



# The tipauni package

निरंजन\*

Version 0.3 — 2021-08-07

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

## Contents

<b>1</b>	<b>Acknowledgements</b>	<b>2</b>
<b>2</b>	<b>Package options</b>	<b>2</b>
<b>3</b>	<b>List of available commands</b>	<b>2</b>
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
<b>4</b>	<b>Implementation</b>	<b>6</b>
<b>5</b>	<b>GNU Free Documentation License</b>	<b>19</b>

© 2021 निरंजन

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled “GNU Free Documentation License”.

---

\*✉ [hi.niranjan@pm.me](mailto:hi.niranjan@pm.me)

## 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.
---------------------	--

---

## 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	- [ɬ]
Retroflex voiced stop	- \texttrtaild	- \:d	- [ɮ]
Palatal voiced stop	- \textbardotlessj	- *j	- [j]
Uvular voiced stop	- \textscg	- \;G	- [G]
Glottal voiceless stop	- \textglotstop	- P	- [ʔ]
Labiodental nasal	- \textltailm	- M	- [ɱ]
Retroflex nasal	- \texttrtailn	- \: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	- \texttrtailr	- \: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	- [ɮ]
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	- [ɬ̺]
Alveolar voiced lateral fricative	- \textlyoghlig	- *z	- [ɮ̺]
Labiodental approximant	- \labdentapp	- V	- [ɸ]
Alveolar approximant	- \textturnr	- *r	- [ɹ]
Retroflex approximant	- \textturnrrtail	- \:R	- [ɻ]
Velar approximant	- \textturnmrleg	- *m	- [ɰ]
Retroflex lateral approximant	- \texttrtail1	- \:l	- [ɭ]
Palatal lateral approximant	- \textturny	- L	- [ʎ]
Velar lateral approximant	- \textsc1	- \;L	- [ɮ̹]

---

<sup>§</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>\textttopiebar{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 %% Laminal
231 \DeclareUnicodeAccent{\textsubsquare}{TU}{\033B} %%
232 \NewDocumentCommand\lmn{ m }{\textsubsquare{\textipa{\#1}}\nontipatrue}
233 %% Other complex shorthand commands
234 \DeclareTextCommand{\@pipeshorthands}{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

```

## 5 GNU Free Documentation License

Version 1.3, 3 November 2008

Copyright © 2000, 2001, 2002, 2007, 2008 Free Software Foundation, Inc.

<https://fsf.org/>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

### Preamble

The purpose of this License is to make a manual, textbook, or other functional and useful document “free” in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondly, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of “copyleft”, which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

## 1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The “**Document**”, below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as “**you**”. You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A “**Modified Version**” of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A “**Secondary Section**” is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document’s overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The “**Invariant Sections**” are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is

released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The “**Cover Texts**” are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A “**Transparent**” copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not “Transparent” is called “**Opaque**”.

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The “**Title Page**” means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, “Title Page” means the text near the most prominent appearance of the work’s title, preceding the beginning of the body of the text.

The “**publisher**” means any person or entity that distributes copies of the Document to the public.

A section “**Entitled XYZ**” means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as “**Acknowledgements**”, “**Dedications**”, “**Endorsements**”, or “**History**”.) To “**Preserve the Title**” of such a section when you modify the Document means that it remains a section “Entitled XYZ” according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

## 2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and

that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

### 3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

### 4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.

- B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
- C. State on the Title page the name of the publisher of the Modified Version, as the publisher.
- D. Preserve all the copyright notices of the Document.
- E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
- G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
- H. Include an unaltered copy of this License.
- I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.
- J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.
- K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
- L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
- M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
- N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.
- O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version’s license notice. These titles must be distinct from any other section titles.

You may add a section Entitled “Endorsements”, provided it contains nothing but endorsements of your Modified Version by various parties—for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

## 5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled “History” in the various original documents, forming one section Entitled “History”; likewise combine any sections Entitled “Acknowledgements”, and any sections Entitled “Dedications”. You must delete all sections Entitled “Endorsements”.

## 6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

## 7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an “aggregate” if the copyright resulting from the compilation is not used to limit the legal rights of the compilation’s users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document’s Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

## 8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled “Acknowledgements”, “Dedications”, or “History”, the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

## 9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, or distribute it is void, and will automatically terminate your rights under this License.

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, receipt of a copy of some or all of the same material does not give you any rights to use it.



## 10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See <https://www.gnu.org/licenses/>.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License “or any later version” applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation. If the Document specifies that a proxy can decide which future versions of this License can be used, that proxy’s public statement of acceptance of a version permanently authorizes you to choose that version for the Document.

## 11. RELICENSING

“Massive Multiauthor Collaboration Site” (or “MMC Site”) means any World Wide Web server that publishes copyrightable works and also provides prominent facilities for anybody to edit those works. A public wiki that anybody can edit is an example of such a server. A “Massive Multiauthor Collaboration” (or “MMC”) contained in the site means any set of copyrightable works thus published on the MMC site.

“CC-BY-SA” means the Creative Commons Attribution-Share Alike 3.0 license published by Creative Commons Corporation, a not-for-profit corporation with a principal place of business in San Francisco, California, as well as future copyleft versions of that license published by that same organization.

“Incorporate” means to publish or republish a Document, in whole or in part, as part of another Document.

An MMC is “eligible for relicensing” if it is licensed under this License, and if all works that were first published under this License somewhere other than this MMC, and subsequently incorporated in whole or in part into the MMC, (1) had no cover texts or invariant sections, and (2) were thus incorporated prior to November 1, 2008.

The operator of an MMC Site may republish an MMC contained in the site under CC-BY-SA on the same site at any time before August 1, 2009, provided the MMC is eligible for relicensing.

## ADDENDUM: How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

Copyright © YEAR YOUR NAME. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled “GNU Free Documentation License”.

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the “with ... Texts.” line with this:

with the Invariant Sections being LIST THEIR TITLES, with the Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.