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 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 fonts for loading an IPA font, it needs to be compiled with \XeLaTeX or \LuaLaTeX. 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 Oleinink 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

<table>
<thead>
<tr>
<th>documentfont</th>
<th>documentfont={\font name}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The default font for the entire document set by this package is the Charis SIL. Users can easily change it with the package-option documentfont. This option takes one value which is the {font name}. e.g. For using the Doulos SIL font as the main font, use the package like it is used in the following.</td>
</tr>
<tr>
<td>\usepackage[documentfont=DoulosSIL]{tipauni}</td>
<td></td>
</tr>
</tbody>
</table>

| incompatible          | By default tipauni will throw a warning if symbols not contained in the tipa package were used. Using this option you can switch this check off if you don’t have to stay compatible with 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{\texttt{t}}}) & \textbf{Input B} column lists the short ones (e.g. \texttt{\textipa{{:t}}})\footnote{All of these commands must be enclosed in the \texttt{\textipa} command. (e.g. \texttt{\textipa{{:t}}} for [t])}. This documentation lists down all the commands necessary for typing symbols in the IPA chart.

3.1 Pulmonic consonants
<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>\texttt{\textbackslash tt}</td>
<td>\textbackslash t</td>
<td>[t]</td>
</tr>
<tr>
<td>Retroflex voiced stop</td>
<td>\texttt{\textbackslash tld}</td>
<td>\textbackslash d</td>
<td>[ɖ]</td>
</tr>
<tr>
<td>Palatal voiced stop</td>
<td>\texttt{\textbackslash tj}</td>
<td>\textbackslash j</td>
<td>[ɟ]</td>
</tr>
<tr>
<td>Uvular voiced stop</td>
<td>\texttt{\textbackslash G}</td>
<td>\textbackslash G</td>
<td>[ɢ]</td>
</tr>
<tr>
<td>Glottal voiceless stop</td>
<td>\texttt{\textbackslash tstop}</td>
<td>P</td>
<td>[ʔ]</td>
</tr>
<tr>
<td>Labiodental nasal</td>
<td>\texttt{\textbackslash mlm}</td>
<td>M</td>
<td>[ɱ]</td>
</tr>
<tr>
<td>Retroflex nasal</td>
<td>\texttt{\textbackslash mln}</td>
<td>\textbackslash n</td>
<td>[ɳ]</td>
</tr>
<tr>
<td>Palatal nasal</td>
<td>\texttt{\textbackslash mn}</td>
<td>\textbackslash n</td>
<td>[ɲ]</td>
</tr>
<tr>
<td>Velar nasal</td>
<td>\texttt{\textbackslash N}</td>
<td>\textbackslash N</td>
<td>[ŋ]</td>
</tr>
<tr>
<td>Uvular nasal</td>
<td>\texttt{\textbackslash N}</td>
<td>\textbackslash N</td>
<td>[ɴ]</td>
</tr>
<tr>
<td>Bilabial trill</td>
<td>\texttt{\textbackslash B}</td>
<td>\textbackslash B</td>
<td>[ʙ]</td>
</tr>
<tr>
<td>Uvular trill</td>
<td>\texttt{\textbackslash R}</td>
<td>\textbackslash R</td>
<td>[ʀ]</td>
</tr>
<tr>
<td>Labiodental flap(^1)</td>
<td>\texttt{\textbackslash mlm}</td>
<td>\textbackslash V</td>
<td>[ʋ]</td>
</tr>
<tr>
<td>Alveolar tap</td>
<td>\texttt{\textbackslash fishhookr}</td>
<td>R</td>
<td>[r]</td>
</tr>
<tr>
<td>Retroflex flap</td>
<td>\texttt{\textbackslash mlrr}</td>
<td>\textbackslash r</td>
<td>[ɻ]</td>
</tr>
<tr>
<td>Bilabial voiceless fricative</td>
<td>\texttt{\textbackslash phi}</td>
<td>F</td>
<td>[ɸ]</td>
</tr>
<tr>
<td>Bilabial voiced fricative</td>
<td>\texttt{\textbackslash beta}</td>
<td>B</td>
<td>[β]</td>
</tr>
<tr>
<td>Dental voiceless fricative</td>
<td>\texttt{\textbackslash theta}</td>
<td>T</td>
<td>[θ]</td>
</tr>
<tr>
<td>Dental voiced fricative</td>
<td>\texttt{\textbackslash theta}</td>
<td>T</td>
<td>[θ]</td>
</tr>
<tr>
<td>Palatal voiceless fricative</td>
<td>\texttt{\textbackslash sh}</td>
<td>S</td>
<td>[ʃ]</td>
</tr>
<tr>
<td>Palatal voiced fricative</td>
<td>\texttt{\textbackslash yogh}</td>
<td>Z</td>
<td>[ʒ]</td>
</tr>
<tr>
<td>Retroflex voiceless fricative</td>
<td>\texttt{\textbackslash tails}</td>
<td>S</td>
<td>[ʂ]</td>
</tr>
<tr>
<td>Retroflex voiceless fricative</td>
<td>\texttt{\textbackslash tails}</td>
<td>Z</td>
<td>[ʐ]</td>
</tr>
<tr>
<td>Palatal voiced fricative</td>
<td>\texttt{\textbackslash ctj}</td>
<td>J</td>
<td>[ʝ]</td>
</tr>
<tr>
<td>Velar voiced fricative</td>
<td>\texttt{\textbackslash gamma}</td>
<td>G</td>
<td>[ɣ]</td>
</tr>
<tr>
<td>Uvular voiceless fricative</td>
<td>\texttt{\textbackslash chi}</td>
<td>X</td>
<td>[χ]</td>
</tr>
<tr>
<td>Uvular voiced fricative</td>
<td>\texttt{\textbackslash invscr}</td>
<td>K</td>
<td>[ɤ]</td>
</tr>
<tr>
<td>Pharyngeal voiceless fricative</td>
<td>\texttt{\textbackslash crh}</td>
<td>\textbackslash h</td>
<td>[ħ]</td>
</tr>
<tr>
<td>Pharyngeal voiced fricative</td>
<td>\texttt{\textbackslash evglotstop}</td>
<td>Q</td>
<td>[ʕ]</td>
</tr>
<tr>
<td>Glottal voiced fricative</td>
<td>\texttt{\textbackslash th}</td>
<td>H</td>
<td>[ɦ]</td>
</tr>
<tr>
<td>Alveolar voiceless lateral fricative</td>
<td>\texttt{\textbackslash belt}</td>
<td>\textbackslash l</td>
<td>[ɭ]</td>
</tr>
<tr>
<td>Alveolar voiced lateral fricative</td>
<td>\texttt{\textbackslash yoghlig}</td>
<td>\textbackslash Z</td>
<td>[ʰ]</td>
</tr>
<tr>
<td>Labiodental approximant</td>
<td>\texttt{\textbackslash app}</td>
<td>V</td>
<td>[v]</td>
</tr>
<tr>
<td>Alveolar approximant</td>
<td>\texttt{\textbackslash turnr}</td>
<td>\textbackslash r</td>
<td>[ɹ]</td>
</tr>
<tr>
<td>Retroflex approximant</td>
<td>\texttt{\textbackslash turnr}</td>
<td>\textbackslash R</td>
<td>[ɻ]</td>
</tr>
<tr>
<td>Velar approximant</td>
<td>\texttt{\textbackslash turnmleg}</td>
<td>\textbackslash m</td>
<td>[ɭ]</td>
</tr>
<tr>
<td>Retroflex lateral approximant</td>
<td>\texttt{\textbackslash traill}</td>
<td>\textbackslash l</td>
<td>[ɪ]</td>
</tr>
<tr>
<td>Palatal lateral approximant</td>
<td>\texttt{\textbackslash turny}</td>
<td>L</td>
<td>[ʎ]</td>
</tr>
<tr>
<td>Velar lateral approximant</td>
<td>\texttt{\textbackslash acl}</td>
<td>\textbackslash L</td>
<td>[ɭ]</td>
</tr>
</tbody>
</table>
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><code>\textbullseye</code></td>
<td><code>\!o</code></td>
<td>[ʘ]</td>
</tr>
<tr>
<td>Postalveolar click</td>
<td><code>\pstalvclick</code></td>
<td>!</td>
<td>[ǃ]</td>
</tr>
<tr>
<td>Palatoalveolar click</td>
<td><code>\textdoublebargraph</code></td>
<td><code>\!c</code></td>
<td>[ǂ]</td>
</tr>
<tr>
<td>Alveolar lateral click</td>
<td><code>\textdoublebargraph</code></td>
<td>`</td>
<td></td>
</tr>
<tr>
<td>Bilabial implosive</td>
<td><code>\texthtb</code></td>
<td><code>\!b</code></td>
<td>[ɓ]</td>
</tr>
<tr>
<td>Dental implosive</td>
<td><code>\texthtd</code></td>
<td><code>\!d</code></td>
<td>[ɗ]</td>
</tr>
<tr>
<td>Palatal implosive</td>
<td><code>\texthtbdotlessj</code></td>
<td><code>\!j</code></td>
<td>[ʄ]</td>
</tr>
<tr>
<td>Velar implosive</td>
<td><code>\texthtg</code></td>
<td><code>\!g</code></td>
<td>[ɠ]</td>
</tr>
<tr>
<td>Uvular implosive</td>
<td><code>\texthtscg</code></td>
<td><code>\!G</code></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><code>\textturnw</code></td>
<td><code>\!*w</code></td>
<td>[ʍ]</td>
</tr>
<tr>
<td>Labial-palatal voiced approximant</td>
<td><code>\textturnh</code></td>
<td>4</td>
<td>[ɥ]</td>
</tr>
<tr>
<td>Epiglottal voiceless fricative</td>
<td><code>\textsch</code></td>
<td><code>\!*H</code></td>
<td>[ʜ]</td>
</tr>
<tr>
<td>Epiglottal voiced fricative/approximant</td>
<td><code>\textbarrevglotstop</code></td>
<td><code>\!*1</code></td>
<td>[ʢ]</td>
</tr>
<tr>
<td>Alveolar voiced lateral flap</td>
<td><code>\textturnlonglegr</code></td>
<td><code>\!*r</code></td>
<td>[ɺ]</td>
</tr>
<tr>
<td>Epiglottal plosive</td>
<td><code>\textbarglotstop</code></td>
<td><code>\!*2</code></td>
<td>[ʡ]</td>
</tr>
<tr>
<td>Alveolo-palatal voiceless fricative</td>
<td><code>\textctc</code></td>
<td><code>C</code></td>
<td>[ɕ]</td>
</tr>
<tr>
<td>Alveolo-palatal voiced fricative</td>
<td><code>\textctz</code></td>
<td><code>\!*Z</code></td>
<td>[ʑ]</td>
</tr>
<tr>
<td>Postalveolar-velar voiceless fricative</td>
<td><code>\texttheng</code></td>
<td><code>\!*3</code></td>
<td>[ɧ]</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><code>\textsci</code></td>
<td>I</td>
<td>[i]</td>
</tr>
<tr>
<td>Near-close near-front rounded</td>
<td><code>\textscy</code></td>
<td>y</td>
<td>[ѵ]</td>
</tr>
<tr>
<td>Open-mid front unrounded</td>
<td><code>\textepsilon</code></td>
<td>E</td>
<td>[ɛ]</td>
</tr>
<tr>
<td>Close central unrounded</td>
<td><code>\textbari</code></td>
<td>1</td>
<td>[ɨ]</td>
</tr>
<tr>
<td>Close central rounded</td>
<td><code>\textbaru</code></td>
<td>0</td>
<td>[ʉ]</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>\texttr</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</td>
<td>\textsi</td>
<td>[ə‿i]</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{s}</td>
<td>\texttextstar{m}</td>
<td>[m̥]</td>
</tr>
<tr>
<td>Voiced</td>
<td>\textsubwedge{s}</td>
<td>\texttextstar{s}</td>
<td>[s̬]</td>
</tr>
<tr>
<td>More rounded</td>
<td>\textsubrhalfring{w}</td>
<td>\textset{w}</td>
<td>[w]</td>
</tr>
<tr>
<td>Less rounded</td>
<td>\textsublhalfring{w}</td>
<td>\textset{w}</td>
<td>[w̅]</td>
</tr>
<tr>
<td>Advanced</td>
<td>\textsubplus{ə}</td>
<td>\texttextstar{+e}</td>
<td>[ə̟]</td>
</tr>
<tr>
<td>Retracted</td>
<td>\textsubbar{l}</td>
<td>\texttextstar{l}</td>
<td>[l̠]</td>
</tr>
<tr>
<td>Mid-centralized</td>
<td>\textovercross{e}</td>
<td>\textset{e}</td>
<td>[e̽]</td>
</tr>
<tr>
<td>Syllabic</td>
<td>\textsyllabic{n}</td>
<td>\textset{n}</td>
<td>[n̩]</td>
</tr>
<tr>
<td>Non-syllabic</td>
<td>\textsubarch{a}</td>
<td>\textset{a}</td>
<td>[a̯]</td>
</tr>
<tr>
<td>Breathy voiced</td>
<td>\textsubumlaut{b}</td>
<td>\texttextstar{b}</td>
<td>[b̤]</td>
</tr>
<tr>
<td>Creaky voiced</td>
<td>\textsubtilde{a}</td>
<td>\texttextstar{a}</td>
<td>[a̰]</td>
</tr>
<tr>
<td>Linguolabial</td>
<td>\textseagull{l}</td>
<td>\textset{m}</td>
<td>[ḻ]</td>
</tr>
<tr>
<td>Velarized</td>
<td>\textsuperimpose{\texttilde{e}}{{\textim{\texttilde{i}}}}</td>
<td>\textset{{\textim{i}}}</td>
<td>[i̱]</td>
</tr>
<tr>
<td>Raised</td>
<td>\textraising{a}</td>
<td>\texttextstar{'}</td>
<td>[a̝]</td>
</tr>
<tr>
<td>Lowered</td>
<td>\textlowering{a}</td>
<td>\texttextstar{&quot;}</td>
<td>[a̞]</td>
</tr>
<tr>
<td>Advanced tongue root</td>
<td>\textadvancing{a}</td>
<td>\texttextstar{&lt;}</td>
<td>[a̝]</td>
</tr>
<tr>
<td>Retracted tongue root</td>
<td>\textretracting{a}</td>
<td>\texttextstar{&gt;}</td>
<td>[a̞]</td>
</tr>
</tbody>
</table>
The documentation of package the \texttt{tipa} on p. 53 describes a shorthand command i.e. \texttt{\textbackslash{}{\textbackslash{}{\textbackslash{}{arg}}}} which is not functional. I haven’t investigated the reasons, but instead provided a new shorthand command for this character.

\section{Implementation}
\begin{enumerate}
\item \texttt{\textbackslash{}{@@=tipauni}}
\item \texttt{\textbackslash{}{\textbackslash{}{\textbackslash{}{package}}}}
\end{enumerate}

Provide the package with some description \& version specifications.
\begin{enumerate}
\item \texttt{\textbackslash{}{ProvidesPackage\{tipauni\}[2021/04/27 v0.1}}
\item Unicode characters with TIPA commands]
\end{enumerate}

Load necessary packages.
\begin{enumerate}
\item \texttt{\textbackslash{}{RequirePackage\{xpars\}}}
\item \texttt{\textbackslash{}{RequirePackage\{fontspec\}}}
\item \texttt{\textbackslash{}{RequirePackage\{xkeyval\}}}
\end{enumerate}

Package options are provided using the package \texttt{xkeyval}. The following commands provide the option \texttt{documentfont}.
\begin{enumerate}
\item \texttt{\textbackslash{}{setmainfont\{CharisSIL\} \% https://ctan.org/pkg/charissil}}
\item \texttt{\textbackslash{}{DeclareOptionX\{documentfont\}\{\textbackslash{}{setmainfont\{#1\}\}}}}
\item \texttt{\textbackslash{}{newif\{nontipaignore\}}}
\item \texttt{\textbackslash{}{DeclareOptionX\{incompatible\}\{\textbackslash{}{nontipaignoretrue\}}}}
\item \texttt{\textbackslash{}{ProcessOptions\textbackslash{}{X}}\textbackslash{}{relax}}
\end{enumerate}

The following commands were kindly suggested by Phelype Oleinik for developing a conditional which is always global.
\begin{enumerate}
\item \texttt{\textbackslash{}{newif\{nontipa\}}}
\item \texttt{\textbackslash{}{protected\{def\{nontipatrue\}\{\textbackslash{}{global\textbackslash{}{let\textbackslash{}{nontipa\textbackslash{}{iftrue}}\}}\}}}
\item \texttt{\textbackslash{}{protected\{def\{nontipafalse\}\{\textbackslash{}{global\textbackslash{}{let\textbackslash{}{nontipa\textbackslash{}{iffalse}}\}}\}}}
\item \texttt{\textbackslash{}{ifnontipaignore}}
\item \texttt{\textbackslash{}{protected\{def\{nontipatrue\}\}}}
\item \texttt{\textbackslash{}{fi}}
\end{enumerate}

The following commands provide the command \texttt{\textbackslash{}{tipaunicmd}} for printing characters that are missing in the \texttt{tipa} package.
\begin{enumerate}
\item \texttt{\textbackslash{}{NewDocumentCommand\{tipaunicmd\}\{m m\}\{}}
\item \texttt{\textbackslash{}{NewDocumentCommand\#1\{}}\texttt{\{nontipatrue#2\}}
\item \texttt{\}}}\texttt{\}}
\end{enumerate}

As can be seen above, everytime when a command that is absent in the \texttt{tipa} package is provided, it sets the conditional \texttt{nontipa} 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{%
\ifnonipa
\PackageWarningNoLine{tipauni}{% 
\hspace{1em} 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}}

%% Pulmonic consonants
%%-- Stops
%%--** Retroflex
\DeclareTextSymbol{\textrtailt}{TU}{0288}{"0288}
\DeclareTextComposite{\tipaunicolon}{TU}{1}{t}{288}
\DeclareTextSymbol{\textrtaild}{TU}{0256}{"0256}
\DeclareTextComposite{\tipaunicolon}{TU}{1}{d}{256}

%%--** Palatal
\DeclareTextSymbol{\textbardotlessj}{TU}{25F}{"25F}
\DeclareTextComposite{\tipaunisemicolon}{TU}{1}{j}{25F}

%%--** Uvular
\DeclareTextSymbol{\textscg}{TU}{262}{"262}
\DeclareTextComposite{\tipaunisemicolon}{TU}{1}{G}{262}

%%--** Glottal
\DeclareTextSymbol{\textglotstop}{TU}{294}{"294}

%% -- Nasals
%%--** Labiodental
\DeclareTextSymbol{\textltailm}{TU}{271}{"271}
\DeclareTextComposite{\tipaunicolon}{TU}{n}{1}{271}

%%--** Palatal
\DeclareTextSymbol{\textltailn}{TU}{273}{"273}
\DeclareTextComposite{\tipaunicolon}{TU}{n}{2}{273}

%%--** Palatal
\DeclareTextSymbol{\textltailn}{TU}{272}{"272}
\DeclareTextComposite{\tipaunicolon}{TU}{n}{2}{272}

%%--** Uvular
\DeclareTextSymbol{\textsctmp}{TU}{274}{"274}
\DeclareTextComposite{\tipaunicolon}{TU}{n}{274}

%%-- Trills
%%--** Bilabial
\DeclareTextSymbol{\textscb}{TU}{299}{"299}
<table>
<thead>
<tr>
<th><strong>Velar</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Retroflex</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Lateral approximants</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Non-pulmonic consonants</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Clicks</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Bilabial</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
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<td><strong>Palato-alveolar</strong></td>
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<td><strong>Implosives</strong></td>
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<tr>
<td><strong>Other consonants</strong></td>
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The following commands redefine the TIPA shorthand input for dependent diacritics.

% No audible release
\DeclareUnicodeAccent{\textcorner}{TU}{"31A} %
\tipaunicmd{\textcorner}{}

% Syllabic
\DeclareUnicodeAccent{\textsyllic}{TU}{"0329} %
\NewDocumentCommand{\textsyllic}{m}{\textipa{#1}\nontipatrue}
% Non-syllabic
\DeclareUnicodeAccent{\textsubarch}{TU}{"032F} %
\NewDocumentCommand{\textsubarch}{m}{\textipa{#1}\ntipatrue}
% Laminal
\DeclareUnicodeAccent{\textsubsquare}{TU}{"033B} %
\NewDocumentCommand{\textsubsquare}{m}{\textipa{#1}\ntipatrue}
% Other complex shorthand commands
\DeclareTextCommand{\@pipeshorthands}{TU}{% 
  if #1[\textpipeshorthand{\textipa{#2}}] else
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:Nn \__tipauni_nontipa_search:n \l__tipauni_textipa_tl
\fi
\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:nnT 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
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\t\tipaunit 
\seq_map_inline:Nn \l__tipauni_remove_from_accents_seq 
{ \tl_remove_all:Nn \l_text_accents_tl {##1} } 
\endgroup } 

Here we locally remove the accents which have a starred variant from the exclusion list of \text_expand:n. 
\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 backslash and reset it afterwards. 
\tl_set:Nx \l__tipauni_textipa_tl { \text_expand:n {#1} } 
\use:x 
\exp_not:n 
\\ 
\tl_set:Nx \l__tipauni_textipa_tl 
{ \exp_args:No \_\_tipauni_act:n \l__tipauni_textipa_tl } 
\escapechar = 
\int_use:N \escapechar 
}

\exp_stop_f: 
\_\_tipauni_textipa_tl 

Finally test for tipa-incompatible symbols. 
\_\_tipauni_nontipa_search: 
\endgroup 

We’ll need a scan mark for the act code, so we initialise it.
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). \texttt{\_\_tipauni\_act:n} should be used inside an \texttt{x}\texttt{-expansion context. The only token which is not allowed to be ever part of the argument for \texttt{\_\_tipauni\_act:n} is \texttt{\_\_tipauni\_act_stop}.

Just to have an easier to spot output we use a private copy of \texttt{\exp\_not:n}, meaning we leave the output in the input stream (but since the whole loop should be used in an \texttt{x}\texttt{-expansion context this is fine, anything expecting arguments will get those later).

The current loop status is indicated by one macro – \texttt{\use\_none:nn} for the initial state; \texttt{\_\_tipauni\_act\_macro:nn} if a macro being the start of a bigraph was encountered; or \texttt{\_\_tipauni\_act\_char:nn} if a character being the start of a bigraph or a monograph was encountered – followed by one \texttt{n\text{-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 \texttt{n\text{-type argument).

We’ll need a few explicit space tokens in the following definitions, so we use a temporary macro to set this up.

Quick test for a leading space using the stop-marker.

We need a few explicit space tokens in the following definitions, so we use a temporary macro to set this up.
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 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.

\cs_new:Npn \__tipauni_act_normal:NnN #1#2#3
{\token_if_eq_meaning:NNTF #1 \use_none:nn
\cs_if_exist_use:cF { __tipauni_act_normal_ \tl_to_str:n {#3} :nw }
{ \__tipauni_act_output:n
{#3}
}
{ #1 {#2} {#3} }
\__tipauni_act_loop:w
}

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).

\cs_new:Npn \__tipauni_act_macro:nn #1#2
{\cs_if_exist_use:cF
\cs_if_exist_use:cF
{ __tipauni_act_macro_ \exp_args:No \tl_to_str:n { \use_i:nn #1 / #2 } : }\exp_args:No \__tipauni_act_output:n
{ \use:nn #1 #2 }
}

If the macro state was active when a group was encountered we need to check whether that group was the correct argument for the replacement, if it was do the replacement, else reinsert the macro and deferred tokens and loop through the group.

\cs_new:Npn \__tipauni_act_group_macro:nn #1#2
{\cs_if_exist_use:cF
\cs_if_exist_use:cF
{ __tipauni_act_group_macro_ \exp_args:No \tl_to_str:n { \use_i:nn #1 / #2 } : }
\exp_args:No \__tipauni_act_output:n
{ \use:nn #1 }
{ __tipauni_act_loop:w #2 \s__tipauni_act_stop . \s__tipauni_act_stop }
}

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
{
To register new bigraphs we use the following functions. The information is always stored inside two macros, the first is called \_\_tipauni\_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 \_\_tipauni\_act\_macro\_\{first token\}/\{second token\}: or \_\_tipauni\_act\_char\_bigraph\_\{first token\}/\{second token\}: or \_\_tipauni\_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
\begin{verbatim}
\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} }
\end{verbatim}

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
\begin{verbatim}
\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} }
\end{verbatim}

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
\begin{verbatim}
\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\_bigraph:nn { {#1} } \}
\cs_gset:cpn { __tipauni_act_char\_mono_ \tl_to_str:n { #1/#2 } : }
{ \__tipauni_act_output:n {#3} }
\end{verbatim}

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:NNn \#1\#2
\begin{verbatim}
\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\_mono:nn { {#1} } \}
\cs_gset:cpn { __tipauni_act_char\_mono_ \tl_to_str:n { #1/#2 } : }
{ \__tipauni_act_output:n {#2} }
\end{verbatim}

Everything that’s now missing is defining the macros storing the replacements as described above.

\_\_tipauni\_new\_macro\_pair\_bigraph:NNn \! \tipaunibang G \{ \}
\_\_tipauni\_new\_macro\_pair\_bigraph:NNn \! \tipaunibang g \{ \}
\_\_tipauni\_new\_macro\_pair\_bigraph:NNn \* \tipaunistar 1 \{ \}
The following commands define the long commands for dependent diacritics.

\begin{verbatim}
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\end{verbatim}

The following commands define the long commands for dependent diacritics.

**-- Dependent diacritic marks**

**-- Voiceless**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubring}{TU}{"0325}
\DeclareTextCommand{\r}{TU}{\textsubring}
\NewDocumentCommand{\textsubring}{m}{\textipa{#1}}
\end{verbatim}

**-- Voiced**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubwedge}{TU}{"032C}
\DeclareTextCommand{\v}{TU}{\textsubwedge}
\NewDocumentCommand{\textsubwedge}{m}{\textipa{#1}}
\end{verbatim}

**-- More rounded**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubrhalfring}{TU}{"0339}
\NewDocumentCommand{\textsubrhalfring}{m}{\textipa{#1}}
\end{verbatim}

**-- Less rounded**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsublhalfring}{TU}{"031C}
\NewDocumentCommand{\textsublhalfring}{m}{\textipa{#1}}
\end{verbatim}

**-- Advanced**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubplus}{TU}{"031F}
\NewDocumentCommand{\textsubplus}{m}{\textipa{#1}}
\end{verbatim}

**-- Retracted**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubbar}{TU}{"0320}
\NewDocumentCommand{\textsubbar}{m}{\textipa{#1}}
\end{verbatim}

**-- Mid-centralized**

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\begin{verbatim}
\DeclareUnicodeAccent{\textsubbar}{TU}{"031F}
\NewDocumentCommand{\textsubbar}{m}{\textipa{#1}}
\end{verbatim}

\end{verbatim}
Lastly the code for environment IPA is provided by the following.
\NewDocumentEnvironment{IPA}{+b}{\textipa{#1}}{}

/package
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Version 1.3, 3 November 2008

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