The tipauni package

निरंजन∗

Version 0.4 — 2021-12-16

🔗 https://ctan.org/pkg/tipauni
 StringTokenizer https://puszcza.gnu.org.ua/bugs/?group=tipauni

Contents

1 Acknowledgements 2

2 Package options 2

3 List of available commands 2
  3.1 Pulmonic consonants ........................................... 2
  3.2 Non-Pulmonic consonants ..................................... 4
  3.3 Other symbols .................................................... 4
  3.4 Vowels ............................................................. 4
  3.5 Independent diacritics ......................................... 5
  3.6 Dependent diacritics .......................................... 5

4 Implementation 6

5 GNU Free Documentation License 19

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∗Envelope hi.niranjan@pm.me
Abstract

This package is the second step for \LaTeX-internally bridging the gap between the Unicode and the TIPA package. The first step was the package \texttt{unitipa}. Users can now use their beloved TIPA shortcuts with the benefits of Unicode i.e. searchability, copy-pasting, changing the font and many more. As this package needs the package \texttt{fontspec} for loading an IPA font, it needs to be compiled with \texttt{Xe\LaTeX} or \texttt{Lua\LaTeX}. This package can also be viewed as an ASCII-based input method for producing IPA characters in Unicode.

1 Acknowledgements

This package is completed because of the rigorous help by Jairo A. del Rio, Jonathan P. Spratte, Phelype Oleinink \& Ulrike Fischer. Their suggestions and contributions are extremely valuable for the development of this package.

Jonathan P. Spratte has helped the package by building a parser based on expl3. Phelype Oleinik has helped the package by building a test-suite for regression-tests. The tests can be seen in the git-repository of the project.

2 Package options

\begin{table}
\begin{tabular}{ll}
\texttt{documentfont} & \texttt{documentfont=\langle font name\rangle} \\
\hline

The default font for the entire document set by this package is the Charis SIL. Users can easily change it with the package-option \texttt{documentfont}. This option takes one value which is the \langle font name\rangle. e.g. For using the Doulos SIL font as the main font, use the package like it is used in the following.

\texttt{\usepackage[documentfont=DoulosSIL]{tipauni}}

\hline
\end{tabular}
\end{table}

\texttt{incompatible}

By default \texttt{tipauni} will throw a warning if symbols not contained in the \texttt{tipa} package were used. Using this option you can switch this check off if you don’t have to stay compatible with \texttt{tipa} to silence this warning.

3 List of available commands

TIPA has two alternative methods for inputting IPA characters. In the following tables, \textbf{Input A} column lists all the long TIPA commands (e.g. \texttt{\textipa{\texttildetilde{t}}} & \textbf{Input B} column lists the short ones (e.g. \texttt{\textipa{\texttilde{t}}}). This documentation lists down all the commands necessary for typing symbols in the IPA chart.

3.1 Pulmonic consonants

\footnote{All of these commands must be enclosed in the \texttt{\textipa} command. (e.g. \texttt{\textipa{\texttilde{t}}} for [t\textipa])}
<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retroflex voiceless stop</td>
<td>\textrtailt</td>
<td>:t</td>
<td>[ʈ]</td>
</tr>
<tr>
<td>Retroflex voiced stop</td>
<td>\textrtaild</td>
<td>:d</td>
<td>[ɖ]</td>
</tr>
<tr>
<td>Palatal voiced stop</td>
<td>\textbardotlessj</td>
<td>:j</td>
<td>[ɟ]</td>
</tr>
<tr>
<td>Uvular voiced stop</td>
<td>\textscg</td>
<td>:G</td>
<td>[ɢ]</td>
</tr>
<tr>
<td>Glottal voiceless stop</td>
<td>\textglotstop</td>
<td>P</td>
<td>[ʔ]</td>
</tr>
<tr>
<td>Labiodental nasal</td>
<td>\textltn</td>
<td>:N</td>
<td>[ɱ]</td>
</tr>
<tr>
<td>Retroflex nasal</td>
<td>\textrtnln</td>
<td>:n</td>
<td>[ɳ]</td>
</tr>
<tr>
<td>Palatal nasal</td>
<td>\textltnln</td>
<td>:*n</td>
<td>[ɲ]</td>
</tr>
<tr>
<td>Velar nasal</td>
<td>\textng</td>
<td>N</td>
<td>[ŋ]</td>
</tr>
<tr>
<td>Uvular nasal</td>
<td>\textscn</td>
<td>:N</td>
<td>[ɴ]</td>
</tr>
<tr>
<td>Bilabial trill</td>
<td>\textscb</td>
<td>:B</td>
<td>[ʙ]</td>
</tr>
<tr>
<td>Uvular trill</td>
<td>\textscr</td>
<td>:R</td>
<td>[ʀ]</td>
</tr>
<tr>
<td>Labiodental flap(^1)</td>
<td>\textlabdentflap</td>
<td>:v</td>
<td>[ʋ]</td>
</tr>
<tr>
<td>Alveolar tap</td>
<td>\textfishhookr</td>
<td>R</td>
<td>[r]</td>
</tr>
<tr>
<td>Retroflex flap</td>
<td>\textrtrllr</td>
<td>:r</td>
<td>[ɾ]</td>
</tr>
<tr>
<td>Bilabial voiceless fricative</td>
<td>\textphi</td>
<td>F</td>
<td>[ɸ]</td>
</tr>
<tr>
<td>Bilabial voiced fricative</td>
<td>\textbeta</td>
<td>B</td>
<td>[β]</td>
</tr>
<tr>
<td>Dental voiceless fricative</td>
<td>\texttheta</td>
<td>T</td>
<td>[θ]</td>
</tr>
<tr>
<td>Dental voiced fricative</td>
<td>\textth</td>
<td>D</td>
<td>[ð]</td>
</tr>
<tr>
<td>Palatal voiceless fricative</td>
<td>\textsh</td>
<td>S</td>
<td>[ʃ]</td>
</tr>
<tr>
<td>Palatal voiced fricative</td>
<td>\textyogh</td>
<td>Z</td>
<td>[ʒ]</td>
</tr>
<tr>
<td>Retroflex voiceless fricative</td>
<td>\textrtails</td>
<td>:s</td>
<td>[ʂ]</td>
</tr>
<tr>
<td>Retroflex voiced fricative</td>
<td>\textrrtailz</td>
<td>:z</td>
<td>[ʐ]</td>
</tr>
<tr>
<td>Palatal voiced fricative</td>
<td>\textctj</td>
<td>J</td>
<td>[ʝ]</td>
</tr>
<tr>
<td>Velar voiced fricative</td>
<td>\textgamma</td>
<td>G</td>
<td>[ɣ]</td>
</tr>
<tr>
<td>Uvular voiceless fricative</td>
<td>\textchi</td>
<td>X</td>
<td>[χ]</td>
</tr>
<tr>
<td>Uvular voiced fricative</td>
<td>\textinvscr</td>
<td>K</td>
<td>[ʁ]</td>
</tr>
<tr>
<td>Pharyngeal voiceless fricative</td>
<td>\textcrh</td>
<td>:h</td>
<td>[ʕ]</td>
</tr>
<tr>
<td>Pharyngeal voiced fricative</td>
<td>\textrevglotstop</td>
<td>Q</td>
<td>[ɦ]</td>
</tr>
<tr>
<td>Glottal voiced fricative</td>
<td>\textthh</td>
<td>H</td>
<td>[ɬ]</td>
</tr>
<tr>
<td>Alveolar voiceless lateral fricative</td>
<td>\textbeltl</td>
<td>:l</td>
<td>[ɭ]</td>
</tr>
<tr>
<td>Alveolar voiced lateral fricative</td>
<td>\textlyoghlig</td>
<td>:z</td>
<td>[ʎ]</td>
</tr>
<tr>
<td>Labiodental approximant</td>
<td>\textlabdentapp</td>
<td>V</td>
<td>[v]</td>
</tr>
<tr>
<td>Alveolar approximant</td>
<td>\textturnr</td>
<td>:r</td>
<td>[ɾ]</td>
</tr>
<tr>
<td>Retroflex approximant</td>
<td>\textturnrrtail</td>
<td>:R</td>
<td>[ɹ]</td>
</tr>
<tr>
<td>Velar approximant</td>
<td>\textturnmrleg</td>
<td>:m</td>
<td>[ɭ]</td>
</tr>
<tr>
<td>Retroflex lateral approximant</td>
<td>\textrtaill</td>
<td>:l</td>
<td>[ɭ]</td>
</tr>
<tr>
<td>Palatal lateral approximant</td>
<td>\textturny</td>
<td>L</td>
<td>[ʎ]</td>
</tr>
<tr>
<td>Velar lateral approximant</td>
<td>\textsc1</td>
<td>:L</td>
<td>[ʟ]</td>
</tr>
</tbody>
</table>
These commands are also available without package tipa. A symbol for this sound was introduced in 2005. The last update of the package tipa was in 2004, so this character is missing in it. A command for it is provided by this package. Such tipauni-exclusive commands are written with red color in this documentation.

### 3.2 Non-Pulmonic consonants

<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilabial click</td>
<td>\textbullseye</td>
<td>!o</td>
<td>[ʘ]</td>
</tr>
<tr>
<td>Postalveolar click</td>
<td>\pstalvclick</td>
<td>!</td>
<td>[ǃ]</td>
</tr>
<tr>
<td>Palatoalveolar click</td>
<td>\textdoublebarpipe</td>
<td>!c</td>
<td>[ǂ]</td>
</tr>
<tr>
<td>Alveolar lateral click</td>
<td>\textdoublepipe</td>
<td>|</td>
<td>[ǁ]</td>
</tr>
<tr>
<td>Bilabial implosive</td>
<td>\textthb</td>
<td>!b</td>
<td>[ɓ]</td>
</tr>
<tr>
<td>Dental implosive</td>
<td>\textthd</td>
<td>!d</td>
<td>[ɗ]</td>
</tr>
<tr>
<td>Palatal implosive</td>
<td>\textthbdotlessj</td>
<td>!j</td>
<td>[ʄ]</td>
</tr>
<tr>
<td>Velar implosive</td>
<td>\textthg</td>
<td>!g</td>
<td>[ɠ]</td>
</tr>
<tr>
<td>Uvular implosive</td>
<td>\texthtscg</td>
<td>!G</td>
<td>[ʛ]</td>
</tr>
</tbody>
</table>

### 3.3 Other symbols

<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labial-velar voiceless fricative</td>
<td>\textturnw</td>
<td>!*w</td>
<td>[ʍ]</td>
</tr>
<tr>
<td>Labial-palatal voiced approximant</td>
<td>\textturnh</td>
<td>4</td>
<td>[ɥ]</td>
</tr>
<tr>
<td>Epiglottal voiceless fricative</td>
<td>\textsch</td>
<td>!;H</td>
<td>[ʜ]</td>
</tr>
<tr>
<td>Epiglottal voiced fricative/approximant</td>
<td>\textbarreuglotstop</td>
<td>!*1</td>
<td>[ʢ]</td>
</tr>
<tr>
<td>Alveolar voiced lateral flap</td>
<td>\textturnlonglegr</td>
<td>!*r</td>
<td>[ɺ]</td>
</tr>
<tr>
<td>Epiglottal plosive</td>
<td>\textbarglotstop</td>
<td>!*2</td>
<td>[ʡ]</td>
</tr>
<tr>
<td>Alveolo-palatal voiceless fricative</td>
<td>\textctc</td>
<td>C</td>
<td>[ɕ]</td>
</tr>
<tr>
<td>Alveolo-palatal voiced fricative</td>
<td>\textctz</td>
<td>!*3</td>
<td>[ʑ]</td>
</tr>
<tr>
<td>Postalveolar-velar voiceless fricative</td>
<td>\textththeng</td>
<td>!*3</td>
<td></td>
</tr>
</tbody>
</table>

### 3.4 Vowels

<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near-close near-front unrounded</td>
<td>\textsci</td>
<td>I</td>
<td>[i]</td>
</tr>
<tr>
<td>Near-close near-front rounded</td>
<td>\textscy</td>
<td>y</td>
<td>[y]</td>
</tr>
<tr>
<td>Open-mid front unrounded</td>
<td>\textepsilon</td>
<td>E</td>
<td>[ɛ]</td>
</tr>
<tr>
<td>Close central unrounded</td>
<td>\textbary</td>
<td>1</td>
<td>[ɪ]</td>
</tr>
<tr>
<td>Vowel Type</td>
<td>Input A</td>
<td>Input B</td>
<td>Symbol</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>Close central rounded</td>
<td>\textbaru</td>
<td>0</td>
<td>[u]</td>
</tr>
<tr>
<td>Near-close near-back rounded</td>
<td>\textupsilon</td>
<td>U</td>
<td>[u]</td>
</tr>
<tr>
<td>Close-mid central unrounded</td>
<td>\textreve</td>
<td>9</td>
<td>[ə]</td>
</tr>
<tr>
<td>Close-mid central rounded</td>
<td>\textbaro</td>
<td>8</td>
<td>[o]</td>
</tr>
<tr>
<td>Mid central vowel</td>
<td>\textschwa</td>
<td>Q</td>
<td>[o]</td>
</tr>
<tr>
<td>Open-mid central unrounded</td>
<td>\textrevesilon</td>
<td>3</td>
<td>[æ]</td>
</tr>
<tr>
<td>Open-mid central rounded</td>
<td>\textcloseresilon</td>
<td>k</td>
<td>[ʊ]</td>
</tr>
<tr>
<td>Near-open central</td>
<td>\textturna</td>
<td>5</td>
<td>[u]</td>
</tr>
<tr>
<td>Close back unrounded</td>
<td>\textturnm</td>
<td>W</td>
<td>[u]</td>
</tr>
<tr>
<td>Close-mid back unrounded</td>
<td>\texttranshorns</td>
<td>7</td>
<td>[v]</td>
</tr>
<tr>
<td>Open-mid back unrounded</td>
<td>\textturnv</td>
<td>2</td>
<td>[a]</td>
</tr>
<tr>
<td>Open-mid back rounded</td>
<td>\textopeno</td>
<td>0</td>
<td>[a]</td>
</tr>
<tr>
<td>Open back unrounded</td>
<td>\textscripta</td>
<td>A</td>
<td>[a]</td>
</tr>
<tr>
<td>Open back rounded</td>
<td>\textturnscripta</td>
<td>6</td>
<td>[o]</td>
</tr>
</tbody>
</table>

### 3.5 Independent diacritics

<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhoticity</td>
<td>\textrhoticity</td>
<td>\textr</td>
<td>[ə˞]</td>
</tr>
<tr>
<td>No audible release</td>
<td>\textcorner</td>
<td>\textc</td>
<td>[n̚]</td>
</tr>
<tr>
<td>Tie bar (standalone)</td>
<td>\texttiebar{a}</td>
<td>\tx{a}</td>
<td>[a]</td>
</tr>
</tbody>
</table>

### 3.6 Dependent diacritics

<table>
<thead>
<tr>
<th>Description</th>
<th>Input A</th>
<th>Input B</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless</td>
<td>\textsubring{a}</td>
<td>\text<em>r</em></td>
<td>[ŋ]</td>
</tr>
<tr>
<td>Voiced</td>
<td>\textsubwedge{a}</td>
<td>\text<em>v</em></td>
<td>[ɡ]</td>
</tr>
<tr>
<td>More rounded</td>
<td>\textsubhalfring{w}</td>
<td>\text{w}</td>
<td>[w]</td>
</tr>
<tr>
<td>Less rounded</td>
<td>\textsubhalfring{w}</td>
<td>\text{w}</td>
<td>[w]</td>
</tr>
<tr>
<td>Advanced</td>
<td>\textsubplus{a}</td>
<td>\text{+}</td>
<td>[a]</td>
</tr>
<tr>
<td>Retracted</td>
<td>\textsubbar{l}</td>
<td>\text{=}</td>
<td>[l]</td>
</tr>
<tr>
<td>Mid-centralized</td>
<td>\textovercross{e}</td>
<td>\text{x}{e}</td>
<td>[ε]</td>
</tr>
<tr>
<td>Syllabic</td>
<td>\textsyllabic{n}</td>
<td>\text{n}</td>
<td>[n]</td>
</tr>
<tr>
<td>Non-syllabic</td>
<td>\textsurchord{a}</td>
<td>\text{ns}{a}</td>
<td>[ŋ]</td>
</tr>
<tr>
<td>Breathy voiced</td>
<td>\textsubumlaut{b}</td>
<td>\text{&quot;*}{b}</td>
<td>[b]</td>
</tr>
<tr>
<td>Creaky voiced</td>
<td>\textsubtilde{a}</td>
<td>\text{~*}</td>
<td>[a]</td>
</tr>
<tr>
<td>Linguolabial</td>
<td>\textseagull{l}</td>
<td>\text{m}</td>
<td>[l]</td>
</tr>
<tr>
<td>Velarized</td>
<td>\textseagull{l}</td>
<td>\text{v}l{1}</td>
<td>[l]</td>
</tr>
<tr>
<td>Raised</td>
<td>\textraising{a}</td>
<td>\text{l'}{a}</td>
<td>[a]</td>
</tr>
<tr>
<td>Lowered</td>
<td>\text lowering{a}</td>
<td>\text{l'}{a}</td>
<td>[a]</td>
</tr>
<tr>
<td>Advanced tongue root</td>
<td>\textadvancing{a}</td>
<td>\text{&lt;}{a}</td>
<td>[a]</td>
</tr>
<tr>
<td>Retracted tongue root</td>
<td>\textretracting{ə}</td>
<td>-</td>
<td>\textasciitilde[ə]</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td>---</td>
<td>------------------</td>
</tr>
<tr>
<td>Dental</td>
<td>\textsubbridge{t}</td>
<td>-</td>
<td>\textasciitilde[t]</td>
</tr>
<tr>
<td>Apical</td>
<td>\textinsubbridge{t}</td>
<td>-</td>
<td>\textasciitilde[t]</td>
</tr>
<tr>
<td>Laminal</td>
<td>\textsubsquare{s}</td>
<td>-</td>
<td>\textasciitilde[s]</td>
</tr>
<tr>
<td>Tie bar (top)</td>
<td>\texttoptiebar{əi}</td>
<td>-</td>
<td>\textasciitilde[əi]</td>
</tr>
<tr>
<td>Tie bar (bottom)</td>
<td>\textbottomtiebar{əi}</td>
<td>-</td>
<td>\textasciitilde[əi]</td>
</tr>
</tbody>
</table>

1. The documentation of package the tipa on p. 53 describes a shorthand command i.e. \textasciitilde{(arg)} which is not functional. I haven’t investigated the reasons, but instead provided a new shorthand command for this character.

4 Implementation

1. \texttt{⟨@=tipauni⟩}
2. ⟨\texttt{package}⟩

Provide the package with some description \texttt{& version specifications}.
3. \texttt{\ProvidesPackage{tipauni}[2021/12/16 v0.4 Arabic characters with TIPA commands]}

Load necessary packages.
4. \texttt{\RequirePackage{xparse}}
5. \texttt{\RequirePackage{fontspec}}
6. \texttt{\RequirePackage{xkeyval}}

Package options are provided using the package \texttt{xkeyval}. The following commands provide the option \texttt{documentfont}.
7. \texttt{\setmainfont{CharisSIL} \texttt{%% https://ctan.org/pkg/charissil}}
8. \texttt{\DeclareOptionX{documentfont}{\setmainfont{#1}}}\texttt{\newif\ifnontipaignore}
9. \texttt{\DeclareOptionX{incompatible}{\nontipaignoretrue}}\texttt{\ProcessOptionsX\relax}

The following commands were kindly suggested by Phelype Oleinik for developing a conditional which is always global.
10. \texttt{\newif\ifnontipa}
11. \texttt{\protected\def\nontipatrue\{\global\let\ifnontipa\iftrue\}}
12. \texttt{\protected\def\nontipafalse\{\global\let\ifnontipa\iffalse\}}
13. \texttt{\ifnontipaignore}
14. \texttt{\protected\def\nontipatrue\{}}
15. \texttt{\fi}

The following commands provide the command \texttt{\tipaunicmd} for printing characters that are missing in the tipa package.
16. \texttt{\NewDocumentCommand\tipaunicmd\{ m m \}{\%}
17. \texttt{\NewDocumentCommand\tipaunicmd\{ m m \}{\nontipatrue \#2\}}}

As can be seen above, everytime when a command that is absent in the tipa package is provided, it sets the conditional \texttt{nontipatrue} to true value. At the end of the document this package checks if there is any instance of a non-TIPA command. If yes, it generates a warning in the .log file saying that this code is now incompatible with the TIPA package and some characters might be displayed with a different font. All of this is achieved with
the help of following commands. The discussion on this question helped a lot for fine tuning the warning message.

\AtEndDocument{%
  \ifnontipa
    \PackageWarningNoLine{tipauni}{%
      You have used a command(s) that is (are) not supported by package TIPA. Thus your current code is incompatible with that package. These commands are printed with a different Unicode font. Refer to the documentation of package tipauni for a list of commands that are not supported in TIPA%
    \%}
  \else
    \fi
%}

From here the code for obtaining Unicode characters with TIPA commands starts.

\DeclareTextCommand{\tipaunistar}{TU}[1]{{#1}}
\DeclareTextAccentDefault{\tipaunistar}{TU}
\DeclareTextCommand{\tipaunisemicolon}{TU}[1]{{#1}}
\DeclareTextAccentDefault{\tipaunisemicolon}{TU}
\DeclareTextCommand{\tipaunicolon}{TU}[1]{{#1}}
\DeclareTextAccentDefault{\tipaunicolon}{TU}
\DeclareTextCommand{\tipaunibang}{TU}[1]{{#1}}
\DeclareTextAccentDefault{\tipaunibang}{TU}
\DeclareTextCommand{\tipaunipipe}{TU}[2]{\@pipeshorthands{#1}{#2}}
\DeclareTextAccentDefault{\tipaunipipe}{TU}
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%%--** Retroflex
\DeclareTextSymbol{\textturnrrtail}{TU}{"27B}%%
\DeclareTextComposite{\tipaunicolon}{TU}{R}{"27B}
%%--** Velar
\DeclareTextSymbol{\textturnmrleg}{TU}{"270}%%
\DeclareTextComposite{\tipaunistar}{TU}{m}{"270}
%%-- Lateral approximants
%%--** Retroflex
\DeclareTextSymbol{\textrtaill}{TU}{"26D}%%
\DeclareTextComposite{\tipaunicolon}{TU}{l}{"26D}
\DeclareTextSymbol{\textturny}{TU}{"28E}%%
\DeclareTextSymbol{\textscl}{TU}{"29F}%%
\DeclareTextComposite{\tipaunisemicolon}{TU}{L}{"29F}
%% Non-pulmonic consonants
%%-- Clicks
%%--** Bilabial
\DeclareTextSymbol{\textbullseye}{TU}{"298}%%
\DeclareTextComposite{\tipaunibang}{TU}{o}{"298}
%%-- Postalveolar click
\tipaunicmd{\pstalvclick} %% tipauni-exclusive
%%--** Palato-alveolar
\DeclareTextSymbol{\textdoublebarpipe}{TU}{"1C2}%%
\DeclareTextComposite{\tipaunibang}{TU}{c}{"1C2} %% tipauni-exclusive
%%--** Alveolar lateral
\DeclareTextSymbol{\textdoublepipe}{TU}{"1C1}%%
%%-- Implosives
%%--** Bilabial
\DeclareTextSymbol{\texthtb}{TU}{"253}%%
\DeclareTextComposite{\tipaunibang}{TU}{b}{"253}
%%--** Dental
\DeclareTextSymbol{\texthtd}{TU}{"257}%%
\DeclareTextComposite{\tipaunibang}{TU}{d}{"257}
%%--** Palatal
\DeclareTextSymbol{\textthbardotlessj}{TU}{"284}%%
\DeclareTextComposite{\tipaunibang}{TU}{j}{"284}
%%--** Velar
\DeclareTextSymbol{\texthtg}{TU}{"260}%%
\DeclareTextComposite{\tipaunibang}{TU}{g}{"260}
%%--** Uvular
\DeclareTextSymbol{\texthtscg}{TU}{"29B}%%
\DeclareTextComposite{\tipaunibang}{TU}{G}{"29B}
%% Other consonants
\DeclareTextSymbol{\textturnw}{TU}{"28D}%%
\DeclareTextSymbol{\textturnh}{TU}{"265}%%
\DeclareTextSymbol{\texttach}{TU}{"29C}%%
\DeclareTextSymbol{\textbarrevglotstop}{TU}{"2A2}%%
\DeclareTextComposite{\tipaunistar}{TU}{(1)}{"2A2} %% tipauni-exclusive
\DeclareTextSymbol{\textbarglotstop}{TU}{"2A1}%%
\DeclareTextComposite{\tipaunistar}{TU}{(2)}{"2A1} %% tipauni-exclusive
\DeclareTextSymbol{\texttcc}{TU}{"255}%%
\DeclareTextSymbol{\textctcc}{TU}{"291}%%
\DeclareTextSymbol{\texttctcc}{TU}{"291} %% tipauni-exclusive
\DeclareTextSymbol{\texttctcc}{TU}{(2)}{"27A} %% tipauni-exclusive
\DeclareTextSymbol{\texttctcc}{TU}{(2)}{"291} %% tipauni-exclusive
\DeclareTextSymbol{\texttheng}{TU}{"267} \% tipauni-exclusive
\DeclareTextComposite{\tipaunistar}{TU}{3}{"267} \% tipauni-exclusive
\DeclareTextComposite{\tipaunistar}{TU}{k}{"029E} \%
\DeclareTextComposite{\tipaunistar}{TU}{t}{"287} \%
\DeclareTextComposite{\tipaunistar}{TU}{w}{"28D} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{E}{"1D07} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{J}{"1D0A} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{A}{"1D00} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{H}{"29C} \%
\DeclareTextComposite{\tipaunistar}{TU}{k}{"029E} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{E}{"1D07} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{J}{"1D0A} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{A}{"1D00} \%
\DeclareTextComposite{\tipaunisemicolon}{TU}{H}{"29C} \%
\% Vowels
\DeclareTextSymbol{\textsci}{TU}{"26A} \%
\DeclareTextSymbol{\textscy}{TU}{"28F} \%
\DeclareTextSymbol{\textepsilon}{TU}{"25B} \%
\DeclareTextSymbol{\textbari}{TU}{"268} \%
\DeclareTextSymbol{\textbaru}{TU}{"289} \%
\DeclareTextSymbol{\textupsilon}{TU}{"28A} \%
\DeclareTextSymbol{\textreve}{TU}{"258} \% ɘ
\DeclareTextSymbol{\textbaro}{TU}{"275} \%
\DeclareTextSymbol{\textschwa}{TU}{"259} \% ə
\DeclareTextSymbol{\textrevepsilon}{TU}{"25C} \%
\DeclareTextSymbol{\textcloserevepsilon}{TU}{"25E} \%
\% Independent diacritic marks
\%-- Rhoticity
\%-- Tie bar (below)
\%-- Tie bar (below) - standalone character
\%-- Laminal
\% Other complex shorthand commands
The following commands redefine the TIPA shorthand input for dependent diacritics.
\% No audible release
\% Syllabic
\% Shipping
\% Non-syllabic
\% Laminal
\% Other complex shorthand commands
We need a few variables.
\seq_new:N \l__tipauni_remove_from_accents_seq
\tl_new:N \l__tipauni_textipa_tl

Since we have a non-standard syntax for some of the accent macros (having a starred variant) we have to exclude them from the list of accents which get special handling from \text_expand:n or else the stars will be surrounded by braces and not found by \@ifstar. This sequence stores the problematic accents which need to be excluded.
\seq_set_split:Nnn \l__tipauni_remove_from_accents_seq { , } { \~, \=, \", \r, \v, \t }

We only search for the macros not contained in tipa if this is requested by the user.
\ifnontipaignore
\cs_new_eq:NN \__tipauni_nontipa_search: \prg_do_nothing:
\cs_new_eq:NN \__tipauni_nontipa_search:n \use_none:n
else
\cs_new_protected:Npn \__tipauni_nontipa_search:
{ \unless\ifnontipa
  \exp_args:No \__tipauni_nontipa_search:n \l__tipauni_textipa_tl
  \fi
}

The warning thrown at the end of the run doesn’t list which symbols were incompatible, so we stop searching when we found one incompatible symbol. We use \str_if_in:mnT so
that groups don’t affect the search. The alternative would be the much slower \regex_match:nnT.

\cs_new_protected:Npn \__tipauni_nontipa_search:n #1
\begin{verbatim}
{ \str_if_in:nnT {#1} {�} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {�} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {�} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {�} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {\n} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {\n} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {\n} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \str_if_in:nnT {#1} {\n} { \nontipatrue \use_none_delimit_by_s_stop:w }
 \use_none:nnn \s_stop
\use:n \cs_gset_eq:NN \__tipauni_nontipa_search: \prg_do_nothing: }
\end{verbatim}

The user facing macro needs to make some local settings.
\NewDocumentCommand\textipa{ +m }%
{ \begingroup
 \let\*\tipaunistar
 \let:\=\tipaunicolon
 \let;\=\tipaunisemicolon
 \let\!\=\tipaunibang
 \let\|\=\tipaunipipe
 \let\=\tipaunit
\seq_map_inline:Nn \l__tipauni_remove_from_accents_seq
{ \tl_remove_all:Nn \l_text_accents_tl {##1} }

Here we locally remove the accents which have a starred variant from the exclusion list of \text_expand:n.
\tl_set:Nx \l__tipauni_textipa_tl \seq_map_inline:Nn \l__tipauni_remove_from_accents_seq {\tl_remove_all:Nn \l_text_accents_tl {#1} }

Here is the real replacement. First we carefully expand the input using \text_expand:n, then we’ll loop over the token list with a construct similar to the expl3 internal \__tl_act:NNNn (hence the name \__tipauni_act:n). Since the replacement code depends on the correct string representation of things we explicitly set the escapechar to a backward-slash and reset it afterwards.
\tl_set:Nx \l__tipauni_textipa_tl \seq_map_inline:Nn \l__tipauni_remove_from_accents_seq {\tl_remove_all:Nn \l_text_accents_tl {#1} }
\exp_not:n \tl_set:Nx \l__tipauni_textipa_tl \seq_map_inline:Nn \l__tipauni_remove_from_accents_seq {\tl_remove_all:Nn \l_text_accents_tl {#1} }
\exp_not:n \tl_set:Nx \l__tipauni_textipa_tl
\begin{verbatim}
{ \exp_args:No \__tipauni_act:n \l__tipauni_textipa_tl }
\escapechar =`
\end{verbatim}
\tl_set:Nx \l__tipauni_textipa_tl \seq_map_inline:Nn \l__tipauni_remove_from_accents_seq {\tl_remove_all:Nn \l_text_accents_tl {#1} }
\exp_not:n \tl_set:Nx \l__tipauni_textipa_tl
\int_use:N \escapechar
\end{verbatim}
\exp_stop_f:
\l__tipauni_textipa_tl
\end{verbatim}

Finally test for tipa-incompatible symbols.
\__tipauni_nontipa_search:
We'll need a scan mark for the act code, so we initialise it.
\scan_new:N \s__tipauni_act_stop
\cs_new:Npn \__tipauni_use_none_delimit_by_act_stop:w #1 \s__tipauni_act_stop {}
The act macro uses a bit of low level coding to get good performance. It implements a loop which does the replacement of single letters, bigraphs or combinations of one macro and one letter (which might be separated from the macro by multiple spaces, or contained in braces as an argument, or both). \__tipauni_act:n should be used inside an x-expansion context. The only token which is not allowed to be ever part of the argument for \__tipauni_act:n is \s__tipauni_act_stop.
\cs_new:Npn \__tipauni_act:n #1 { \__tipauni_act_loop:w #1 \s__tipauni_act_stop }
Just to have an easier to spot output we use a private copy of \exp_not:n, meaning we leave the output in the input stream (but since the whole loop should be used in an x-expansion context this is fine, anything expecting arguments will get those later).
\cs_new_eq:NN \__tipauni_act_output:n \exp_not:n
The current loop status is indicated by one macro – \use_none:nn for the initial state;
\__tipauni_act_macro:nn if a macro being the start of a bigraph was encountered; or
\__tipauni_act_char:nn if a character being the start of a bigraph or a monograph was encountered – followed by one n-type argument containing information depending on the state. So for \__tipauni_act_loop:Nnw the arguments are: #1 is the status macro, #2 more status information, #3 the remainder of the argument list. It'll branch off depending on the first token in #3 being either a space, a group (anything started by a character of category 1, typically an opening brace) and anything else (a valid N-type argument).
\cs_new:Npn \__tipauni_act_loop:Nnw #1#2#3 \s__tipauni_act_stop
{ \__tipauni_act_if_head_is_space:nTF {#3} { \__tipauni_act_space:Nnw } \tl_if_head_is_group:nTF {#3} \__tipauni_act_group:Nnn \__tipauni_act_normal:NnN \use_ii:nn }
We'll need a few explicit space tokens in the following definitions, so we use a temporary macro to set this up.
\group_begin:
\cs_set:Npn \__tipauni_tmp:n #1
{ Quick test for a leading space using the stop-marker.
\cs_new:Npn \__tipauni_act_if_head_is_space:nTF #1
{ \__tipauni_act_if_head_is_space:w \s__tipauni_act_stop #1 \s__tipauni_act_stop \__tipauni_act_if_head_is_space_true:w \s__tipauni_act_stop #1 \s__tipauni_act_stop \use_ii:nn }
13
The case with a space needs a bit of special treatment if the current state is macro. In that case we defer the decision and save the space inside the additional status n-type argument. That consists of two nested n-type arguments, the first being the control sequence under test and the second tokens which need to be reinserted should the replacement fail.

This macro just works as a helper to get the two separate arguments in the status and append a space token to the deferred list.

The end marker is a single \s__tipauni_act_stop in a group, hence we need to test for that. If this isn’t the end we need to handle two different cases, if the current state is a macro the group might actually be the correct argument to that macro, else a bigraph shouldn’t contain a group, so we output whatever the current status deferred information was (either as a mono replacement or just as is) and act on the group.

The final code needs to remove the remainder of the loop and reinsert whatever was deferred, unless that happens to be one of the single tokens to be replaced in which case we do the replacement.
The normal case is pretty straightforward, if the current state is the initial state, check whether the token under test is the start of one of the replacement sequences (this would be stored inside a macro), if it isn’t directly output it. If it is the code in that macro will do the right thing. If the current state is something else the state macro will handle things, so we just call it with the arguments it should get.

The code that should handle a macro will test whether a replacement occurs (stored inside a macro), if it does calls that macro, else outputs the deferred information. Since the macro state will have two groups in the deferred state we need to handle that using \use_i:nn to get the macro name, and \use:nn to just unbrace the macro and the other deferred tokens (which might be any number of spaces).

If the char state is active we need to check whether a bigraph was found, if so do that replacement, else test whether the single char is to be replaced without being part of a bigraph, if not output it unchanged. If there was no bigraph the newly found character might be the start of a mono- or bigraph so we pass it back to the N-type act to evaluate
that, in which case we need to remove a trailing `\__tipauni_act_loop:w` which would
start the next loop which we do using `\use_i:nn`.

\cs_new:Npn \__tipauni_act_char:nn #1#2
\{ 
\cs_if_exist_use:cF { \__tipauni_act_char_bigraph_ \tl_to_str:n { #1/#2 } : } 
\{ \cs_if_exist_use:cF { \__tipauni_act_char_mono_ \tl_to_str:n { #1 } : } 
\{ \__tipauni_act_output:n {#1} \} \} 
\use_i:nn \{ \__tipauni_act_normal:Nn \use_none:nn \} \} \} 
\}

To register new bigraphs we use the following functions. The information is always
stored inside two macros, the first is called `@@_act_normal_ ⟨first token⟩:nw` and will
set the correct state, the second is named dependent on the state it should be found
in, either `@@_act_macro_ ⟨first token⟩/⟨second token⟩;`, `@@_act_char_bigraph_ ⟨first
token⟩/⟨second token⟩;`, or `@@_act_char_mono_ ⟨token⟩;`. Those second macros contain
the actual replacement.

The first macro is a wrapper which just inputs `\__tipauni_new_macro_bigraph:NNn`
for the two macros in `#1` and `#2`.

\cs_new_protected:Npn \__tipauni_new_macro_pair_bigraph:NNn #1#2#3#4
\{ 
\__tipauni_new_macro_bigraph:NNn #1 #3 {#4} \__tipauni_new_macro_bigraph:NNn #2 #3 {#4} \}
\}

A macro bigraph should consist of a control sequence followed by another token. It’ll
switch the state to `macro`.

\cs_new_protected:Npn \__tipauni_new_macro_bigraph:NNn #1#2#3
\{ 
\cs_gset:cpn { \__tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w 
\{ \__tipauni_act_loop:Nnw \__tipauni_act_macro:nn { {##1} {} } \} \} 
\cs_gset:cpn { \__tipauni_act_macro_ \tl_to_str:n { #1/#2 } : } 
\{ \__tipauni_act_output:n {#3} \} \}
\}

A character bigraph should consist of two characters. It’ll switch the state to `char`.

\cs_new_protected:Npn \__tipauni_new_char_bigraph:NNn #1#2#3
\{ 
\cs_gset:cpn { \__tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w 
\{ \__tipauni_act_loop:Nnw \__tipauni_act_char:nn { {##1} } \} \} 
\cs_gset:cpn { \__tipauni_act_char_bigraph_ \tl_to_str:n { #1/#2 } : } 
\{ \__tipauni_act_output:n {#3} \} \}
\}

And lastly the single replacements which should just be a single character. These will
also switch the state to `char` (as they might be also a start of a bigraph).

\cs_new_protected:Npn \__tipauni_new_char_mono:Nn #1#2
\{ 
\cs_gset:cpn { \__tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w 
\{ \__tipauni_act_loop:Nnw \__tipauni_act_char:nn { {##1} } \} 
\cs_gset:cpn { \__tipauni_act_char_mono_ \tl_to_str:n { #1 } : } 
\{ \__tipauni_act_output:n {#2} \} \}
\}
Everything that’s now missing is defining the macros storing the replacements as described above.

\__tipauni_new_macro_pair_bigraph:NNNn \! \tipaunibang G {�}
\__tipauni_new_macro_pair_bigraph:NNNn \! \tipaunibang g {�}
\__tipauni_new_macro_pair_bigraph:NNNn \* \tipaunistar 1 {�}
\__tipauni_new_macro_pair_bigraph:NNNn \* \tipaunistar 2 {�}
\__tipauni_new_macro_pair_bigraph:NNNn \* \tipaunistar 3 {�}
\__tipauni_new_macro_pair_bigraph:NNNn \* \tipaunistar Z {�}
\__tipauni_new_macro_pair_bigraph:NNNn \: \tipaunicolon R {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon A {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon G {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon B {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon E {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon H {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon J {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon L {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon N {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon R {�}
\__tipauni_new_macro_pair_bigraph:NNNn \; \tipaunisemicolon U {�}
\\__tipauni_new_char_bigraph:NNn || {�}
\__tipauni_new_char_bigraph:NNn "" {�}
\clist_map_inline:n\{5,6,2,8,1,7,4,19,3,9,4,0,1,17,4,12,1,15,1,20,1,9,17,1,13,1,16,1,18,1,11,1,1,1,1\}
\__tipauni_new_char_mono:Nn #1
\ExplSyntaxOff

The following commands define the long commands for dependent diacritics.

\%\%-- Dependent diacritic marks
\%\%\%-- Voiceless
\DeclareUnicodeAccent\{\textsubring\}{TU}{\textstyle}{0325}\%
\DeclareTextCommand\{\tipaunisubring\}{\textstyle}{\textipa}{\textsubring}\%
\\protected\def\tipaunisubring{\&\ifstar{\TipaUniSubRing}{\TipaUniSubRing}}
\NewDocumentCommand\TipaUniSubRing\{ m \}{\textsubring{\textipa{#1}}}\%
\%\%\%-- Voiced
\DeclareUnicodeAccent\{\textsubwedge\}{TU}{\textstyle}{032C}\%
\DeclareTextCommand\{\tipaunisubwedge\}{\textstyle}{\textipa}{\textsubwedge}\%
\\protected\def\tipaunisubwedge{\&\ifstar{\TipaUniSubWedge}{\TipaUniSubWedge}}
\NewDocumentCommand\TipaUniSubWedge\{ m \}{\textsubwedge{\textipa{#1}}}\%
\%\%\%-- More rounded
\DeclareUnicodeAccent\{\textsubrhalfring\}{TU}{\textstyle}{0339}\%
\NewDocumentCommand\TipaUniSubRhalfring\{ m \}{\textsubrhalfring{\textipa{#1}}}\%
\%\%\%-- Less rounded
\DeclareUnicodeAccent\{\textsublhalfring\}{TU}{\textstyle}{031C}\%
\NewDocumentCommand\TipaUniSubLhalfring\{ m \}{\textsublhalfring{\textipa{#1}}}\%
\%\%\%-- Advanced
\DeclareUnicodeAccent\{\textsubplus\}{TU}{\textstyle}{031F}\%
\NewDocumentCommand\TipaUniSubPlus\{ m \}{\textsubplus{\textipa{#1}}}\%
\%\%\%-- Retracted
\Decla...
Lastly the code for environment IPA is provided by the following.
\begin{verbatim}
\NewDocumentEnvironment{IPA}{+b}{\textipa{#1}}{}
\end{verbatim}
5 GNU Free Documentation License

Version 1.3, 3 November 2008

https://fsf.org/

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Preamble

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