain to the number of quarter-durations per minute. Instead of numerical specifications, conventional Italian tempo terms may be encoded in square brackets, such as `*MM[Presto]`. Finally, an "unknown tempo" can be explicitly represented by the presence of a question mark, i.e. `*MM?`. (See EXAMPLES below.)

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for tempo.

`MM`	tempo keyword
`0-9`	numbers
`.`	decimal point
`-`	range signifier
`[ ]`	tempo-term delineators
`A-Z`	tempo-term characters
`a-z`	tempo-term characters
<*space*>	tempo-term space

Summary of **tempo** *Signifiers*

EXAMPLES

Several examples of tempo indications are given below:

`*MM60`	tempo of 60 quarter-durations per minute
`*MM60.`	tempo of 60 quarter-durations per minute
`*MM60.0`	tempo of 60 quarter-durations per minute
`*MM96.3`	tempo of 96.3 quarter-durations per minute
`*MM72-78`	tempo range between 72 and 78 quarter-durations per minute
`*MM51.2-51.4`	tempo range between 51.2 and 51.4 quarter-durations per minute
`*MM[Largo]`	tempo Largo
`*MM[Allegro molto]`	Allegro molto tempo
`*MM?`	unknown tempo

Examples of **tempo** *Interpretations*

SEE ALSO

midi (4), **perform** (4)

REPRESENTATION

thru — through-composed format designation

DESCRIPTION

The **thru** tandem interpretation identifies a given Humdrum representation as being in a *through-composed format.*

Musical scores are often notated to take advantage of repetitions in the music. Notational devices such as repeat marks and Da Capos can be encoded using Humdrum *section labels* and *expansion lists;* the resulting succinct representations are called *abbreviated format* files.

Abbreviated formats are implicitly indicated by the presence of an *expansion list* encoded prior to any data records. When an abbreviated format file is expanded using the **thru** command, any expansion lists present in the input are discarded. The presence of a `*thru` tandem interpretation in a file (prior to any data) explicitly identifies the file as being in a through-composed format rather than abbreviated format.

SIGNIFIERS

The `*thru` tandem interpretations consist simply of a single asterisk, followed by the keyword `thru`.

SEE ALSO

expansion lists (3), **section labels** (3), **thru** (4)

REPRESENTATION

timebase — timebase designation

DESCRIPTION

The **timebase** tandem interpretation permits the encoding of notated timebase for a Humdrum representation.

Timebase tandem interpretations consist of a single asterisk, followed by the keyword `tb`, followed by a `**recip`-like encoded duration. Durations consist of a single integer followed by zero or more periods (representing augmentation dots).

SIGNIFIERS

The following table summarizes the mappings of signifiers and signifieds for timebase.

tb	timebase keyword
0-9	`**recip`-like durations
.	augmentation dot

Summary of **timebase** *Signifiers*

EXAMPLES

Several examples of timebase indications are given below:

`*tb32`	thirty-second note timebase
`*tb8.`	dotted eighth note timebase

Examples of **timebase** *Interpretations*

SEE ALSO

assemble (4)

REPRESENTATION

transposition — transposition designation

DESCRIPTION

The **transposition** tandem interpretation permits the encoding of transposition information for a given pitch-related spine.

Transpositions can be characterized by the diatonic letter name shift, and the chromatic semitone shift. For example, transposing a pitch from C to D may be regarded as a diatonic letter name shift of up 1, as well as a chromatic semitone shift up 2. By contrast, a transposition from C to C double-sharp may be characterized as a diatonic letter name shift of 0, as well as a chromatic semitone shift up 2.

Transposition tandem interpretations consist of a single asterisk, followed by either the keyword `Tr` or `ITr`, followed by the lower-case letter 'd', followed by a signed integer, followed by the lower-case letter 'c', followed by another signed integer. The first integer indicates the diatonic letter name shift, while the second integer indicates the chromatic semitone shift. The keyword `Tr` indicates a transposition; the keyword `ITr` indicates a transposing instrument.

EXAMPLES

Several examples of transposition interpretations are given below:

`*Trd1c2`	encoded data is transposed up 1 diatonic letter name; up 2 semitones
`*Trd-1c-2`	encoded data is transposed down 1 diatonic letter name; down 2 semitones
`*Trd0c1`	encoded data is transposed up 1 semitones; same diatonic letter names
`*Trd0c-1`	encoded data is transposed down 1 semitones; same diatonic letter names
`*ITrd-1c-2`	transposing instrument; encoded data is at concert pitch; original score was *notated* up 1 diatonic letter name; up 2 semitones

Examples of **transposition** *Interpretations*

SEE ALSO

****kern** (2), **key** (3), **key signature** (3), **trans** (4),