

Unicode request for expected IPA retroflex letters and similar letters with hooks

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Unicode supports right-hook: consonants $\text{d} \text{t} \text{ɳ} \text{r} \text{ɻ} \text{ʂ} \text{t} \text{z} \text{ɖ} \text{ʝ} \text{ʒ}$ and vowels $\text{a} \text{ɑ} \text{e} \text{ɛ} \text{ɜ} \text{ə} \text{i} \text{ɪ} \text{ɹ} \text{ɹ} \text{u} \text{u}$, and left-hook: ɸ and all basic Latin consonants except the semivowels $\text{j} \text{y} \text{w}$.

Expected IPA retroflex letters (from alveolars)

- ɸ A7F2 LATIN SMALL LETTER T WITH TOP HOOK AND RETROFLEX HOOK. Figures 12–14 + note.
- ɻ A7F3 LATIN SMALL LETTER TURNED R WITH LONG LEG AND RETROFLEX HOOK. Figures 8–11.

Additional letter with fishhook

- ɸ A7F4 LATIN SMALL LETTER L WITH FISHHOOK. Figures 1–7.

Additional retroflex hooks

- ɸ 10790 LATIN SMALL LETTER O WITH RETROFLEX HOOK. Figure 15.
- ɸ 10791 LATIN SMALL LETTER I WITH STROKE AND RETROFLEX HOOK. Figure 16.
- ɸ 10793 LATIN SMALL LETTER TESH WITH RETROFLEX HOOK. Figure 17.

Additional palatal hooks

- ɸ 10794 LATIN SMALL LETTER L WITH BELT AND PALATAL HOOK. Figure 24–25.
- ɸ 10795 LATIN SMALL LETTER ENG WITH PALATAL HOOK. Figure 26.
- ɸ 10796 LATIN SMALL LETTER TURNED R WITH PALATAL HOOK. Figures 18–20.
- ɸ 10797 LATIN SMALL LETTER R WITH FISHHOOK AND PALATAL HOOK. Figure 20.
- ɸ 10798 LATIN SMALL LETTER EZH WITH PALATAL HOOK. Figures 21–22.
- ɸ 10799 LATIN SMALL LETTER DEZH WITH PALATAL HOOK. Figure 23.
- ɸ 1079A LATIN SMALL LETTER TESH WITH PALATAL HOOK. Figure 23.

Properties

All proposed characters are simple letters and do not need decomposition. E.g.,

A7F4;LATIN SMALL LETTER L WITH FISHHOOK;Ll;0;L; ; ; ; ;N; ; ; ;

Chart

Highlighted characters are those proposed in this request. Greyed-out cells are already assigned. Other characters are being proposed in separate requests by the same author.

The first three characters are proposed for the BMP, per the Script Ad Hoc Committee. A gap in the Supplemental Plane is left for <ɖʒ>, which is expected from <ɖʒ> but not yet attested.

	...0	...1	...2	...3	...4	...5	...6	...7	...8	...9	...A	...B	...C	...D	...E	...F
Latin Extended-D																
U+A7Fx	ƒ	ɀ	Ɂ	ɂ	Ƀ											
Phonetic Extensions Supplement-A																
U+1079x	Ʉ	Ʌ		Ɇ	ɇ	Ɉ	ɉ	Ɋ	ɋ	Ɍ	ɍ					

References

Ian Bekker (2003) *The Vowels of South African English*, PhD thesis, North-West University, Potchefstroom

Anita Bickford & Rick Floyd (2006) *Articulatory Phonetics*, SIL International.

G.H. Breckwoldt (1972) “A Critical Investigation of Click Symbolism”. Rigault & Charbonneau (eds.) *Proceedings of the Seventh International Congress of Phonetic Sciences*, Mouton, pp. 281–293.

Melaku Dissassa (1980) “Some aspects of Oromo phonology”, M.A. thesis, Kansas State University.

Aharon Dolgopolsky (2013: 230) *Indo-European Dictionary with Nostratic Etymologies*, vol. I.

Clement Doke (1926) “Phonetics of the Zulu Language”, *Bantu Studies* 2.

——— (1936) “An Outline of †Khomani Bushman Phonetics”, *Bantu Studies* 10:1.

——— (1938) *Text Book of Lamba Grammar*.

Nicholas Evans (1995) *A Grammar of Kayardild: with historical-comparative notes on Tangkic*.

——— (2003) *Bininj Gun-Wok: A pan-dialectal grammar of Mayali, Kunwinjku and Kune*, vol. 1.

Rei Fukui (2004) *TIPA Manual*, v. 1.3.

Pamela Grunwell (1981) *The Nature of Phonological Disability in Children*. Academic Press.

William Kretzschmar (1993/1994) *Handbook of the Linguistic Atlas of the Middle and South Atlantic States*. University of Chicago Press. [LAMSAS is a project of the University of Georgia]

John Laver (1994) *Principles of Phonetics*. Cambridge University Press.

Raven McDavid & Raymond O’Cain (1980) *Linguistic Atlas of the Middle and South Atlantic States*. University of Chicago Press, fasc. 2.

Edwin Pulleyblank (1970) “Late Middle Chinese” (part 1), *Asia Major* 15.

Alan Rumsey (2017) “Dependency and relative determination in language acquisition: the case of Ku Waru,” in Enfield (ed.) *Dependencies in Language*.

UPSID: UCLA Phonological Segment Inventory Database. Ian Maddieson (1981) “UPSID: Data and Index”, *UCLA Working Papers in Phonetics* 53.

Figures

Small l with fishhook / r with ascender (ɺ)

An old letter for a lateral flap, used in IPA transcription before the official adoption of *l*. Used by Dolgopolsky (2013) for a liquid that is historically ambiguous between [r] and [l]. Considered for similar use (as a ‘rhotic lateral’) by the extIPA in 2015, but the eventual decision was to not adopt it.

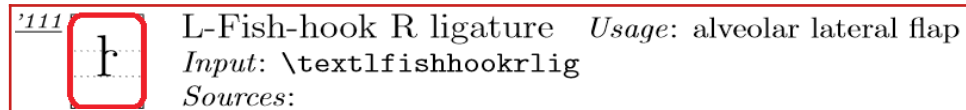


Figure 1. Fukui (2004: 29)

The flapped lateral occurs before all vowels and in conjunction with the semi-vowels. The phonetic symbol for the flapped lateral is **ɺ**; but in current Lamba orthography no distinction is made between it and l, as the

Figure 2. Doke (1938: 29). The apparent descender is simply a misalignment with the baseline, as seen in the next illustration.

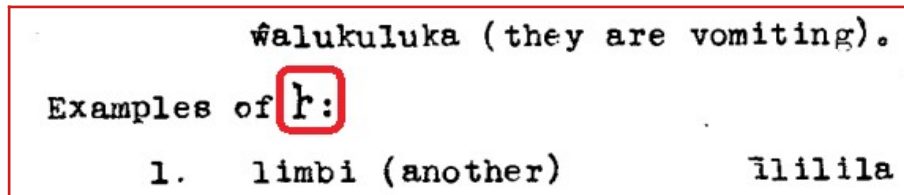


Figure 3. Doke (1938: 38), showing that the letter has no descender. (This is also apparent from the consonant table on p. 11, where the ligature appears in italic hand.)

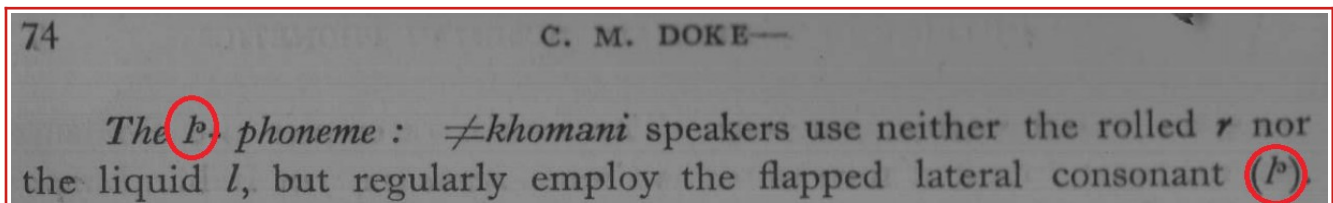


Figure 4. Doke (1936: 74). A typeset ligature in italic typeface.

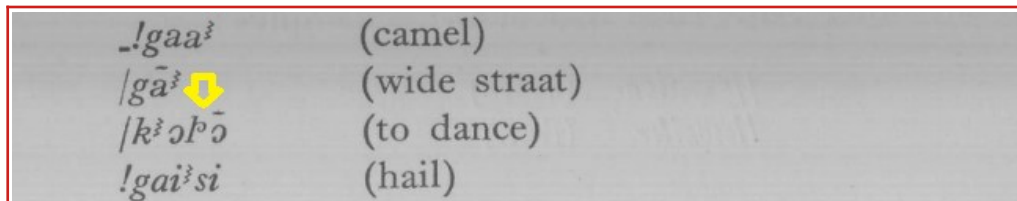


Figure 5. Doke (1936: 68). An example of the *l-r* ligature in the context of a word.

ɽ = a consonant (flap or tap) that is intermediate between ʀ and ɭ (Loubignac's Ĩ in ZAS), or a phoneme without phonemic distinction between ʀ and ɭ (as in proto-Agaw).

Figure 6. Dolgopolsky (2013: 230)

und volksetymologischer Verdrehung") ||| From N *paLuC∇ (or *paLúC∇?) 'stinging insect (flea, mosquito, tick)' > HS: C ≈ *f∇ll∇t- 'flea' > EC: Gdl fillét id. (coll.); ?? Hr {AMS} filláyue, Gwd {AMS} filláye 'flea' (× N *P̣'ɪʔu¹L∇ 'stinging insect') ||| Ag *fɜɽɽʊt- (= *fɜllʊt-), {Ap.} *fɜll∇t- > Bln {R} filúttā, Xm {R} fəltə, Q {R} peleyə, {Flad} pelea, Km {Ap.} fäläy 'flea' ¶ Ap. AV 9 (Ag *fɜll∇t- or *fɜɽɽ∇t-), R WB

Figure 7. Dolgopolsky (2013: 494), for proto-Agaw ('Ag'), showing that here *ɽ is not the lateral flap [ɭ] but rather a consonant indeterminate between *l and *r.

Alveolar IPA letters with retroflex tail

Along with implosive <ɗ> mentioned in the *Handbook* as an obvious, if unofficial, extension of the IPA, the lateral flap <ɭ> and old-style implosive <ɟ> fill out the retroflex series.

(For <ɗ̥> and <ɟ̥/ɟ̄>, see the separate requests for click and extIPA letters.)

Turned r with long leg and retroflex hook (ɭ)

This is the retroflex lateral flap, a sound that occurs throughout South Asia in languages spoken by half a billion people, from Pashtun to Oriya (Masica 1991 *The Indo-Aryan Languages*), in Sulawesi, and in various languages of Australia, Africa and the Americas.

Lateral approximant		ĩ	ɭ	ʎ	ɮ
Lateral flap		ɻ	ɭ		

Figure 8. Bekker (2003: 439). The letter is grey rather than black because it's not an official IPA symbol.

suffice). Other unofficial symbols are **[ɭ]** for a retroflex lateral flap and [ɻ] for an epiglottal

Figure 9. Ball et al., section 4.1.

	Labial	Apico-Alveolar	Palatal	Velar
Plain stop	p	t		k
Fricative		s		
Prenasalized stop	mb (b)	nd (d)	ɲd͡ʒ (j)	ŋg (g)
Nasal	m	n	ɲ (ny, yn)	ŋ (ng)
Continuant	w	r	j (y)	
	Retroflex flap	Alveolar continuant	Palatal continuant	Prestopped velar
Lateral	ɭ (rlt)	l (l)	ʎ (ly, yl)	ʁ (l)

Figure 10. Rumsey (2017: Table 1)

Retroflex lateral flap /ɭ/.
(1) a. /lim/ → [ɭim] a woman's name
b. /(kera) ko.la/ → [(kɛrɐ) ko.ɭɐ] '(bird) chicken'
c. /(kum) pini.l/ → [(kum)pinɭ] '(ear) eardrum'

Figure 11. Rumsey (2017: 98)

Mark Harvey (p.c.), who wrote a grammar of Gaagudju where the sound occurs allophonically, said of the letter ɭ that he “can foresee that it will need to be used in descriptions of Australian languages, so [he] would be happy to support its inclusion.”

Robert Mailhammer (p.c.) said of the proposal for ɭ that “the symbol [ɭ] used has been an l with either a tap or a retroflex tap superscript [...]. But having a proper symbol would, of course be good. [...] for the lateral flaps there is definitely a need.”

Lakhan Gusain at John Hopkins (p.c.) says he would like to have this letter for Pashto.

Eric Zobel (p.c.) said “For us Sulawesianists, it’s quite a pity that the retroflex lateral flap doesn’t get a Unicode symbol. Sneddon has described it for the Sangiric languages, Himmelmann for Totoli and Dondo,” and, “I’m am working on two chapters (‘Chamorro’/‘Palauan’) for the OUP *Guide to the Malayo-Polynesian languages of Southeast Asia and Madagascar*, and there will also be a chapter about the

languages of Sulawesi. I'm lobbying to have the authors use the SIL PUA symbol for the retroflex lateral flap in the phonetic overview, and mention the attestation in Buol, Totoli, Tonsawang, Sangir etc."

Small t with top hook and retroflex hook (ɽ)

A voiceless retroflex implosive. It occurs in Oromo. It is the single missing voiceless implosive letter.

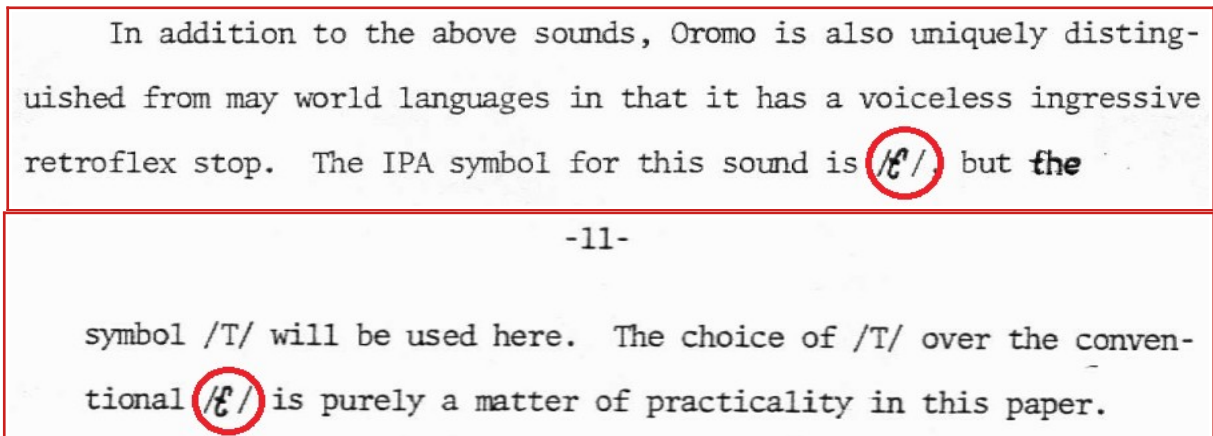


Figure 12. Dissassa (1980: 10-11)

Table 28.1 lists the implosives that have been found in languages. Unlike ejectives, implosives can be either voiced or voiceless. The voiced series of implosives is more common than the voiceless series. There appear to be no implosive fricatives used in any language, although a voiced implosive affricate [dʒ] is reported to occur in Roglai of Vietnam (Norris McKinney, personal communication) and Komo of the Democratic Republic of Congo.

Table 28.1. Implosive sounds

	Bilabial	Alveolar	Palato-alveolar	Retroflex (alveolar)	Palatal	Velar	Uvular	
vl.	ɓ̥	ɗ̥		ɽ̥		ɠ̥	ʄ̥	implosive stop
vd.	ɓ	ɗ		ɽ	f	ɠ	ʄ	
vd.			dʒ					implosive affricate

The ingressive glottalic airstream mechanism is symbolized by adding a hook to the top of the basic symbol of the corresponding pulmonic sound.

Figure 13. Bickford & Floyd (2006)

p̣		ṭ		ṭ		ḳ
		ɓ̣		ṣ		ʂ̣ x̣
ɓ				ɽ		ʂ
ɓ̣				ɽ̣		ʂ̣

Figure 14. Breckwoldt (1972: 288)

Laver (1994: 582, Table 19.2h) lists a voiceless retroflex implosive in a table like that of Bickford & Floyd, for the frequency of sounds in the UPSID, but the printed symbol is a typographic error: <ɸ̣ f̣ f̣~f̣ f̣ c̣ ḳ q̣>. The other UPSID tables all have a retroflex-tailed letter in the retroflex column. For example, the voiced implosive series is <ɓ̣ ɗ̣ ɗ̣~ɗ̣ ɗ̣ ɗ̣ ɗ̣ f̣ ɗ̣ ɗ̣>, with a non-IPA retroflex ɗ̣. Other typos occur in these UPSID tables, such as <Ŋ> for <ŋ> in Table 19.2j and for <ɓ> in 19.2p, so it appears that this would have been a retroflex ɓ̣ but for the lack of proper font support.

Other letters with retroflex tail

Small o with retroflex hook (ọ)

The only basic-Latin vowel without a tailed variant. Used for prosodic/allophonic retroflexion in descriptions of Iwaidja. In the figure below it slightly resembles an o-ogonek, but is analogous to other retroflex/rhotic vowels (cf. the a-with-tail <ạ> rather than a-ogonek <ȧ> in the transcription following each example).

Firstly, although retroflexion can be realised phonetically on a syllable-initial segment (e.g. /gomɗaw/ (i) ‘long-necked turtle’), a final segment (e.g. /gunbaɗ/ ‘knee’), a vowel (e.g. /be’g/ ‘deaf adder’), or various combinations of the above (e.g. ɗoɗ/ ‘louse’, /gaɭgi:/ ‘salmon-tailed catfish’ (E:D)), it only needs to be marked once on any syllable and once a syllable is marked as retroflex the loci of retroflexion will be predictable: any apical segment in the syllable and the vowel. Retroflexion is more clearly audible on the vowel in monosyllables, which are phonetically lengthened, as discussed in §2.1.2.

Within a syllable, all apical stops and nasals agree in retroflexion. Thus there are words like /tɪt/ ‘moon’, ɗoɗ/ ‘louse’ and /tɛŋki?/ ‘near’ on the one hand and /nin/ ‘small bird’, /nan/ ‘I saw you’ and /taɪkujɛŋ/ ‘long-legged’ on the other, but no syllables like */tɪt/, */tɪt/, */nan/ or */nɛn/. The only exceptions to such ‘retroflexion agreement’ occur when two apical consonants are linked across a morpheme and syllable boundary (see below). Note also that the retroflex continuant /ɹ/ does not participate in these effects and hence we find words like /naɹin/ ‘snake’.

Figure 15. Evans (2003: 86). Syllable-level retroflexion of consonants and vowels.

Small i with stroke and retroflex hook (ị)

Used for Tarascan in the UPSID.

<u>Retroflexed high central unrounded vowel.</u>		
/ị/	1	Tarascan.

Figure 16. UPSID (1981: 229)

Small tesh with retroflex hook (t-ʃ ligature: tʃ)

<i>Polish</i>
[prɔʃ ^w ãɥ̣] ‘please’
[prɔʃ ^ʃ ãɥ̣] ‘pig’
[ɣ ^ʃ ɔ̣ãɥ̣] ‘he took it’
[tʃ ^w tʃi:nã] ‘swamp plant’
[tʃ ^w tʃãɥ̣] ‘luck’

Figure 17. Laver (1994: 560)

Palatal hook

Turned r (with fishhook) and palatal hook (ɹ, ʃ)

Used for palatalization of English *r*.

effect, transcribing *rara* as [ˈra:ɹθ]. In all positions it is slightly palatalized before *i*. Between low vowels some speakers, e.g. Dugal Goongarra, pronounce it as a retroflex flap, neutralizing the distinction between *r* and *rd*.

‘south’	<i>rwa</i>	/ɹaɹa/	[ˈɹaɹ]
‘egg’	<i>kuru</i>	/kuɹu/	[ˈkɔɹɔ]
‘east’	<i>riya</i>	/ɹiya/	[ˈɹeɪ]
‘young girl’	<i>nguriwa</i>	/ŋuɹiwa/	[ˈŋɔɹi]
‘red ant’	<i>barakurra</i>	/paɹakura/	[baɹəkʉr ~ ˈbaɹəkʉr]

Figure 18. Evans (1995: 56)

[β v z ɔ̃ z ɿ ʁ z̥ ɿ̥ z̥ ʒ̥ ž j j ʀ ʀ fi] denote weak (lenis) voiced fricatives. When initial in a word or final in a phrase, these sounds are often partly or wholly devoiced (equivalent to [β̥ v̥ z̥ ɔ̥̃ z̥ ɿ̥ ʁ̥ z̥̥ ɿ̥̥ z̥̥ ʒ̥̥ ž̥ j̥ j̥ ʀ̥ ʀ̥]). This fact is indicated by the field workers only when the devoicing is complete or especially noticeable.

Figure 19. Kretzschmar (1994: 124). The palatal ɿ is repeated several times on the page. The symbol highlight in yellow goes with the next entry.

ɿ	ʀ	ɿ̥	ʀ̥	
ɿ̥	ʀ̥	ɿ̥̥	ʀ̥̥	
ʒ̥	z̥	ʒ̥̥	z̥̥	ʒ̥̥̥
θ̥	ð̥			ʒ̥̥̥̥
ɿ̥	ʀ̥	ɿ̥̥	ʀ̥̥	
ɿ̥̥	ʀ̥̥	ɿ̥̥̥	ʀ̥̥̥	

Figure 20. Kretzschmar (1994: 116).

Small ezh, dez and tesh with palatal hook (ɿ̥̥, dɿ̥̥, tɿ̥̥)

Used for palatalization of [ʒ] since the dedicated IPA letter <ɿ̥̥> was abandoned.

[tɿ̥̥ dɿ̥̥] denote the consonants in *church, judge*. These are regularly so written, though the stop element is probably often more palatalized and somewhat farther retracted than ordinary [t d]. When the palatalization is especially distinct, the sounds may be written as [tɿ̥̥̥ dɿ̥̥̥] or [tɿ̥̥̥̥ dɿ̥̥̥̥].

Figure 21. Kretzschmar (1993: 123). <ɿ̥̥̥> is also visible (yellow) in my figures 19–20. On p. 115, Kretzschmar notes that in Kurath et al. (1943) *LANE*, <ɿ̥̥̥> and <ɿ̥̥̥̥> have the hook coming off the bottom of the letters, but they are clearly allographs.

lla	ve'dʒɪ'njə
b	vedʒɪ'njə
c	ʎvedʒɪ'njəz

Figure 22. McDavid & O'Cain (1980: 130)

Apical Coronal Lingual (A.C.L.) [t; d; t̥; d̥; ts; dz; tʃ; dʒ; tθ; dð; t; d]
 Laminal Coronal Lingual (L.C.L.) [t̠; ɕ; t̠ʃ; ɕʃ]

Figure 23. Grunwell (1981: 73). <t̠ʃ> and <ɕʃ>. The <t̠ʃ> (yellow) may not look like a ligature, but the context suggests this is just a matter of font support.

Small l with belt and palatal hook (ɭ)

A palatalized lateral fricative. Found for Coastal Chontal and also in Doke.

tion is Coastal Chontal, a Tequistlatecan Otomanguean Mesoamerican Indian language of Central America (Suárez 1983: 36, citing Waterhouse 1962 and Waterhouse and Morrison 1950). The contrasting lateral segments concerned are [l, l̥, l̥', l̥', l̥ʰ], which are, respectively, a voiced lateral resonant, a voiced palatalized lateral resonant, a glottally checked lateral resonant, a voiceless lateral fricative, a voiceless palatalized lateral fricative, (and

Figure 24. Laver (1994: 310). <ɭ> with description.

for. No doubt the use of narrow transcription forms such as ɰ and ɱ for prevelars, t̠ d̠ and p̠ for prepalatals, ɭ and ɮ for palatalized laterals, and t̠, d̠, p̠, b̠, ŋ̠ and m̠ for labialized forms, will in certain quarters be

Figure 25. Doke (1926: 22) <ɭ> along with an unsupported l-ʒ ligature. The latter may be specific to Doke.

Small eng with palatal hook (ŋ̠)

A fronted velar, as in Vietnamese; analogous to fronted velars k̠ g̠ in Russian.

rhyme group. According to Professor Eugénie Henderson Vietnamese *-nh* and *-ch* are not strictly a palatal nasal and stop, but are fronted velars which she writes as ⟨ŋ⟩ [k̟].⁶⁹ The vowels in front of them are diphthongized: *-anh* [ɛiŋ], *-ênh* [ɛiŋ], *-inh* [iɪŋ]. It may well be that in Middle Chinese also there was a palatal glide before the final consonant which would justify a reconstruction /aijŋ/ [ɛiŋ] /aijk/ [ɛik̟]; and further that in Old Chinese there was a distinct set of palatal final consonants (though even there one might prefer to treat them as combinations of /ŋ/ and /k/ + /j/). As far as

Figure 26. Pulleyblank (1970: 237). The hook is centered on the ⟨ŋ⟩ here, as it is on the ⟨k⟩; these are obviously allographs of ⟨ŋ, k̟⟩.

Expected but as yet unattested

Small dez with retroflex hook (d-ʒ ligature: dʒ̟)

The obvious choice for people who use *ʃ* and *ʒ* together with the old IPA ligatures for affricates, as in Figure 17. That example, for Polish, shows only the voiceless affricate /tʃ/, but Polish also has a corresponding voiced affricate that would need to be transcribed the same way. Polish contrasts affricates such as /dʒ/ with plosive-fricative sequences such as /dʒʃ/.

Ad hoc, no additional attestations

Small lezh with curl (l-ʒ ligature)

This is seen in Figure 25. However, IPA use of ⟨ʒ̟⟩ for palatalized [ʒʲ] is obsolete, and I've found no repetition of Doke's usage. At later dates, *lʒ* with palatal hook would be expected instead.

ISO/IEC JTC 1/SC 2/WG 2
**PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
 FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹**

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html> for guidelines and details before filling this form.

Please ensure you are using the latest Form from <http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. Title:	<i>Additional phonetic click letters</i>
2. Requester's name:	<i>Kirk Miller</i>
3. Requester type (Member body/Liaison/Individual contribution):	<i>individual</i>
4. Submission date:	<i>2020 June 11</i>
5. Requester's reference (if applicable):	
6. Choose one of the following:	
This is a complete proposal:	<input checked="" type="checkbox"/>
(or) More information will be provided later:	<input type="checkbox"/>

B. Technical - General

1. Choose one of the following:		
a. This proposal is for a new script (set of characters):		
Proposed name of script:		
b. The proposal is for addition of character(s) to an existing block:	<input checked="" type="checkbox"/>	
Name of the existing block:	<i>Latin Extended-D, Phonetic Extensions Supplement-A</i>	
2. Number of characters in proposal:	<i>13</i>	
3. Proposed category (select one from below - see section 2.2 of P&P document):		
A-Contemporary <input checked="" type="checkbox"/>	B.1-Specialized (small collection) <input type="checkbox"/>	B.2-Specialized (large collection) <input type="checkbox"/>
C-Major extinct <input type="checkbox"/>	D-Attested extinct <input type="checkbox"/>	E-Minor extinct <input type="checkbox"/>
F-Archaic Hieroglyphic or Ideographic <input type="checkbox"/>	G-Obscure or questionable usage symbols <input type="checkbox"/>	
4. Is a repertoire including character names provided?	<input checked="" type="checkbox"/>	
a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?	<input checked="" type="checkbox"/>	
b. Are the character shapes attached in a legible form suitable for review?	<input checked="" type="checkbox"/>	
5. Fonts related:		
a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?	<i>Kirk Miller</i>	
b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):	<i>SIL (Gentium Release)</i>	
6. References:		
a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?	<input checked="" type="checkbox"/>	
b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?	<input checked="" type="checkbox"/>	
7. Special encoding issues:		
Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?	<input checked="" type="checkbox"/>	

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at <http://www.unicode.org> for such information on other scripts. Also see Unicode Character Database (<http://www.unicode.org/reports/tr44/>) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

¹ Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? If YES explain	<input type="text"/>	<i>no</i>
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? If YES, with whom? If YES, available relevant documents:	<input type="text"/> <i>The author is a members of the user community.</i>	<i>yes</i>
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Reference:	<input type="text"/>	
4. The context of use for the proposed characters (type of use; common or rare) Reference:	<input type="text"/>	<i>phonetic</i>
5. Are the proposed characters in current use by the user community? If YES, where? Reference:	<input type="text"/> <i>see illustrations</i>	<i>yes</i>
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? If YES, is a rationale provided? If YES, reference:	<input type="text"/>	<i>no</i>
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	<input type="text"/>	<i>no</i>
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? If YES, is a rationale for its inclusion provided? If YES, reference:	<input type="text"/>	<i>no</i>
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? If YES, is a rationale for its inclusion provided? If YES, reference:	<input type="text"/> <i>(Unicode disprefers use of combining retroflex and palatal hooks)</i>	<i>yes</i>
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? If YES, is a rationale for its inclusion provided? If YES, reference:	<input type="text"/>	<i>no</i>
11. Does the proposal include use of combining characters and/or use of composite sequences? If YES, is a rationale for such use provided? If YES, reference:	<input type="text"/>	<i>no</i>
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? If YES, reference:	<input type="text"/>	<i>no</i>
12. Does the proposal contain characters with any special properties such as control function or similar semantics? If YES, describe in detail (include attachment if necessary)	<input type="text"/>	<i>no</i>
13. Does the proposal contain any Ideographic compatibility characters? If YES, are the equivalent corresponding unified ideographic characters identified? If YES, reference:	<input type="text"/>	<i>no</i>