

Articulatory Phonetic Alphabet

(Artalph)

by

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Description of Articulatory Phonetic Alphabet

Artalph is a system of phonetic **signs** that includes **symbols** functioning as didactic software and **characters** operating as a font. Artalph signs are mainly transparent or translucent icons. They are *easily comprehensible*, yet, due to their interrelations, are *highly precise*, which renders them useful for numerous didactic and research activities in linguistics, anthropology, and speech pathology.

1. A novel structural principle (Tab.1)

The Artalph **characters** represent phonemes, linguistically distinctive sounds characterised by a particular set of *phonological features*. Yet these signs are not chosen arbitrarily but are composed of **symbols** that represent these distinguishing *phonological features*. The power of each symbol lies more in its combinatory abilities and its place within the character than in its own iconic shape.

Thus, on the level of its symbol inventory, Artalph is a writing system based on an entirely new alphabetic principle: *one symbol for one phonological feature*. This is a higher level of phonological abstraction in relation to other comparable systems; for example, the International Phonetic Alphabet (IPA) is based on the principal of *one sign for one sound*.

2. A new type of alphabetic sign (Tab.2 & 3)

The main novelty of Artalph consists in a new way of sound representation, one based on the sound *articulation*. The Artalph composite characters are best described as stylized pictograms of the human articulatory apparatus.

Unlike existing alphabets, then, which are systems of arbitrary signs that encode the corresponding sounds in an impervious manner, the Artalph offers *motivated signs* that are easy to interpret and to memorise thanks to their *pictographic* nature.

However, the composite signs of the Artalph differ from the realistic pictures or pictograms used in phonetic textbooks to represent the articulation of sounds. The difference lies again in the *level of abstraction* and in the *combinatory ability of the inventory*: its primary symbols can be combined in such a way that all phonological features necessary for the description and articulation of the represented sound can be combined in *one* pictogram, whereas the use of conventional pictures requires several representations to describe one sound, not to mention the many phonetic characteristics that cannot be captured by a realistic picture.

3. A novel approach to suprasegmental marks (Tab.4 & 5)

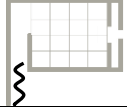
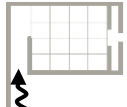
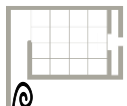
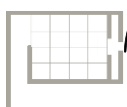
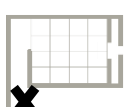
To mark stress or length, Artalph does not require the addition of extra symbols. Instead, the pictographic nature of this new alphabet's signs allows for the changing of a character's form itself in a logical and visually recognizable way: an enlarged character marks a stressed sound, a lengthened character a long sound. Breaks between words can be indicated by spacing or by the vertical bars used in IPA. The characters in syllabic units, on the other hand, are linked with a horizontal line at the bottom to emphasize their unity.

Tab.1. (a) Artalphy inventory: **symbols** that constitute the characters and represent phonological features




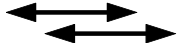






| N | Generic symbols | Meaning [phonetic feature] | Icon = pictographic metaphor |
|----|-----------------|--|---|
| 1 | | vowel [+syllabic] | Fluid shape = free flowing of the air and the voice + mouth cavity |
| 2 | | Consonant [-syllabic] or [+consonantal] | Rectangular shape = absence of free flowing + mouth cavity w/teeth; Angular shapes = obstacles |
| 3 | | Approximant (semi-vowel or semi-consonant) [+approximant] | Hybrid consonant-vowel shape = mixed nature |
| 4 | | Indicator (place of articulation) This example : [+labial] | Shape = joining pad of interaction, its position = place of articulation Red colour = active point of tension |
| 9 | | Supplementary indicator (place of additional quality) These examples: labialised , palatalised | Shape & position = point of additional action Blue green colour = secondary characteristic or articulation |
| 5 | | Vertical lines of the grid + Visual aid (“tongue”) These examples: palatal [+dor, -ant]/ alveolar [+cor,+ant] | Shapes = tongue; their pointed part on the line = place of articulation: 1-velar, 2-palatal, 3-retroflex,4-post/alveolar,5-dental Red colour = active or moving part |
| 6 | | Vertical lines of the grid + Visual aid (position of the “tongue”) [+front]/[+back] | Shape = tongue; its pointed part on the vertical line = place of articulation: 2-3-back, 3-4-central,4-5-front |
| 7 | | Horizontal lines of the grid + Visual aid (“tongue”) [+high] | Shape = tongue, its upper round part = the position of tongue’s back: 1-close[+high], 2-close-mid, 3-open-mid, 4-open [+low] |
| 8 | | Configuration of lips [+rounded]/[-unrounded] | Round shape = rounded lips; rectangular shape = unrounded lips; rounded rectangle = undefined regarding this feature |
| 10 | | Nasal [+nasal] | Shape and place = nose Red colour = active part |

*Grey or “faded” shapes serve to demonstrate the position of the symbol within the character

Tab.1. (b) Artaliph inventory: additional **symbols** for phonological features (DIACRITICS in IPA)

| N | Symbols | Meaning | Icon = pictographic metaphor |
|---|---|--|--|
| 1 |  | Voiced [+voice] (unnecessary for sounds voiced by definition: vowels, nasals, etc.) | Wavy shape & place = sound wave from the vocal cords |
| 2 |  | Creaky voiced | Arrow head = sharpness |
| 3 |  | Breathy voiced | Spiraling shape = breath & air |
| 4 |  | Aspirated | Spiraling shape & place = puff of air |
| 5 |  | Voiceless | Crossed bars = blocked way |

Tab.1. (c) Artaliph inventory: **symbols** for MODES of articulation for CONSONANTS

| N | Symbols | Meaning | Pictographic metaphor – combination of icons |
|----|---|-------------------|--|
| 1 |  | Plosive | Sudden and single movement of interacting surfaces |
| 2 |  | Trill | Repetitive interaction of surfaces, vibration |
| 3 |  | Tap or flap | Single tap of one surface on another |
| 4 |  | Fricative | Surfaces rubbing against one another |
| 5 |  | Lateral | Free movement on the sides of interacting surfaces |
| 6 |  | Lateral fricative | Combination of 4 & 5 |
| 7 |  | Affricate | Late release, movement occur only on a second try |
| 8 |  | Clicks | Two points of contact (! = loudest consonants) |
| 9 |  | Implosives | Ingressive and egressive airstream mechanism |
| 10 |  | Ejectives | Simultaneous closure of the glottis, air ejection |

Tab.2. (a) Artaliph **characters** for PULMONIC CONSONANTS of the IPA

(the corresponding IPA signs are located on top of the characters)

| | | Bilabial | Labiodental | Dental |
|---|---------------------|------------|-------------|------------|
| 1 | Plosive | <p>p b</p> | | |
| 2 | Nasal | <p>m</p> | <p>ɱ</p> | |
| 3 | Trill | <p>B</p> | | |
| 4 | Tap or Flap | | | |
| 5 | Fricative | <p>ɸ β</p> | <p>f v</p> | <p>θ ð</p> |
| 6 | Lateral fricative | | | |
| 7 | Approximant | | <p>ɹ</p> | |
| 8 | Lateral approximant | | | |

Tab.2. (b) Artalph **characters** for PULMONIC CONSONANTS of the IPA (continuation)

(the corresponding IPA signs are located on top of the characters)

| | Alveolar | Postalveolar | Retroflex | Palatal |
|---|----------|--------------|-----------|---------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

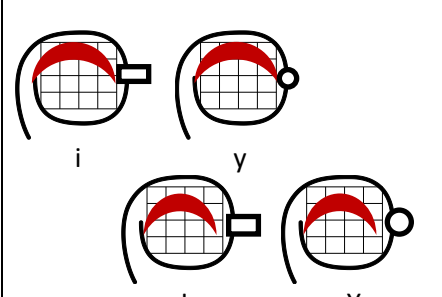
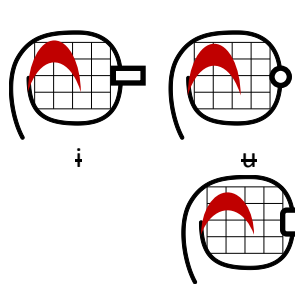
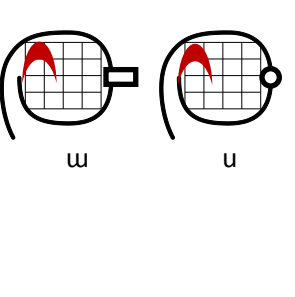
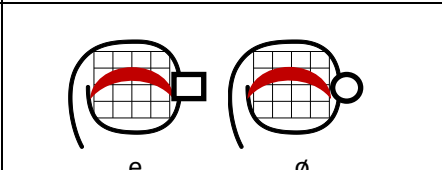
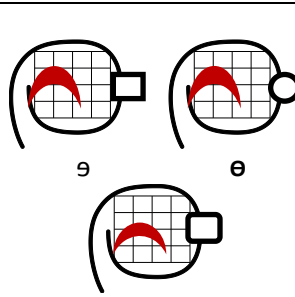
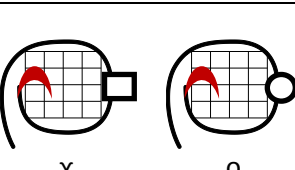
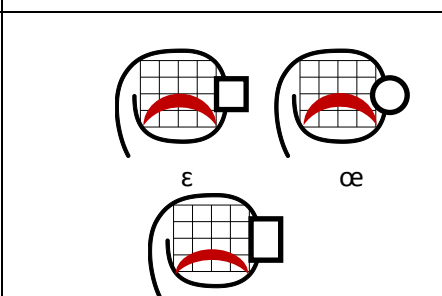
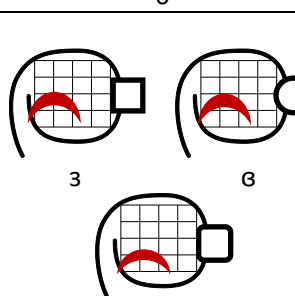
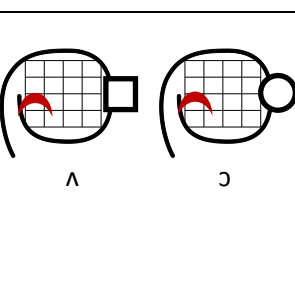
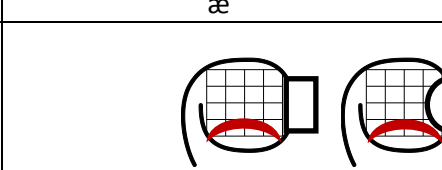
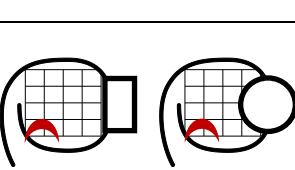
Tab.2. (c) Artaliph **characters** for PULMONIC CONSONANTS of the IPA (continuation)

(the corresponding IPA signs are located on top of the characters)

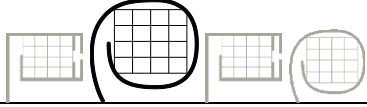



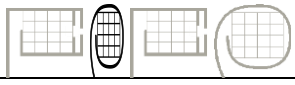




| | Velar | Uvular | Pharyngeal | Glottal |
|---|-------|--------|------------|---------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

Tab.3. Artalph **characters** for VOWELS of the IPA

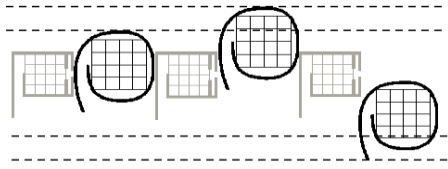
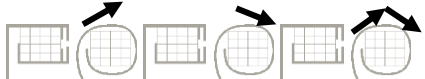
(the corresponding IPA signs are located under the characters)

| | Front | Central | Back |
|-----------|--|---|--|
| Close |  <p>i y ɪ ʏ</p> |  <p>ɨ ɥ ɯ ʉ</p> |  <p>ɯ u</p> |
| Close-mid |  <p>e ø</p> |  <p>ə ɘ ɚ</p> |  <p>ɤ o</p> |
| Open-mid |  <p>ɛ œ æ</p> |  <p>ɜ ɞ ɚ</p> |  <p>ʌ ɔ</p> |
| Open |  <p>a ɶ</p> | |  <p>ɑ ɒ</p> |
| | Unrounded □ / Rounded ○ | | |

Tab.4. Artaliph inventory: **symbols** for SUPRASEGMENTALS

| N | Symbols | Meaning | Pictographic metaphor |
|---|---|----------------------------------|--|
| 1 |  | Primary stress | The biggest = most stressed |
| 2 |  | Secondary stress | Second biggest = less stressed |
| 3 |  | Long | Length of the symbol = length of the sound |
| 4 |  | Half-long | Length of the symbol = length of the sound |
| 5 |  | Extra-short | Length of the symbol = length of the sound |
| 6 |  | Syllable break or syllable unity | Meander like linked symbols = syllable pronounced as a sound unite |
| 7 |  | Minor group (foot) | Same as IPA |
| 8 |  | Major group (intonation) | Same as IPA |
| 9 |  | Linking (absence of break) | Same as IPA |

Tab.5. Artaliph inventory: **symbols** for TONES and WORD ACCENTS

| | | | |
|---|---|--|----------------------------------|
| 1 |  | LEVELS: extra high level high mid low extra low | Level = level |
| 2 |  | CONTOURS: rising, falling, rising-falling | Direction of the arrow = contour |