

M A N U A L O F
A R T I C U L A T O R Y
P H O N E T I C S

Revised Edition

by

WILLIAM A. SMALLEY

Cartoons by George Ivan Smith

PRACTICAL ANTHROPOLOGY

Box 307, Tarrytown, New York 10591, U.S.A.

Part One (Lessons 1-14) Copyright © 1961

Part Two (Lessons 15-Appendix B) Copyright © 1962

Revised Edition Copyright © 1963

Cartoons Copyright © 1964

by William A. Smalley

2M [8M] 67

INDEX

Phonetic symbols not a part of the usual English alphabet are combined with it in the index below. The order in which they appear follows. Other symbols, not shown in this listing are included in the index as subheadings under the basic symbol they most resemble, with [ø] under [o], [ø] under [b], etc.

a a v æ b b c č d d e e f g ēb g h i ī z j ġ k k p l ī m w n ī
 n ī m o ø o œ p p q r ř ř s š t u ü v v ī w x y z ž ř ř θ r.

[a] lower-low front unrounded oral vowel 261ff. [a·] long 269ff. [ə] nasalized 333ff. [ă] laryngealized 398f. [ă] retroflexed 417ff. [ă] breathy 420ff. [ă] pharyngealized 441ff. [ă] raised 370ff. [ă] lowered 370ff. [ă] fronted 370ff. [ă] backed 370ff. [ă] with very slight rounding 370ff. [A] voiceless 392ff.

Affricates 136ff, 148, 229f, 277, 454ff; aspirated and unaspirated 139ff; dental 166f; flat end grooved 167; lateral 259n; laterally released 228f; retroflexed 168; velar 143; voiced 139f.

Air stream: Sammy 78, 379ff, 406f, 429f, 433, 436, 77ff, 378ff, 405ff, 427ff, 490ff.

Alveolar 3ff, 20, 85ff, 148, 166f, 170, 278.

Alveopalatal 3ff, 20ff, 75f, 85ff, 148, 164, 170, 193ff, 196, 218, 225f, 275ff.

Amoy 30ff, 61f.

Articulation 3ff, 490ff; manners of 11ff, 490ff; points of 3ff, 493ff.

Articulators 9ff, 493ff.

Aspiration 108ff, 113ff, 229, 277, 396f.

[a] lower-low central unrounded oral vowel: Sammy 175; 174f,

187ff, 263ff, 335. [a·] long 269ff. [ə] nasalized: Sammy 334f, 333ff. [ă] laryngealized 398f. [ă] retroflexed 417ff. [ă] breathy 420ff. [ă] pharyngealized 441ff. [ă] raised 370ff. [ă] lowered 370ff. [ă] fronted 370ff. [ă] backed 370ff. [g] with slight rounding 370ff. [G] voiceless 392ff.

[v] lower-low back unrounded oral vowel: Sammy 264; 261ff. [v·] long 269ff. [v] nasalized 333ff. [v̄] laryngealized 398f. [v] retroflexed 417ff. [v̄] breathy 420ff. [v̄] pharyngealized 441ff. [v̄] raised 370ff. [v̄] lowered 370ff. [v̄] fronted 370ff. [v̄] backed 370ff. [v̄] with slight rounding 370ff. [V] voiceless 392ff.

[æ] low front unrounded oral vowel: Sammy 235; 232, 234ff, 263ff. [æ·] long 269ff. [ǣ] nasalized 333ff. [ǣ] laryngealized 398f. [ǣ] retroflexed 417ff. [ǣ] breathy 420ff. [ǣ] pharyngealized 441ff. [ǣ] raised 370ff. [ǣ] lowered 370ff. [ǣ] fronted 370ff. [ǣ] backed 370ff. [ǣ] slightly rounded 370ff. [Æ] voiceless 392ff.

- [b] voiced bilabial stop with egressive lung air 79ff, 84.
 [b^h] with voiceless release 347. [b^t] with voiced aspiration 422, 454. [b·] long 269ff.
- [b] pharyngealized 446ff. [b] laryngealized 460. [be] with voiced release 346f. [bb bv] affricated 138ff, 148, 454.
 [b^t] with egressive pharynx air 405, 407, 456. [b] with ingressive pharynx air 378, 386, 456. [b^c] with ingressive mouth air: Sammy 436; 427ff, 458.
- Back. see Mouth, Tongue, Vowels.
 Back-velar articulation 20ff, 48, 57f, 85ff, 148.
- Backed velar articulation: Sammy 324.
- "Backwards c" 201. see [ɔ].
 "Barred d" 469. see [d].
 "Barred i" 285. see [ɪ].
- Beat. see syllable.
- Bilabial 19f, 22f, 48ff, 52, 57f, 85ff, 110, 148, 192.
- Black Bobo 199.
- Blade. see Tongue
- Blade-alveolar articulation 20ff.
- "Boston a" 261. see [a].
- Boundaries. see Syllables.
- "Bracketing technique" 371.
- Brazilian 228.
- Breathy vowels 420ff.
- [θ] voiced flat bilabial fricative with egressive lung air: Sammy 49; 48ff, 51f, 56, 148, 454. [θb] affricate 138ff, 148, 454.
- [c] voiceless alveopalatal stop with egressive lung air 275ff, 307, 455. [c^h] aspirated, 275f, 279f, 307, 455. [c'] with egressive pharynx air 405, 457. [d] with ingressive pharynx air 378ff, 457. [c^t] with ingressive mouth air 427
459. [c^h_t] aspirated with ingressive mouth air 427, 459.
 [c] fortis 388f. [ç] lenis 388f.
 "C wedge" 469. see [c].
 "Capital h" 182ff. see [H].
 "Capital m" 192. see [M].
 "Caret" 201. see [A].
 Cavities 174, 492.
 Central. see Mouth, Vowels.
 "Clear l" 218. see [l^].
 Clicks 427ff, 458f, 491; song (Zulu) 438.
- Clusters, consonant 136, 349ff. 413f; vowel 293ff, 285, 320, 372, Fennish 329ff; glide 309, 319f, 372.
- Comanche 158, 394f.
- Complementary distribution 486ff.
- Consonant clusters. see clusters.
- Consonants 494ff, all odd-numbered lessons; charts 148, 257ff, 357ff, 453ff; English phonemes 467ff; length 269, 272f; modifications 459f; nasalized 333ff; pharyngealized 446f; preceding on-glides 186f; released and unreleased 345f, 415; syllabic 152ff, continuant 494ff.
- Contours. see Pitch.
- "Crossed o" 309. see also [ø]
- [χ] voiceless grooved unaspirated alveopalatal affricate with egressive lung air 138ff, 148, 455. [χ^h] aspirated 138ff, 148, 455.
- [d] voiced alveolar stop with egressive lung air 79ff, 148, 455. [d] dental 164, 454.
- [d̪] retroflexe : Sammy 168, 164, 169, 455. [d^h] with voiceless release 347. [d̪^h] with voiced aspiration 422, 455. [d̪] flapped 246f, 248f, 455. [d̪·] long 269ff. [d̪] pharyngealized 446ff. [d̪ə] with voiced release 346f. [d̪]

with ingressive pharynx air 378, 387, 457. [d̪] with ingressive mouth air 427, 459. [d̪ d̪] affricates 138ff, 148, 164, 454. [d̪̄ d̪̄] affricates 164, 169, 455. [d̪̄] affricate, lateral 217, 457. [d̪̄] see [j]. [d̪̄] affricate with ingressive mouth air 427, 459. "Dark l" 218, see [l̄]. Dental 5ff, 164ff, 218, 226f. "Dental n" 192; see [n]. Diacritics [~] alveopalatal 218. [.] backing 164, 322f. [+] breathiness 420. [^] dental 218. [] egressive pharynx air 405ff. [\] falling pitch 90. [^] flap 247ff. [„] fortis 387; [„] fronting 164, 322f. [^] higher than normal 218, 371. [‘] ingressive mouth air 427ff. [‘] laryngealized 398f. [‘] length 269. [‘] lenis 387. [^] lower than normal 371. [^] backed 371. [‘] fronted 371. [„] more rounded 371. [~] pharyngealized 441. / phonemic transcription 12, 467. [] phonetic transcription 12. [] retroflexed 218. [/] rising pitch 90. [r̄] step up and step down in pitch 90. [~] trill 246ff. [-] unreleased 345.

Diagrams, facial 1f, 74ff, 79; see under various phonetic symbols; segmental 111, 137, 184f, 223, 335, 348, 498.

"Double-dotted u" 309. see [ü]. Double nasals. see Nasals.

Double stops. see Stops.

[d̪] voiced, flat, dental fricative with egressive lung air: Sammy 14, 49, 43ff, 48, 54, 148, 454.

[e] mid front unrounded oral

vowel 232ff. [ē] long 269ff. [ē] nasalized 333ff. [é] laryngealized 398f. [ē] retroflexed: Sammy 418, 417ff. [ē] breathy 420ff. [ē] pharyngealized 441ff. [ē̄] raised 370ff. [ē̄̄] lowered 370ff. [ē̄̄ ē̄̄] fronted and backed 370ff. [ē̄̄] with slight rounding 370ff. [E] voiceless 392ff.

Egressive lung air: Sammy 379, 379, 490f, 454f.

Egressive mouth air 491.

Egressive pharynx air: Sammy 406f, 405f, 491f, 456.

"Eng" 469. see [ŋ].

English, affricates 136ff; American 102, 218f, 225, 334; Brooklynese 102; consonant clusters 470, 473ff; consonant phonemes 467ff; contour range 90ff; controlled intonation 118ff; dentals 165f; "eng" [ŋ] 192; fortis 388; fricatives 43f, 46f, 48; [H] 182, 482ff; juncture 159; laterals 17, 217ff, 222ff; lenis 388; off-glides 176f; on-glides 183, 185n; 89ff, 118ff; [r] 180f; stops 12f, 102, 108f; stress 155f, 159f; syllable boundary 154; syllabic 152f; voicing 81ff, 111; vowel phonemes 476ff; [w] 179, 482ff.

"Enya" 192. see [ñ].

Erakor 282.

"Esh" 469. see [ʂ].

[ə] lower-mid central unrounded oral vowel: Sammy 288; 285ff, 368; open transition, voiced release 346ff. [ə̄] long 269ff. [ə̄] nasalized 333ff.

[ə̄] laryngealized 398f. [ə̄] retroflexed 417ff. [ə̄] breathy 420ff. [ə̄] pharyngealized 441ff. [ə̄̄̄ ē̄̄ ē̄̄ ē̄̄] raised, lowered, fronted, backed 370ff. [ə̄̄̄] slightly rounded 370ff,

consonant release 347.

[ɛ] lower-mid front unrounded oral vowel: Sammy 175, 174, 187f, 190, 201. [ɛ•] long 269ff. [ɛ̄] nasalized 333ff. [ɛ̄] laryngealized 398f. [ɸ] 417ff. [ɸ̄] breathy 420ff. [ɸ̄] pharyngealized: Sammy 442, 441ff. [ɛ̄ ɛ̄ ɛ̄ ɛ̄ ɛ̄] raised, lowered, fronted, backed, and with slight rounding 370ff.

[f] voiceless flat labio-dental fricative with egressive lung air: Sammy 14, 49, 43ff, 48, 87, 148, 454. [f•] long 269ff. [f̄] rounded 460. [f̄] pharyngealized: Sammy 442, 446ff. [f̄] with egressive pharynx air 456. Faucalization, Faecal pillars 425, 493.

Fall, Falling. see Pitch, Glides.

Finnish 272ff, 329ff.

Flaps 246ff, 249, 253f, 256, 281, 456, 494f.

Foe 282.

Fortis 388.

Free fluctuation 488ff.

French 27, 221, 219, 346f.

Fricatives: Sammy 49, 13ff, 43ff, 48ff, 52ff, 55ff, 75f, 80f, 87f, 116f, 143, 148, 166, 172, 454ff; flat 167, 454, 496; grooved 167, 454f, 496; lateral 217, 221ff, 496.

Front. see Mouth, Vowels.

Fronted velar articulation: Sammy 324.

[g] voiced velar stop with egressive lung air: Sammy 78, 79ff, 148, 455. [ḡ] fronted 322ff, 455. [ḡ] backed 322, 455. [ḡ] with voiced aspiration 422, 455. [g•] long 269ff. [ḡ] pharyngealized 446ff. [ḡ] with voiced re-

lease 346f. [ḡ] with ingressive pharynx air: Sammy 381, 378, 457.

"Gamma" 363. see [r].

German 320f.

Glides. see Pitch, Vowels.

Glottal stop. see Stops, [ʔ].

Glottalized consonants 456ff.

Glottis. see Vocal cords. Gola 131ff, 449.

[ḡb] voiced double stop with egressive lung air: Sammy 299, 298ff, 306, 454. [ḡb̄] with ingressive pharynx air 378, 456.

[ḡ] voiced flat velar fricative with egressive lung air: Sammy 53, 48, 52ff, 56, 148, 200, 455. [ḡ ḡ] fronted, backed, 322ff, 455. [ḡ•] long 269ff. [ḡ] nasalized 333f. [ḡ] pharyngealized 446ff. [ḡḡ] affricate 138ff, 148, 455.

[h] voiceless glottal fricative 182f, 396f, 445, 492.

[H] voiced centralizing glide: Sammy 181, 181f.

[h̄] voiceless pharyngeal glide 144ff.

[h̄] aspiration 108ff, 140, 182f, 229, 277, 396f, 422ff.

[h̄] voiced aspiration (breathy) 422ff, 454f.

"Hat with the Bird" 93f, 118ff, 271.

Hausa 33ff, 161f, 463f.

"House that Jack Built" 205, 238f.

"Hook," "Hooked" 333, 411.

Huli 143

High. see Pitch, Tongue.

"High tongue l" 218. see [l̄].

[i] high front unrounded oral vowel: Sammy 235, 232ff. [i•] long 269ff. [ī] nasalized 333ff. [ī] laryngealized 398f.

- [i] retroflexed 417ff. [i] breathy 420ff. [i] pharyngealized 441ff. [i[^] i^v i^c i] raised, lowered, fronted, backed, slightly rounded 370ff. [I] voiceless 392ff.
- Implosives 378ff, 386, 416f, 424, 431, 456ff.
- Ingressive, air stream: Sammy 380; 490f; lung air 379, 490f; mouth air 427ff, 458f, 491f; pharynx air 379ff, 456ff, 491f.
- Intonation. see Pitch.
- "Inverted m" 363. see [w].
- Italian 225, 227.
- [‡] lower-high central unrounded oral vowel: Sammy 288f; 285, 287ff, 290, 367f. [‡•] long 269ff. [‡] nasalized 333ff. [‡] laryngealized 398f. [‡] retroflexed 417ff. [‡] breathy 420ff. [‡] pharyngealized 441ff. [‡[^] ‡^v ‡^c] raised, lowered, fronted, backed, with slight rounding 370ff. [‡] voiceless 392ff.
- [z] lower-high front unrounded oral vowel 232ff. [z•] long 269ff. [z] nasalized 333ff. [z] pharyngealized 398f. [z] retroflexed 417ff. [z] breathy 420ff. [z] pharyngealized 441ff. [z[^] z^v z^c z] raised, lowered, fronted, backed, slightly rounded 370ff.
- [j] voiced alveopalatal stop with egressive lung air 275f, 279ff, 307, 455. [j^f] with voiced aspiration 422, 455. [f] with ingressive pharynx air 378ff, 387, 457. [j^c] with ingressive mouth air 427, 459.
- "J wedge" 469. see [j].
- Juncture 158ff.
- [y] voiced grooved alveopalatal affricate with egressive lung air 138ff, 148, 455, 468.
- [k] voiceless velar stop with egressive lung air 75, 114f, 455. [k] fronted 322ff, 455. [k] backed 322, 455. [k^h] aspirated 109f, 113f, 148, 455.
- [k•] long 269ff. [k] pharyngealized 446ff. [k] fortis 388f. [k] lenis 388f. [k-] unreleased 345f. [kx] affricate 138ff, 148, 322ff, 455.
- [k^f] with egressive pharynx air 405, 457. [kf] with ingressive pharynx air: Sammy 381; 378, 457.
- Kaka 305f, 342, 386f.
- Khmu? 159, 198f, 224f, 244f, 254f.
- Korean 388.
- Kpelle 72.
- Kuy 280, 425f, 413ff.
- [k^p] voiceless unaspirated double stop with egressive lung air: Sammy 299f, 298ff, 305f, 454.
- [kp] with ingressive pharynx air 378, 456.
- [l] voiced alveolar lateral with egressive lung air 17f, 148.
- [l^h] high tongue: Sammy 219; 217ff, 226, 230, 457. [l^v] low tongue: Sammy 219; 217ff, 226, 230, 457. [l] dental 217, 226f, 456. [l] alveopalatal: Sammy 194; 225ff, 457. [l] flap 246f, 249, 457. [l] syllabic 151ff.
- [l] nasalized 333f. [l•] long 269ff. [l] pharyngealized: Sammy 442; 446ff. [l-] unreleased 346. [l] breathy 460.
- [l^c l^v] fronted, backed 460; lateral glide 228. [l] pharyngealized 460. [L] voiceless 217, 221, 457.
- Labial 5ff, 18f.
- Labio-dental articulation 19ff, 22f, 57f, 85ff, 148, 454ff.

- Laryngealized vowels. see Vowels. Mid. see Pitch, Tongue.
- Larynx 45, 77f, 380ff, 398ff, 405ff, 491ff.
- Laterals 17f, 148, 217f, 220ff, 231, 255f, 456f, 495f; alveopalatal 225f; dental 226f; English 217ff, 222; French 219; fricative 221f, 496; high and low tongue 218ff; Khmu? 224f; oral 217, 222; retroflexed 227f; Spanish 219; velar 227f.
- Length 269ff, 297, 329ff, 400; of pitch glides 62ff.
- Lenis 388.
- Level. see Pitch
- Liberian English 401.
- "Light l" 218. see [l^]
- Lips 3fT, 74, 174, 201, 311, 494; rounding 210f.
- Long. see Length, Vowels.
- Low. see Pitch, Tongue, Vowels.
- Lower-high, Lower-mid, Lower-Low. see Tongue, Vowels.
- "Low tongue l" 218. see [l^].
- Lung air 490ff; with voiced implosives 381. see Ingressive lung air, Egressive lung air.
- Lungs 77, 490.
- [t] voiced lateral alveolar fricative, with egressive lung air 217, 221f, 455. [t̪] voiceless 217, 222.
- [m] voiced bilabial nasal with egressive lung air: Sammy 16, 16ff, 148, 192, 456. [m̪] syllabic 151ff. [m̪̄] long 269ff. [m̪̄] pharyngealized 446ff. [m̪̄̄] unreleased 346. [m̪̄̄̄] breathy 460. [m̪̄̄̄̄] rounded 460. [m̪̄̄̄̄̄] laryngealized 460. with ingressive mouth air stop: Sammy 433, 427, 458. [M̪̄̄̄̄̄] voiceless 192, 196f, 456.
- Maidu 379n.
- Maninka 281, 306.
- Mano 41, 342f, 449f.
- Mansfield, Sam. see "Hat with a Bird," Diagrams, facial.
- Minimal pair 46, 483ff.
- Modifications. see Consonants, Diacritics, Vowels
- Mouth 174, 201.
- Mouth air. see Clicks.
- [w̄] high back unrounded oral vowel 363ff, 367f. [w̄̄] long 269ff. [w̄̄̄] nasalized 333ff.
- [w̄̄̄̄] laryngealized 398f. [w̄̄̄̄̄] retroflexed 417ff. [w̄̄̄̄̄̄] breathy 420ff. [w̄̄̄̄̄̄̄] pharyngealized 441ff. [w̄̄̄̄̄̄̄̄] raised, lowered, fronted, backed, with slight rounding 370ff. [w̄̄̄̄̄̄̄̄̄] voiceless 392ff:
- [n] voiced alveolar nasal with egressive lung air: Sammy 16, 334, 16f, 148, 192, 457. [n̪] dental 192, 195ff, 456. [n̪̄] retroflexed 192, 195f, 457. [N̄] flapped 246f, 249, 457.
- [n̪̄̄] syllabic 151ff. [n̪̄̄̄] long 269ff. [n̪̄̄̄̄] unreleased 346.
- [n̪̄̄̄̄̄] pharyngealized 446ff. [n̪̄̄̄̄̄̄] laryngealized 460. [n̪̄̄̄̄̄̄̄] breathy 460. [n̪̄̄̄̄̄̄̄̄̄] fronted, backed 460. [n̪̄̄̄̄̄̄̄̄̄̄] with ingressive mouth air stop 427, 459. [n̪̄̄̄̄̄̄̄̄̄̄̄] with ingressive mouth air affricate 427, 459. [N̄] voiceless 197, 457.
- Nasal cavity. see Cavities.
- Nasals 16ff, 148, 192ff, 255ff, 333, 456f, 495f; double 298ff, 303f, 329, 496; voiceless 196ff; Khmu? 198; Black Bobo 199.
- Nasalization, nasalized 333, 399f, 449f.
- Non-continuant 494ff.
- Non-vocoid 185n.
- Nuclei, English vowel 478ff.
- [ñ̄] voiced alveopalatal nasal with egressive lung air: Sammy 194, 192ff, 199. [ñ̄̄] unreleased 346. [ñ̄̄̄] with voiced release 346f. [ñ̄̄̄̄] with ingressive mouth air stop 427,

459. [N] voiceless 192, 196f, 457.

[ŋ] voiced velar nasal with egressive lung air: Sammy 16, 16f, 148, 192f, 200, 457. [ŋ] palatal 322ff, 455. [ŋ] backed 322, 457. [N] voiceless 192, 457.

[ŋm] voiced double nasal with egressive lung air: Sammy 299, 298ff, 306, 456.

[o] mid back rounded oral vowel: Sammy 175; 174, 187f, 190.

[o·] long 269ff. [ø] nasalized 333ff. [ö] laryngealized 398f. [o] retroflexed 417ff.

[ø] breathy 420ff; Kuy 425.

[ø] pharyngealized: Sammy 442; 441ff. [o^ o^v o^c o^r ø] raised, lowered, fronted, backed, with slightly less rounding 370ff. [O] voiceless 392ff.

"0 digraph" 309. see [æ].

"Old Macdonald Had a Farm" 239f. On-glides. see Vowels.

Off-glides. see English, Vowels. Onset. see Stress.

"Open o" 201. see [o].

Oral cavity. see Cavities, Vowels.

Orals 495f.

Quarkoye 389n.

[ø] mid front rounded oral vowel: Sammy 313; 309, 311ff, 320f. [ø·] long 269ff. [ø] nasalized 333ff. [ø] laryngealized 398f. [ø] retroflexed 417ff. [ø] breathy 420ff. [ø] pharyngealized 441ff. [ø^ ø^v ø^c ø^r ø] raised, lowered, fronted, backed, with slightly less rounding 370ff. [ø] voiceless 392ff.

[ɔ] low back rounded oral vowel:

Sammy 202; 201, 208ff, 262ff. [ɔ·] long 269ff. [ɔ] nasalized 333f. [ɔ] pharyngealized 398f. [ɔ] retroflexed 417ff. [ɔ] breathy 420ff. [ɔ] pharyngealized 441ff. [ɔ^ ø^v ø^c ø^r ø] raised, lowered, fronted, backed, with slightly less rounding 370ff. [ɔ] voiceless 392ff.

[œ] low front rounded oral vowel: Sammy 314; 309ff. [œ·] long 269ff. [œ] nasalized 333ff. [œ] laryngealized 398f. [œ] retroflexed 417ff. [œ] breathy 420ff. [œ] pharyngealized 441ff. [œ^ œ^v œ^c œ^r œ] raised, lowered, fronted, backed, with slightly less rounding 370ff. [Œ] voiceless 392ff.

[p] voiceless unaspirated bilabial stop with egressive lung air: Sammy 2, 78; 6, 12, 75, 80f, 83, 108ff, 113ff, 148, 306, 454. [p^h] aspirated 108ff, 110, 113f, 148, 454. [p·] long 269ff. [p-] unreleased 345f. [p] fortis 388f. [p] lenis 388f. [p] pharyngealized 446ff. [pp] affricate 138ff, 148, 454. [pf] affricate 138ff, 148, 454. [p'] with egressive pharynx air: Sammy 406; 405, 456. [β] with ingressive pharynx air: Sammy 380; 378, 456. [p^f] with ingressive mouth air: Sammy 429; 427, 458.

Palate, palatal. see Articulation, points of. "Period." see Syllable division. Pharyngeal cavity. see Cavities. Pharyngeal, pharyngealized 441ff. see Cavities, Consonants, Glides, Vowels.

Phonemes, English consonant 467ff; English vowel 476ff. Phonemic 12n; transcription

- 469ff, 489.
 Phonetic 12n.
 Phonetician's theme song 451f.
 Pitch 26ff, 61ff, 89ff, 118ff, 135, 215, 449f, 462ff, 492; contours 97ff; glides 35ff, 62ff, 90, 95ff, 126ff, 215f; hearing 61ff; intonation 26ff, 37ff, 62ff, 66, 68ff, 89ff, 118ff, 129ff; symbols 90, 95; tone 89, 131ff, 162f.
- Portuguese 225.
- Preaspiration 397f.
- Primary. see Stress.
- "Printed a" 261. see [a].
- [p] voiceless flat bilabial fricative with egressive lung air: Sammy 49; 48ff, 52, 56, 87, 148, 454. [pp] affricate 138ff, 148, 454. [p̪] with egressive pharynx air 405, 456.
- Quiotepec Chinantec 355f.
- [r] voiced retroflexed glide with egressive lung air: Sammy 180; 179ff, 183ff. [r̪] voiced retroflexed central syllabic 151ff.
- Rearticulation 296f, 320.
- Red Bobo 389ff.
- Released. see Transition, open.
- Resonants 495ff.
- Retroflexed 168ff, 192, 218, 417ff.
- Rhythm 159.
- Rise, rising. see Pitch.
- Root. see Tongue.
- Rounded, rounding. see Lips.
- [ř] voiced alveolar trill with egressive lung air 250f, 282f, 457. [ř̪] long 269ff. [č] nasalized 333f. [ř̪] voiceless 250f, 282, 457. [ř̪] uvular: Sammy 252; 246, 251ff. [ř̪] voiceless uvular 246, 251ff, 457.
- [ř] voiced alveolar flap with egressive lung air 246ff, 282f, 457. [ř̪] pharyngealized 446ff. [ř̪] voiceless 246, 457.
- [s] voiceless alveolar fricative with egressive lung air: Sammy 14, 49; 13ff, 43ff, 48, 118, 455. [s̪] dental: Sammy 165; 164, 454. [s̪] syllabic 151ff. [s̪̄] long 269ff; Finnish 270. [s̪̄] nasalized 333f. [s̪̄ s̪̄] fortis, lenis 388f. [s̪̄] pharyngealized 446ff. [s̪̄̄] with egressive pharynx air 405, 457. Sammy. see Diagrams, facial.
- Secondary. see Stress.
- Segmentation 498f.
- Short glides. see Length.
- "Shwa" 285. see [ə].
- Slant lines 467.
- Sounds, description of 1ff, 490ff.
- Spanish 225, 165, 219.
- Stops 12f, 74f, 79ff, 148, 186, 255f, 275ff, 303ff, 454f, 456f, 494; aspirated 108, 113ff, 422ff; Zulu 411f; double 298ff, 305, 329, 494; egressive lung air 454f; egressive pharynx air 456f; ingressive pharynx air 456f; English voiced, releases on 346f; glottal 102f, 445, 492; glottalized 406, 456f; implosive 456f; long 270f; retroflexed 168; unaspirated 113ff; unreleased 345f; voiced aspirated 422ff.
- Stress 154ff, 191, 215, 499; stress-timing 159f.
- Summary review 453ff, 490ff.
- "S wedge" 469. see [š].
- Syllability, syllabic 152, 499; syllabic consonants 161; glides 184f.
- "Syllabic indicator 152.
- Syllables 150ff, 499.
- Symbols, symbolization 453ff, 363ff; English consonant pho-

nemes 467ff; phonemic, phonetic 12n; used by different linguists 377, 475; see *Diacritics*.

[š] voiceless grooved alveopalatal fricative with egressive lung air; Sammy 14, 49, 43ff, 48, 138ff, 148, 455. [š̪] retroflexed 164, 169, 455. [š̡] with egressive pharynx air 405, 457.

[t] voiceless alveolar stop
 with egressive lung air: Sammy
 75f, 114f, 148, 455. [t̪]
 dental 164f, 454. [t̪] retro-
 flexed 164, 169, 455. [t̪^h]
 aspirated 109f, 113f, 455. [t̪]
 flap 246, 248f, 455. [t̪·]
 long 269ff. [t̪] unreleased
 345f. [t̪ t̪] fortis, lenis
 388f. [t̪] pharyngealized
 446ff. [t̪] rounded 460. [tθ]
 ts ts̪ ts̪] affricates 138ff,
 148, 164, 217, 228, 454. [t̪s]
 see [č]. [t̪^h] with egressive
 pharynx air 405, 457. [t̪^h]
 with ingressive mouth air 427,
 459. [t̪̪ t̪̪ t̪̪̪ t̪̪̪ t̪̪̪̪ t̪̪̪̪̪]
 t̪̪̪̪ with ingressive mouth air
 427, 459. [t̪̪] with ingressive
 pharynx air 378, 457.

Teeth. see Articulation, points of.

"Ten Little Indians" 29, 318.

Tertiary. see Stress.

Thai 89, 144ff., 379, 462f.

"Theta" 469. see [θ].

"Tilde" 192. see Diacritics

Tip. see Tongue.

Tip-alveolar 20f

148.
Tiptendal 20ff 18 57 85ff

tip dental 2011, 48, 51, 8911,
148.

To'a'ba'ita 105, 107f.

Tone. see Pitch.

Tongue 9ff, 74, 167, 174, 193,
201, 211, 243, 268, 276ff,
291f, 316f, 493.

Transcription exercises, English phonemic 467ff, 489; matching symbols 149, 259, 357, 465; pitch 72, 100, 135; review 260, 362, 465. A transcription

- exercise is found at the end of almost every lesson.

Transition, close and open 348f.
Trills 246ff, 250ff, 281f, 456f,
495; Khmu? 254f.

"Typewriter a" 261. see [a].

[u] high back rounded oral vowel; Sammy 202, 201, 203ff. [u[.]] long 269ff; Kuy 425. [u] nasalized 333ff. [ū] laryngealized 398f. [u] retroflexed 417ff. [u] breathy 420ff; Kuy 425. [u] pharyngealized 441ff. [u[^] u[~] u[‘] u[>] u[’]] raised, lowered, fronted, backed, with slightly less rounding 370ff. [U] voiceless 392ff.

Unaspirated 148, 139f, 229, 277.
Unreleased. see Transition, close
Unrounded 314f; see Lips.

"Upside-down a" 261. see [ɔ].

"Upside-down m" 363. see [w].

"Upside-down v" 201. see [Λ].

"Upsilon" 201. see [v]

^{309.} see [ü]

Uvula 4f, 251ff.

- [ü] high front rounded oral vowel: Sammy 312; 309, 311f, 315f
32Of. [ü·] long 269ff. [ǖ] nasalized 333ff. [ǖ] laryngealized 398f. [ǖ] retroflexed 417ff. [ǖ] breathy 420ff. [ǖ] pharyngealized 441ff. [ür ǖ ǖ]
ǖ ǖ raised, lowered, fronted,
backed, with slightly less
rounding 370ff. [Ü] voiceless
392ff.

[v] lower-high back rounded oral vowel: Sammy 202, 201, 203ff, 232. [v•] long 269ff. [ɥ] nasalized 333ff. [ڻ] laryngealized 398f. [ڻ] retroflexed

417ff. [v] breathy 420ff.
 [v] pharyngealized 441ff. [v^v v^v v^v] raised, lowered, fronted, backed, with slightly less rounding 370ff.

[v] voiced flat labio-dental fricative with egressive lung air: Sammy 14, 49; 43ff, 87, 148, 454. [v·] long 269ff.
 [v] pharyngealized 446ff.
 Velar articulations: Sammy 324f, 5ff, 20ff, 48, 52ff, 85ff, 143ff, 218, 322ff, 469, 493.
 "Velar n" 192. see [ŋ].
 "Velarized l" 218. see [l̪].
 Velic 9ff, 74, 174, 496.
 Velum. see Velar.
 Vietnamese 42, 59, 71f, 89, 158f, 170f.
 Vocal cords 45, 491f.
 Voooid 185n.

Voiced, Voicing: Sammy 45ff, 77f, 77, 79f, 81, 83f, 111f, 137, 277f, 304f, 492; affricates 139ff, 229; clicks 435ff; flaps 250, 253; fricatives 43ff, 55; implosives 381; stops 79ff, 111f.

Voiceless, Voicelessness: Sammy 45ff, 77f, 45ff, 77, 79f, 83ff, 111f, 277f, 304f, 492; affricates, lateral 229; clicks 428ff; flaps 250; fricatives 43ff, 55, 221; nasals 196ff; pharyngealized glides 444; stops 111ff; vowels 392ff.

Vowels 174ff, 185n, 191, 203ff, 209, 261ff, 266f, 271f, 285f, 291, 296, 337f, 449f, 497; back 201ff; back unrounded 363ff, 400; breathy 420ff, 425f; central 201, 208ff, 285; chart 363; clusters 285, 294ff; English 205, 476ff; equivalences 376f; front 232ff, 237ff; front rounded 309ff; glided 174ff, 188ff, 212ff, 235f, 272, 294ff, 315, 319, 497; glides, voiceless 395f;

glides, lack of syllabicity 184; glide onsets 185ff; Khmu? 244f; labeling 210ff, 267ff, 291ff, 315ff, 340ff, 368f; laryngealized 398ff, 443f; length 269ff, 296, 320; modifications 370f, 422, 461f; nasalized 336f, 372, 399f; nuclei 478ff; off-glides 176ff, 183, 213f, 236, 239f; off-glides and on-glides 176ff, 236ff, 266f; oral 334ff, 343f, 372; pharyngealized 441ff; pure 187f, 190, 213, 235, 239, 266, 315; rearticulated 296f, 320; retroflexed 417ff; short 270; summary 461ff; symbols 363, 376; tongue height 211; voiceless 392ff. see Diacritics.

[ʌ] low central unrounded oral vowel: Sammy 202; 201, 208ff, 262f. [ʌ·] long 269ff. [ʌ] nasalized 333ff. [ʌ] laryngealized 398f. [ʌ] retroflexed 417ff. [ʌ] breathy 420ff. [ʌ] pharyngealized 441ff. [ʌ̄ ʌ̄̄ ʌ̄̄̄] raised, lowered, fronted, backed, with slight rounding 370ff.

[w] voiced glide to high back position: Sammy 178; 176ff, 183ff, 239ff. [W] voiceless 395f.

"Walrus and the Carpenter" 315f. Weak. see Stress.

"Written a" 261. see [a]

[x] voiceless flat velar fricative with egressive lung air: Sammy 53; 48, 52f, 55f, 76f, 148, 200, 455. [x] palatal 322ff, 455. [x] backed 322, 455. [x·] long 296ff. [x] nasalized 333f. [x] pharyngealized 446ff. [x̄ x̄̄] fronted, backed, 460. [x̄̄] with egressive pharynx air 405, 457.

[y] voiced glide to high front

position; Sammy 177, 176ff, [?] voiceless glottal stop with 183ff, 193f, 461. [Y] voiceless egressive lung air: Sammy 104, 461, 102ff, 105ff, 349ff, 386, 406, 455, 492.

[z] voiced alveolar fricative
with egressive lung air: Sammy
14, 49, 78; 43ff, 48, 148, 455.

[9] voiced pharyngeal glide with egressive lung air $\text{h} \text{h} \text{h}$.

[z] dental 164, 454. [z] retroflexed: Sammy 168; 168ff.

[θ] voiceless flat dental frica-

[z] syllabic 151ff. [z•] long
269ff. [z̩] nasalized: Sammy
335, 333f. [z̪] pharyngealized
446ff. [z̫] breathy 460. [z̬]
laryngealized 460.

[θ] voiceless flat dental fricative with egressive lung air: Sammy 14, 49, 43ff, 48, 54, 148, 454. [θ'] with egressive pharynx air 456.

"Z wedge" 469. see [ž].
Zulu 411f, 438ff; song 438.

[r] mid back unrounded oral vowel 363, 365ff. [r·] long 269ff. [ṛ] nasalized 333ff.

[z̥] voiced grooved alveopalatal fricative with egressive lung air: Sammy 14, 49, 43ff, 48, 138ff, 455. [z̥] retroflexed 164, 169, 455.

[$\ddot{\imath}$] laryngealized 398ff. [$\ddot{\imath}$]
 retroflexed 417ff. [$\ddot{\imath}$]
 breathy 420ff. [$\ddot{\imath}$] pharyngealized 441ff. [$\gamma^* \gamma^* \gamma' \gamma'$]
 $\ddot{\imath}$ raised, lowered, fronted,
 backed, with slight rounding 370ff.