Yeadon Measurements

For use with the yeadon python module by C. Dembia (fitze)

Key:

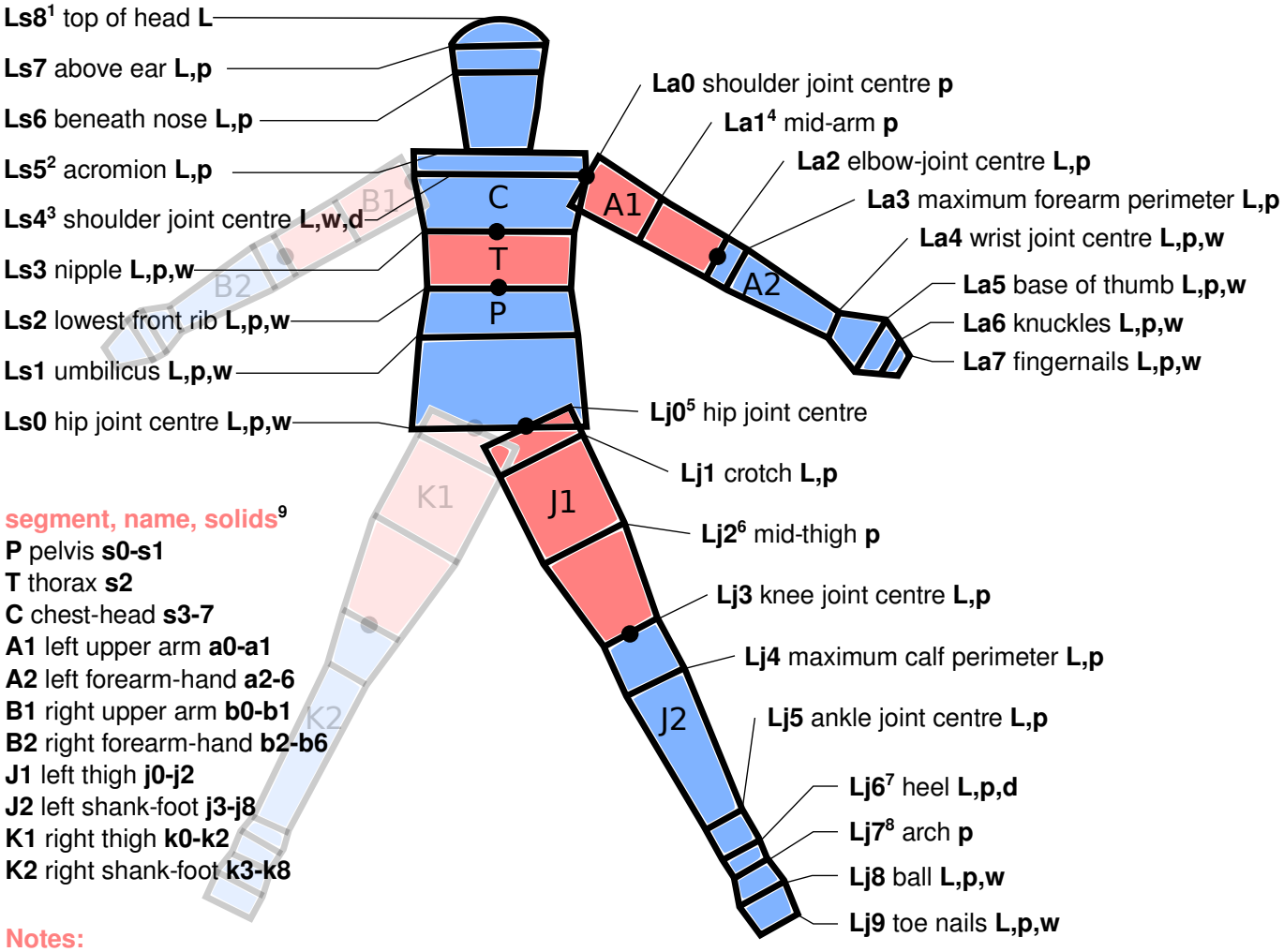
● denotes a joint centre
L (on the left) denotes a level at which a stadium solid or circle is defined (except for **Ls8**)
L (on the right) denotes a length measurement
  Ls1L-Ls5L measured from **Ls0; Ls6L-Ls8L** measured from **Ls5L**
  La2L-La4L measured from **La0; La5L-La7L** measured from **La4L** (some for **b**)
  Lj1L,Lj3-5L measured from **Lj0; Lj6L,Lj8L-Lj9L** measured from **Lj5L** (same for **k**)
p denotes a perimeter measurement, must have 2w < p < pi*w
w denotes a width (medio-lateral, or side to side) measurement
d denotes a depth (anterior-posterior, or front to back) measurement

level, name, measurements needed

Ls8[1] top of head **L**
Ls7 above ear **L,p**
Ls6 beneath nose **L,p**
Ls5[2] acromion **L,p**
Ls4[3] shoulder joint centre **L,w,d**
Ls3 nipple **L,p,w**
Ls2 lowest front rib **L,p,w**
Ls1 umbilicus **L,p,w**
Ls0 hip joint centre **L,p,w**

La0 shoulder joint centre **p**
La1[4] mid-arm **p**
La2 elbow-joint centre **L,p**
La3 maximum forearm perimeter **L,p**
La4 wrist joint centre **L,p,w**
La5 base of thumb **L,p,w**
La6 knuckles **L,p,w**
La7 fingernails **L,p,w**

Lj0[5] hip joint centre
Lj1 crotch **L,p**
Lj2[6] mid-thigh **p**
Lj3 knee joint centre **L,p**
Lj4 maximum calf perimeter **L,p**
Lj5 ankle joint centre **L,p**
Lj6[7] heel **L,p,d**
Lj7[8] arch **p**
Lj8 ball **L,p,w**
Lj9 toe nails **L,p,w**



segment, name, solids[9]

P pelvis **s0-s1**
T thorax **s2**
C chest-head **s3-7**
A1 left upper arm **a0-a1**
A2 left forearm-hand **a2-6**
B1 right upper arm **b0-b1**
B2 right forearm-hand **b2-b6**
J1 left thigh **j0-j2**
J2 left shank-foot **j3-j8**
K1 right thigh **k0-k2**
K2 right shank-foot **k3-k8**

Notes:

Total mass can be measured and provided to "correct" the densities used.
1 s0 is the only semi-ellipsoidal solid (with circular cross section)
2 two stadia at this level, one for s4 and one for s5. s4 stadium's parameters are calculated from Ls4's stadium. Ls5 perimeter measured around neck
3 depth is measured in lieu of perimeter since arms interfere
4 La1L is set as half of La2L
5 stadium (circle) parameter calculated from Ls0's stadium
6 Lj2L is set as the average of Lj1L and Lj3L
7 Lj6's (and Lk6's) stadia are the only stadium oriented anterior-posteriorly
8 Lj7L is set as the average of Lj6L and Lj8L
9 Yeadon's 1990 paper indexes the solids from 1, while this formulations indexes from 0

Yeadon, M. R. (1990c). The simulation of aerial movement-ii. a mathematical inertia model of the human body. Journal of Biomechanics, 23:67–74.