TIPA Manual

Version 1.3

Rei Fukui

Graduate School of Humanities and Sociology

The University of Tokyo

fkr@l.u-tokyo.ac.jp

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PHONETICS is the **science** of speech-sounds.
From a practical point of view it is the **art** of producing speech-sounds and recognizing them by ear.

(Henry Sweet, *A Primer of Phonetics*, 1906; Boldface by Sweet)

The non-roman letters of the International Phonetic Alphabet have been designed as far as possible to harmonise well with the roman letters. The Association does not recognise makeshift letters; It recognises only letters which have been carefully cut so as to be in harmony with the other letters.

(*The Principles of the International Phonetic Association*, 1949)

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Chapter 1

Introduction

TIPA[1] is a system for processing IPA (International Phonetic Alphabet) symbols in LaTeX. It is based on TSIPA[2] but both METAFONT source codes and LaTeX macros have been thoroughly rewritten so it can be considered as a new system.

Among many features of TIPA, the following are the new features as compared with TSIPA or any other existing systems for processing IPA symbols.

- A new 256 character encoding for phonetic symbols ('T3'), which includes all the symbols and diacritics found in the recent versions of IPA and some non-IPA symbols.
- Complete support of LaTeX 2_ε.
- A variety of font styles including roman, slanted, bold, bold extended, sans serif and typewriter.
- Easy input method in the IPA environment.
- Extended macros for accents and diacritics.[3]
- A flexible system of macros for 'tone letters'.
- An optional package (`vowel.sty`) for drawing vowel diagrams. This package can be used independently from the TIPA package.[4]
- A slightly modified set of fonts that go well when used with Times Roman and Helvetica fonts.

[1] TIPA stands for *TEX IPA* or *Tokyo IPA*. The primary ftp site in which the latest version of TIPA is placed is `ftp://tooyoo.L.u-tokyo.ac.jp/pub/TeX/tipa`, and also it is mirrored onto the directory `fonts/tipa` of the CTAN archives.

[2] TSIPA was made in 1992 by Kobayashi Hajime, Fukui Rei and Shirakawa Shun. It is available from a CTAN archive.

One problem with TSIPA was that symbols already included in `OT1`, `T1` or Math fonts are excluded, because of the limitation of its 128 character encoding. As a result, a string of phonetic representation had to be often composed of symbols from different fonts, disabling the possibility of automatic inter-word kerning, and also too many symbols had to be realized as macros.

[3] These macros are now defined in a separate file called '`exaccent.sty`' in order for the authors of other packages to be able to make use of them. The idea of separating these macros from other ones was suggested by Frank Mittelbach.

[4] Documentation is also made separately in '`vowel.tex`' so that no further mention will be made here.

1.1 Installation

1.1.1 Basics

In a CTAN site or any other sites that have a copy of the TIPA package, the directory structure of TIPA looks as follows.

`sty` — containing `*.sty`, `*.fd`, `*.def` files.
`mf` — containing METAFONT source files.
`tfm` — containing font metric files.
`doc` — containing document files.
`dvips` — containing tipa.map file.
`type1` — containing PostScript type1 fonts.

If you are using a recent set of LaTeX2e distribution, all you need to do is basically only two things.

- Copy all the files in the `sty` directory into an appropriate place.
- Copy all the files in the `mf` directory into an appropriate place.

In the case of a popular Unix-like OS, the actual installation procedure will look like the following.
(`$texmf` stands for your TeX system directory; `/usr/local/share/texmf`, for example).

`mkdir $texmf/tex/latex/tipa` — create a directory for style files.
`cp sty/* $texmf/tex/latex/tipa` — copy all the files in `sty`.
`mkdir $texmf/fonts/source/fkr` — create a directory for
`mkdir $texmf/fonts/source/fkr/tipa`   mf files.
`cp mf/* $texmf/fonts/source/fkr/tipa` — copy all the `mf` files.
`mktexlsr` — update the kpathsea database.

If you are using Windows or Mac, follow the equivalent steps: i.e., create a directory/folder for style files and copy the contents of the TIPA `sty` directory/folder; then, create a directory/folder for METAFONT source files and copy the contents of the TIPA `mf` directory/folder.

If you are going to run TIPA on the basis of `pk` files, all other things such as `tfm` files and `pk` files will be generated automatically. That's all for the installation.

You may optionally copy all the `tfm` files into an appropriate directory which TeX and device driver programs can find. This will save time for the automatic font generation.

```
mkdir $texmf/fonts/tfm/fkr
mkdir $texmf/fonts/tfm/fkr/tipa
cp tfm/* $texmf/fonts/tfm/fkr/tipa
```

If your TeX system is not equiped with the automatic font generation mechanism, you may have to create and install `pk` files by yourself. For example:

(generate pk font files; please ask someone how to do this.)
```
mkdir $texmf/fonts/pk/ljfour/fkr
mkdir $texmf/fonts/pk/ljfour/fkr/tipa
cp *pk $texmf/fonts/pk/ljfour/fkr/tipa
```

1.1.2 Installing Type1 fonts

If you want to create a PDF document, you need to install Type1 fonts. First, copy the contents of the directories `dvips` and `type1` onto appropriate directories. For example:

```
cp dvips/tipa.map $texmf/dvips/config
mkdir $texmf/fonts/type1/fkr
mkdir $texmf/fonts/type1/fkr/tipa
cp type1/* $texmf/fonts/type1/fkr/tipa
mktexlsr — update the kpathsea database.
```

Then, edit config files for your device driver. In the case of `dvips`, edit `config.ps` and/or `config.pdf`, for example, and insert a line containing:

```
p +tipa.map
```

There are several ways to make PDF documents. The author of this document usually uses `dvips`. For example:

```
dvips -Ppdf tipaman
```

will produce `tipaman.ps`. In this case, `config.pdf` has to be modified as explained above. Then, by using Acrobat Distiller (this is not free software), you can convert it to a PDF file. Alternatively, you can use free software such as `dvipdfm`, `dvipdf`, `pdflatex`, and so on.

In the case of `pdflatex`, for example, you have to copy the file `tipa.map` onto the following directory.

```
$texmf/pdftex/config
```

Then, edit `pdftex.cfg` and insert a line containing:

```
map +tipa.map
```

1.2 TIPA font families

This version of TIPA includes two families of IPA fonts, `tipa` and `xipa`. The former family of fonts is for normal use with LaTeX, and the latter family is intended to be used with '`times.sty`'(PSNFSS). They all have the same `T3` encoding as explained in the previous section.

- `tipa`

  Roman: `tipa8`, `tipa9`, `tipa10`, `tipa12`, `tipa17`

  Slanted: `tipasl8`, `tipasl9`, `tipasl10`, `tipasl12`

  Bold extended: `tipabx8`, `tipabx9`, `tipabx10`, `tipabx12`

  Bold extended Slanted: `tipabs10`

  Sans serif: `tipass8`, `tipass9`, `tipass10`, `tipass12`, `tipass17`

  Sans serif Bold extended: `tipasb10`

Sans serif Slanted: `tipasi10`

Bold: `tipab10`

Typewriter Text: `tipatt8`, `tipatt9`, `tipatt10`, `tipatt12`

Typewriter Text Slanted: `tipats10`

- `xipa`

  Roman: `xipa10`

  Slanted: `xipasl10`

  Bold: `xipab10`

  Bold Slanted: `xipabs10`

  Sans serif Bold: `xipasb10`

  Sans serif Slanted: `xipasi10`

All these fonts are made by METAFONT, based on the Computer Modern font series. In the case of the `xipa` series, parameters are adjusted so as to look fine when used with Times Roman (in the cases of `xipa10`, `xipasl10`, `xipab10`) and Helvetica (in the case of `xipass10`).

Chapter 2

TIPA Encoding

2.1 Selection of symbols

2.1.1 IPA symbols

When the first version of TIPA (version 1.0) was released, the selection of IPA phonetic symbols was made based on the following works.

- *Phonetic Symbol Guide* (Pullum and Ladusaw, 1986).
- The official IPA charts of '49, '79, '89 and '93 versions.
- Articles published in the *JIPA*[1], such as IPA (1989), IPA (1990), Esling and Gaylord (1993), IPA (1993), and so on.
- An unpublished paper by J. C. Wells: "Computer-coding the IPA: a proposed extension of SAMPA" (Wells, 1995).
- Popular textbooks on phonetics.

More specifically, this first version tried to incorporate all the symbols and diacritics defined in the '79, '89 and '93 versions of IPA and some non-IPA symbols. And in the case of the '49 version of IPA, as was described in the *Principles* (IPA, 1949), there were too many obsolete symbols and only those symbols that had had some popularity at least for some time or for some group of people were included.

Then, soon after the first release, several important works were published.

- The second edition of *Phonetic Symbol Guide* (Pullum and Ladusaw, 1996). (henceforth abbreviated as *PSG*.)
- The official IPA chart of '96 version.
- "Preview of the IPA Handbook" (IPA, 1995).
- *Handbook of the International Phonetic Association* (IPA, 1999). (henceforth abbreviated as *Handbook*.)

[1] *Journal of the International Phonetic Association.*

The differences between '93 and '96 versions of IPA are very few. However, the second edition of *PSG* contains much more symbols than before.

The current version of tipa (version 1.1) is a result of an effort to increase the number of symbols as much as possible and to cover almost all the symbols included in *PSG*. However, the 256 character encoding (see next section for detail) used in TIPA has been already filled with symbols assigned in the first release. Therefore, it was necessary to create a set of new auxiliary fonts to include new symbols, and the new set of fonts is now called TIPX.

It should be also noted that TIPA includes all the necessary elements of 'tone letters', enabling all the theoretically possible combinations of the tone letter system. This system was devised by Yuen-Ren Chao (Chao, 1933) and it is now admitted as an official way of representing tones in the recent publication of the International Phonetic Association.

But the treatment of tone letters is quite insufficient in that only a limited number of combinations is allowed. This is apparently due to the fact that there has been no 'portable' way of combining symbols that can be used across various computer environments. Therefore TEX's productive system of macro is an ideal tool for handling a system like tone letters.

In the process of writing METAFONT source codes for TIPA phonetic symbols there have been many problems besides the one with the selection of symbols. One such problem was that sometimes the exact shape of a symbol was unclear. For example, the shapes of the symbols such as ʗ (Stretched C), and ʝ (Curly-tail J) differ according to sources. This is partly due to the fact that the IPA has been continuously revised for the past few decades, and partly due to the fact that different ways of computerizing phonetic symbols on different systems have resulted in a diversity of the shapes of phonetic symbols.

Although there is no definite answer to such a problem yet, it seems to me that it is a privilege of those working with METAFONT to have a systematic way of controlling the shapes of phonetic symbols.

2.1.2 Non-IPA symbols

Besides IPA symbols, TIPA also contains symbols that are useful for the following areas of phonetics and linguistics.

- Symbols used in the American phonetics. (e.g., æ, ᴇ, ʊ, λ, etc.)
- Symbols used in the historical study of Indo-European languages. (e.g., ꝥ, p, ƕ, ʒ, ь, ъ, and accents such as á̄, ĕ, etc.)
- Symbols used in the phonetic description of languages in East Asia. (e.g., ʅ, ʅ, ȡ, ȵ, ȶ, etc.)
- Diacritics used in 'ExtIPA Symbols for Disordered Speech' (ICPLA, 1994) and 'VoQS (Voice Quality Symbols)' (Ball et al., 1994). (e.g., n̪̈, f, ḿ, etc.)

	'0	'1	'2	'3	'4	'5	'6	'7
'00x	Accents and diacritics							
'04x								
'05x	Punctuation marks							
'06x	Basic IPA symbols I (vowels)							
'07x			Diacritics, etc.					
'10x	Basic IPA symbols II							
'13x				Diacritics, etc.				
'14x	Punct.	Basic IPA symbols III (lowercase letters)						
'17x							Diacritics	
'20x	Tone letters and other suprasegmentals							
'23x								
'24x	Old IPA, non-IPA symbols							
'27x								
'30x	Extended IPA symbols							
'33x							Germanic	
'34x	Basic IPA symbols IV							
'37x							Germanic	

Table 2.1: Layout of the `T3` encoding

2.2 Encoding

The 256 character encoding of TIPA is now officially called the '`T3`' encoding.[2] In deciding this new encoding, care is taken to harmonize with other existing encodings, especially with the `T1` encoding. Also the easiness of inputting phonetic symbols is taken into consideration in such a way that frequently used symbols can be inputted with small number of keystrokes.

Table 2.1 shows the layout of the `T3` encoding.

The basic structure of the encoding found in the first half of the table (character codes `'000-'177`) is based on normal text encodings (ASCII, `OT1` and `T1`) in that sectioning of this area into several groups, such as the section for accents and diacritics, the section for punctuation marks, the section for numerals, and the sections for uppercase and lowercase letters, is basically the same with these encodings.

Note also that the `T3` encoding contains not only phonetic symbols but also usual punctuation marks that are used with phonetic symbols, and in such

[2]In a discussion with the LaTeX 2_ε team it was suggested that the 128 character encoding used in WSUIPA would be referred to as the `OT3` encoding.

ASCII	`:`	`;`	`"`							
TIPA	ː	ˑ	ˈ							
ASCII	`0`	`1`	`2`	`3`	`4`	`5`	`6`	`7`	`8`	`9`
TIPA	ʉ	ɨ	ʌ	ɜ	ɥ	ɐ	ɒ	ɤ	ɵ	ɘ
ASCII	`@`	`A`	`B`	`C`	`D`	`E`	`F`	`G`	`H`	`I`
TIPA	ə	ɑ	β	ç	ð	ɛ	ɸ	ɣ	ɦ	ɪ
ASCII	`J`	`K`	`L`	`M`	`N`	`O`	`P`	`Q`	`R`	`S`
TIPA	ʝ	ʁ	ʎ	ɱ	ŋ	ɔ	ʔ	ʕ	ɾ	ʃ
ASCII	`T`	`U`	`V`	`W`	`X`	`Y`	`Z`	`|`		
TIPA	θ	ʊ	ʋ	ɯ	χ	ʏ	ʒ	|		

Table 2.2: TIPA shortcut characters

cases the same codes are assigned as the normal text encodings. However, it is a matter of trade-off to decide which punctuation marks are to be included. For example ':' and ';' might have been preserved in `T3` but in this case ':' has been traditionally used as a substitute for the length mark 'ː' so that I decided to exclude ':' in favor of the easiness of inputting the length mark by a single keystroke.

The encoding of the section for accents and diacritics is closely related to `T1` in that the accents commonly included in `T1` and `T3` have the same encoding.

The sections for numerals and uppercase letters are filled with phonetic symbols that are used frequently in many languages, because numerals and uppercase letters are usually not used as phonetic symbols. Also, the assignments made here are used as the 'shortcut characters', which will be explained in section 3.2.1.

As for the section for uppercase letters in the usual text encoding, a series of discussion among the members of the `ling-tex` mailing list revealed that there seem to be a certain amount of consensus on what symbols are to be assigned to each code. For example, they were almost unanimous for the assignments such as ɑ for `A`, β for `B`, ð for `D`, ʃ for `S`, θ for `T`, etc. For more details, see table 2.2.

The encoding of the section for numerals was more difficult than the above case. One of the possibilities was to assign symbols based on the resemblance of shapes. One can easily think of assignments such as ɜ for `3`, ɓ for `6`, etc. But the resemblance of shape alone does not serve as a criteria for all the assignments. So I decided to assign basic vowel symbols to this section.[3] Fortunately the resemblance of shape is to some extent maintained as is shown in table 2.2.

The encoding of the section for lowercase letters poses no problem since they are all used as phonetic symbols. Only one symbol, namely 'g', needs some attention because its shape should be 'ɡ', rather than 'g', as a phonetic symbol.[4]

The second half of the table (character codes `'200-'377`) is divided into four sections. The first section is devoted to the elements of tone letters and other suprasegmental symbols.

Among the remaining three sections the last section `'340-'377` contains

[3]This idea was influenced by the above mentioned article by J. C. Wells (Wells, 1995).

[4]However, it was declared that these two symbols are equivalent in the most recent version of the IPA. Anyway, alternative shape 'g' is preserved in another section and can be used as `\textg`.

more basic symbols than the other two sections. This is a result of assigning the same character codes as latin-1 (ISO8859-1) and T1 encodings to the symbols that are commonly included in TIPA, latin-1 and T1 encoded fonts.[5] These are the cases of æ, ø, œ, ç and þ. And within each section, symbols are arranged largely in alphabetical order.

For a table of the `T3` encoding, see Appendix F.

[5] This is based on a suggestion by Jörg Knappen.

Chapter 3

Usage

3.1 Declaration of TIPA package

In order to use TIPA, first declare `tipa.sty` package at the preamble of a document.

```
\documentclass{article}
\usepackage{tipa}
```

If you want to use an additional set of phonetic symbols, declare `tipx.sty` after the declaration of `tipa.sty`.

```
\documentclass{article}
\usepackage{tipa}
\usepackage{tipx}
```

3.1.1 Encoding options

The above declaration uses `OT1` as the default text encoding. If you want to use TIPA symbols with `T1`, specify the option '`T1`'.

```
\documentclass{article}
\usepackage[T1]{tipa}
```

If you want to use a more complex form of encoding, declare the use of `fontenc` package by yourself and specify the option '`noenc`'. In this case the option '`T3`', which represents the TIPA encoding, must be included as an option to the `fontenc` package. For example, if you want to use TIPA and the University Washington Cyrillic (`OT2`) with the `T1` text encoding, the following command will do this.

```
\documentclass{article}
\usepackage[T3,OT2,T1]{fontenc}
\usepackage[noenc]{tipa}
```

By default, TIPA includes the `fontenc` package internally but the option `noenc` suppresses this.

3.1.2 Using TIPA with PSNFSS

In order to use TIPA with `times.sty`, declare the use of `times.sty` before declaring `tipa` packages.

```
\documentclass{article}
\usepackage{times}
\usepackage{tipa}
```

Font description files `t3ptm.fd` and `t3phv.fd` are automatically loaded by the above declaration.

This manual can be typeset with Times Roman and XIPA fonts by uncommenting a few lines that appear near the top of the file `tipaman.tex`.

3.1.3 Other options

TIPA can be extended by the options `tone`, `extra`.

If you want to use the optional package for 'tone letters', add '`tone`' option to the `\usepackage` command that declares `tipa` package.

```
\usepackage[tone]{tipa}
```

And if you want to use diacritics for extIPA and VoQS, specify '`extra`' option.

```
\usepackage[extra]{tipa}
```

Finally, there is one more option called '`safe`', which is used to suppress definitions of some possibly 'dangerous' commands of TIPA.

```
\usepackage[safe]{tipa}
```

More specifically, the following commands are suppressed by declaring the `safe` option. Explanation on the function of each command will be given later.

- `\s` Equivalent to `\textsyllabic`; maybe harmless but too short for a control sequence name.
- `\*` Already defined in plain TeX; however, many consider its redefinition harmless.
- `\|`, `\:`, `\;`, `\!` Already defined in LaTeX; these redefinitions are obviously the most dangerous ones. However, remedies are prepared even in 'unsafe' mode. There is a command called `\Vert` which has the same meaning as `\|` and can be used in 'unsafe' mode. For the remaining three commands, TIPA provides commands called `\tipamedspace`, `\tipathickspace` and `\tipanegthinspace` which retain the meanings of `\:`, `\;` and `\!`, respectively, even in the 'unsafe mode'.

Despite the above 'remedies', you may sometimes want to use the above commands with their original names in the 'unsafe' mode. In such cases, a command called `\tipasafemode` can be used. For example:

Input: `\textipa{[\!b] [\:r] [\;B]}\quad{\tipasafemode`
`$ a\:a\quad b\;b\quad c\!c\quad\| $}\quad`
`\textipa{[\!b] [\:r] [\;B] (back again!)}`

Output: [ɓ] [ɽ] [ʙ] *a a* *b b* *ac* ‖ [ɓ] [ɽ] [ʙ] (back again!)

As is shown in this example, `\tipasafemode` must be used within a group. Otherwise, the meanings of TIPA's special macros are lost.

Finally, more than one options can be specified at the same time, by separating a comma. For example:

```
\usepackage[tone,extra,safe]{tipa}
```

3.2 Input commands for phonetic symbols

3.2.1 Ordinary phonetic symbols

TIPA phonetic symbols can be inputted by the following two ways.

(1) Input macro names in the normal text environment.

(2) Input macro names or *shortcut characters* within the following groups or environment.

- `\textipa{...}`[1]
- `{\tipaencoding ...}`
- `\begin{IPA} ... \end{IPA}`

(These groups and environment will be henceforth referred to as the *IPA environment*.)

A shortcut character refers to a single character that is assigned to a specific phonetic symbol and that can be directly inputted by an ordinary keyboard. In TIPA fonts, the character codes for numerals and uppercase letters in the normal ASCII encoding are assigned to such shortcut characters, because numerals and uppercase letters are usually not used as phonetic symbols. Additional shortcut characters for symbols such as æ, œ, ø may also be used if you are using a T1 encoded font and an appropriate input system for it.

The following pair of examples show the same phonetic transcription of an English word that are inputted by the above mentioned two input methods.

Input 1: `[\textsecstress\textepsilon kspl\textschwa`
`\textprimstress ne\textsci\textesh\textschwa n]`

Output 1: [ˌɛkspləˈneɪʃən]

Input 2: `\textipa{[""Ekspl@"neIS@n]}`

Output 2: [ˌɛkspləˈneɪʃən]

[1] I personally prefer a slightly shorter name like `\ipa` rather than `\textipa` so that I usually put a command `\let\ipa\textipa` somewhere in my style file. However, this command was named after the general convention of LaTeX 2ε. The same can be said for all the symbol names beginning with `\text`.

Symbol name	*Macro name*	*Symbol*
Turned A	`\textturna`	ɐ
Glottal stop	`\textglotstop`	ʔ
Right-tail D	`\textrtaild`	ɖ
Small capital G	`\textscg`	ɢ
Hooktop B	`\texthtb`	ɓ
Curly-tail C	`\textctc`	ɕ
Crossed H	`\textcrh`	ħ
Old L-Yogh ligature	`\textOlyoghlig`	ɮ
Beta	`\textbeta`	β

Table 3.1: Naming of TIPA symbols

It is apparent that inputting shortcut characters in the IPA environment is far easier than inputting lengthy symbol names in the normal text environment.

Moreover, although the outputs of the above examples look almost the same, they are *not* identical, exactly speaking. This is because in the IPA environment automatic kerning between neighboring symbols is enabled, as is illustrated by the following pair of examples.

Input 1: `v\textturnv v w\textsca w  y\textturny y [\textesh]`

Output 1: vʌv wᴀw yʎy [ʃ]

Input 2: `\textipa{v2v w\textsca w yLy [S]}`

Output 2: vʌv wᴀw yʎy [ʃ]

In the next example, *Input 2* is far better theen *Input 1*, for the same reason.

Input 1: `[\textipa{S}]`

Output 1: [ʃ]

Input 2: `\textipa{[S]}`

Output 2: [ʃ]

Therefore, it is recommended to use `\textipa` or other IPA environments as much as possible.

Table 2.2 shows most of the shortcut characters that can be used in the IPA environment, together with the corresponding characters in the ASCII encoding.

3.2.2 Naming of phonetic symbols

Every TIPA phonetic symbol has a unique symbol name, such as *Turned A, Hooktop B, Schwa*. Also each symbol has a corresponding macro name, such as `\textturna`, `\texthtb`, `\textschwa`. The naming was made based on the literature listed in section 2.1. Among them, *PSG* is particularly important because it gives several explicit principles on naming. As an example, the three terms 'turned', 'inverted' and 'reversed' are distinguished in the following way (p. xxvii):

Turned rotated by 180 degrees (e.g., t vs. ʇ)

Inverted vertical mirror image (e.g., ʀ vs. ʁ)
Reversed horizontal mirror image (e.g., ʔ vs. ʕ)

The name used as a control sequence is usually an abbreviated form of the corresponding symbol name with a prefix `\text`. The conventions used in the abbreviation can be summarized as follows.

- Suffixes and endings such as '-ive', '-al', '-ed' are omitted.
- 'right', 'left' are abbreviated to `r`, `l` respectively.
- For 'small capital' symbols, prefix `sc` is added.
- A symbol with a hooktop is abbreviated as `ht`...
- A symbol with a curly-tail is abbreviated as `ct`...
- A 'crossed' symbol is abbreviated as `cr`...
- A ligature is abbreviated as ...`lig`.
- For an old version of a symbol, prefix `O` is added.

Note that the prefix `O` (old) should be given in uppercase letter.

Table 3.1 shows some examples of correspondence between symbol names and control sequence names.

3.2.3 Ligatures

Just like the symbols such as “, ”, –, —, fi, ff are realized as ligatures by inputting ``` `` ```, `''`, `--`, `---`, `fi`, `ff` in TEX, two of the TIPA symbols, namely *Secondary Stress* and *Double Pipe*, and double quotation marks[2] can be inputted as ligatures in the IPA environment.

Input: ``\textipa{" "" | || `` ''}``
Output: ˈ ˌ | ‖ “ ”

3.2.4 Special macros `\*`, `\;`, `\:` and `\!`

TIPA defines `\*`, `\:`, `\;` and `\!` as special macros in order to easily input phonetic symbols that do not have a shortcut character explained above. Before explaining how to use these macros, it is necessary to note that these macros are primarily intended to be used by linguists who usually do not care about things in math mode. And they can be 'dangerous' in that they override existing LATEX commands used in the math mode. So if you want to preserve the original meaning of these commands, declare the option '`safe`' at the preamble. (However, TIPA provides cammands called `\tipamedspace`, `\tipathickspace` and `\tipanegthinspace`, having the same meanings as `\:`, `\;` and `\!`, respectively. These can be used even in 'unsafe' mode.)

The macro `\*` is used in three different ways. First, when this macro is followed by one of the letters f, k, r, t or w, it results in a turned symbol.[3]

[2] Although TIPA fonts do not include the symbols “ and ”, a negative value of kerning is automatically inserted between ‘ and ‘, ’ and ’, so that the same results can be obtained as in the case of the normal text font.

[3] This idea was pointed out by Jörg Knappen.

Input: `\textipa{\*f \*k \*r \*t \*w}`

Output: ɟ ʞ ɹ ʇ ʍ

Secondly, when this macro is followed by one of the letters j, n, h, l or z, it results in a frequently used symbol that otherwise has no easy way to input.

Input: `\textipa{\*j \*n \*h \*l \*z}`

Output: ɟ ɲ ħ ɬ ɮ

Thirdly, when this macro is followed by letters other than the above cases, they are turned into the symbols of the default text font. This is useful in the IPA environment to select symbols temporarily from the normal text font.

Input: `\textipa{\*A dOg, \*B k\ae{}t,  ma\super{\*{214}}}`

Output: A dɔg, B kæt, ma^{214}

The remaining macros `\;`, `\:` and `\!` are used to make small capital symbols, retroflex symbols, and implosives or clicks, respectively.

Input: `\textipa{\;B \;E \;A \;H \;L \;R}`

Output: ʙ ᴇ ᴀ ʜ ʟ ʀ

Input: `\textipa{\:d \:l \:n \:r \:s \:z}`

Output: ɖ ɭ ɳ ɽ ʂ ʐ

Input: `\textipa{\!b \!d \!g \!j \!G \!o}`

Output: ɓ ɗ ɠ ʄ ʛ ʘ

3.2.5 Punctuation marks

The following punctuation marks and text symbols that are normally included in the text encoding are also included in the `T3` encoding so that they can be directly inputted in the IPA environment.

Input: `\textipa{! ’ ( ) * + , - . / = ? [ ] ‘}`

Output: ! ’ ( ) * + , - . / = ? [ ] ‘

All the other punctuation marks and text symbols that are not included in `T3` need to be inputted with a prefix `\*` explained in the last section when they appear in the IPA environment.

Input: `\textipa{\*; \*: \*@ \*\# \*\$ \*\& \*\% \*\{ \*\}}`

Output: ; : @ # $ & % { }

Input in the normal text environment	*Input in the IPA environment*	*Output*
`\'a`	`\'a`	á
`\"a`	`\"a`	ä
`\ a`	`\~a`	ã
`\r{a}`	`\r{a}`	å
`\textsyllabic{m}`	`\s{m}`	m̩
`\textsubumlaut{a}`	`\"*a`	a̤
`\textsubtilde{a}`	`\~*a`	a̰
`\textsubring{a}`	`\r*a`	ḁ
`\textdotacute{e}`	`\.'e`	ė́
`\textgravedot{e}`	``\`.e``	ė̀
`\textacutemacron{a}`	`\'=a`	ā́
`\textcircumdot{a}`	`\^.a`	ȧ̂
`\texttildedot{a}`	`\~.a`	ȧ̃
`\textbrevemacron{a}`	`\u=a`	ā̆

Table 3.2: Examples of inputting accents and diacritics

3.2.6 Accents and diacritics

Table 3.2 shows how to input accents and diacritics in TIPA with some examples. Here again, there are two kinds of input methods; one for the normal text environment, and the other for the IPA environment.

In the IPA environment, most of the accents and diacritics can be inputted more easily than in the normal text environment, especially in the cases of subscript symbols that are normally placed over a symbol and in the cases of combined accents, as shown in the table.

As can be seen by the above examples, most of the accents that are normally placed over a symbol can be placed under a symbol by adding an `*` to the corresponding accent command in the IPA environment.

The advantage of IPA environment is further exemplified by the all-purpose accent `\|`, which is used as a macro prefix to provide shortcut inputs for the diacritics that otherwise have to be inputted by lengthy macro names. Table 3.3 shows examples of such accents. Note that the macro `\|` is also 'dangerous' in that it has been already defined as a math symbol of LaTeX. So if you want to preserve the original meaning of this macro, declare '`safe`' option at the preamble. (However, there is an alternative command called `\Vert` (originally defined in plain TeX) which has the same meaning as `\|` and can be used even if the `safe` option is not specified.)

Finally, examples of words with complex accents that are inputted in the IPA environment are shown below.

Input: `\textipa{*\|c{k}\r*mt\'om *bhr\'=at\=er}`

Output: *k̂m̥tóm *bhrā́tēr

For a full list of accents and diacritics, see Appendix A.

Input in the normal text environment	*Input in the IPA environment*	*Output*
`\textsubbridge{t}`	`|[t`	t̪
`\textinvsubbridge{t}`	`|]t`	t̺
`\textsublhalfring{a}`	`|(a`	a̜
`\textsubrhalfring{a}`	`|)a`	a̹
`\textroundcap{k}`	`|c{k}`	k̑
`\textsubplus{o}`	`|+o`	o̟
`\textraising{e}`	`|'e`	e̝
`\textlowering{e}`	`|‘e`	e̞
`\textadvancing{o}`	`|<o`	o̘
`\textretracting{a}`	`|>a`	a̙
`\textovercross{e}`	`|x{e}`	e̽
`\textsubw{k}`	`|w{k}`	k̫
`\textseagull{t}`	`|m{t}`	t̼

Table 3.3: Examples of the accent prefix `\|`

3.2.7 Superscript symbols

In the normal text environment, superscript symbols can be inputted by a LaTeX macro called `\textsuperscript`. This macro takes one argument which can be either a symbol or a string of symbols, and can be nested.

Since the name of this macro is too long, TIPA provides an abbreviated form of this macro called `\super`.

Input 1: `t\textsuperscript h  k\textsuperscript w`
`a\textsuperscript{bc}`
`a\textsuperscript{b\textsuperscript{c}}`

Output 1: t$^{\text{h}}$ k$^{\text{w}}$ a$^{\text{bc}}$ a$^{\text{b}^{\text{c}}}$

Input 2: `\textipa{t\super{h} k\super{w}`
`a\super{bc} a\super{b\super{c}}}`

Output 2: t$^{\text{h}}$ k$^{\text{w}}$ a$^{\text{bc}}$ a$^{\text{b}^{\text{c}}}$

(A quiz question: A careful reader may have noticed that the above *Output1* and *Output2* slightly differ. Explain the reason.)

These macros automatically select the correct size of superscript font no matter what size of text font is used.

3.2.8 Tone letters

TIPA provides a flexible system of macros for ‘tone letters’. A tone letter is represented by a macro called ‘`\tone`’, which takes one argument consisting of a string of numbers ranging from 1 to 5. These numbers denote pitch levels, 1 being the lowest and 5, the highest. Within this range, any combination is allowed and there is no limit in the length of combination.

As an example of the usage of the tone letter macro, the four tones of Chinese are shown below.

Input: `\tone{55}ma ‘‘mother’’, \tone{35}ma ‘‘hemp’’,`
`\tone{214}ma ‘‘horse’’, \tone{51}ma ‘‘scold’’`

Output: ma˥ “mother”, ma˧˥ “hemp”, ma˨˩˦ “horse”, ma˥˩ “scold”

The next example looks ridiculous but shows capabilities of the tone letter macro.

Input: `\tone{15253545}`

Output: ˩˥˨˥˧˥˦˥

`\stone`

In some languages, length distinctions accompany the tone letter description. In such cases a command called `\stone` can be used to represent a tone letter that is shorter than a usual one. The next example from Cantonese illustrates this (look at the examples for *entering tones*).

Tone name	*Input*	*Output*
high level	`\tone{53}` or `\tone{55}`	˥˧ or ˥
low level	`\tone{21}` or `\tone{22}`	˨˩ or ˨
high rising	`\tone{35}`	˧˥
low rising	`\tone{24}`	˨˦
high departing	`\tone{44}`	˦
low departing	`\tone{33}`	˧
high entering	`\stone{55}`	˥
mid entering	`\stone{44}`	˦
low entering	`\stone{33}`	˧

`\rtone`

In some languages, the level/contour bars are placed at the right hand side of the vertical bar. In such cases a command called `\rtone` is used instead of `\tone`. The next example is from the Kyoto Japanese.

Input: `\textipa{[\rtone{11}a\rtone{53}me]} ‘rain’`

Output: [꜖a꜒꜔me] ‘rain’

3.3 How easy is it to input phonetic symbols?

Let us briefly estimate here how easy (or difficult) it is to input phonetic symbols with TIPA in terms of the number of keystrokes.

The following table shows statistics for all the phonetic symbols that appear in the ’93 version of IPA chart (diacritics and symbols for suprasegmentals excluded). It is assumed here that each symbol is inputted within the IPA environment and the `safe` option is not specified.

keystrokes	*number*	*examples*
1	65	a, b, ə, ɑ, β, etc.
2	2	ø, ‖
3	30	æ, ʈ, ʙ, ɓ, etc.
5	1	ç
more than 5	7	ʚ, ʡ, ǂ, ɰ, etc.

Font style	*Input in the IPA environment*	*Output*
Roman	`\textipa{f@"nEtIks}`	fəˈnɛtɪks
Slanted	`\textipa{\slshape f@"nEtIks}`	*fəˈnɛtɪks*
or	`\textipa{\textsl{f@"nEtIks}`	*fəˈnɛtɪks*
or	`\textsl{\textipa{f@"nEtIks}`	*fəˈnɛtɪks*
Bold extended	`\textipa{\bfseries f@"nEtIks}`	**fəˈnɛtɪks**
or	`\textipa{\textbf{f@"nEtIks}`	**fəˈnɛtɪks**
or	`\textbf{\textipa{f@"nEtIks}`	**fəˈnɛtɪks**
Sans serif	`\textipa{\sffamily f@"nEtIks}`	fəˈnɛtɪks
or	`\textipa{\textsf{f@"nEtIks}`	fəˈnɛtɪks
or	`\textsf{\textipa{f@"nEtIks}`	fəˈnɛtɪks
Typewriter Text	`\textipa{\ttfamily f@"nEtIks}`	`fəˈnɛtɪks`
or	`\textipa{\texttt{f@"nEtIks}`	`fəˈnɛtɪks`
or	`\texttt{\textipa{f@"nEtIks}`	`fəˈnɛtɪks`

Table 3.4: Examples of font switching

As is shown in the table, about 92% of the symbols can be inputted within three keystrokes.

3.4 Changing font styles

This version of TIPA includes five styles of fonts, i.e., roman, slanted, bold, bold extended, sans serif and typewriter. These styles can be switched in much the same way as in the normal text fonts (see table 3.4).

The bold fonts are usually not used within the standard LaTeX class packages so that if you want to use them, it is necessary to use low-level font selection commands of LaTeX 2_ε.

Input: `{\fontseries{b}\selectfont abcdefg \textipa{ABCDEFG}}`

Output: **abcdefg αβɕðɛɸɤ**

Note also that slanting of TIPA symbols should correctly work even in the cases of nested accents and in the cases of symbols made up by macros.

Input: `\textsl{\textipa{\'{\"{\u*{e}}}}}`

Output: *ḗ̤*

Input: `\textsl{\textdoublebaresh}`

Output: *ʄ* (This symbol is composed by a macro.)

Chapter 4

Customizing TIPA

4.1 Internal commands

Some of the internal commands of TIPA are defined without the letter `@` in order to allow a user to extend the capability of TIPA.

4.1.1 `\ipabar`

Some TIPA symbols such as `\textbarb` ƀ, `\textcrtwo` ƻ are defined by using an internal macro command `\ipabar`. This command is useful when you want to make barred or crossed symbols not defined in TIPA.

This command requires the following five parameters to control the position and length of the bar.

- `#1` the symbol to be barred
- `#2` the height of the bar (in dimen)
- `#3` bar width
- `#4` left kern added to the bar
- `#5` right kern added to the bar

Parameters `#3`, `#4`, `#5` are to be given in a scaling factor to the width of the symbol, which is equal to 1 if the bar has the same width as the symbol in question. For example, the following command states a barred b (ƀ) of which the bar position in the y-coordinate is `.5ex` and the width of the bar is slightly larger than that of the letter b.

```
% Barred B
\newcommand\textbarb{%
  \ipabar{{\tipaencoding b}}{.5ex}{1.1}{}{}}
```

Note that the parameters `#4` and `#5` can be left blank if the value is equal to 0.

And the next example declares a barred c (ꞓ) of which the bar width is a little more than half as large as the letter c and it has the same amount of kerning at the right.

```
% Barred C
\newcommand\textbarc{%
  \ipabar{{\tipaencoding c}}{.5ex}{.55}{}{.55}}
```

More complex examples with the `\ipabar` command are found in `T3enc.def`.

4.1.2 `\tipaloweraccent`, `\tipaupperaccent`

These two commands are used in the definitions of TIPA accents and diacritics. They are special forms of the commands `\loweraccent` and `\upperaccent` that are defined in `exaccent.sty`. The difference between the commands with the prefix `tipa` and the ones without it is that the former commands select accents from a T3 encoded font while the latter ones do so from the current text font.

These commands take two parameters, the code of the accent (in decimal, octal or hexadecimal number) and the symbol to be accented, as shown below.

Input: `\tipaupperaccent{0}{a}`

Output: à

Optionally, these commands can take an extra parameter to adjust the vertical position of the accent. Such an adjustment is sometimes necessary in the definition of a nested accent. The next example shows TIPA's definition of the 'Circumflex Dot Accent' (e.g., â).

```
% Circumflex Dot Accent
\newcommand\textcircumdot[1]{\tipaupperaccent[-.2ex]{2}%
  {\tipaupperaccent[-.1ex]{10}{#1}}}
```

This definition states that a dot accent is placed over a symbol thereby reducing the vertical distance between the symbol and the dot by `.1ex`, and a circumflex accent is placed over the dot and the distance between the two accents is reduced by `.2ex`.

If you want to make a combined accent not included in TIPA, you can do so fairly easily by using these two commands together with the optional parameter. For more examples of these commands, see `tipa.sty` and `extraipa.sty`.

4.1.3 `\tipaLoweraccent`, `\tipaUpperaccent`

These two commands differ from the two commands explained above in that the first parameter should be a symbol (or any other thing, typically an `\hbox`), rather than the code of the accent. They are special cases of the commands `\Loweraccent` and `\Upperaccent` and the difference between the two pairs of commands is the same as before.

The next example makes a schwa an accent.

Input: `\tipaUpperaccent[.2ex]%`
`{\lower.8ex\hbox{\textipa{\super@}}}{a}`

Output: ə̊a

The next example is an interesting application of this command for the Middle High German (This macro and the example below are provided by Christian Folini and now included in `tipa.sty`).

```
\newcommand{\sups}[2]{\textipa{\tipaUpperaccent[.2ex]{%
  \lower.8ex\hbox{\super{#2}}}{#1}}}
```

> Und swer dc mit flis tuͦt, so stat das gelt und oͮch dù guͤter in deste bessere behabnùsse und behùgde. (1330 AD. Translation: And if this is done with diligence, the money and the affairs will be in better shape.)

In this example, tuͦt is inputted as `t\sups{u}{o}t` and so on.

4.1.4 `\ipaclap`

This command is useful if you need to compose a new symbol by overlapping two symbols. This command is different from TEX's commands `\llap` and `\rlap` in that the alignment is made at the center of each symbol.

The next example shows how to make a Slashed B.

Input: `\ipaclap{\textipa{b}}{\textipa{/}}`

Output: b̸

4.2 Manual Kerning

The shapes of phonetic symbols are sometimes *nasty* in the sense that they can have a leftward or rightward protrusion that cannot be found in the case of normal text fonts. In such cases it is sometimes necessary to input kerning commands manually.

One way to do this is to prepare a set of kerning commands like the following:

```
\newcommand\K{\kern.05em} % small amount of kerning
\newcommand\KK{\kern.1em} % middle amount of kerning
\newcommand\KKK{\kern.2em} % big amount of kerning
```

And then to put these commands whenever necessary. For example:

Input: `\textipa{[\textrhooke r]}`

Output: [ᶒr] — This is OK but

Input: `\textipa{[\textrhooke]}`

Output: [ᶒ] — this doesn't look good so that

Input: `\textipa{[\textrhooke\KK]}`

Output: [ᶒ] — manually fixed like this.

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Appendix A

Annotated List of TIPA Symbols

For each symbol, a large scale image of the symbol is displayed with a frame. Within the frame, horizontal lines that indicate `x_height` and baseline are also shown. At the top left corner of a frame, a number indicating the octal code of the symbol is shown. In the case of a symbol from `tipx` fonts, the code number is underlined.

Next, the following information is shown at the right of each symbol in this order: (1) the name of the symbol, (2) explanation on its usage with some examples (for non-IPA usages, an asterisk is put at the beginning), (3) input method in typewriter style, and finally (4) sources or references.

Sometimes the input method is displayed in the form of *Input1: xxx, Input2: yyy*. In such cases *Input1* indicates the one used in the normal text environment and *Input2*, the one used in the IPA environment.

The following abbreviations are used in the examples of usage and explanations in the footnote.

ExtIPA = ExtIPA Symbols for Disordered Speech
VoQS = Voice Quality Symbols
PSG = Phonetic Symbol Guide (Pullum and Ladusaw, 1996)
Handbook = Handbook of the International Phonetic Association (IPA, 1999)
Principles = Principles of the International Phonetic Association (IPA, 1949)
JIPA = Journal of the International Phonetic Association
IE Indo-European
OHG Old High German
OCS Old Church Slavic

A.1 Vowels and Consonants

'141 a — Lower-case A *Usage*: open front unrounded vowel
Input: `a`
Sources: IPA '49–'96

'040 ᶏ — Right-hook A
Input: `\textrhooka`
Sources: *PSG*

'065 ɐ — Turned A *Usage*: near-open central vowel
Input1: `\textturna` *Input2*: `5`
Sources: IPA '49–'96

'101 ɑ — Script A *Usage*: open back unrounded vowel
Input1: `\textscripta` *Input2*: `A`
Sources: IPA '49–'96

'066 ɒ — Turned script A *Usage*: open back rounded vowel
Input1: `\textturnscripta` *Input2*: `6`
Sources: IPA '49–'96

'041 ɑ — Inverted script A
Input: `\textinvscripta`
Sources: *PSG*

'346 æ — Ash *Usage*: near-open front unrounded vowel
Input: `\ae`
Sources: IPA '49–'96

'042 ꜵ — A-O ligature
Input: `\textaolig`
Sources: *PSG*

'300 ᴀ — Small capital A[1] *Usage*: *open central unrounded vowel
Input1: `\textsca` *Input2*: `\;A`
Sources: *PSG*

'043 4 — Left-hook four
Input: `\textlhookfour`
Sources: *PSG*

'160 Ɐ — Inverted small capital A
Input: `\textinvsca`
Sources: *PSG*

'161 Ꜵ — Small capital A-O ligature
Input: `\textscaolig`
Sources: *PSG*

'062 ʌ — Turned V[2] *Usage*: open-mid back unrounded vowel
Input1: `\textturnv` *Input2*: `2`
Sources: IPA '49–'96

[1] This symbol is fairly common among Chinese phoneticians.

[2] In a previous version of *PSG* this symbol was called 'Inverted V' but it was apparently a mistake.

'162 ᴧ

Small capital delta
Input: `\textscdelta`
Sources: *PSG*

'142 b

Lower-case B *Usage*: voiced bilabial plosive
Input: `b`
Sources: IPA '49–'96

'240 ƀ

Crossed B
Input: `\textcrb`
Sources: *PSG*

Macro ƀ

Barred B
Input: `\textbarb`
Sources: *PSG*

'272 ь

Soft sign *Usage*: *as in *OCS* ognь 'fire'.
Input: `\textsoftsign`
Sources: *PSG*

'273 ъ

Hard sign *Usage*: *as in *OCS* gradъ 'town'.
Input: `\texthardsign`
Sources: *PSG*

'341 ɓ

Hooktop B *Usage*: voiced bilabial implosive
Input1: `\texthtb` *Input2*: `\!b`
Sources: IPA '49–'96

'340 ʙ

Small capital B *Usage*: voiced bilabial trill
Input1: `\textscb` *Input2*: `\;B`
Sources: IPA '89–'96

'102 β

Beta *Usage*: voiced bilabial fricative
Input1: `\textbeta` *Input2*: `B`
Sources: IPA '49–'96

'143 c

Lower-case C *Usage*: voiceless palatal plosive
Input: `c`
Sources: IPA '49–'96

Macro ꞓ

Barred C
Input: `\textbarc`
Sources: *PSG*

Macro č

Wedge C *Usage*: *equivalent to IPA tʃ
Input: `\v{c}`
Sources: *PSG*

'347 ç

C Cedilla *Usage*: voiceless palatal fricative
Input: `\c{c}`
Sources: IPA '49–'96

'301 ƈ

Hooktop C *Usage*: voiceless palatal implosive
Input: `\texthtc`
Sources: IPA '89

'103 ɕ

Curly-tail C *Usage*: voiceless alveolo-palatal fricative
Input1: `\textctc` *Input2*: `C`
Sources: IPA '49–'96

'302 ʗ
Stretched C[3] *Usage*: postalveolar click
Input: `\textstretchc`
Sources: IPA '49, '79

'044
Stretched C (original form)
Input: `\textstretchcvar`
Sources: Beach (1938)

'045
Curly-tail stretched C
Input: `\textctstretchc`
Sources: *PSG*

'046
Curly-tail stretched C (original form)
Input: `\textctstretchcvar`
Sources: Beach (1938)

'144 d
Lower-case D *Usage*: voiced dental or alveolar plosive
Input: `d`
Sources: IPA '49–'96

'241 đ
Crossed D
Input: `\textcrd`
Sources: *PSG*

Macro
Barred D
Input: `\textbard`
Sources: *PSG*

'047
Front-hook D
Input: `\textfrhookd`
Sources: *PSG*

'050
Front-hook D (Original)[4]
Input: `\textfrhookdvar`
Sources:

'342 ɗ
Hooktop D *Usage*: voiced dental or alveolar implosive
Input1: `\texthtd` *Input2*: `\!d`
Sources: IPA '49–'96

'343 ɖ
Right-tail D *Usage*: voiced retroflex plosive
Input1: `\textrtaild` *Input2*: `\:d`
Sources: IPA '49–'96

'243 ᶑ
Hooktop right-tail D *Usage*: voiced retroflex implosive
Input: `\texthtrtaild`
Sources: *PSG*, *Handbook*

'242 ȡ
Curly-tail D *Usage*: *voiced alveolo-palatal plosive
Input: `\textctd`
Sources:

[3] The shape of this symbol differs according to the sources. In *PSG* and recent articles in *JIPA*, it is 'stretched' toward both the ascender and descender regions and the whole shape looks like a thick staple. In the old days, however, it was stretched only toward the descender and the whole shape looked more like a stretched c, as is shown in the next item (original form).

[4] This shape is used by Jones (1973).

'051 ȸ D-B ligature
Input: `\textdblig`
Sources: *PSG*

Macro ʣ D-Z ligature
Input: `\textdzlig`
Sources: *PSG*

Macro ʥ D-Curly-tail Z ligature
Input: `\textdctzlig`
Sources:

'303 ʤ D-Yogh ligature *Usage*: voiced postalveolar affricate
Input: `\textdyoghlig`
Sources: IPA '49–'96

Macro ȡʑ Curly-tail D-Curly-tail Z ligature
Input: `\textctdctzlig`
Sources:

'104 ð Eth *Usage*: voiced dental fricative
Input1: `\dh` *Input2*: `D`
Sources: IPA '49–'96

'145 e Lower-case E *Usage*: close-mid front unrounded vowel
Input: `e`
Sources: IPA '49–'96

'052 ᶒ Right-hook E
Input: `\textrhooke`
Sources: *PSG*

'100 ə Schwa *Usage*: mid central vowel
Input1: `\textschwa` *Input2*: `@`
Sources: IPA '49–'96

'304 ɚ Right-hook schwa *Usage*: r-colored ə
Input: `\textrhookschwa`
Sources: IPA '49, '79

'071 ɘ Reversed E *Usage*: close-mid central unrounded vowel
Input1: `\textreve` *Input2*: `9`
Sources: IPA '49–'96

'244 ᴇ Small capital E
Input1: `\textsce` *Input2*: `\;E`
Sources: *PSG*

'105 ɛ Epsilon *Usage*: open-mid front unrounded vowel
Input1: `\textepsilon` *Input2*: `E`
Sources: IPA '49–'96

'053 ᶓ Right-hook epsilon
Input: `\textrhookepsilon`
Sources: *PSG*

'305 ʚ Closed epsilon[5] *Usage*: (obsolete) open-mid central rounded vowel
Input: `\textcloseepsilon`
Sources: IPA '93

'063 ɜ **Reversed epsilon** *Usage*: open-mid central unrounded vowel
Input1: `\textrevepsilon` *Input2*: `3`
Sources: IPA '49–'96

'307 ɝ **Right-hook reversed epsilon** *Usage*: r colored ɜ
Input: `\textrhookrevepsilon`
Sources: *PSG*

'306 ɞ **Closed reversed epsilon**[6] *Usage*: open-mid central rounded vowel
Input: `\textcloserevepsilon`
Sources: *Handbook*

'146 f **Lower-case F** *Usage*: voiceless labiodental fricative
Input: `f`
Sources: IPA '49–'96

'163 ꜰ **Small capital F**
Input: `\textscf`
Sources: *PSG*

'147 ɡ **Lower-case G** *Usage*: voiced velar plosive
Input1: `\textscriptg` *Input2*: `g`
Sources: IPA '49–'96

Macro ǥ **Barred G**
Input: `\textbarg`
Sources: *PSG*

Macro **Crossed G**
Input: `\textcrg`
Sources: *PSG*

'344 ɠ **Hooktop G** *Usage*: voiced velar implosive
Input1: `\texthtg` *Input2*: `\!g`
Sources: IPA '49–'96

'245 g **Looptail G** *Usage*: equivalent to ɡ
Input1: `g` *Input2*: `\textg`
Sources:

'345 ɢ **Small capital G** *Usage*: voiced uvular plosive
Input1: `\textscg` *Input2*: `\;G`
Sources: IPA '49–'96

'311 ʛ **Hooktop small capital G** *Usage*: voiced uvular implosive
Input1: `\texthtscg` *Input2*: `\!G`
Sources: IPA '89–'96

'107 ɣ **Gamma** *Usage*: voiced velar fricative
Input1: `\textgamma` *Input2*: `G`
Sources: IPA '49–'96

'054 γ **Greek gamma**[7]
Input: `\textgrgamma`
Sources: *PSG*

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[5] In the 1993 version of IPA, this symbol was used as the symbol for the open-mid central rounded vowel. However, in the 1996 version, this symbol was replaced by Closed reversed epsilon, i.e., ɞ. In fact, it was a typographical error, as was anounced in IPA (1995, p. 48).

[6] See the footnote above.

'055 ɣ **Front-tail gamma**
Input: `\textfrtailgamma`
Sources: *PSG*

'056 ɣ **Back-tail gamma**
Input: `\textbktailgamma`
Sources: *PSG*

'310 ɤ **Baby gamma** *Usage*: (obsolete) close-mid back unrounded vowel
Input: `\textbabygamma`
Sources: IPA '49, '79

'067 ɤ **Ram's horns** *Usage*: close-mid back unrounded vowel
Input1: `\textramshorns` *Input2*: `7`
Sources: IPA '89–'96

'150 h **Lower-case H** *Usage*: voiceless glottal fricative
Input: `h`
Sources: IPA '49–'96

'377 ƕ **H-V ligature** *Usage*: *as in *Gothic* ƕas 'what'.
Input: `\texthvlig`
Sources: *PSG*

'350 ħ **Crossed H**[8] *Usage*: voiceless pharyngeal fricative
Input: `\textcrh`
Sources: IPA '49–'96

'110 ɦ **Hooktop H** *Usage*: voiced glottal fricative
Input1: `\texthth` *Input2*: `H`
Sources: IPA '49–'96

'057 ɦ **Right-tail hooktop H**
Input: `\textrtailhth`
Sources: *PSG*

'060 ꜧ **Heng**
Input: `\textheng`
Sources: *PSG*

'312 ɧ **Hooktop heng** *Usage*: simultaneous ʃ and x
Input: `\texththeng`
Sources: IPA '49–'96

'064 ɥ **Turned H** *Usage*: voiced labial-palatal approximant
Input1: `\textturnh` *Input2*: `4`
Sources: IPA '49–'96

'313 ʜ **Small capital H** *Usage*: voiceless epiglottal fricative
Input1: `\textsch` *Input2*: `\;H`
Sources: IPA '89–'96

'151 i **Lower-case I** *Usage*: close front unrounded vowel
Input: `i`
Sources: IPA '49–'96

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[7] It is not my intention to include all the Greek letters appearing in *PSG*. The reason for including this symbol is to assure typographical consistency with the next two symbols derived from Greek gamma.

[8] In *Handbook*, this symbol is called 'Barred H'.

'031 ı **Undotted I** *Usage*: *used in Turkish orthography
Input: `\i`
Sources: *PSG*

'061 ɨ **Barred I** *Usage*: close central unrounded vowel
Input1: `\textbari` *Input2*: `1`
Sources: IPA '49–'96

'111 ɪ **Small capital I** *Usage*: near-close near-front unrounded vowel
Input1: `\textsci` *Input2*: `I`
Sources: IPA '89–'96

'314 ɩ **Iota** *Usage*: (obsolete) near-close near-front unrounded vowel
Input: `\textiota`
Sources: IPA '49, '79

'061 ɿ **Left-hooktop I**[9]
Input: `\textlhti`
Sources:

'246 ɿ **Left-hooktop Long I**[10]
Input: `\textlhtlongi`
Sources: *PSG*

'247 ʅ **Viby I**[11]
Input: `\textvibyi`
Sources: *PSG*

Macro ʅ **Raised Viby I**
Input: `\textraisevibyi`
Sources:

'152 j **Lower-case J** *Usage*: voiced palatal approximant
Input: `j`
Sources: IPA '49–'96

'032 ȷ **Undotted J**
Input: `\j`
Sources:

'112 ʝ **Curly-tail J**[12] *Usage*: voiced palatal fricative
Input1: `\textctj` *Input2*: `J`
Sources: IPA '89–'96

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[9] This symbol is sometimes found instead of ɿ (next item) in textbooks of Chinese in Japan.

[10] The two symbols ɿ and ʅ are mainly used among Chinese linguists. These symbols are based on "det svenska landsmålsalfabetet" and introduced to China by Bernhard Karlgren. The original shapes of these symbols were in italic as was always the case with "det svenska landsmålsalfabetet". It seems that the Chinese linguists who wanted to continue to use these symbols in IPA changed their shapes upright. *PSG*'s descriptions to the origin of these symbols are inaccurate.

[11] I call this symbol 'Viby I', based on the following description by Bernhard Karlgren: "Une voyelle très analogue à ʅ se rencontre dans certains dial. suédois; on l'appelle 'i de Viby'." (Karlgren, 1915–1926, p. 295)

[12] In the official IPA charts of '89 through '96, this symbol has a dish serif on top of the stem, rather than the normal sloped serif found in the letter j. I found no reason why it should have a dish serif here, so I changed it to a normal sloped serif. The official (?) IPA shape can be used by the `\textctjvar` command. (ʝ)

'062 ʝ Curly-tail J (a variety found in 1996 IPA) *Usage*: same as the above
Input: `\textctjvar`
Sources: IPA '89–'96

Macro ǰ Wedge J *Usage*: *equivalent to IPA dʒ
Input: `\v{\j}`
Sources: *PSG*

'351 ɟ Barred dotless J *Usage*: voiced palatal plosive
Input: `\textbardotlessj`
Sources: IPA '89–'96

'315 ɟ Old barred dotless J *Usage*: voiced palatal plosive
Input: `\textObardotlessj`
Sources: IPA '49, '79

'352 ʄ Hooktop barred dotless J[13] *Usage*: voiced palatal implosive
Input1: `\texthtbardotlessj` *Input2*: `\!j`
Sources: *Handbook*

'063 ʄ Hooktop barred dotless J (a variety) *Usage*: same as the above
Input: `\texthtbardotlessjvar`
Sources: IPA '89–'93, *PSG*

'250 ᴊ Small capital J
Input1: `\textscj` *Input2*: `\;J`
Sources: *PSG*

'153 k Lower-case K *Usage*: voiceless velar plosive
Input: `k`
Sources: IPA '49–'96

'316 ƙ Hooktop K *Usage*: voiceless velar implosive
Input: `\texthtk`
Sources: IPA '89

'251 ʞ Turned K
Input1: `\textturnk` *Input2*: `\*k`
Sources: *PSG*

'164 ᴋ Small capital K
Input: `\textsck`
Sources: *PSG*

'165 Turned small capital K
Input: `\textturnsck`
Sources: *PSG*

'154 l Lower-case L *Usage*: alveolar lateral approximant
Input: `l`
Sources: IPA '49–'96

'353 ɫ L with tilde
Input1: `\textltilde` *Input2*: `\|~l`
Sources: IPA '49–'96

[13] In *PSG* the shape of this symbol slightly differs. Here I followed the shape found in IPA '89–'96.

'252 ƚ Barred L
Input: `\textbarl`
Sources: *PSG*

'354 ɬ Belted L *Usage*: voiceless dental or alveolar lateral fricative
Input: `\textbeltl`
Sources: IPA '49–'96

'355 ɭ Right-tail L *Usage*: retroflex lateral approximant
Input1: `\textrtaill` *Input2*: `\:l`
Sources: IPA '49–'96

'320 ɮ L-Yogh ligature *Usage*: voiced alveolar lateral fricative
Input: `\textlyoghlig`
Sources: IPA '89–'96

'255 ɮ Old L-Yogh ligature *Usage*: voiced alveolar lateral fricative
Input: `\textOlyoghlig`
Sources: IPA '49, '79

'111 L-Fish-hook R ligature *Usage*: alveolar lateral flap
Input: `\textlfishhookrlig`
Sources:

'317 ʟ Small capital L *Usage*: velar lateral approximant
Input1: `\textscl` *Input2*: `\;L`
Sources: IPA '89–'96

'166 ⅃ Reversed small capital L
Input: `\textrevscl`
Sources: *PSG*

'253 λ Lambda
Input: `\textlambda`
Sources: *PSG*

'254 ƛ Crossed lambda
Input: `\textcrlambda`
Sources: *PSG*

'155 m Lower-case M *Usage*: bilabial nasal
Input: `m`
Sources: IPA '49–'96

'115 ɱ Left-tail M (at right)[14] *Usage*: labiodental nasal
Input1: `\textltailm` *Input2*: `M`
Sources: IPA '49–'96

'064 H-M ligature
Input: `\texthmlig`
Sources: *PSG*

'127 ɯ Turned M *Usage*: close back unrounded vowel
Input1: `\textturnm` *Input2*: `W`
Sources: IPA '49–'96

[14] *PSG* calls this symbol 'Meng'.

'356 ɰ Turned M, right leg *Usage*: voiced velar approximant
Input: `\textturnmrleg`
Sources: IPA '79–'93

'167 ᴍ Small capital M
Input: `\textscm`
Sources: *PSG*

'156 n Lower-case N *Usage*: dental or alveolar nasal
Input: `n`
Sources: IPA '49–'96

'065 Front-bar N[15]
Input: `\textfrbarn`
Sources: *PSG*

'066 ƞ N, right leg[16]
Input: `\textnrleg`
Sources: IPA '49

Macro ñ N with tilde
Input: `\~n`
Sources: *PSG*

'361 ɲ Left-tail N (at left) *Usage*: palatal nasal
Input: `\textltailn`
Sources: IPA '49–'96

'116 ŋ Eng *Usage*: velar nasal
Input1: `\ng` *Input2*: `N`
Sources: IPA '49–'96

'357 ɳ Right-tail N *Usage*: retroflex nasal
Input1: `\textrtailn` *Input2*: `\:n`
Sources: IPA '49–'96

'256 ȵ Curly-tail N *Usage*: *alveolo-palatal nasal
Input: `\textctn`
Sources:

'360 ɴ Small capital N *Usage*: uvular nasal
Input1: `\textscn` *Input2*: `\;N`
Sources: IPA '49–'96

'157 o Lower-case O *Usage*: close-mid back rounded vowel
Input: `o`
Sources: IPA '49–'96

'067 ♀ Female sign
Input: `\textfemale`
Sources: *PSG*

'070 Uncrossed female sign
Input: `\textuncrfemale`
Sources: *PSG*

[15] This shape is based on *PSG* (p. 119). However, its original shape looks a little different. Here I simply followed the shape found in *PSG* because in its source (Trager, 1964) the shape of this symbol is unclear (typewritten, modified by handwriting).

[16] In *PSG*, this symbol is called 'Long-Leg N'.

'362 ʘ Bull's eye[17] *Usage*: bilabial click
Input1: `\textbullseye` *Input2*: `\!o`
Sources: IPA '93, '96

'071 ⊙ Bull's eye (an old version) *Usage*: bilabial click
Input: `\textObullseye`
Sources: IPA '79, '89

'070 ɵ Barred O *Usage*: close-mid central rounded vowel
Input1: `\textbaro` *Input2*: `8`
Sources: IPA '49–'96

'370 ø Slashed O *Usage*: close-mid front rounded vowel
Input: `\o`
Sources: IPA '49–'96

'367 œ O-E ligature *Usage*: open-mid front rounded vowel
Input: `\oe`
Sources: IPA '49–'96

'327 ɶ Small capital O-E ligature *Usage*: open front rounded vowel
Input1: `\textscoelig` *Input2*: `\OE`
Sources: IPA '79–'96

'117 ɔ Open O *Usage*: open-mid back rounded vowel
Input1: `\textopeno` *Input2*: `O`
Sources: IPA '49–'96

'072 ɔ̢ Right-hook open O
Input: `\textrhookopeno`
Sources: *PSG*

'257 ɔe Turned C (Open O)-E ligature
Input: `\textturncelig`
Sources: *PSG*

'260 ω Omega
Input: `\textomega`
Sources: *PSG*

'073 ℧ Inverted omega
Input: `\textinvomega`
Sources: *PSG*

'321 ɷ Closed omega *Usage*: (obsolete) near-close near-back rounded vowel
Input: `\textcloseomega`
Sources: IPA '49, '79

'261 ꭥ Small capital omega
Input: `\textscomega`
Sources: *PSG*

'160 p Lower-case P *Usage*: voiceless bilabial plosive
Input: `p`
Sources: IPA '49–'96

[17] In *PSG* this name is spelled 'Bullseye'.

'322 ƥ Hooktop P *Usage*: voiceless bilabial implosive
Input: `\texthtp`
Sources: IPA '89

'074 Left-hook P
Input: `\textlhookp`
Sources: *PSG*

'170 ᴘ Small capital P
Input: `\textscp`
Sources: *PSG*

'337 ƿ Wynn *Usage*: *labiovelar approximant
Input: `\textwynn`
Sources: Old English

'376 þ Thorn *Usage*: *interdental fricative
Input1: `\textthorn` *Input2*: `\th`
Sources: Old English

'120 A variety of thorn (1)
Input: `\textthornvari`
Sources: *PSG*

'121 A variety of thorn (2)
Input: `\textthornvarii`
Sources: *PSG*

'122 A variety of thorn (3)
Input: `\textthornvariii`
Sources: *PSG*

'123 A variety of thorn (4)
Input: `\textthornvariv`
Sources: *PSG*

'106 ɸ Phi *Usage*: voiceless bilabial fricative
Input1: `\textphi` *Input2*: `F`
Sources: IPA '49–'96

'161 q Lower-case Q *Usage*: voiceless uvular plosive
Input: `q`
Sources: IPA '49–'96

'323 ʠ Hooktop Q *Usage*: voiceless uvular implosive
Input: `\texthtq`
Sources: IPA '89

'075 ȹ Q-P ligature
Input: `\textqplig`
Sources: *PSG*

'171 ꞯ Small capital Q[18] *Usage*: *voiceless pharyngeal plosive
Input1: `\textscq` *Input2*: `\;Q`
Sources:

[18] Suggested by Prof S. Tsuchida for Austronesian languages in Taiwan. In *PSG* 'Female Sign' and 'Uncrossed Female Sign'(pp. 110–111) are noted for pharyngeal stops, as proposed by Trager (1964). Also, I'm not sure about the difference between an epiglottal plosive and a pharyngeal stop.

'162 r Lower-case R *Usage*: alveolar trill
Input: `r`
Sources: IPA '49–'96

'122 ɾ Fish-hook R *Usage*: alveolar tap or flap
Input1: `\textfishhookr` *Input2*: `R`
Sources: IPA '49–'96

'324 ɼ Long-leg R *Usage*: alveolar fricative trill
Input: `\textlonglegr`
Sources: IPA '49, '79

'363 ɽ Right-tail R *Usage*: retroflex tap or flap
Input1: `\textrtailr` *Input2*: `\:r`
Sources: IPA '49–'96

'364 ɹ Turned R *Usage*: alveolar approximant
Input1: `\textturnr` *Input2*: `\*r`
Sources: IPA '49–'96

'365 ɻ Turned R, right tail *Usage*: retroflex approximant
Input1: `\textturnrrtail` *Input2*: `\:R`
Sources: IPA '49–'96

'325 ɺ Turned long-leg R *Usage*: alveolar lateral flap
Input: `\textturnlonglegr`
Sources: IPA '49–'96

'366 ʀ Small capital R *Usage*: uvular trill
Input1: `\textscr` *Input2*: `\;R`
Sources: IPA '49–'96

'172 ᴙ Reversed small capital R
Input: `\textrevscr`
Sources: *PSG*

'113 ʁ Inverted small capital R *Usage*: voiced uvular fricative
Input1: `\textinvscr` *Input2*: `K`
Sources: IPA '49–'96

'163 s Lower-case S *Usage*: voiceless alveolar fricative
Input: `s`
Sources: IPA '49–'96

Macro š Wedge S *Usage*: *equivalent to IPA ʃ
Input: `\v{s}`
Sources: *PSG*

'371 ʂ Right-tail S (at left) *Usage*: voiceless retroflex fricative
Input1: `\textrtails` *Input2*: `\:s`
Sources: IPA '49–'96

'123 ʃ Esh *Usage*: voiceless postalveolar fricative
Input1: `\textesh` *Input2*: `S`
Sources: IPA '49–'96

Macro Double-barred esh
Input: `\textdoublebaresh`
Sources: Beach (1938), *PSG*

'076 ƪ Reversed esh with top loop
Input: `\textlooptoprevesh`
Sources: IPA '49

'262 ʆ Curly-tail esh *Usage*: palatalized ʃ
Input: `\textctesh`
Sources: IPA '49, '79

'164 t Lower-case T *Usage*: voiceless dental or alveolar plosive
Input: `t`
Sources: IPA '49–'96

'077 Front-hook T
Input: `\textfrhookt`
Sources: *PSG*

'263 ƫ Left-hook T *Usage*: palatalized t
Input: `\textlhookt`
Sources: *PSG*

'372 ʈ Right-tail T *Usage*: voiceless retroflex plosive
Input1: `\textrtailt` *Input2*: `\:t`
Sources: IPA '49–'96

'326 ƭ Hooktop T *Usage*: voiceless dental or alveolar implosive
Input: `\texthtt`
Sources: IPA '89

'330 ʇ Turned T *Usage*: dental click
Input1: `\textturnt` *Input2*: `\*t`
Sources: IPA '49, '79

'100 Curly-tail turned T
Input: `\textctturnt`
Sources: Beach (1938), *PSG*

'264 ȶ Curly-tail T *Usage*: *voiceless alveolo-palatal plosive
Input: `\textctt`
Sources:

Macro ʨ T-Curly-tail C ligature
Input: `\texttctclig`
Sources:

Macro Curly-tail T-Curly-tail C ligature
Input: `\textcttctclig`
Sources:

'265 ʦ T-S ligature
Input: `\texttslig`
Sources: IPA '49, '79

'331 ʧ T-Esh ligature *Usage*: voiceless postalveolar affricate
Input: `\textteshlig`
Sources: IPA '49–'96

'124 θ Theta *Usage*: voiceless dental fricative
Input1: `\texttheta` *Input2*: `T`
Sources: IPA '49–'96

'165 u Lower-case U *Usage*: close back rounded vowel
Input: `u`
Sources: IPA '49–'96

'060 ʉ Barred U *Usage*: close central rounded vowel
Input1: `\textbaru` *Input2*: `0`
Sources: IPA '49–'96

'125 ʊ Upsilon *Usage*: near-close near-back rounded vowel
Input1: `\textupsilon` *Input2*: `U`
Sources: IPA '89–'96

'366 ᴜ Small capital U *Usage*: *equivalent to IPA ʊ
Input1: `\textscu` *Input2*: `\;U`
Sources: IPA '49–'96

'173 ∩ Turned small capital U
Input: `\textturnscu`
Sources: *PSG*

'166 v Lower-case V *Usage*: voiced labiodental fricative
Input: `v`
Sources: IPA '49–'96

'126 ʋ Script V[19] *Usage*: voiced labiodental approximant
Input1: `\textscriptv` *Input2*: `V`
Sources: IPA '49–'96

'167 w Lower-case W *Usage*: voiced labio-velar approximant
Input: `w`
Sources: IPA '49–'96

'373 ʍ Turned W *Usage*: voiceless labio-velar fricative
Input1: `\textturnw` *Input2*: `\*w`
Sources: IPA '49–'96

'170 x Lower-case X *Usage*: voiceless velar fricative
Input: `x`
Sources: IPA '49–'96

'130 χ Chi *Usage*: voiceless uvular fricative
Input1: `\textchi` *Input2*: `X`
Sources: IPA '49–'96

'171 y Lower-case Y *Usage*: close front rounded vowel
Input: `y`
Sources: IPA '49–'96

'114 ʎ Turned Y *Usage*: palatal lateral approximant
Input1: `\textturny` *Input2*: `L`
Sources: IPA '49–'96

'131 ʏ Small capital Y *Usage*: near-close near-front rounded vowel
Input1: `\textscy` *Input2*: `Y`
Sources: IPA '49–'96

[19] In *Handbook*, this symbols is called 'Cursive V'.

'266 Left-hooktop long Y[20]
Input: `\textlhtlongy`
Sources: *PSG*

'267 Viby Y[21]
Input: `\textvibyy`
Sources: *PSG*

'172 z Lower-case Z *Usage*: voiced alveolar fricative
Input: `z`
Sources: IPA '49–'96

'336 Comma-tail Z *Usage*: *as in *OHG* ëz̦z̦an 'to eat'.
Input: `\textcommatailz`
Sources: OHG, *PSG*

Macro ž Wedge Z *Usage*: *equivalent to IPA ʒ
Input: `\v{z}`
Sources: *PSG*

'375 ʑ Curly-tail Z *Usage*: voiced alveolo-palatal fricative
Input: `\textctz`
Sources: IPA '49–'96

'374 ʐ Right-tail Z *Usage*: voiced retroflex fricative
Input1: `\textrtailz` *Input2*: `\:z`
Sources: IPA '49–'96

Macro ƻ Crossed two
Input: `\textcrtwo`
Sources: IPA '49

'101 Turned two
Input: `\textturntwo`
Sources: IPA '49

'132 ʒ Yogh[22] *Usage*: voiced postalveolar fricative
Input1: `\textyogh` *Input2*: `Z`
Sources: IPA '49–'96

'102 Bent-tail yogh
Input: `\textbenttailyogh`
Sources: IPA '49

'270 ʓ Curly-tail yogh *Usage*: palatalized ʒ
Input: `\textctyogh`
Sources: IPA '49, '79

'271 Reversed yogh
Input: `\textrevyogh`
Sources: *PSG*

'103 Turned three
Input: `\textturnthree`
Sources: IPA '49

[20] See explanations in footnote 11.

[21] See explanations in footnote 11.

[22] In *Handbook*, this symbols is called 'Ezh'.

'120 ʔ Glottal stop *Usage*: glottal plosive
Input1: `\textglotstop` *Input2*: `P`
Sources: IPA '49–'96

'124 A variety of glottal stop (1)
Input: `\textglotstopvari`
Sources: *PSG*

'125 A variety of glottal stop (2)
Input: `\textglotstopvarii`
Sources: *PSG*

'126 A variety of glottal stop (3)
Input: `\textglotstopvariii`
Sources: *PSG*

'274 ˀ Superscript glottal stop
Input: `\textraiseglotstop`
Sources:

'334 ʡ Barred glottal stop *Usage*: epiglottal plosive
Input: `\textbarglotstop`
Sources: IPA '89–'96

'333 ʖ Inverted glottal stop *Usage*: alveolar lateral click
Input: `\textinvglotstop`
Sources: IPA '49, '79

Macro ƾ Crossed inverted glottal stop
Input: `\textcrinvglotstop`
Sources: IPA '49

'104 Curly-tail inverted glottal stop
Input: `\textctinvglotstop`
Sources: Beach (1938), *PSG*

'105 Turned glottal stop (PSG 1996:211)
Input: `\textturnglotstop`
Sources: *PSG*

'121 ʕ Reversed glottal stop *Usage*: voiced pharyngeal fricative
Input1: `\textrevglotstop` *Input2*: `Q`
Sources: IPA '49–'96

'335 ʢ Barred reversed glottal stop *Usage*: voiced epiglottal fricative
Input: `\textbarrevglotstop`
Sources: IPA '89–'96

'174 ǀ Pipe *Usage*: dental click
Input1: `\textpipe` *Input2*: `|`
Sources: IPA '89–'96

'106 Pipe (a variety with no descender) *Usage*: dental click
Input: `\textpipevar`
Sources: *PSG*

'175 ǂ Double-barred pipe *Usage*: palatoalveolar click
Input: `\textdoublebarpipe`
Sources: IPA '89–'96

'110 Double-barred pipe (a variety with no descender) *Usage*: same as the above
Input: `\textdoublebarpipevar`
Sources: *PSG*

Macro Double-barred slash *Usage*: *a variant of ǂ
Input: `\textdoublebarslash`
Sources: *PSG*

'177 Double pipe *Usage*: alveolar lateral click
Input1: `\textdoublepipe` *Input2*: `||`
Sources: IPA '89–'96

'107 Double pipe (a variety with no descender) *Usage*: same as the above
Input: `\textdoublepipevar`
Sources: *PSG*

'041 Exclamation point *Usage*: (post)alveolar click
Input: `!`
Sources: IPA '89–'96

A.2 Suprasegmentals

'042 Vertical stroke (Superior) *Usage*: primary stress
Input1: `\textprimstress` *Input2*: `"`
Sources: IPA '49–'96

'177 Vertical stroke (Inferior) *Usage*: secondary stress
Input1: `\textsecstress` *Input2*: `""`
Sources: IPA '49–'96

'072 Length mark *Usage*: long
Input1: `\textlengthmark` *Input2*: `:`
Sources: IPA '49–'96

'073 Half-length mark *Usage*: half-long
Input1: `\texthalflength` *Input2*: `;`
Sources: IPA '49–'96

'222 Vertical line *Usage*: minor (foot) group
Input: `\textvertline`
Sources: IPA '89–'96

'223 Double vertical line *Usage*: major (intonation) group
Input: `\textdoublevertline`
Sources: IPA '89–'96

'074 Bottom tie bar *Usage*: linking (absence of a break)
Input1: `\textbottomtiebar` *Input2*: `\t*{}`
Sources: IPA '89–'96

'224 Down arrow[23] *Usage*: downstep
Input: `\textdownstep`
Sources: IPA '89–'96

'225 ↑ Up arrow *Usage*: upstep
Input: `\textupstep`
Sources: IPA '89–'96

'226 ↘ Downward diagonal arrow *Usage*: global fall
Input: `\textglobfall`
Sources: IPA '89–'96

'227 ↗ Upward diagonal arrow *Usage*: global rise
Input: `\textglobrise`
Sources: IPA '89–'96

'005 ← Superscript left arrow
Input: `\textspleftarrow`
Sources: *PSG*, p. 243

'007 ↓ Down full arrow *Usage*: ingressive airflow
Input: `\textdownfullarrow`
Sources: ExtIPA, *Handbook*

'010 ↑ Up full arrow *Usage*: egressive airflow
Input: `\textupfullarrow`
Sources: ExtIPA, *Handbook*

'011 → Subscript right arrow *Usage*: sliding articulation
Input: `\textsubrightarrow`
Sources: ExtIPA

'012 ↔ Subscript double arrow *Usage*: labial spreading
Input: `\textsubdoublearrow`
Sources: ExtIPA

A.2.1 Tone letters

The tones illustrated here are only a representative sample of what is possible. For more details see section 3.2.8.

Macro ˥ Extra high tone
Input: `\tone{55}`
Sources: IPA '89–'96

Macro ˦ High tone
Input: `\tone{44}`
Sources: IPA '89–'96

Macro ˧ Mid tone
Input: `\tone{33}`
Sources: IPA '89–'96

Macro ˨ Low tone
Input: `\tone{22}`
Sources: IPA '89–'96

[23] The shapes of `\textdownstep` and `\textupstep` differ according to sources. Here I followed the shapes found in the recent IPA charts.

Macro ˩ Extra low tone
Input: `\tone{11}`
Sources: IPA ’89–’96

Macro ˥˩ Falling tone
Input: `\tone{51}`
Sources: IPA ’89–’96

Macro ˩˥ Rising tone
Input: `\tone{15}`
Sources: IPA ’89–’96

Macro ˦˥ High rising tone
Input: `\tone{45}`
Sources: IPA ’89–’96

Macro ˩˨ Low rising tone
Input: `\tone{12}`
Sources: IPA ’89–’96

Macro ˦˥˦ High rising falling tone
Input: `\tone{454}`
Sources: IPA ’89–’96

A.2.2 Diacritical Tone Marks

Some symbols included in the next section are also used as diacritical tone marks.

’230 ā́ Macron plus acute accent *Usage*: high rising tone
Input: `\texthighrise{a}`
Sources: IPA ’89–’96

’231 ā̀ Grave accent plus macron *Usage*: low rising tone
Input: `\textlowrise{a}`
Sources: IPA ’89–’96

’232 a᷈ Grave plus acute plus grave accent *Usage*: rising-falling tone
Input: `\textrisefall{a}`
Sources: IPA ’89–’96

’233 a᷉ Acute plus grave plus acute accent *Usage*: falling-rising tone
Input: `\textfallrise{a}`
Sources:

A.3 Accents and Diacritics

’000 è Grave accent *Usage*: low tone
Input: `` \`e ``
Sources: IPA ’49–’96

’001 é Acute accent *Usage*: high tone
Input: `\'e`
Sources: IPA ’49–’96

'002 ê **Circumflex accent** *Usage*: falling tone
Input: `\^e`
Sources: IPA '49–'96

'003 ẽ **Tilde** *Usage*: nasalized
Input: `\~e`
Sources: IPA '49–'96

'004 ë **Umlaut** *Usage*: centralized
Input: `\"e`
Sources: IPA '49–'96

'005 e̋ **Double acute accent** *Usage*: extra high tone
Input: `\H{e}`
Sources: IPA '89–'96

'006 e̊ **Ring**
Input: `\r{e}`
Sources:

'007 ě **Wedge** *Usage*: rising tone
Input: `\v{e}`
Sources: IPA '49–'96

'010 ĕ **Breve** *Usage*: extra short
Input: `\u{e}`
Sources: IPA '49–'96

'011 ē **Macron** *Usage*: mid tone
Input: `\=e`
Sources:

'012 ė **Dot**
Input: `\.e`
Sources:

'013 ȩ **Cedilla**
Input: `\c{e}`
Sources:

'014 ę **Polish hook (Ogonek accent)**
Input1: `\textpolhook{e}` *Input2*: `\k{e}`
Sources:

<u>'000</u> **Reversed Polish hook**
Input: `\textrevpolhook{o}`
Sources: *PSG*, p. 129

'015 ȅ **Double grave accent** *Usage*: extra low tone
Input1: `\textdoublegrave{e}` *Input2*: `\H*e`
Sources: IPA '89–'96

'016 e̖ **Subscript grave accent** *Usage*: low falling tone
Input1: `\textsubgrave{e}` *Input2*: `` \`*e ``
Sources: IPA '49, '79

'017 e̗ **Subscript acute accent** *Usage*: low rising tone
Input1: `\textsubacute{e}` *Input2*: `\'*e`
Sources: IPA '49, '79

Macro ḙ Subscript circumflex accent
Input1: `\textsubcircum{e}` *Input2*: `\^*e`
Sources:

'020 g̑ Round cap
Input1: `\textroundcap{g}` *Input2*: `\|c{g}`
Sources:

Macro ā́ Acute accent with macron
Input1: `\textacutemacron{a}` *Input2*: `\'=a`
Sources:

Macro ā̀ Grave accent with macron
Input: `\textgravemacron{a}`
Sources:

'234 a̍ Vertical bar accent
Input: `\textvbaraccent{a}`
Sources:

'235 a̎ Double vertical bar accent
Input: `\textdoublevbaraccent{a}`
Sources:

'236 ė̀ Grave dot accent
Input1: `\textgravedot{e}` *Input2*: `\`.e`
Sources:

'237 ė́ Dot acute accent
Input1: `\textdotacute{e}` *Input2*: `\'.e`
Sources:

Macro ȧ̂ Circumflex dot accent
Input1: `\textcircumdot{a}` *Input2*: `\^.a`
Sources:

Macro ȧ̃ Tilde dot accent
Input1: `\texttildedot{a}` *Input2*: `\~.a`
Sources:

Macro ā̆ Breve macron accent
Input1: `\textbrevemacron{a}` *Input2*: `\u=a`
Sources:

Macro ā̊ Ring macron accent
Input1: `\textringmacron{a}` *Input2*: `\r=a`
Sources:

Macro š́ Acute wedge accent
Input1: `\textacutewedge{s}` *Input2*: `\v's`
Sources:

Macro ȧ̆ Dot breve accent
Input: `\textdotbreve{a}`
Sources:

'021 t̪ Subscript bridge *Usage*: dental
Input1: `\textsubbridge{t}` *Input2*: `\|[t`
Sources: IPA '49–'96

'022 d̺ Inverted subscript bridge *Usage*: apical
Input1: `\textinvsubbridge{d}` *Input2*: `\|]t`
Sources: IPA '89–'96

'023 n̻ Subscript square *Usage*: laminal
Input: `\textsubsquare{n}`
Sources: IPA '89–'96

'024 o̹ Subscript right half-ring[24] *Usage*: more rounded
Input1: `\textsubrhalfring{o}` *Input2*: `\|)o`
Sources: IPA '49–'96

'025 o̜ Subscript left half-ring *Usage*: less rounded
Input1: `\textsublhalfring{o}` *Input2*: `\|(o`
Sources: IPA '49–'96

'026 k̫ Subscript W *Usage*: labialized
Input1: `\textsubw{k}` *Input2*: `\|w{k}`
Sources: IPA '79

'026 g Over W *Usage*: *labialized
Input: `\textoverw{g}`
Sources:

'027 t̼ Subscript seagull *Usage*: linguolabial
Input1: `\textseagull{t}` *Input2*: `\|m{t}`
Sources: IPA '89–'96

'030 e̽ Over-cross *Usage*: mid-centralized
Input1: `\textovercross{e}` *Input2*: `\|x{e}`
Sources: IPA '49–'96

'033 ɔ̟ Subscript plus[25] *Usage*: advanced
Input1: `\textsubplus{\textopeno}` *Input2*: `\|+O`
Sources: IPA '49–'96

'034 ɛ̝ Raising sign *Usage*: raised
Input1: `\textraising{\textepsilon}` *Input2*: `\|'E`
Sources: IPA '49–'96

'035 e̞ Lowering sign *Usage*: lowered
Input1: `\textlowering{e}` *Input2*: ``\|`e``
Sources: IPA '49–'96

'036 u̘ Advancing sign *Usage*: advanced tongue root
Input1: `\textadvancing{u}` *Input2*: `\|<u`
Sources: IPA '49–'96

'037 ə̙ Retracting sign *Usage*: retracted tongue root
Input1: `\textretracting{\textschwa}` *Input2*: `\|>@`
Sources: IPA '49–'96

[24] Diacritics `\textsubrhalfring` and `\textsublhalfring` can be placed after a symbol by inputting, for example, `[e\textsubrhalfring{}]` [e˒].

[25] The diacritics such as `\textsubplus`, `\textraising`, `\textlowering` `\textadvancing` and `\textretracting` can be placed after a symbol by inputting `[e\textsubplus{}]` [e˖], for example.

'003 ḛ Subscript tilde *Usage*: creaky voiced
Input1: `\textsubtilde{e}` *Input2*: `\~*e`
Sources: IPA '89–'96

'004 e̤ Subscript umlaut *Usage*: breathy voiced
Input1: `\textsubumlaut{e}` *Input2*: `\"*e`
Sources: IPA '79, '89, '93

'006 u̥ Subscript ring *Usage*: voiceless
Input1: `\textsubring{u}` *Input2*: `\r*u`
Sources: IPA '49–'96

'007 e̬ Subscript wedge *Usage*: voiced
Input1: `\textsubwedge{e}` *Input2*: `\v*e`
Sources: IPA '49–'96

'011 e̠ Subscript bar *Usage*: retracted
Input1: `\textsubbar{e}` *Input2*: `\=*e`
Sources: IPA '49–'96

'012 ẹ Subscript dot *Usage*: *retroflex
Input1: `\textsubdot{e}` *Input2*: `\.*e`
Sources:

'020 e̯ Subscript arch *Usage*: non-syllabic
Input: `\textsubarch{e}`
Sources:

'042 m̩ Syllabicity mark *Usage*: syllabic
Input1: `\textsyllabic{m}` *Input2*: `\s{m}`
Sources: IPA '49–'96

'046 t̴ Superimposed tilde *Usage*: velarized or pharyngealized
Input1: `\textsuperimposetilde{t}` *Input2*: `\|~{t}`
Sources: IPA '49–'96

'136 t˺ Corner *Usage*: no audible release
Input: `t\textcorner`
Sources: IPA '89–'96

'137 t˹ Open corner *Usage*: *release/burst
Input: `t\textopencorner`
Sources:

'176 ə˞ Rhoticity *Usage*: rhoticity
Input: `\textschwa\textrhoticity`
Sources: IPA '89–'96

'040 bʹ Celtic palatalization mark *Usage*: *as in *Irish* bʹan 'woman'.
Input: `b\textceltpal`
Sources:

'275 k˂ Left pointer
Input: `k\textlptr`
Sources:

'276 k˃ Right pointer
Input: `k\textrptr`
Sources:

'004 Rectangle[26] *Usage*: *equivalent to IPA ˺ (Corner)
Input: `p\textrectangle`
Sources:

'006 Retracting sign (a variety)
Input: `\textretractingvar`
Sources: IPA '49

'076 Top tie bar *Usage*: affricates and double articulations
Input1: `\texttoptiebar{gb}` *Input2*: `\t{gb}`
Sources:

See page 47 for 'Bottom tie bar'.

'047 Apostrophe *Usage*: ejective
Input: `'`
Sources: IPA '49–'96

'134 Reversed apostrophe *Usage*: (obsolete) week aspiration
Input: `\textrevapostrophe`
Sources: IPA '49, '79

'056 Period *Usage*: syllable break as in [ɹi.ækt]
Input: `.`
Sources: IPA '89–'96

'043 Hooktop
Input: `\texthooktop`
Sources:

'044 Right hook
Input: `\textrthook`
Sources:

'001 Right hook (long)
Input: `\textrthooklong`
Sources:

'045 Palatalization hook
Input: `\textpalhook`
Sources:

'002 Palatalization hook (long)
Input: `\textpalhooklong`
Sources:

'003 Palatalization hook (a variety)
Input: `\textpalhookvar`
Sources:

Macro Superscript H *Usage*: aspirated
Input1: `p\textsuperscript{h}` *Input2*: `p\super h`
Sources: IPA '49–'96

[26] This symbol is used among Japanese linguists as a diacritical symbol indicating no audible release (IPA ˺), because the symbol ˺ is used to indicate pitch accent in Japanese.

Macro k$^{\text{w}}$ Superscript W *Usage*: labialized
Input1: `k\textsuperscript{w}` *Input2*: `k\super w`
Sources: IPA '49–'96

Macro t$^{\text{j}}$ Superscript J *Usage*: palatalized
Input1: `t\textsuperscript{j}` *Input2*: `t\super j`
Sources: IPA '49–'96

Macro t$^{\text{ɣ}}$ Superscript gamma *Usage*: velarized
Input1: `t\textsuperscript{\textgamma}` *Input2*: `t\super G`
Sources: IPA '89–'96

Macro d$^{\text{ʕ}}$ Superscript reversed glottal stop *Usage*: pharyngealized
Input1: `d\textsuperscript{\textrevglotstop}` *Input2*: `d\super Q`
Sources: IPA '89–'96

Macro d$^{\text{n}}$ Superscript N *Usage*: nasal release
Input1: `d\textsuperscript{n}` *Input2*: `d\super n`
Sources: IPA '89–'96

Macro d$^{\text{l}}$ Superscript L *Usage*: lateral release
Input1: `d\textsuperscript{l}` *Input2*: `d\super l`
Sources: IPA '89–'96

A.4 Diacritics for ExtIPA, VoQS

In order to use diacritics listed in this section, it is necessary to specify the option '`extra`' at the preamble (See the section entitled "Other options" on section 3.1.3). Note also that some of the diacritics are defined by using symbols from fonts other than TIPA so that they may not look quite satisfactory and/or may not be slanted (e.g. `\whistle{s}` s̫).

'011 s͍ Subscript double arrow *Usage*: *labial spreading
Input: `\spreadlips{s}`
Sources: ExtIPA '94

Macro v͆ Overbridge *Usage*: *dentolabial
Input: `\overbridge{v}`
Sources: ExtIPA '94

Macro n̪͆ Bibridge *Usage*: *interdental/bidental
Input: `\bibridge{n}`
Sources: ExtIPA '94

Macro t͇ Subscript double bar *Usage*: *alveolar
Input: `\subdoublebar{t}`
Sources: ExtIPA '94

Macro f͈ Subscript double vertical line *Usage*: *strong articulation
Input: `\subdoublevert{f}`
Sources: ExtIPA '94

Macro v͉ Subscript corner *Usage*: *weak articulation
Input: `\subcorner{v}`
Sources: ExtIPA '94

Macro s Up arrow *Usage*: *whistled articulation
Input: `\whistle{s}`
Sources: ExtIPA ’94

’012 θs Subscript right arrow *Usage*: *sliding articulation
Input: `\sliding{\textipa{Ts}}`
Sources: ExtIPA ’94

Macro m Crossed tilde *Usage*: *denasal
Input: `\crtilde{m}`
Sources: ExtIPA ’94

Macro a Dotted tilde *Usage*: *nasal escape
Input: `\dottedtilde{a}`
Sources: ExtIPA ’94

Macro s Double tilde *Usage*: *velopharyngeal friction
Input: `\doubletilde{s}`
Sources: ExtIPA ’94

Macro n Parenthesis plus ring *Usage*: *partial voiceless
Input: `\partvoiceless{n}`
Sources: ExtIPA ’94

Macro n Parenthesis plus ring *Usage*: *initial partial voiceless
Input: `\inipartvoiceless{n}`
Sources: ExtIPA ’94

Macro n Parenthesis plus ring *Usage*: *final partial voiceless
Input: `\finpartvoiceless{n}`
Sources: ExtIPA ’94

Macro s Parenthesis plus subwedge *Usage*: *partial voicing
Input: `\partvoice{s}`
Sources: ExtIPA ’94

Macro s Parenthesis plus subwedge *Usage*: *initial partial voicing
Input: `\inipartvoice{s}`
Sources: ExtIPA ’94

Macro s Parenthesis plus subwedge *Usage*: *final partial voicing
Input: `\finpartvoice{s}`
Sources: ExtIPA ’94

’275 J Subscript left pointer *Usage*: *right offset jaw voice
Input: `\sublptr{J}`
Sources: VoQS ’94

’276 J Subscript right pointer *Usage*: *left offset jaw voice
Input: `\subrptr{J}`
Sources: VoQS ’94

Appendix B

Recent Changes

B.1 Changes from Version 1.2 to 1.3

Some symbols included in the xipa and related font families have been modified.

B.2 Changes from Version 1.1 to 1.2

The following

- The following symbols are added to the `tipx` fonts:

  Varieties of glottal stop symbols and a new symbol:
  ʔ (`\textglotstopvari`)
  ʔ (`\textglotstopvarii`)
  ʔ (`\textglotstopvariii`)
  ɼ (`\textlfishhookrlig`)

- Symbol shapes of the `xipa` and `xipx` font families slightly modified.

B.3 Changes from Version 1.0 to 1.1

The following changes have been made since the first release of TIPA[1].

- The following typefaces are newly added in Version 1.1. Font description files (`*.fd`) modified accordingly.

  Bold Extended Slanted Roman: ***[ˌɛkspləˈneɪʃən]***
  Sans Serif Bold Extended: **[ˌɛkspləˈneɪʃən]**
  Sans Serif Slanted: *[ˌɛkspləˈneɪʃən]*
  Typewriter Text: `[ˌɛkspləˈneɪʃən]`
  Typewriter Text Slanted: *`[ˌɛkspləˈneɪʃən]`*

- Many bugs fixed in the METAFONT source codes; modifications made for almost every symbol. The `xipa` family of fonts now more closely simulates

[1] The first release of TIPA has been known as 'beta0624'. I originally intended to change it to something like 'tipa-1.0' soon after the release but unfortunately I didn't have the opportunity to do so.

Times Roman style.[2]

- `t3enc.def` and `tipa.sty` modified.
- New series of fonts, **tipx** and **xipx** have been created. These fonts are collections of symbols missing in the previous version of TIPA and cover almost all the symbols that appear in the second edition of *PSG* (1996). (Remember that TIPA was released in 1996 and at the time the second edition of *PSG* was not available.) Some of the symbols included in the previous version of TIPA are now moved into **tipx** and **xipx**. Thus the T3 encoding is slightly modified.

  In order to use newly created fonts, add the following after the declaration of TIPA.

  `\usepackage{tipx}`

  For a list of newly created symbols, see next section.

  The encoding of `tipx` and `xipx` still has no definite name. The style file (`tipx.sty`) uses the U encoding and new family names (tipx and xipx which are arbitrary). In the future, it may be possible to use a new encoding name TS3 (I experimentally put `ts3enc.def` and `ts3*.fd` in the `sty` directory of the package. Use these files at your own risk, if the system doesn't complain.)
- Some new tone letter commands, `\stone` and `\rtone`.
- Manual updated.
- Manual for the `vowel.sty` completed.
- Some diacritic commands added.

B.3.1 Newly created symbols

The following two symbols are newly adopted in the `tipa` encoding (i.e., T3).

Hooktop right-tail D — ᶑ
Left-hooktop long Y — ɥ

The following command was realized by a macro in the previous version but now is assigned a code of its own in the `tipa` encoding (i.e., T3).

Crossed lambda — ƛ

The following symbols are (mostly) newly created symbols in the `tipx` fonts. (Note that some are moved from the `tipa` because of the encoding change.)

[2] I'm not fully satisfied with the result of this simulation and further changes will be made in the next release. However, I have no intention of simulating too closely in order to avoid any possible copyright problems.

Right-hook A — ą
Left-hook four — ɥ
Inverted script A — ɑ
A-O ligature — ꜵ
Inverted small capital A — ᴀ
Small capital A-O ligature — ᴁ
Stretched C (original form) — ɕ
Curly-tail stretched C — ɕ
Curly-tail stretched C (original form) — ɕ
Front-hook D — ɗ
Front-hook D (Original) — ɗ
D-B ligature — ȸ
Small capital delta — ᴧ
Right-hook E — ę
Right-hook epsilon — ɛ̨
Small capital F — ꜰ
Greek gamma — γ
Front-tail gamma — ɣ
Back-tail gamma — ɣ
Right-tail hooktop H — ɦ
Heng — ꜧ
Curly-tail J (a variety found in 1996 IPA) — ʝ
Hooktop barred dotless J (a variety) — ʄ
Small capital K — ᴋ
Turned small capital K — ʞ
Reversed small capital L — ⅃
H-M ligature — ɱ
Small capital M — ᴍ
Front-bar N — ƞ
Right leg N — ƞ
Bull's eye (an old version) — ⊙
Female sign — ♀
Uncrossed female sign — ♀
Right-hook open O — ɔ̨
Inverted omega — ɷ
Left-hook P — ƥ
Small capital P — ᴘ
A variety of thorn (1) — þ
A variety of thorn (2) — þ
A variety of thorn (3) — þ
A variety of thorn (4) — þ
Q-P ligature — ȹ
Reversed small capital R — ᴙ
Reversed esh with top loop — ƪ
Front-hook T — ƭ
Curly-tail turned T — ʇ
Turned small capital U — ᴜ
Turned two — ƻ
Bent-tail yogh — ʒ
Turned three — ɛ

Curly-tail inverted glottal stop — ʖ
Turned glottal stop (PSG 1996:211) — ʖ
Pipe (a variety with no descender) — ǀ
Double pipe (a variety with no descender) — ǁ
Double-barred pipe (a variety with no descender) — ǂ
Superscript left arrow — $^{\leftarrow}$
Down full arrow — ↓
Up full arrow — ↑
Subscript right arrow — $_{\rightarrow}$
Subscript double arrow — $_{\leftrightarrow}$
Reversed Polish hook — an accent command e.g., o̜
Retracting sign (a variety) — ˗
Right hook (long) — ˛
Palatalization hook (long) — ˛
Palatalization hook (a variety) — ˛

B.3.2 Symbol shape changes

Shapes of the following symbols have been modified from the first version to the present.

Name	Macro name	New	Old	Old symbol name
Pipe	`\textpipe`	|	ǀ	`\textpipevar`
Double pipe	`\textdoublepipe`	ǁ	ǁ	`\textdoublepipevar`
Double-barred pipe	`\textdoublebarpipe`	ǂ	ǂ	`\textdoublebarpipevar`
Down arrow	`\textdownstep`	ꜜ	↓	`\textdownfullarrow`
Up arrow	`\textupstep`	ꜛ	↑	`\textupfullarrow`
Bull's eye	`\textbullseye`	ʘ	⊙	`\textObullseye`
Hooktop barred dotless J	`\texthtbardotlessj`	ʄ	ʄ	`\texthtbardotlessjvar`

For each symbol, the old shape is preserved in the `tipx` fonts and can be accessed by a new name (in most cases `var` or `O` is attached) indicated at the rightmost column of the above table.

Appendix C

Symbols not included in TIPA

Although the present version of TIPA includes almost all the symbols found in *PSG* and *Handbook*, there are still some symbols not included or defined in TIPA.

Some such symbols can be realized by writing appropriate macros, while some others cannot be realized without resorting to the Metafont.

This section discusses these problems by classifying such symbols into three categories, as shown below.

(1) Symbols that can be realized by TEX's macro level and/or by using symbols from other fonts.

(2) Symbols that can be imitated by TEX's macro level and/or by using symbols from other fonts (but may not look quite satisfactory).

(3) Symbols that cannot be realized at all, without creating a new font.

With the addition of the TIPX fonts, symbols that belong to the third category are virtually non-existent now.

As for the symbols that belong to the first and second categories, TIPA provides a variety of macros and parts of symbols that can be used to compose a desired symbol if you can write an appropriate macro for it.

The following table shows symbols that belong to the first category. For each symbol, an example of input method and its output is also given. Note that barred or crossed symbols can be easily made by TIPA's `\ipabar` macro.

Barred small capital I	`\ipabar{\textsci}{.5ex}{1.1}{}{}`	ᵻ
Barred J	`\ipabar{j}{.5ex}{1.1}{}{}`	ɉ
Crossed K	`\ipabar{k}{1.2ex}{.6}{}{.4}`	ꝁ
Barred open O	`\ipabar{\textopeno}{.5ex}{.6}{.4}{}`	ɔ̵
Barred small capital omega	`\ipabar{\textscomega}{.5ex}{1.1}{}{}`	ꭥ̵
Barred P	`\ipabar{p}{.5ex}{1.1}{}{}`	ᵽ
Half-barred U	`\ipabar{u}{.5ex}{.5}{}{.5}`	ʉ
Barred small capital U	`\ipabar{\textscu}{.5ex}{1.1}{}{}`	ᵾ
Double slash	`/\kern-.25em/`	//
Triple slash	`/\kern-.25em/\kern-.25em/`	///

The next definitions attach a tiny 'left hook' (which shows palatalization) to a symbol. For example:

```
% Left-hook B
\newcommand\textlhookb{{\tipaencoding
  b\hspace{-.15em}\raisebox{.0ex}{\textpalhookvar}}}
% Left-hook M
\newcommand\textlhookm{{\tipaencoding
  m\hspace{-.15em}\raisebox{.0ex}{\textpalhook}}}
```

The former example uses a left-hook called `\textpalhookvar`, (̡) and the latter uses a hook called `\textpalhook`, (̡).

Left-hook B — b̡
Left-hook M — m̡

Symbols that belong to the second category are shown below. Note that slashed symbols can be in fact easily made by a macro. For example, a slashed b i.e., b̸ can be made by `\ipaclap{\textipa{b}}{\textipa{/}}`. The reason why slashed symbols are not included in TIPA is as follows: first, a simple overlapping of a symbol and a slash does not always result in a good shape, and secondly, it doesn't seem significant to devise fine-tuned macros for symbols which were created essentially for typewriters.

Slashed B	b̸
Slashed C	c̸
Slashed D	d̸
Slashed U	u̸
Slashed W	w̸

Appendix D

FAQ

Q1: I have installed all the TIPA fonts. But the system can't find them. What's wrong?

A1: Please don't forget to run the command `mktexlsr` after the installation. Also, try to run the command:

```
kpsewhich tipa10.mf
```

If the system shows nothing in return, you must have installed them in a wrong place.

Q2: I'm using shortcut letters but there are still many symbols which have no shortcut letters. What can I do? Do I have to use all these long names?

A2: You are free to define shorter names. LaTeX's `\newcommand` is a safe way to do this. For example:

```
\newcommand{\vef}{\textbarrevglotstop}
```

Input: `[\vef] is a voiced epiglottal fricative.`

Output: [ʢ] is a voiced epiglottal fricative.

Q3: I want to use the LaTeX command `\|` in the IPA environment. But I don't want to specify the `safe` option. Is it possible?

A3: Use a command called `\Vert` instead of `\|`. It has the same meaning. Other possibly dangerous commands such as `\:`, `\:` and `\!` have a similar substitute command. For more details, see page 12.

Q4: I can't input Eng (`\ng`) properly. Why?

A4: Use `\textipa{N}`. Technically speaking, this is a matter of priority among the `OT1`, `T1` and `T3` encodings. But may be called a bug. I'll work out this problem in the next release.

Q5: How can I input *capital letters*, I mean real capital letters, not small capitals, within the IPA environment?

A5: Use the command `\*`. For example:

Input: `\textipa{["pI\*Di]}`

Output: [ˈpɪDi]

This command is explained in section 3.2.4.

Q6: How can I output an accent or diacritic symbol alone? For example, I want to print the umlaut symbol alone, in order to explain the usage of this symbol.

A6: Try to add an empty argument to the umlaut command.

Input: `\texipa{[\"{}]}`

Output: [¨]

Q7: Are there only a limited number of tone letters?

A7: Absolutely not! Please read section 3.2.8 carefully.

Q8: How to create a PDF file?

A8: You can find a few examples in section 1.1.2.

Q9: I have succeeded in creating a PDF document. But TIPA fonts don't look good (jaggy). What's wrong?

A9: Type1 fonts are not embedded in your document and pk fonts are used instead. Install Type1 font files and/or map file correctly.

Q10: I have succeeded in creating a PDF document with Type1 fonts embedded. But some symbols are missing. Why?

A10: In some versions of `dvips`, the character shifting switch is turned on by default. In order to prevent this, try to invoke `dvips` in the following way.

`dvips -Ppdf -G0` *filename*

Q11: I find no description on hyphenation of phonetic texts in this manual.

A11: I haven't seen any description on hyphenation in *Handbook* nor in *Principles*.

Q12: Why is italic font not included in TIPA? Slanted fonts can be used as substitutes. But I want real italic fonts.

A12: It isn't difficult to create italic shapes for a limited number of symbols such as Schwa, Turned script A, and so on. However, creating a whole set of IPA symbols in italic is quite a different story. It is difficult to distinguish, for example, Lower-case A and Script A in italic. In the IPA's *Principles*, it is recommended that the IPA symbols should be roman, excluding italic shapes in some of the examples. Another point that should be made is that there exist several systems of phonetic symbols in which all the symbols appear in italic. These are the ones mainly used in Scandinavian countries, and the problem is, there is no one-to-one correspondences between such systems and the IPA. Aside from the strictly phonetic use of symbols, however, there is a practical need for italic versions of symbols such as italic Schwa. Therefore, it may be helpful to create a new auxiliary font containing limited number of italic symbols.

Q13: Which is the first name of the author of TIPA? I'm confused.

A13: Rei is his first name.

Q14: I can't send e-mail to the author.

A14: I recently changed my e-mail address.

`fkr@l.u-tokyo.ac.jp`

For instance,
the Greek letters included in the International Alphabet
are cut in roman adaptations. Thus, since the ordinary shape of
the Greek letter β does not harmonise with roman type,
in the International Phonetic Alphabet it is given the form β.
(*Principles*, 1949, p. 1)

... And of the two form of Greek theta, θ and ϑ,
it has been necessary to choose the first (in vertical form),
since the second cannot be made to harmonise with
roman letters. (*Principles*, 1949, p. 2)

Appendix E

Specimens

This section displays all the symbols included in the TIPA font families. Sample texts are taken from the *Principles* (1949). The languages taken up here include: One variety of Southern British English (in a narrower transcription), one form of Parisian French, one variety of North German (in a narrower transcription), Cairene Arabic (spoken language) and Swahili of Zanzaibar.

E.1 tipa10 and tipx10

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˒ ˓ ̏ ˎ ˏ ̑ ˺ ˽ ˼ ˃ ˂ ̫ ̰ ˣ ˥ ˩ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ̮ ˜ ʼ ( ) * + , - .
/ ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ
ʏ ʒ [ʿ] ˥ ˹ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˞ ˌ ˍ ˎ ╲ ╲ ╲ ˏ ⁄ ⁄
⁄ ˍ ˎ ╲ ╲ ╲ ˏ ⁄ ⁄ ⁄ | ‖ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ˈ ˝ ̏ ̋ ƀ đ ɖ ᶑ ᴇ ɡ ɿ ʅ ᴊ ɻ̝ ƚ λ ƛ ɮ ɳ æ ω ʊ ʆ ʧ ʨ ʦ
ɥ ɥ̢ ʓ ʓ ь ъ ˀ ˂ ˃ ǀ ᴀ ɕ ʗ ʥ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ʞ ʟ ɮ ɷ ɓ ɗ ɼ ɹ ʄ ɶ ɫ ʧ ʊ ʖ ʡ ʢ ʐ p ʙ
ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɦ

˓ ̫ ̰ ̯ ˺ ˿ ꜛ ↓ ↑ ɑ̢ ɑ ꭤ ɟ ɕ ʗ ɕ ȡ ɗ ȸ ɛ ɛ ɣ ɣ ɣ ɦ ɧ ı ȷ ʆ ʮ ɿ ɳ ♀ ♀ ⊙ ʡ ɷ p ȹ ʅ ȶ ʒ
ƺ ʓ ɜ ƽ ʢ | ‖ ǂ ꝁ þ þ þ þ ʔ ʔ ʔ ∀ Ꜹ Δ Ⅎ K ꓘ ꓶ M P Q Я ∩

ðə ˈnɔˑθ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpjuˑtɪŋ wɪtʃ wəz ðə ˈstrɒŋgɐ, wɛn ə ˈtrævlɐ keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn huˑ fɜˑst səkˈsiˑdɪd ɪn ˈmeɪkiŋ ðə ˈtrævlɐ teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.2 tipa12 and tipx12

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˒ ˓ ̏ ˎ ˏ ̑ ˺ ˽ ˼ ˃ ˂ ̫ ̰ ˣ ˥ ˩ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ̮ ˜ ʼ
( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ
ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˹ ʻ a b c d e f g h i j k l m n o p q r
s t u v w x y z ‖ | ǂ ˞ ˌ ˍ ˎ ╲ ╲ ╲ ˏ ⁄ ⁄ ⁄ ˍ ˎ ╲ ╲ ╲ ˏ ⁄ ⁄ ⁄ | ‖ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ˈ
˝ ̏ ̋ ƀ đ ɖ ᶑ ᴇ ɡ ɿ ʅ ᴊ ɻ̝ ƚ λ ƛ ɮ ɳ æ ω ʊ ʆ ʧ ʨ ʦ ɥ ɥ̢ ʓ ʓ ь ъ ˀ ˂ ˃ ǀ ᴀ ɕ
ʗ ʥ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ʞ ʟ ɮ ɷ ɓ ɗ ɼ ɹ ʄ ɶ ɫ ʧ ʊ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ ɠ
ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɦ

˓ ̫ ̰ ̯ ˺ ˿ ꜛ ↓ ↑ ɑ̢ ɑ ꭤ ɟ ɕ ʗ ɕ ȡ ɗ ȸ ɛ ɛ ɣ ɣ ɣ ɦ ɧ ı ȷ ʆ ʮ ɿ ɳ ♀ ♀ ⊙ ʡ
ɷ p ȹ ʅ ȶ ʒ ƺ ʓ ɜ ƽ ʢ | ‖ ǂ ꝁ þ þ þ þ ʔ ʔ ʔ ∀ Ꜹ Δ Ⅎ K ꓘ ꓶ M P Q Я ∩

---

la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.3 `tipa17` and `tipx17`

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̹ ̜ ̏ ̀ ́ ̑ ̻ ̺ ̼ ̒ ̔ ̫ ̴ ̽ ˥ ˩ ˖ ˔ ˕ ˧ ˨ ˊ ! ˈ ˞ ̮ ̯ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ʔ ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˥ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ǁ ǀ ǂ ˜ ˌ _ ˎ ∖ ∖ ∖ ˏ ⁄ ⁄ ⁄ _ ˎ ∖ ∖ ˏ ⁄ ⁄ ⁄ | ‖ ↓ ↑ ↗ ↘ ˇ ˋ ^ ˜ ˈ ˝ ˵ ˶ ƀ đ ɖ ᶑ ᴇ ɡ ˥ ˩ ᴊ ʞ ɫ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʦ ʦ ɥ ɰ ʓ ʓ ƅ ƅ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ʫ ɷ ƥ ɠ ɼ ɹ ʄ œ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʑ ʑ þ ƕ

̹ ̮ ̯ ̻ ̆ ← ↔ ↓ ↑ ą ɑ ɶ ɟ c ɕ ɕ ɗ ɗ ȡ ę ę ɣ ɣ ɣ ɦ ɧ ı ȷ ʄ ɱ ɲ ŋ ♀ ♀ ʘ ʚ ɷ p ɸ ʅ ʈ ɟ ʒ ʒ ɛ ʖ ʢ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Ꜳ Δ Ⅎ K ꓘ ꓕ M P Ꝗ Я ꓵ

ˈʔaɪnst ʃtʀɪtən zɪç ˈnɔʁtvɪnt ʔʊnt ˈzɔnə, ˈveːʀ fɔn ʔiˑnən ˈbaɪdən voːl dɐʁ ˈʃtɛʁkɐʀə vɛːʀə, ʔɑls ʔaɪn ˈvɑndɐʀɐʁ, deːʁ ʔɪn ʔaɪnən vɑʁmən ˈmɑntəl gəˈhʏlt vaːʁ, dəs veːgəs daːˈheːʁ kaːm. ziˑ vʊʁdən ˈʔaɪniç, dɑs ˈdeːʁjeːnɪgə fyːʁ dən ˈʃtɛʁkɐʀən gɛltən zɔltə, deːʁ dən ˈvɑndɐʀɐʁ ˈtsvɪŋən vyʁdə, zaɪnən ˈmɑntəl ˈʔɑptsuˑneːmən.

E.4 `tipa8` and `tipx8`

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̹ ̜ ̏ ̀ ́ ̑ ̻ ̺ ̼ ̒ ̔ ̫ ̴ ̽ ˥ ˩ ˖ ˔ ˕ ˧ ˨ ˊ ! ˈ ˞ ̮ ̯ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ʔ ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˥ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ǁ ǀ ǂ ˜ ˌ _ ˎ ∖ ∖ ∖ ˏ ⁄ ⁄ ⁄ _ ˎ ∖ ∖ ˏ ⁄ ⁄ ⁄ | ‖ ↓ ↑ ↗ ↘ ˇ ˋ ^ ˜ ˈ ˝ ˵ ˶ ƀ đ ɖ ᶑ ᴇ ɡ ˥ ˩ ᴊ ʞ ɫ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʦ ʦ ɥ ɰ ʓ ʓ ƅ ƅ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ʫ ɷ ƥ ɠ ɼ ɹ ʄ œ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʑ ʑ þ ƕ

̡ ̢ ̣ ̤ ˚ ˂ ꭑ ↓ ↑ ą ɑ ꭐ ɟ ȼ ʗ ʗ ȡ ȡ ȸ ȩ ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɦ ɳ ɳ ♀ ♀ ⊙ ʡ ɷ p ȹ ɭ ȶ ɟ ƻ ʓ ɛ ƽ ʡ | ‖ ǂ
ŀ þ þ þ þ ʔ ʔ ˀ ∀ Ꜳ Δ ꜰ ᴋ ꓘ ɹ ᴍ ᴘ ǫ ᴙ ∩

---

marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.5 tipa9 and tipx9

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̧ ̨ " ˋ ˊ ̑ ̻ ̺ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ̯ ˜ ' ( ) * + , - . / ʉ ɨ ʌ
ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a
b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ _ ˍ ˎ ˎ \ ˏ ˏ / / _ ˍ ˎ \ \ ˏ ˏ / / | ‖ ↓ ↑
↗ ↘ ˇ ˋ ˆ ˜ ' " ̆ ̋ ƀ đ ɖ ᶑ ᴇ ɡ ɿ ʅ ᴊ ʮ ɬ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʨ ʦ ɥ ɥ ʓ ƺ ь ъ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ
ɚ ɞ ʚ ɝ ɤ ʛ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ɓ ɗ ɽ ɹ ʄ ɶ ɻ ʧ ʊ ƽ ʡ ʢ ʐ p ʙ ɓ ɗ ᶑ ɠ ɢ æ ç ħ ɟ ʄ ɬ ɫ ɭ ɰ ɳ ɴ ɲ
ʘ ɼ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

̡ ̢ ̣ ̤ ˚ ˂ ꭑ ↓ ↑ ą ɑ ꭐ ɟ ȼ ʗ ʗ ȡ ȡ ȸ ȩ ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɦ ɳ ɳ ♀ ♀ ⊙ ʡ ɷ p ȹ ɭ ȶ ɟ ƻ ʓ ɛ ƽ
ʡ | ‖ ǂ ŀ þ þ þ þ ʔ ʔ ˀ ∀ Ꜳ Δ ꜰ ᴋ ꓘ ɹ ᴍ ᴘ ǫ ᴙ ∩

---

upepo ulikuwa ukiɓiʃana na ɟua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ɟuɓa. walipatana kuwa atakajemvua ɟuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.6 tipabx10 and tipxbx10

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̧ ̨ " ˋ ˊ ̑ ̻ ̺ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ̯ ˜ ' (
) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ
ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t
u v w x y z ‖ | ǂ ˜ ˌ _ ˍ ˎ ˎ \ ˏ ˏ / / _ ˍ ˎ \ \ ˏ ˏ / / | ‖ ↓ ↑ ↗ ↘ ˇ ˋ ˆ ˜ ' " ̆
̋ ƀ đ ɖ ᶑ ᴇ ɡ ɿ ʅ ᴊ ʮ ɬ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʨ ʦ ɥ ɥ ʓ ƺ ь ъ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ
ɚ ɞ ʚ ɝ ɤ ʛ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ɓ ɗ ɽ ɹ ʄ ɶ ɻ ʧ ʊ ƽ ʡ ʢ ʐ p ʙ ɓ ɗ ᶑ ɠ ɢ æ ç
ħ ɟ ʄ ɬ ɫ ɭ ɰ ɳ ɴ ɲ ʘ ɼ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

̡ ̢ ̣ ̤ ˚ ˂ ꭑ ↓ ↑ ą ɑ ꭐ ɟ ȼ ʗ ʗ ȡ ȡ ȸ ȩ ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɦ ɳ ɳ ♀ ♀ ⊙ ʡ ɷ
p ȹ ɭ ȶ ɟ ƻ ʓ ɛ ƽ ʡ | ‖ ǂ ŀ þ þ þ þ ʔ ʔ ˀ ∀ Ꜳ Δ ꜰ ᴋ ꓘ ɹ ᴍ ᴘ ǫ ᴙ ∩

ðə ˈnɔˑθ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpjuˑtɪŋ wɪtʃ wəz ðə ˈstrɒŋgɐ, wɛn ə ˈtrævlɐ keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn huˑ fɜˑst səkˈsiˑdɪd ɪn ˈmeɪkiŋ ðə ˈtrævlɐ teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.7 tipabx12 and tipxbx12

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̧ ̨ " ˋ ˊ ̑ ̻ ̺ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ !
ˈ ʳ ̯ ˜ ' ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ
ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a b c d
e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ _ ˍ ˎ ˎ \ ˏ ˏ

/ / ˍ ˎ \ \ \ ˏ ⁄ / / | ‖ ꜜ ꜛ ↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ ̈ ˝ ƀ đ ɖ ᶑ ᴇ ɡ ʅ ʅ ᴊ ʞ
ƚ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʨ ʦ ɥ ɥ ʓ ʓ ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ ʥ ɚ ɞ ɜ ɝ ɤ
ʛ ɧ ʜ ɩ ɟ ʞ ʟ ɮ ɷ ꞵ ᶑ ɼ ɹ ʄ ɶ ʇ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ ɢ æ ç
ħ ɟ ʄ ɫ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ ƥ ɥ

˛ ˓ ˒ ˓ ˚ ˿ ᴍ ↓ ↑ ą ɑ ɶ ʄ ɕ ʆ ɕ ɗ ɗ ȸ ę ɛ ɣ ɣ ɣ ɧ ɧ ı ʝ ʃ ɯ ɴ ɳ
♀ ♀ ☉ ʔ ɷ ƥ ɸ ɭ ƫ ɟ ʒ ʓ ɛ ʖ ʕ | ‖ ǂ ŀ þ þ þ þ ʔ ʔ ʔ ∀ Ꜻ ▲ ꜰ
ᴋ ꓘ ᴊ M ᴘ Q ᴙ ɷ

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la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.8 `tipabx8` and `tipxbx8`

ˋ ˊ ˆ ˜ ̈ ˝ ˚ ˇ ˘ ˉ ˙ ˛ ˓ ̎ ˋ ˊ ˆ ˽ ˬ ˭ ˒ ˓ ˽ ˜ ˣ ı ȷ ˖ ˔ ˕ ˧ ˦ ˊ ! ˈ ʳ ˬ ˜ ʼ ( ) * + , - . /
ʉ ɨ ʌ ɜ ɥ ɐ ᴅ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ʔ ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ
[ˁ] ˥ ˹ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ , ˍ ˎ \ \ \ ˏ ⁄ / / ˍ ˎ \ \
\ ˏ / / / | ‖ ꜜ ꜛ ↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ ̈ ˝ ƀ đ ɖ ᶑ ᴇ ɡ ʅ ʅ ᴊ ʞ ƚ λ ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʨ ʦ ɥ ɥ ʓ ʓ
ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ ʥ ɚ ɞ ɜ ɝ ɤ ʛ ɧ ʜ ɩ ɟ ʞ ʟ ɮ ɷ ꞵ ᶑ ɼ ɹ ʄ ɶ ʇ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ
ɢ æ ç ħ ɟ ʄ ɫ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ ƥ ɥ

˛ ˓ ˒ ˓ ˚ ˿ ᴍ ↓ ↑ ą ɑ ɶ ʄ ɕ ʆ ɕ ɗ ɗ ȸ ę ɛ ɣ ɣ ɣ ɧ ɧ ı ʝ ʃ ɯ ɴ ɳ ♀ ♀ ☉ ʔ ɷ ƥ ɸ ɭ ƫ ɟ ʒ
ʓ ɛ ʖ ʕ | ‖ ǂ ŀ þ þ þ þ ʔ ʔ ʔ ∀ Ꜻ ▲ ꜰ ᴋ ꓘ ᴊ M ᴘ Q ᴙ ɷ

ˈʔaɪnst ʃtʀɪtən zɪç ˈnɔʁtvɪnt ʔʊnt ˈzɔnə, ˈveːʀ fɔn ʔiˑnən ˈbaɪdən voːl dɐʁ ˈʃtɛʁkɐʀə vɛːʀə, ʔɑls ʔaɪn ˈvɑndɐʀɐʁ, deːʁ ʔɪn ʔaɪnən vɑʁmən ˈmɑntəl gəˈhʏlt vaːʁ, dəs veːgəs daːˈheːʁ kaːm. ziˑ vʊʁdən ˈʔaɪniç, dɑs ˈdeːʁjeːnɪgə fyːʁ dən ˈʃtɛʁkɐʀən gɛltən zɔltə, deːʁ dən ˈvɑndɐʀɐʁ ˈtsvɪŋən vyʁdə, zaɪnən ˈmɑntəl ˈʔɑptsuˑneːmən.

E.9 `tipabx9` and `tipxbx9`

ˋ ˊ ˆ ˜ ̈ ˝ ˚ ˇ ˘ ˉ ˙ ˛ ˓ ̎ ˋ ˊ ˆ ˽ ˬ ˭ ˒ ˓ ˽ ˜ ˣ ı ȷ ˖ ˔ ˕ ˧ ˦ ˊ ! ˈ ʳ ˬ ˜ ʼ ( ) * +
, - . / ʉ ɨ ʌ ɜ ɥ ɐ ᴅ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ʔ ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ
ʊ ʋ ɯ χ ʏ ʒ [ˁ] ˥ ˹ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜
, ˍ ˎ \ \ \ ˏ ⁄ / / ˍ ˎ \ \ \ ˏ / / / | ‖ ꜜ ꜛ ↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ ̈ ˝ ƀ đ ɖ ᶑ ᴇ ɡ ʅ ʅ ᴊ ʞ ƚ λ
ƛ ɮ ɳ æ ω ɷ ʆ ʨ ʨ ʦ ɥ ɥ ʓ ʓ ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ ʥ ɚ ɞ ɜ ɝ ɤ ʛ ɧ ʜ ɩ ɟ ʞ ʟ ɮ ɷ ꞵ
ᶑ ɼ ɹ ʄ ɶ ʇ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ɫ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ
ʈ ʍ ʐ ʑ ƥ ɥ

˛ ˓ ˒ ˓ ˚ ˿ ᴍ ↓ ↑ ą ɑ ɶ ʄ ɕ ʆ ɕ ɗ ɗ ȸ ę ɛ ɣ ɣ ɣ ɧ ɧ ı ʝ ʃ ɯ ɴ ɳ ♀ ♀ ☉ ʔ ɷ ƥ ɸ
ɭ ƫ ɟ ʒ ʓ ɛ ʖ ʕ | ‖ ǂ ŀ þ þ þ þ ʔ ʔ ʔ ∀ Ꜻ ▲ ꜰ ᴋ ꓘ ᴊ M ᴘ Q ᴙ ɷ

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marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.10 tipasl10 and tipxsl10

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*` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ¸ " \ ⁄ ^ ˓ ˒ ˔ ˕ ˖ ˗ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ′ ! ʻ ʳ ˬ ˷ ~ ʼ ( ) * + , - .*
/ ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ
ʏ ʒ [ʿ] ˥ ˦ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ǁ | ǂ ˜ , _ ˍ \ \ ˎ ⁄ ⁄
⁄ ˍ \ \ \ ⁄ ⁄ ⁄ | ǁ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ˈ ˮ ˇ ˝ ƀ đ ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ʮ ƚ λ ƛ ɮ ɳ æ ω ɷ ʆ ʧ ʨ ʦ
ɥ ɥ ʒ ʓ ʙ ъ ˀ ˂ ˃ ǀ ᴀ ɗ ʗ ʤ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ʄ ɠ ɾ ɺ ʈ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ƥ ʙ
ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˓ ˬ ˯ ˺ ˻ ˿ ↓ ↑ ą ɑ ɶ ɟ ɕ ʗ ɕ ɖ ɗ ȸ ę ɛ̨ ɣ ɣ ɣ ɦ ɧ ı ȷ ʃ ɦ ɲ ŋ ʕ ʕ ʘ ɕ ɷ p ȹ ɭ ɬ ɟ
ʐ ʓ ɛ ʖ ʡ ǀ ǁ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ɷ

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upepo ulikuwa ukiɓiʃana na ʄua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ʄuɓa. walipatana kuwa atakajemvua ʄuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.11 tipasl12 and tipxsl12

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ¸ " \ ⁄ ^ ˓ ˒ ˔ ˕ ˖ ˗ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ′ ! ʻ ʳ ˬ ˷ ~ ʼ
*( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ*
ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˦ ʻ a b c d e f g h i j k l m n o p q r
s t u v w x y z ǁ | ǂ ˜ , _ ˍ \ \ ˎ ⁄ ⁄ ⁄ ˍ \ \ \ ⁄ ⁄ ⁄ | ǁ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ˈ
ˮ ˇ ˝ ƀ đ ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ʮ ƚ λ ƛ ɮ ɳ æ ω ɷ ʆ ʧ ʨ ʦ ɥ ɥ ʒ ʓ ʙ ъ ˀ ˂ ˃ ǀ ᴀ ɗ
ʗ ʤ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ʄ ɠ ɾ ɺ ʈ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ
ɢ æ ç ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˓ ˬ ˯ ˺ ˻ ˿ ↓ ↑ ą ɑ ɶ ɟ ɕ ʗ ɕ ɖ ɗ ȸ ę ɛ̨ ɣ ɣ ɣ ɦ ɧ ı ȷ ʃ ɦ ɲ ŋ ʕ ʕ ʘ ɕ
ɷ p ȹ ɭ ɬ ɟ ʐ ʓ ɛ ʖ ʡ ǀ ǁ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ɷ

ðə ˈnɔˑθ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpjuˑtɪŋ wɪtʃ wəz ðə ˈstrɒŋgɐ, wɛn ə ˈtrævlɐ keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn huˑ fɜˑst səkˈsiˑdɪd ɪn ˈmeɪkiŋ ðə ˈtrævlɐ teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.12 tipasl8 and tipxsl8

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*` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ¸ " \ ⁄ ^ ˓ ˒ ˔ ˕ ˖ ˗ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ′ ! ʻ ʳ ˬ ˷ ~ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ*
ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˦ ʻ a b c d e f g h i j
k l m n o p q r s t u v w x y z ǁ | ǂ ˜ , _ ˍ \ \ ˎ ⁄ ⁄ ⁄ ˍ \ \ \ ⁄ ⁄ ⁄ | ǁ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ˈ ˮ ˇ ˝ ƀ đ
ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ʮ ƚ λ ƛ ɮ ɳ æ ω ɷ ʆ ʧ ʨ ʦ ɥ ɥ ʒ ʓ ʙ ъ ˀ ˂ ˃ ǀ ᴀ ɗ ʗ ʤ ɚ ɞ ɜ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ʄ ɠ
ɾ ɺ ʈ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˓ ˬ ˯ ˺ ˻ ˿ ↓ ↑ ą ɑ ɶ ɟ ɕ ʗ ɕ ɖ ɗ ȸ ę ɛ̨ ɣ ɣ ɣ ɦ ɧ ı ȷ ʃ ɦ ɲ ŋ ʕ ʕ ʘ ɕ ɷ p ȹ ɭ ɬ ɟ ʐ ʓ ɛ ʖ ʡ ǀ ǁ ǂ
ƚ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ɷ

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la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.13 tipasl9 and tipxsl9

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ˓ ‟ ˎ ˏ ̑ ̺ ̪ ̻ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ‿ ˜ ' ( ) * + , - . / ʉ ɨ ʌ
ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a
b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ ˍ ⸜ ⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ ˍ ⸜ ⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ | ‖ ↓ ↑
↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ ̏ ̋ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ɳ æ ω Ω ʆ ȶ ƫ ʦ ɥ ʮ ʓ ƹ ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ ʤ
ɚ ʚ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ɷ ꞵ ɗ ɼ ɹ ƭ ɶ ʈ ʧ ᴜ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ
ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˒ ̫ ˓ ̺ ← ↔ ↓ ↑ ą ɑ ɶ ȸ ƈ ʗ ɕ ȡ ȡ ȸ ę ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɧ ɴ η ♀ ♀ ʘ ʡ ɷ p ɸ ɭ ȶ ʈ ƺ ʓ ɛ ʖ
ʖ | ‖ ǂ ƚ þ þ þ þ ? ? ʡ ∀ Æ Δ ꜰ ᴋ ᴎ ɹ ᴍ ᴘ ǫ ᴙ ᴖ

'ʔaɪnst ʃtʀɪtən zɪç 'nɔʁtvɪnt ʔʊnt 'zɔnə, 'veːʀ fɔn ʔiˑnən 'baɪdən voːl dɐʁ 'ʃtɛʁkɐʀə vɛːʀə, ʔals ʔaɪn 'vandɐʀɐʁ, deːʁ ʔɪn ʔaɪnən vaʁmən 'mantəl gə'hʏlt vaːʁ, dəs veːgəs daː'heːʁ kaːm. ziˑ vʊʁdən 'ʔaɪnɪç, das 'deːʁjeːnɪgə fyːʁ dən 'ʃtɛʁkɐʀən gɛltən zɔltə, deːʁ dən 'vandɐʀɐʁ 'tsvɪŋən vyʁdə, zaɪnən 'mantəl 'ʔaptsuˑneːmən.

E.14 tipass10 and tipxss10

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ˓ ‟ ˎ ˏ ̑ ̺ ̪ ̻ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ‿ ˜ ' ( ) * + , - .
/ ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ
ʒ [ʿ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ ˍ ⸜ ⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ ˍ ⸜
⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ | ‖ ↓ ↑ ↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ ̏ ̋ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ɳ æ ω Ω ʆ ȶ ƫ ʦ ɥ ʮ
ʓ ƹ ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ ʤ ɚ ʚ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ɷ ꞵ ɗ ɼ ɹ ƭ ɶ ʈ ʧ ᴜ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ
ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˒ ̫ ˓ ̺ ← ↔ ↓ ↑ ą ɑ ɶ ȸ ƈ ʗ ɕ ȡ ȡ ȸ ę ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɧ ɴ η ♀ ♀ ʘ ʡ ɷ p ɸ ɭ ȶ ʈ
ƺ ʓ ɛ ʖ ʖ | ‖ ǂ ƚ þ þ þ þ ? ? ʡ ∀ Æ Δ ꜰ ᴋ ᴎ ɹ ᴍ ᴘ ǫ ᴙ ᴖ

marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.15 tipass12 and tipxss12

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˛ ˓ ‟ ˎ ˏ ̑ ̺ ̪ ̻ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ˈ ʳ ‿ ˜ '
( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ
ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s
t u v w x y z ‖ | ǂ ˷ ˌ ˍ ⸜ ⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ ˍ ⸜ ⸜ ⸜ ⸜ ⸝ ⸝ ⸝ ⸝ | ‖ ↓ ↑ ↗ ↘ ˏ ˎ ˆ ˜ ˈ ˮ
̏ ̋ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ɳ æ ω Ω ʆ ȶ ƫ ʦ ɥ ʮ ʓ ƹ ь ъ ˀ ˂ ˃ | ᴀ ʗ ʗ
ʤ ɚ ʚ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ɷ ꞵ ɗ ɼ ɹ ƭ ɶ ʈ ʧ ᴜ ʖ ʡ ʢ ʐ p ʙ ɓ ɗ ɖ ʛ ɢ æ ç
ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˒ ̫ ˓ ̺ ← ↔ ↓ ↑ ą ɑ ɶ ȸ ƈ ʗ ɕ ȡ ȡ ȸ ę ɛ̢ ɣ ɣ ɣ ɧ ɧ ı ȷ ʃ ɧ ɴ η ♀ ♀ ʘ ʡ
ɷ p ɸ ɭ ȶ ʈ ƺ ʓ ɛ ʖ ʖ | ‖ ǂ ƚ þ þ þ þ ? ? ʡ ∀ Æ Δ ꜰ ᴋ ᴎ ɹ ᴍ ᴘ ǫ ᴙ ᴖ

upepo ulikuwa ukiɓiʃana na ʄua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ʄuɓa. walipatana kuwa atakajemvua ʄuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.16 tipass17 and tipxss17

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˏ ˓ ̏ ˎ ˏ ̑ ˥ ˩ ˦ ˃ ˂ ˬ ˭ ˟ | ˩ ˖
˔ ˕ ˧ ˫ ′ ! ' ʳ ˯ ~ ' ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː
ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ɟ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ
ʋ ɯ χ ʏ ʒ [ˈ] ˺ ˹ ʻ a b c d e f g h i j k l m n o p q r
s t u v w x y z ‖ | ǂ ˞ ˌ ˍ ˎ ˎ ˎ ˎ ˏ ˏ ˏ ˏ ˍ ˎ ˎ ˎ ˏ ˏ ˏ | ‖
↓ ↑ ↗ ↘ ˊ ˋ ˮ ˜ ˈ ˝ ˇ ˝ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ɫ ƛ ƛ ɮ ɳ
ɶ ω Ω ʆ ʈ ʨ ʦ ɥ ɰ ʓ ʓ ƅ ƅ ˀ ˂ ˃ ǀ ᴀ ȼ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɠ
ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ƥ ɗ ɽ ɹ ɾ ɶ ʇ ʧ ʊ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ɖ ɠ
ɢ æ ç ħ ɟ ʄ ɬ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɻ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˞ ˯ ˰ ˓ ˚ ˿ - ↓ ↑ ą ɑ ꭤ ɟ ɕ ʗ ɕ ȡ ȡ ȸ ę ɛ̢ ɣ ɣ ɣ ɦ ɧ ɿ
ʝ ʃ ɱ ɳ ɳ ♀ ♀ ʘ ʓ ɷ ƥ ȹ ʅ ƫ ʈ ʐ ʒ ɜ ʖ ʡ ǀ ǁ ǂ ƚ þ þ
þ þ ʔ ʔ ʡ ∀ Ꜳ Δ Ⅎ K ꓘ ⅃ M Ⴁ Q Я Ո

ðə ˈnɔ·θ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpju·tɪŋ wɪtʃ wəz ðə ˈstrɒŋgɐ, wɛn ə ˈtrævlɐ keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn hu· fɜ·st səkˈsi·dɪd ɪn ˈmeɪkiŋ ðə ˈtrævlɐ teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.17 tipass8 and tipxss8

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˏ ˓ ̏ ˎ ˏ ̑ ˥ ˩ ˦ ˃ ˂ ˬ ˭ ˟ | ˩ ˖ ˔ ˕ ˧ ˫ ′ ! ' ʳ ˯ ~ ' ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ
ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ɟ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ˈ] ˺ ˹ ʻ a b c d e f g h i j k
l m n o p q r s t u v w x y z ‖ | ǂ ˞ ˌ ˍ ˎ ˎ ˎ ˎ ˏ ˏ ˏ ˏ ˍ ˎ ˎ ˎ ˏ ˏ ˏ | ‖ ↓ ↑ ↗ ↘ ˊ ˋ ˮ ˜ ˈ ˝ ˇ ˝ ƀ đ ȡ ɖ
ᴇ ɡ ɿ ʅ ᴊ ʞ ɫ ƛ ƛ ɮ ɳ ɶ ω Ω ʆ ʈ ʨ ʦ ɥ ɰ ʓ ʓ ƅ ƅ ˀ ˂ ˃ ǀ ᴀ ȼ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ƥ ɗ ɽ ɹ ɾ ɶ
ʇ ʧ ʊ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ɬ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɻ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˞ ˯ ˰ ˓ ˚ ˿ - ↓ ↑ ą ɑ ꭤ ɟ ɕ ʗ ɕ ȡ ȡ ȸ ę ɛ̢ ɣ ɣ ɣ ɦ ɧ ɿ ʝ ʃ ɱ ɳ ɳ ♀ ♀ ʘ ʓ ɷ ƥ ȹ ʅ ƫ ʈ ʐ ʒ ɜ ʖ ʡ ǀ ǁ ǂ ƚ
þ þ þ þ ʔ ʔ ʡ ∀ Ꜳ Δ Ⅎ K ꓘ ⅃ M Ⴁ Q Я Ո

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la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.18 tipass9 and tipxss9

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̡ ‶ ˎ ˏ ̑ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ǀ ǁ ˖ ˔ ˕ ˧ ˫ ´ ! ' ˞ ̮ ~ ' ( ) * + , - . / ʉ ɨ ʌ
ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ˈ] ˥ ˩ ‘ a b
c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ _ ˍ \ \ \ ˏ / / / _ ˍ \ \ \ ˏ / / / | ‖ ↓ ↑ ↗ ↘
ˏ ˎ ̌ ̃ ˈ ˝ ̌ ˝ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ȵ æ ω ɷ ʆ ƫ ʨ ʦ ɥ ʮ ʓ ʓ ь ъ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ʚ
ɝ ɤ ƈ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ β ɖ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ
œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˳ ̮ ̯ ̡ ˔ ← - ↓ ↑ ą ɑ ꭡ ʄ ɕ ʗ ɕ ȡ ȡ ȸ ę ɛ ɣ ɤ ɤ ɦ ɧ ɿ ʝ ʆ ɱ ƞ η ♀ ♀ ʘ ʡ ɷ ƥ ȹ ɩ ƭ ʈ ʓ ʒ ɛ ʖ
¿ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Ꜳ Δ Ⅎ K ꓘ ⅃ M P Q Я ∩

ˈʔaɪnst ʃtʀɪtən zɪç ˈnɔʁtvɪnt ʔʊnt ˈzɔnə, ˈveːʀ fɔn ʔiˑnən ˈbaɪdən voːl dɐʁ ˈʃtɛʁkɐʀə vɛːʀə, ʔɑls ʔaɪn ˈvɑndɐʀɐʁ, deːʁ ʔɪn ʔaɪnən vɑʁmən ˈmɑntəl gəˈhʏlt vaːʁ, dəs veːgəs daːˈheːʁ kaːm. ziˑ vʊʁdən ˈʔaɪniç, dɑs ˈdeːʁjeːnɪgə fyːʁ dən ˈʃtɛʁkɐʀən gɛltən zɔltə, deːʁ dən ˈvɑndɐʀɐʁ ˈtsvɪŋən vyʁdə, zaɪnən ˈmɑntəl ˈʔɑptsuˑneːmən.

E.19 tipab10 and tipxb10

**` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̡ ‶ ˎ ˏ ̑ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ǀ ǁ ˖ ˔ ˕ ˧ ˫ ´ ! ' ˞ ̮ ~ ' ( ) * + , - .
/ ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ
ʏ ʒ [ˈ] ˥ ˩ ‘ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ _ ˍ \ \ \ ˏ / / /
/ _ ˍ \ \ \ ˏ / / / | ‖ ↓ ↑ ↗ ↘ ˏ ˎ ̌ ̃ ˈ ˝ ̌ ˝ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ȵ æ ω ɷ ʆ ƫ ʨ ʦ
ɥ ʮ ʓ ʓ ь ъ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ʚ ɝ ɤ ƈ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ β ɖ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ᴘ ʙ
ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ**

**˳ ̮ ̯ ̡ ˔ ← ̼ ↓ ↑ ą ɑ ꭡ ʄ ɕ ʗ ɕ ȡ ȡ ȸ ę ɛ ɣ ɤ ɤ ɦ ɧ ɿ ʝ ʆ ɱ ƞ η ♀ ♀ ʘ ʡ ɷ ƥ ȹ ɩ ƭ ʈ
ʓ ʒ ɛ ʖ ¿ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Ꜳ Δ Ⅎ K ꓘ ⅃ M P Q Я ∩**

marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.20 tipabs10 and tipxbs10

***` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̡ ‶ ˎ ˏ ̑ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ǀ ǁ ˖ ˔ ˕ ˧ ˫ ´ ! ' ˞ ̮ ~ ' (
) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ
ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ˈ] ˥ ˩ ‘ a b c d e f g h i j k l m n o p q r s t
u v w x y z ‖ | ǂ ˷ ˌ _ ˍ \ \ \ ˏ / / / _ ˍ \ \ \ ˏ / / / | ‖ ↓ ↑ ↗ ↘ ˏ ˎ ̌ ̃ ˈ ˝ ̌
˝ ƀ đ ȡ ɖ ᴇ ɡ ɿ ʅ ᴊ ʞ ƚ λ ƛ ɮ ȵ æ ω ɷ ʆ ƫ ʨ ʦ ɥ ʮ ʓ ʓ ь ъ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ
ɚ ɞ ʚ ɝ ɤ ƈ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ β ɖ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ɖ ɠ ɢ æ ç
ħ ɟ ʄ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ***

***˳ ̮ ̯ ̡ ˔ ← ̼ ↓ ↑ ą ɑ ꭡ ʄ ɕ ʗ ɕ ȡ ȡ ȸ ę ɛ ɣ ɤ ɤ ɦ ɧ ɿ ʝ ʆ ɱ ƞ η ♀ ♀ ʘ ʡ ɷ
ƥ ȹ ɩ ƭ ʈ ʓ ʒ ɛ ʖ ¿ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Ꜳ Δ Ⅎ K ꓘ ⅃ M P Q Я ∩***

upepo ulikuwa ukiɓiʃana na ʄua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ʄuɓa. walipatana kuwa atakajemvua ʄuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.21 tipasb10 and tipxsb10

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̨ " ` ´ ⌢ ⊓ ⊔ ⊡ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ' ʳ ˬ ˜ ' ( ) *
+ , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ
ʃ θ ʊ ʋ ɯ χ ʏ ʒ ['] ˥ ˩ ' a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ |
ǂ ˜ ˌ ˍ ˎ ˏ ╲ ╱ ⁄ ╴ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ' " ˘ ˝ ƀ đ ȡ ɖ ᴇ ɡ ʅ ʅ ᴊ
ʞ ɫ λ ƛ ɮ ɲ æ ω ʊ ʆ ʧ ʨ ʦ ɥ ʮ ʓ ʑ ъ ь ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʝ ƙ ʟ
ɮ ɷ ƥ ɗ ɼ ɺ ɬ œ ɿ ʧ ʊ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ᶑ ʛ ɢ æ ç ħ ɟ ʄ ɫ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ
œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˒ ˓ ˔ ˕ ˚ ˖ - ↓ ↑ ą ɑ æ ɟ c ɕ ɕ ɖ ɖ ȡ ę ɛ ɣ ɣ ɣ ɧ ɧ ɿ ʝ ʃ ɱ ɲ ɳ ǫ ǫ ʘ ʡ ɷ p
ɸ ɭ ɫ ʐ ʒ ʒ ɜ ʖ ʡ | ‖ ǂ ɫ þ þ þ þ ? ? ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ᴎ ᴊ ᴍ ᴘ ᴏ ᴙ ᴖ

ðə ˈnɔˑθ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpjuˑtɪŋ wɪtʃ wəz ðə ˈstrɒŋge, wɛn ə ˈtrævle keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn huˑ fɜˑst səkˈsiˑdɪd ɪn ˈmeɪkiŋ ðə ˈtrævle teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.22 tipasi10 and tipxsi10

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*` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̨ " ` ´ ⌢ ⊓ ⊔ ⊡ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ ! ' ʳ ˬ ˜ ' ( ) * + , - .
/ ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ
ʒ ['] ˥ ˩ ' a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ ˍ ˎ ˏ ╲ ╱ ⁄ ╴
↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ' " ˘ ˝ ƀ đ ȡ ɖ ᴇ ɡ ʅ ʅ ᴊ ʞ ɫ λ ƛ ɮ ɲ æ ω ʊ ʆ ʧ ʨ ʦ ɥ ʮ
ʓ ʑ ъ ь ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʝ ƙ ʟ ɮ ɷ ƥ ɗ ɼ ɺ ɬ œ ɿ ʧ ʊ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ᶑ
ʛ ɢ æ ç ħ ɟ ʄ ɫ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ*

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*˒ ˓ ˔ ˕ ˚ ˖ - ↓ ↑ ą ɑ æ ɟ c ɕ ɕ ɖ ɖ ȡ ę ɛ ɣ ɣ ɣ ɧ ɧ ɿ ʝ ʃ ɱ ɲ ɳ ǫ ǫ ʘ ʡ ɷ p ɸ ɭ ɫ ʐ
ʒ ʒ ɜ ʖ ʡ | ‖ ǂ ɫ þ þ þ þ ? ? ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ᴎ ᴊ ᴍ ᴘ ᴏ ᴙ ᴖ*

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la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.23 tipatt10 and tipxtt10

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ̦ ̨ " ` ´ ⌢ ⊓ ⊔ ⊡ ˒ ˓ ̫ ̼ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ˊ !
' ʳ ˬ ˜ ' ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ
ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ ['] ˥ ˩ ' a b c d e
f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ ˍ ˎ ˏ ╲ ╱ ⁄ ╴
/ ˍ ˎ ˏ ╲ ╱ ⁄ ╴ | ‖ ↓ ↑ ↗ ↘ ˊ ˋ ˆ ˜ ' " ˘ ˝ ƀ đ ȡ ɖ ᴇ ɡ ʅ ʅ ᴊ ʞ
ɫ λ ƛ ɮ ɲ æ ω ʊ ʆ ʧ ʨ ʦ ɥ ʮ ʓ ʑ ъ ь ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɠ ɧ ʜ
ɩ ʝ ƙ ʟ ɮ ɷ ƥ ɗ ɼ ɺ ɬ œ ɿ ʧ ʊ ʖ ʡ ʢ ʐ ᴘ ʙ ɓ ɗ ᶑ ʛ ɢ æ ç ħ ɟ ʄ ɫ ɬ ɭ
ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˒ ˓ ˔ ˕ ˚ ˖ - ↓ ↑ ą ɑ æ ɟ c ɕ ɕ ɖ ɖ ȡ ę ɛ ɣ ɣ ɣ ɧ ɧ ɿ ʝ ʃ ɱ ɲ ɳ ǫ ǫ ʘ
ʡ ɷ p ɸ ɭ ɫ ʐ ʒ ʒ ɜ ʖ ʡ | ‖ ǂ ɫ þ þ þ þ ? ? ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ᴎ ᴊ ᴍ ᴘ ᴏ ᴙ ᴖ

'ʔaɪnst ʃtʀɪtən zɪç 'nɔʁtvɪnt ʔʊnt 'zɔnə, 'veːʀ fɔn ʔiˑnən
'baɪdən voːl dɐʁ 'ʃtɛʁkəʀə vɛːʀə, ʔals ʔaɪn 'vandəʀəʁ, deːʁ ʔɪn
ʔaɪnən vaʁmən 'mantəl gə'hʏlt vaːʁ, dəs veːgəs daː'heːʁ kaːm. ziˑ
vʊʁdən 'ʔaɪniç, das 'deːʁjeːnɪgə fyːʁ dən 'ʃtɛʁkəʀən gɛltən
zɔltə, deːʁ dən 'vandəʀəʁ 'tsvɪŋən vyʁdə, zaɪnən 'mantəl
'ʔaptsuˑneːmən.

E.24 tipatt12 and tipxtt12

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˞ ˞ ˵ ˋ ˊ ⁀ ˺ ˽ ˻ ˒ ˓ ʷ ˜ ˟ ˥ ˩ ˖ ˔
˕ ˧ ˫ ˏ ! ˈ ʳ ˛ ˛ ~ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ
ː ˑ ˘ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ
ɯ χ ʏ ʒ [ʻ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s
t u v w x y z ‖ | ǂ ˜ ˌ _ ‾ ╲ ╲ ╲ ⁄ ⁄ ⁄ / _ ‾ ╲ ╲ ╲ ⁄ ⁄ /
/ | ‖ ↓ ↑ ↗ ↘ ˘ ˘ ˜ ˜ ˌ ˝ ˘ ˘ ƀ đ ɗ ᶑ ᴇ ɡ ʅ ʅ ᴊ ʞ ɫ λ ƛ ɧ
ɳ æ ω Ω ʆ ʨ ʨ ʦ ɥ ɥ ʓ ƺ ь ъ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ ɚ ɞ ʚ ɝ ɤ ƍ ɧ
ʜ ɩ ʄ ƙ ʟ ʒ ɷ β ɖ ɼ Ɪ ƭ ɶ ɿ ʧ ʊ ɔ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ ɢ æ ç
ħ ɟ ʄ ɬ ɮ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɦ

˞ ˛ ˏ ˒ ˺ ← ↤ ↓ ↑ ą ɑ ɶ ʄ ɕ ʆ ʗ ȡ ȡ ȸ ę ɛ γ ɣ ɣ ɧ ɧ ɿ ʝ ʄ
ɱ ɳ ŋ ♀ ♀ ʘ ʡ ɷ p ɸ ɭ ȶ ʓ ƨ ʒ ɜ ʢ ʡ | ‖ ǂ ʈ þ þ þ þ ʔ ʔ ʡ
Ɐ Ꜳ Δ F K ꓘ ⅃ M P Q Я Ʊ

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marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.25 tipatt8 and tipxtt8

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˞ ˞ ˵ ˋ ˊ ⁀ ˺ ˽ ˻ ˒ ˓ ʷ ˜ ˟ ˥ ˩ ˖ ˔ ˕ ˧ ˫ ˏ ! ˈ ʳ ˛ ˛ ~ ʼ ( ) *
+ , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ˘ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ
ʋ ɯ χ ʏ ʒ [ʻ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ _
‾ ╲ ╲ ╲ ⁄ ⁄ ⁄ / _ ‾ ╲ ╲ ╲ ⁄ ⁄ / / | ‖ ↓ ↑ ↗ ↘ ˘ ˘ ˜ ˜ ˌ ˝ ˘ ˘ ƀ đ ɗ ᶑ ᴇ ɡ ʅ ʅ ᴊ ʞ ɫ λ
ƛ ɧ ɳ æ ω Ω ʆ ʨ ʨ ʦ ɥ ɥ ʓ ƺ ь ъ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ ɚ ɞ ʚ ɝ ɤ ƍ ɧ ʜ ɩ ʄ ƙ ʟ ʒ ɷ β ɖ ɼ Ɪ
ƭ ɶ ɿ ʧ ʊ ɔ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ʄ ɬ ɮ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɦ

˞ ˛ ˏ ˒ ˺ ← ↤ ↓ ↑ ą ɑ ɶ ʄ ɕ ʆ ʗ ȡ ȡ ȸ ę ɛ γ ɣ ɣ ɧ ɧ ɿ ʝ ʄ ɱ ɳ ŋ ♀ ♀ ʘ ʡ ɷ p ɸ ɭ ȶ ʓ
ƨ ʒ ɜ ʢ ʡ | ‖ ǂ ʈ þ þ þ þ ʔ ʔ ʡ Ɐ Ꜳ Δ F K ꓘ ⅃ M P Q Я Ʊ

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upepo ulikuwa ukiɓiʃana na ɟua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ɟuɓa. walipatana kuwa atakajemvua ɟuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.26 tipatt9 and tipxtt9

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˒ ˓ ˵ ˋ ˊ ˆ ̺ ̻ ̼ ˃ ˂ ̫ ̴ ˝ ˥ ˩ ˖ ˔ ˕ ˧ ˨ ́ ! ˈ ʳ ̜ ̹
˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ˘ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ
ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʻ] ˥ ˥ ʻ a b c d e f g h i j k l m n o p q
r s t u v w x y z ‖ | ǂ ˜ ˌ ˍ ˎ ˏ ˆ ˇ ˈ ˉ ˊ ˋ ˌ ˍ ˎ ˏ | ‖ ↓ ↑ ↗ ↘
̆ ̀ ̄ ̃ ˈ ̎ ̌ ̋ ƀ đ ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ɟ ƚ λ ƛ ɧ ɲ æ ω ʊ ʆ ʈ ʄ ʦ ɥ ɰ ʓ ƺ ɓ ɓ ˀ ˂
˃ | ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɗ ɧ ʜ ι ɟ ƙ ʟ ɮ ɷ ƥ ɋ ɼ ɪ ƭ ɶ ɟ ʧ ᴜ ƽ ʡ ʢ ʐ ƿ ʙ ɓ ɗ ɖ
ɠ ɢ æ ç ħ ɟ ƒ ł ɬ ɭ ɰ ɳ ɴ ɲ ɵ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʑ ƶ þ ƕ

ˎ ˪ ˩ ˧ ̚ ꜛ ̴ ↓ ↑ ą ɑ æ ɟ ɔ ʗ ɕ ɗ ɗ ɸ ę ɛ γ ɣ ɣ ɦ ɧ ɿ ɟ ʃ ɬ n ɳ ǫ ǫ ʘ ʚ ɷ p
ɸ ʅ ƫ ʓ ʒ ʒ ɛ ʕ ʖ ǀ ǁ ǂ ƀ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ᴖ

ðə 'nɔˑθ 'wɪnd ənd ðə 'sʌn wə dɪs'pjuˑtɪŋ wɪtʃ wəz ðə 'strɒŋgɐ, wɛn ə 'trævlɐ keɪm ə'lɒŋ 'ræpt ɪn ə 'wɔːm 'kloʊk. ðeɪ ə'griːd ðət ðə 'wʌn huˑ fɜˑst sək'siˑdɪd ɪn 'meɪkiŋ ðə 'trævlɐ teɪk hɪz 'kloʊk ɒf ʃʊd bɪ kən'sɪdəd 'strɒŋgə ðən ðɪ 'ʌðə.

E.27 tipats10 and tipxts10

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˒ ˓ ˵ ˋ ˊ ˆ ̺ ̻ ̼ ˃ ˂ ̫ ̴ ˝ ˥ ˩ ˖ ˔ ˕ ˧ ˨ ́ !
*ˈ ʳ ̜ ̹ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ˘ = ⁀ ? ə ɑ β ɕ*
ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʻ] ˥ ˥ ʻ a b c d e
f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ ˍ ˎ ˏ ˆ ˇ ˈ ˉ ˊ
ˋ ˌ ˍ ˎ ˏ | ‖ ↓ ↑ ↗ ↘ ̆ ̀ ̄ ̃ ˈ ̎ ̌ ̋ ƀ đ ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ɟ
ƚ λ ƛ ɧ ɲ æ ω ʊ ʆ ʈ ʄ ʦ ɥ ɰ ʓ ƺ ɓ ɓ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɗ ɧ ʜ
ι ɟ ƙ ʟ ɮ ɷ ƥ ɋ ɼ ɪ ƭ ɶ ɟ ʧ ᴜ ƽ ʡ ʢ ʐ ƿ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ƒ ł ɬ ɭ
ɰ ɳ ɴ ɲ ɵ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʑ ƶ þ ƕ

ˎ ˪ ˩ ˧ ̚ ꜛ ̴ ↓ ↑ ą ɑ æ ɟ ɔ ʗ ɕ ɗ ɗ ɸ ę ɛ γ ɣ ɣ ɦ ɧ ɿ ɟ ʃ ɬ n ɳ ǫ ǫ ʘ
ʚ ɷ p ɸ ʅ ƫ ʓ ʒ ʒ ɛ ʕ ʖ ǀ ǁ ǂ ƀ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ᴖ

la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.28 xipa10 and xipx10

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ˒ ˓ ˵ ˋ ˊ ˆ ̺ ̻ ̼ ˃ ˂ ̫ ̴ ˝ ˥ ˩ ˖ ˔ ˕ ˧ ˨ ́ ! ˈ ʳ ̜ ̹ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ
ɤ ɵ ɘ ː ˑ ˘ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʻ] ˥ ˥ ʻ a b c d e f g h
i j k l m n o p q r s t u v w x y z ‖ | ǂ ˜ ˌ ˍ ˎ ˏ ˆ ˇ ˈ ˉ ˊ ˋ ˌ ˍ ˎ ˏ | ‖ ↓ ↑ ↗ ↘ ̆ ̀ ̄ ̃ ˈ ̎ ̌ ̋ ƀ
đ ɖ ɗ ᴇ ɡ ɿ ʅ ᴊ ɟ ƚ λ ƛ ɧ ɲ æ ω ʊ ʆ ʈ ʄ ʦ ɥ ɰ ʓ ƺ ɓ ɓ ˀ ˂ ˃ | ᴀ ƈ ʗ ʤ ɚ ɘ ɞ ɝ ɤ ɗ ɧ ʜ ι ɟ ƙ ʟ ɮ ɷ
ƥ ɋ ɼ ɪ ƭ ɶ ɟ ʧ ᴜ ƽ ʡ ʢ ʐ ƿ ʙ ɓ ɗ ɖ ɠ ɢ æ ç ħ ɟ ƒ ł ɬ ɭ ɰ ɳ ɴ ɲ ɵ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʑ ƶ þ ƕ

ˎ ˪ ˩ ˧ ̚ ꜛ ̴ ↓ ↑ ą ɑ æ ɟ ɔ ʗ ɕ ɗ ɗ ɸ ę ɛ γ ɣ ɣ ɦ ɧ ɿ ɟ ʃ ɬ n ɳ ǫ ǫ ʘ ʚ ɷ p ɸ ʅ ƫ ʓ ʒ ʒ ɛ
ʕ ʖ ǀ ǁ ǂ ƀ þ þ þ þ ʔ ʔ ʔ ᴠ ᴁ ᴧ ꜰ ᴋ ʞ ᴊ ᴍ ᴘ ǫ ᴙ ᴖ

'ʔaɪnst ʃtʀɪtən zɪç 'nɔʁtvɪnt ʔʊnt 'zɔnə, 'veːʀ fɔn ʔiˑnən 'baɪdən voːl dɐʁ 'ʃtɛʁkɐʀə vɛːʀə, ʔals ʔaɪn 'vandɐʀɐʁ, deːɐ ʔɪn ʔaɪnən vaʁmən 'mantəl gə'hʏlt vaːʁ, dɔs veːgəs daː'heːɐ kaːm. ziˑ vʊʁdən 'ʔaɪniç, das 'deːʁjeːnɪgə fyːʁ dən 'ʃtɛʁkɐʀən gɛltən zɔltə, deːɐ dən 'vandɐʀɐʁ 'tsvɪŋən vyʁdə, zaɪnən 'mantəl 'ʔaptsuˑneːmən.

E.29 `xipab10` and `xipxb10`

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ¸ ˛ " ˋ ˊ ˆ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ʹ ! ˈ ʳ ̮ ˜ ' ( ) * + , - . / ʉ ɨ
ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ]
˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ ˍ ˎ ˏ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿ ̀ ́ ̂ ̃ /
| ‖ ꜜ ꜛ ↗ ↘ ˊ ˋ ˆ ˜ ' " ̏ ̋ ƀ đ ɖ ᶑ ᴇ g ɿ ʅ ᴊ ʞ ƚ ƛ ƛ ɮ ɳ æ ω ɷ ʆ ʈ ʨ ʦ ɥ ʮ ʓ ɛ ь ъ ˀ ˂ ˃
ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ʚ ɋ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ
ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɧ

˒ ˪ ˫ ˩ ˚ ˿ ꜗ ↓ ↑ ᶏ ɑ ꭤ ɻ ƈ ʗ ɕ ȡ ȡ ȸ ᶒ ᶓ ɣ ɣ ɣ ɦ ɧ ı ɟ ʆ ɱ ƞ ɳ ♀ ♀ ⊙ ʡ ɷ ƥ ɸ ɭ ȶ
ʐ ƻ ʒ ɛ ʖ ʢ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Æ Δ Ϝ K Ж ɹ M P Q Я ∩

marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

E.30 `xipasl10` and `xipxsl10`

*` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ¸ ˛ " ˋ ˊ ˆ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ʹ ! ˈ ʳ ̮ ˜ ' ( ) * + , - . / ʉ ɨ ʌ ɜ ɥ ɐ ɒ*
ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥ ˩ ʻ a b c d e f g h
i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ ˍ ˎ ˏ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿ ̀ ́ ̂ ̃ / | ‖ ꜜ ꜛ ↗ ↘ ˊ ˋ ˆ ˜ ' " ̏ ̋ ƀ
đ ɖ ᶑ ᴇ g ɿ ʅ ᴊ ʞ ƚ ƛ ƛ ɮ ɳ æ ω ɷ ʆ ʈ ʨ ʦ ɥ ʮ ʓ ɛ ь ъ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɞ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ
ʚ ɋ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɧ

˒ ˪ ˫ ˩ ˚ ˿ ꜗ ↓ ↑ ᶏ ɑ ꭤ ɻ ƈ ʗ ɕ ȡ ȡ ȸ ᶒ ᶓ ɣ ɣ ɣ ɦ ɧ ı ɟ ʆ ɱ ƞ ɳ ♀ ♀ ⊙ ʡ ɷ ƥ ɸ ɭ ȶ ʐ ƻ ʒ ɛ
ʖ ʢ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Æ Δ Ϝ K Ж ɹ M P Q Я ∩

upepo ulikuwa ukiɓiʃana na ɟua kuwa nani mweɲe ŋguvu kupita mwenziwe, mara akapita masafiri alijekuwa amevaa ɟuɓa. walipatana kuwa atakajemvua ɟuɓa kwanza msafiri ndije mweɲe ŋguvu.

E.31 `xipass10` and `xipxss10`

` ´ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ¯ ˙ ¸ ˛ " ˋ ˊ ˆ ̺ ̻ ̼ ˒ ˓ ̫ ̰ ˟ ı ȷ ˖ ˔ ˕ ˧ ˫ ʹ ! ˈ ʳ ̮ ˜ ' ( ) * + , - . / ʉ ɨ
ʌ ɜ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʿ] ˥
˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˷ ˌ ˍ ˎ ˏ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿ ̀ ́ ̂ ̃ / | ‖
ꜜ ꜛ ↗ ↘ ˊ ˋ ˆ ˜ ' " ̏ ̋ ƀ đ ɖ ᶑ ᴇ g ɿ ʅ ᴊ ʞ ƚ ƛ ƛ ɮ ɳ æ ω ɷ ʆ ʈ ʨ ʦ ɥ ʮ ʓ ɛ ь ъ ˀ ˂ ˃ ǀ ᴀ
ƈ ʗ ʤ ɚ ɞ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ɟ ƙ ʟ ɮ ɷ ʚ ɋ ɼ ɺ ʄ ɶ ɟ ʧ ᴜ ʖ ʡ ʢ ʐ ƥ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ʄ ł ɬ ɭ
ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ɧ

˒ ˪ ˫ ˩ ˚ ˿ - ↓ ↑ ᶏ ɑ ꭤ ɻ ƈ ʗ ɕ ȡ ȡ ȸ ᶒ ᶓ ɣ ɣ ɣ ɦ ɧ ı ɟ ʆ ɱ ƞ ɳ ♀ ♀ ⊙ ʡ ɷ ƥ ɸ ɭ ȶ
ʐ ƻ ʒ ɛ ʖ ʢ | ‖ ǂ ƚ þ þ þ þ ʔ ʔ ʔ ∀ Æ Δ Ϝ K Ж ɹ M P Q Я ∩

ðə ˈnɔˑθ ˈwɪnd ənd ðə ˈsʌn wə dɪsˈpjuˑtɪŋ wɪtʃ wəz ðə ˈstrɒŋgɐ, wɛn ə ˈtrævlɐ keɪm əˈlɒŋ ˈræpt ɪn ə ˈwɔːm ˈkloʊk. ðeɪ əˈgriːd ðət ðə ˈwʌn huˑ fɜˑst səkˈsiˑdɪd ɪn ˈmeɪkiŋ ðə ˈtrævlɐ teɪk hɪz ˈkloʊk ɒf ʃʊd bɪ kənˈsɪdəd ˈstrɒŋgə ðən ðɪ ˈʌðə.

E.32 xipabs10 and xipxbs10

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ˉ ˙ ˛ ¸ ˶ ˵ ˄ ˓ ˔ ˒ ˑ ˓ ˒ ̫ ̯ ˘ ɪ ɟ ˖ ˔ ˕ ˧ ˫ ´ ! ˈ ˌ ̮ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ʒ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʽ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˞ ˌ _ ˍ ˎ ˏ \ \ ˊ / / / _ ˍ ˎ \ \ ˊ / / / | ‖ ↓ ↑ ↗ ↘ ˝ ˵ ˜ ˜ ˈ ˮ ˘ ˝ ɓ ɗ ɖ ɗ ᴇ ɡ ʅ ʅ ᴊ ɚ ƚ λ ƛ ɮ ɳ æ ω ʊ ʃ ʈ ʧ ʦ ɥ ɥ ʒ ɛ ʙ ʙ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɵ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ω ꞵ ʠ ɼ ɺ ʆ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ƒ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˳ ˽ ˼ ˽ ˚ ˂ ˗ ↓ ↑ ą ɑ ɶ ɟ ƈ ʗ ɕ ᵭ ᵭ ȸ ę ɛ̢ ɣ ɣ ɣ ɦ ɧ ɿ ʝ ʃ ɱ ɲ ŋ ɣ ɣ ʘ ʔ ɷ p ɸ ʅ ʇ ʓ ʐ ʑ ɛ ʖ ʕ | ‖ ǂ ɫ þ þ þ þ ʔ ʔ ʔ ∀ Ꭰ ∆ Ꭶ Ꮶ ꓘ Ꮷ Ꮇ Ꮲ Ꮕ Я Ω

la biːz e l sɔlɛːj sə dispytɛ, ʃakœ̃ asyrɑ̃ k il etɛ l ply fɔːr, kɑ̃t iz ɔ̃ vy œ̃ vwajaʒœːr ki s avɑ̃sɛ, ɑ̃vlɔpe dɑ̃ sɔ̃ mɑ̃to. i sɔ̃ tɔ̃be dakɔːr, kə səlyi ki arivɛ l prəmje a fɛr ote sɔ̃ mɑ̃to o vwajaʒœːr, sərɛ rgarde kɔm l ply fɔːr.

E.33 xipasi10 and xipxsi10

*ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ˉ ˙ ˛ ¸ ˶ ˵ ˄ ˓ ˔ ˒ ˑ ˓ ˒ ̫ ̯ ˘ ɪ ɟ ˖ ˔ ˕ ˧ ˫ ´ ! ˈ ˌ ̮ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ʒ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʽ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˞ ˌ _ ˍ ˎ ˏ \ \ ˊ / / / _ ˍ ˎ \ \ ˊ / / / | ‖ ↓ ↑ ↗ ↘ ˝ ˵ ˜ ˜ ˈ ˮ ˘ ˝ ɓ ɗ ɖ ɗ ᴇ ɡ ʅ ʅ ᴊ ɚ ƚ λ ƛ ɮ ɳ æ ω ʊ ʃ ʈ ʧ ʦ ɥ ɥ ʒ ɛ ʙ ʙ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɵ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ω ꞵ ʠ ɼ ɺ ʆ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ƒ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ*

˳ ˽ ˼ ˽ ˚ ˂ - ↓ ↑ ą ɑ ɶ ɟ ƈ ʗ ɕ ᵭ ᵭ ȸ ę ɛ̢ ɣ ɣ ɣ ɦ ɧ ɿ ʝ ʃ ɱ ɲ ŋ ɣ ɣ ʘ ʔ ɷ p ɸ ʅ ʇ ʓ ʐ ʑ ɛ ʖ ʕ | ‖ ǂ ɫ þ þ þ þ ʔ ʔ ʔ ∀ Ꭰ ∆ Ꭶ Ꮶ ꓘ Ꮷ Ꮇ Ꮲ Ꮕ Я Ω

ˈʔaɪnst ʃtʀɪtən zɪç ˈnɔʁtvɪnt ʔʊnt ˈzɔnə, ˈveːʀ fɔn ʔiˑnən ˈbaɪdən voːl dɐʁ ˈʃtɛʁkɐʀə vɛːʀə, ʔals ʔaɪn ˈvandɐʀɐʁ, deːʁ ʔɪn ʔaɪnən vaʁmən ˈmantəl gəˈhʏlt vaːʁ, dəs veːgəs daːˈheːʁ kaːm. ziˑ vʊʁdən ˈʔaɪnɪç, das ˈdeːʁjeːnɪgə fyːʁ dən ˈʃtɛʁkɐʀən gɛltən zɔltə, deːʁ dən ˈvandɐʀɐʁ ˈtsvɪŋən vyʁdə, zaɪnən ˈmantəl ˈʔaptsuˑneːmən.

E.34 xipasb10 and xipxsb10

ˋ ˊ ˆ ˜ ¨ ˝ ˚ ˇ ˘ ˉ ˙ ˛ ¸ ˶ ˵ ˄ ˓ ˔ ˒ ˑ ˓ ˒ ̫ ̯ ˘ ɪ ɟ ˖ ˔ ˕ ˧ ˫ ´ ! ˈ ˌ ̮ ˜ ʼ ( ) * + , - . / ʉ ɨ ʌ ʒ ɥ ɐ ɒ ɤ ɵ ɘ ː ˑ ‿ = ⁀ ? ə ɑ β ɕ ð ɛ ɸ ɣ ɦ ɪ ʝ ʁ ʎ ɱ ŋ ɔ ʔ ʕ ɾ ʃ θ ʊ ʋ ɯ χ ʏ ʒ [ʽ] ˥ ˩ ʻ a b c d e f g h i j k l m n o p q r s t u v w x y z ‖ | ǂ ˞ ˌ _ ˍ ˎ ˏ \ \ ˊ / / / _ ˍ ˎ \ \ ˊ / / / | ‖ ↓ ↑ ↗ ↘ ˝ ˵ ˜ ˜ ˈ ˮ ˘ ˝ ɓ ɗ ɖ ɗ ᴇ ɡ ʅ ʅ ᴊ ɚ ƚ λ ƛ ɮ ɳ æ ω ʊ ʃ ʈ ʧ ʦ ɥ ɥ ʒ ɛ ʙ ʙ ˀ ˂ ˃ ǀ ᴀ ƈ ʗ ʤ ɚ ɵ ɞ ɝ ɤ ɠ ɧ ʜ ɩ ʄ ƙ ʟ ɮ ω ꞵ ʠ ɼ ɺ ʆ œ ɟ ʧ ʊ ʖ ʡ ʢ ʐ ʙ ɓ ɗ ɖ ʛ ɢ æ ç ħ ɟ ƒ ƚ ɬ ɭ ɰ ɳ ɴ ɲ ʘ ɽ ɹ ɻ ʀ œ ø ʂ ʈ ʍ ʐ ʑ þ ƕ

˳ ˽ ˼ ˽ ˚ ˂ - ↓ ↑ ą ɑ ɶ ɟ ƈ ʗ ɕ ᵭ ᵭ ȸ ę ɛ̢ ɣ ɣ ɣ ɦ ɧ ɿ ʝ ʃ ɱ ɲ ŋ ɣ ɣ ʘ ʔ ɷ p ɸ ʅ ʇ ʓ ʐ ʑ ɛ ʖ ʕ | ‖ ǂ ɫ þ þ þ þ ʔ ʔ ʔ ∀ Ꭰ ∆ Ꭶ Ꮶ ꓘ Ꮷ Ꮇ Ꮲ Ꮕ Я Ω

marra ʃ ʃamsi wi r riːħ kaːnu bi jitxanʔum ʔinhu l ʔaʔwa fiːhum. u baʕdeːn ʃaːfu raːgil saːjiħ gaj mim baʕiːd mitlaffaʕ bi ʕabaːja tʔiːla. fa ttafaʔum ʕala ʔin illi jixalliːh jiʔlaʕ il ʕabaːja fi l ʔawwal jikuːn huwwa ʔaʔwa mit taːni.

Appendix F

Layout of TIPA fonts

Some phoneticians refer to Upsilon by the name *Bucket*,
but it looks more like an urn to us.

(*PSG*, 1996, p. 185)

....
....
O Attic shape! Fair attitude! with brede
Of marble men and maidens overwrought,
With forest branches and the trodden weed;
Thou, silent form, dost tease us out of thought
As doth eternity: Cold Pastoral!
When old age shall this generation waste,
Thou shalt remain, in midst of other woe
Than ours, a friend to man, to whom thou say'st,
"Beauty is truth, truth beauty, —that is all
Ye know on earth, and all ye need to know."

(John Keats, *Ode on a Grecian Urn*)

F.1 `tipa10`

	´0	*´1*	*´2*	*´3*	*´4*	*´5*	*´6*	*´7*	
´00x	`	´	ˆ	˜	¨	˝	˚	ˇ	″0x
´01x	˘	¯	˙	¸	˛	‶	`	´	
´02x	⌢	⊓	⊔	▫	›	‹	ω	⁓	″1x
´03x	×	ı	ȷ	˖	⊥	⊤	⊣	⊢	
´04x	ˊ	!	ˈ	ʳ	ˌ	ʲ	~	ʼ	″2x
´05x	(	)	*	+	,	-	.	/	
´06x	ʉ	ɨ	ʌ	ɜ	ɥ	ɐ	ɒ	ɤ	″3x
´07x	ɵ	ɘ	ː	ˑ	‿	=	⁀	?	
´10x	ə	ɑ	β	ɕ	ð	ɛ	ɸ	ɣ	″4x
´11x	ɦ	ɪ	ʝ	ʁ	ʎ	ɱ	ŋ	ɔ	
´12x	ʔ	ʕ	ɾ	ʃ	θ	ʊ	ʋ	ɯ	″5x
´13x	χ	ʏ	ʒ	[	ʿ	]	⌝	⌜	
´14x	ʻ	a	b	c	d	e	f	g	″6x
´15x	h	i	j	k	l	m	n	o	
´16x	p	q	r	s	t	u	v	w	″7x
´17x	x	y	z	‖	|	ǂ	˞	ˌ	
´20x	_	ˎ	ˎ	\	\	ˏ	ˏ	/	″8x
´21x	/	_	ˎ	\	\	\	ˏ	ˏ	
´22x	/	/	|	‖	↓	↑	↗	↘	″9x
´23x	ˇ	ˋ	ˆ	˜	ˈ	ˮ	˵	˶	
´24x	ƀ	đ	ȡ	ᶑ	ᴇ	ɡ	ɿ	ʅ	″Ax
´25x	ᴊ	ʞ	ƚ	λ	ƛ	ɮ	ȵ	æ	
´26x	ω	Ω	ʆ	ʨ	ʨ	ʦ	ɥ	ʯ	″Bx
´27x	ʓ	ƹ	ь	ъ	ˀ	˂	˃	|	
´30x	ᴀ	ƈ	ʗ	ʤ	ɚ	ʚ	ɞ	ɝ	″Cx
´31x	ɤ	ʛ	ɧ	ʜ	ɩ	ɟ	ƙ	ʟ	
´32x	ɮ	ɷ	β	ʠ	ɼ	ɺ	ƭ	ɶ	″Dx
´33x	ʇ	ʧ	ᴜ	ʖ	ʡ	ʢ	ʐ	ƥ	
´34x	ʙ	ɓ	ɗ	ɖ	ɠ	ɢ	æ	ç	″Ex
´35x	ħ	ɟ	ʄ	ɬ	ɬ	ɭ	ɰ	ɳ	
´36x	ɴ	ɲ	ʘ	ɽ	ɹ	ɻ	ʀ	œ	″Fx
´37x	ø	ʂ	ʈ	ʍ	ʐ	ʑ	þ	ƕ	
	″8	″9	″A	″B	″C	″D	″E	″F	

F.2 `tipx10`

	´*0*	´*1*	´*2*	´*3*	´*4*	´*5*	´*6*	´*7*	
´*00x*	ʾ	ʿ	ʲ	ʒ	▫	←	⊶	↓	″0x
´*01x*	↑	→	↔						
´*04x*	ᶏ	ɑ	ꭢ	ʄ	C	ƈ	ɕ	ɗ	″2x
´*05x*	ɗ	ȸ	ᶒ	ᶓ	ɣ	ɣ	ɣ	ɦ̢	
´*06x*	ɧ	ɩ	ʝ	ʆ	ɱ	ɲ	ŋ	♀	″3x
´*07x*	ϙ	⊙	ɂ	ɷ	p	ɸ	ʅ	ƫ	
´*10x*	ɟ̡	ƨ	ʓ	ɜ	ʖ	ʕ	|	‖	″4x
´*11x*	ǂ	ŀ							
´*12x*	þ	þ	þ	þ	ʔ	ʔ	ʔ		″5x
´*13x*									
´*16x*	∀	ᴁ	Δ	ꜰ	ᴋ	ꓘ	ꓶ	ᴍ	″7x
´*17x*	ᴘ	Q	ᴙ	∩					
	″8	″9	″A	″B	″C	″D	″E	″F	