# THE INTERNATIONAL PHONETIC ALPHABET (2005)

CONSONANTS (PULMONIC)

| | Bilabial | Labio-dental | Dental | Alveolar | Post-alveolar | Retroflex | Palatal | Velar | Uvular | Pharyngeal | Epi-glottal | Glottal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nasal | m | ɱ | | n | | ɳ | ɲ | ŋ | ɴ | | | |
| Plosive | p b | ƥ ɓ | | t d | | ʈ ɖ | c ɟ | k g | q ɢ | | ʡ | ʔ |
| Fricative | ɸ β | f v | θ ð | s z | ʃ ʒ | ʂ ʐ | ç ʝ | x ɣ | χ ʁ | ħ ʕ | ʜ ʢ | h ɦ |
| Approximant | | ʋ | | ɹ | | ɻ | j | ɰ | | | | |
| Trill | ʙ | | | r | | | | | ʀ | | я | |
| Tap, Flap | | ⱱ | | ɾ | | ɽ | | | | | | |
| Lateral fricative | | | | ɬ ɮ | | ɭ | ʎ | ʟ | | | | |
| Lateral approximant | | | | l | | ɭ | ʎ | ʟ | | | | |
| Lateral flap | | | | ɺ | | ɺ | | | | | | |

Where symbols appear in pairs, the one to the right represents a modally voiced consonant, except for murmured ɦ.
Shaded areas denote articulations judged to be impossible. Light grey letters are unofficial extensions of the IPA.

Figure 1:   IPA symbols [wikipedia].

| Unvoiced Consonants | | | Voiced Consonants | | | Vowels | | | |
|---|---|---|---|---|---|---|---|---|---|
| Example | Dbet | IPA | Example | Dbet | IPA | Example | Dbet | IPA | L/T |
| /ch/urch | C | tʃ | | | | h/a/t | @ | æ | |
| /sh/e | S | ʃ | /th/is | D | ð | h/u/t | A | ʌ | T |
| /th/ink | T | θ | /b/ee | b | b | b/e/t | E | ɛ | L |
| /f/ish | f | f | /d/og | d | d | h/i/t | I | ɪ | L |
| /h/e | h | h | /g/ab | g | g | b/oy/ | O | ɔɪ | |
| /c/at | k | k | /j/udge | J | ʤ | b/ir/d | R | ɝ | |
| /p/en | p | p | /l/ook | l | l | p/u/t | U | ʊ | L |
| /s/ee | s | s | /m/an | m | m | h/ow/ | W | aʊ | |
| ca/t/ | t | t | /n/ap | n | n | wh/y/ | Y | aɪ | |
| /wh/at | H | ʍ | /r/eal | r | r | c/au/ght | c | ɔ | T |
| | | | plea/s/ure | Z | ʒ | f/a/ther | a | ɑ | |
| | | | si/ng/ | G | ŋ | b/ai/t | e | e / eɪ | T |
| | | | /v/ow | v | v | b/ee/ | i | i | T |
| | | | /w/in | w | w | b/oa/t | o | o / oʊ | T |
| | | | /y/ou | y | j | b/oo/ | u | u | T |
| | | | /z/oo | z | z | th/e/ | | ə | L |

Table    1:    LDC    unvoiced    consonants,    voiced    consonants    and    vowels.
http://en.wikipedia.org/wiki/Wikipedia:IPA_for_English#Key

Table 2: The four vowels used in Phatak and Allen (2007) (aka MN64) were /a, xq, i, xi/ as defined by the DOS-ASCII (DOS-bet) filename convention. To reduce the translation confusion, these four MN64 vowels have been colored-coded cyan here, and in the table below. The initial 'x' in DOS-bet indicates an upper case letter follows, thus these translate to LDC-bet as /a, Q, i, I/. The defined spoken sounds are: [c/o/t, h/a/t, b/ee/, h/i/t], and in IPA they are [ɑ, æ, ɪ, i]. The cyan labels are the vowels used in MN64. The red is the vowel incorrectly reported by Phatak and Allen (2007), which was really the long /e/ (bet ɛ → beet i). Latex (tipa) symbols for all the LDC CVs: \textipa{A} → ɑ.

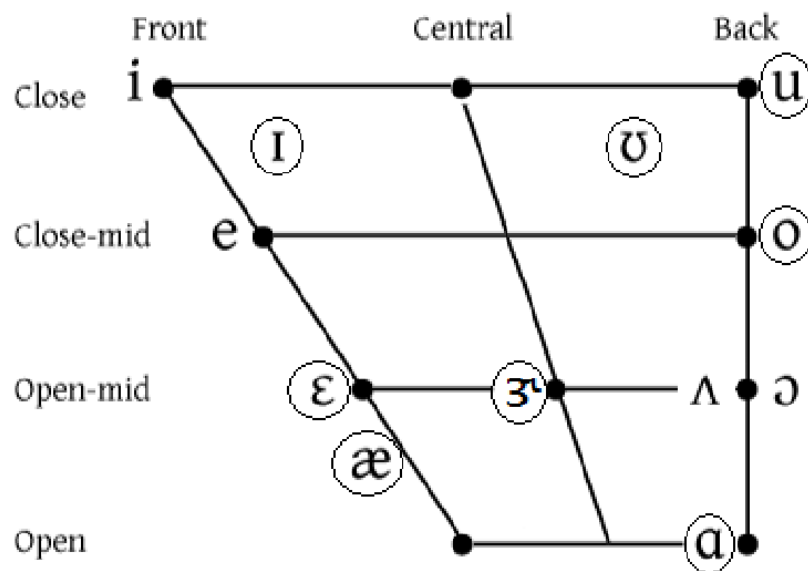| Example | DARPA-bet | LDC-bet | IPA-bet | tipa symbol |
|---------|-----------|---------|---------|-------------|
| /a/ h*a*t | @ | Q (e.g., xq) | æ | \ae |
| /u$_1$/ /*a*/way, f/*a*/ther? | A | A (e.g., xa) | ə | @ |
| /u$_2$/ h**u**t | A | A | ʌ | 2 |
| /th/ this | D | D | ð | D |
| /e/ bet | E | E | ɛ | E |
| /ee/ b**ee** | i | i | i | i |
| /i/ hit | I | I (e.g., xi) | ɪ | I |
| /u/ put | U | U(e.g, xu) | ʊ | U |
| /o/ cot | a | a | ɑ | A |
| /ai/ way, bait | e | e | e/eɪ | e/eI |
| /oa/ boat | o | o | o/oʊ | oU |
| /au/ caught | c | c | ɔ | O |
| b/oo/ | u | u | u | u |
| /y/ why | Y | Y | aɪ | aI |
| /ow/ how | W | W | aʊ | aU |
| /ng/ sing | G | G | ŋ | N |
| /oy/ boy | O | O | ɔɪ | OI |
| /ch/ church | C | C | ʧ | \textteshlig |
| /j/ judge | J | J | ʤ | \textdyoghlig |
| /ir/ bird | R | R | ɝ | \textrhookrevepsilon |
| /sh/ she | S | S | ʃ | S |
| /th/ think | T | T | θ | T |
| /s/ pleasure | Z | Z | ʒ | Z |
| /b/ bee | b | b | b | b |
| /d/ dog | d | d | d | d |
| /f/ fish | f | f | f | f |
| /g/ dog | g | g | ɡ | g |
| /h/ he | h | h | h | h |
| /c/ cat | k | k | k | k |
| /l/ look | l | l | l | l |
| /m/ man | m | m | m | m |
| /n/ man | n | n | n | n |
| /p/ pen | p | p | p | p |
| /r/ real | r | r | r | r |
| /s/ see | s | s | s | s |
| /t/ cat | t | t | t | t |
| /oo/ boo | u | u | u | u |
| /v/ vow | v | v | v | v |
| /w/ win | w | w | w | w |
| /y/ you | y | y | j | j |
| /z/ zoo | z | z | z | z |

Figure 2: Vowel "triangle." Circles indicate those used in CV06.
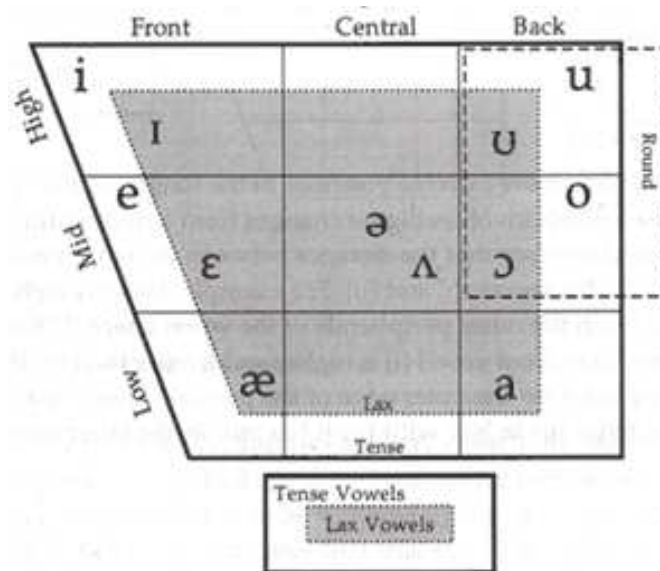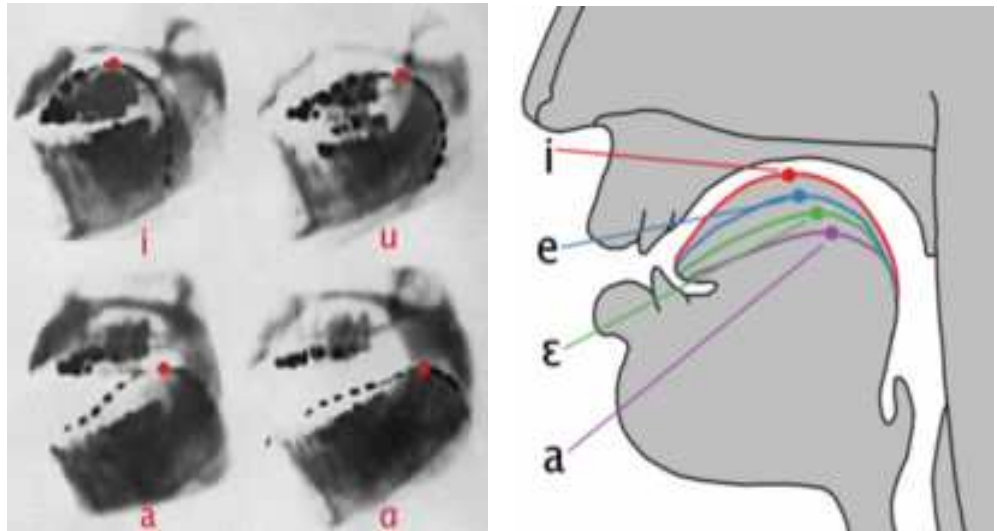


Figure 3: Tense vs. Lax vowels.

Figure 4: Cardinal vowels of the human vocal tract, xray images. [wikipedia]

Table 3: LDC Consonants

| Example | Dbet | IPA |
|---------|------|-----|
| /ch/urch | C | ʧ |
| /th/is | D | ð |
| /j/udge | J | ʤ |
| /sh/e | S | ʃ |
| /th/ink | T | θ |
| plea/s/ure | Z | ʒ |
| /b/ee | b | b |
| /d/og | d | d |
| /f/ish | f | f |
| /g/ab | g | g |
| /h/e | h | h |
| /c/at | k | k |
| /l/ook | l | l |
| /m/an | m | m |
| /n/ap | n | n |
| /p/en | p | p |
| /r/eal | r | r |
| /s/ee | s | s |
| ca/t/ | t | t |
| /v/ow | v | v |
| /w/in | w | w |
| /y/ou | y | j |
| /z/oo | z | z |