

Music_{TEX}

Using _{TEX} **to write polyphonic**

or instrumental music

Version 5.14 –

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Chapter 1

What is Music_{TEX} ?

Music_{TEX} is a set of _{TEX} macros to typeset polyphonic, orchestral or polyphonic music. Therefore, it is mainly supposed to be used to type wide scores – just because true musicians seldom like to have to frequently turn pages – and this is not really compatible with L^AT_EX's standard page formats, even the `normalshapemediumseries4.sty` the `normalshapemediumseries\textheight` and `normalshapemediumseries\textwidth` of which are too small for musician needs.

However, a L^AT_EX style has been also provided (and it is used for the typing of the present paper) but this `normalshapemediumseries` style is fit for musicographic books rather than for normal scores to be actually played.

It should be emphasized that Music_{TEX} is not intended to be a compiler which would translate some standard musical notations into _{TEX} nor to decide by itself about aesthetic problems in music typing. Music_{TEX} only typesets staves, notes, chords, beams, slurs and ornaments as requested by the composer. Since it makes very few typesetting decisions, Music_{TEX} appears to be a versatile and rather powerful tool. However, due to the important amount of information to be provided to the typesetting process, coding Music_{TEX} might appear to be awfully complicated, just as the real keyboard or orchestral music. Therefore, it should be interfaced therefore by some pre-compiler in the case of the composer/typesetter wanting aesthetic decisions to be automatically made by somebody (or something) else.

1.1 Music_{TEX} principal features

1.1.1 Music typesetting is two-dimensional

Most of the people who just learnt a bit of music at college probably think that music is a linear sequence of symbols, just as literary texts to be _{TEX}-ed. In fact, with the exception of strictly monodic instruments like most orchestral wind instruments and solo voices, one should be aware that reading music actually is a matricial operation: the non-soloist musician successively reads *columns* of simultaneous notes which he actually plays if he is a pianist, clavichordist or organist, which he actually reads and watches if he conducts an orchestra, and which he is supposed to check and partially play when he is

a soloist who wants to play in time with the accompanying instrument or choir.

In fact, our personal experience of playing piano and organ as well as sometimes helping as an alternate Kapellmeister leads us to think that actual music reading and composing is a slightly more complicated intellectual process: music reading, music composing and music thinking seems to be a three layer process. The musician usually reads or thinks several consecutive notes (typically a long *beat* or a group of logically connected notes), then he goes down to the next instrument or voice and finally assembles the whole to build a part of music lasting roughly a few seconds. Then he handles the next *beat* or *bar* of his score.

Thus, it appears that the humanly logical way of coding music consists in horizontally accumulating a set of *vertical combs* with *horizontal teeth* as described in Table 1.1.

<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>
<i>s e q u e n c e</i>	<i>s e q . f o u r</i>	<i>s e q .</i>	<i>s e q . t e n</i>
<i>o n e</i>		<i>s e v e n</i>	
<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>
<i>s e q u e n c e</i>	<i>s e q . f i v e</i>	<i>s e q .</i>	<i>s e q .</i>
<i>t w o</i>		<i>e i g h t</i>	<i>e l e v e n</i>
<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>	<i>n o t e</i>
<i>s e q u e n c e</i>	<i>s e q . s i x</i>	<i>s e q . n i n e</i>	<i>s e q .</i>
<i>t h r e e</i>			<i>t w e l v e</i>

Table 1.1: The order in which a musician reads music

This is the reason why, in **MusicT_EX** the fundamental *macro* is of the form

```
normalshapemediumseries\notes ... & ... & ...
normalshapemediumseries\notes
```

where the character `normalshapemediumseries&` is used to separate the notes to be typeset on respective staves of the various instruments, starting from the bottom.

In the case of an instrument whose score has to be written with several staves, these staves are separated by the character `normalshapemediumseries|`.

Thus, a score written for a keyboard instrument and a monodic instrument (for example piano and violin) will be coded as follows:

```
normalshapemediumseries\notes ... normalshapemediumseries|...
& ... normalshapemediumseries\enotes
```

for each column of simultaneous *groups of notes*. It is worth emphasizing that we actually said “*groups of notes*”: this means that in each section of the previous macro, the music typesetter is welcome to insert, not only chord notes to be played at once, but small sequences of consecutive notes which build something he understands as a musical phrase. This is why note typing macros are of two kinds in MusicT_EX, namely the note macros which are not followed by spacing afterwards, and those which induce horizontal spacing afterwards.

1.1.2 The spacing of the notes

It seems that many books have dealt with this problem. Although it can lead to interesting algorithms, we think it is not in practice an important point.

In fact, each column of notes has not necessarily the same spacing and, in principle, this *spacing* should depend on the shortest duration of the simultaneous notes. But this cannot be established as a rule, for at least two reasons:

1. spacing does not depend only on the local notes, but also on the context, at least in the same bar.
2. in the case of polyphonic music, exceptions can easily be found. Here is an example:

where it can be clearly seen that the half notes at beats 2 and 3 must be spaced as if they were quarter notes since they overlap, which is obvious only because of the presence of the indication of the *meter* 4/4.

Therefore, we preferred to provide the composer/typesetter with a set of macros, the spacing of which increases by a factor of (incidentally, this can be adjusted):

```
normalshapemediumseries\notes ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm1 spatial unit
```

```
normalshapemediumseries\Notes ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm1.4 spacial unit
```

```
normalshapemediumseries\NOtes ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm2 spatial units
```

normalshapemediumseries\NOTes ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm2.8 spatial
units

normalshapemediumseries\NOTES ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm4 spatial units

normalshapemediumseries\NOTES ... & ... & ...
normalshapemediumseries\enotes % to 2.5cm5.6 spatial
units

The size of the spatial unit (normalshapemediumseriesnormalshapemediumseries\elemskip) can be freely adjusted. In addition, MusicT_EX provides a means of adjusting the note spacing according to an average number of elementary spaces within a line (macro normalshapemediumseriesnormalshapemediumseries\autolines).

1.1.3 Music tokens, rather than a readymade generator

The tokens provided by MusicT_EX are:

- the note symbols *without stem*;
- the note symbols *with stems, and hooks for eighth notes and beyond*;
- the indications of beam beginnings and beam ends;
- the indications of beginnings and ends of ties and slurs;
- the indications of accidentals;
- the ornaments: arpeggios, trills, mordents, pincés, turns, staccatos and pizzicatos, fermatas;
- the bars, the meter and signature changes, etc.

Thus, normalshapemediumseries\wh a produces an *A (of nominal frequency 222.5 Hz, unless transposed)* of duration being a *whole note*. In the same way, normalshapemediumseries\wh h produces an *A (445 Hz)* of duration represented by a *whole note*, normalshapemediumseries\qu c produces a *C (250 Hz approx.)* whose value is a *quarter note with stem up*, normalshapemediumseries\c1 J produces a *C (125 Hz approx.)* of duration equal to an *eighth note with stem down*, etc.

To generate quarter, eighth, sixteenth, etc. chords, the macro `normalshapemediumseries` can be used: it produces a quarter note head the vertical position of which is memorized and recalled when another stemmed note (possibly with a hook) is coded; then the stem is adjusted to link all simultaneous notes. Thus, the perfect C-major chord, i.e.

```
=0000 cegj
is          coded          normalshapemediumseries\
zq cnormalshapemediumseries\zq enormalshapemediumser
ies\zq gnormalshapemediumseries\qu j or, in a more concise
way,          normalshapemediumseries\
zq{ceg}normalshapemediumseries\qu j (stem up): in fact, single
notes are treated... like one-note chords.
```

1.1.4 Beams

Beams are generated using macros which define their beginning (at the current horizontal position), together with their altitude, their direction (upper of lower), their multiplicity, their slope and their reference number. This latter feature – the reference number – appears to be necessary, since one may want to write beams whose horizontal extents overlap: therefore, it is necessary to specify which beam the notes hang on and which beam is terminated at a given position.

1.1.5 Setting anything on the score

A general macro (`normalshapemediumseries` `zcharnote`) provides a means of putting any sequence of symbols (in fact, some `normalshapemediumseries` `hbox{...}`) at any pitch of any staff of any instrument. Thus, any symbol defined in a font (letters, math symbols, etc.) can be used to typeset music.

1.2 A simple example

Before giving more details, we give below an example of the two first bars of the sonata in C-major K545 by :

The *coding* is set as follows:

```
\begin{music}
\parindent 1cm
```

```

\def\nbinstruments{1}\relax % a single
instrument
\def\instrumenti{Piano}%      % whose name is
Piano
\nbporteesi=2\relax          % with two
stoffs
\generalmeter{\meterfrac{4}{4}}\relax % 4/4
meter chosen
\debutextrait                % starting
real score
\normal                       % normal
12 pt note spacing
\temps\Notes\ibu0f0\qh0{cge}\tbu0\qh0g|\hl
j\notes
\temps\Notes\ibu0f0\qh0{cge}\tbu0\qh0g|\ql
l\sk\ql n\notes
\barre                        % bar
\Notes\ibu0f0\qh0{dgf}|\qlp i\notes
\notes\tbu0\qh0g|\ibb11j3\qb1j\tb11\qb1k\
enotes
\temps\Notes\ibu0f0\qh0{cge}\tbu0\qh0g|\hl
j\notes
\finextrait                   % terminate
excerpt
\end{music}

```

- `normalshapemediumseries\ibu0f0` begins an upper beam, aligned on the *f*, reference number 0, slope 0
- `normalshapemediumseries\tbu0` terminates this beam before writing the second *g* by means of `normalshapemediumseries\qh0g`
- `normalshapemediumseries\qh . .` indicates a note hanging on a beam.
- `normalshapemediumseries\sk` sets a space between the two quarters at the right hand, so that the second is aligned with the third eighth of the left hand.
- `normalshapemediumseries\qlp` is a quarter with a point.
- `normalshapemediumseries\ibb11j3` begins a double beam, aligned on the *C* (`normalshapemediumseries` at this pitch) of slope 0.15.

1.3 Some highlights

1.3.1 Signatures

Signatures can be stated either for all instruments, for example by `normalshapemediumseriesnormalshapemediumseries\generalsignaturenormalshapemediumseries{-2}` which sets two flats on each staff, or separately for each instrument. Thus, the `normalshapemediumseriesnormalshapemediumseries\generalsignature` can be partly overridden by `normalshapemediumseriesnormalshapemediumseries\signiinormalshapemediumseries=1` which puts one sharp on the staffs of *instrument number 2* (ii). Of course, the current signature may change at any time as well as the meters and clefs.

1.3.2 Transposition

An important question is: “*can MusicT_EX transpose a score ?*”. The answer is now 99.5 % *yes*. In fact, there is an internal register named `normalshapemediumseriesnormalshapemediumseries\transpose` the default value of which is zero, but it may be set to any reasonable positive or negative value. In that case, it offsets all symbols pitched with letter symbols by that number of pitch steps. However, it will neither change the signature nor the local accidentals, and if – for example – you transpose a piece written in *C* by 1 pitch, MusicT_EX will not know whether you want it in *D_b*, in *D* or in *D_#*. This might become tricky if accidentals occur within the piece, which might have to be converted into flats, naturals, sharps or double sharps, depending on the new chosen signature. To avoid this trouble, *relative* accidentals have been implemented, the actual output of which depends on the pitch of this accidental and of the current signature.

1.3.3 Selecting special instrument scores

Another question is: “*can I write an orchestral score and extract the separate scores for individual instruments ?*” The answer is 95 % *yes*: in fact, you can define your own macros `normalshapemediumseries\mynotes...normalshapemediumseries\enotes,`
`normalshapemediumseries\myNotes...normalshapemediumseries\enotes` with as many arguments as there are in the orchestral score (hope this is less or equal to 9,

but T_EXperts know how to work around) and change its definition depending on the selected instrument (or insert a test on the value of some selection register). But the limitation is that the numbering of instruments may change, so that `normalshapemediumseries\signiii` may have to become `normalshapemediumseries\signi` if instrument *iii* is alone. But, in turn, this is not a serious problem for average T_EX wizard apprentices.

1.3.4 Variable staff and note sizes

Although the staff size is 20 pt as a standard, MusicT_EX allors scores of 16 pt staff sizes. In addition, any instrument may have a special staff size (usually smaller than the overall staff size) and special commands `\smallnotesize` or `\tinynotesize` enable notes (and also beams or accidentals) to be of a smaller size, in order to quote optional notes or *cadenzas*.

1.4 How to get it

The whole *distribution* fits into a single 1.2Mbyte or 1.44Mbyte diskette. It can also be obtained through an *anonymous ftp* at `normalshapemediumseries.lps.u-psud.fr` (193.55.39.100), after selecting the subdirectory `normalshapemediumseries[.musictex]`. All sources (including fonts) are provided, either separately or “zipped” or as VMS “save sets”.

1.5 Enhancements

1.5.1 Recent easy enhancements

Many enhancements have been asked for, and this is a proof that MusicT_EX is considered as useful by many people. Some of these enhancements which seemed hard were in fact rather easy to implement, for example small notes to represent grace notes and *cadenzas*. But others may induce heavy problems, for example the need of having *nice* slurs and ties.

In the same way, we recently introduce Andreas EGLER’s fonts to have nicer braces at the left of the score, for example for piano music.

Besides, we recently found a hard incompatibility of MusicT_EX and a genuine product of the author’s native country, namely `french.sty` by Bernard GAULLE which is the *standard* of the French T_EX user group, namely the GUTenberg association. This was partly due to macro name collisions — easy to solve — and to the fact that `french.sty` sets a lot of characters as `normalshapemediumseriesnormalshapemediumseries\`

active characters in order to make them handle correctly the French spacing before and after punctuation marks. This seems to have been solved in the 4.99 version of MusicT_EX, with the restriction that French macros cannot be used — at least easily — within lyrics.

Besides, MusicT_EX has been adapted — since version 5.00 — to score *gregorian chant* and *percussion music*.

1.5.2 The tie/slur problem

While typesetting notes and even beams is a rather simple problem because it is a *local typesetting*, ties and slurs are much more difficult to handle.

Of course there is small problem in case of a typesetter wanting a slur or a tie binding two consecutive notes, not separated by a bar. In practice this *very restricted* use of slurs or ties can easily be solved by putting some symbols extracted from the normalshapemediumseries16 or normalshapemediumseries16/normalshapemediumseries20 fonts somewhere on the staves using the general use normalshapemediumseriesnormalshapemediumseries\zcharnote macro.

But serious music typesetters or composers know that many ties are supposed to link notes which are on both sides of a bar, which is a likely place to insert line breakings, so that the coding of *ties* must have various versions and sizes to resist that possible line breaking. What has been said about ties is still more serious in the case of *phrasing slurs* which may extend over several bars, lines and sometimes pages. In this case, their shape is not only a question of producing a long curved symbol of nice looking shape, it also has to cope with *glue*. An then the worst is that music way of typing does not accept *ragged lines* but equal length lines, even for the last line of a music piece. Thus, long distance slurs and ties need to be cut into separate parts (beginning, continuing(s), endings) which T_EX can only link using *horizontal line overlaps* or normalshapemediumseriesnormalshapemediumseries\leaders to insure slur continuity over this unavoidable glue.

Therefore and up to now, ties and slurs have been implemented in a way which may look rather ugly, but we think it is the only way of implementing *in one pass* ties and slurs which run *across glue*. The principle is to have tie/slur symbols with a rather long horizontal part. Then, at each time a glue occurs and at each time a group of notes is coded while a slur or tie is pending, an normalshapemediumseriesnormalshapemediumseries\hrule is issued which overlaps the preceding tie/slur symbol so that the final output seems to contain a continuous line. Unfortunately, this is possible only in the glue expansion direction, namely in the horizontal direction.

Variable size initial and final curved slur symbols have recently been implemented; the user has to choose them according to his intention to have short or long range slur symbols.

1.5.3 MusiX_{TEX}

MusiX_{TEX} is a new package, heavily derived from Music_{TEX} by Andreas EGLER and Ross MITCHELL. Its fundamentals are taken from Music_{TEX}, but it works in three passes :

1. The first pass _{TEX}es the source with a different set of macros, which generate a special file telling where slurs/ties start and begin.
2. The second pass (a C program) computes the optimal length of the slurs/recorded.
3. The third pass generates the definitive DVI from the initial source, owing to information produced by the second pass, name to choose the adequate slur/tie symbols according to the chosen final note spacing.

We do not describe MusiX_{TEX} here, but we give some suggestion to make the same Music_{TEX} source runnable with both Music_{TEX} and MusiX_{TEX}.

1.5.4 Enhancement limitations

Many requested improvements have not been *yet* implemented for several reasons:

- The author's natural lazyness (!)
- More seriously: many of them would require using some more registers; unfortunately, _{TEX} registers are not numerous (256 of each kind and the limit of `normalshapemediumseriesnormalshapemediumseries\dimen` registers is nearly reached) and we are afraid many requested new features would make _{TEX} stupidly crash even when typesetting reasonable scores.
- We do not think it is wise to introduce in Music_{TEX} itself a great number of macros which would be poorly used by most users: the reason is that _{TEX} memory is hardly limited and that unused macros may occupy some _{TEX} storage which could make things crash because of `normalshapemediumseriescapacity` exceeded...

1.6 Acknowledgements

The idea of implementing the present package is due to the previous work (M2pt uT_EX) of Andrea STEINBACH and Angelika SCHOFER¹. This work provided the basis of the Metafont codes and some line breaking procedures, which both are still used here... with 99% corrections and updates.

Besides, the original fonts of MusicT_EX, named `musicn20`, `musicn16`, `musicn13` and `musicn11`, have been recently reviewed by Andreas EGLER and the new release — used in the version 5.00 and above of MusicT_EX — is called `musikn20`, `musikn16`, `musikn13` `musikn11` and `musicbrb`.

¹ Steinbach A. & Schofer A., *Theses* (1987, 1988), Rheinische Friedrich-Wilhelms Universität, Bonn, Germany.

Chapter 2

Practical use

2.1 Heading statements

Before any reference to MusicT_EX macros:

```
normalshapemediumseries\input musicnft
normalshapemediumseries\input musicctex
```

which may be followed by `normalshapemediumseries\input musicadd` in the case you have more than six instruments (voice is two instruments: one for the music, one for the text) or more than 6 simultaneous beams or ties or slurs.

After that, you may write a complete book of T_EX provided that you do not use `normalshapemediumseries&` as a tabulation character (its `normalshapemediumseriesnormalshapemediumseries\catcode` has been changed) inside the music score and that you do not overwrite MusicT_EX's definitions. This means that no special macros have been designed to help you write titles, author names, comments, literature excerpts, etc., unless you use L^AT_EX with the `musicctex` style.

2.2 Before you begin to write notes

You should first specify whether you want to typeset music in size 20pt per staff or 16pt. This is only optional, the default value being 20pt. If you want the 16pt size, then you have to say:

```
normalshapemediumseriesnormalshapemediumseries\
musiccsizenormalshapemediumseries=16Then, the first compulsory declar
ation is:normalshapemediumseries\def
normalshapemediumseriesnormalshapemediumseries\
nbinstrumentsnormalshapemediumseries{n}where n is the
number of instruments, used by MusicTEX to performs loops building staves,
setting signatures, meters, etc. Therefore, it must be defined before any other
statements. An instrument may consist of several staves, e.g. the piano. The
difference between one instrument of several staves and several instruments is
```

as follows: • distinct instruments may have distinct *signatures*, distinct staves of a unique instrument share the same signature.

- *stems* may be hung to *beams* belonging to different staves of the same instrument.
- *chords* may extend across several staves of the same instrument.
- staves of a unique *instrument* are tied together with a big brace at the beginning of each line.

If the number of staves (in French “*portées*”) is not equal to one, this number must be specified by:

```
normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
nbporteesr=pnormalshapemediumseries\relax
```

where *p* is the number of staves, and where *r* is the roman numeral of the instrument considered (e.g.

```
normalshapemediumseriesnormalshapemediumseries\
nbporteesiii
```

for the 3rd instrument, starting from the bottom). This value may be zero, in which case the staff lines are omitted, and this instrument may be used to code the *lyrics* of a song, below the actual “instrument” representing the notes of the song.

Unless all your instruments only use the *violin* clef, you have to specify all the clefs used for all the instruments. This is done by coding:

```
normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
cleftoks r={{s1}{s2}{s3}{s4}}%
```

where *r* is the roman numeral of the instrument, *s1* specifies the clef of the lower staff, *s2* the clef of the second staff, etc. One must always give four values with the above syntax, otherwise... *s1*=0 means the *violin* clef (clef de sol in French), *s1*=1 through *s1*=4 mean the *alto* clef (clef d’ut in French) set on first (lower) through fourth (next to upper line of the staff), *s1*=5 means the *bass* clef at third (middle) line, and *s1*=6 means the usual *bass* clef (clef de fa in French) at the usual fourth line. As an example, a standard piano score should include:

```
normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
cleftoksi={{6}{0}{0}{0}}%    or    normalshapemediumseries\
cleftoksi={6000}%
```

If the signature is not void, one should code:

```

normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
generalsignaturenormalshapemediumseries{s}normalshap
emediumseries\relax

```

where $s > 0$ indicates the number of *sharps* in the signature and $s < 0$ the number of *flats*².

If there a *meter* indication is to be posted, it should be specified using the macro

```

normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
generalmeter{m}%

```

where m is the description of the meter indication which should appear on each staff. If it is a *fraction* (e.g. 3/4) on should code

```

normalshapemediumseries\
generalmeter{normalshapemediumseries\meterfrac{3}
{4}}%

```

or, in a simpler way (if the numbers are less than 10):

```

normalshapemediumseries\
generalmeter{normalshapemediumseries\meterfrac 34}%

```

Special denotations can be used, such as `normalshapemediumseriesnormalshapemediumseries\allabreve` to `get -6pt` and `normalshapemediumseriesnormalshapemediumseries\meterC` to `get -6pt`.

However, not all music scores have the same meter in each staff. Especially, some staves may have *ternary* meters while others have *binary*. This can be specified by using the `normalshapemediumseriesnormalshapemediumseries\generalmeter` macro to set the meter for most of the scores and overriding it by means of a more sophisticated command:

```

normalshapemediumseries\
metertoksii={{normalshapemediumseries\
meterfrac{12}8}{normalshapemediumseries\ allabreve}
{}}}%

```

which sets the meter to 12/8 for the first (lower) staff, and *alla breve* for the second staff of the instrument number 2 (*ii*). Note that there is room for 4

² We have seen once a score in G-minor where the signature consisted of two flats (B and E) plus one sharp (F). This is not supported by MusicT_EX.

staves and that void items must be specified, otherwise T_EX weird errors occur.

2.2.1 Instrument names

If you want the *name of the instruments* (or the *name of the voices*) to be displayed in front of their respective staves at the beginning, you may code:

```
normalshapemediumseries\defnormalshapemediumseries\  
instrumentr{name of the instrument}%
```

where *r* is the roman numeral of the instrument considered. In this case, you should also adjust the normalshapemediumseriesnormalshapemediumseries\parindent dimension so that the long name of an instrument does not spill too far into the left margin.

2.2.2 Polyphonic songs

Except staves of a unique instrument tied together with a big brace, staves normally begin on the left with a thin vertical rule. However, it is usual to tie all human voices together with a left heavy and right thin vertical rule. This can be specified (but only once per system) by specifying

```
normalshapemediumseriesnormalshapemediumseries\def  
normalshapemediumseriesnormalshapemediumseries\  
lowersonginstrum{m}  
normalshapemediumseriesnormalshapemediumseries\def  
normalshapemediumseriesnormalshapemediumseries\  
uppersonginstrum{n}
```

where *m* and *n* are the instrument numbers of the first and last choral voices. An example of using this feature is given in normalshapemediumseries and – more complicated – also in normalshapemediumseries and normalshapemediumseries.

2.3 Starting your masterpiece

2.3.1 Typing the first system

Just code

normalshapemediumseriesnormalshapemediu
mseries\
debutmorceau**which will initiate (with indentati**

on

normalshapemediumseriesnormalshapemediu
mseries\parindent)

**the first set of staves for all instruments you have p
reviously defined. But that is not sufficient to
begin writing notes and silences. In fact, you also
must choose the spacing of the notes.2.3.2 Easy
selecting note spacing**

The easiest way of getting a reasonable note spacing is done by saying

`normalshapemediumseries`
`normalshapemediumseries\`
This defines an elementary spacing of `normalshapemediumseries10pt`. If you say `normalshapemediumseriesnormalshapemediumseries\large`³ the elementary spacing (`normalshapemediumseriesnormalshapemediumseries\elemskip`) is set to `normalshapemediumseries 12pt`. Once this is done, you can select multiples of this value to select specific note spacing by initiating your note column with `normalshapemediumseries\notes` (spacing `normalshapemediumseries\elemskip`), `normalshapemediumseries\Notes` (spacing `normalshapemediumseries 1.4normalshapemediumseries\elemskip`), etc. There is also a macro named `normalshapemediumseriesnormalshapemediumseries\etroit` which yields narrower⁴ spacings but not increasing in the same way. In practice, the choice of the macro `normalshapemediumseries\notes`, `normalshapemediumseries\Notes`, `normalshapemediumseries\Notes`, etc., to initiate of column of notes sets an internal

³ To avoid problems with the L^AT_EX macro of the same name, this macro is only activated under L^AT_EX when

`normalshapemediumseriesnormalshapemediumseries\begin{music}` is invoked.

⁴ *etroit* means *narrow* in French.

dimension register, named
normalshapemediumseriesnormalshapemediu
mseries\noteskip **to the given multiple of**
normalshapemediumseriesnormalshapemediu
mseries\elemskip. **Thus, each *spacing note***
(**normalshapemediumseriesnormalshapemedi
umseries\qu,**
normalshapemediumseriesnormalshapemediu
mseries\qh,
normalshapemediumseriesnormalshapemediu
mseries\hl, etc.) **will be followed by a spacing**
of
normalshapemediumseriesnormalshapemediu
mseries\noteskip. **Then, the advantage of the**
definition of normalshapemediumseries
elemskip **is that, whenever it is changed, all**
subsequent normalshapemediumseries
noteskips **will be updated proportionally so that**
a simple change of normalshapemediumseries
elemskip **can expand or shrink all consecutive**
note spacings as a whole.**If these values of**
normalshapemediumseries\elemskip are not fit
to your needs, you can also
saynormalshapemediumseries
normalshapemediumseriesnormalshapem
ediumseries\normal
normalshapemediumseriesnormalshapem
ediumseries\elemskip=15pt**or revert to the**
basic note introducing

sequence: `normalshapemediumseries`

`normalshapemediumseriesnormalshapemediumseries\vnotes q`
`normalshapemediumseries\elemskip`
note specifications

`normalshapemediumseries\enotes` where q is a positive integer or decimal number. Of course, if you are sufficiently skilled with $\text{T}_{\text{E}}\text{X}$, you can also compute

`normalshapemediumseriesnormalshapemediumseries\elemskip` according to the number of bars you want in a line and the number of notes in each bar. However, you may also prefer to ask $\text{MusicT}_{\text{E}}\text{X}$ to compute the size of

`normalshapemediumseriesnormalshapemediumseries\elemskip` from the current page width

(`normalshapemediumseriesnormalshapemediumseries\hsize`) after assuming a constant number of bars of a constant number of beats within each line⁵. In this case, you have better use the

`normalshapemediumseriesnormalshapemediumseries\autolines` macro, which is described below (see: 2.14, “Line and page breaking”).

2.4 Note pitch specification

Note pitches are usually specified by letters ranging from `normalshapemediumseries` to `normalshapemediumseries z` for those which are usually written under the G-clef (`normalshapemediumseries` corresponds

⁵ This does not meet the requirements of contemporaneous music, but fits very well to baroque and romantic music.

to the *A* of nominal frequency 222.5 Hz; the *G* of the G-clef is denoted `normalshapemediumseries`). Lower pitch notes are specified using upper case letters ranging from `normalshapemediumseries` to `normalshapemediumseries` (the *F* of the F-clef is denoted `normalshapemediumseries`, and `normalshapemediumseries` is one octave below).

If necessary, a numeric symbol can be used to place a symbol independently of the active clef.

Besides, notes below `normalshapemediumseries` (i.e. the *A* of nominal frequency 55.625 Hz), namely the lowest octave of the modern pianos, can only be coded using the transposition features (see below: *transposition* and *octavation*) or in absolute vertical position using numbers.

2.5 Writing notes

There are two major kinds of note macros:

1. those which terminate a note/chord stem and are followed by a horizontal spacing of value `normalshapemediumseriesnormalshapemediumseries\noteskip`,
2. those which initiate or extend a note/chord stem and do not cause horizontal spacing.

The first kind is used to type a melody, the second kind is used to type chords.

2.5.1 Single (spacing) notes

`normalshapemediumseriesnormalshapemediumseries\nwh p` : whole note at pitch *p*.

`normalshapemediumseriesnormalshapemediumseries\nhu p` : half note at pitch *p* with stem up.

`normalshapemediumseriesnormalshapemediumseries\nhl p` : half note at pitch *p* with stem down.

`normalshapemediumseriesnormalshapemediumseries\nqu p` : quarter note at pitch *p* with stem up.

normalshapemediumseriesnormalshapemediumseries\ql **p** : quarter note at pitch p with stem down.

normalshapemediumseriesnormalshapemediumseries\cu **p** : eighth note⁶ at pitch p with stem up.

normalshapemediumseriesnormalshapemediumseries\cl **p** : eighth note at pitch p with stem down.

normalshapemediumseriesnormalshapemediumseries\ccu **p** : sixteenth note at pitch p with stem up.

normalshapemediumseriesnormalshapemediumseries\ccl **p** : sixteenth note at pitch p with stem down.

normalshapemediumseriesnormalshapemediumseries\cccu **p** : 32-th note at pitch p with stem up.

normalshapemediumseriesnormalshapemediumseries\cccl **p** : 32-th note at pitch p with stem down.

normalshapemediumseriesnormalshapemediumseries\cccuu **p** : 64-th note at pitch p with stem up.

normalshapemediumseriesnormalshapemediumseries\ccccl **p** : 64-th note at pitch p with stem down.

As an example, the sequence:

was coded as:

⁶ The normalshapemediumseries\c of this macro name is taken from the French word “croche” which is by the way one half of the english “crotchet”; normalshapemediumseries\cc . . . , normalshapemediumseries\ccc . . . are standing for “double croche”, “triple croche”, etc.

```

\notes\cu c\temps\cl j\enotes\barre
\notes\ccu c\temps\ccl j\enotes\barre
\notes\cccu c\temps\cccl j\enotes\barre
\notes\cccu c\temps\ccccl j\enotes

```

If these notes are preceded by *non-spacing* notes (i.e. macros `normalshapemediumseriesnormalshapemediumseries\zq` or `normalshapemediumseriesnormalshapemediumseries\zh`) their stem is extended up or down so as to join all notes into a single chord.

2.5.2 Non-spacing (chord) notes

normalshapemediumseriesnormalshapemediumseries\zq *p* : quarter (or shorter) note head at pitch *p* with no spacing after.

normalshapemediumseriesnormalshapemediumseries\zh *p* : half note head at pitch *p* with no spacing after.

It must be pointed out that the pitch *p* of these notes is memorized so that the stem of the further spacing note will join them into a chord. This stem top and bottom pitch is *reset* at each spacing note.

REMARK : Notes of duration longer than whole notes are always non-spacing. This saves one useless definition, since these notes are always longer than other simultaneous ones. If needed they can be followed by `normalshapemediumseriesnormalshapemediumseries\sk` to force spacing.

2.5.3 Shifted non-spacing (chord) heads

These symbols are used mainly in chords where *second* intervals are present. It is the responsibility of the typist to choose which heads should be shifted left or right.

`normalshapemediumseriesnormalshapemediumseries\rw p` : whole note head shifted right by one note width ($\approx 6\text{pt}$), no spacing.

`normalshapemediumseriesnormalshapemediumseries\lw p` : whole note head shifted left by one note width ($\approx 6\text{pt}$), no spacing.

`normalshapemediumseriesnormalshapemediumseries\rh p` : half note head shifted right by one note width ($\approx 6\text{pt}$), no spacing.

`normalshapemediumseriesnormalshapemediumseries\lh p` : half note head shifted left by one note width ($\approx 6\text{pt}$), no spacing.

`normalshapemediumseriesnormalshapemediumseries\rq p` : quarter note head shifted right by one note width ($\approx 6\text{pt}$), no spacing.

`normalshapemediumseriesnormalshapemediumseries\lq p` : quarter note head shifted left by one note width ($\approx 6\text{pt}$), no spacing. Except that they are shifted left of right, these macros act like

`normalshapemediumseries\z . . .` macros for stem building.**2.5.4 Shifted notes**

`normalshapemediumseriesnormalshapemediumseries\rqu` : acts like `normalshapemediumseries\qu` but the note head is shifted one note width. This is used for *chords* with upper note on the right side of the stem.

`normalshapemediumseriesnormalshapemediumseries\rql` : same with stem down.

`normalshapemediumseriesnormalshapemediumseries\rhu` : same as above for a half note, stem up.

normalshapemediumseriesnormalshapemediumseries\rhl : same with stem down.

In addition one can use the command **normalshapemediumseries**normalshapemediumseries\roff to offset any note character by one quarter note head, e.g.:

```
\roff{\zqup h}
```

which will post a pointed quarter note with stem up, offset by one quarter note head with respect to its normal abscissa. `\roff{...}` is heavily recommended instead of `\qsk` if the score is intended to be run also with MusiX_TE_X.

2.5.5 Non-spacing single notes

normalshapemediumseriesnormalshapemediumseries\zhu : half note with stem up but no spacing. It acts like **normalshapemediumseries**normalshapemediumseries\hu for stem building.

normalshapemediumseriesnormalshapemediumseries\zhl : half note with stem down but no spacing. It acts like **normalshapemediumseries**normalshapemediumseries\s\hl for stem building.

normalshapemediumseriesnormalshapemediumseries\zqu : quarter note with stem up but no spacing. It acts like **normalshapemediumseries**normalshapemediumseries\qu for stem building.

normalshapemediumseriesnormalshapemediumseries\zql : quarter note with stem down but no spacing. It acts like **normalshapemediumseries**normalshapemediumseries\ql for stem building.

normalshapemediumseriesnormalshapemediumseries\zcu : eighth note with stem up but no spacing. It acts like **normalshapemediumseries**normalshapemediumseries\cu for stem building.

normalshapemediumseriesnormalshapemediumseries

`ies\zc1` : eighth note with stem down but no spacing. It acts like `normalshapemediumseries\c1` for stem building.

normalshapemediumseries`normalshapemediumseries\lhu`,

normalshapemediumseries`normalshapemediumseries\lhl`,

normalshapemediumseries`normalshapemediumseries\lqu`,

normalshapemediumseries`normalshapemediumseries\lql` : same as above, but the whole of the note is shifted one note width on the left.

normalshapemediumseries`normalshapemediumseries\zw p` : whole note at pitch p with no spacing after.

normalshapemediumseries`normalshapemediumseries\zwq p` : arbitrary duration note (2.5pt) at pitch p with no spacing after.

normalshapemediumseries`normalshapemediumseries\zbv p` : breve note (2.5pt) at pitch p with no spacing after.

normalshapemediumseries`normalshapemediumseries\zsb p` : semi-breve note (2.5pt) at pitch p with no spacing after.

2.5.6 Single (spacing) stemless notes

Although not standard in real music scores, one may need to have stemless quarter and half noteheads posted in the same way as whole notes. This can be done with the following commands:

normalshapemediumseries`normalshapemediumseries\nh p` : half notehead at pitch p .

normalshapemediumseriesnormalshapemediumseries
ies\nq **p** : quarter notehead at pitch *p*.

As an example, the sequence:

was coded as:

```
\notes\nq c\temps\nq j\enotes\barre  
\Notes\nh c\temps\nh j\enotes\barre  
\notes\nq {cdef}\enotes\finextrait
```

In case of special need, non spacing variants have been provided, namely
normalshapemediumseriesnormalshapemediumseries\znh and
normalshapemediumseriesnormalshapemediumseries\znq.

2.5.7 Pointed notes

One simple way of doing consists in putting
normalshapemediumseriesnormalshapemediumseries\pt *p* to get a
dot after the normal note head at pitch *p*. Thus a quarter note with a point can
be coded normalshapemediumseries\pt
hnormalshapemediumseries\qu h.

A simpler way of doing consists in using compact macros, namely:
normalshapemediumseriesnormalshapemediumseries\qup,
normalshapemediumseriesnormalshapemediumseries\qupp,
normalshapemediumseriesnormalshapemediumseries\quppp,
normalshapemediumseriesnormalshapemediumseries\zqp,
normalshapemediumseriesnormalshapemediumseries\zhp,
normalshapemediumseriesnormalshapemediumseries\zwp (these
three normalshapemediumseries\z...p are useful in chords),
normalshapemediumseriesnormalshapemediumseries\hup,
normalshapemediumseriesnormalshapemediumseries\whp,
normalshapemediumseriesnormalshapemediumseries\qhp,
normalshapemediumseriesnormalshapemediumseries\qhpp,
normalshapemediumseriesnormalshapemediumseries\qlp,
normalshapemediumseriesnormalshapemediumseries\qlpp, etc.

You may also introduce pointed notes, especially in groups by coding a *period* before (not after) the letter representing the pitch: `normalshapemediumseries\qu{.a.^b.c}` which is equivalent to:

```
\pt{a}\qu{a}\pt{b}\sh{b}\qu{b}\pt{c}\qu{c}
```

Finally, pointed notes can also be produced without spacing after, using `normalshapemediumseriesnormalshapemediumseries\zhup`, `normalshapemediumseriesnormalshapemediumseries\zhlp`, `normalshapemediumseriesnormalshapemediumseries\zqup`, `normalshapemediumseriesnormalshapemediumseries\zqlp`, `normalshapemediumseriesnormalshapemediumseries\zcup`, `normalshapemediumseriesnormalshapemediumseries\zclp`, and the same with two `normalshapemediumseries`'s for double-pointed notes.

2.6 Beams

Beams are not automatically handled, but they must be declared explicitly, *before* the first spacing note involving them is coded. Two kinds of macros are provided:

1. fixed slope beams have an arbitrary slope chosen by the user in the range -45% to +45% (by multiples of 5%);
2. semi-automatic beams have their slope computed knowing the number of `normalshapemediumseriesnormalshapemediumseries\noteskip` over which they are supposed to extend, and knowing the initial and final pitch of the notes they are supposed to link.

2.6.1 Fixed slope beams

`normalshapemediumseriesnormalshapemediumseries\ibu nps` : initiates an *upper beam* 3 horizontal line spacings above the pitch p ; m is its reference number, which must be in the range [0-5] ([0-9] if `normalshapemediumseries` file has been `normalshapemediumseries\input`); s is the slope of the beam.

s is an integer in the range $[-9,9]$. $s=1$ means a slope of 5%, $s=9$ means a slope of 45% (the maximum with the normalshapemediumseries20 or normalshapemediumseries16 fonts), $s=-3$ means a slope of -15%, etc. With usual spacings a slope of 2 or 3 is fit for ascending scales. A slope of 6 to 9 is fit for ascending arpeggios.

normalshapemediumseriesnormalshapemediumseries\ibl nps : initiates a *lower beam 3* horizontal line spacings below the pitch p . Other parameters as above.

normalshapemediumseriesnormalshapemediumseries\ibbu nps : initiates a *double upper beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbl nps : initiates a *double lower beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbbu nps : initiates a *triple upper beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbbbl nps : initiates a *triple lower beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbbbu nps : initiates a *quadruple upper beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbbbl nps : initiates a *quadruple lower beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries\ibbbbbu nps : initiates a *quintuple upper beam* (same parameter meaning).

normalshapemediumseriesnormalshapemediumseries

`ies\ibbbbbl nps` : initiates a *quintuple lower beam*
 (same parameter meaning).

Beam termination is also not automatic. The termination of a given beam must be explicitly declared *before* coding the last spacing note connected to that beam.

`normalshapemediumseriesnormalshapemediumseries\tbu n` : terminates upper beam number *n* at current position.

`normalshapemediumseriesnormalshapemediumseries\tbl n` : terminates lower beam number *n* at current position.

`normalshapemediumseriesnormalshapemediumseries\tbu` and `normalshapemediumseriesnormalshapemediumseries\tbl` terminate beams of any multiplicity. Therefore 32-th notes hanging on a triple beam are initiated by `normalshapemediumseriesnormalshapemediumseries\ibbbu nps` and terminated by `normalshapemediumseriesnormalshapemediumseries\tbu n`. It is also possible to code beams whose multiplicity is not the same at the beginning. The multiplicity can be increased at any position. For instance, `normalshapemediumseriesnormalshapemediumseries\nbbu n` which sets the multiplicity of upper beam number *n* to 2 starting at the current position, `normalshapemediumseriesnormalshapemediumseries\nbbbu n` sets its multiplicity to 3, `normalshapemediumseriesnormalshapemediumseries\nbbbbu n` sets its multiplicity to 4, and `normalshapemediumseriesnormalshapemediumseries\nbbbbbu n` sets it to 5. `normalshapemediumseriesnormalshapemediumseries\nbbbl n` ... `normalshapemediumseriesnormalshapemediumseries\nbbbbbl n` perform the same functions for lower beams. Notes hanging or standing on beams are coded in the form `normalshapemediumseries\qhn p` and `normalshapemediumseries\qbn p` where *n* is the beam number and *p* the pitch of the note head. Music_{TEX} adjusts the length of the note stem to link the bottom of the chord to an upper beam (normally with `normalshapemediumseriesnormalshapemediumseries\qh`) and the top of the chord to a lower beam (normally with `normalshapemediumseriesnormalshapemediumseries\qb`). Note that the difference between upper and lower beams does not mainly consist in the

beam being above or below the note heads; rather, it specifies whether the abscissa of the beginning and the end of this beam is aligned on the right (upper beam) or on the left (lower) beam. Thus, the sequence:
has been coded as

```
\notes\ibu0h0\qh0e\nbbu0\qh0e\nbbbu0\qh0e\
nbbbu0\relax
\qh0e\nbbbu0\qh0e\nbbbu0\qh0e\tbu0\qh0e\
enotes
```

It is quite possible to terminate with
normalshapemediumseriesnormalshapemediumseries\tbu a beam
initiated with normalshapemediumseriesnormalshapemediumseries\
ib1. This may give:

which has been coded as

```
\notes\ib10p0\qb0p\nbb10\qb0p\nbb10\qb0p\
tbu0\qh0e\enotes
```

Partial termination of beams is also possible, by using
normalshapemediumseriesnormalshapemediumseries\tbbu or
normalshapemediumseriesnormalshapemediumseries\tbb1: these
macros terminate the current beam except that of order 1 (eighths).
normalshapemediumseriesnormalshapemediumseries\tbbbu or
normalshapemediumseriesnormalshapemediumseries\tbb11
terminate the current beam except those of order 1 and 2, etc.

The macros
normalshapemediumseriesnormalshapemediumseries\tbbu and
normalshapemediumseriesnormalshapemediumseries\tbb1 may also
be invoked when only a single beam is active. Then, a second beam (upper or
lower according the initiating procedure) is opened *one note width before the
current position, and closed immediately*. Thus the following sequence

is coded:

```
\notes\ibu0e0\qh0e\tbbu0\tbu0\qh0e\enotes
```


The same behaviour occurs in the case of
`normalshapemediumseriesnormalshapemediumseries\tbbbu`,
`normalshapemediumseriesnormalshapemediumseries\tbbbl`,
`normalshapemediumseriesnormalshapemediumseries\tbbbbu`,
`normalshapemediumseriesnormalshapemediumseries\tbbbbbl`,
`normalshapemediumseriesnormalshapemediumseries\tbbbbb` and
`normalshapemediumseriesnormalshapemediumseries\tbbbbbbl`.

The symmetrical pattern is also possible. For example:

has been coded as:

```
\Notes\ibbl0j0\rlap{\qsk\tbb10}\qb0j\tb10\
qb0j\enotes
```

REMARK: these codings may seem complicated. In fact, it is the responsibility of the user to define macros which perform the most common sequences in his masterpiece. For example, one could define sets of four sixteenths by the macro:

```
normalshapemediumseries\defnormalshapemediumseries\
qqhnormalshapemediumseries#1normalshapemediumseries#
2normalshapemediumseries#3normalshapemediumseries#4n
ormalshapemediumseries#5{%
normalshapemediumseries\
ibbl0normalshapemediumseries#2normalshapemediumserie
s#1normalshapemediumseries\qh
normalshapemediumseries#2normalshapemediumseries\qh
normalshapemediumseries#3normalshapemediumseries\
tbl0normalshapemediumseries\qh
normalshapemediumseries#4}
```

where the first argument is the slope and the other four arguments are the pitches of the four consecutive sixteenths wanted.

2.6.2 Repeated pattern beams

Note heads hanging on beams are not necessarily quarter (or higher order) note heads. It is possible to hang half note heads on beams using `normalshapemediumseriesnormalshapemediumseries\hh` and `normalshapemediumseriesnormalshapemediumseries\hb` macros, e.g.:

has been coded as:

```
\Notes\ibbl0j0\hb0j\tbl0\hb0j\enotes  
\Notes\ibbu0g0\hh0g\tbu0\hh0g\enotes
```

It is also possible to write

which was coded as:

```
\Notes\ibbl0j3\wh j\tbl0\wh l\enotes  
\Notes\ibbu0g3\wh g\tbu0\wh i\enotes
```

However, a better look could be obtained in a more sophisticated way⁷:

which was simply coded as:

```
\Notes\zw j\qsk\ibbl0j3\sk\tbl0\wh l\enotes  
\Notes\ibbu0g3\wh g\tbu0\qsk\wh i\enotes
```

⁷ You are suggested to make your own macro if you have to type many of these.

2.6.3 Semi-automatic beams

In order to avoid tedious checks to adjust the slope (and even the starting pitch) of beams in music with a lot of steep beams, a set of automatically slope computing has recently been implemented (file `normalshapemediumseries.tex`). If you say `normalshapemediumseries\Ibu2gj3` MusicT_EX will understand that you want to build an upper beam (beam number 2) horizontally extending 3 `normalshapemediumseries\noteskip`, the first note of which is a `normalshapemediumseries` and the last note is a `normalshapemediumseries`. Knowing these parameters it will choose the highest slope number which corresponds to a slope not more than $(\text{normalshapemediumseries} - \text{normalshapemediumseries}g) / (3\text{normalshapemediumseries}\text{normalshapemediumseries}\text{noteskip})$. Moreover, if there is no sufficiently steep beam slope available, then it will raise the starting point.

Ten such macros are available:
`normalshapemediumseriesnormalshapemediumseries\Ibu`,
`normalshapemediumseriesnormalshapemediumseries\Ibbu`,
`normalshapemediumseriesnormalshapemediumseries\Ibbbu`,
`normalshapemediumseriesnormalshapemediumseries\Ibbbbu`,
`normalshapemediumseriesnormalshapemediumseries\Ibbbbbu`,
`normalshapemediumseriesnormalshapemediumseries\Ibl`,
`normalshapemediumseriesnormalshapemediumseries\Ibbl`,
`normalshapemediumseriesnormalshapemediumseries\Ibbbl`,
`normalshapemediumseriesnormalshapemediumseries\Ibbbbl` and
`normalshapemediumseriesnormalshapemediumseries\Ibbbbbl`.
Examples of their use is given in `normalshapemediumseries.tex`.

2.7 Rests

Except that difference that they have no specific pitch, rests are coded in a very simple way.

2.7.1 ordinary rests

Full bar rests (also called “pauses”) are coded as `normalshapemediumseriesnormalshapemediumseries\pause`;
smaller rests are `normalshapemediumseriesnormalshapemediumseries\`

`\hpause` (of duration equal to a *half note*),
`\normalshapemediumseries\normalshapemediumseries\`
`\soupon` (duration equal to a *quarter note*),
`\normalshapemediumseries\normalshapemediumseries\`
`\dsoupon` (duration equal to an *eighth note*, also
`\normalshapemediumseries\normalshapemediumseries\ds`),
`\normalshapemediumseries\normalshapemediumseries\`
`\quartsoupon` (duration equal to an *sixteenth note*, also
`\normalshapemediumseries\normalshapemediumseries\qs`),
`\normalshapemediumseries\normalshapemediumseries\`
`\huitsoupon` (duration equal to an *thirtysecond note*, also
`\normalshapemediumseries\normalshapemediumseries\hs`),
`\normalshapemediumseries\normalshapemediumseries\`
`\seizoupon` (duration equal to an *sixty fourth note*, also
`\normalshapemediumseries\normalshapemediumseries\qqs`).

Long rests (lasting several bars) can be coded as
`\normalshapemediumseries\normalshapemediumseries\PAuse` and
`\normalshapemediumseries\normalshapemediumseries\PAUse`, which
 respectively yield:

2.7.2 Lifted rests

All the previous rests are *hboxes*; this means that they can be vertically offset
 to meet polyphonic music requirements using the standard T_EX command
`\normalshapemediumseries\normalshapemediumseries\raise`.

In addition, two symbols have been provided to put a *full rest* or a *half
 rest* above or below the staff. Then the ordinary `\pause` or `\hpause` cannot
 be used since there is a need for small horizontal line to distinguish between
 the full and the half rest. They are :

- `\normalshapemediumseries\normalshapemediumseries\`
`\expause p` (spacing) for to 1.5em1 at pitch position *p*,
- `\normalshapemediumseries\normalshapemediumseries\`
`\exhpause p` (spacing) for to 1.5em1,
- `\normalshapemediumseries\normalshapemediumseries\`
`\zexpause p` (non spacing) for to 1.5em1,
- `\normalshapemediumseries\normalshapemediumseries\`
`\zexhpause p` (non spacing) for to 1.5em1.

2.8 Phantom notes

It may be interesting, when coding a sequence of notes within a unique pair `normalshapemediumseries\notes...normalshapemediumseries\enotes`, to skip one note place in order – for example – to set the third note of one staff at the same abscissa as that of the second note of another staff. This can be done by inserting `normalshapemediumseriesnormalshapemediumseries\sk` which causes a spacing of one `normalshapemediumseriesnormalshapemediumseries\noteskip`⁸.

If you just want to shift a note or a symbol by one note head width, you may write `normalshapemediumseriesnormalshapemediumseries\qsk`. However, if you want to offset a note by one note head width in a chord, you have better use the `normalshapemediumseriesnormalshapemediumseries\roff` macro⁹.

Note that these two latter macros must be used inside a pair `normalshapemediumseries...normalshapemediumseries\notes...normalshapemediumseries\enotes`. If you want to make a spacing of one note head width outside, write `normalshapemediumseriesnormalshapemediumseries\nspace`. Conversely, a more general spacing is allowed within the `normalshapemediumseries\notes...normalshapemediumseries\enotes` pairs, namely:

`normalshapemediumseriesnormalshapemediumseries\nspace`
`normalshapemediumseriesnormalshapemediumseries\off d`
where d is any $\text{T}_{\text{E}}\text{X}$ valid dimension, for example `normalshapemediumseries\noteskip` or `normalshapemediumseries5normalshapemediumseries\nspace`
Interligne. In fact, if you look to the Music $\text{T}_{\text{E}}\text{X}$ source, you will find

⁸ Do not use

`normalshapemediumseriesnormalshapemediumseries\kern` nor `normalshapemediumseriesnormalshapemediumseries\hskip`: in fact `normalshapemediumseriesnormalshapemediumseries\sk` not only causes a space but also records that space for correct handling of beams.

⁹ The reason for that pertains to Musi $\text{X}\text{T}_{\text{E}}\text{X}$ which might dilate or shrink the `normalshapemediumseries\nspace` while the `normalshapemediumseries\roff` offset is absolute.

that `normalshapemediumseries\off` is the basic control sequence used to define `normalshapemediumseriesnormalshapemediumseries\sk`, `normalshapemediumseriesnormalshapemediumseries\qsk`, etc.

2.9 Collective coding: sequences of notes

As seen in the MOZART example, it is not necessary to write a macro sequence `normalshapemediumseries\notes...normalshapemediumseries\enotes` for each column. If, on all staves of all instruments, spacings are equal or multiple of a unique value, the notes may be concatenated in each staff: each note in each staff makes the current position horizontally advance by the elementary spacing specified by the choice of `normalshapemediumseries\notes`, `normalshapemediumseries\Notes`, `normalshapemediumseries\NOTes`, etc.

The major interest of this feature resides in that fact that the note macros are able to write several items; for instance `normalshapemediumseries\qu{cdefghij}` writes the *C-major* scale in quarters with stem up. In the same way `normalshapemediumseries\cl{abcde f gh}` writes the *A-minor* scale in eighths. Not all note generating macros can be used to perform collective coding, but most of them can. They are:

- all the spacing notes:
`normalshapemediumseriesnormalshapemediumseries\wh`,
`normalshapemediumseriesnormalshapemediumseries\hu`,
`normalshapemediumseriesnormalshapemediumseries\hl...`
`normalshapemediumseriesnormalshapemediumseries\ccccl`
and the beam hooked notes, i.e.
`normalshapemediumseriesnormalshapemediumseries\qhn` and
`normalshapemediumseriesnormalshapemediumseries\qbn`.
- all the chord notes with names of the form `normalshapemediumseries\z...`

Conversely, shifted notes are not supposed to be used in collective coding, mainly because they are used in very special cases which do not deserve wasting memory space to make them collective.

If necessary a void space can be inserted in a collective coding by using `normalshapemediumseries`.

2.10 Accidentals

Accidentals can be introduced in two ways.

The first way, the *manual* way of coding them, consists for example in coding `normalshapemediumseries` `normalshapemediumseries\fl a` to put a *flat* at the pitch *a*, supposedly before the further note of that pitch. There is no control upon the fact that a note will be put at this position and at this pitch. Naturals, sharps, double flats and double sharps are coded `normalshapemediumseries\na p`, `normalshapemediumseries\sh p`, `normalshapemediumseries\df1 p` and `normalshapemediumseries\dsh p` respectively.

Alternate procedures `normalshapemediumseries\lfl`, `normalshapemediumseries\lna`, `normalshapemediumseries\lsh`, `normalshapemediumseries\ldfl` and `normalshapemediumseries\ldsh` place the same accidentals, but their abscissa is shifted one note head width on the left. The purpose of this is to avoid collision of accidentals in a chord with narrow intervals.

The second way of coding accidentals consists in putting the symbol `normalshapemediumseries^` (sharp), the symbol `normalshapemediumseries_` (flat), the symbol `normalshapemediumseries=` (natural), the symbol `normalshapemediumseries>` (double sharp), or the symbol `normalshapemediumseries<` (double flat) within the coding of the note, e.g.: `normalshapemediumseries\qh{g}` yields a *G*♯. This may very well be combined with collective coding, e.g.: `normalshapemediumseries\qu{a^ d}`.

Two sizes are available for accidentals. They revert to the small version when notes are supposed to be too close to each other. These two sizes can be forced by coding `normalshapemediumseries\bigfl`, `normalshapemediumseries\bigsh`, etc., or `normalshapemediumseries\smallfl`, `normalshapemediumseries\smallsh`, etc. If one does not want to have any small accidentals, then one can declare `normalshapemediumseries\bigaccid` (conversely `normalshapemediumseries\smallaccid` or `normalshapemediumseries\varaccid` – the latter restoring variable sizes).

Small accidentals can also be put *above* the note heads. This is done using `normalshapemediumseriesnormalshapemediumseries\uppersh p`, `normalshapemediumseriesnormalshapemediumseries\upperna p` or `normalshapemediumseriesnormalshapemediumseries\upperfl p`:

It also possible to introduce *cautionary accidentals* on a score, i.e. small size accidentals between parentheses. This done by preceding the name of the accidental keyword by a `normalshapemediumseries`, e.g. by coding `normalshapemediumseries`

`normalshapemediumseriesnormalshapemediumseries\cflp` to get a cautionary flat. Available cautionary accidentals are `normalshapemediumseriesnormalshapemediumseries\csh`, `normalshapemediumseriesnormalshapemediumseries\cfl`, `normalshapemediumseriesnormalshapemediumseries\cna`, `normalshapemediumseriesnormalshapemediumseries\cdf` and `normalshapemediumseriesnormalshapemediumseries\cdsh`, which give:

Since cautionary accidentals are wider than normal ones, it might be useful to insert some spacing before them, either using `normalshapemediumseriesnormalshapemediumseries\temp` or a `normalshapemediumseriesnormalshapemediumseries\sk` within a `normalshapemediumseries\notes...normalshapemediumseries\enotes` group.

2.11 Transposition and octavation

An important feature is the existence of a special register `normalshapemediumseriesnormalshapemediumseries\transpose` the normal value of which is 0. If you say

```
normalshapemediumseries\transpose=3
```

all subsequent pitches specified by upper or lower case letters will be transposed 3 positions. If you set `normalshapemediumseriesnormalshapemediumseries\transpose` to 7 you may write your music one octave below its final pitch. Thus, you can define *octavation* macros like

```
normalshapemediumseries\defnormalshapemediumseries\
soqnormalshapemediumseries#1{normalshapemediumserie
s\zq{normalshapemediumseries#1}
{normalshapemediumseries\
transpose=7normalshapemediumseries\relax
```



```
normalshapemediumseries\
qu{normalshapemediumseries#1}}}
```

to build quarter note octaves in a single call. Note that the octaviated note is coded within braces so that the transposition is only local.

Octaviation can also be performed in is another way, namely unusing special codes to transpose by multiples of 7 intervals. For example `normalshapemediumseries\qu{'ab}` is equivalent to `normalshapemediumseries\qu{hi}` and `normalshapemediumseries\qu{`kl}` is equivalent to `normalshapemediumseries\qu{de}`. It should be emphasized here that the `normalshapemediumseries'` (*acute accent*) and the `normalshapemediumseries`` (*grave accent*) have cumulative effects, so that `normalshapemediumseries\"A'A}` is equivalent to `normalshapemediumseries\qu{ah}` and that the `normalshapemediumseries\transpose` parameter is only reset to its initial value (not necessarily zero) when changing staff or instrument (i.e. `normalshapemediumseriesnormalshapemediumseries|` or `normalshapemediumseries&`) or at `normalshapemediumseries\enotes`. Since this may be confusing, it is useful to use the `normalshapemediumseries!` prefix to reset the `normalshapemediumseries\transpose` register explicitly to the value it had when entering `normalshapemediumseries\notes`¹⁰. Thus `normalshapemediumseries\qu{!a'a}` always gives the note `normalshapemediumseries` and its upper octave `normalshapemediumseries` *shifted by the value of normalshapemediumseries\transpose at the beginning of the current normalshapemediumseries\notes...normalshapemediumseries\enotes group* (or `normalshapemediumseries\Notes...normalshapemediumseries\enotes`, etc.) whatever the number of previous grave and acute accents occurring inbetween.

The above processes indeed change the vertical position of the note heads and associated symbols (note stems, accents and beams) but they do not take care of the necessary changes of accidentals when transposing, i.e. the fact that an *F*♯ occurring with a zero signature should become a *B*♯ when transposing from the tonality of *C* major to *F* major where the normal *B* is the *B*♭. Since the intent of the composer is not obvious – he may want to shift a group of notes within the same tonality or conversely to transpose it in another tonality – this is not done automatically. Thus the `normalshapemediumseriesnormalshapemediumseries\sh`, `normalshapemediumseriesnormalshapemediumseries\fl`, `normalshapemediumseriesnormalshapemediumseries\na`,

¹⁰ This value is saved in another register named

```
normalshapemediumseriesnormalshapemediumseries\
normaltranspose.
```

normalshapemediumseriesnormalshapemediumseries\dsh and
normalshapemediumseriesnormalshapemediumseries\df1 symbols
are not affected by a change of the
normalshapemediumseriesnormalshapemediumseries\transpose
register.

But the composer/typesetter may ask MusicT_EX to do that work. In this
case, he should code
normalshapemediumseriesnormalshapemediumseries\Sh,
normalshapemediumseriesnormalshapemediumseries\F1,
normalshapemediumseriesnormalshapemediumseries\Na,
normalshapemediumseriesnormalshapemediumseries\dSh and
normalshapemediumseriesnormalshapemediumseries\df1 (or
normalshapemediumseriesnormalshapemediumseries\bigSh,
normalshapemediumseriesnormalshapemediumseries\bigF1,
normalshapemediumseriesnormalshapemediumseries\bigNa,
normalshapemediumseriesnormalshapemediumseries\bigdSh and
normalshapemediumseriesnormalshapemediumseries\bigdF1 or
normalshapemediumseriesnormalshapemediumseries\smallSh,
normalshapemediumseriesnormalshapemediumseries\smallF1,
normalshapemediumseriesnormalshapemediumseries\smallNa,
normalshapemediumseriesnormalshapemediumseries\smalldSh,
normalshapemediumseriesnormalshapemediumseries\smalldF1,
normalshapemediumseriesnormalshapemediumseries\cSh,
normalshapemediumseriesnormalshapemediumseries\cF1,
normalshapemediumseriesnormalshapemediumseries\cNa,
normalshapemediumseriesnormalshapemediumseries\cdSh and
normalshapemediumseriesnormalshapemediumseries\cdF1) instead
of the usual lower case accidental symbols. The symbol
normalshapemediumseriesnormalshapemediumseries\Sh (resp.
normalshapemediumseriesnormalshapemediumseries\bigSh and
normalshapemediumseriesnormalshapemediumseries\smallSh)
means that the corresponding pitch has to be raised by *one half pitch* with
respect to its normal value *according to the current signature*. Thus
normalshapemediumseries\Sh b means a *B♯* if the signature is zero or
positive, and a *B♭* if it is negative. The same logic applies for all accidentals
having an upper case forelast letter.

Obviously, the computation is done after taking account of the value of
the normalshapemediumseriesnormalshapemediumseries\
transpose register.

The compact codes normalshapemediumseries^,
normalshapemediumseries_, normalshapemediumseries= are normally not

affected by transposition and signatures, but their behaviour can be changed by saying `normalshapemediumseriesnormalshapemediumseries\relativeaccidentals` and `reset` by `normalshapemediumseriesnormalshapemediumseries\absoluteaccidentals` (the default situation).

Although *relative accidental coding* is an easy and safe way of coding *transposable* scores, care should be exercised in getting rid of the habit of saying `normalshapemediumseries\na b` to rise the pitch of a *B* when the tonality is *F* major (i.e. with `normalshapemediumseriesnormalshapemediumseriesnormalshapemediumseries\normalshapemediumseries\normalshapemediumseries\signn=-1` or `normalshapemediumseriesnormalshapemediumseriesnormalshapemediumseries\generalsignature{-1}`). An example of sophisticated transposition is given in the score `normalshapemediumseries.tex` (which `normalshapemediumseries\inputs normalshapemediumseries.tex`). It should be noted that *relative accidental coding* is compatible with *cautionary accidental coding*: in this case, one should code `normalshapemediumseriesnormalshapemediumseries\cNa`, `normalshapemediumseriesnormalshapemediumseries\cSh`, `normalshapemediumseriesnormalshapemediumseries\cFl`, `normalshapemediumseriesnormalshapemediumseries\cdSh`, `normalshapemediumseriesnormalshapemediumseries\cdFl` respectively.

Besides, the typical piano octave transposition δ - - - - can be obtained by coding:

```
normalshapemediumseriesnormalshapemediumseries\octfin p
n
```

which puts the δ and dotted line symbols at the pitch *p* (usually `normalshapemediumseries` to `normalshapemediumseries`). The length is *n* `normalshapemediumseriesnormalshapemediumseries\noteskip`.

This obviously fit for short octavation denotations. To transpose a whole line, use `normalshapemediumseriesnormalshapemediumseries\octline p`. Since

`normalshapemediumseriesnormalshapemediumseries\octfin` terminates with a small hook down, to indicate clearly where octavation stops, you may also like to use `normalshapemediumseriesnormalshapemediumseries\octsup` which behaves like `normalshapemediumseriesnormalshapemediumseries\octfin` without the final hook. All this supposes you have an idea of the actual line breaking of your score in that section, and this is admittedly difficult to handle when octave transposition is supposed to long a large number of lines. In that latter case, you can use the

`normalshapemediumseries\def`
`normalshapemediumseriesnormalshapemediumseries\`
`everystaff{...}` to insert whatever code you like at each new line of score. This has been used to set octavation in the score of the *Toccata in F* by Charles-Marie WIDOR¹¹: at each bar (or virtual bar, namely `normalshapemediumseriesnormalshapemediumseries\zbarre`), the `normalshapemediumseries\everystaff` procedure is updated to produce the convenient code, in case of the line breaking happening before the next definition.

2.12 Ties and slurs

They have been implemented in a way which may look rather ugly, but we think it is the only way of implementing *in one pass* ties and slurs which run *across glue*.

Slurs and ties must be initiated within the pair `normalshapemediumseries\notes...normalshapemediumseries\notes` before the spacing note is coded. They must be terminated also before the last note is coded.

¹¹ A French organist (1844-1937) and composer who was in charge of the organ of St-Sulpice in Paris, from 1864 to 1934.

normalshapemediumseriesnormalshapemediu
mseries\itenu *np* (*ten* stands for the Italian
word *tenuto*) initiates an upper tie (convex) at pitch *p*.
Just like beams, ties have a reference number *n*, from
0 to 6 (or 9 if normalshapemediumseries is included).
normalshapemediumseriesnormalshapemediums
eries\itenl *np* initiates a lower tie (concave).
The tie of reference number *n* is terminated by
normalshapemediumseriesnormalshapemediums
eries\tten *n*. Slurs are initiated with
normalshapemediumseriesnormalshapemediums
eries\ilegu *np* and
normalshapemediumseriesnormalshapemediums
eries\ilegl *np*, where *leg* stands for the Italian
word *legato*, and they are terminated with
normalshapemediumseriesnormalshapemediums
eries\tleg *n*. Except that slurs start before the
note position and stop after, ties and slurs work the
same way with the same syntax. They also share the
same registers so that slurs nesting tied notes should
have numbers *n* distinct from each other. **2.12.1**

Standard and nicer slurs

Since version 4.7, beginnings and ends of slurs are produced using a special font (normalshapemediumseries16 or normalshapemediumseries20) rather than using T_EX bracing tokens from normalshapemediumseries10. Thus the bending of slurs is now nicer and, moreover, several slur sizes are available. For example:

has been coded using
normalshapemediumseriesnormalshapemediumseries\
Ilegu rather than
normalshapemediumseriesnormalshapemediumseries\ilegu (resp.

using `normalshapemediumseriesnormalshapemediumseries\Ilegl` rather than `normalshapemediumseriesnormalshapemediumseries\ilegl` if a lower slur is wanted), namely:

```
\NOTes\Ilegu01\qu g\enotes
\NOTes\qu h\enotes
\NOTes\ql i\enotes
\NOTes\tleg0\ql j\enotes
```

It should to be noted that, as a standard, *ties* still use the T_EX bracing symbols; this is mainly done to avoid visibility problems with ties occurring in the middle of staves, i.e. in a situation where tie lines could overlap and be confused with staff lines. But the MusicT_EX user can request using special fonts by coding `normalshapemediumseriesnormalshapemediumseries\Itenu` or `normalshapemediumseriesnormalshapemediumseries\Itenl` instead of `normalshapemediumseriesnormalshapemediumseries\itenu` or `normalshapemediumseriesnormalshapemediumseries\itenl`. Even more, big symbol ties are available using `normalshapemediumseriesnormalshapemediumseries\ITenu` or `normalshapemediumseriesnormalshapemediumseries\ITenl`.

As a standard, only two slur and tie symbol sizes are referred by MusicT_EX macros, but a quick look into `normalshapemediumseries.tex` show that these definitions explicitly refer to a character number of the slur font:

```
\def\ITenu#1{\selecttenu{#1}\I@tenu{70}}%
\def\Ilegu#1#2{\selecttenu{#1}{\advance\
locx@skip by -1.5\qn@width
\I@tenu{70}{#2}}}%
\def\Itenu#1{\selecttenu{#1}\I@tenu{66}}%
\def\ilegu#1#2{\selecttenu{#1}{\advance\
locx@skip by -1.5\qn@width
\I@tenu{66}{#2}}}%
```

Then the MusicT_EX user can, for his own special needs, define new macros using other character codes in the range 64–79, knowing that each character of this range is one point longer than the previous one.

2.12.2 Problem with large slur ends

Due to spacing problems, it may happen that the end of an slur overlaps the end of the horizontal rule. The easiest way of removing that slight trouble consists in replacing `\leg` or `\legl` with the more sophisticated commands :

```
\rlap{\qsk\tleg0}
```

which delays the position of the closing slur symbol by a space equal to the note head width.

2.12.3 Weird slurs and ties

In some special cases, usually in romantic music, one may want to invert the sense of a slur, linking for example a keyboard phrase beginning at the left hand and ending at the right hand. Thus, the slur of number n (a numeric value, not a roman numeral) can be inverted by

normalshapemediumseriesnormalshapemediu
mseries\Invertslur *n* Besides, for some good
reason, one may want to raise a slur at the next
line. This is done by \def\
atnextline{ **normalshapemediumseries**norma
lshapemediumseries\liftslur *n*{
dimension }} which will lift the slur number *n* by
the given amount at the next line change. Of
course,
normalshapemediumseriesnormalshapemediu
mseries\liftslur could be called in the
middle of a line, but the result would be rather
ugly. These two features are used at bars number
131–132 of examples normalshapemediumseries
PACIFIQB and normalshapemediumseries.2.12.4
Refined slurs for clever typesetters

In addition to the previous extension and improvement of existing features, long nice horizontal slurs are also available, but they can be used only with two restrictions:

- They are not managed when *glue* is inserted, especially by
normalshapemediumseriesnormalshapemediumseries\
temp and
normalshapemediumseriesnormalshapemediumseries\barre;
- They cannot be cut at line breaking.

Thus, their use is recommended only for nice slurs extending a few bars and not supposed to occur across lines. With this restrictions,

has been obtained by coding:

```
\NOTes\zcharnote 1{\huslur{3.5\noteskip}}\qu  

g\notes  

\NOTes\qu h\notes  

\NOTes\ql i\notes
```


`\NOTes\ql j\enotes`

However, the best solution is now to use MusiX_TE_X which systematically makes beautiful slurs, at the cost of a three pass system instead of one...

2.13 Bars

2.13.1 Bars and spacing

Ordinary *bars* are coded using the macro `normalshapemediumseriesnormalshapemediumseries\barre` (this is a French word¹²). This macro provides an optional (discretionary) line or page break¹³. It also provides some *glue* in order to expand the text over an evenly filled line.

However, since the number of bars in a score line is generally small, it may be convenient to allow *glue* not only on each sides of *bars*. This can be done using the macro `normalshapemediumseriesnormalshapemediumseries\temps` (the French word for *beat*). This macro has two effects:

1. it inserts some *glue* but prevents line breaking¹⁴,
2. if some ties or slurs are pending it expands them across the glue by writing an `normalshapemediumseriesnormalshapemediumseries\hrule` which overlaps the unfinished tie and makes it look prolonged.

Whatever the care you exercise in adjusting the size of the `normalshapemediumseriesnormalshapemediumseries\elemskip`, you are still likely to find some broken ties (which indicate excessive glue disassembling the gliding tie `normalshapemediumseriesnormalshapemediumseries\hrules`) or

¹² Whose advantage is that it differs from `normalshapemediumseries\bar` which is already defined in T_EX.

¹³ Unless it is triggered according to bar counting when `normalshapemediumseriesnormalshapemediumseries\autolines` has been invoked.

¹⁴ This could unpleasantly occur if you insert a space...

some unexpected (and unwanted) line breaks or some `Over[aw]full` `normalshapemediumseriesnormalshapemediumseries\hboxes`. A useful means of estimating the remaining space to be filled with glue consists in declaring `normalshapemediumseriesnormalshapemediumseries\raggedlinestrue:` after that, an `normalshapemediumseriesnormalshapemediumseries\hfil` will be inserted by `MusicTEX` before each computed (when using `normalshapemediumseriesnormalshapemediumseries\autolines`) or forced line break. Thus, all the musical text will be packed on the left of the line and you will clearly see the amount of remaining space. Then, it will be up to you to decide changing some spacing parameters.

Important: *do not use `normalshapemediumseriesnormalshapemediumseries\temps` when beams are pending, otherwise their spatial synchronization would fail. In other words, ties and slurs can jump over glue (because horizontal rules may overlap and thus have some elasticity) but beams (as well as any oblique lines) cannot.*

2.13.2 Bar numbering

Unless otherwise specified, bars are numbered. This is a good means of finding errors provided that the `MusicTEX` user has put comments in his source text recording the (expected) bar number. However, this can look unpleasant for final outputs, since the habit is to number bars only each other five or ten bars. This is not a serious problem since the frequency of bar numbering is defined as:

```
normalshapemediumseries\def
normalshapemediumseriesnormalshapemediumseries\
freqbarno{1}
```

If you replace the `normalshapemediumseries1` by `normalshapemediumseries5`, bar numbering will occur each other five bars. You can also inhibit any bar number printing by telling:

```
normalshapemediumseries\defnormalshapemediumseries\
wbarno{ }
```

or, in a more clever way:

```
normalshapemediumseries\defnormalshapemediumseries\
freqbarno{9999}.
```

The bar counter is also accessible, its name is `normalshapemediumseriesnormalshapemediumseries\barno`. This has nothing to do with the bar counting invoked by

`normalshapemediumseriesnormalshapemediumseries\autolines`,
so you can change it without any dramatic consequence.

2.13.3 Full and instrument divided bars

Normally, bars (as well as double bars, final bars and repeat bars) are drawn as a continuous line, starting for the bottom of the lower staff of the lower instrument, and ending at the top of the upper staff of the upper instrument. However, one may want to have discontinuous bars, that is, one continuous bar for all the staves of a unique instrument. This is done by issuing the command `normalshapemediumseriesnormalshapemediumseries\sepbarrules`. An example of this is given in the `normalshapemediumseries` (or `normalshapemediumseries`) example; it has also been used in the example of section .

The initial situation can be forced or restored by `normalshapemediumseriesnormalshapemediumseries\stdbarrules`.

2.14 Line and page breaking

Bars provide a line breaking mechanism which is supposed to enable T_EX to break a full score into lines and pages, with an optimal distribution of the text into lines and pages. Unfortunately, this does not work correctly for scores of more than approximately one page. The reason is that T_EX must compile the entire contents of a paragraph, before it tries to break it into lines and pages. Therefore, one cannot rely on T_EX to make that work which automatically results in the diagnostic `normalshapemediumseries capacity exceeded, memory...`

To circumvent this dramatically restrictive capacity¹⁵ unless you use some BigT_EX¹⁶ another mechanism must be invoked to break lines.

The first one is the manual one: you replace some of the `normalshapemediumseries\barre` macro calls by either `normalshapemediumseriesnormalshapemediumseries\alaligne` (equivalent to `normalshapemediumseriesnormalshapemediumseries\break within text: in fact it contains a normalshapemediumseriesnormalshapemediumseries\break plus`

¹⁵ T_EX has been designed to type text, not music.

¹⁶ Whose drawback is that it is very slow on ordinary PCs.

some (many) other things). In the same way, you can code `normalshapemediumseries\alapage` to force an `normalshapemediumseriesnormalshapemediumseries\eject` with proper reinitialization of staves, clefs and signatures.

The second one is fit for scores with bars of regular length: after `normalshapemediumseriesnormalshapemediumseries\debutmorceau`, you code the following macro:

```
normalshapemediumseries\autolines tml
```

where *t* is the number of *elementary spacings* (the length of `normalshapemediumseries\notes...normalshapemediumseries\enotes`) in an average bar, *m* is the number of bars you wish in a line and *l* is the number of lines you wish in a page¹⁷.

This sets some parameters, namely `normalshapemediumseriesnormalshapemediumseries\maxbarsinline` and `normalshapemediumseriesnormalshapemediumseries\maxlinesinpage` which are simply used to count the bars, optionally perform `normalshapemediumseriesnormalshapemediumseries\alaligne` or `normalshapemediumseriesnormalshapemediumseries\alapage` instead of the `normalshapemediumseriesnormalshapemediumseries\barre`. You may freely alter the values of these parameters, once they have been established by `normalshapemediumseriesnormalshapemediumseries\autolines`. Moreover, you can still force line breaking of page ejection using `normalshapemediumseries\alaligne` or `normalshapemediumseriesnormalshapemediumseries\alapage` without problem since these macros actually reset the bar counters appropriately.

On the other hand, you may want to forbid line breaking at a bar, then you replace `normalshapemediumseries\barre` by `normalshapemediumseriesnormalshapemediumseries\xbarre`.

Conversely, you may want to break a line *not at a bar*¹⁸. This is allowed by `normalshapemediumseriesnormalshapemediumseries\zbarre`

¹⁷ After having coded nearly one hundred of pages of music, I strongly recommend the use of `normalshapemediumseriesnormalshapemediumseries\autolines` except when inserting short excerpts of less than one line, such as in musicographic books.

(optional line break) or forced by `normalshapemediumseries\zalaligne` or `normalshapemediumseriesnormalshapemediumseries\zalapage`.

The final heavy double bar of a piece is provided by `normalshapemediumseriesnormalshapemediumseries\finmorceau`. If you just want to terminate the text with a simple bar, you say `normalshapemediumseriesnormalshapemediumseries\suspmorceau`. If you want to terminate it without a bar, you code `normalshapemediumseriesnormalshapemediumseries\zsuspmorceau`. Once you have stopped the score by any of these means, you can restart it using `normalshapemediumseriesnormalshapemediumseries\reprmorceau`.

However, using `normalshapemediumseries\reprmorceau` after a `normalshapemediumseries\finmorceau` may have a little drawback: if `normalshapemediumseries\finmorceau` occurs at the bottom of a page defined by `normalshapemediumseriesnormalshapemediumseries\autolines`, it does not cause a page break which could lead to an empty page after the end of the piece but, conversely, this might cause another trouble if this only was the end of a score part, not the end of the whole score. Therefore, an alternate command has been provided, namely `normalshapemediumseriesnormalshapemediumseries\Suspmorceau` which duly performs the page break, in order to be ready to score another part of a complex piece. Thus, as a rule :

- use `normalshapemediumseriesnormalshapemediumseries\finmorceau` at the very end of your score,
- use `normalshapemediumseriesnormalshapemediumseries\Suspmorceau` at the end of the parts of a complex piece.

If you want the next vertical bar to be a double bar, you have to declare `normalshapemediumseriesnormalshapemediumseries\setdoublebar` before the `normalshapemediumseriesnormalshapemediumseries\barre` (or the `normalshapemediumseriesnormalshapemediumseries\suspmorceau` or `normalshapemediumseriesnormalshapemediumseries\alaligne` or `normalshapemediumseriesnormalshapemediumseries\alapage`) to be marked with a double thin bar.

18 For example, you may prefer to turn the page at a place where the pianist has one hand free.

2.15 Changing score attributes

As seen before, you can change the signature of the whole set of instruments by `normalshapemediumseriesnormalshapemediumseries\generalsignature n` where $n > 0$ means a number of sharps, $n < 0$ means a number of flats. Or, you may prefer to change the signature of only one or two instruments by the statement:

```
normalshapemediumseries\signr=s
```

where r is the roman numeral of the instrument considered, and s its specific signature. Since you may change simultaneously (with respect to the score) but consecutively (with respect to your code) the signatures of several instruments, this change takes place only when you say `normalshapemediumseriesnormalshapemediumseries\changesignature` (within a bar) or `normalshapemediumseriesnormalshapemediumseries\changecontext` (after a single vertical rule) or `normalshapemediumseriesnormalshapemediumseries\Changecontext` (after a double vertical rule). In the same way, you may want to change the active clefs. This is done by

```
normalshapemediumseries  
normalshapemediumseriesnormalshapemediumseries\  
cleftoks r={{s1}{s2}{s3}{s4}}%
```

where r is the roman numeral of the instrument, $s1$ specifies the clef of the lower staff, $s2$ the clef of the second staff, etc. One must always give four values with the above syntax, otherwise... $s1=6$ means the *bass* clef (clef de fa in French), $s1=0$ means the *violin* clef (clef de sol in French), $s1=1$ through $s1=5$ mean the *alto* clef (clef d'ut in French) set on first (lower) through fifth (upper line of the staff). As seen above in the case of signatures, several clefs may be changed at the same time; thus all the clef changes become operational only when the macro `normalshapemediumseriesnormalshapemediumseries\changeClefs` is coded. Normal usage consists in issuing this command before the bar, not after (this helps the music player when the change happens across a line break).

The `\changeClefs` command normally takes some horizontal space to put one or more clef symbols, but it may happen that you have no notes immediately before on the staff whose clef is changed. In that case, you can use `normalshapemediumseriesnormalshapemediumseries\zchangeClefs` which performs the same posting, overwritten left on the last part of the score in that staff. Of course it is your responsibility to ensure that no notes will collide with the clef change symbols.

Caution should be exercised changing clefs when *beams* are pending: in fact the `\changeClefs` and `\zchangeClefs` perturbate the computation of beams and this command should be invoked only

- out of `normalshapemediumseries\notes`, `normalshapemediumseries\Notes...` — `normalshapemediumseries\enotes pairs`;
- only when no beam is pending¹⁹.

If a clef change has to be typeset when one or several beams are pending, the operation should be done in a more manual way:

- say `normalshapemediumseriesnormalshapemediumseries\saveClefs` instead of `normalshapemediumseriesnormalshapemediumseries\changeClefs`: This actually records the `normalshapemediumseriesnormalshapemediumseries\cleftoks r` statement and no further `normalshapemediumseries\changeClefs` will repeat the clef change; the new clef will not be typeset by `\saveClefs` itself but rather by the next `\notes` or `\Notes` command;
- say `\charnote0{\smallclefdesol}` (resp. `\charnote0{\smallclefdefa}` or `\charnote0{\smallclefdut}`) where you like it and at the right staff (i.e. within `normalshapemediumseries\notes`, `normalshapemediumseries\Notes...` — `normalshapemediumseries\enotes pairs`) to type set the wanted clef symbol.

As an example, an excerpt of BRAHMS's Intermezzo op. 117,1 provided by Miguel FILGUEIRAS:

which was coded as:

```
\begin{music}
\def\nbinstruments{1}\relax
\def\freqbarno{9999}% no bar numbers
\nbporteesi=2\relax
\cleftoksi={6000}\generalsignature{-3}% 3 flats
\debutextrait
\normal
\off{1em}\temps\Notes\larpeggio{E}5\zq{EI}\qu{N}%
\charnote0{\smallclefdesol}\relax
```

¹⁹ No problem with slurs and ties.

```

\nextstaff\qsk\ib10e{-1}\zq{eg}\qb01\zq{d}\qb0k\
enotes
\cleftoksi={0000}\saveclefs\Notes\tbu0\zq{ce}\qh0j\
relax
\nextstaff\zq{sn}\cl{1}\enotes
\Notes\zq{be}\qu{i}\nextstaff\zq{sn}\ql{1}\enotes
\cleftoksi={6000}\changeClefs\Notes\zq{E}\cu{I}\
relax
\nextstaff\ibbulh{-1}\zq{ae}\qh1h\tbu1\zq{N}\qh1g\
enotes
\finextraIt
\end{music}

```

Meter changes are implemented the same way:

```
normalshapemediumseries\metertoks r={ {m1} {m2} {m3} {m4} }%
```

where *r* is the roman numeral of the instrument, *m1* specifies the meter of the lower staff, *m2* the meter of the second staff, etc. One must always give four values with the above syntax, otherwise... Since meter changes are meaningful only across bars, they are actually taken in account with `normalshapemediumseriesnormalshapemediumseries\changecontext` or `normalshapemediumseriesnormalshapemediumseries\Changecontext` or `normalshapemediumseriesnormalshapemediumseries\alaligne` or `normalshapemediumseriesnormalshapemediumseries\alapage`.

2.16 Repeats

To insert a *repeat bar* you can use several sets of procedures.

2.16.1 Elementary and unsafe solutions

The simplest consists in using the commands `normalshapemediumseriesnormalshapemediumseries\leftrepeatsymbol`, `normalshapemediumseriesnormalshapemediumseries\rightrepeatsymbol` and `normalshapemediumseriesnormalshapemediumseries\leftrightherepeatsymbol` – coded outside the `normalshapemediumseries\notes...normalshapemediumseries\enotes` pairs – which will simply insert these colon adorned double bars at the requested place. For example:

has been coded as:

```
\notes\hu g\enotes
\leftrepeatsymbol
\notes\hu h\enotes
\leftrightherepeatsymbol
\notes\hu i\enotes
\rightrepeatsymbol
\Notes\wh j\enotes
```

However, the previous way of coding does not provide for line breaking at repeat bars, nor does it advance the bar numbering. In fact, this way of coding if only fit for repeats occurring in the middle of a bar.

A second way of coding consists in saying
normalshapemediumseriesnormalshapemediumseries\
setleftrepeat,
normalshapemediumseriesnormalshapemediumseries\
setrightrepeat or
normalshapemediumseriesnormalshapemediumseries\
setleftrightherepeat before a bar
(normalshapemediumseriesnormalshapemediumseries\barre),
normalshapemediumseriesnormalshapemediumseries\
susporceau or
normalshapemediumseriesnormalshapemediumseries\
changecontext). In this case, the next single²⁰ vertical bar will be
replaced with the selected repeat bar. This meets the traditional music
typesetting conventions in the only case of the *right repeat* but, unfortunately,
left and left/right repeats use to behave in a different manner when in the
middle of a line and at a line break.

20 normalshapemediumseriesnormalshapemediumseries\
setrightrepeat does not change the effect of
normalshapemediumseriesnormalshapemediumseries\
finorceau; in that case use
normalshapemediumseriesnormalshapemediumseries\
finrightrepeat.

2.16.2 Safe and correct coding

The third coding, namely the correct coding – i.e. transforming in the correct manner when occurring at a line break – is obtained by substituting the `normalshapemediumseriesnormalshapemediumseries\barre` command with `normalshapemediumseriesnormalshapemediumseries\leftrepeat`, `normalshapemediumseriesnormalshapemediumseries\rightrepeat` and `normalshapemediumseriesnormalshapemediumseries\leftrightrepeat`.

Now, if you want to force a new line at a repeat, you should code respectively:

```
normalshapemediumseriesnormalshapemediumseries\  
setrightrepeat  
normalshapemediumseriesnormalshapemediumseries\  
alaligne  
normalshapemediumseriesnormalshapemediumseries\  
setrightrepeat  
normalshapemediumseriesnormalshapemediumseries\  
suspmorceau  
normalshapemediumseries\  
alaligne  
normalshapemediumseriesnormalshapemediumseries\  
leftrepeatsymbol  
normalshapemediumseriesnormalshapemediumseries\  
reprmorceau  
normalshapemediumseriesnormalshapemediumseries\  
leftrepeatsymbol  
normalshapemediumseriesnormalshapemediumseries\  
debutmorceau  
normalshapemediumseriesnormalshapemediumseries\  
leftrepeatsymbol
```

or the combination of two of these in the case of a left/right repeat.

2.16.3 Specific first and second pass scoring

A frequent situation consists in a long repeated score, but the last few bars are different at first pass and at second pass. This can be specified by saying `normalshapemediumseriesnormalshapemediumseries\setprimavolta` or `normalshapemediumseriesnormalshapemediumseries\`

`setsecondavolta`²¹ before the next `normalshapemediumseries` or `repeat` (usually `normalshapemediumseries\rightrepeatsymbol`). For example :

has been coded as:

```

\def\nbinstruments{1}
\generalsignature{0}\savesignature
\nbporteesi=1\cleftoksi={{0}{0}{0}{0}}\
relax
\debutextrait\normal
\Notes\qu {ghij}\enotes
\setprimavolta\barre
\Notes\qu {hijk}\enotes
\setsecondavolta\setrightrepeat\barre
\Notes\qu {ijkl}\enotes
\barre
\NOTes\wh j\enotes
\finextrait

```

The “prima volta” and “seconda volta” symbols are normally set at `normalshapemediumseries` `2normalshapemediumseries\Interligne` above the upper line of the staff, and one centimeter wide. If the music typesetter does not like that, he can issue for example:

```

normalshapemediumseriesnormalshapemediumseries\
Setprimavolta{4\Interligne}{0.78in}

```

where the first argument is the vertical offset, and the second one is the length of the upper horizontal line. A symmetrical feature is `normalshapemediumseriesnormalshapemediumseries\Setsecondavolta` with also two dimension arguments.

Note that these special settings are only valid for one usage; after that, they are reset to the standard values.

²¹ From the Italian *prima volta* meaning “first time”, and *seconda volta* meaning “second time”.

2.16.4 Large scope repeats

Large scope repeats have also been provided special symbols, namely using `normalshapemediumseriesnormalshapemediumseries\coda` and `normalshapemediumseriesnormalshapemediumseries\segno`:

which have been coded:

```
\NOTes\coda 1\enotes  
\NOTes\segno 1\enotes
```

2.17 Miscellaneous

2.17.1 Putting anything anywhere

Special macros are provided to help the composer to set any T_EX text on the staves. The macro

normalshapemediumseriesnormalshapemediu
mseries\
charnote **pnormalshapemediumseries**{text }
sets the given text with its base line at pitch p of the
current staff (this means it must be coded inside
normalshapemediumseries\
notes...normalshapemediumseries\
enotes). Whatever the length of the text, the
spacing is
normalshapemediumseriesnormalshapemediums
eries\noteskip. If you do not want it to cause
spacing, you code
normalshapemediumseriesnormalshapemediums
eries\zcharnote. If you want the possible
spilling text to expand on the left rather than on the
right, then you can use
normalshapemediumseriesnormalshapemediums
eries\lcharnote. To place some text at the
mid-position between the two staves of a keyboard
instrument, you may code:normalshapemediumseries
normalshapemediumseriesnormalshapem
ediumseries\midtwotext{text } %
(spacing)normalshapemediumseries
normalshapemediumseriesnormalshapem
ediumseries\zmidtwotext{text } % (non
spacing)being however careful, a) to put it inside
normalshapemediumseries\
notes...normalshapemediumseries\
enotes, b) to code it in the text of the lower staff.A
text to be put above the current staff is introduced by

`normalshapemediumseries`
`normalshapemediumseriesnormalshapemediumseries\upertext{...}`. This may however cause some collision with bar numbering or notes above the staff; it is then wise to use `normalshapemediumseriesnormalshapemediumseries\Upertext{...}` which puts the text two pitches higher (recommended to post the tempo). The macro `normalshapemediumseriesnormalshapemediumseries\zcharnote` is fit for coding special notations like accents above or below the notes. It behaves like `normalshapemediumseriesnormalshapemediumseries\charnote` but causes no spacing. **2.17.2**

Metronomic indications

Metronomic indication deserves a special macro. The mention:

60

is coded by `normalshapemediumseriesnormalshapemediumseries\metron{normalshapemediumseries\hup}{60}` (normally embedded in `normalshapemediumseriesnormalshapemediumseries\Upertext` which is in turn embedded within `normalshapemediumseries\notes...normalshapemediumseries\enotes`).

2.17.3 Usual ornaments

Arpeggios (i.e. -4pt“) can be coded with the macro

`normalshapemediumseriesnormalshapemediumseries\arpeggio pm`

where p is the pitch of the base of the arpeggio symbol and m is its multiplicity (one period is equal to one space between staff lines, i.e. 5 points). This macro causes a space of one note head width. It should be issued before the concerned chords. Its variant

`normalshapemediumseriesnormalshapemediumseries\larpeggio` sets the arpeggio symbol slightly more on the left, in order to avoid collision with accidentals in front of the chords.

Note the `normalshapemediumseriesnormalshapemediumseries\arpeggio` and `normalshapemediumseriesnormalshapemediumseries\larpeggio` make an extra spacing of width one notehead (i.e; `normalshapemediumseriesnormalshapemediumseries\qsk`) so that it is wise to insert a `normalshapemediumseries\qsk` in the other staves before notes which are synchrononous to the arpeggiated note.

Trills can be coded in several ways. `normalshapemediumseriesnormalshapemediumseries\trille l` (where *l* is a T_EX dimension) yields 1cm while `normalshapemediumseriesnormalshapemediumseries\Trille l` (where *l* is a T_EX dimension) yields 2cm. To put these patterns at a given pitch, one may use `normalshapemediumseriesnormalshapemediumseries\xtrille pl` or `normalshapemediumseriesnormalshapemediumseries\xTrille pl`. On the other hand `normalshapemediumseriesnormalshapemediumseries\ntrille pn` is equivalent to `normalshapemediumseriesnormalshapemediumseries\xtrille pnormalshapemediumseries{nnormalshapemediumseries\noteskip}` and `normalshapemediumseriesnormalshapemediumseries\nTrille pn` is equivalent to `normalshapemediumseriesnormalshapemediumseries\xTrille p{nnormalshapemediumseries\noteskip}`

Other *ornaments* are available:

- `normalshapemediumseriesnormalshapemediumseries\ mordant p` for to 1.5em0,
- `normalshapemediumseriesnormalshapemediumseries\ pince p` for to 1.5em0,
- `normalshapemediumseriesnormalshapemediumseries\ Pince p` for to 1.5em0,
- `normalshapemediumseriesnormalshapemediumseries\ Lpince p` for to 2em0 (thanks to A. EGLER),
- `normalshapemediumseriesnormalshapemediumseries\ Pincesw p` for to 2em0,

- `normalshapemediumseriesnormalshapemediumseries\
Pincene p` for to $2em_0$,
- `normalshapemediumseriesnormalshapemediumseries\
Pincenw p` for to $2em_0$,
- `normalshapemediumseriesnormalshapemediumseries\
turn p` for to $2.5em_0$,
- `normalshapemediumseriesnormalshapemediumseries\
backturn p` for to $2.5em_0$,
- `normalshapemediumseriesnormalshapemediumseries\
upz p` (upper *pizzicato*) to put a dot above a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
lpz p` (lower *pizzicato*) to put a dot below a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
usf p` (upper *sforzando*) to put a > accent above a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
lsf p` (lower *pizzicato*) to put a > accent below a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
ust p` (upper *staccato* or *portato*) to put a hyphen above a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
lst p` (lower *staccato* or *portato*) to put a hyphen below a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
uppz p` (upper strong *pizzicato*) to put an apostrophe above a note head at pitch p ,
- `normalshapemediumseriesnormalshapemediumseries\
lppz p` (lower strong *pizzicato*) to put a reversed apostrophe below a note head at pitch p .
- `normalshapemediumseriesnormalshapemediumseries\
pointdorgue p` puts a *fermata* (in French “point d’orgue”) at pitch p . No spacing occurs.
- `normalshapemediumseriesnormalshapemediumseries\
pointdurgue p` puts a reverse *fermata* at the same place.
- `normalshapemediumseriesnormalshapemediumseries\
PED` to insert the piano pedal command below the staff; pedal release is

specified by
`normalshapemediumseriesnormalshapemediumseries\DEP;`
 thus the following example

was coded as:

```
\temps\Notes\qsk\PED\wh J|\qsk\qu h\enotes
\temps\Notes|\qu g\enotes
\temps\Notes|\hu k\enotes
\temps\Notes\DEP\enotes
```

2.17.4 New line synchronization of coding

The `normalshapemediumseriesnormalshapemediumseries\everystaff` procedure named `normalshapemediumseriesnormalshapemediumseries\everystaff{...}` is executed each time a new system is typed. It is normally void, but it can be defined (simply by `normalshapemediumseries\defnormalshapemediumseriesnormalshapemediumseries\everystaff{...}`) to tell MusicT_EX to post anything reasonable at the beginning of each system. It was used in the example NWIDOR to post octavation dashed lines at the end of the piece.

The `normalshapemediumseriesnormalshapemediumseries\atnextline` procedure named `normalshapemediumseriesnormalshapemediumseries\atnextline`, normally void, is executed at the next computed (through `normalshapemediumseriesnormalshapemediumseries\autolines`) or forced line break (using `normalshapemediumseriesnormalshapemediumseries\alaligne` or `normalshapemediumseriesnormalshapemediumseries\alapage`). More precisely, it is executed after the break and before the next system is typed. Thus it is fit for posting new definitions of layout parameters, when no system is pending²².

In some scores, tenor parts are not code using the *bass* clef, but using rather the *violin clef* subscripted by a `normalshapemediumseries8`. This is not directly supported by the `normalshapemediumseriesnormalshapemediumseries\`

²² Its logic is similar to plain T_EX's

`normalshapemediumseriesnormalshapemediumseries\vadjust` command.

`\cleftoksnormalshapemediumseries=` command, but it can be handled using `\normalshapemediumseriesnormalshapemediumseries\everystaff` and `\normalshapemediumseriesnormalshapemediumseries\zcharnote`. As an example the following score

was coded as:

```

\def\nbinstruments{4}
\cleftoksi={6000}
\cleftoksii={0000}
\cleftoksiii={0000}
\cleftoksiv={0000}
\font\eightfig=cmr8
\def\everystaff{\znotes&\zcharnote{-6}}{\
eightfig
  \kern -1.4\Interligne 8}&\zcharnote{-6}}{\
eightfig
  \kern -1.4\Interligne 8}\enotes}
\debutextraitlet
\normal
\Notes\hu{HIJK}&\hu{efgh}&\hl{hijk}&\
hl{hmlk}\enotes
\finextraitlet

```

where the `\eightfig` font declaration can obviously be omitted if the T_EX format declares an 8 point roman font.

2.17.5 Beams across bars

The `\normalshapemediumseriesnormalshapemediumseries\barre` macro inserts glue and terminates spacing account. Thus it is not compatible with pending *beams* and this is the usual way most composers wrote their scores, at least until the beginning of the XIX-th century. Unfortunately, later composers (BRAHMS, SCRIBAN, etc.) wanted to write beams jumping across bars.

This can be partly handled by MusicT_EX, using the macro `normalshapemediumseriesnormalshapemediumseries\`
`xbeambarre`²³ which puts a bar line of global width `normalshapemediumseries\elemskip` with no glue around. Bar counting is done for `normalshapemediumseriesnormalshapemediumseries\`
`autolines` purpose but no line breaking can occur, which means that the beams going across line or page breaks are not supported.

We give an example from BRAHMS's Intermezzo op. 118,1 provided by Miguel FILGUEIRAS:

whose coding is:

```
\begin{music}
\def\interfacteur{13}
\def\nbinstruments{1}
\nbporteesi=2\relax
\cleftoksi={6000}
\generalmeter{\allabreve}
\debutextrait
\normal
\off{1em}\temps\Notes\qp\nextstaff\Ilegu0r\zq{q}\
ql{j}\enotes
\barre
\Notes\qsk\ibu0a1\qh0{CEJLcL}\relax
\nextstaff\qsk\rw{1}\pt{p}\zh{p}\pt{i}\hl{i}\
enotes
\Notes\qh0J\iten11a\qh0a\nextstaff\tleg0\zq{o}\
ql{h}\enotes
\xbeambarre
\Notes\zh{.L.a}\hl{.e}\relax
\nextstaff\tten1\qb0{chj}\tb10\qb01\cl{q}\ds\enotes
\Notes\qp\nextstaff\zq{q}\ql{j}\enotes
\finextrait
\end{music}
```

2.18 Small and tiny notes

Before entering details, let us point out that we are presently concerned with typing notes of smaller size than the normal one, without attempting to

²³ An ugly mixture of French and English which is therefore not likely to be redefined by somebody else.

change the interval between the five lines building a single staff. Changing staff line interval will be treated in a further section.

2.18.1 Cadenzas and explicit ornaments

Ornaments and *cadenzas* usually need to be written using smaller notes²⁴. This can be done everywhere by stating `normalshapemediumseriesnormalshapemediumseries\smallnotesize` or `normalshapemediumseriesnormalshapemediumseries\tinynotesize`. Normal note size is restored by `normalshapemediumseriesnormalshapemediumseries\normalnotesize`.

These macros only have a local scope. Thus, if these macros are invoked outside the `normalshapemediumseries\notes...normalshapemediumseries\enotes` pair, the change is valid for the rest of the piece unless explicitly modified but, if they are invoked inside, their effect is local to the current staff of the current `normalshapemediumseries\notes...normalshapemediumseries\enotes` pair. As an example, the following excerpt (beginning of the Aria of the “Creation” by Joseph HAYDN)

can be coded as:

```
\def\DS{\hbox{\ds}}
\def\FS{\hbox{\kern 0.3\noteskip\soupir}\kern -0.3\noteskip}
\def\qbl#1#2#3{\ibl{#1}{#2}{#3}\qb{#1}{#2}}%
\def\qbu#1#2#3{\ibu{#1}{#2}{#3}\qh{#1}{#2}}%
\def\nbinstruments{2}%
\generalmeter{\meterfrac{4}{4}}%
\signaturegenerale{0}%
\nbportesii=1\relax
\nbportesii=2\relax
\cleftoksi={{6}{0}{0}{0}}
\cleftoksii={{6}{0}{0}{0}}
\etroit
%
% end of preliminary definitions
%
\debutextrait
\NOTes\soupir&\soupir|\qu g\enotes
% mesure 1
```

²⁴ This is independent of the staff size.

```

\advance\barno by -1\relax
\barre\Notes\itenu2J\wh J&\zw N\ibl0c0\qb0e|\qu j\
enotes
\notes&\qb10c0|\noteskip=0.6\elemskip\tinyotesize
\Ibbulki2\qh1{kj}\tqhli\qsk\enotes
\Notes&\qb0e\tbl0\qb0c|\qu j\enotes
\temps\Notes&\ibl0c0\qb0{ece}\tbl0\qb0c|\ql l\sk\ql
j\enotes
% mesure 2
\barre\Notes\tten2\wh J&\ql J\sk\ql L|\ppt g\rlap{\
qu g}\qbl1e0\relax
      \zq c\qble\zq c\qble\relax
      \zq c\tbl1\rlap{\qble}\ \ \ccu h\enotes
\temps\Notes&\ql N\sk\pt L\ibl0L{-4}\qb0L|\ibl1e0\zq
c\rlap{\qble}\cu g\relax
      \zq c\rlap{\qble}\raise\Interligne\DS \
rlap{\qu g}\qblg\enotes
\notes&\sk\tbb10\tbl0\qb0J|\tbl1\zq c\qble\enotes
\finextrait

```

2.18.2 Grace notes

Grace notes are a special case of small and tiny notes: the difference is that they are always coded as eighth notes with an oblique bar over the flag. To perform this, special variants of `normalshapemediumseriesnormalshapemediumseries\cu` and `normalshapemediumseriesnormalshapemediumseries\cl` have been provided, namely `normalshapemediumseriesnormalshapemediumseries\grcu` and `normalshapemediumseriesnormalshapemediumseries\grcl`, with the only difference that the flag has been slashed. Using this together with the note reduction macro, grace notes (optionally chord grace notes) can be easily coded:

The previous example was coded as:

```

\Notes\qsk\hu h\enotes
\temps\smallnotesize
\notes\grcu j\enotes
\temps\normalnotesize
\Notes\hu i\enotes

```

```

\barre\tinynotesize
\notes\qsk\zq h\grcl j\enotes
\normalnotesize
\nOTES\wh i\enotes

```

2.18.3 Gregorian note shapes

Provided that four line staves are used, *gregorian music* was frequently quoted using specific *neumes*, and this way of coding has been commonly used for the coding of liturgical chant in the Catholic Church until the middle of the twentieth century. Symbols available in MusicT_EX are :

- Diamond shaped *punctum*: 2.5pt Γ =
normalshapemediumseriesnormalshapemediumseries\
diamg *p* ,
- Square *punctum*: 2.5pt Δ =
normalshapemediumseriesnormalshapemediumseries\
carrg *p* ,
- Left stemmed *virga*: 2.5pt Θ =
normalshapemediumseriesnormalshapemediumseries\
carpg *p* ,
- Right stemmed *virga*: 2.5pt Λ =
normalshapemediumseriesnormalshapemediumseries\
carqg *p* .

They all have a non-spacing variant, which are :

- Non spacing diamond shaped *punctum*: 2.5pt Γ =
normalshapemediumseriesnormalshapemediumseries\
zdiamg *p* ,
- Non spacing square *punctum*: 2.5pt Δ =
normalshapemediumseriesnormalshapemediumseries\
zcarrg *p* ,
- Non spacing left stemmed *virga*: 2.5pt Θ =
normalshapemediumseriesnormalshapemediumseries\
zcarpg *p* ,
- Non spacing right stemmed *virga*: 2.5pt Λ =
normalshapemediumseriesnormalshapemediumseries\
zcarqg *p* .

To memorize these symbols, remember that `carr` comes from the French word *carré* which means *square*, that the letter `p` has a tail on the left side and the `q` has a tail on the right side. Other *neumes* can be obtained by combining two or more of these symbols

2.18.4 Percussion stemless note shapes

Percussion music often uses stemless note heads different from the usual ones.

- White diamond or *rimshot*: `2.5pĩ = normalshapemediumseriesnormalshapemediumseries\diamw p`,
- The *shaker*: `2.5ptO = normalshapemediumseriesnormalshapemediumseries\shaker p`,
- The tremolo chord: `to 2emN = normalshapemediumseriesnormalshapemediumseries\tremolord p`,

They all have a non-spacing variant²⁵, which are :

- Non spacing white diamond or *rimshot*: `2.5pĩ = normalshapemediumseriesnormalshapemediumseries\zdiamw p`,
- Non spacing *shaker*: `2.5ptO = normalshapemediumseriesnormalshapemediumseries\zshaker p`,
- Non spacing tremolo chord: `to 2emN = normalshapemediumseriesnormalshapemediumseries\ztremolord p`,

2.18.5 Other note shapes

The classical note heads given above — namely `0.5ex!`, `0.5ex-` and `0.5ex#` — can be replaced with less classical note heads, for example to code special *violin harmonic notes* or *percussion music*. See an example in 2.23.2

²⁵ Stemless, not to be confused with `normalshapemediumseries\zq` qui extends stems within a chord. For that purpose, see 2.23.3 and 2.18.5.

At present time, alternate available note heads are :

- The $0.5ex\Gamma$ symbol which is obtained using the `\qu`, `\qh` etc. macros replacing the “q” letter in the macro name with a “y” or writing `normalshapemediumseriesnormalshapemediumseries\ycu`, `normalshapemediumseriesnormalshapemediumseries\ycl`, `normalshapemediumseriesnormalshapemediumseries\yccu`, `normalshapemediumseriesnormalshapemediumseries\ycup` etc. instead of `\cu`, `\cl`, `\ccu`, `\cup`, etc.
- The $0.5ex\text{diamond}$ symbol which is obtained using the `\qu`, `\qh` etc. macros replacing the “q” letter in the macro name with a “d” (think of *diamond*) or writing `normalshapemediumseriesnormalshapemediumseries\dcu`, `normalshapemediumseriesnormalshapemediumseries\dcl`, `normalshapemediumseriesnormalshapemediumseries\dccu`, `normalshapemediumseriesnormalshapemediumseries\dcup`, etc. instead of `\cu`, `\cl`, `\ccu`, `\cup`, etc.
- The $0.5ex'$ symbol which is obtained using the `\qu`, `\qh` etc. macros replacing the “q” letter in the macro name with a “k” or writing `normalshapemediumseriesnormalshapemediumseries\kcu`, `normalshapemediumseriesnormalshapemediumseries\kcl`, `normalshapemediumseriesnormalshapemediumseries\kccu`, `normalshapemediumseriesnormalshapemediumseries\kcup`, etc. instead of `\cu`, `\cl`, `\ccu`, `\cup`, etc.
- The $0.5ex5$ symbol which is obtained using the `\qu`, `\qh` etc. macros replacing the “q” letter in the macro name with a “x” or writing `normalshapemediumseriesnormalshapemediumseries\xcu`, `normalshapemediumseriesnormalshapemediumseries\xcl`, `normalshapemediumseriesnormalshapemediumseries\xccu`, `normalshapemediumseriesnormalshapemediumseries\xcup` instead of `\cu`, `\cl`, `\ccu`, `\cup`, etc.
- The $0.5ex\&$ symbol which is obtained using the `\qu`, `\qh` etc. macros replacing the “q” letter in the macro name with the pair “ox” or writing `normalshapemediumseriesnormalshapemediumseries\oxcu`, `normalshapemediumseriesnormalshapemediumseries\oxcl`, `normalshapemediumseriesnormalshapemediumseries\oxccu`, `normalshapemediumseriesnormalshapemediumseries\oxcup` instead of `\cu`, `\cl`, `\ccu`, `\cup`, etc.

2.19 Staff size

2.19.1 Moving from 20pt to 16pt general staff sizes and conversely

You also want to write some parts of your score in 20pt staff size and in 16pt staff size, namely for distinct parts of pieces. Changing the general staff size is done by saying:

```
normalshapemediumseries
normalshapemediumseriesnormalshapemediumseries\
musicsize=16normalshapemediumseries\computespecifics
or
normalshapemediumseries\musicsize=20
normalshapemediumseriesnormalshapemediumseries\
computespecifics
respectively.
```

2.19.2 Changing staff size for certain instruments

Regardless of the general choice of 16pt or 20pt staff sizes, it is now possible to assign certain instruments – not sperate staffs belonging to a same instrument – to have narrower staff size. This is done by giving a special definition of `normalshapemediumseriesnormalshapemediumseries\staffspacingr` where *r* is the roman numeral of the instrument considered. For example, if the second instrument (starting from the system bottom) is required to have 25% narrower staffs, one only hase to declare:

```
normalshapemediumseries\defnormalshapemediumseries\
staffspacingii{0.75}
```

before the starting command `normalshapemediumseries\debutmorceau`.

Not only does this statement change the vertical spacing between staff lines, but is also changes the size of the key, accidental and note symbols to fit the modified staff line spacing. However, the existence of discrete font scales for music symbol typing results in some reasonable restrictions of the values of `normalshapemediumseriesnormalshapemediumseries\staffspacingr`: recommended values are approximately 1, 0.8 and 0.64; if different values are chosen, then the symbol size is taken smaller than the line spacing, which may lead to readable but rather ugly typesetting.

As an example, we give two bars of the *Ave Maria* by Charles GOUNOD using the first prelude of Johann-Sebastian Bach's *Well Tempered Clavier* (transcription for organ, violin and voice, thanks to Markus VEITTES):

This example was coded as:

```

\def\nbinstruments{4}
\sepbarrules
\generalmeter{\meterC}\relax
\def\oct{\advance\transpose by 7\relax}
\def\staffspacingii{0.64}
\def\staffspacingiv{0.64}
\cleftoksi{{6}{0}{0}{0}}
\cleftoksii{{0}{0}{0}{0}}
\cleftoksiv{{0}{0}{0}{0}}
\nbporteesi=2\relax
\nbporteesiii=0\relax
%
\debutextrait
\normal\elemskip=0.02\hsize
%Takt 9
\Notes\zhl c\raise27pt\qs\qupp e|\ds&\oct
  \itenu5h\hl h&gra---&\itenl4h\hu h\enotes
\Notes|\ibbl0j3\qb0h\tqb0l\enotes
\Notes|\ibbl1k0\qb1o\qb1h\qb1l\tqb1o\enotes
\temps\Notes\zhl c\raise27pt\qs\qupp e|\ds&\oct
  \tten5\ibl4c0\qb4h&&\tten4\ibu5g{-3}\
qh5h\enotes
\Notes|\ibbl0j3\qb0h\tqb0l&\oct\qb4a&---&\
tqh5a\enotes
\Notes|\ibbl1k0\qb1o\qb1h&\oct\qb4b&ti-&\cu
b\enotes
\Notes|\qb1l\tqb1o&\oct\tqb4c&a&\cu c\enotes
\barre
%Takt 10
\Notes\zhl c\raise27pt\qs\qupp d|\ds&\oct
  \qlp d&ple---&\Ilegu4k\pt d\qu d\enotes

```

```

\Notes|\ibbulg3\bigaccid\qh1{^f}\tqh1h\
enotes
\Notes|\ibbu2i0\qh2k\qh2f\enotes
\Notes|\qh2h\tqh2k&\oct \cl e&&\tleg4\cu e\
enotes
\temps\Notes\zh1 c\raise27pt\qs\qupp d|\ds&\
oct
\ql d&na,&\qu d\enotes
\Notes|\ibbulg3\qh1f\tqh1h\enotes
\Notes|\ibbu2i0\qh2k\qh2f\qh2h\tqh2k&\qp&&\
qp\enotes

```

2.20 Layout parameters

Most layout parameters are set by MusicT_EX to reasonable default values. However, sophisticated scores²⁶ may need more place below the lowest staff, between staves, etc. We give below a short list of the most significant parameters.

2.20.1 List of layout parameters

REMARK : the mention “(NOT to be changed)” does not mean that this parameter cannot be changed, but that it should not be modified directly, e.g. by saying something like `normalshapemediumseries\interligne=14pt`. In other words, changing these parameters must be performed using more comprehensive macros which not only update them but also perform some other compulsory related changes.

normalshapemediumseries`normalshapemediumseries\interligne` : vertical interval between lines in a staff of the current instrument, taking account of a possible specification of `normalshapemediumseriesnormalshapemediumseries\staffspacingr` (see 2.19.2) (*NOT to be changed*)

normalshapemediumseries`normalshapemediumseries\Interligne` : vertical distance between the base of staff lines of the current instrument, taking account of a possible specification of `normalshapemediumseriesnormalshapemediumseries\staffspacingr`

²⁶ To our knowledge, the most complicated scores are those written for the piano, during the romantic and post-romantic periods.

(`normalshapemediumseriesnormalshapemediumseries\interligne` is the size of the blank space between lines; the difference between them is the line thickness
`normalshapemediumseriesnormalshapemediumseries\lthick`) (*NOT to be changed*).

normalshapemediumseriesnormalshapemediumseries\internote : the vertical spacing of contiguous notes of the current instrument, taking account of a possible specification of `normalshapemediumseriesnormalshapemediumseries\staffspacingr`, i.e. the half of `normalshapemediumseries\Interligne` (*NOT to be changed*)

normalshapemediumseriesnormalshapemediumseries\Internote : the vertical spacing of contiguous notes of the instrument(s) whose `normalshapemediumseriesnormalshapemediumseries\staffspacingr` has the *default value* of one (1.0). Since this dimension is the same, regardless of the actual value of the staff line spacing of any instrument, only this value should be used to specify horizontal spacings. It should be used rather than absolute dimensions in pt or mm, since `\Internote` is duly proportional to the general size (`normalshapemediumseriesnormalshapemediumseries\musicsize`) but not dependent on specific changes in `normalshapemediumseriesnormalshapemediumseries\staffspacingr` (*NOT to be changed*)

normalshapemediumseriesnormalshapemediumseries\nullthick : reserved height above base line for zero staff lines (text of songs)

normalshapemediumseriesnormalshapemediumseries\staffbotmarg : margin below the first staff of the lowest instrument. If not already assigned a non zero dimension, it is set to `normalshapemediumseriesnormalshapemediumseries\bottomfacteur`
`normalshapemediumseriesnormalshapemediumseries\Interligne` at the next system.

normalshapemediumseriesnormalshapemediumseries\stafftopmarg : margin above the upper staff of the upper instrument.

normalshapemediumseriesnormalshapemediumseries\interbeam : vertical distance between beams.

normalshapemediumseriesnormalshapemediumseries\
interportee : the distance between the bottom of one staff and the
bottom of the next one. It is set to 2
normalshapemediumseriesnormalshapemediumseries\
interfacteurnormalshapemediumseries\internote at the next
system.

normalshapemediumseriesnormalshapemediumseries\
Interportee : the distance between the top of one staff and the
bottom of the next one. Re-computed at the at the next system.

normalshapemediumseriesnormalshapemediumseries\
interinstrument : the additional vertical distance between two
different instruments. This means that the distance between the upper
staff of the previous instrument and the lowest line of the current
instrument is equal to
normalshapemediumseriesnormalshapemediumseries\
interportee+normalshapemediumseries\
interinstrument. This value is normally zero, but it helps putting
additional space between distinct instruments for the sake of clarity.
This is a general dimension which holds for each of the vertical spaces
between instruments, except the upper one, in which case this interval
is irrelevant. However, this parameter can be overridden for the space
above a specific instrument. For example (see the example
normalshapemediumseries.tex) one can state:

```
\def\interinstrumenti{5pt}
```

to force an additional spacing of 5 points above instrument *i*, whatever
the value of
normalshapemediumseriesnormalshapemediumseries\
interinstrument. This feature can usefully be used to have more
space before instruments representing *voices*, in order to have enough
place to put *lyrics* without assigning these lyrics a zero staff specific
instrument (useful to avoid having too many declared insruments in a
choir score).

normalshapemediumseriesnormalshapemediumseries\
systemheight : the distance from the bottom of the lowest staff to
the top of the highest staff of the upper instrument. This is the height of
the vertical bars (single, double, repeats, etc.) (*NOT to be changed*).

In addition, when handling notes of a given staff of a given instrument, the following dimensions are available (note these are not true registers, but *equivalenced symbols* through a `normalshapemediumseries\def`):

- `normalshapemediumseriesnormalshapemediumseries\altitude` : the altitude of the lowest line of the lowest staff of the current instrument (*NOT to be changed*).
- `normalshapemediumseriesnormalshapemediumseries\altportee` : the altitude of the lowest line of the current staff (*NOT to be changed*).
- `normalshapemediumseriesnormalshapemediumseries\stemfactor` : a parameter defining the size of half, quarter and hooked eighth notes stems. Normally a stem has the length of one octave, i.e. 3.5
`normalshapemediumseriesnormalshapemediumseries\Interligne`. However, this is not valid for small size notes and, therefore, the stem size is related to the
`normalshapemediumseriesnormalshapemediumseries\interbeam` dimensions which, in turn, is *normally* equal to 0.75
`normalshapemediumseriesnormalshapemediumseries\Interligne`. Thus the normal value of
`normalshapemediumseriesnormalshapemediumseries\stemfactor` is 4.66, but it can be shortened for any purpose by saying, for example:

```
\def\stemfactor{3.5}
```

Normal stem length is restored by calling the macro
`normalshapemediumseriesnormalshapemediumseries\normalstems`.

2.20.2 Changing layout parameters

Most of these values can be changed, but only between the end of the previous system and the beginning of the next one. This can be inserted between a `normalshapemediumseriesnormalshapemediumseries\suspmorceau` (or a `normalshapemediumseriesnormalshapemediumseries\finmorceau`) and a `normalshapemediumseriesnormalshapemediumseries\reprmorceau` (or a `normalshapemediumseriesnormalshapemediumseries\debutmorceau`), but it is wiser to say, for example:

```
\def\atnextline{\global\staffbotmarg=5\
Interligne}
```

When doing so, the MusicT_EX user should be aware that this could disturb pending *slurs* or *ties*, since the altitude of these is stored in an absolute way, starting from the baseline of the systems. Therefore, changing the `normalshapemediumseries` `normalshapemediumseries\staffbotmarg` dimension can also be made by means of `normalshapemediumseries` `normalshapemediumseries\advancebottom{<dimension>}` which updates all pending slur and tie altitudes by the given dimension. This has been used in `normalshapemediumseries` `pacifiqn` and `normalshapemediumseries`.

The user may prefer to redefine `normalshapemediumseries\def` `normalshapemediumseries` `normalshapemediumseries\bottomfacteur` or `normalshapemediumseries\def` `normalshapemediumseries` `normalshapemediumseries\interfacteur` to a given integer number, but this can be done only between a `normalshapemediumseries` `normalshapemediumseries\suspmorceau` (or a `normalshapemediumseries` `normalshapemediumseries\finmorceau`) and a `normalshapemediumseries` `normalshapemediumseries\reprmorceau` (or a `normalshapemediumseries` `normalshapemediumseries\debutmorceau`), but it is wiser to use `normalshapemediumseries` `normalshapemediumseries\atnextline` as previously.

It is also wise to use `normalshapemediumseries` `normalshapemediumseries\atnextline` to change the the number of instruments, the staff spacings, the number of staves at the next line... provided that the coding of the notes *resists* an unexpected line change executing the `normalshapemediumseries` `normalshapemediumseries\atnextline`.

In anycase it is a good idea to look at the procedures `normalshapemediumseries` `normalshapemediumseries\computewidths` and `normalshapemediumseries` `normalshapemediumseries\`

computespecifics to understand what they really compute, and also to find the places where they are actually invoked.

2.20.3 Changing the vertical distance between consecutive systems

If this has to be changed only once at the beginning of a piece, the simplest is to say

```
\def\bottomfacteur{8}
```

before invoking
normalshapemediumseriesnormalshapemediumseries\
debutmorceau. Note that
normalshapemediumseriesnormalshapemediumseries\
bottomfacteur is invoked to compute the dimension register
normalshapemediumseriesnormalshapemediumseries\
staffbotmarg whenever this register contains a zero dimension. The
number (it must be a number) is multiplied by
normalshapemediumseriesnormalshapemediumseries\
Interligne and affected to
normalshapemediumseriesnormalshapemediumseries\
staffbotmarg.

If this has to be changed several times to meet page layout requirements with scores sometimes – but only sometimes – going very deep below the lowest staff of the systems, it is wiser to use
normalshapemediumseriesnormalshapemediumseries\
advancebottom, namely:

```
\advancebottom{10pt}
```

to advance the bottom margin register by that dimension at the next system line break.

REMARK : it is also possible to change the system top margin, i.e.
normalshapemediumseriesnormalshapemediumseries\
advancebottom, namely:

`stafftopmargin` between systems. Changing top and bottom margin add together but it may influence the position of the whole in the pages.

2.20.4 Changing staff distance within systems

This can be done at the beginning by changing the definition of `normalshapemediumseriesnormalshapemediumseries\interfacteur` (it is `normalshapemediumseries\defined` to a number) before the `firstnormalshapemediumseriesnormalshapemediumseries\debutmorceau`. But it is also possible to give a new dimension to the `dimension` register `normalshapemediumseriesnormalshapemediumseries\interportee` and, optionally, to the `dimension` register `normalshapemediumseriesnormalshapemediumseries\interinstrument` (see above).

2.20.5 Changing the number of lines in staves

Unless explicitly specified, staves consist of five lines, in accordance to the normal way of coding music scores. However, two exceptions might be preferred when using MusicT_EX :

- *gregorian music* is often written using staff of four lines instead of five,
- *percussion music* (e.g. drums, triangle) only needs one line staves, since the pitch cannot change.

Therefore, since its version 5.00, MusicT_EX allows for choosing the number of lines of the staves of an instrument. This is done by defining the macro `normalshapemediumseriesnormalshapemediumseries\stafflinesnr` — where *r* is the roman numeral of the wanted instrument as usual — to be the number of lines of the specific staff. For example :

```
\def\stafflinesii{4}
```

will make the instrument number 2 (i.e. *ii*) to have staves of four lines, that is, fit for gregorian music.

2.20.6 Resetting normal layout parameters

Except `normalshapemediumseriesnormalshapemediumseries\musicsize` which has to be explicitly changed if needed, all layout registers are reset to default values by

`normalshapemediumseriesnormalshapemediumseries\`
`resetfacteurs` which `put zero dimensions into`
`normalshapemediumseriesnormalshapemediumseries\`
`staffbotmarg` and
`normalshapemediumseriesnormalshapemediumseries\`
`stafftopmarg,` so that the next
`normalshapemediumseriesnormalshapemediumseries\`
`debutmorceau` will recompute them, unless they have
 been given non zero dimensions inbetween.

2.20.7 Typesetting one-line excerpts rather than large scores

Very often, what is wanted is not to typeset a large comprehensive score of several lines and pages, but an excerpt of one or two bars, preferably centered such as the various examples of this manual. This can be done simply by replacing `normalshapemediumseriesnormalshapemediumseries\debutmorceau` with

`normalshapemediumseriesnormalshapemediumseries\`
`debutextrait27` and `normalshapemediumseries\finmorceau` or
`normalshapemediumseries\suspmorceau` with
`normalshapemediumseriesnormalshapemediumseries\finextrait.`

If you want to terminate it without a bar, you code `normalshapemediumseriesnormalshapemediumseries\zfinextrait` which acts like `normalshapemediumseries\zsuspmorceau..`

2.20.8 Lyrics

Lyrics can be introduced in two ways. The first one consists in dedicating one instrument whose `normalshapemediumseriesnormalshapemediumseries\nbportesr` is zero. Then the text of the lyrics is just inserted, note by note, by inserting it at the right position between `normalshapemediumseries\notes...normalshapemediumseries\enotes`. The drawback is that a four voice choir needs eight instruments which may lead to troubles if there is also an orchestra score below the voices.

²⁷ *Extrait* is the French word for *excerpt*.

Therefore, another solution consists in adjusting `normalshapemediumseriesnormalshapemediumseries\interinstrument` and `normalshapemediumseriesnormalshapemediumseries\staffbotmarg` to give more place below the song instruments²⁸. Then the texts of the lyrics are indicated with the song tune instrument, using `normalshapemediumseriesnormalshapemediumseries\zcharnote` with a negative numeric position value.

By the way, the `normalshapemediumseries\zcharnote` may have a `normalshapemediumseries\vbox` as a second argument, and this `normalshapemediumseriesnormalshapemediumseries\vbox` may contain several `normalshapemediumseries\hboxes` describing the text of the different couplets (see example `normalshapemediumseries`).

2.21 Other special ornaments

Since the first release of Music_{TEX}, many users have either asked for new features or proposed their own procedures to be included in Music_{TEX}. Some of them have been added because of their high utility, some others have been left aside for several reasons. The major reason for not including many proposals in the Music_{TEX} release is that – at least on many computers and especially PC’s – the _{TEX} memory is limited to 65 000 “words”. This is a very restricted value which causes many trials to exceed the capacity of _{TEX} (unless using “big_{TEX}”). Therefore, only the proposed macros of very general use can be introduced in the release as a standard and the users are suggested to take their specific procedures and include them (directly or by means of an `normalshapemediumseries\input`) in their own source code.

This is particularly valid for people who want to typeset *baroque* music using the ancient *ornament codings* rather than the modern equivalents. As a compromise, some macros kindly provided by Ian COLLIER in Great Britain have slightly been updated and provided in a separate file named `normalshapemediumseries.tex`.

For example, brackets can be produced:

²⁸ Beware of a shift of one position, since `normalshapemediumseries\intersinstrumentr` indicates the interval *above* the *r*-th instrument.

2.22 The musicsty macros

This file is made for non T_EXperts and/or lazy score typesetters. It provides

- a set of font definitions of common use, such as `\tenrm`, `\eightrm`, etc.,
- a reasonable setting of `normalshapemediumseriesnormalshapemediumseries\hsize`, `normalshapemediumseriesnormalshapemediumseries\vsize`, `normalshapemediumseriesnormalshapemediumseries\hoffset`, `normalshapemediumseriesnormalshapemediumseries\voffset` dimensions in order to have a good layout fit for European A4 paper²⁹
- a set of text size commands:

```
normalshapemediumseriesnormalshapemediumseries\  
eightpoint which sets the usual  
normalshapemediumseriesnormalshapemediumseries\  
rm,  
normalshapemediumseriesnormalshapemediumseries\  
bf,  
normalshapemediumseriesnormalshapemediumseries\  
sl,  
normalshapemediumseriesnormalshapemediumseries\  
it commands to 8 point font size;
```

```
normalshapemediumseriesnormalshapemediumseries\  
tenpoint which sets the usual  
normalshapemediumseriesnormalshapemediumseries\  
rm,  
normalshapemediumseriesnormalshapemediumseries\  
bf,  
normalshapemediumseriesnormalshapemediumseries\  
sl,  
normalshapemediumseriesnormalshapemediumseries\  
it commands to 10 point font size;
```

```
normalshapemediumseriesnormalshapemediumseries\  
twlpoint to get 12 point font size;
```

²⁹ People addicted to *legal* or other paper sizes should correct it for their own purpose.

normalshapemediumseriesnormalshapemediumseries\
frtpoint to get 14.4 point font size;

normalshapemediumseriesnormalshapemediumseries\
svtpoint to get 17.28 point font size;

normalshapemediumseriesnormalshapemediumseries\
twtpoint to get 20.74 point font size;

normalshapemediumseriesnormalshapemediumseries\
twfvpoint to get 24.88 point font size;

- a set of commands to make easy piece titles :
 - **normalshapemediumseries**normalshapemediumseries\
author or
normalshapemediumseriesnormalshapemediumseries\
fullauthor to be put at the right of the first page, below the
title of the piece; the calling sequence is, for example:

```
\author{Daniel TAUPIN\\organiste \`a  
Gif-sur-Yvette}
```

where the \\ makes the author name displayed on two or several
lines.
 - **normalshapemediumseries**normalshapemediumseries\
shortauthor to be put at the bottom of each page,
 - **normalshapemediumseries**normalshapemediumseries\
fulltitle which is the big main title of the piece,
 - **normalshapemediumseries**normalshapemediumseries\
subtitle is displayed below the main title of the piece,
 - **normalshapemediumseries**normalshapemediumseries\
shorttitle or
normalshapemediumseriesnormalshapemediumseries\
title which is the title repeated at the bottom of each page,
 - **normalshapemediumseries**normalshapemediumseries\
othermention which is displayed on the left of the page, in
front of the author's name (it may contain several \\ to display
it on several lines,
 - **normalshapemediumseries**normalshapemediumseries\
maketitle which displays all the previous stuff.

- Some additional commands to make *footnotes*. These commands are

- The normal Plain- $\text{T}_\text{E}\text{X}$

`normalshapemediumseriesnormalshapemediumseries\footnote` command which has two arguments — not only one as in $\text{L}^\text{A}\text{T}_\text{E}\text{X}$ — namely the label of the footnote, i.e. any sequence of characters and not only figures, and the text of the footnote.

IMPORTANT: the `\footnote` command does not work inside boxes³⁰, therefore this command must not be issued within music. But another alternate feature is provided (see below).

- The `normalshapemediumseriesnormalshapemediumseries\Footnote` command, which counts the footnotes and uses a number as the label of the foot note (equivalent to $\text{L}^\text{A}\text{T}_\text{E}\text{X}$'s `\footnote` command). The same restriction applies concerning footnotes within the music coding.
- The `normalshapemediumseriesnormalshapemediumseries\vfootnote` command, taken from the Plain- $\text{T}_\text{E}\text{X}$, which makes the footnote itself at the bottom of the current page, but does not put the footnote label at the place it is referred in the main text.

Thus, if a footnote is needed whose reference lies inside the music itself, the music typesetter must perform it in two steps :

1. quote the reference inside the music, using `zcharnote` for example,
2. post the footnote itself, using `\vfootnote` outside the music, either before `normalshapemediumseriesnormalshapemediumseries\debutmorceau` or between `normalshapemediumseriesnormalshapemediumseries\suspmorceau` and `normalshapemediumseriesnormalshapemediumseries\reprmorceau` or equivalent commands.

³⁰ This is not a $\text{T}_\text{E}\text{X}$ -bug, this is a feature!

Note that `musicsty` should not be used with L^AT_EX.

2.23 Abnormal music coding

2.23.1 Gregorian chant

Gregorian chant is often coded using four line staffs (see section 2.20.5) and using special notes (called *neumes*) which are described in section 2.18.3. But the gregorian chant also needs a special *alto clef* which is in fact the ancestor of the modern alto clef. The gregorian *alto clef* can be invoked instead of the modern one by re-declaring the `normalshapemediumseriesnormalshapemediumseries\clefdutr` macro. Thus

```
\def\clefdutiv{\gclefdut}
```

will cause the instrument number 4 (i.e. `iv`) to exhibit a gregorian C clef whenever the value of `\cleftoskiv` refers to an alto clef. The modern alto clef can be restored for that instrument by :

```
\def\clefdutiv{\clefdutsymbol}
```

2.23.2 Music score without clefs or with special clefs

Regardless of the number of lines of the staves, an instrument may have no clefs, e.g. for *percussion music* but also for any weird purpose. This done by declaring some of the following items :

```
\def normalshapemediumseriesnormalshapemediumseries\  
clefdesolr{\relax}  
\def normalshapemediumseriesnormalshapemediumseries\  
clefdutr{\relax}  
\def normalshapemediumseriesnormalshapemediumseries\  
clefdefar{\relax}
```

At first sight, it could be thought to be silly to cancel the G clef, the C clef and/or the F clef to have an empty clef symbol. But the reason is that the absence of clefs does not mean that notes should not be raised according to their pitch. Thus, if the user uses the G clef coding of pitches, he is welcome to use the present feature to cancel the G clef, but if he uses some alto clef coding, then he should cancel the alto clef symbol. Of course, all this is irrelevant if the engraver chooses to use numeric coding of note position like `\qu{10}`.

Normal symbols for these clefs and for instrument or roman number *r* can be restored by :

```
\def\  
clefdesolr{ normalshapemediumseriesnormalshapemediumseries\  
\clefdesolsymbol}  
\def\  
clefdefar{ normalshapemediumseriesnormalshapemediumseries\  
clefdefasymbol}  
\def\  
clefdutr{ normalshapemediumseriesnormalshapemediumseries\  
clefdutsymbol}
```

Besides, a special *drum clef* (two heavy vertical bars) can replace any of the standard clefs, for exemple the G clef by saying :

```
\def\  
clefdesolr{ normalshapemediumseriesnormalshapemediumseries\  
\drumclefsymbol}
```


It is to be emphasised that these features are specific to one instrument — not one staff of a several staff instrument — so that some weird score for *monks*, *drum* and *electronic keyboard* such as

could be coded as follows, regardless this is relevant :

```

\parindent 19mm
\def\nbinstruments{3}      \def\instrumenti{keyboard}
\def\instrumentii{drum}    \def\instrumentiii{monks}
\def\stafflinesnbii{1}    \def\stafflinesnbiii{4}
\generalsignature{0}      \generalmeter{\relax}
\signi=-1\relax           % one flat at
keyboard
\nbporteesi=2\relax % 2 staffs at keyboard
\cleftoksi={6000}\cleftoksiii={3000}\
cleftoksii={1000}
\def\clefdutiii{\gclefdut} % gregorian C clef at
instrument iii
\def\clefdutii{\drumclefsymbol} % cancel C clef
at instrument ii
\def\interinstrumentii{-4\Interligne} % less spacing
above drum
\normal
\debutextrait
\Notes\hu F|\zh c\hu h&\diamw 0&\carrg {acd}\enotes
\NOTes\qu I|\zq N\qu d&\diamg 0&\diamg f\enotes
\NOTes\qu J|\zq a\qu e&\diamg 0&\diamg e\enotes
\notes\hu G|\zh b\hu d&\zshaker 3\diamw {00}&\zcarrg
d\carqg g\carrg {hgh}\enotes
\finextrait

```

In the same way, a possible violin score with *harmonic notes* (see 2.18.5) could be :

It was coded as follows:

```

\def\nbinstruments{1}\nbporteesi=1\relax
\generalsignature{-2}\generalmeter{\
allabreve}\cleftoksi={0000}
\normal
\debutextrait
\NOTes\zd o\zh d\hu h\enotes

```

```

\Notes\ibu0k0\zq g\yh0k\qh0j\zq e\yh0i\tbu0\
qh0j\enotes
\barre
\NOTes\zd g\hu k\enotes
\NOTes\hpause\enotes
\barre
\NOTes\zd o\zh d\hl h\enotes
\Notes\ib10b0\zq g\yb0k\qb0j\zq e\yb0i\tb10\
qb0j\enotes
\barre
\NOTes\zd g\hu k\enotes
\NOTes\hpause\enotes
\finextrait

```

2.23.3 Usual percussion music

Besides single percussion scores usually written using one-line staves, percussion music involving several instruments is often written on five-line staves with a *drum clef*, where the instruments are distinguished by the type of the note heads and the apparent pitch of the note on the staff. We give an example — kindly provided by Agusti MARTÍN DOMINGO :

Its coding was :

```

\begin{music}
\def\nbinstruments{1}\generalsignature{0}\
def\stafflinesbi{5}
\generalmeter{\meterfrac44}
\cleftoksi={0000}\def\clefdesoli{\
drumclefsymbol}
\normal
\debutextrait
\leftrepeat
\Notes\zql f\rlap{\soupon}\ibu0m0\XH0{nn}\
enotes
\Notes\zk d\zql f\zq j\XH0n\tbu0\XH0n\enotes
\Notes\zql f\rlap{\soupon}\ibu0m0\XH0{nn}\
enotes

```

```

\Notes\zk d\zql f\zq j\xh0n\tbu0\xh0n\enotes
\barre
\Notes\zql f\rlap{\soupon}\ibu0m0\kh0{nn}\
enotes
\Notes\zx d\zql f\zq j\kh0n\tbu0\kh0n\enotes
\Notes\zql f\rlap{\soupon}\ibu0m0\kh0{nn}\
enotes
\Notes\zx d\zql f\zq j\kh0n\tbu0\kh0n\enotes
\barre
\Notes\zql f\rlap{\soupon}\ibu0m0\oxh0{nn}\
enotes
\Notes\zox d\zql f\zq j\kh0n\tbu0\oxh0n\
enotes
\Notes\zql f\rlap{\soupon}\ibu0m0\oxh0{nn}\
enotes
\Notes\zox d\zql f\zq j\kh0n\tbu0\oxh0n\
enotes
\setrightrepeat\finextrait
\end{music}

```

To use these different note heads, one must

- either include a specific percussion file namely `musicper.tex` after the usual `\input musicctex` or invoke the L^AT_EX style option ;
- use special macro names to replace the usual elliptic back note head with either a double sharp sign or with a +. These macros are :
 - `normalshapemediumseriesnormalshapemediumseries\zx,`
 - `normalshapemediumseriesnormalshapemediumseries\xu,`
 - `normalshapemediumseriesnormalshapemediumseries\xup,`
 - `normalshapemediumseriesnormalshapemediumseries\xupp,`
 - `normalshapemediumseriesnormalshapemediumseries\xl,`
 - `normalshapemediumseriesnormalshapemediumseries\xlp,`
 - `normalshapemediumseriesnormalshapemediumseries\`

`xlpp,`
`normalshapemediumseriesnormalshapemediumseries\`
`xh,`
`normalshapemediumseriesnormalshapemediumseries\`
`xb,`
`normalshapemediumseriesnormalshapemediumseries\`
`zx,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcu,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcup,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcupp,`
`normalshapemediumseriesnormalshapemediumseries\`
`xccu,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcccu,`
`normalshapemediumseriesnormalshapemediumseries\`
`xccccu,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcl,`
`normalshapemediumseriesnormalshapemediumseries\`
`xclp,`
`normalshapemediumseriesnormalshapemediumseries\`
`xclpp,`
`normalshapemediumseriesnormalshapemediumseries\`
`xccl,`
`normalshapemediumseriesnormalshapemediumseries\`
`xcccl` and
`normalshapemediumseriesnormalshapemediumseries\`
`xccccl`, which behave exactly like `\zq`, `\qu`, `\qup`, `\qupp`,
`\ql`, `\qlp`, `\qlpp`, `\qh`, `\qb`, `\zq`, `\cu`, `\cup`, `\cupp`, `\`
`ccu`, `\cccu`, `\ccccu`, `\cl`, `\clp`, `\clpp`, `\ccl`, `\`
`cccl` and `\ccccl`, except that the note head is 0.6ex5 instead
of 0.5ex! .

- `normalshapemediumseriesnormalshapemediumseries\`
`zox,`
`normalshapemediumseriesnormalshapemediumseries\`
`oxu,`
`normalshapemediumseriesnormalshapemediumseries\`
`oxup,`
`normalshapemediumseriesnormalshapemediumseries\`

oxupp,
 normalshapemediumseriesnormalshapemediumseries\
 oxl,
 normalshapemediumseriesnormalshapemediumseries\
 oxlp,
 normalshapemediumseriesnormalshapemediumseries\
 oxlpp,
 normalshapemediumseriesnormalshapemediumseries\
 oxh,
 normalshapemediumseriesnormalshapemediumseries\
 oxb,
 normalshapemediumseriesnormalshapemediumseries\
 zx,
 normalshapemediumseriesnormalshapemediumseries\
 oxcu,
 normalshapemediumseriesnormalshapemediumseries\
 oxcup,
 normalshapemediumseriesnormalshapemediumseries\
 oxcupp,
 normalshapemediumseriesnormalshapemediumseries\
 oxccu,
 normalshapemediumseriesnormalshapemediumseries\
 oxcccu,
 normalshapemediumseriesnormalshapemediumseries\
 oxccccu,
 normalshapemediumseriesnormalshapemediumseries\
 oxcl,
 normalshapemediumseriesnormalshapemediumseries\
 oxclp,
 normalshapemediumseriesnormalshapemediumseries\
 oxclpp,
 normalshapemediumseriesnormalshapemediumseries\
 oxccl,
 normalshapemediumseriesnormalshapemediumseries\
 oxccccl and
 normalshapemediumseriesnormalshapemediumseries\
 oxcccccl, to get a note head of 0.6ex& instead of 0.5ex! .

- normalshapemediumseriesnormalshapemediumseries\
 zk,
 normalshapemediumseriesnormalshapemediumseries\
 ku,
 normalshapemediumseriesnormalshapemediumseries\

kup,
normalshapemediumseriesnormalshapemediumseries\
kupp,
normalshapemediumseriesnormalshapemediumseries\
kl,
normalshapemediumseriesnormalshapemediumseries\
klp,
normalshapemediumseriesnormalshapemediumseries\
klpp,
normalshapemediumseriesnormalshapemediumseries\
kh,
normalshapemediumseriesnormalshapemediumseries\
kb,
normalshapemediumseriesnormalshapemediumseries\
zk,
normalshapemediumseriesnormalshapemediumseries\
kcu,
normalshapemediumseriesnormalshapemediumseries\
kcup,
normalshapemediumseriesnormalshapemediumseries\
kcupp,
normalshapemediumseriesnormalshapemediumseries\
kccu,
normalshapemediumseriesnormalshapemediumseries\
kcccu,
normalshapemediumseriesnormalshapemediumseries\
kccccu,
normalshapemediumseriesnormalshapemediumseries\
kcl,
normalshapemediumseriesnormalshapemediumseries\
kclp,
normalshapemediumseriesnormalshapemediumseries\
kclpp,
normalshapemediumseriesnormalshapemediumseries\
kccl,
normalshapemediumseriesnormalshapemediumseries\
kcccl and
normalshapemediumseriesnormalshapemediumseries\
kccccl, to get a note head of 0.6ex' instead of 0.6ex! .

2.24 Writing your own macros: the `normalshapemediumseries\catcode` problems

As seen before, the `normalshapemediumseries\catcodes` of the `normalshapemediumseries|` and `normalshapemediumseries&` symbols are modified by MusicT_EX, in the range of the actual scores but no more³¹ in the whole of the T_EX source. Thus, if you define your own macros to make your writing easier, you are likely to invoke the `normalshapemediumseries|` or `normalshapemediumseries&` symbols in a part of text where their `normalshapemediumseries\catcodes` are not correctly set. This may result typically in a diagnostic like :

```
! Misplaced alignment tab character &.
```

when you attempt, not to define, but to use your macro using the `normalshapemediumseries&` symbol to change the instrument. Smart T_EXers know that the `normalshapemediumseries\catcodes` are attached to the characters *when they are input* and not when they are used; thus you must be sure that `normalshapemediumseries|` and `normalshapemediumseries&` have the correct MusicT_EX `normalshapemediumseries\catcode` when the macro is defined, which may well occur outside the actual score.

It is also worth pointing out that the same problem may occur with other punctuation marks like “`normalshapemediumseries<`”, “`normalshapemediumseries>`”, “`^`”, etc., if their `normalshapemediumseries\catcode` has been changed by some other set of macros, like `normalshapemediumseries.sty`.

2.25 Musicla_{T_EX}

2.25.1 The `musictex.sty` style

As said before, the amount of memory and registers used by MusicT_EX makes it hardly compatible with L^AT_EX. However, Nicolas BROUARD succeeded in building a `normalshapemediumseries.sty` which is now included

³¹ Since version 4.99.

in the distribution. This is not recommended to make separate music scores. Its purpose is rather to provide a means of inserting short musical excerpts in books or articles written with L^AT_EX. Then, the `normalshapemediumseriesnormalshapemediumseries\documentstyle` command should include `normalshapemediumseries` in the options.

The L^AT_EX style file `normalshapemediumseries.sty` simply `\inputs` the following files (in that very order):

- `normalshapemediumseries.tex`
- `normalshapemediumseries.tex`
- `normalshapemediumseries.tex`
- `normalshapemediumseries.tex`
- `normalshapemediumseries.tex`

In the case of a L^AT_EX user wanting to use accidental transposition facilities, he should invoke `normalshapemediumseries` in the options of the `normalshapemediumseriesnormalshapemediumseries\documentstyle` command.

In case of `normalshapemediumseriescapacity exceeded...`, use a “BigLaT_EX” (after checking there is no visible error in the source code).

2.25.2 Wide music in L^AT_EX

Another difficulty appears with L^AT_EX: internal L^AT_EX macros handle the page size in a way which is not supposed to be changed within a given document. This means that text horizontal and vertical sizes are somewhat frozen so that one can hardly insert pieces of music of page size different from the size specified by the LaTeX *style*. Although a *largemusic* has been provided, the main drawback is an unpredictable behaviour of top and bottom printouts, especially page numberings.

If the whole of a document has wide pages, it can be haddled with the `normalshapemediumseries a4wide` style option, or any derivate of it.

2.25.3 The `normalshapemediumseries\catcode` problems

The `normalshapemediumseries.tex` file merely overrides the `normalshapemediumseriesnormalshapemediumseries\`

catcodes of the `normalshapemediumseries` and `normalshapemediumseries|` and `normalshapemediumseries&` symbols which are modified by MusicT_EX. To have access to these symbols when coding music, one should then enclose the scores or excerpts within `normalshapemediumseries\begin{music}` and `normalshapemediumseries\end{music}`. But there is also another possibility, i.e. to say `normalshapemediumseries\nextinstrument` instead of `normalshapemediumseries&` and `normalshapemediumseries\nextstaff` instead of `normalshapemediumseries|`.

Another problem comes from the `normalshapemediumseries.sty` written by Bernard GAULLE which is the standard of the GUTenberg French association. This style changes many `normalshapemediumseries\catcodes` which lead MusicT_EX to fail in many cases. Therefore, since the version 4.99, the `normalshapemediumseries\catcodes` of all are forced to the adequate value at `normalshapemediumseries\debutmorceau`, `normalshapemediumseries\debutextrait` and restored at their original value at `normalshapemediumseries\finmorceau`, `normalshapemediumseries\suspmorceau` and `normalshapemediumseries\finextrait`. This means that some facilities like the *guillemets* or the *tabulation* character are inhibited within music scores (possible problem with sophisticated *lyrics*) but perfectly available within the normal text.

Anyway, in case of emergency, one can invoke `normalshapemediumseries\catcodesmusic` to establish the `normalshapemediumseries\catcodes` at their value fit for music, and `normalshapemediumseries\endcatcodesmusic` to reset them at their external value, for example those chosen by `normalshapemediumseries.sty`.

2.26 Implementation and restrictions

The macroinstruction file MusicT_EX contains approximately 2500 lines of code, that is 80 000 bytes approximately. This requires your score to be compiled by the most extended versions of T_EX (65 000 words of working memory). It is therefore wise to set `normalshapemediumseries\tracingsstats` to 2 in

order to have an information about the memory used in each page. In desperate situations, we recommend using the “BigT_EX” processors which, unfortunately, perform a great deal of disk input/outputs (on PCs with i286 processors) which make them awfully slow³².

In particular, the number of registers it uses and the amount of memory used by L^AT_EX macros makes it doubtfully compatible with L^AT_EX, unless using BigL^AT_EX.

Other precautions are necessary: beware of end-of-line spaces; they corrupt layout and may cause unwanted line breakings after which music symbols seem to *float* in the air without staves. To avoid that, it is recommended to use `normalshapemediumseriesnormalshapemediumseries\relax` rather than `normalshapemediumseries%` at the end of source lines.

³² Using i386 or i486 processors, this problem disappears with the specific version of `normalshapemediumseries emTeX`

Chapter 3

Installation

3.1 Getting the stuff

As seen before, all the files are available at *anonymous ftp* normalshapemediumseries rsovax.lps.u-psud.fr (193.55.39.100) in the directory³³ normalshapemediumseries[anonymous.musictex], which can more easily be reached using the simple command

```
cd musictex
```

This directory normally contains normalshapemediumseries.zip which contains all the distribution for PC (MS-DOS) computers. This is only for normalshapemediumseries-ing convenience since all source files are directly available in the same directory. In addition a set of examples (i.e. the files whose name does not begin with “normalshapemediumseries”) is packed into normalshapemediumseries.zip, and normalshapemediumseries.zip contains the zipped DVIs of a large subset of the examples. Finally the PK files of specific fonts are provided in normalshapemediumseries.zip; getting this file is useless if you are able to normalshapemediumseries metafont the files whose normalshapemediumseries.mf are provided in the main package.

The VMS files are also packed into normalshapemediumseries.bck . Notwithstanding the fact that files are packed together or not, the files provided are of two kinds:

1. the basic files;
2. the example files.

All *basic files* are either of the form normalshapemediumseries.* (excluding of course normalshapemediumseries.zip and normalshapemediumseries.bck), normalshapemediumseries.* and normalshapemediumseries.*. Other files (normalshapemediumseries.tex or normalshapemediumseries.dvi) are example files.

Fonts are provided as normalshapemediumseries.mf files but also as normalshapemediumseries *.tfm and normalshapemediumseries.pk files for 300 dpi printers or previewers. Additional values of the dpi parameter are also provided in normalshapemediumseries.zip. Normally needed fonts are

³³ UNIX addicts would beware that this primary server is an old MicroVax run the VMS system. Therefore the brackets in the directory name are compulsory, not optional.

normalshapemediumseries20,		normalshapemediumseries16,
normalshapemediumseries13,		normalshapemediumseries11,
normalshapemediumseries	or	normalshapemediumseries ³⁴ ,
normalshapemediumseries20,		normalshapemediumseries16,
normalshapemediumseries13,		normalshapemediumseries11,
normalshapemediumseries20 and normalshapemediumseries16.		

3.2 Installing the fonts

All files with the extension `.tfm`³⁵ have to be copied in the same directory as the other `.tfm`'s. Then, if you get the error message:

```
! Font ... not loadable: Metric (TFM) file not found.
```

this means you did not succeed in installing the `.tfm`'s, or you installed them in the wrong directory. Then look at your general T_EX documentation³⁶ and try again.

The `.tfm` only contains the width, height and depth of each character of a font and is the only font file needed for T_EXing. But, to preview and/or view you need the pixel fonts, i.e. not the metrics but the exact drawing of the characters. On most systems they are packed and have either the extension `.pk` or the extension `.<dpi>normalshapemediumseries`, where *dpi* is the actual resolution of the font needed in the requested size. This means that the the given `*.pk` files provided often have to be renamed as `*.300pk`, especially in UNIX systems.

Mostly needed and spreaded are the fonts for dvi-driver with resolution of 300dpi. Using EmT_EX the `.pk`-fonts have to be copied in `...\pixel.lj\300dpi\`. In UNIX systems they often have to be renamed as `*.300pk` and put in a directory — the name of which can be provided by your local manual or T_EX-wizard — of the form `.../fonts/pk`.

3.3 Building a format

Introducing the basically needed files in a *format* (with INITEX) is a means of saving computer time and memory. Besides, you will have a format compatible with MusiX_T_EX and — provided you made the symmetrical format for MusiX_is, including `musicxpt` in your MusiX_T_EX format — you

³⁴ `musicbra` and `musicbrb` exhibit some drawing differences, but they meet the same purpose of typing *piano braces*.

³⁵ T_EX font metric files, needed directly from binary for T_EXing the examples or the doc.

³⁶ The specific T_EX installation manual, not necessarily the T_EXbook.

can compile exactly the same source files with both MusicT_EX and MusiX_TE_X, which is a good means of finding whether some strange behaviour is specific to one implementation or the other, or whether you made some general mistake.

3.3.1 Starting from nil

1. Build up a file called `musictex.ini` with following contents:

```
\input plain % or your local plain-like TeX
format
\input musicnft
\input musictex
\input musicvbm
\input musictrp % optionally
\input musicsty % optionally
\def\fmtname{musictex}\def\fmtversion{5.08}
\dump
```

2. Make your format with the command

```
initex musictex.ini37
```

3. Then your format may be invoked for T_EXing score by something like

```
tex &musictexjobname38.
```

3.3.2 Starting from your usual plain format

1. First, try to find — on your favourite system — whether `tex` is an executable routine, or a `tex.bat` command in MS-DOS or a *shell* procedure under UNIX.
2. If `tex` is a command try to find the “initex” local command: usually it is either `initex` or `tex -i`.
3. Try to find the name of the “plain T_EX” format (usually posted when T_EXing anything).

³⁷ depends on your implementation. `normalshapemediumseries` may require another form, such as “`tex386 -i`”.

³⁸ depends on your implementation. Very often the formatless T_EX is invoked by `virtex` rather than `tex` which already invokes a default plain format.

4. Then, *mutatis mutandis*, assuming the “initex” command has the name `initex` and the “plain T_EX” format is `plain`, run the shell command:

```
initex \&plain musictex.ins
```

which will produce a format file `musictex.fmt` which you shall put in the same directory as the others formats (hoping you have the access rights...). Note, in UNIX systems, the backslash before the `&` which tells the system to consider this character as a member of the command, not a batch execution indication. Once this is done, you can MusicT_EX any score you have written using a command such as:

```
tex \&musictex my-score.tex
```

that is, specifying your new format `musictex.fmt` instead of the usual `plain.fmt`.

For MS-DOS/emT_EX users the format building command is:

```
tex386 -i &plain musictex.ins
```

(you can change `plain` into `dc-plain` or any other plain-like format you have) then:

```
copy musictex.fmt \emtex\btexfmts\*.*
```

and the `musictex.bat` command can be

```
if exist %1.tex goto tex
goto end
```

```
:tex
tex386 -mt20000 &musictex %1 %2 %3 %4
%5 %6 %7 %8 %9
```

```
:end
```

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Chapter 4

Examples

Due to compatibility problems with L^AT_EX (used to produce this notice) large examples must be T_EX-ed separately, i.e. using T_EX and not L^AT_EX. Therefore, the MusicT_EX future user is suggested to produce some of the following examples and to look carefully at the way some special features have been coded.

When producing this examples, care should be taken about the fact that many several files are supposed to be included (by means of `normalshapemediumseriesnormalshapemediumseries\input`) in other files. Thus the only good files to be directly T_EX-ed are those which begin with “`normalshapemediumseries\input musicnft`” or “`% \input musixtex`”. This latter command indicates that this exemple can be run, both with MusicT_EX inserting

```
\input musicnft
\input musictex
\input musicvbm
\input musictrp
\input musicsty
```

at the beginning, or inserting the correponding files of MusiXT_EX (see corresponding manual). A simplerway of doing consists in having two formats, one for MusicT_EX (see 3.3), one for MusiXT_EX plus its compatibility input files.

In addition, it must be noted that most DVI previewers and laser printers have their origin at one inch below and one inch right of the right upper corner of the paper, while the musical examples have their upper left significant corner only at one centimeter right and below the left top of the paper. Therefore, special parameters have to be given to the DVI transcription programs `unless` `special` `normalshapemediumseriesnormalshapemediumseries\hoffset` and `normalshapemediumseriesnormalshapemediumseries\voffset` T_EX commands are introduced within the source T_EX text.

Suggested tests are:

- `normalshapemediumseries` for a long original piano work (11 pages);
`normalshapemediumseries` is the same in 16 pt staff size;

- `normalshapemediumseries` for a sophisticated piano score (use `BigTEX` !);
- `normalshapemediumseries` to get an ancient polyphonic song with three transpositions;
- `normalshapemediumseries` if you like Christmas carols with four voices, a three-staff organ score and the same transposed to meet ordinary singer's limitations; `normalshapemediumseries` is the same without organ. See `normalshapemediumseries_angescax.tex` to see how the same source has been used for two distinct layouts.
- `normalshapemediumseries` if you like imitations of J.-S. Bach (included in `normalshapemediumseries`);
- `normalshapemediumseries` if you like pre-baroque music (included in `normalshapemediumseries`);
- `normalshapemediumseries` if you want to get all the organ works³⁹ of the author in a single book (65 pages);
- `normalshapemediumseries` and `normalshapemediumseries` to get the Toccata by Charles-Marie WIDOR in two different sizes;
- `normalshapemediumseries` to get the “Méditation” (alias “Ave Maria”) by Charles GOUNOD for organ and violin or song. and `normalshapemediumseries_AVEMARIO` to get the same for organ solo;
- `normalshapemediumseries` to get the “Cantique de Jean Racine” by Gabriel FAURÉ in a transcription fit for organ rather than for piano.

³⁹ All subsets of `normalshapemediumseries` can be `MusicTEX`-ed separately.

Chapter 5

Summary of denotations

5.1 Pitches

5.2 Notes and Rests

5.3 Other symbols