

COMP BOOK

Leg Volumes - TLC
11 May 1993 - Chair -

80 SHEETS • 10 x 7⁷/₈ • COLLEGE & MARGIN • 43-461

 **National®**
Made in USA

DENNISON STATIONERY PRODUCTS CO.
FRAMINGHAM, MA 01701-0344



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①

Rec Data Name: Troy *Beta*
Kein Sex: M
Erik Weight: 5'8
Jason Height: 189.5

5/10/93/10/93

chain: Seat 44cm
Height 47.5cm

sitting			Lying down start			Lying down (30 min)		
	R	L						
C1	17.4 17.5	17.45	16.9 17.2 17.05	16.2 16.25	16.2	16.3 16.35	16.95 16.9	16.35 16.3
C2	22.25 21.9	22.15	22.2 22.9 22.55	21.6 21.25	21.4	22.25 22.2 22.3	21.1 21.2 21.	22.05 21.9 22.2
C3	31.75 31.9	31.85	32.2 32.4 32.3	31.9 31.5	31.7	31.2 31.3 31.1	32.25 32. 32.5	32.15 32.4 31.9
C4	28.2 27.9	28.1	28.1 27.9 28.0	29.1 28.7	28.9	28.5 28.8 28.2	28.7 28.7 28.7	28.05 28.2 27.9
C5	36.3 36.2	36.25	36.2 36.2 36.2	35.8 35.7	35.75	34.15 34.2 34.1	35.0 34.9 35.1	34 34 34
C6	40.8 40.85	40.825	39.9 39.8 39.85	40.1 38.9	39.5	38.35 38.4 38.3	39.7 39.35 40.1	38.65 38.4 38.9
C7	48 47.55	47.75	45.8 46. 45.9	45.6 45.9	45.75	45.75 45.8 45.6	46.15 46.3 46.0	45.95 45.8 46.1
C8	52 51.6	51.8	50.45 50.6 50.5	49.9 49.9	49.9	50.2 50.3 50.1	49.0 49.2 48.8	49.85 49.4 50.3
			L	8.5	7.15	R	7.175	7.475
				11.35			11.825	7.375
				9.25			11.1	6.
				10.95			12.2	
				8.625			8.125	
				7.85				

Jason Dehl
M
Height: 170
Troy

Chair sp.

(2)

5/10/93

Lying down (60 min)				Sitting up			
	R	L		R	L		
C1	16.4 16.7 16.9 16.5 16.2	16.35 16.5 16.2		17.1 17.0 16.9	17.2 17.1		
C2	22.1 23.1 22.4 21.9 22.2	21.6 21.6 22.2		22.3 22.1 21.9	22.1 21.95		
C3	32.35 32.5 32.2	31.4 31.4 31.4		31.9 31.95 32.0	32.2 32.1		
C4	29.15 28.9 29.4	28.15 28.2 28.1		27.9 27.9 27.9	27. 27.0		
C5	35.15 35.1 35.2	34.3 34.3 34.3		35.2 35.1 35.0	34.9 34.7		
C6	39.4 40 39.8	38.2 38.1 38.3		38.3 38.45 38.6	38.9 39.0 39.1		
C7	46.1 46.15 46.1	45.1 45.3 44.9		47.0 46.85 46.7	46.7 46.5 46.3		
C8	49.3 49.2 49.4	48.85 48.9 48.8		50.2 50.2 50.2	51.8 52.45 52.5		

Calc

Jason Dahl
M

CHAIR Exp.

(2)

5

Weight: 170

Height: 5'11" Sitting

Lying down (initial)

Lying (30 min)

		(L)		(R)		(L)		(R)	
C1	16.2	15.7	15.2	15.1	C1	14.8	14.5	14.5	14.3
	15.7	15.1	15.1	15.0		14.8	14.5	14.3	14.3
C2	23.8	23.8	21.8	22.4	C2	21.9	21.9	22.3	21.7
	23.8	21.4	21.4	22.1		21.8	22.0	21.7	21.7
C3	31.2	30.3	30.3	31.4	C3	30.9	31.2	31.0	30.6
	31.5	30.5	30.5	32.1		30.8	31.3	30.6	30.6
C4	26.5	26.2	26.2	29.3	C4	29.2	29	28.5	28.3
	26.5	26.9	26.9	29.4		29.2	29.3	28.3	28.3
C5	34.4	35.8	35.8	34.0	C5	36.6	35.5	36.2	36.0
	34.5	35.8	35.8	34.1		36.8	35.0	36.0	36.0
C6	42.0	44.5	44.5	40.3	C6	42.5	41.0	43.7	43.2
	41.9	44.5	44.5	40.8		42.4	40.5	43.2	43.2
C7	50.5	50.5	50.5	48.4	C7	47.5	47.2	47.0	47.2
	50.3	50.5	50.5	48.6		48.1	47.8	47.2	47.2
C8	52.4	54.2	54.2	50.8	C8	51.0	51	51.3	51.1
	53	54.0	54.0	50.6		49.9	51.2	51.1	51.1

		(L)		(R)	
H0				GIRTHS	
H1	10.2	10.15	10.4	10.5	C1 16.8 16.6
H2	10.3	10.35	10.7	10.7	C2 20.6 20.7
H3	11.25	11.2	10.8	10.9	C3 30.2 30.6
H4	12.2	12.1	10.3	10.4	C4 26.8 26.5
H5	8	8	8.2	8.25	C5 34.4 34.2
H6	8.9	8.8	10.5	10.6	C6 42.5 42.4
H7	8.1	8.15	9.6	9.6	C7 49.2 48.9
					C8 52.7 52.7

		(L)	
C1	16.8	16.7	
C2	21.3	21.4	
C3	31	31.7	
C4	27.2	27.2	
C5	33.7	33.7	
C6	40.5	40	
C7	49.35	49.1	
C8	57.2	53.8	

Lying down (60) + Immediate
Sitting Vp

	Ⓢ	Ⓢ	Ⓢ	Ⓢ
c1	14.2 14.3	C ₁ 14.1 14.3	15.5 15.5	15.2 15.0
c2	21.3 21.4	C ₂ 22.0 22.1	22.4 22.4 22.4	21.3 21.4
c3	30.8 31.2	C ₃ 30.9 31.0	31.5 31.2	30.3 30.2
c4	28.0 28.9	C ₄ 28.4 27.9	27.3 27.1	26.2 26.2
c5	35.3 35.3	C ₅ 36.0 36.1	33.5 33.7	35.5 35.6
c6	40.8 40.5	C ₆ 44.2 44.0	40.7 40.9	43.4 42.7
c7	48.3 48.0	C ₇ 47.0 46.8	49.2 49.1	50.5 50.0
c8	50.5 51.3	C ₈ 51.0 50.6	51.8 52.0	53.5 53.8

5/11/93

Rec Date: (R) Name: (L) Steve
 Ankle H⁰ ~~8.0~~ Sex: M

H ¹	10.3	10.4	10.4	10.5
H ²	10.4	10.4	9.6	9.7
H ³	10.9	11.0	9.4	9.4
H ⁴	12.2	12.2	10.2	10.1
H ⁵	8.0	8.0	7.8	7.9
H ⁶	9.0	8.9	10.4	10.4
H ⁷	8.0	8.3	10.2	10.2

C1 29.6 29.6 30.5 29.5

C2 29.9 29.5 29.6 30

C3 53.1 53.1 54.8 55.0

C² 49.1 49.0 48.4 48.7

C⁰ 42.9 42.6 41.1 40.8

C⁵ 34.8 34.7 32.4 33.0

C⁴ 26.1 26.3 27.0 27.0

C³ 30.4 30.4 30.7 30.7

C² 20.8 21.0 21.1 21.3

C¹ 15.8 16.1 16.6 16.8

C⁷ 54.4 54.4 56.1 53.0

C⁶ 53.6 54.6 51.4 52.8

C⁵ 55.0 55.0 53.2 53.4

C⁴ 55.1 54.9 53.1 53.4

Initial	①	②	lying (80 min)
28.1	28.6	28.9	28.9
28.1	28.8	28.9	28.9
29.5	30.1	29.8	29.8
29.6	30	29.7	29.7
54.8	54.9	54.9	54.9
55.0	55.0	55.0	55.0
48.4	48.7	48.7	48.7
41.1	40.8	40.8	40.8
32.4	33.0	33.0	33.0
27.0	27.0	27.0	27.0
30.7	30.7	30.7	30.7
21.1	21.3	21.3	21.3
16.6	16.8	16.8	16.8
53.0	52.8	52.8	52.8
52.8	52.7	52.7	52.7
53.4	53.5	53.5	53.5
53.4	53.6	53.6	53.6

X 48.6 48.6

Rec. Data
Tony Clapp
Kevin G.

Name: Steve
Sex: M

5/11/93

sitting	①	② Lying Initial	③	④ Lying (30 min)	⑤
c1 24.0	24.0	23.6	1	23.1	23.6
24.0	24.0	23.7		23.1	23.8
c2 29.6	29.6	30.3	2	29.5	30.1
29.8	29.5	30.2		29.6	30
c3 39.2	38.8	39.1	3	38.3	39.9
39.1	38.7	39.3		38.2	39.7
c4 35.1	34.8	36.1	4	35.7	35.7
35.2	34.7	36.0		35.6	35.9
c5 40.9	41.1	41.1	5	41.6	41.1
41.1	41.0	41.3		41.4	41.2
c6 46.5	48.2	45.8	6	45.8	44.6
46.6	48.8	45.6		45.9	46.1
c7 54.1	54.4	51.1	7	53.0	52.8
53.6	54.6	51.4		52.8	52.7
c8 55.0	55.0	53.2	8	53.4	53.5
55.1	54.9	53.1		53.4	53.6

no height data
Previous page?

Steve Wasmund

5/11/93

5'11"

175

Lying (60 min)			Sitting (Post)	
	3 (B)	6 (C)	6 (C)	1 (D)
C1	28.8 23.6	28.7 22.9 22.9	24.0 23.9	25.5 23.6
C2	29.8 29.5	29.5 28.6 28.9	30.0 29.8	28.0 28.1
C3	39.6 39.6	39.5 39.4	38.6 38.6	38.0 37.7
C4	35.2 35.5	35.5 35.6	34.4 34.6	34.0 34.1
C5	40.5 40.4	42.0 42.2	40.0 40.0	40.0 40.1
C6	45.2 45.1	45.1 45.1	47.1 46.9	48.7 48.9
C7	51.9 52.1	53.0 52.8	53.6 53.7	55.1 55.0
C8	53.6 53.2	53.5 53.3	55.5 55.3	55.7 55.8

4

Standing

Immediate Sit

	R	L
C8	58, 54.5	58, 58
C7	55, 55.4	53.5, 53.5
C6	46, 46	44, 44
C5	37.2, 37.2	34.5, 34.5
C4	32.2, 32.7	30, 36.5
C3	26.5, 26.5	35.3, 35.4
C2	21.8, 22.1	21.5, 21.4
C1	23.2, 23.2	22.6, 22.6

	R	L
C8	59.5, 59.2	59, 59.4
C7	56.7, 56.6	54.5, 54.7
C6	49, 48.8	47.0, 46.8
C5	40.5, 40.7	39.5, 39.3
C4	38.7, 38.7	37, 37
C3	32.5, 32.5	36.2, 36.2
C2	29.2, 29	29.1, 27.8
C1	23.5, 23.4	23, 23.1

height
20
2

Immediate drop (71A)

Immediate drop + 10p up

	R	L
8	57.5, 57.8	57.8, 57.8
7	50.5, 50.5	55, 55
6	47.2, 47.2	42.2, 46.5
5	40.3, 40.6	39, 39.1
4	32.4, 32.4	32, 32.97
3	38.3, 38.5	34.5, 36.5
2	28.1, 28.1	24.4, 24.4
C1	23.2, 23.2	22.9, 22.8

	R	L
8	57.5, 57.8	56.5, 56.7
7	56, 56.2	56.1, 56.6
6	47.8, 47.8	46.8, 46.5
5	40.5, 40.5	40, 40
4	38.5, 38.5	38, 39.7
3	37.5, 37.5	36.6, 36.6
2	29, 29.0	27.7, 27.6
C1	23.4, 23.2	23, 23.4

Immediate drop (71A)

(30 min)

	R	L
C8	58.7, 58.4	57.5, 57.8
C7	55.5, 54.8	53.3, 53.5
C6	47.5, 46.9	45.5, 45.7
C5	40.7, 40.4	38.4, 39.3
C4	40, 40	38.2, 38
C3	38.1, 38	37, 36.7
C2	28.5, 28.3	27.8, 27.7
C1	23.2, 23.2	22.7, 22.4

	R	L
C8	58.5, 58.3	57, 57.2
C7	55.2, 55.5	53.5, 53.3
C6	47.1, 46.8	45.5, 45.2
C5	40.5, 40.4	38.7, 38.8
C4	39.8, 39.5	37.7, 37.3
C3	38.2, 38.3	36.5, 36.4
C2	28.6, 28.6	27.5, 27.2
C1	22.8, 22.8	22.8, 22.5

4

STANDING	
R	L
C8 58, 58.5	58, 58
C7 55.5, 55.5	53.5, 53.5
C6 46, 46	44, 44
C5 39.2, 39.2	38.5, 38.8
C4 37.6, 37.7	36, 36.5
C3 36.5 36.5	35.3 35.4
C2 28.8 28.7	28.5 28
C1 23.0 23.2	22.6, 22.6

immediate Sit	
R	L
59.5, 59.2	59 , 59.4
56.7, 56.6	54.5, 54.7
49, 48.8	47.0 , 46.8
40.5 40.7	39.5 39.5
38.8 38.8	37 37
37.5 37.5	36.2 36.2
28.2 28	28.1 27.8
23.3 23.4	23 23.1

No height given

immediate drop (Tilt)

R	L
C8 58, 57.8	57.8 57.5
7 56.5 56.5	55 55
6 47.1 47.2	46.2 46.3
5 40.3, 40.6	39, 39.1
4 40, 39.8	38, 37.9, 37.9
3 38.3, 38.5	36.5 36.5, 36.5
2 28.7, 28.5	28.4, 28.3
C1 23.2 23.0	22.9, 22.8

immediate tip-up

R	L
59.5 59.8	59.5 59.7
56, 56.2	56.1 56.1 56.6
47.8, 47.8	46.8 46.5
40.5 40.5	40 40
39.5 39.5	39 39.2
37 37.5	36.6 36.6
29 28.6	27.7 27.6
23.4 23.2	23 23.4

Actual test

immediate drop (Tilt)

R	L
C8 58.7 58.4	57.5 57.8
7 55.9 54.8	53.3, 53.5
6 47.6, 46.8	45.5, 45.7
5 40.7, 40.9	38.4 38.3, 38.5
4 40 40	38.2 38
3 38.1 38	37 36.7, 36.85
2 28.5, 28.3	27.8, 27.7
C1 23 23.2	22.7 22.4

(30 min.)

R	L
58.5 58.3	57 57.3
55.2 55.5	53.5 53.3
47.6, 46.8	45.5 45.2
40.5, 40.4	38.7, 38.8
39.8, 39.5	37.7, 37.3
38.2, 38.3	36.5, 36.6
28.6 28.6	27.5, 27.3
22.8 22.8	22.8 22.5

(Comin)

Immediate sit up

	R		L	
C ₈	57.8	57.6	58	58.2
7	55.4	55.6	53.6	53.9
6	47.4 ¹⁵	47.5	46.5	46.2
5	40.5	40.3	40.5	38.2 ³⁴
4	39.7 ¹⁵	39.8	38.2	38.4 ³
3	37.5 ³⁵	37.2	36.5	36, 36.2
2	28.4	28.5	28	28.2 28
C ₁	23	22.8	22.4	22.5

	R		L	
C ₈	59.3	59	58.3	58.6
	56.8	56.8	55.5	55.5
	47.5	47.3	46.2	46
	39.5	39.3	39.8	39.9
	39.4	39.1	37	37.2
	37	37.3	35.8	35.5
	28	27.8	27.8	27.9
C ₁	22.8	23	22.8	23

Immediate sit

	R		L	
C ₈	60.6	60.4	60.5	60.4
	58.3	58.5	58.3	58.4
	49.8	49.7	50	50.2
	45	44.8	44	44.3
	36.3	36.4	34.8	35.2
	36.2	36.4	37.2	37
	27.3	27.5	27.8	27.7
C ₁	22.7	22.8	22.4	22.2

	8.5	8.4	8.45
	8.2	8.1	8.15
	8	8	8
	11.4	11.6	11.5
	11.3	11.3	11.3
	10.7	10.8	10.75
	11.1	11.2	11.15

Immediate sit Tilt

	R		L	
C ₈	58.8	58	58.2	58
7	56	56.2	54.8	54.4
6	47.6	47.4	47.6	47
5	45.4	45.1	44.2	43.9
4	36.4	36.5	36.3	36.3
3	37.5	37.2	36.8	36.9
2	26.8	26.9	27.6	27.7
1	22.5	22.8	21.9	22.4

	R		L	
C ₈	58.5	58.6	58.2	58.2
7	56.5	56.3	54.2	54
6	50.1	49.8	49.1	49.3
5	40.2	44	43.3	43.4
4	36.1	36.3	36.3	36.2
3	36.6	36.2	36.6	36.3
2	26.9	26.6	27.2	27
1	21.5	21.8	21.6	21.7

Subj, 5

(RT) 21

Free
standing

	R	L
C ₈ 59, 58.8	57.2, 57.4	
C ₇ 55, 55.1	54.2, 54.2	
C ₆ 49.5, 49.7	49.1, 49.2	
C ₅ 41.8, 41.6	42.7, 42.5	
C ₄ 35, 35.1	34.6, 34.5	
C ₃ 36.2, 36	36.4, 36.4	
C ₂ 26.9, 27.1	27.6, 27.5	
C ₁ 22.7, 22.5	22.4, 22.5	

immediate sit

	R	L
C ₈ 60.6, 60.4	60.5, 60.4	
56.3, 56.5	54.3, 54.9	
49.8, 49.7	50, 50.2	
45, 44.8	44, 44.3	
36.3, 36.4	34.8, 35.2	
36.2, 36.4	37.2, 37	
27.3, 27.5	27.8, 27.7	
C ₁ 22.7, 22.8	22.4, 22.2	

immediate sit Tilt

	R	L
C ₈ 58.8, 59	58.9, 59	
7 56, 56.2	54.6, 54.4	
6 47.6, 47.4	47.8, 47	
5 45.4, 45.1	44.2, 43.9	
4 36.6, 36.5	36.3, 36.15	
3 37.5, 37.2	36.8, 36.9	
2 26.8, 26.9	27.6, 27.7	
1 22.19, 21.8	21.8, 21.8	

Height

h ₇	8, 8
h ₆	7.45, 7.4, 7.5
h ₅	8, 8, 8
h ₄	12.6, 12.4, 12.6
h ₃	10.7, 10.8, 10.6
h ₂	10.8, 10.8, 10.8
h ₁	11.25, 11.2, 11.3

(2T)

h ₇	8.5, 8.4, 8.45
h ₆	8.2 , 8.1, 8.15
h ₅	8 , 8, 8
h ₄	11.4 , 11.6, 11.5
h ₃	11.3, 11.3, 11.3
h ₂	10.7, 10.8, 10.75
h ₁	11.1, 11.2, 11.15

(30 min sit) Tilt

	R	L
C ₈ 59.4, 59.6	59.8, 59.6	
7 56.5, 56.3	54.2, 54.1	
6 50.1, 49.8	49.1, 49.3	
5 44.2, 44	43.3, 43.4	
4 36.1, 36.3	36.3, 36.4, 35	
3 36.6, 36.2	36.6, 36.3, 36.45	
2 26.9, 26.6	27.2, 27, 27.1	
1 21.5, 21.8	21.6, 21.7	

2 ✓
Gomin Tilt

	A	L
C4	59.9, 60	59.8 59.5
7	55.5 55.6	53.9 54
6	49.7 49.5	49.8 49.6
5	45, 45.4	43.8 44.1
4	36.8 ⁶ 36.4	35.4 ⁴⁵ 35.5
3	36.3 ⁷⁵ 36.2	36.2 36 ⁶¹
2	26.3 26.2	26.8 26.9 ⁴⁵
C1	21.5 21.4	21.5 21.7

23
sit Post
immediate tip-up

	R	L
C8	60.5 60.8	59 59.2
	56 56.2	55.2 54.8
	48.4 48.8	48.4 49.5 ^{49.5} 49.8
	43.3 44.1	44.2 44.6
	35.9 35.7	35.4 35.6
	36 36.1	36.4 36.4
	26.5 26.8	27.3 27.1
9	22.4 22.4	22.2 22.2

(6)

25

12 May Chair Tilt Mark Salber 170# 6'0"

Heights-stand

	R	L		R	L
h ₃₁	11.1, 11.2	11.3, 11.3	C ₈	52.6, 52.7	52.3, 52.2
h ₃₂	12.1, 12.1	12.3, 12.4	T	52.2, 52.3	52.7, 53.8
h ₃₃	12.0, 12.1	12.6, 12.6	G	44.1, 44.2	44.6, 43.9
h ₄	59, 69	70, 70	B	37.2, 37.2	38.1, 38.3
h ₅	76, 7.7	8.2, 8.3	-4	34.9, 34.9	34.5, 34.7
h ₆	99, 8.7	7.9, 7.9	-3	32.8, 32.7	32.5, 32.4
h ₇	72, 72	7.9, 7.9	-2	28.1, 28.3	17.6, 27.5
			-1	24.2, 24.4	22.9, 23.0

Revised H - 5.9

co-rected

Revised R, 34.5, 34.6 33.9, 33.9

7165 Data-Printer

C₃

C₂

C₁

T, Head Rights

	R	L
h ₁	10.1, 11.1	10.9, 11.0
h ₂	12.0, 12.0	12.2, 12.3
h ₃	14.1, 14.1	14.6, 14.8
h ₄		
h ₅	9.9, 9.9	10.3, 10.2
h ₆	7.8, 9.0	8.1, 8.1
h ₇	2.9, 3.0	7.6, 7.7
h ₈	9.5, 9.4	9.0, 9.0

	R	L	
h ₁	12.7, 12.2	11.9, 12.3	12.1
h ₂	17.2, 12.2	10.4, 12.4	10.3 10.38
h ₃	9.7, 9.6	8.9, 8.9	8.9
h ₄	13.4	11.9	11.9
h ₅	10.6, 9.6	10.2, 10.3	10.25
h ₆	7.0, 9.0	8.2, 1.2	8.2
h ₇	7.3, 7.4	7.5, 7.5	7.5

(6)

27

12 May Chair Tilt Mark Sather 170# 6'0"

Heights - Stand

	R	L
h ₁	11.3, 11.2	11.3, 11.3
h ₂	12.1, 12.1	12.3, 12.4
h ₃	13.0, 12.9	12.6, 12.6
h ₄	6.9, 6.9	7.0, 7.0
h ₅	7.6, 7.7	8.2, 8.3
h ₆	8.9, 8.9	7.9, 7.9
h ₇	7.8, 7.8	7.9, 7.9

Stand

	R	L
C ₈	58.6, 58.7	58.3, 58.2
T	55.2, 55.3	53.7, 53.8
6	46.1, 46.2	44.5, 43.9
5	39.2, 37.2	38.2, 38.3
- 4	34.9, 34.9	34.8, 34.7
- 3	37.8, 37.7	37.5, 37.6
- 2	28.4, 28.3	27.6, 27.5
- 1	24.2, 24.4	22.9, 23.0
corrected	C ₄ 34.5, 34.6	33.9, 33.9

Repeat H - 5.4

71.65 Baro. Pressure

Rechecking

	R	L
heights h ₁	11.1	10.9, 11.0
h ₂	12.0, 12.0	12.2, 12.3
h ₃	14.1, 14.1	15.0, 14.8
h ₄		
h ₅	9.9, 9.9	10.5, 10.2
h ₆	9.0, 9.0	8.1, 8.1
h ₇	7.5, 7.6	7.6, 7.6
corrected h ₃	9.5, 9.4	9.0, 9.0

Skin stretched in chair

Tilted Heights

	R L	L L
h ₁	12.3, 12.2	11.9, 12.3
h ₂	12.2, 12.2	10.4, 12.4
h ₃	9.7, 9.6	8.9, 8.9
h ₄	12.4	11.9
h ₅	9.6, 9.6	10.2, 10.3
h ₆	9.0, 9.0	8.2, 8.2
h ₇	7.3, 7.4	7.5, 7.5

MARK - Dr. ~~Thompson~~ - measure

Clay - record

Upright - chair - start

Tilted - Immediately

	RL	LL		RL	LL
C8	58.0, 57.9	58.1, 58.5	C8	55.8, 58.8	54.9, 54.7
C7	53.6, 53.7	53.7, 53.4	C7	53.2, 53.0	52.5, 52.5
C6	46.3, 4	46.7, 40.7	C6	46.2, 46.3	45.0, 44.7
C5	39.3, 39.4	39.1, 39.1	C5	39.3, 39.4	39.4, 39.5
C4	35.7, 35.8	35.9, 35.8	C4	35.9, 35.8	35.9, 36.0
C3	39.0, 39.1	39.0, 39.1	C3	39.0, 39.1	38.8, 38.4
C2	27.9, 27.8	27.9, 27.8	C2	27.9, 27.8	29.2, 29.0
C1	22.8, 22.1	22.8, 22.1	C1	22.8, 22.1	22.2, 22.0

Tilted - 30 min

Tilted 60 min

	RL	LL		RL	LL
C8	55.10, 55.4	55.0, 55.1		55.2, 55.3	54.7, 54.6
C7	53.3, 53.2	52.1, 52.0, 51.1		54.3, 54.3	51.6, 51.7
C6	46.5, 46.4	44.8, 44.6		46.6, 46.7	45.5, 44.7, 44.5
C5	39.1, 39.2	39.6, 39.8		39.3, 39.3	38.8, 38.6
C4	35.7, 35.6	36.5, 36.3		35.3, 35.5	35.9, 35.5, 35.9
C3	39.7, 39.8	38.9, 38.4		39.3, 39.2	38.8, 38.6
C2	27.5, 27.2	28.4, 28.1		27.8, 27.6	30.1, 28.4, 29.0
C1	23.0, 23.0	22.0, 21.8		22.8, 23.0	22.2, 22.2

Upright Post

C8
C7
C6
C5
C4
C3
C2
C1

7

Dave

Tilt - Immediate

	Heights		Chair	
	RL	LL	RL	LL
Top	^{7.8} h ₇ 7.8, 8.85	8.2, 8.1 8.15 C 8	64.01, 64.6	60.8, 60.7
Down	^{8.65} h ₆ 8.5, 8.8	9.4, 9.4 9.4 C 7	60.1, 60.05	58.5, 58.5
	^{10.55} h ₅ 10.6, 10.5	10.7, 10.7 10.7 C 6	55.5, 55.6	52.8, 52.8
	^{15.1} h ₄ 16.85 , 15.1	15.1 15.1 C 5	47.8, 47.55	46.1, 46.0
	^{10.05} h ₃ 7.35, 7.4	10.1, 10.0	39.5, 39.6	37.8, 37.6
	^{11.3} h ₂ 11.7, 11.8	11.3, 11.3	<u>41.8, 41.7</u>	39.1, 38.8
	^{12.85} h ₁ 11.8, 11.9	12.8, 12.85	C 2) 30.1, 30.7	29.4, 29.15
			C 1) 23.8, 23.9	23.8, 23.9

Tilt - 30 min

Tilt - 60 min Chair

	Chair		Chair	
	RL	LL	RL	LL
C 8	^{64.3} 61.7 , 61.3	60.1, 60.0	C 8 <u>63.6, 63.8</u>	60.4, 60.4
C 7	^{60.7} 59.1 , 59.2	59.1, 59.5	C 7 <u>60.4, 60.5</u>	58.1, 58.15
C 6	^{54.1} 54.1, 54.15	52.8, 52.8	C 6 53.9, 53.8	53.9, 53.9
C 5	^{47.1} 45.6 , 45.8	46.8, 46.75	C 5 45.9 , 45.8	47.9, 47.8
C 4	^{38.4} 37.6 , 37.4	37.2, 37.2	C 4 39.0, 39.0	36.3, 36.4
C 3	^{39.0} 40.4 , 40.5	39.1, 40.2	C 3 40.45, 40.35	39.0, 39.0
C 2	^{29.8} 30.0, 29.8	28.9, 29.0	C 2 29.8, 29.8	29.1, 28.9
C 1	23.3, 23.3	23.7, 23.65	C 1 23.4, 23.35	23.3, 23.25

8

Kevin

Heights - in chair

Tilt - Immediate - chair

		RL	LL		RL	LL
Top	h7	9.0, 8.9	10, 9.8	C8	67, 66.9	66.0, 66.3
Down	h6	10.8, 10.7	9.7, 9.5	C7	60.5, 60.7	60.4, 60.3
	h5	9.2, 9.1	9.6, 9.5	C6	52.3, 52.5	51.2, 50.9
	h4	- - NA	NA	C5	45.3, 45.2	45.1, 45.3
	h3	11.2, 11.1	11.3, 11.1	C4	38.3, 38.6	39.1, 39.4
	h2	11.3, 11.1	11.1, 11.0	C3	43.3, 43.2	43.3, 43.1
	h1	11.5, 11.2	12.4, 12.5	C2	34.4, 34.2	<u>35.3, 35.2</u>
				C1	24.6, 24.4	24.6, 24.4

Tilt - 30min - chair

Tilt - 60min - chair

	RL	LL		RL	LL
C8	67.1, 67	66, 65.7	C8	67.2, 67.1	65.5, 65.6
C7	60.6, 60.6	60.4, 60.2	C7	60.1, 60.4	60.3, 60.4
C6	51.2, 51.2	52.2, 52.3	C6	50.9, 50.8	53.3, 53.4
C5	45, 44.9	45.2, 45.4	C5	44.9, 44.8	44.8, 44.6
C4	39.2, 39.2	39.1, 39.6	C4	38.4, 38.3	38.8, 39.0
C3	43.3, 43.1	42.7, 42.6	C3	43.3, 43.4	42.9, 42.8
C2	34.5, 34.4	34.2, 34	C2	34.4, 35.7	34.3, 34.2
C1	24.5, 24.4	24, 24.1	C1	24.4, 24.6	24.4, 24.3
	24.5, 24.6	24.3, 24.2		24.4, 24.6	24.4, 24.3

Clay

Heights-intilt-chair

Top Down	RL	LL
h7	8.2 8.3 8.1	8.4 8.5 8.45
h6	11.7 10.7 10.7	8.5 8.5 8.5
h5	11.4 11.4 11.4	9.8 9.7 9.75
h4	-	-
h3	9.6 9.6	9.5 9.4 9.45
h2	11.7 11.75	11.8 11.9 11.85
h1	11.4 11.4 11.5	13.8 13.8 13.8

Tilt-Immediate-chair

	RL	LL
C8	74.5 74.4	70.0 71.0
C7	67.0 66.9	65.5 65.6
C6	56.9 57.0	59.2 59.0
C5	50.3 50.2	50.45 50.5
C4	40.6 40.55	41.4 41.5
C3	44.9 44.9	43.9 44
C2	33.1 33.1	33.2 33.0
C1	25.1 25.0	24.4 24.3

Tilt-30 min-chair

Design	RL	LL
C8	72.2 72.1	68.8 68.9
C7	66.5 66.4	63.9 63.6
C6	57.1 57.0	56.5 56.6
C5	49.8 49.8	49.2 49.1
C4	41.1 40.5	40.8 40.8
C3	45.8 45.8	44.1 44.1
C2	34.0 33.7	32.8 32.7
C1	24.5 24.6	24.3 24.2

Tilt-60 min-chair

	RL	LL
C8	73.4 73.5	69.7 69.6
C7	67.0 67.1	63.6 63.7
C6	56.4 56.5	57.9 57.8
C5	49.3 49.5	49.6 49.5
C4	40.6 40.5	41.4 41.4
C3	44.8 44.9	44.1 44.2
C2	33.9 33.9	32.7 32.8
C1	24.4 24.4	24.4 24.3

Summary 5-1993

Data		p#	I	H	30	60	H	h
1- Troy Barta		1	✓	✓	✓	✓	✓	?
2- Jason Dahl		5	✓	✓	✓	✓	✓	✓
3- Steve		11	✓	✓	✓	✓	✓	?
4- Tony		17	✓	✓	✓	✓	✓	?
5- Eric		21	✓	✓	✓	✓	✓	✓
6- Mark	27 28		✓	✓	✓	✓	✓	✓
7- Dave			✓	✓	✓	✓	✓	✓
8- Kevin			✓	✓	✓	✓	✓	✓
9- Clay			✓	✓	✓	✓	✓	✓

Design & Protocol

H 0 min (R) and (L)
 I 0 min
 I 30 min
 I 60 min
 H 0 min

19 Apr. 1995

Note: Some supine
 standing meas. made.
 Segment heights were
 made at one phase
 + some at another -
 indicated by h

P.S. and M.S. on the middeck, and

with the countdown and holds in

countdown. It can range from a

Shift of large fluid volumes from the lower to limbs to the remaining rest of the body is ^{significant and} one of the ^{best} documented effects of weightlessness. ()

Although not as well documented, in every case suitably studied this shift has been rapid with a time constant of a few hours ().

Prior to launch the crew is supine

Legs elevated for appreciable times which are a function of crew position and countdown. ~~varies with crew position~~ Cdr. and pilot followed by other flight ^{deck} crew members and enter first, ~~to exit last through P.S.~~ finally the ^{crew} P.S. and M.S. on the middeck, and ~~with the countdown and holds in~~ countdown. It can range from a

22
Such a supposition of volume shifts is
consistent $\approx$ generally accepted knowledge.

& observing
Also experiencing the effects of the the

effects of this launch position during launches
and sims leaves little doubt that a large &
rapid diuresis occurs. In sims ~~there is~~ ^{the} a

concerted rush for the stairs to the small
toilet on the next ^{pad} deck and the bad jokes

on intercom about full bladders all attest to
this.

minimum of 45 mins to several hours.
plus anecdotes of dizziness

This has caused several investigators to assume that significant fluid shifts effectively adding to the time spent in $\bar{w}$, a factor which occur on the pad before launch (1) might be significant to other studies. (1)

and several investigators have made studies of the ^{various supposed} effects of this position however none to our knowledge have studied the phenomena postulated.

Our direct measurement of leg volume charges as part of a ~~much larger~~ study we have studied the effects of posture on fluid shift from the legs and recently included ^{singles} included large leg angles and body tilt angles i.e. large head down tilt angles. as observer and participant in ~~the~~ simulated count d and were surprised at the small tissue

fluid shifts that occur under the circumstances

have been surprisingly small and led to
our measurement of tissue leg volume changes
in the launched position.

The following is the result of a preliminary study whose results are consistent c our findings in large leg elevation angles.

Methodology: Nine males subjects, — —

Px Characteristics, were the subjects — Time

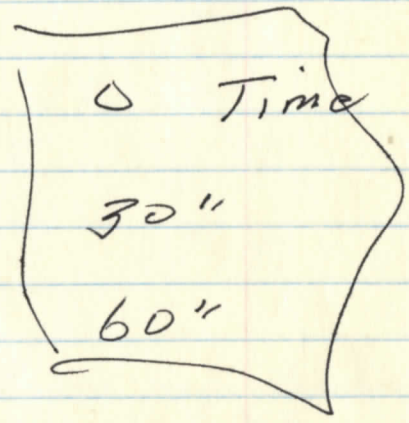
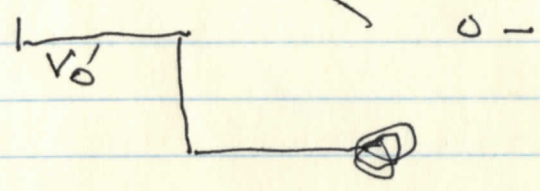
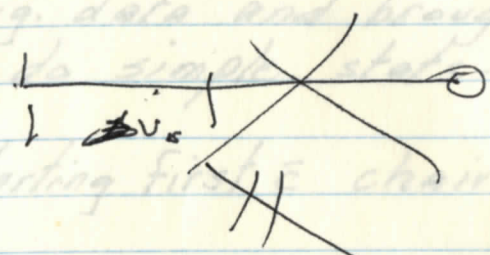
describe approval, etc.

After their usual ^{ad lib} activities, ~~no~~ except exercise, they were weighed in shorts and ~~g~~ sat upright in a chair selected to approximate the shuttle seat — x — x
 — and leg volumes ^{from 3 cm above the malleolus} determined by to buttocks ~~crease~~ by 8 girth duplicate girth determinations at previously marked levels on the leg.

Chair

19 Apr. Bill Sq. said the T.C. statistician had listed leg vol. data and we would discuss it today but he wasn't there - I picked up orig. data and brought it back & will try to do simple stat.

Starting first chair data.

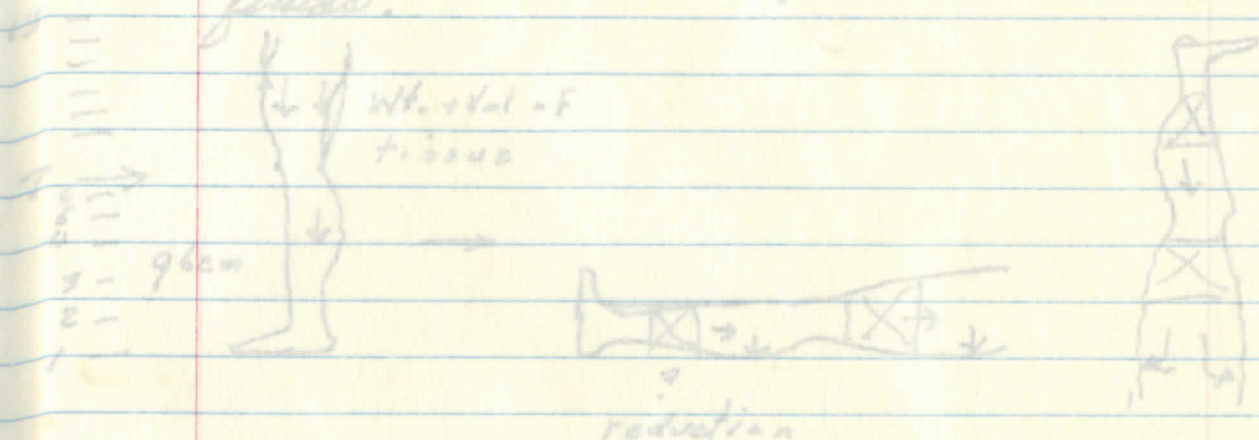


19 Apr. Bill Sq. said the TLC statistician had listed leg vol. data and we would discuss it today but he wasn't there - I picked up orig. data and brought it back & will try to do simple stats -

Starting first c chair data -

9 APR

24 Apr 93 Started in depth review of chair data
 & single leg elevation. (See N.B.). Plotted
 leg girths for various phases to look at
 any oblique vol. displacements not seen in
 fluids.

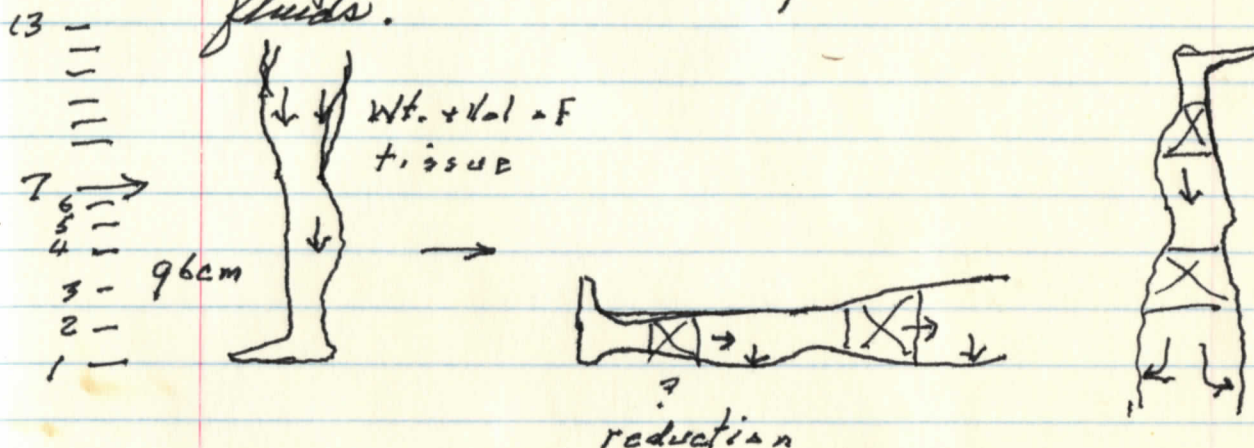


Stand-thie: Ankle segments and calf showed sig. decreases
 in girth. Ankle might be fluid. Knee showed
 anomalous gain. Lower thigh showed large
 decreases and upper the expected increase.

leg elevation: Ankle segs showed slight, prob. insign.
 decreases in girth & sig. Δ in calf. And
 esp. lowest thigh segment but only sl. Δ 's
 in upper thigh except top which showed + Δ .

leg lowering: No sig. Δ in ankle region but ^{4th} calf seg.
 showed anomalous decrease while 5th + 6th
 showed nice reciprocal Δ 's + knee showed no Δ .
 Leg 8 did not show a reciprocal change to
 the large Δ on elevation and upper circ.
 showed little Δ .

24 Apr. 95 Started in depth review of chair data
 c single leg elevation. (Sep. N.B.). Plotted
 leg girths for various phases to look at
 any obvious vol. displacements not assoc. c
 fluids.



Stand $\rightarrow$ Lie: Ankle segments and calf showed sig. decreases
 in girth. Ankle might be fluid. Knee showed
 anomalous gain. Lower thigh showed large
 decreases and upper the expected increase.

Leg elevation: Ankle segs. showed slight, prob. insig.
 decreases in girth c sig. $-\Delta$ in calf. and
 esp. lowest thigh segment but only sl. Δ 's
 in upper thigh except top which showed $+\Delta$.

Leg lowering: No sig. Δ in ankle region but ^{4th} calf seg.
 showed anomalous decrease while 5th + 6th
 showed nice reciprocal Δ 's + knee showed no Δ .
 Seg. 8 did not show a reciprocal change to
 the large Δ on elevation and upper circs.
 showed little Δ .



$$\cos$$

$$W \sin \theta = y$$

