

OUTLINE OF A PROPOSED ORTHOGRAPHY FOR AMERICAN SIGN LANGUAGE

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Introduction. Presented in this report is the first approximation of a literal orthography for the American Sign Language of the Deaf (ASL). This writing system has been designed to be powerful enough to record the fine details of ASL performance which are of great interest to linguists' and, it is to be hoped' straightforward enough to be used as an everyday written medium for the language, whether for personal correspondence or literature.

To these ends an alphabetic code has been devised which intends to represent more or less consistently the analog of the phonemic level of spoken language writing at its best. At the same time, a "phonetic" adjunct provided where surface-level detail is called for. There will no doubt be times when the suggested spelling of a lexical sign will tend toward the phonetic or morphological. An example of this practice will be seen in my use of /n/ to spell signs which have evolved from fingerspelling of English words beginning with n-, or in name-signs. The 2-fingered handshake used in such signs usually alternates freely or contextually with /h/, and has been excluded from phonemic-level handshake inventories by sign linguists (including the author). I permit myself exceptions to strict adherence to the phonemic analysis which underlies the present work where for esthetic or other reasons such discipline seems counterproductive at best.

In the body of this work, the phonemic-level inventories will be given, expanded to the phonetic alternations which can be explained by rule so that written forms may be realized appropriately. It is especially important that this task be undertaken to a greater extent than one might find in new writing systems for spoken languages, because it is assumed that the users of this orthography may be unfamiliar with signed language in general, as well as non-native in ASL proficiency. After all, when coming to a new spoken language speakers will be able to relate orthographic principles already known in general to the new code; in learning to spell ASL, there is little to fall back on, aside from some familiar symbols in the handshake notation which will be recognized as related to

fingerspelling conventions.

In notating signs in his pioneer Dictionary Of American Sign Language, Stokoe utilizes 55 primary symbols and a handful of modifying symbols to represent Handshape, Place of Articulation, and Movement, which had been shown to be the three parameters which distinguish each sign from all others, fine details of performance being important for correct pronunciation but nonetheless non-distinctive--a method of notation which makes encoding into symbols relatively easy, once one has learned the values of the individual symbols and the allowable combining patterns, but leaves decoding into correct production very difficult, depending upon frequent verbal descriptions. The use of the system presupposes a knowledge of ASL phonotactics, rules by which specific combinations of structural components are determined to be either well-formed signs or non-sign gestures, as well as a fairly large sign vocabulary, because the pronunciations of many of the signs lacking verbal descriptions cannot be reconstructed wholly from the written symbols. These deficiencies, perhaps, would be no harder on the knowledgeable ASL user than the lack of stress notation is for the English user (etc.) or the practice of writing with consonants only is for readers of Biblical Hebrew; but the amount of fine phonetic detail omitted in the transcriptions represents a considerable loss to the linguist. Furthermore, of the 55 primary symbols Stokoe utilizes, only 18 are ordinary letters and numbers, making it impossible to reproduce the system using a typewriter.

The orthography presented here uses the 26 letters of the English alphabet, the apostrophe ('), and the hyphen (-) in the phonemic spelling, and certain diacritics (represented by punctuation marks within words) in the phonetic transcription code; yet it strives to represent a wealth of detail missing from Stokoe's perhaps more graphic 55-plus symbols. The way this can be accomplished is by fitting all the descriptive information into a frame, the small set of symbols being used in different parts of a word to represent different concepts (thus, the letter 'a' may represent 3 independent characteristics of a single sign, depending on where in the frame it appears--a handshape category, the palmar surface of a hand, or the direction 'down').

Let me emphasize another point about the application of phonemic analysis to ASL writing: In spoken language research, such an analysis bears a heavy load of assumptions, not least of which is the definition of a phoneme. Millennia of consensus have aided orthographers and other linguists in enumerating first phones and then phonemes in specific languages, and then phonemes and their interrelationships and featural specifications in general. Psycholinguistic research has amassed much evidence of the reality of phonological segments as they are currently understood.

The task of developing an adequate transcription of ASL is equally dependent upon the specification of a theory of sign structure in which the constituent units of signs share a common level of analysis. We shall reveal in these pages details of the theory underlying the present writing system. Suffice it to say at this point merely that although I believe the Handshape, Place of Articulation, and Movement (Sig, Tab, and Des of Stokoe) do figure in phonemic units in ASL, that they do not share a common level of analysis (exactly). Place of Articulation and Movement are related in ASL much as Place of Articulation and Manner are related in spoken language; Handshape and its adjunct Contacting Region (about which much more will be mentioned later) may function much as tip/blade/retroflex/lateral tongue-use function in spoken language. In the present system I still separate some featural specifications from others in the manner of Stokoe.

1. THE FRAME. The organizational frame of the written sign comprises optional prefixes relevant to active-hand doubling (a form of reduplication used in inflections and derivations), a Preamble in which the Handshape and Contacting Region of the active hand(s) and of the base hand where one need be specified, and the spatial relation between the hands where this is not predictable; a movement Stem incorporating Place of Articulation and Movement type; and optional suffixes which notate inflectional morphemes by which signs show variations in grammatical aspect and number.

1.1 Handedness is represented by a prefix, separated from the rest of the sign by a hyphen.

The values are:

s- identical movement

s-gidodd "opposite"

s-baadidd "proceed"

s-bleccs "deer"

so- contrary movement

so-biphopp "navy, sailor"

so-by-omgg "leave"

si- alternating movement

si-by-ays "maybe"

si-fizizus "explain"

sio- alternating, contrary movement

sio-blhihy-euws "mix"

Note that here by "contrary movement" is meant movement where the two hands' movements in analogous parts of the movement cycle differ in direction as defined by the pairs up/down, toward/away, and ipsilateral/contralateral. Thus, movement by both hands simultaneously from left to right is "contrary movement", and marked by the prefix "so-".

1.2 Handshape Group. The handshape of a sign is obligatorily denoted in every sign. Most signs have as their first letters handshape designators. There are several comments to be made about the notation of handshape before the inventories and rules are given below. First, in signs made on a base hand, when the base hand does not represent a specific nominal classifier, its shape is entirely predictable and non-distinctive, at least within a system where the givens of the sign include the active handshape and contacting region and the base hand's contacting region. Thus when there is a base hand, all 3 of these specifications are written (if the base hand contacting region is identical with that of the active hand, it is not written); when the base handshape is a classifier, the symbols for it appear between the active contacting region and the base contacting region.

Some handshapes are written with two or more letters. This is because there are more distinctive

handshapes than there are English letters. The system is not entirely arbitrary, however. Most of the symbols include a letter familiar from fingerspelling, with optional modifying symbols. In fact, I have analyzed handshapes using 14 features (other analyses are possible, of course) and found much symmetry of structure in the handshape inventory.

Finally, some handshape symbols have been chosen which differ from the expected (possibly). For one thing, I have chosen letters always, never numbers, though I expect figures to be written as they are in English ideographically. Thus, for example, the "3" handshape is written as "vr", "4" is "wr", and "open-8" is "q". With the exception of the last example, all such spellings follow the internal structure of the system as presented below, the modifying symbols carrying generally constant import.

1.2.1 Definitions of Descriptive Terms. All the handshapes described below, whether phonemic or phonetic in level of representation, will be described as consistently as possible using the following terms (most of which correspond to distinctive features):

ARCHED, bent at the first and second joints if said of fingers, bent at the first joint if said of the thumb

EXTENDED AT RIGHT ANGLES TO THE PALMAR PLANE, having the knuckle ridge joint bent at right angles if said of fingers, or, if said of the thumb, having the whole thumb, down to the wrist, pivot around so as to cause the thumb to protrude from the edge of the palm at right angles to the palmar plane

EXTENDED IN THE PALMAR PLANE, having the knuckle ridge joint straight, if said of the fingers, and, if said of the thumb, extended from the palm sideways, without moving out of the palmar plane

FINGER, any of the set of digital extremities except the thumb (which is never referred to herein as a "finger")

FIRST JOINT, SEGMENT, etc., counted from the tip end of the digit rather than from the knuckle ridge end

FIST, a handshape with non-significant fingers tucked into the palmar surface

FLAT, said of handshapes with significant protruding fingers extended in the palmar plane

FOLDED, said of a handshape having significant extended fingers extending at right angles to the palmar plane

HAND, a handshape which does not have non-significant fingers tucked into the palmar surface

INDEX FINGER, the finger closest to the thumb

KNUCKLE RIDGE, the ridge formed by the third joints of the fingers (the "great knuckles" joining the proximal phalanges of the fingers to the metacarpal bones)

LAID OVER, said of the thumb in a fist handshape when it is tucked in and lies on top of non-significant fingers

LITTLE FINGER, the fourth finger away from the thumb

MIDDLE FINGER, the second finger away from the thumb

PALMAR PLANE, the plane defined by the flat surface of the palm and extending beyond the boundaries of the palm

RING FINGER, the third finger away from the thumb

SIGNIFICANT DIGITS, the digits which form the active part of a handshape, and which have contacting and pointing privileges

SPREAD, said of a handshape in which adjacent fingers do not touch each other along the interdigital surfaces

STRAIGHT, forming a straight angle (180 degrees) if said of a joint, or with both the first and second joints forming straight angles, if said of a finger or of the thumb

THUMB ALONGSIDE THE INDEX EDGE, with the thumb straight and in lengthwise contact with the radial edge of the palmar mass

1.2.2 Modifying Symbols. The basic handshape letter of a shape may be modified in order to specify the value for one or more features by which the shape differs from the basic shape denoted

by that letter. The following symbols are used, most frequently in phonetic transcriptions:

a- FOLDED

-l anamorphic distortion, such as flattening, spreading, etc.

-r an extra digit is extended in the palmar plane (usually)

-h ARCHED (most of the time)

1.2.3 Descriptions of Individual Handshape Groups. The phonemic-level handshapes are given below, with phonetic variants spelled out, and contexts for their appearance noted as succinctly as possible.

a a fist with straight thumb alongside the index finger edge; the first joints of the fingers are usually straight. AEEFEAWS, "sorry"

ar a fist with straight thumb extended in the plane of the palm; the first joints of the fingers are usually straight. ARETSI, "not"

b a flat hand with the fingers straight, parallel to each other and touching; the position of the thumb is conditioned by the nature of the contact, etc., but contact is never on the thumb tip. BAATI, "thanks"

[ab] a folded hand with the fingers straight, parallel to each other and touching; the thumb is "conveniently out of the way", depending on the nature of the contact, etc. This shape occurs most often as a surface-level variant of /b/, where the tips make contact. ABIP, "have"; BOAZI, "grate"

bl a flat hand with the fingers straight and spread, the thumb straight, extended in the palmar plane. This is the number "5", among other things (classifiers). BLEPI, "fine"

blh a flat hand with the fingers arched and spread; the thumb is arched and extended in the palmar plane. This is a claw handshape. SIO-BLHIHYEUWS, "mix"

br a flat hand with the fingers straight, parallel to each other and touching, the thumb straight and extended in the palmar plane. Contact is on the thumb. This may be

an anchoring form of /b/. BRECCCL or BECCCL, "stubborn"

c a flat hand with the fingers arched, parallel to each other and touching; the thumb is arched, extended at right angles to the palmar plane. CIFA, "wish"

[cl] a folded hand with the fingers straight, parallel to each other and touching; the thumb is straight, extended at right angles to the palmar plane. This is a grasping form of /c/, an open form of flat /o/, etc. CESORU, "smile"

[cr] a flat hand with the fingers arched, parallel to each other and touching; the thumb is straight, extended in the palmar plane. S-CAYHYDUS, "England"

d A flat hand with the index finger straight; the remaining fingers arched, parallel to each other and touching; the thumb is extended at right angles to the palmar plane and makes tip contact with the middle finger. S-DIDIRI, "divorce". Note that /d/ is a HAND because its non-significant finger (the index finger) is extended; contact privileges are not extended to the index finger in /d/ (except in A-B-C stories), being reserved usually for the vertex of the thumb-index loop.

[dr] a flat fist with the index finger straight, the middle finger arched; the thumb is extended at right angles to the palmar plane and makes tip contact with the middle finger. This is a dialectal form of /d/, commonly called baby-D, bD, etc.

Featurally, it is the FIST version of /qr/ ("8"), with the index-finger left extended (to tuck the index finger into the palm would be quite awkward).

e a flat hand with the fingers arched to the extent that the first segments are parallel to the palmnar plane, parallel to each other and touching; the thumb is tucked into the palmar surface, so that the fingertips make contact with the hair-bearing surface of the thumb. S-ERIS, "Easter"

[el] a flat hand with the fingers arched to the extent that the first segments are parallel to the palmar plane, parallel to each other and touching; the thumb is straight, alongside the index edge. This is a form of /a/, /e/

[er] a flat hand with the fingers arched to the extent that the first segments are parallel to the palmar plane, parallel to each other and touching; the thumb is straight, extended in the palmar plane. This is a form of /ar/, /c/, etc.

f a flat hand with the index finger arched and in tip-contact with the arched thumb; the remaining fingers are straight and spread. S-FEDOIRID', "family"

[fl] a flat hand with the index finger straight, extended at right angles to the palmar plane; the thumb is straight, extended at right angles to the palmar plane, and optionally in tip contact with the index finger; the remaining fingers are straight and spread. This is "open-f", and is either a grasping /f/ or the begging of a sequence ending in /f/, as in the sign FYUM, "choose", where /f...m/ indicates "closing to /f/"

g a flat fist with the index finger straight, thumb laid over the second segment of the middle finger. This is the number "1". GOEDS, "right"

[ag] a folded fist with the index finger straight; the thumb is laid over the second segment of the middle finger. This is a phonetic form of /g/, and occurs usually when there is tip contact. GIP, "I, me"

[gh] a flat fist with the index finger arched; the thumb laid over the second segment of the middle finger. This is phonetically identical in shape with /x/, and may be written to indicate a phonemic /g/ origin of a phonetic [x]. Contacting region privileges are those of /g/. GIYDS, "time"

gr a folded fist with the index finger straight, the thumb straight and extended at right angles to the palmar plane. This is fingerspelling G/Q. S-GREDOID', "group", GRIAADS, "word"

h a flat fist with the index and middle fingers straight, parallel to each other and touching; the thumb is laid over the second segment of the ring finger.

HAAEEZIUS, "railroad"

[ah] a folded fist with the index and middle fingers straight, parallel to each other and touching; the thumb is laid over the second segment of the ring finger. This occurs when /h/ has tip contact, as in S-HIDOL, "dominoes"; as well as in some other contact-movement clusters, as in HETSES, "Nixon"

[hl] a flat fist with the index and middle fingers, parallel to each other and touching; the thumb is straight, extended at right angles to the palmar plane. This shape closes to "30", and may be considered a phonetic variant of /3/, though in HYTMS, "duck", the shape shows an origin in /h/-related classifiers.

[hr] a flat fist with the index and middle fingers straight, parallel to each other and touching; the thumb is straight, extended in the palmar plane. This is an anchoring form of /h/, as in HECCL, "horse"

i a flat fist with the little finger straight; the thumb is laid over the second segment of the middle finger. IEPFAS, "egotistical"

ir a flat fist with the index and little fingers straight, the thumb laid over the second segment of the middle finger. This is the HORNS handshape. IROYDS, "whiskey"

k a flat fist with the index and middle fingers straight; the middle finger is slightly folded, so that the thumb, straight and extended at right angles to the palmar plane, can make contact with the second segment. KIWOUD, "perfect"

[kl] a flat hand with the index finger extended in the palmar plane; the middle, ring, and little fingers are straight and extended at right angles to the palmar plane, and the thumb is in contact with the second segment of the middle finger. This is a dialectal variant of /k/ (and "p" in fingerspelling).

l a flat fist, with the index finger straight; the thumb is straight and extended in the palmar plane. LEEDOD, "landlord"

[al] a folded fist, with the index finger straight; the thumb is straight, extended

in the palmar plane. This is a form of /g/, as in S-GIDOL, "all kinds of"

[lh] a flat fist, with the index finger arched, the thumb straight and extended in the palmar plane. This is an anchoring form of /x/ in XETMS, "who". It is a tense form of /l/ in S-LYORA, "large".

M a folded fist with the index, middle, and ring fingers straight, parallel to each other and touching; the thumb is laid over the second segment of the little finger.

MIOODS, "doctor"

[mh] a folded fist with the index, middle, and ring fingers arched, parallel to each other and touching; the thumb is laid over the second segment of the little finger.

This is fingerspelling "m". MYDZWEUS, "Monday"

o a folded hand with the fingers arched, parallel to each other and touching; the thumb is arched and in tip contact with the index finger. OITS, "eat"

[ol] a folded hand with the fingers straight, parallel to each other and touching, the thumb straight and in tip contact with the index finger. OYADS, "money"

or a folded fist with the index finger straight, the thumb straight and in tip contact with the index finger. This is "baby O". ORIADZIS, "write"

q a flat hand with the middle finger arched, remaining fingers straight; the thumb is straight and extended in the palmar plane. This is "open-8". QIPFYS, "feel"

qr a flat hand with the middle finger arched, remaining fingers straight; the thumb is straight, extended at right angles to the palmar plane, and in tip contact with the middle finger. This is the number "8". QRIADZINS, "dry cleaning"

ql a flat hand with the middle finger arched, remaining fingers straight; the thumb is straight, extended at right angles to the palmar plane. This is "open 8", and is used in signs which open from /q/ or close to /q/. QIPIND, "like", S-QIPIN, "interesting"

r a straight fist with the index and middle fingers straight, the middle finger crossed

over the index finger lengthwise, and the thumb laid over the second segment of the ring finger. RIIKXES, "rat"

[rr] a straight fist with the index and middle fingers straight, the middle finger crossed over the index finger lengthwise, and the thumb extended straight in the palmar plane. This is an anchoring form of /r/, as in S-REUP, "retired"

s a fist with the thumb laid over the second segment of the middle finger.

SOEZWEUS, "coffee"

[sl] a folded hand with the fingers arched, parallel to each other and touching, the thumb laid over the first segment of the middle finger. This is "open-s", and occurs as the first shape in sighs which open to /s/. S-SYANS, "many"

t a folded fist with the index finger arched; the thumb is laid over the third segment of the middle finger. TEEAWIAD, "time"

uh a flat fist with the index and middle fingers arched, parallel to each other and touching; the thumb is laid over the second segment of the ring finger. This is a bent-h classifier sign. UHAA-CE-RAD, "get in"

v a flat fist with the index and middle fingers straight and spread; the thumb is laid over the second segment of the ring finger. VIKIG or VIKKIG, "see"

[av] a folded fist with the index and middle fingers straight and spread; the thumb is laid over the second segment of the ring finger. This variant occurs with tip contact (real or virtual), as in VIIG, "look at", VIUT, "stuck"

vh a flat fist with the index and middle fingers arched and spread; the thumb is laid over the second segment of the ring finger. VHOED, "hard"

vl a flat hand with the index, middle, and little fingers straight, the ring finger arched; the thumb is straight, extended at right angles to the palmar plane and in tip contact with the ring finger. This is the number "7". VLID, "#7", VLYD, "seven of them"

vr a flat fist with the index and middle fingers straight and spread; the thumb is straight, extended in the palmar plane. This is the number "3". VREKIAD, "lousy"; VRIAHUID, "run into a wall with a car"

[vrh] a flat fist with the index and middle fingers arched, and spread; the thumb is straight and extended in the palmar plane. This is usually a wiggling state of /vr/, as in VREKL, "insect", but may be independent, as in VRHAIAD, "champ"

w a flat hand with the index, middle, and ring fingers straight and spread; the thumb is laid over the first segment of the little finger. WOEWIAD, "world"

[aw] a folded hand with the index, middle, and ring fingers straight and spread; the thumb is laid over the first segment of the little finger. This variant is used when there is tip pointing, as in SO-WIEDOS, "War"

[wh] a flat hand with the index, middle, and ring fingers arched and spread; the thumb is laid over the first segment of the little finger. This variant is a wiggling state of /w/, as in WEX'EL, "wied"

wr a flat hand with the fingers straight and spread, the thumb tucked into the palm surface. This is the number "4". WRETS, "talk"

[awr] a folded hand with the fingers straight and spread; the thumb is tucked into the palm surface. This variant is used when there is tip pointing, as in SO-WRIEDOS, "war", S-WRYKKL, "flutter eyelashes", etc.

wrh a flat hand with the fingers arched, and spread; the thumb is tucked into the palm surfaces. This variant may be morphologically determined. Compare S-WRHEKK, "stare non-neutrally" with S-WRID, "stare", where the arching of the fingers in the former may be related to the central shape in the elaborated form S-WRIMIND "ooh, take a look at that!"

x a flat fist with the index finger arched; the thumb is laid over the second segment of the middle finger. XIADZAS, "taxes"

xh a flat fist with the index finger arched, the thumb straight, alongside the index finger edge, in tip or pad contact with the index finger tip. This may be a tense form of /or/ ("baby-O"), /a/, /s/, etc., as in [so-xheedru], "change" from SO-AEEDRU; or a form of /x/, as in SI-XIDUS, "manage", where the [xh] variant often appears.

xr a flat fist with the index finger arched, the thumb straight, extended at right angles to the palmar plane. This is "baby-C" in classifier sighs, and an anchoring variant of /x/, as in [xretl], "who", from XETL.

y a flat fist with the little finger straight; the thumb is straight and extended in the palmar plane. YECCRUS, "cow", YEEAD, "that"

yr a flat fist with the index and little fingers straight, the thumb straight and extended in the palmar plane. This is the ILY or "airplane" handshape, as in YRII, "go by plane".

[ayr] a folded fist with the index and little fingers straight and extended at right angles to the palmar plane, and the thumb straight and extended in the palmar plane. This is a phonetic variant of /yr/, as in YRIIS, "airplane"

yl a flat fist with the little finger straight; the thumb is straight and laid alongside the index finger edge of the palmar mass. This is a form of /i/, as in S-YLEDS, "inch" (with uncommon contacting region), and a normal variant of /y/ when contact is not on the thumb.

1.2 Contacting Region Symbols. As can be seen in the examples above, there are several contacting regions on the hand. Contacting region is distinctive, and must be notated for the active hand. Given the active handshape and contacting region, and the contacting region of the base hand, the shape of the base hand can be predicted. Therefore, if there is a base hand, its contacting region must be specified (it is omitted when identical to that of the active hand). Not all

contacting regions appearing in the following inventory are valid for all of the handshapes. Therefore the descriptions will be followed by a chart showing the valid entries.

a palmar surface. BADS, "school". Note that in this system, the sign YEEAD, "that", is notated with knuckle contact /ee/, rather than palm /a/.

aa palm surface of tips. HAAYZIUS, "railroad". Note that /h/ has knuckle contact, as in HEEAZI, "holy".

e radial side of palmar mass. CETHS, "policeman"

ee knuckles of a FIST shape. Called "palm" contact for fist shapes in other notation systems, but because shapes such as /h/ have both knuckles and palm-of-tips contact, I prefer to keep the two separate.

i tips of significant fingers. The exact fingers involved varies from shape to shape. Index in GIP, "I, me"; little finger in IIADZAS, "draw"; middle finger in KIADS, "Presbyterian"

ii radial of tips. Used where a shape also has regular radial contact.

o ulnar side of palmar mass. KOEDS, "careful"

oo heel of palm. COOCS, "cabbage"

u between opposed digits. FUODZIMS, "gravy"

uu between adjacent digits. GIUUZY "appear"

y back of hand. BAAYDS, "warn"

yy elbow. BYY:YRAD, "day" (":" in YY:Y separates YY (elbow) from Y (back); cf.

BY:YY-YDS, a dialectal form of BYY:YADS, "noon"; "-" in the second example separates YY (elbow) from Y (upward path)

(* Chart of valid Handshape/Contacting-Region entries about here *)

1.3 Relationship Between the Hands. When the spatial relation between the hands must be notated for clarity, movement direction symbols are borrowed with the marker -h- preceding.

The movement direction symbol directly represents the direction from the base hand in which the active hand is displaced. The inventory is thus:

ha the active hand is below the base hand

hy the active hand is above the base hand

he the active hand is on the contralateral side of the base hand

ho the active hand is on the ipsilateral side of the base hand, separated more than usual from it

hi the active hand is in front of the base hand

hu the active hand is closer to the body than the base hand

2. The Movement Stem. The stem of the sign comprises the symbol or sequence of symbols representing the movement of the sign, incorporating the place of articulation. There are three basic types of movement symbols:

1. Gross Directional Movement (Path movement)

2. Contact

3. Local Movement

A 3x3x4 grid suffices to specify the greater part of the the signs and inflections in the language.

Note that 2-touch signs within a location are all of a size, and do not normally cross location boundaries.

Level		Contralateral	Midsagittal	Ipsilateral
4	Proximal	temple, brow	top of head, forehead	temple, brow
	Virtual			
	Neutral			
	Distal			
3	Proximal	eye, cheek	nose, whole face	eye, cheek
	Virtual			
	Neutral			
	Distal			

2	Proximal	Shoulder	Mouth, Chin, Throat	Shoulder
	Virtual	The Neutral Space		
	Neutral			
	Distal			
4	Proximal	Abdomen	Chest	Abdomen
	Virtual	Arm		
	Neutral			
	Distal			

2.1 Gross Directional Movements. The following vowel symbols are used to notate the directions of path movement, whether in free space or in brushing or grazing contact movements.

They are analogous to the spatial relation symbols above.

a downward, as in YYA, "now"

y upward, as in GIYJS, "upstairs"

e to the contralateral, as in GIKKEKH, "eyes"

o to the ipsilateral, as in OYOM, "and"

i outward from the signer's body, as in S-QIPI, "tend"

u inward toward the signer's body, as in S-KOEDIRY, "borrow"

Diagonal movements may be written as vectors of 2 orthogonal directions, so that /io/ would be outward and to ipsilateral.

2.2 Contact movements. There are three basic kinds of contacting movement. They are represented along with their places of articulation in consonantal letters. The types are holding contact, shown by stops; brushing (continuous) contact, shown by fricatives; and grazing (released) contact, shown by affricate sequences (stop followed by homologous fricative).

2.2.1 Stop Contact. Stop contact involves hold manner or a static syllabic segment. The contact may be virtual; in other words, the active hand may be making contact with a locus in free space as if there were a body part or other solid object there. The stop symbols are presented in the following tables:

Phonemic Stop Contacts:

	Level	Contralateral	Midsagittal	Ipsilateral
4	Proximal	ch	c	cc
	Virtual		c'	cc'
	Neutral		j	
	Distal			
3	Proximal	kh	k	kk
	Virtual		k'	kk'
	Neutral		g	
	Distal			
2	Proximal	th	t	tt
	Virtual	th'	t'	tt'
	Neutral	dh	d	dd
	Distal	dh'	d'	dd'
4	Proximal	ph	p	pp
	Virtual			
	Neutral	dh	b	
	Distal			

Phonetic Stop Contacts:

	Level	Contralateral	Midsagittal	Ipsilateral
4	Proximal	ch	c	cc
	Virtual	ch'	c'	cc'
	Neutral	jh	j	jj
	Distal	jh'	j'	jj'
3	Proximal	kh	k	kk
	Virtual	kh'	k'	kk'
	Neutral	gh	g	gg
	Distal	gh'	g'	gg'
2	Proximal	th	t	tt
	Virtual	th'	t'	tt'
	Neutral	dh	d	dd
	Distal	dh'	d'	dd'
4	Proximal	ph	p	pp
	Virtual	ph'	p'	pp'
	Neutral	bh	b	bb

	Distal	bh'	b'	bb'
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2.2.2 Brushing contact. Brushing contact involves continuous contact while making gross path movement. This movement is made within one phonemic location. Brushing contact movements are represented by a fricative consonant letter (or letter sequence) folowed by a directional vowel, as in BEFA, "relieved". The following tables illustrate the notation of brushing contact:

Phonemic Brushing Contacts:

	Level	Contralateral	Midsagittal	Ipsilateral
4	Proximal		s:	ss:
	Virtual		s:'	ss:'
	Neutral		z:	
	Distal			
3	Proximal	xh	x	xx
	Virtual		x'	xx'
	Neutral		g:	
	Distal			
2	Proximal	sh	s	ss
	Virtual	sh'	s'	ss'
	Neutral	zh	z	zz
	Distal	zh'	z'	zz'
4	Proximal	fh	f	ff
	Virtual			
	Neutral	vh	v	
	Distal			

Phonetic Brushing Contacts:

	Level	Contralateral	Midsagittal	Ipsilateral
4	Proximal	s:h	s:	ss:
	Virtual	s:h'	s:'	ss:'
	Neutral	z:h	z:	zz:
	Distal	z:h'	z:'	zz':
3	Proximal	xh	x	xx
	Virtual	xh'	x'	xx'
	Neutral	g:h	g:	gg:
	Distal	g:h'	g:'	gg:'
2	Proximal	sh	s	ss
	Virtual	sh'	s'	ss'

4	Neutral	zh	z	zz
	Distal	zh'	z'	zz'
	Proximal	fh	f	ff
	Virtual	fh'	f'	ff'
	Neutral	vh	v	vv
	Distal	vh'	v'	vv'

2.2.3 Grazing Contact. Grazing contact involves a sequence of brushing contact followed by free path movement away from contact. This almost always stems from a sequence of stop contact followed by path movement, as can be seen in inflectional paradigms. The grazing symbols are represented by combining the symbol for a stop with the homologous brushing contact plus a directional vowel.

3. Local Movements. Hand-internal or "local" movements are various types of movements which can occur simultaneously with directional and contact movements. These include the following inventory:

l wiggling the fingers sequentially, as in BLETL, "mother"

lh wiggling the fingers in unison, as in BYTLH, "pig"

m closing handshape, as in SOYDZIM, "all gone". See below for handshape sequence predictability in closing.

m' closing handshape by rubbing thumb on fingers, as in OIHYZIM, "sow seeds"

n open handshape, as in QINTS, "electric light"

n' open handshape while thumb maintains contact with fingers, as in WRYZON, "few"

r twist of wrist (axial revolution); followed by directional vowel (direction palm ends up facing): BLORI, "finish"

rh nodding from wrist (radial revolution); followed by directional vowel (direction palm ends up facing): SEERHAS, "yes"

w hovering movement (circling in or above a plane tangential to the plane of

articulation); followed by vowels describing the first two quarter-circle tangents, as in BAFWEA, "please"

wh orbiting (circling in a chordal plane), as in GIIWHIA, "about"

wr full-circle radial revolution, with concomitant axial revolution, as in GEEAWRIA, "hour"

wrh full-circle radial revolution with concomitant axial revolution, involving orbiting as well, as in BYAWRHIAD, "all"

4. Combinations of Movements. Combinations of movements are represented sequentially as follows:

a. /Stop + Vowel/ represents contact then movement away from the point of contact with no frication. CICIG, "cent"

b. Local movements follow stops and vowels if they occur simultaneously with them. SOFAM, "restrain feelings", GITRU, "bitter"

c. Non-simultaneous directions, etc., are represented by separating symbols with a hyphen, as in BO-O-AD, "never".

5. Opening and Closing Conventions. The opening and closing conventions consist of statements of the following types: (1) those where the written handshape is the beginning handshape and the opening or closing changes it TO some other predictable handshape ("X opens to Y", "X closes to Y"); and (2) those where the written handshape is the ending handshape and the opening or closing forms it from some other predictable shape ("X opens from Y", "X closes from Y").

5.1 Conventions with /m/ and /n/

/b/ closes to /ab/ S-BAYDM, "hypocrite"

/bl/ closes to /blh/ BLYZUM, "want"

/c/ closes to /s/ CETAM, "old"

/d/ closes to /o/ DOODM, "do"

/g/ closes to /x/ GIIM, "ask a question"

/l/ closes to #21 LEEDM, "twenty-one"

/v/ closes to /vh/ VEEK'M, "doubt"

/a/ opens to /bl/ S-AYHUZIN, "cause"

/o/ opens to /bl/ S-OIDION, "clear"

/or/ opens to /l/ OREKKN, "wake up"

/s/ opens to /bl/ SIAND, "drop"

/vh/ opens to /v/ VHIADYN, "jump up"

/a/ closes from /b/ AAATSOM, "better"

/o/ closes from /bl/ OOCM, "boy"

/or/ closes from /l/ ORETM, "bird"

/s/ closes from /bl/ SOYTSIM, "all gone"

/y/ closes from /b/ YAACAM, "why"

/ar/ opens from /xh/ AROAND, "quick"

/c/ opens from /s/ CEKKN, "shock"

/g/ opens from /s/ GEEKN, GEEKKN, "understand"

/k/ opens from /o/ KIIN, "okay"

/v/ opens from /s/ VIK'N-SY

5.2 Conventions with /m'/ and /n'/

/k/ closes to /gr/ KYDN', "dog"

/o/ closes to /a/ S-OIDOM', "disappear"

/o/ opens to /wr/ OYZON', "few"

5.3 Long Local Movements. When local movements repeat without the rest of the stem

repeating as a unit, the local movement is written double (those with -h- repeat only the first letter).

5.4 Reduplication. Simple reduplication is marked as follows:

-s This ending marks unstressed reduplication (nouns, etc.)

-sh This is tense or marked reduplication (continuative, etc.)

-z This is fast reduplication (incessant, etc.)

Reduplication within a sweep, as in the exhaustive, is represented by the reduplication letter(s) as above, followed by a directional vowel, as in the pair FIIS ("preach") and FIISO ("preach to each of them"). These inflections may be nested, as represented in FIIZ-SO, "preach incessantly (feverishly) at each place".

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