



# The tipauni package

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 <https://ctan.org/pkg/tipauni>  
 <https://gitlab.com/niruvt/tipauni>

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## Abstract

This package is the second step for L<sup>A</sup>T<sub>E</sub>X-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 `fontspec` for loading an IPA font, it needs to be compiled with X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X or LuaL<sup>A</sup>T<sub>E</sub>X. 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 Oleinik & 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-suit for regression-tests. The tests can be seen in the git-repository of the project.

## 2 Package options

---

<b>documentfont</b>	<code>documentfont=&lt;font name&gt;</code>
---------------------	---

---

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.

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

---

<b>incompatible</b>	By default <code>tipauni</code> will throw a warning if symbols not contained in the <code>tipa</code> package were used. Using this option you can switch this check off if you don't have to stay compatible with <code>tipa</code> to silence this warning.
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---

## 3 List of available commands

TIPA has two alternative methods for inputting IPA characters. In the following tables, **Input A** column lists all the long TIPA commands (e.g. `\texttrtailt`) & **Input B** column lists the short ones (e.g. `\textipa{\:t}`)<sup>1</sup>. This documentation lists down all the commands necessary for typing symbols in the IPA chart.

### 3.1 Pulmonic consonants

---

<sup>1</sup>All of these commands must be enclosed in the `\textipa` command. (e.g. `\textipa{\:tP}` for [\[ʔ\]](#))

Description	- Input A	- Input B	- Symbol
Retroflex voiceless stop	- \texttrtailt	- \:t	- [t]
Retroflex voiced stop	- \texttrtaild	- \:d	- [d]
Palatal voiced stop	- \textbardotlessj	- *j	- [j]
Uvular voiced stop	- \textscg	- \;G	- [G]
Glottal voiceless stop	- \textglotstop	- P	- [ʔ]
Labiodental nasal	- \textltailm	- M	- [m]
Retroflex nasal	- \textrtailn	- \:n	- [ɳ]
Palatal nasal	- \textltailn	- *n	- [ɲ]
Velar nasal	- \ng <sup>s</sup>	- N	- [ŋ]
Uvular nasal	- \textscn	- \;N	- [ɴ]
Bilabial trill	- \textscb	- \;B	- [ʙ]
Uvular trill	- \textscr	- \;R	- [ʀ]
Labiodental flap <sup>1</sup>	- \labdentflap	- *v	- [ɸ]
Alveolar tap	- \textfishhookr	- R	- [ɾ]
Retroflex flap	- \textrtailr	- \:r	- [ɽ]
Bilabial voiceless fricative	- \textphi	- F	- [ɸ]
Bilabial voiced fricative	- \textbeta	- B	- [β]
Dental voiceless fricative	- \texttheta	- T	- [θ]
Dental voiced fricative	- \dh <sup>s</sup>	- D	- [ð]
Palatal voiceless fricative	- \textsh	- S	- [ɕ]
Palatal voiced fricative	- \textyogh	- Z	- [ʒ]
Retroflex voiceless fricative	- \textrtails	- \:s	- [ɬ]
Retroflex voiced fricative	- \textrtailz	- \:z	- [ɺ]
Palatal voiced fricative	- \textctj	- J	- [ɟ]
Velar voiced fricative	- \textgamma	- G	- [ɣ]
Uvular voiceless fricative	- \textchi	- X	- [χ]
Uvular voiced fricative	- \textinvscr	- K	- [ʁ]
Pharyngeal voiceless fricative	- \textcrh	- *h	- [ħ]
Pharyngeal voiced fricative	- \textrevglotstop	- Q	- [ʕ]
Glottal voiced fricative	- \texthth	- H	- [ɦ]
Alveolar voiceless lateral fricative	- \textbeltl	- *l	- [ɬ]
Alveolar voiced lateral fricative	- \textlyoghlig	- *z	- [ɺ]
Labiodental approximant	- \labdentapp	- V	- [ɸ]
Alveolar approximant	- \textturnr	- *r	- [ɹ]
Retroflex approximant	- \textturnrrtail	- \:R	- [ɻ]
Velar approximant	- \textturnmrleg	- *m	- [ɰ]
Retroflex lateral approximant	- \textrtail1	- \:l	- [ɭ]
Palatal lateral approximant	- \textturny	- L	- [ʎ]
Velar lateral approximant	- \textsc1	- \;L	- [ɮ]

---

<sup>s</sup> These commands are also available without package `tipa`.

<sup>1</sup> 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 `tipa`-exclusive commands are written with red color in this documentation.

---

### 3.2 Non-Pulmonic consonants

Description	- Input A	- Input B	- Symbol
Bilabial click	- <code>\textbullseye</code>	- <code>\!o</code>	- [⦿]
Postalveolar click	- <code>\pstalvclick</code>	- <code>!</code>	- [!] ]
Palatoalveolar click	- <code>\textdoublebarpipe</code>	- <code>\!c</code>	- [‡]
Alveolar lateral click	- <code>\textdoublepipe</code>	- <code>  </code>	- [  ]
Bilabial implosive	- <code>\texthtb</code>	- <code>\!b</code>	- [ɓ]
Dental implosive	- <code>\texthtd</code>	- <code>\!d</code>	- [ɗ]
Palatal implosive	- <code>\texthtbardotlessj</code>	- <code>\!j</code>	- [ɟ]
Velar implosive	- <code>\texthtg</code>	- <code>\!g</code>	- [ɠ]
Uvular implosive	- <code>\texthtscg</code>	- <code>\!G</code>	- [ʁ]

### 3.3 Other symbols

Description	Input A	- Input B	- Symbol
Labial-velar voiceless fricative	- <code>\textturnw</code>	- <code>\*w</code>	- [ɰ]
Labial-palatal voiced approximant	- <code>\textturnh</code>	- <code>4</code>	- [ɥ]
Epiglottal voiceless fricative	- <code>\textsch</code>	- <code>\;H</code>	- [ħ]
Epiglottal voiced fricative/approximant	- <code>\textbarrevglotstop</code>	- <code>\*1</code>	- [ʕ]
Alveolar voiced lateral flap	- <code>\textturnlonglegr</code>	- <code>\!r</code>	- [ɭ]
Epiglottal plosive	- <code>\textbarglotstop</code>	- <code>\*2</code>	- [ʡ]
Alveolo-palatal voiceless fricative	- <code>\textctc</code>	- <code>C</code>	- [ç]
Alveolo-palatal voiced fricative	- <code>\textctz</code>	- <code>\*Z</code>	- [ʒ]
Postalveolar-velar voiceless fricative	- <code>\texttheng</code>	- <code>\*3</code>	- [ɟ͡ʂ]

### 3.4 Vowels

Description	- Input A	- Input B	- Symbol
Near-close near-front unrounded	- <code>\textsci</code>	- <code>I</code>	- [ɪ]
Near-close near-front rounded	- <code>\textscy</code>	- <code>y</code>	- [ʏ]
Open-mid front unrounded	- <code>\textepsilon</code>	- <code>E</code>	- [ɛ]
Close central unrounded	- <code>\textbari</code>	- <code>1</code>	- [ɨ]
Close central rounded	- <code>\textbaru</code>	- <code>0</code>	- [ʉ]

Near-close near-back rounded	- \textupsilon	- U	- [ʊ]
Close-mid central unrounded	- \textreve	- 9	- [ə]
Close-mid central rounded	- \textbaro	- 8	- [ø]
Mid central vowel	- \textschwa	- @	- [ə]
Open-mid central unrounded	- \textrevepsilon	- 3	- [ɜ]
Open-mid central rounded	- \textcloserevepsilon	- &	- [ɔ]
Near-open central	- \textturna	- 5	- [ɐ]
Close back unrounded	- \textturnm	- W	- [ʊ]
Close-mid back unrounded	- \textramshorns	- 7	- [ɹ]
Open-mid back unrounded	- \textturnv	- 2	- [ʌ]
Open-mid back rounded	- \textopeno	- 0	- [ɔ]
Open back unrounded	- \textscripta	- A	- [ɑ]
Open back rounded	- \textturnscripta	- 6	- [ɒ]

### 3.5 Independent diacritics

Description	- Input A	- Input B	- Symbol
Rhoticity	- ə\texttrhoticity	- ə\tr	- [ə]
No audible release	- n\textcorner	- n\tc	- [n]
Tie bar (standalone)	- \stdlnetiebar{ei}	- \ts{ei}	- [ə_i]

### 3.6 Dependent diacritics

Description	- Input A	- Input B	- Symbol
Voiceless	- \textsubring{m}	- \r*m	- [m̥]
Voiced	- \textsubwedge{s}	- \v*s	- [s̥]
More rounded	- \textsubrhalfring{w}	- \l)w	- [w̥]
Less rounded	- \textsublhalfring{w}	- \l(w	- [w̥]
Advanced	- \textsubplus{ə}	- \l+e	- [ə̥]
Retracted	- \textsubbar{l}	- \=*l	- [l̥]
Mid-centralized	- \textovercross{e}	- \l x{e}	- [é]
Syllabic	- \textsyllabic{n}	- \s{n}	- [n̥]
Non-syllabic	- \textsubarch{a}	- \ns{a}	- [ḁ]
Breathy voiced	- \textsubumlaut{b}	- \"*b	- [b̥]
Creaky voiced	- \textsubtilde{ə}	- \~*@	- [ə̥]
Linguolabial	- \textseagull{l}	- \lml	- [l̥]
Velarized	- \textsuperimposetilde{i}	- \vl{i} <sup>1</sup>	- [i̥]
Raised	- \textraising{ə}	- \l'@	- [ə̥]
Lowered	- \textlowering{ə}	- \l'@	- [ə̥]
Advanced tongue root	- \textadvancing{ə}	- \l<@	- [ə̥]
Retracted tongue root	- \textretracting{ə}	- \l>@	- [ə̥]

---

Dental	- <code>\textsubbridge{t}</code>	- <code>\l[t</code>	- <a href="#">[t]</a>
Apical	- <code>\textinvsubbridge{t}</code>	- <code>\l]t</code>	- <a href="#">[t]</a>
Laminal	- <code>\textsubsquare{s}</code>	- <code>\lmn{s}</code>	- <a href="#">[s]</a>
Tie bar (top)	- <code>\textttop.tiebar{ei}</code>	- <code>\t{ei}</code>	- <a href="#">[ei]</a>
Tie bar (bottom)	- <code>\textbottomtiebar{ei}</code>	- <code>\t*{ei}</code>	- <a href="#">[ei]</a>

---

<sup>1</sup> The documentation of package `tipa` on p. 53 describes a shorthand command i.e. `\l~{arg}` which is not functional. I haven't investigated the reasons, but instead provided a new shorthand command for this character.

---

## 4 Implementation

```

1 <@@=tipauni>
2 <*package>

```

Provide the package with some description & version specifications.

```

3 \ProvidesPackage{tipauni}[2021/04/27 v0.1
4 Unicode characters with TIPA commands]

```

Load necessary packages.

```

5 \RequirePackage{xparse}
6 \RequirePackage{fontspec}
7 \RequirePackage{xkeyval}

```

Package options are provided using the package `xkeyval`. The following commands provide the option `documentfont`.

```

8 \setmainfont{CharisSIL} %% https://ctan.org/pkg/charissil
9 \DeclareOptionX{documentfont}{\setmainfont{#1}}
10 \newif\ifnontipaignore
11 \DeclareOptionX{incompatible}{\nontipaignoretrue}
12 \ProcessOptionsX\relax

```

The following commands were kindly suggested by Phelype Oleinik for developing a conditional which is always global.

```

13 \newif\ifnontipa
14 \protected\def\nontipatrue{\global\let\ifnontipa\iftrue}
15 \protected\def\nontipafalse{\global\let\ifnontipa\iffalse}
16 \ifnontipaignore
17 \protected\def\nontipatrue{}
18 \fi

```

The following commands provide the command `\tipaunicmd` for printing characters that are missing in the `tipa` package.

```

19 \NewDocumentCommand\tipaunicmd{ m m }{%
20   \NewDocumentCommand#1{ }{\nontipatrue #2}%
21 }%

```

As can be seen above, everytime when a command that is absent in the `tipa` package is provided, it sets the conditional `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.

```

22 \AtEndDocument{%
23   \ifnontipa
24     \PackageWarningNoLine{tipauni}{%
25       You have used a command(s) that is (are) not\MessageBreak
26       supported by package TIPA. Thus your current code is\MessageBreak
27       incompatible with that package. These commands are\MessageBreak
28       printed with a different Unicode font. Refer to the\MessageBreak
29       documentation of package tipauni for a list of\MessageBreak
30       commands that are not supported in TIPA%
31     }%
32   \else
33     \fi
34 }%

```

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

```

35 \DeclareTextCommand{\tipaunistar}{TU}[1]{{#1}}
36 \DeclareTextAccentDefault{\tipaunistar}{TU}
37 \DeclareTextCommand{\tipaunisemicolon}{TU}[1]{{#1}}
38 \DeclareTextAccentDefault{\tipaunisemicolon}{TU}
39 \DeclareTextCommand{\tipaunicolon}{TU}[1]{{#1}}
40 \DeclareTextAccentDefault{\tipaunicolon}{TU}
41 \DeclareTextCommand{\tipaunibang}{TU}[1]{{#1}}
42 \DeclareTextAccentDefault{\tipaunibang}{TU}
43 \DeclareTextCommand{\tipaunipipe}{TU}[2]{\@pipeshortands{#1}{#2}}
44 \DeclareTextAccentDefault{\tipaunipipe}{TU}
45 %% Pulmonic consonants
46 %%-- Stops
47 %%--** Retroflex
48 \DeclareTextSymbol{\texttrtailt}{TU}{"0288}%%
49 \DeclareTextComposite{\tipaunicolon}{TU}{t}{"288}
50 \DeclareTextSymbol{\texttrtaild}{TU}{"0256}%%
51 \DeclareTextComposite{\tipaunicolon}{TU}{d}{"256}
52 %%--** Palatal
53 \DeclareTextSymbol{\textbardotlessj}{TU}{"25F}%%
54 \DeclareTextComposite{\tipaunistar}{TU}{j}{"25F}
55 %%--** Uvular
56 \DeclareTextSymbol{\textscg}{TU}{"262}%%
57 \DeclareTextComposite{\tipaunisemicolon}{TU}{G}{"262}
58 %%--** Glottal
59 \DeclareTextSymbol{\textglotstop}{TU}{"294}%%
60 %%-- Nasals
61 %%--** Labiodental
62 \DeclareTextSymbol{\textltailm}{TU}{"271}%%
63 %%--** Retroflex
64 \DeclareTextSymbol{\texttrtailn}{TU}{"273}%%
65 \DeclareTextComposite{\tipaunicolon}{TU}{n}{"273}
66 %%--** Palatal
67 \DeclareTextSymbol{\textltailn}{TU}{"272}%%
68 \DeclareTextComposite{\tipaunistar}{TU}{n}{"272}
69 %%--** Uvular
70 \DeclareTextSymbol{\textscn}{TU}{"274}%%
71 \DeclareTextComposite{\tipaunisemicolon}{TU}{N}{"274}
72 %%-- Trills
73 %%--** Bilabial
74 \DeclareTextSymbol{\textscb}{TU}{"299}%%

```

```

75 \DeclareTextComposite{\tipaunisemicolon}{TU}{B}{"299}
76 %%---** Uvular
77 \DeclareTextSymbol{\textscr}{TU}{"280}%%
78 \DeclareTextComposite{\tipaunisemicolon}{TU}{R}{"280}
79 %%-- Taps or flaps
80 %%-- Labiodental flap
81 \tipaunicmd{\labdentflap}{ } %% tipauni-exclusive
82 \DeclareTextComposite{\tipaunistar}{TU}{v}{"2C71} %% tipauni-exclusive
83 %%---** Alveolar
84 \DeclareTextSymbol{\textfishhookr}{TU}{"27E}%%
85 %%---** Retroflex
86 \DeclareTextSymbol{\textrtailr}{TU}{"27D}%%
87 \DeclareTextComposite{\tipaunicolon}{TU}{r}{"27D}
88 %%-- Fricatives
89 %%---** Bilabial
90 \DeclareTextSymbol{\textphi}{TU}{"278}%%
91 \DeclareTextSymbol{\textbeta}{TU}{"3B2}%%
92 %%---** Dental
93 \DeclareTextSymbol{\texttheta}{TU}{"3B8}%%
94 %%---** Postalveolar
95 \DeclareTextSymbol{\textesh}{TU}{"283}%%
96 \DeclareTextSymbol{\textyogh}{TU}{"292}%%
97 %%---** Retroflex
98 \DeclareTextSymbol{\textrtails}{TU}{"282}%%
99 \DeclareTextComposite{\tipaunicolon}{TU}{s}{"282}
100 \DeclareTextSymbol{\textrtailz}{TU}{"290}%%
101 \DeclareTextComposite{\tipaunicolon}{TU}{z}{"290}
102 %%---** Palatal
103 \DeclareTextSymbol{\textctj}{TU}{"29D}%%
104 %%---** Velar
105 \DeclareTextSymbol{\textgamma}{TU}{"263}%%
106 %%---** Uvular
107 \DeclareTextSymbol{\textchi}{TU}{"3C7}%%
108 \DeclareTextSymbol{\textinvscr}{TU}{"281}%%
109 %%---** Pharyngeal
110 \DeclareTextSymbol{\textcrh}{TU}{"127}%% h
111 \DeclareTextComposite{\tipaunistar}{TU}{h}{"127}
112 \DeclareTextSymbol{\textrevglotstop}{TU}{"295}%%
113 %%---** Glottal
114 \DeclareTextSymbol{\textthth}{TU}{"266}%%
115 %%-- Lateral fricatives
116 %%---** Alveolar
117 \DeclareTextSymbol{\textbeltl}{TU}{"26C}%%
118 \DeclareTextComposite{\tipaunistar}{TU}{l}{"26C}
119 \DeclareTextSymbol{\textlyoghlig}{TU}{"26E}%%
120 \DeclareTextComposite{\tipaunistar}{TU}{z}{"26E}
121 %%-- Approximants
122 %%-- Labiodental approximant
123 \tipaunicmd{\labdentapp}{ } %% tipauni-exclusive
124 %%---** Alveolar
125 \DeclareTextSymbol{\textturnr}{TU}{"279}%%
126 \DeclareTextComposite{\tipaunistar}{TU}{r}{"279}
127 %%---** Retroflex
128 \DeclareTextSymbol{\textturnrrtail}{TU}{"27B}%%

```



```

129 \DeclareTextComposite{\tipaunicolon}{TU}{R}{27B}
130 %%---** Velar
131 \DeclareTextSymbol{\textturnmrleg}{TU}{270}%%
132 \DeclareTextComposite{\tipaunistar}{TU}{m}{270}
133 %%-- Lateral approximants
134 %%---** Retroflex
135 \DeclareTextSymbol{\texttrtail}{TU}{26D}%%
136 \DeclareTextComposite{\tipaunicolon}{TU}{l}{26D}
137 \DeclareTextSymbol{\textturny}{TU}{28E}%%
138 \DeclareTextSymbol{\textschl}{TU}{29F}%%
139 \DeclareTextComposite{\tipaunisemicolon}{TU}{L}{29F}
140 %% Non-pulmonic consonants
141 %%-- Clicks
142 %%---** Bilabial
143 \DeclareTextSymbol{\textbullseye}{TU}{298}%%
144 \DeclareTextComposite{\tipaunibang}{TU}{o}{298}
145 %%-- Postalveolar click
146 \tipaunicmd{\pstalvclick}{ } %% tipauni-exclusive
147 %%---** Palato-alveolar
148 \DeclareTextSymbol{\textdoublebarpipe}{TU}{1C2}%%
149 \DeclareTextComposite{\tipaunibang}{TU}{c}{1C2} %% tipauni-exclusive
150 %%---** Alveolar lateral
151 \DeclareTextSymbol{\textdoublepipe}{TU}{1C1}%
152 %%-- Implosives
153 %%---** Bilabial
154 \DeclareTextSymbol{\texthtb}{TU}{253}%%
155 \DeclareTextComposite{\tipaunibang}{TU}{b}{253}
156 %%---** Dental
157 \DeclareTextSymbol{\texthtd}{TU}{257}%%
158 \DeclareTextComposite{\tipaunibang}{TU}{d}{257}
159 %%---** Palatal
160 \DeclareTextSymbol{\texthtbardotlessj}{TU}{284}%%
161 \DeclareTextComposite{\tipaunibang}{TU}{j}{284}
162 %%---** Velar
163 \DeclareTextSymbol{\texthtg}{TU}{260}%%
164 \DeclareTextComposite{\tipaunibang}{TU}{g}{260}
165 %%---** Uvular
166 \DeclareTextSymbol{\texthtscg}{TU}{29B}%%
167 \DeclareTextComposite{\tipaunibang}{TU}{G}{29B}
168 %% Other consonants
169 \DeclareTextSymbol{\textturnw}{TU}{28D}%%
170 \DeclareTextSymbol{\textturnh}{TU}{265}%%
171 \DeclareTextSymbol{\textsch}{TU}{29C}%%
172 \DeclareTextSymbol{\textbarrevglotstop}{TU}{2A2}%%
173 \DeclareTextComposite{\tipaunistar}{TU}{1}{2A2} %% tipauni-exclusive
174 \DeclareTextSymbol{\textbarglotstop}{TU}{2A1}%%
175 \DeclareTextComposite{\tipaunistar}{TU}{2}{2A1} %% tipauni-exclusive
176 \DeclareTextSymbol{\textctc}{TU}{255}%%
177 \DeclareTextSymbol{\textctz}{TU}{291}%%
178 \DeclareTextComposite{\tipaunistar}{TU}{Z}{291} %% tipauni-exclusive
179 \DeclareTextSymbol{\textturnlongleg}{TU}{27A}%%
180 \DeclareTextComposite{\tipaunibang}{TU}{r}{27A} %% tipauni-exclusive
181 \DeclareTextSymbol{\texttheng}{TU}{267}%%
182 \DeclareTextComposite{\tipaunistar}{TU}{3}{267} %% tipauni-exclusive

```

```

183 \DeclareTextComposite{\tipaunistar}{TU}{k}{\029E} %
184 \DeclareTextComposite{\tipaunistar}{TU}{t}{\0287} %
185 \DeclareTextComposite{\tipaunistar}{TU}{w}{\028D} %
186 \DeclareTextComposite{\tipaunisemicolon}{TU}{E}{\01D07} %
187 \DeclareTextComposite{\tipaunisemicolon}{TU}{J}{\01D0A} %
188 \DeclareTextComposite{\tipaunisemicolon}{TU}{A}{\01D00} %
189 \DeclareTextComposite{\tipaunisemicolon}{TU}{H}{\029C} %
190 \DeclareTextComposite{\tipaunisemicolon}{TU}{U}{\01D1C} %
191 %% Vowels
192 \DeclareTextSymbol{\textsci}{TU}{\026A}%%
193 \DeclareTextSymbol{\textscy}{TU}{\028F}%%
194 \DeclareTextSymbol{\textepsilon}{TU}{\025B}%%
195 \DeclareTextSymbol{\textbari}{TU}{\0268}%%
196 \DeclareTextSymbol{\textbaru}{TU}{\0289}%%
197 \DeclareTextSymbol{\textupsilon}{TU}{\028A}%%
198 \DeclareTextSymbol{\textreve}{TU}{\0258}%% ə
199 \DeclareTextSymbol{\textbaro}{TU}{\0275}%%
200 \DeclareTextSymbol{\textschwa}{TU}{\0259}%% ə
201 \DeclareTextSymbol{\textrevepsilon}{TU}{\025C}%%
202 \DeclareTextSymbol{\textcloserevepsilon}{TU}{\025E}%%
203 \DeclareTextSymbol{\textturna}{TU}{\0250}%%
204 \DeclareTextSymbol{\textturnm}{TU}{\026F}%%
205 \DeclareTextSymbol{\textramshorns}{TU}{\0264}%%
206 \DeclareTextSymbol{\textturnv}{TU}{\028C}%%
207 \DeclareTextSymbol{\textopeno}{TU}{\0254}%%
208 \DeclareTextSymbol{\textscripta}{TU}{\0251}%%
209 \DeclareTextSymbol{\textturnscripta}{TU}{\0252}%%
210 %% Independent diacritic marks
211 %%-- Rhoticity
212 \DeclareTextSymbol{\textrhoticity}{TU}{\02DE}%%
213 \tipaunicmd{\tr}{ }
214 %%-- Tie bar (below)
215 \DeclareTextCommand{\tipaunitextbottomtiebar}{TU}[2]{\#1\symbol{"035C}\#2}
216 \NewDocumentCommand\textbottomtiebar{ m }{\tipaunitextbottomtiebar\#1}
217 %%-- Tie bar (below) - standalone character
218 \DeclareTextCommand{\tipaunits}{TU}[2]{\#1\symbol{"203F}\#2}
219 \NewDocumentCommand\stdlnetiebar{ m }{\tipaunits\#1}
220 \NewDocumentCommand\ts{ m }{\tipaunits\#1}

```

The following commands redefine the TIPA shorthand input for dependent diacritics.

```

221 %% No audible release
222 \DeclareUnicodeAccent{\textcorner}{TU}{\031A}%%
223 \tipaunicmd{\tc}{ }
224 %% Syllabic
225 \DeclareUnicodeAccent{\textsyllabic}{TU}{\0329} %%
226 \NewDocumentCommand\s{ m }{\textsyllabic{\textipa{\#1}}\nontipatrue}
227 %% Non-syllabic
228 \DeclareUnicodeAccent{\textsubarch}{TU}{\032F} %_%
229 \NewDocumentCommand\ns{ m }{\textsubarch{\textipa{\#1}}}
230 %% Laminar
231 \DeclareUnicodeAccent{\textsubsquare}{TU}{\033B} %%
232 \NewDocumentCommand\lmn{ m }{\textsubsquare{\textipa{\#1}}\nontipatrue}
233 %% Other complex shorthand commands
234 \DeclareTextCommand{\@pipeshortands}{TU}[2]{%
235   \if \#1[\tipaunisubbridge{\textipa{\#2}}\else

```

```

236 \if #1]\tipauniinvsubbridge{\textipa{#2}}\else
237 \if #1(\tipaunisublhalfring{\textipa{#2}}\else
238 \if #1)\tipaunisubrhalfring{\textipa{#2}}\else
239 \if #1+\tipaunisubplus{\textipa{#2}}\else
240 \if #1'\tipauniraising{\textipa{#2}}\else
241 \if #1`\tipaunilowering{\textipa{#2}}\else
242 \if #1<\tipauniadvancing{\textipa{#2}}\else
243 \if #1>\tipauniretracting{\textipa{#2}}\else
244 \if #1x\tipauniovercross{\textipa{#2}}\else
245 \if #1m\tipauniseagull{\textipa{#2}}\else #1#2%
246 \fi\fi\fi\fi\fi\fi\fi\fi\fi\fi\fi\fi
247 }%
248 \DeclareTextAccentDefault{\@pipeshorthands}{TU}
249 \ExplSyntaxOn
250 \NewDocumentCommand \super { m }
251 {%
252   \str_case:nn {#1}
253   {
254     {h} { }
255     {w} { }
256     {j} { }
257     { } { }
258     { } { }
259     {n} { }
260     {l} { }
261   }
262 }

```

We need a few variables.

```

263 \seq_new:N \l__tipauni_remove_from_accents_seq
264 \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.

```

265 \seq_set_split:Nnn \l__tipauni_remove_from_accents_seq { , }
266 { \~, \=, \", \r, \v, \t }

```

We only search for the macros not contained in `tipa` if this is requested by the user.

```

267 \ifnontipaignore
268   \cs_new_eq:NN \__tipauni_nontipa_search: \prg_do_nothing:
269   \cs_new_eq:NN \__tipauni_nontipa_search:n \use_none:n
270 \else
271   \cs_new_protected:Npn \__tipauni_nontipa_search:
272   {
273     \unless\ifnontipa
274       \exp_args:No \__tipauni_nontipa_search:n \l__tipauni_textipa_tl
275     \fi
276   }

```

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`.

```

277   \cs_new_protected:Npn \__tipauni_nontipa_search:n #1

```

```

278 {
279   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
280   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
281   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
282   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
283   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
284   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
285   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
286   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
287   \str_if_in:nnT {#1} {} { \nontipatru \use_none_delimit_by_s_stop:w }
288   \use_none:nnn \s_stop
289   \use:n { \cs_gset_eq:NN \__tipauni_nontipa_search: \prg_do_nothing: }
290 }
291 \fi

```

The user facing macro needs to make some local settings.

```

292 \NewDocumentCommand\textipa{ +m }%
293 {
294   \beginngroup
295   \let\*\tipaunistar
296   \let\:\tipaunicolon
297   \let\;\tipaunisemicolon
298   \let\!\tipaunibang
299   \let\|\tipaunipipe
300   \let\t\tipaunit

```

Here we locally remove the accents which have a starred variant from the exclusion list of `\text_expand:n`.

```

301   \seq_map_inline:Nn \l__tipauni_remove_from_accents_seq
302   { \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.

```

303   \tl_set:Nx \l__tipauni_textipa_tl { \text_expand:n {#1} }
304   \use:x
305   {
306     \exp_not:n
307     {
308       \escapechar = \\\
309       \tl_set:Nx \l__tipauni_textipa_tl
310       { \exp_args:No \__tipauni_act:n \l__tipauni_textipa_tl }
311       \escapechar =
312     }
313     \int_use:N \escapechar
314   }
315   \exp_stop_f:
316   \l__tipauni_textipa_tl

```

Finally test for tipa-incompatible symbols.

```

317   \__tipauni_nontipa_search:
318   \endgroup
319 }

```

We'll need a scan mark for the `act` code, so we initialise it.

```

320 \scan_new:N \s__tipauni_act_stop
321 \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`.

```

322 \cs_new:Npn \__tipauni_act:n #1 { \__tipauni_act_loop:w #1 {\s__tipauni_act_stop} . \s__tipau

```

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).

```

323 \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).

```

324 \cs_new:Npn \__tipauni_act_loop:w { \__tipauni_act_loop:Nnw \use_none:nn {} }
325 \cs_new:Npn \__tipauni_act_loop:Nnw #1#2#3 \s__tipauni_act_stop
326 {
327   \__tipauni_act_if_head_is_space:nTF {#3}
328   { \__tipauni_act_space:Nnw }
329   {
330     \tl_if_head_is_group:nTF {#3}
331     { \__tipauni_act_group:Nnn
332       \__tipauni_act_normal:NnN
333     }
334     #1 {#2} #3 \s__tipauni_act_stop
335   }

```

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

```

336 \group_begin:
337   \cs_set:Npn \__tipauni_tmp:n #1
338   {

```

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

```

339   \cs_new:Npn \__tipauni_act_if_head_is_space:nTF ##1
340   {
341     \__tipauni_act_if_head_is_space:w
342     \s__tipauni_act_stop ##1 \s__tipauni_act_stop
343     \__tipauni_act_if_head_is_space_true:w
344     \s__tipauni_act_stop #1 \s__tipauni_act_stop
345     \use_ii:nn
346   }
347   \cs_new:Npn \__tipauni_act_if_head_is_space:w
348   ##1 \s__tipauni_act_stop #1 ##2 \s__tipauni_act_stop
349   {}

```

```

350 \cs_new:Npn \__tipauni_act_if_head_is_space_true:w
351 \s__tipauni_act_stop #1 \s__tipauni_act_stop \use_ii:nn ##1 ##2
352 {##1}

```

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.

```

353 \cs_new:Npn \__tipauni_act_space:Nnw ##1 ##2 #1
354 {
355   \token_if_eq_meaning:NNTF ##1 \__tipauni_act_macro:nn
356   { \__tipauni_act_space_macro:nn ##2 }
357   {
358     \cs_if_exist_use:cTF { __tipauni_act_char_mono_ \tl_to_str:n { ##2 } : }
359     { \__tipauni_act_output:n {~} }
360     { \__tipauni_act_output:n { ##2 ~ } }
361     \__tipauni_act_loop:w
362   }
363 }
364 }
365 \__tipauni_tmp:n {~}
366 \group_end:

```

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.

```

367 \cs_new:Npn \__tipauni_act_space_macro:nn #1#2
368 { \__tipauni_act_loop:Nnw \__tipauni_act_macro:nn { {#1} { #2 ~ } } }

```

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 what ever the current status deferred information was (either as a `mono` replacement or just as is) and act on the group.

```

369 \cs_new:Npn \__tipauni_act_group:Nnn #1#2#3
370 {
371   \__tipauni_use_none_delimit_by_act_stop:w
372   #3 \__tipauni_act_final:Nnw #1 {#2} \s__tipauni_act_stop
373   \token_if_eq_meaning:NNTF #1 \__tipauni_act_macro:nn
374   { \__tipauni_act_group_macro:nn {#2} {#3} }
375   {
376     \cs_if_exist_use:cF { __tipauni_act_char_mono_ \tl_to_str:n { #2 } : }
377     { \__tipauni_act_output:n {#2} }
378     { \__tipauni_act_loop:w #3 {\s__tipauni_act_stop} . \s__tipauni_act_stop }
379   }
380   \__tipauni_act_loop:w
381 }

```

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.

```

382 \cs_new:Npn \__tipauni_act_final:Nnw
383 #1#2 \s__tipauni_act_stop #3 \__tipauni_act_loop:w #4 \s__tipauni_act_stop
384 {
385   \cs_if_exist_use:cF { __tipauni_act_char_mono_ \tl_to_str:n { #2 } : }
386   {
387     \token_if_eq_meaning:NNTF #1 \__tipauni_act_macro:nn

```

```

388         { \exp_args:No \__tipauni_act_output:n { \use:nn #2 } }
389         { \__tipauni_act_output:n {#2} }
390     }
391 }

```

The normal case is pretty straight forward, 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.

```

392 \cs_new:Npn \__tipauni_act_normal:NnN #1#2#3
393 {
394     \token_if_eq_meaning:NNTF #1 \use_none:nn
395     {
396         \cs_if_exist_use:cF { __tipauni_act_normal_ \tl_to_str:n {#3} :nw }
397         { \__tipauni_act_output:n }
398         {#3}
399     }
400     { #1 {#2} {#3} }
401     \__tipauni_act_loop:w
402 }

```

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).

```

403 \cs_new:Npn \__tipauni_act_macro:nn #1#2
404 {
405     \cs_if_exist_use:cF
406     { __tipauni_act_macro_ \exp_args:No \tl_to_str:n { \use_i:nn #1 / #2 } : }
407     { \exp_args:No \__tipauni_act_output:n { \use:nn #1 #2 } }
408 }

```

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.

```

409 \cs_new:Npn \__tipauni_act_group_macro:nn #1#2
410 {
411     \cs_if_exist_use:cF
412     { __tipauni_act_macro_ \exp_args:No \tl_to_str:n { \use_i:nn #1 / #2 } : }
413     {
414         \exp_args:No \__tipauni_act_output:n { \use:nn #1 }
415         { \__tipauni_act_loop:w #2 {\s__tipauni_act_stop} . \s__tipauni_act_stop }
416     }
417 }

```

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`.

```

418 \cs_new:Npn \__tipauni_act_char:nn #1#2
419 {

```

```

420 \cs_if_exist_use:cF { __tipauni_act_char_bigraph_ \tl_to_str:n { #1/#2 } : }
421 {
422   \cs_if_exist_use:cF { __tipauni_act_char_mono_ \tl_to_str:n { #1 } : }
423   { \__tipauni_act_output:n {#1} }
424   \use_i:nn { \__tipauni_act_normal:NnN \use_none:nn {} {#2} }
425 }
426 }

```

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.

```

427 \cs_new_protected:Npn \__tipauni_new_macro_pair_bigraph:NNNn #1#2#3#4
428 {
429   \__tipauni_new_macro_bigraph:NNn #1 #3 {#4}
430   \__tipauni_new_macro_bigraph:NNn #2 #3 {#4}
431 }

```

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

```

432 \cs_new_protected:Npn \__tipauni_new_macro_bigraph:NNn #1#2#3
433 {
434   \cs_gset:cpn { __tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w
435   { \__tipauni_act_loop:Nnw \__tipauni_act_macro:nn { ##1 } {} } }
436   \cs_gset:cpn { __tipauni_act_macro_ \tl_to_str:n { #1/#2 } : }
437   { \__tipauni_act_output:n {#3} }
438 }

```

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

```

439 \cs_new_protected:Npn \__tipauni_new_char_bigraph:NNn #1#2#3
440 {
441   \cs_gset:cpn { __tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w
442   { \__tipauni_act_loop:Nnw \__tipauni_act_char:nn { ##1 } {} }
443   \cs_gset:cpn { __tipauni_act_char_bigraph_ \tl_to_str:n { #1/#2 } : }
444   { \__tipauni_act_output:n {#3} }
445 }

```

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).

```

446 \cs_new_protected:Npn \__tipauni_new_char_mono:Nn #1#2
447 {
448   \cs_gset:cpn { __tipauni_act_normal_ \tl_to_str:n {#1} :nw } ##1##2 \__tipauni_act_loop:w
449   { \__tipauni_act_loop:Nnw \__tipauni_act_char:nn { ##1 } {} }
450   \cs_gset:cpn { __tipauni_act_char_mono_ \tl_to_str:n {#1} : }
451   { \__tipauni_act_output:n {#2} }
452 }

```

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

```

453 \__tipauni_new_macro_pair_bigraph:NNNn \! \tipaunibang G {}
454 \__tipauni_new_macro_pair_bigraph:NNNn \! \tipaunibang g {}
455 \__tipauni_new_macro_pair_bigraph:NNNn \* \tipaunistar 1 {}

```



```

456 \__tipauni_new_macro_pair_biggraph:NNNn \* \tipaunistar      2 { }
457 \__tipauni_new_macro_pair_biggraph:NNNn \* \tipaunistar      3 { }
458 \__tipauni_new_macro_pair_biggraph:NNNn \* \tipaunistar      Z { }
459 \__tipauni_new_macro_pair_biggraph:NNNn \: \tipaunicolon      R { }
460 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon A { }
461 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon G { }
462 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon B { }
463 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon E { }
464 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon H { }
465 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon J { }
466 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon L { }
467 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon N { }
468 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon R { }
469 \__tipauni_new_macro_pair_biggraph:NNNn \; \tipaunisemicolon U { }
470 \__tipauni_new_char_biggraph:NNn || { }
471 \__tipauni_new_char_biggraph:NNn " " { }
472 \clist_map_inline:nn
473 {
474   {5}{ }, {A}{ }, {6}{ }, {2}{ }, {B}{ }, {C}{ }, {D}{ø}, {9}{ø}, {E}{ },
475   {3}{ }, {g}{ }, {G}{ }, {7}{ }, {H}{ }, {L}{ }, {4}{ }, {1}{ }, {I}{ },
476   {J}{ }, {M}{ }, {W}{ }, {N}{η}, {8}{ }, {O}{ }, {F}{ }, {R}{ }, {K}{ },
477   {S}{ }, {T}{ }, {O}{ }, {U}{ }, {V}{ }, {X}{ }, {Y}{ }, {Z}{ },
478   {P}{ }, {Q}{ },
479   {:}{ }, {;}{ }, {!}{ }, {&}{ }, {@}{ø}, {||}{ }, {"}{ }
480 }
481 { \__tipauni_new_char_mono:Nn #1 }
482 \ExplSyntaxOff

```

The following commands define the long commands for dependent diacritics.

```

483 %%-- Dependent diacritic marks
484 %%---** Voiceless
485 \DeclareUnicodeAccent{\textsubring}{TU}{0325} %%
486 \DeclareTextCommand{\r}{TU}{\tipaunisubring}
487 \protected\def\tipaunisubring{\@ifstar{\TipaUniSubRing}{\TipaUniSubRing}}
488 \NewDocumentCommand\TipaUniSubRing{ m }{\textsubring{\textipa{#1}}}
489 %%---** Voiced
490 \DeclareUnicodeAccent{\textsubwedge}{TU}{032C} %%
491 \DeclareTextCommand{\v}{TU}{\tipaunisubwedge}
492 \protected\def\tipaunisubwedge{\@ifstar{\TipaUniSubWedge}{\TipaUniSubWedge}}
493 \NewDocumentCommand\TipaUniSubWedge{ m }{\textsubwedge{\textipa{#1}}}
494 %%---** More rounded
495 \DeclareUnicodeAccent{\textsubrhalfring}{TU}{0339} %%
496 \NewDocumentCommand\tipaunisubrhalfring{ m }{\textsubrhalfring{\textipa{#1}}}
497 %%---** Less rounded
498 \DeclareUnicodeAccent{\textsublhalfring}{TU}{031C} %%
499 \NewDocumentCommand\tipaunisublhalfring{ m }{\textsublhalfring{\textipa{#1}}}
500 %%---** Advanced
501 \DeclareUnicodeAccent{\textsubplus}{TU}{031F} %%
502 \NewDocumentCommand\tipaunisubplus{ m }{\textsubplus{\textipa{#1}}}
503 %%---** Retracted
504 \DeclareUnicodeAccent{\textsubbar}{TU}{0320} %%
505 \DeclareTextCommand{\=}{TU}{\tipaunisubbar}
506 \protected\def\tipaunisubbar{\@ifstar{\TipaUniSubBar}{\TipaUniSubBar}}
507 \NewDocumentCommand\TipaUniSubBar{ m }{\textsubbar{\textipa{#1}}}
508 %%---** Mid-centralized

```

```

509 \DeclareUnicodeAccent{\textovercross}{TU}{033D} %%
510 \NewDocumentCommand\tipauniovercross{ m }{\textovercross{\textipa{#1}}}
511 %%---** Breathy voiced
512 \DeclareUnicodeAccent{\textsubumlaut}{TU}{0324} %%
513 \DeclareTextCommand{\~}{TU}{\tipaunisubumlaut}
514 \protected\def\tipaunisubumlaut{\@ifstar{\TipaUniSubUmlaut}{\TipaUniSubUmlaut}}
515 \NewDocumentCommand\TipaUniSubUmlaut{ m }{\textsubumlaut{\textipa{#1}}}
516 %%---** Creaky voiced
517 \DeclareUnicodeAccent{\textsubtilde}{TU}{0330} %%~
518 \DeclareTextCommand{\-}{TU}{\tipaunisubtilde}
519 \protected\def\tipaunisubtilde{\@ifstar{\TipaUniSubTilde}{\TipaUniSubTilde}}
520 \NewDocumentCommand\TipaUniSubTilde{ m }{\textsubtilde{\textipa{#1}}}
521 %%---** Linguo-labialized
522 \DeclareUnicodeAccent{\textseagull}{TU}{033C} %%
523 \NewDocumentCommand\tipauniseagull{ m }{\textseagull{#1}}
524 %%---** Velarized
525 \DeclareUnicodeAccent{\textsuperimposetilde}{TU}{0334} %%
526 \NewDocumentCommand\tipaunisuperimposetilde{ m }{\textsuperimposetilde{#1}}
527 \NewDocumentCommand\vl{ m }{\textsuperimposetilde{\textipa{#1}}}
528 %%---** Raised
529 \DeclareUnicodeAccent{\textraising}{TU}{031D} %%
530 \NewDocumentCommand\tipauniraising{ m }{\textraising{#1}}
531 %%---** Lowered
532 \DeclareUnicodeAccent{\textlowering}{TU}{031E} %%
533 \NewDocumentCommand\tipaunilowering{ m }{\textlowering{#1}}
534 % %%---** Advanced tongue root
535 \DeclareUnicodeAccent{\textadvancing}{TU}{0318} %%
536 \NewDocumentCommand\tipauniadvancing{ m }{\textadvancing{#1}}
537 %%---** Retracted tongue root
538 \DeclareUnicodeAccent{\textretracting}{TU}{0319} %%
539 \NewDocumentCommand\tipauniretracting{ m }{\textretracting{#1}}
540 %%---** Dental
541 \DeclareUnicodeAccent{\textsubbridge}{TU}{032A} %%
542 \NewDocumentCommand\tipaunisubbridge{ m }{\textsubbridge{#1}}
543 %%---** Apical
544 \DeclareUnicodeAccent{\textinvsubbridge}{TU}{033A} %%
545 \NewDocumentCommand\tipauniinvsubbridge{ m }{\textinvsubbridge{#1}}
546 %%---** Tie bar (above)
547 \DeclareTextCommand\tipaunitexttptiebar{ TU }[2]{#1\symbol{"0361}#2}
548 \NewDocumentCommand\texttptiebar{ m }{\tipaunitexttptiebar#1}
549 \DeclareTextCommand\tipaunit{ TU }{\@ifstar{\textbottomtiebar}{\texttptiebar}}

```

Lastly the code for environment IPA is provided by the following.

```

550 \NewDocumentEnvironment{IPA}{+b}{\textipa{#1}}{}
551 \endpackage

```

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