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MOMENTS OF INERTIA AND CENTERS OF GRAVITY OF THE LIVING HUMAN BODY

TECHNICAL DOCUMENTARY REPORT NO. AMRL-TDR-63-36

May 1963

Behavioral Sciences Laboratory
6570th Aerospace Medical Research Laboratories
Aerospace Medical Division
Air Force Systems Command
Wright-Patterson Air Force Base, Ohio

DDC
JUL 18 1963
TISIA B

Contract Monitor: Charles E. Clauser
Project No. 7184, Task No. 718403

[Prepared under Contract No. AF 33(657)-7848
by W. R. Santschi, J. DuBois, and C. Omoto
of North American Aviation, Inc., Los Angeles, California]

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FOR ERRATA

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THE FOLLOWING PAGES ARE CHANGES

TO BASIC DOCUMENT

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ERRATA - February 1964

The following corrections apply to Technical Documentary Report No. AMRL-TDR-63-36, Moments of Inertia and Centers of Gravity of the Living Human Body:

Page 55

The dimension taken as Biacromial Diameter (paragraph 3) should have been Biclavicular Diameter. Paragraph 3 should be changed to read:

3. BICLAVICULAR DIAMETER: Subject sits erect, his upper arms hanging at his sides and his forearms extended horizontally. Using the anthropometer, measure the distance between the most lateral points of the clavicles.

The dimensions listed in the data pages as Biacromial Diameter should be renamed accordingly.

Biacromial Diameter (Y) can be approximated from the following regression equation:

$Y = 0.415 X + 10.76$ Standard error of estimate = ±0.66

Where X = Chest Breadth

All Values are in inches

BEHAVIORAL SCIENCES LABORATORY
AEROSPACE MEDICAL RESEARCH LABORATORIES
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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1. Anthropology
2. Anthropometry
3. Body (Anatomy)
4. Weightlessness
5. Human Engineering

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FOREWORD

This study was initiated by the Anthropology Branch, Human Engineering Division, Behavioral Sciences Laboratory, 6570th Aerospace Medical Research Laboratories. The research was conducted by North American Aviation, Inc., Los Angeles 9, California, under the provisions of Contract No. AF 33(657)-7848. Mr. William R. Santschi, Head of the Bioscience Unit, Life Sciences Group, was the principal investigator for North American Aviation, Inc. Mr. J. DuBois, Biophysicist, was responsible for the theoretical aspects of the study. Selection of subjects and anthropometry phases of the study were conducted by Miss Constance Omoto, Physical Anthropologist. Mr. Charles E. Clauser, of the Anthropology Branch, monitored the contract for the 6570th Aerospace Medical Research Laboratories. The work was performed in support of Project No. 7184, "Human Performance in Advanced Systems," Task No. 718408, "Anthropology for Design." The research sponsored by this contract was initiated in February 1962 and completed in August 1962. This report is cataloged by North American Aviation as NA-62-950.

The authors wish to express appreciation to Mr. H. T. E. Hertzberg, Chief of the Anthropology Branch, for a critical review of the manuscript. Gratitude is also expressed to staff members, Mr. M. N. Goldberg, Mr. D. Walton, and Mr. A. P. Holm, for their assistance in measuring the subjects, and to Mr. F. Mazy, Senior Design Specialist, for the design of the measurement apparatus. The authors are particularly indebted to the NAA-employee subjects whose cooperation in voluntarily submitting to the rigors of measurement made this study possible.

ABSTRACT

A study was conducted to determine the moments of inertia and centers of gravity of a sample of 66 living male subjects representative of the Air Force population in stature and weight. Eight body positions were investigated: Standing; Standing, Arms Over Head; Spread Eagle; Sitting; Sitting, Forearms Down; Sitting, Thighs Elevated; Mercury Configuration; Relaxed (Weightless). The procedure was based upon the compound pendulum having a theoretical accuracy of approximately ±2 to ±8 per cent depending upon position and axis. Orthogonal axes, defined as the intersections of the sagittal, frontal, and transverse planes through the standing body, were designated as X, Y, and Z. A set of 50 anthropometric dimensions was taken on each subject, as well as photographs of each subject in each position. Results of the study show that the average moment of inertia varied in this sample from 11 lb. in sec.^{2} about the Z axis to 152 lb. in sec.^{2} about the X axis. Linear regression analysis of moments of inertia vs. stature and weight yielded correlation coefficients ranging between 0.77 and 0.98.

PUBLICATION REVIEW

This technical documentary report has been reviewed and is approved.

Walter F. Grether

WALTER F. GRETHER
Technical Director
Behavioral Sciences Laboratory

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MOMENTS OF INERTIA AND CENTERS OF GRAVITY

OF THE

LIVING HUMAN BODY

INTRODUCTION

Moments of inertia and centers of gravity of the human body are fundamental parameters which enter into all computations involving body rotation. These computations arise in the analysis of total body motion under conditions of weightlessness, where body rotation of an individual is easily produced by his own action or by external forces; under conditions of acceleration, where the vector does not act through the body center of gravity due to body position or restraint; and, in general, in the design of air or space transport systems where human weight is a significant percentage of vehicle weight.

The purpose of this study is twofold; first, to obtain data on the characteristics of the moment-of-inertia parameter about three axes and for various body positions for a well-defined group of living humans; and, second, to supplement the existing data on the location of the center of gravity of the total human body.

Earlier investigators have used pendulum techniques to obtain data on human body segment moments of inertia and centers of gravity for a small number of cadaver subjects (references 2, 3). In the measurement of living humans, balance techniques have been employed to obtain total body center of gravity (references 8, 10). One investigator has utilized volume contour maps to measure total body center of gravity and moment of inertia, a method which involved assumptions about body cross section and density (reference 11).

The present study makes use of a generalized compound pendulum method in which the only assumption made is mean body density, utilized in computing a small second-order buoyancy correction factor.

SECTION I

THEORETICAL CONSIDERATIONS

METHOD

The technical aspects of the compound pendulum method, upon which this study is based, are treated in detail in reference 4; a brief description is presented here for general background.

The compound or physical pendulum is an elementary dynamic system consisting of an extended mass oscillating about a fixed horizontal axis under the force of gravity. If two parallel axes of oscillation are provided, and certain simplifying assumptions made, it is not difficult to show that the simultaneous solution of the torque equations for the two axes yields expressions for the moment of inertia and center of gravity of the pendulum in terms of its weight, periods, axis separation and acceleration due to gravity. Since the sums of the moments of inertia of two or more masses with respect to the same axis equals the moment of inertia of the combined masses with respect to that axis, the moment of inertia and center of gravity of a mass (the human subject) distinct from the double axis pendulum can be found.

In reference 4 it is shown that the distance from the short suspension axis (figure 1) to the center of gravity of the subject is given by

$$L_s = \frac{4\pi^2\Delta L\left[\left(\frac{W'}{g} + \rho V'\right)(2L_s' + \Delta L) + \Delta L\left(\frac{W}{g} + \rho V\right) - \frac{T_{pl}^2}{4\pi^2}(W + W')\right] - W'L_s'(T_{pl}^2 - T_{ps}^2)}{W(T_{pl}^2 - T_{ps}^2) - 8\pi^2\left(\frac{W'}{g} + \rho V\right)\Delta L},$$

while the moment of inertia of the subject about an axis parallel to the fulcrum axis and passing through his center of gravity is given by

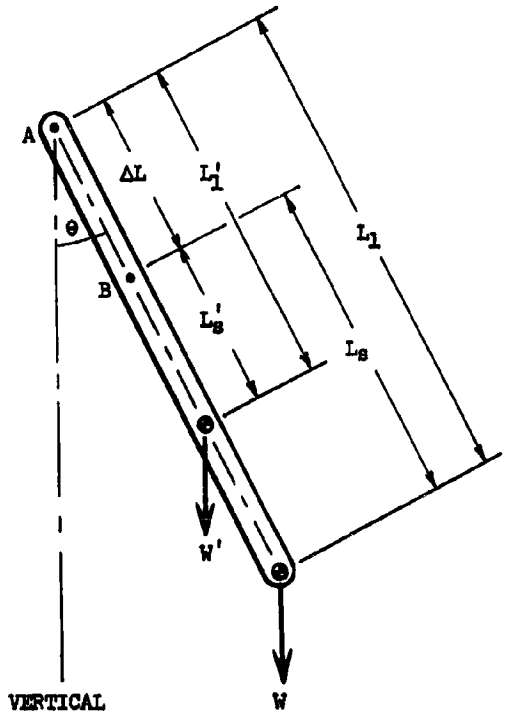
$$I_o = \frac{T_{ps}^2}{4\pi^2}(W'L_s' + WL_s) - I_s' - \left(\frac{W}{g} + \rho V\right)L_s^2 .$$

Where:

T_{ps} is the period of the pendulum about the short suspension axis

T_{pl} is the period of the pendulum about the long suspension axis

I_s' is the moment of inertia of the pendulum (without subject) about the short axis



A - Long suspension axis

B - Short suspension axis

θ - Angular displacement of pendulum

W' - Weight of pendulum without subject

W - Weight of subject

ΔL - Distance between support axes

L_s' - Distance from short suspension axis to CG of pendulum

L_l' - Distance from long suspension axis to CG of pendulum

L_s - Distance from short suspension axis to CG of subject

L_l - Distance from long suspension axis to CG of subject

Figure 1. Schematic of Compound Pendulum

g is the acceleration due to gravity

V is the subject volume based upon body weight and an assumed mean body density of 65.246 lb/ft^3

V' is the pendulum volume

ρ is the ambient air density

The remaining symbols are as given previously.

A given determination of center of gravity and moment of inertia involves only five measurements: air temperature, subject weight, the two pendulum periods about the short and long suspension axes and a reference distance from the subject to the short suspension fulcrum. All other constants in the equations are determined, once, prior to the actual subject measurements.

Also noteworthy is the fact that the center of gravity measurement is made in proper relationship with the gravity vector as contrasted with other methods (references 8 and 10) in which the displacement of subcutaneous fat and viscera is orthogonal to the direction of measurement.

ACCURACY

The theoretical limits of accuracy obtainable with the compound pendulum technique (as applied to living human measurement) was estimated (reference 4) from the total differentials of L_s and I_o. These limits depend upon the magnitude of the moment of inertia which in turn is a function of body weight, anthropometry, body position and axis. Provided the crucial experimental variables are carefully controlled, accuracies of ±2% for maximum I_o values and ±8% for minimum I_o values appear within the realm of possibility (reference 4). The distance to the center of gravity can be measured to within ±0.5% or better along the X and Z axes.

Some of the practical considerations in achieving these estimated limits are touched upon in Section III.

DATA RECORDING AND PROCESSING

Since an enormous quantity of raw data is generated rapidly when a large number of subjects are measured for moment of inertia and cg in eight distinct positions about three body axes, a 7090 computer program was written to calculate individual I_o and L_s values and to carry out the statistical analysis on the computed moments and cgs. Perhaps unique in this study is the total integration of the experimental procedure with the data processing. This was achieved by recording all data, anthropometry included, directly on decimal data key punch sheets, an arrangement designed to minimize transcription errors and provide an orderly procedure for the experiment.

The computer program was written in Fortran and consists of a main program and five subroutines. Three of the latter are used where required to compute averages, standard deviations, simple and multiple regression correlation coefficients, equation constants and standard errors of estimates. All of the printout data tables in this report were generated by the other two subroutines.

BODY COORDINATE SYSTEM

An orthogonal axis system was defined by the intersection of the three principal planes of the body passing through the center of gravity of the body as shown in figure 2. The Z-axis is formed by the intersection of the sagittal plane and the frontal plane; the Y-axis, by the intersection of the frontal and transverse planes; and, the X-axis, by the intersection of the sagittal and transverse planes.

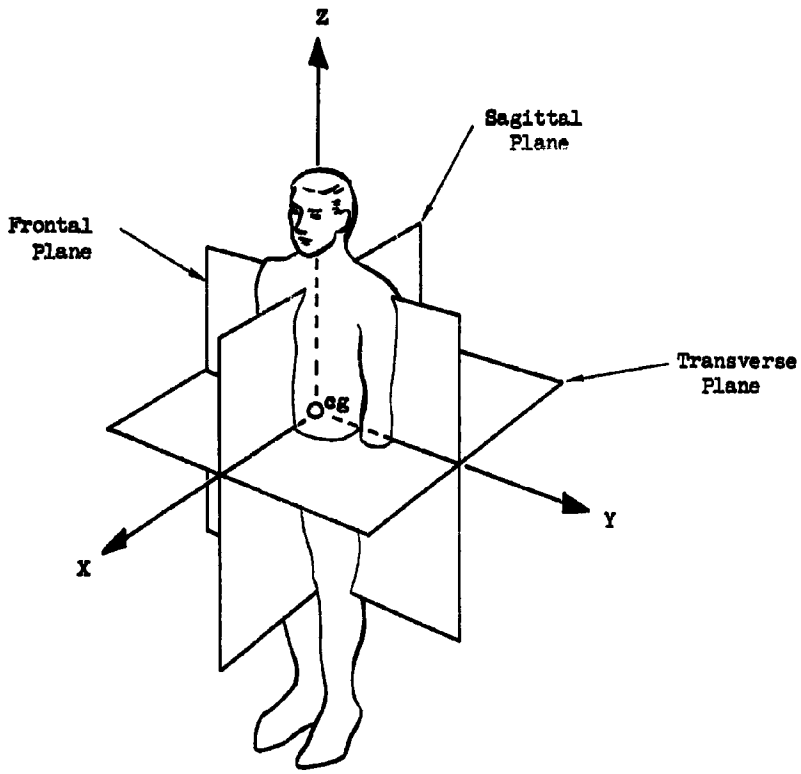


Figure 2. Body Coordinate System

The orthogonal axis system was referenced to the body as shown in figure 3. The location of the center of gravity of the body was measured along the Z-axis from the top of the head, L(Z), along the X-axis from the back plane, L(Y), and along the Y-axis from the anterior superior spine of the ilium, L(X). However, since body symmetry with respect to the sagittal plane was assumed, L(Y) was defined as equal to one-half the bispinous breadth (Appendix III).

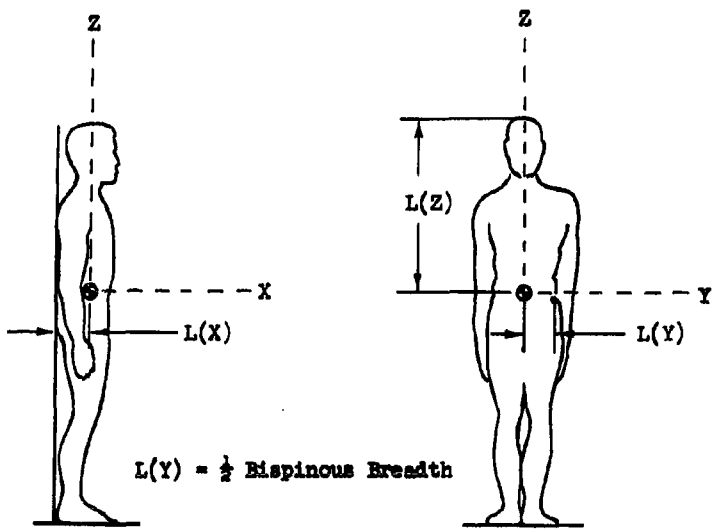


Figure 3. Reference Landmarks for Location of Center of Gravity

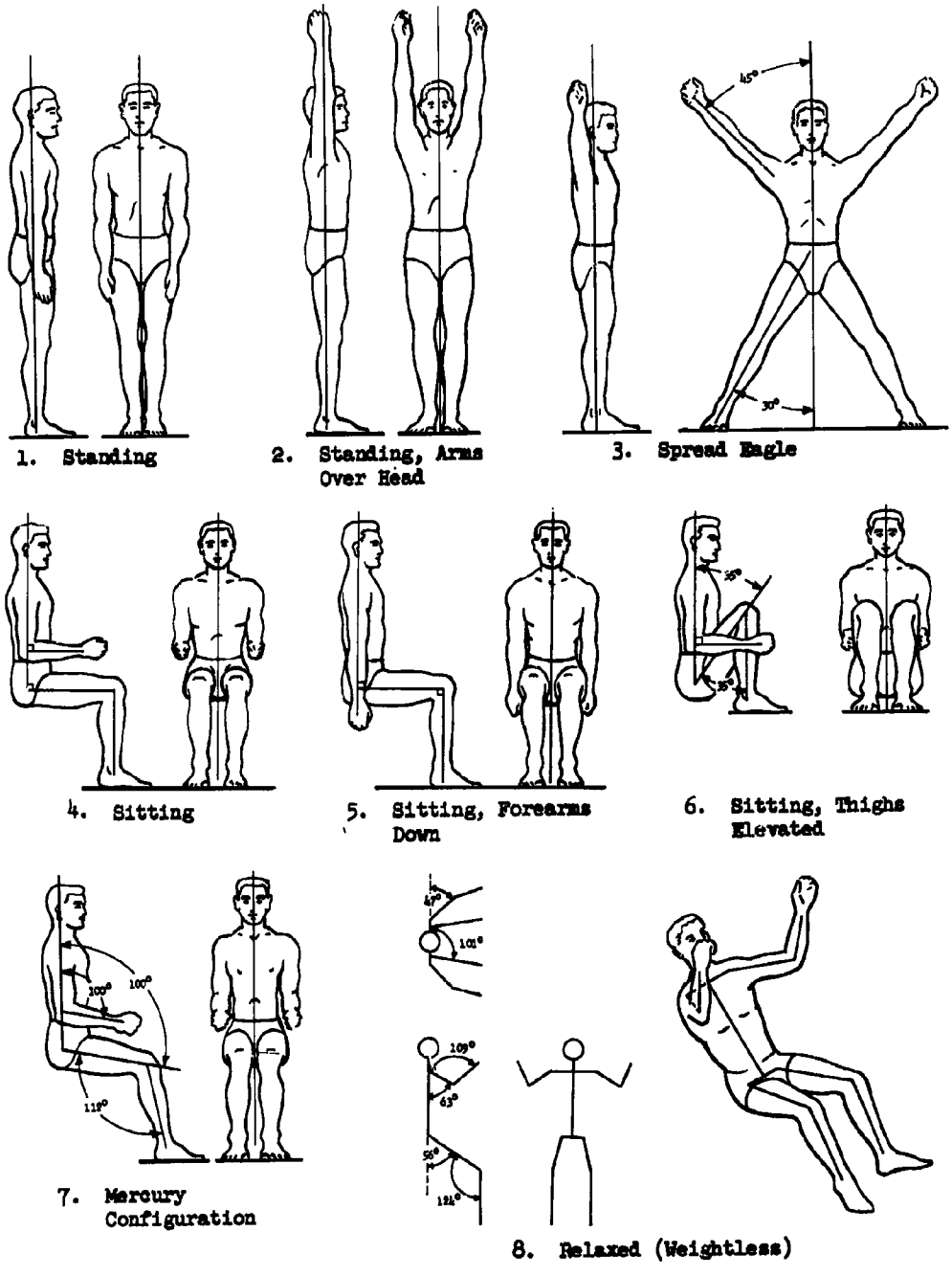
SELECTION OF BODY POSITIONS

Eight body positions (figure 4) were defined. Factors which were considered in the selection of the positions included the desirability of a standard anthropometric posture (Standing), the capability of determining the effect of changes in limb position on moment of inertia, (Standing, Arms Over Head; Sitting, Forearms Down) positions predicted to yield maximum and minimum moment of inertia values (Spread Eagle; Sitting, Thighs Elevated), and special applications (Mercury Configuration, Relaxed-Weightless).

DESCRIPTION OF POSITIONS

1.	STANDING	Subject stands erect with head oriented in the Frankfort plane and with arms hanging naturally at the sides as described in WADC TR 52-321 stature measurement (reference 7).
2.	STANDING, ARMS OVER HEAD	Legs, torso and head same as position 1; upper extremities raised over head, parallel to Z-axis; wrist axes parallel to X-axis; hands slightly clenched.
3.	SPREAD EAGLE	Torso and head same as position 1; subject against plane parallel to YZ plane; arms at 45° with Z-axis, legs at 30° with Z-axis; wrist axes parallel to YZ plane; hands slightly clenched.
4.	SITTING	Upper legs and forearms parallel to X-axis; upper arms, lower legs and spine parallel to Z-axis; soles parallel to XY plane; wrist axes parallel to Z-axis; head in Frankfort plane.
5.	SITTING, FOREARMS DOWN	Same as position 4, except forearms parallel to Z-axis, wrist axes parallel to X-axis.
6.	SITTING, THIGHS ELEVATED	Same as position 4, except upper leg angle approximately 35° with YZ plane.
7.	MERCURY CONFIGURATION	Same as position 4, except 100° back-thigh angle, thigh-leg angle 112°, forearm parallel to thigh.
8.	RELAXED (WEIGHTLESS)	Position predicted to be assumed by a human, relaxed in the weightless state.* See figure 4.

* Unpublished study by K. W. Kennedy, Anthropology Branch, Behavioral Sciences Laboratory, 6570th Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio.



1. Standing

2. Standing, Arms Over Head

3. Spread Eagle

4. Sitting

5. Sitting, Forearms Down

6. Sitting, Thighs Elevated

7. Mercury Configuration

8. Relaxed (Weightless)

Figure 4. Body Positions

SECTION II

DESCRIPTION OF APPARATUS

DESIGN AND FABRICATION OF PENDULUMS

Two compound pendulums were designed in accordance with the criteria presented in reference 4 to accommodate the subject sample for the eight positions previously defined. One pendulum (I_{ox}/I_{oy}) was utilized for the determination of moment of inertia about the X and Y axes; the other was used for measurement about the Z-axis (I_{oz}). The pendulums, weighing in the range of 40 to 60 lbs., were constructed mainly of welded 1-inch aluminum tubing. The cone fulcrums, designed for minimum friction and wear, were fabricated of steel and tipped with hard-facing alloy; the cones rested on hardened steel pads. The pads were secured to a heavy steel support fixture which was anchored solidly to concrete. A hoist mechanism was devised to transfer the pendulums from the short to the long suspension axis and to rotate the I_{ox}/I_{oy} pendulum. The pendulums, suspended from the support fixture, are shown in figures 5 and 6.

INSTRUMENTATION

Since determination of moment of inertia by the use of a compound pendulum is dependent upon accurate measurement of the pendulum period, an electronic timer system was designed to measure time to within ±0.0001 sec. The timer system consisted of a light source, a photo diode, an electronic counter (Hewlett Packard Model 522B), and reset and inhibition circuitry which permitted the measurement of either a single cycle or a series of cycles up to 10. A thin blackened rod, attached to each pendulum equidistant from the short suspension axes, interrupted the light source during oscillation to automatically start and stop the counter. The switch (rod, light source, and photo diode) can be seen in position in figure 5.

BODY RESTRAINT

Pressure-sensitive tape and Velcro tape (1- and 2-inch widths) were used to restrain the subjects in their proper positions and to ensure rigidity with respect to the pendulum. Shim material of low-density rigid polystyrene foam was utilized in various thicknesses and shapes to align and restrain the head, feet, knees and wrists of the subjects where necessary. The restraint materials and techniques were chosen to minimize artifacts in the measurement of human moment of inertia.

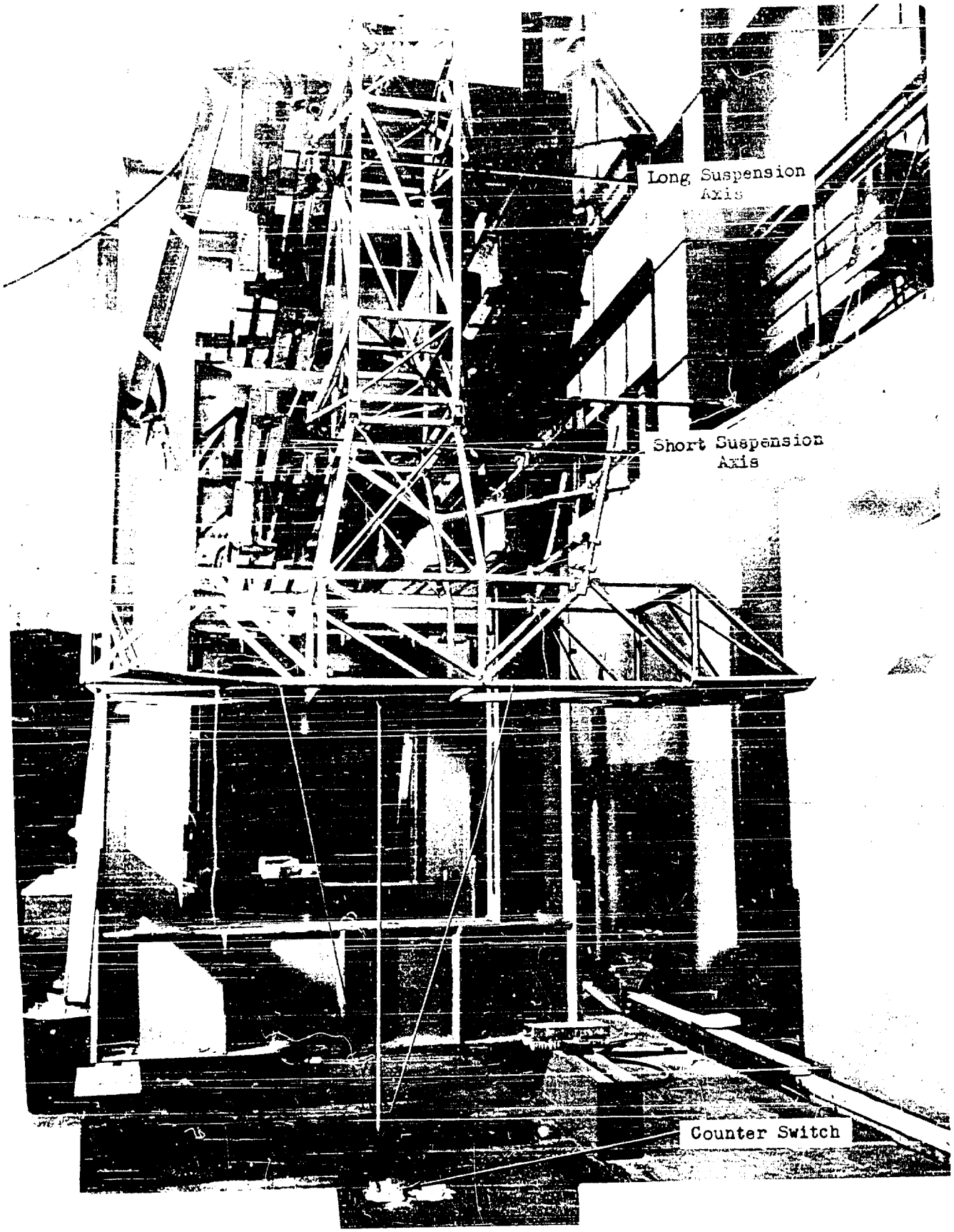


Figure 5. Moment-of-Inertia Measurement Apparatus (I_{oz} Pendulum)

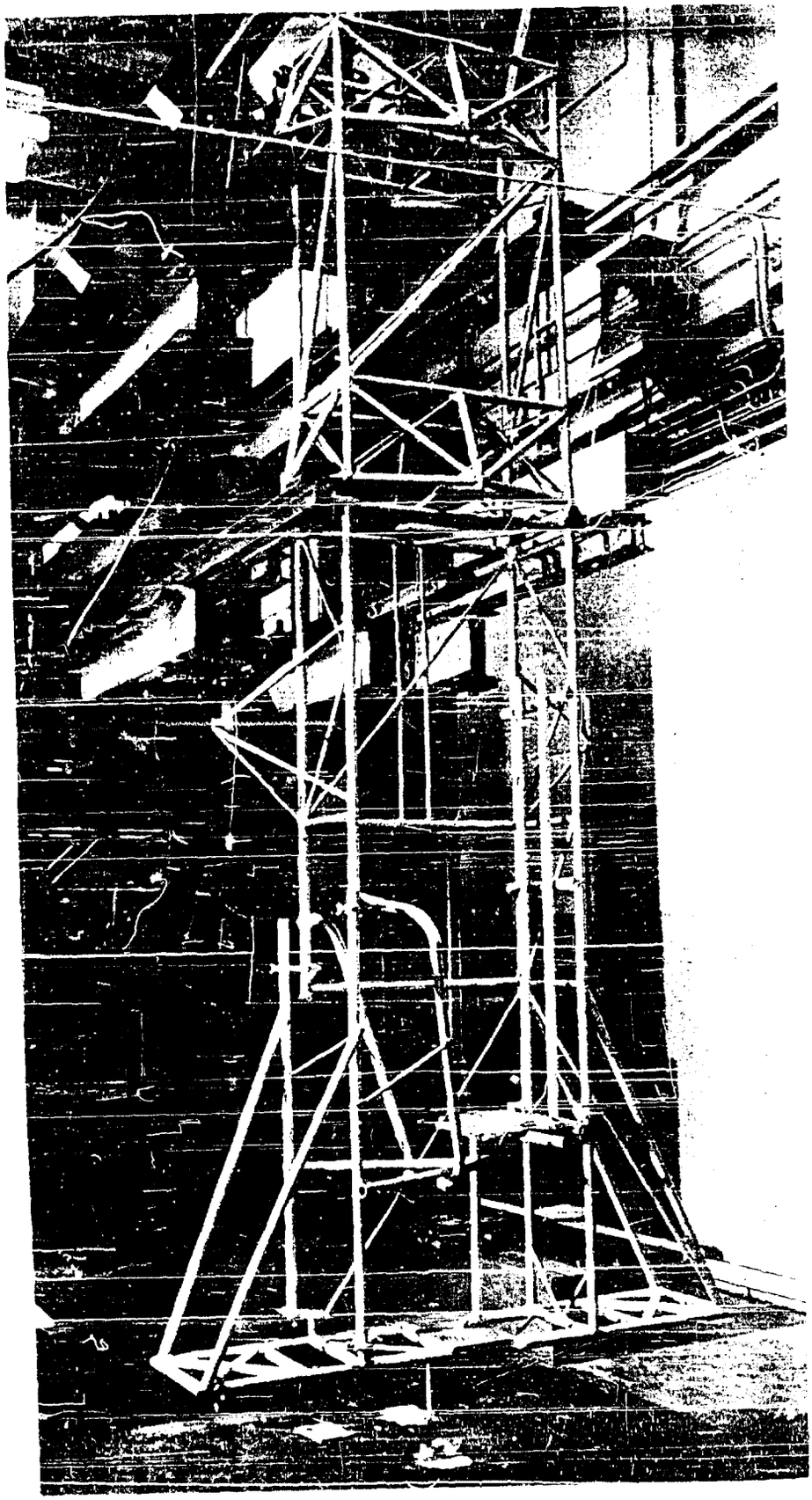


Figure 6. Moment-of-Inertia Measurement Apparatus (I_{ox}/I_{oy} Pendulum)

SECTION III

EXPERIMENTAL PROCEDURE

SELECTION OF SUBJECTS

The sample of 66 male subjects was selected on the basis of stature and weight from North American Aviation employees to represent the Air Force population stature and weight characteristics described in reference 7. For this total sample whose stature-weight scattergram is shown in figure 7, 60 subjects are contained within the bounds of 1st and 99th percentile values of stature and weight and 50 within the area bounded by the 5th and 95th percentile values. The stature-weight correlation coefficient value for the total sample is approximately 0.6, in comparison with the Air Force population value of approximately 0.5 reported in reference 6.

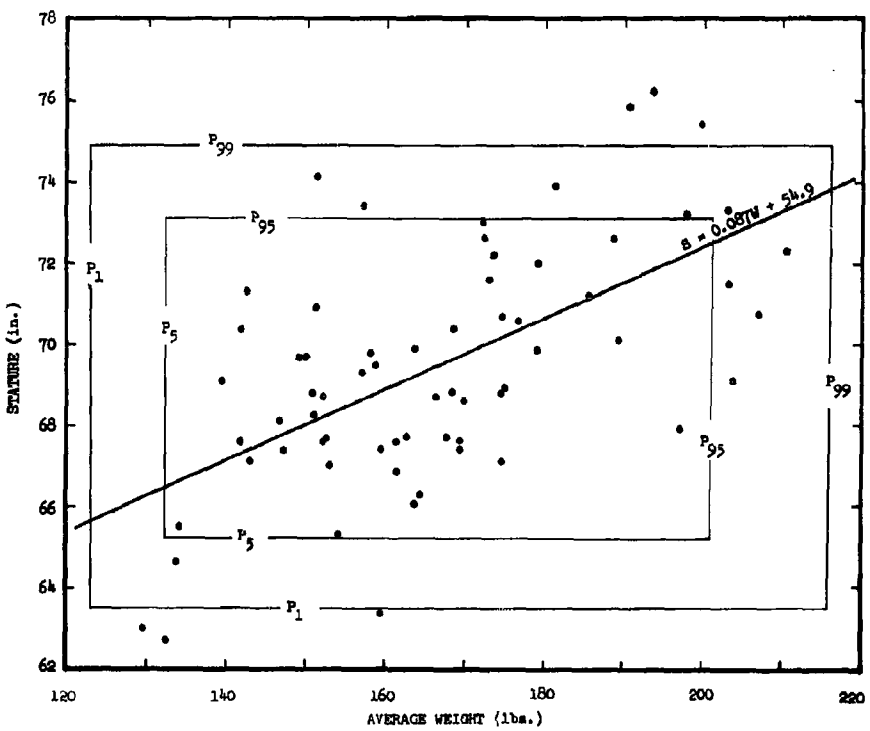


Figure 7. Scattergram of Statures and Weights of 66 Subjects

ANTHROPOMETRY OF SUBJECTS

Fifty measurements were taken on each subject. These measurements, listed in table I, included thirty-five standard Air Force dimensions contained in reference 7, and fifteen other dimensions. The former are useful for describing the characteristics of the subject sample in relation to the Air Force population, while the latter are expected to be useful in determining other biophysical characteristics such as the weight of certain segments of the body, etc.

TABLE I

MEASUREMENT OF SUBJECTS

Age	Hip Breadth, Sitting
Ankle Circumference	Iliac Spine Height
Axillary Arm Circumference	Juxtanipple Skinfold
Biacromial Diameter	Knee Circumference, Standing
Biceps Circumference (Extended)	Lower Arm Length
Bispinous Breadth	Lower Thigh Circumference
Buttock-popliteal Length	Midaxillary Line, Xyphoid Skinfold
Buttock Circumference	Shoulder Height (Acromial Height)
Buttock Depth	Sitting Height
Calf Circumference	Span
Cervicale Height	Sphyrion Height
Chest Breadth	Stature
Chest Circumference	Substernale Height
Chest Depth	Suprasternale Height
Elbow Circumference (Extended)	Thigh Circumference
Fist Circumference	Tibiale Height
Foot Breadth	Triceps Skinfold
Foot Length	Trochanteric Height
Forearm Circumference (Extended)	Upper Arm Length
Hand Breadth at Metacarpale	Waist Breadth
Hand Length	Waist Circumference
Head Breadth	Waist Depth
Head Circumference	Waist Height
Head Length	Weight
Hip Breadth	Wrist Circumference

All measurements were made with standard anthropometric instruments in accordance with techniques specified in references 7 and 9. Lange skinfold calipers* were used in obtaining skinfold thickness measurements. A description of the anthropometric dimensions is given in Appendix III.

---

* Cambridge Scientific Industries, 18 Poplar Street, Cambridge, Maryland.

CALIBRATION OF APPARATUS

Calibration of the apparatus, consisting of the timer and pendulums, was a straightforward procedure. The timer was checked with respect to accuracy by adjusting the period of the oscillator in the Hewlett Packard electronic counter to correspond with that of a secondary frequency standard maintained by the NAA Metrology Laboratory. This calibration insured a basic counter accuracy of 2 parts in 10^6. The design of the photo-diode switch provided a pulse rise time at the input to the counter of approximately 1 microsec.

Reproducibility of period measurements was evaluated with the aid of an eight-foot simple pendulum oscillating through a one degree arc. It was found to be approximately ±0.0001 sec. for single-cycle comparisons and approximately ±0.00005 sec. for 10-cycle averages.

Moments of inertia and centers of gravity of the pendulums with respect to their short suspension axes were measured by taking at least 10 10-cycle averages of the periods for each suspension, axis and position. Fulcrum friction was reduced to a minimum by substituting lubricated glass plates for the steel pads. Fulcrum separations (ΔL) were measured with a height gage to about ±0.001 inch. The pendulums were weighed to an accuracy of ±0.01 lb. on a calibrated Triner scale.

The accuracy of the I_o measurement was evaluated experimentally through the use of a 139-lb. machined steel block, approximately 2 x 12 x 20 inches, having a computed I_o about one axis of approximately 16.33 lb. in. sec.^{2} Measured I_o differed from the computed value by less than 1 percent.

Following calibration of the pendulums for positions 1, 2 and 3, a short pilot study was run to assess subject period reproducibility and to develop an effective restraint technique. The results of this study demonstrated that a period reproducibility of ±0.0005 sec. could be maintained with all subjects capable of participating in the experiment even through fulcrum and axis transfers.

A restraint procedure finally evolved which utilized a combination of drafting tape, Velcro tape and polystyrene foam shim blocks. Head movement in the upright positions was found to be particularly critical and careful attention was required in its positioning and restraint.

MOMENT OF INERTIA AND CG DETERMINATION

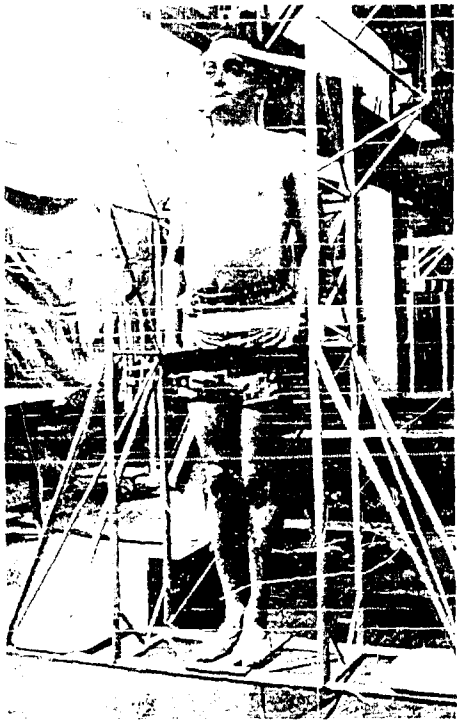
The subject was instructed to be as relaxed as possible and to breathe normally during measurement.

Subject weight, both pre and post-run, was recorded for each position. The subject was weighed on a Fairbanks, Morse and Co. scale (Code 10737, accuracy ±0.05 lb.) and measured while clad only in trunks or shorts whose weight ranged between 4 and 8 oz. The garment weight was assumed a part of the subject body weight in all cases.

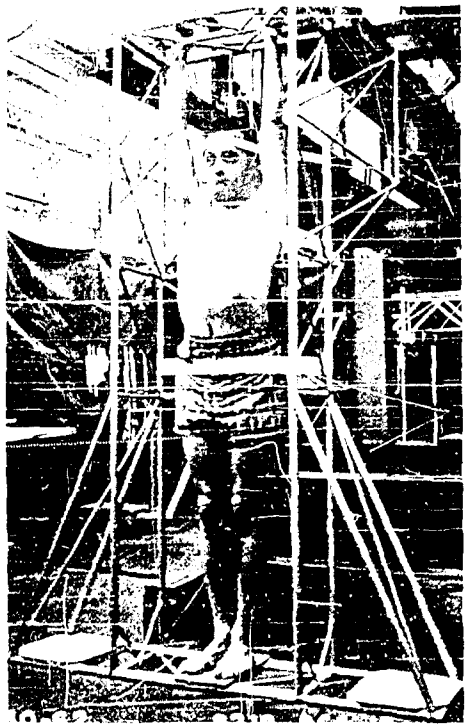
After the subject assumed position on the pendulum, a check was made to ensure that the cg of the subject was within prescribed limits by noting the position of the pendulum axis with respect to a gravity reference line and shimming the subject where required. The subject was securely restrained to the pendulum in the proper position by use of masking and Velcro tape at appropriate locations on the body. (The restraint technique is demonstrated for both pendulums and all positions in figures 8 through 11.)

The pendulum was made to oscillate through an angle of ±1°. At least two 10-cycle-period averages were taken for each suspension axis to ensure that reproducibility was achieved. The criterion for reproducibility was that successive average periods be within ±0.0005 sec.

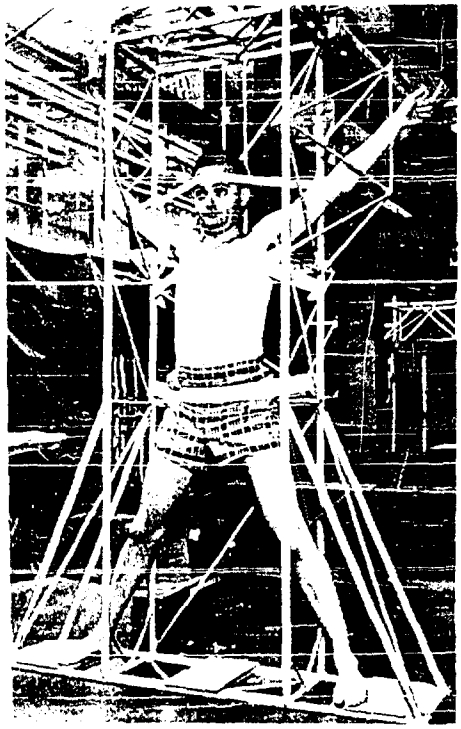
A body-reference distance from the top of the subjects' heads to the short-fulcrum suspension axis of the I_{ox}/I_{oy} pendulum was measured for each position, and air temperature was recorded.



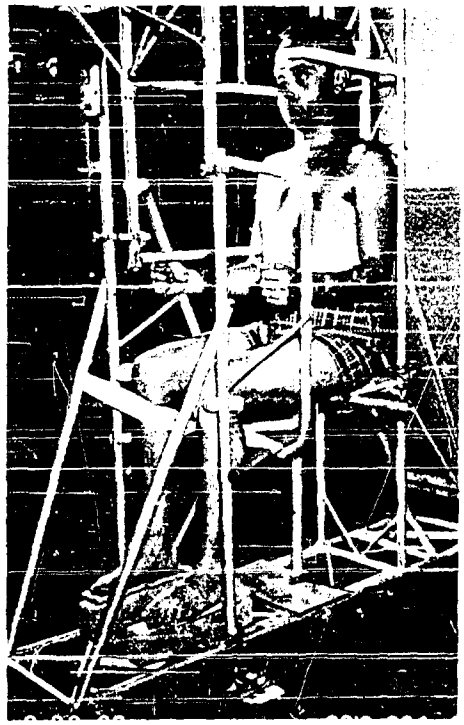
1. Standing



2. Standing, Arms Over Head

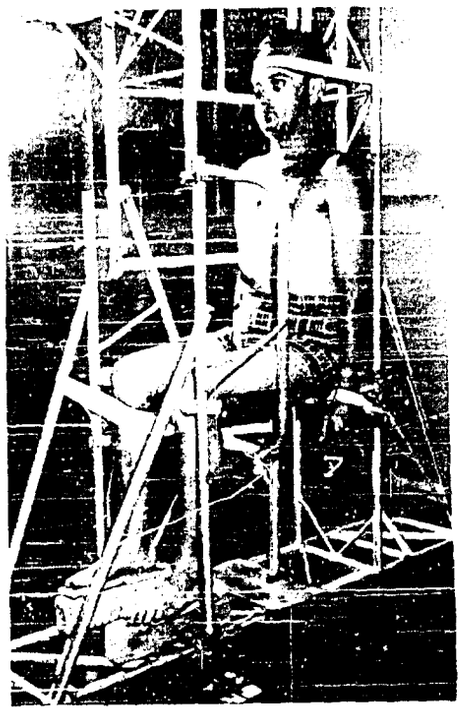


3. Spread Eagle

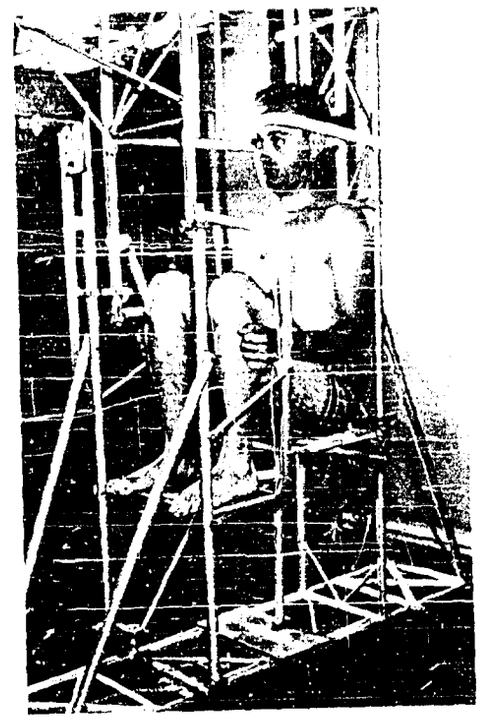


4. Sitting

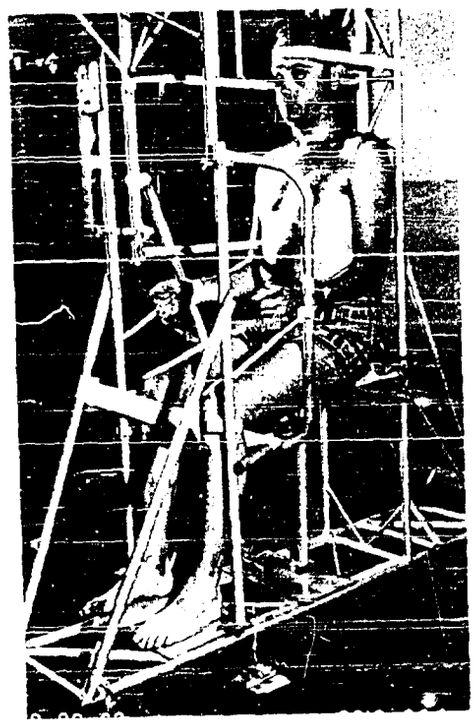
Figure 8. Subject Restrained in Positions 1 Through 4 (I_{ox}/I_{oy} Pendulum)



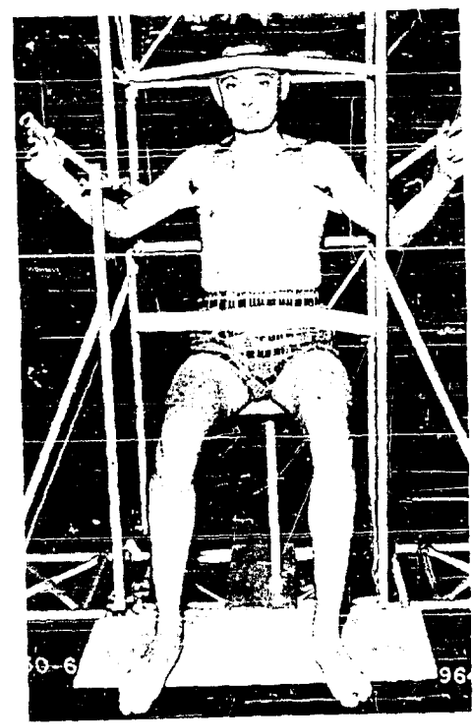
5. Sitting, Forearms Down



6. Sitting, Thighs Elevated

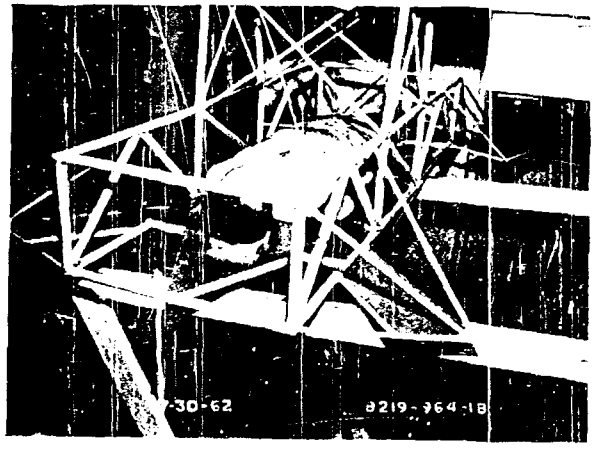


7. Mercury Configuration

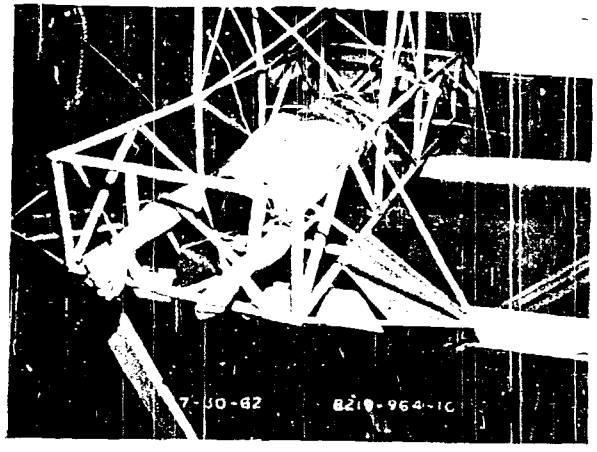


8. Relaxed (Weightless)

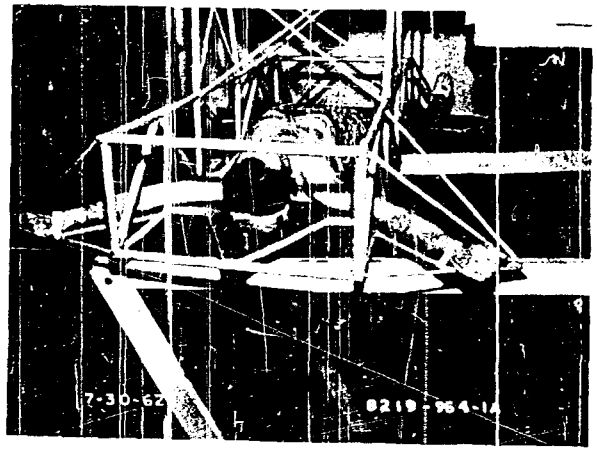
Figure 9. Subject Restrained in Positions 5 Through 8 (I_{ox}/I_{oy} Pendulum)



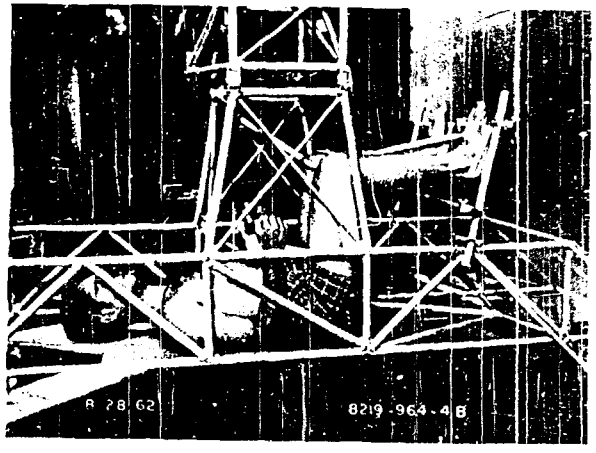
1. Standing



2. Standing, Arms Over Head

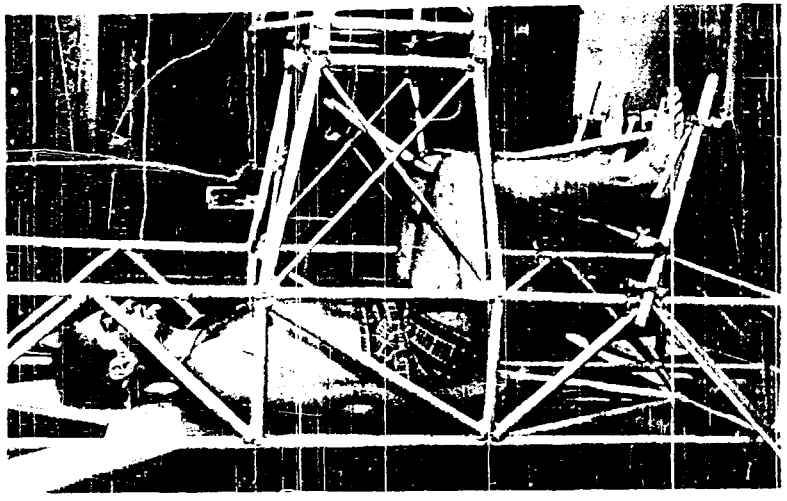


3. Spread Eagle

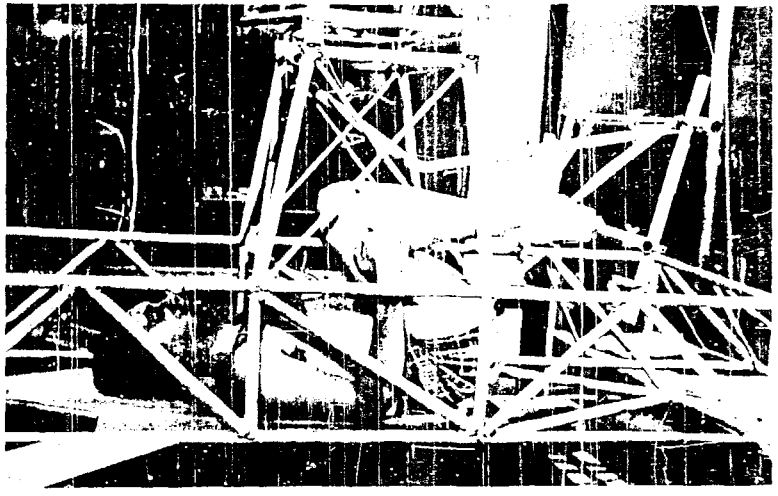


4. Sitting

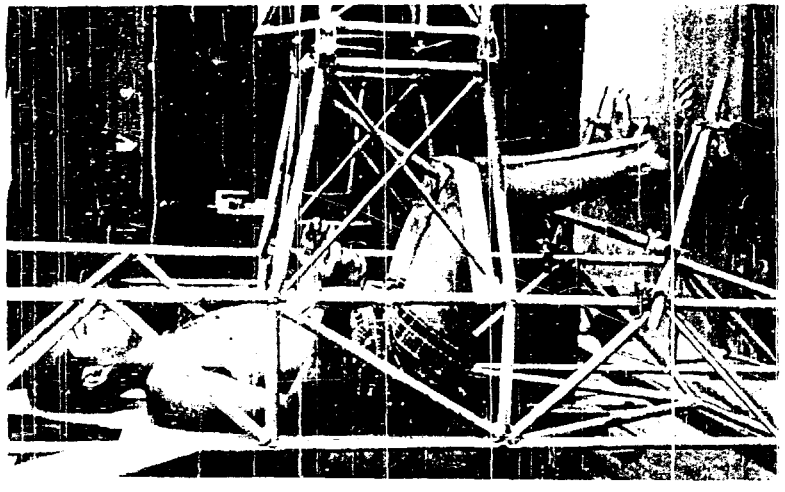
Figure 10. Subject Restrained in Positions 1 Through 4 (I_{oz} Pendulum)



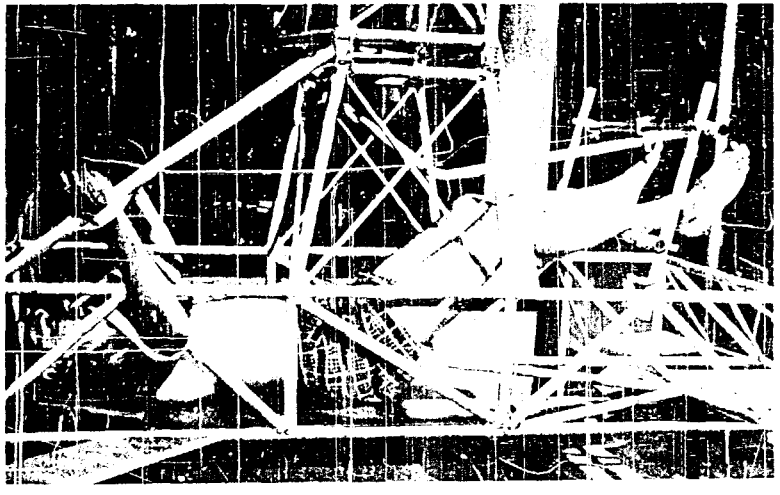
5. Sitting, Forearms Down



6. Sitting, Thighs Elevated



7. Mercury



8. Relaxed

Figure 11. Subject Restrained in Positions 5 Through 8 (I_{oz} Pendulum)

SECTION IV

RESULTS

The experimental results of the study are summarized in tables II and III wherein the most significant statistical information is listed. Computer printout of all statistical data is contained in Appendix I. In Appendix II, the individual centers of gravity, moments of inertia and anthropometry for each subject are presented. Lists of symbols and definitions applicable to the computer program printout sheets can also be found in Appendices I and II.

All correlations presented in the tables are based upon subject weight averaged over all positions. This weight is recorded for each subject on his individual data sheet in Appendix II. Since weight variations were seldom greater than one pound, this procedure should not significantly affect correlation coefficients.

Table II presents the arithmetic means and standard deviations of the centers of gravity and moments of inertia of the sample along with the means and standard deviations of age, stature and weight. The mean centers of gravity for all body positions are shown graphically in figure 12. Body symmetry was assumed insofar as the Y-axis centers of gravity are concerned; hence, their means and standard deviations are independent of body position. This assumption was not involved in the determinations of the Y-axis moments of inertia, however.

Table III shows the results of the linear regression analysis of moment of inertia vs. stature and weight. The multiple correlation coefficients all exceed 0.9 with only three exceptions. These large values of R indicate a very strong dependence of moment of inertia on stature and weight, which combined with the relatively small values of standard error of estimate and the large sample size, demonstrate the usefulness of the regression equation as a predictive tool. Regression equations, with which I_o values can be computed from stature and weight, are given for each position and axis.

The general equations of motion of a body involve an inertial tensor whose elements consist of the parameters measured in this study, i.e., the moments of inertia I_x, I_y, I_z, and the products of inertia I_{xy}, I_{xz}, I_{yz}. Although the determination of the latter was beyond the scope of this experiment, it can be shown (reference 5) that the largest of these, I_{xz}, can be found using a modification of the compound pendulum method.

TABLE II

ARITHMETIC MEANS AND STANDARD DEVIATIONS OF SAMPLE CENTERS OF GRAVITY AND MOMENTS OF INERTIA

		Axis	Center of Gravity (in.)		Moment of Inertia (lb.in.sec.^{2})	
			Mean	S.D.	Mean	S.D.
1.	Standing	x	3.5	0.20	115.0	19.3
		y	4.8	0.39	103.0	17.9
		z	31.0	1.45	11.3	2.2
2.	Standing, Arms Over Head	x	3.5	0.22	152.0	26.1
		y	4.8	0.39	137.0	25.3
		z	28.6	1.33	11.1	1.9
3.	Spread Eagle	x	3.3	0.19	151.0	27.1
		y	4.8	0.39	114.0	21.3
		z	28.5	1.90	36.6	7.9
4.	Sitting	x	7.9	0.36	61.1	10.3
		y	4.8	0.39	66.6	11.6
		z	26.5	1.14	33.5	5.8
5.	Sitting, Forearms Down	x	7.7	0.34	62.4	9.7
		y	4.8	0.39	68.1	12.0
		z	26.8	1.16	33.8	5.9
6.	Sitting, Thighs Elevated	x	7.2	0.37	39.1	6.0
		y	4.8	0.39	38.0	5.8
		z	23.1	0.78	26.3	5.1
7.	Mercury Configuration	x	7.9	0.34	65.8	10.3
		y	4.8	0.39	75.2	14.0
		z	27.1	1.14	34.2	5.6
8.	Relaxed (Weightless)	x	7.3	0.33	92.2	13.3
		y	4.8	0.39	88.2	13.3
		z	27.5	1.44	35.9	5.4

Sample Size 66

Mean Age 33.2 yrs. S.D. Age 7.2 yrs.

Mean Weight 166.4 lbs. S.D. Weight 19.8 lbs.

Mean Stature 69.4 in. S.D. Stature 2.9 in.

TABLE III

CORRELATION OF MOMENT OF INERTIA WITH STATURE AND WEIGHT

		Axis	$R_{i \cdot sw}$	S.E.*	I_o Regression Equations *
1.	Standing	x	0.98	4.18	-232.0 + 3.77S + 0.512W
		y	0.96	5.27	-212.0 + 3.43S + 0.460W
		z	0.93	0.84	-0.604 - 0.098S + 0.112W
2.	Standing,	x	0.98	5.63	-328.0 + 5.36S + 0.652W
	Arms Over	y	0.96	6.89	-332.0 + 5.34S + 0.589W
	Head	z	0.89	0.87	1.4 - 0.085S + 0.094W
3.	Spread	x	0.98	4.90	-353.0 + 5.63S + 0.677W
	Eagle	y	0.96	6.24	-270.0 + 4.30S + 0.516W
		z	0.93	2.82	-101.0 + 1.52S + 0.191W
4.	Sitting	x	0.92	4.01	-91.6 + 1.43S + 0.322W
		y	0.92	4.51	-135.0 + 2.26S + 0.268W
		z	0.97	1.45	-52.8 + 0.76S + 0.201W
5.	Sitting,	x	0.91	3.98	-78.7 + 1.29S + 0.309W
	Forearms	y	0.92	4.67	-127.0 + 2.05S + 0.321W
	Down	z	0.97	1.36	-53.7 + 0.765S + 0.206W
6.	Sitting,	x	0.89	2.79	-33.8 + 0.543S + 0.212W
	Thighs	y	0.77	3.66	-22.2 + 0.434S + 0.180W
	Elevated	z	0.92	2.00	-30.4 + 0.328S + 0.204W
7.	Mercury	x	0.93	3.75	-94.3 + 1.57S + 0.308W
	Configuration	y	0.94	4.96	-175.0 + 2.85S + 0.318W
		z	0.96	1.64	-45.0 + 0.668S + 0.197W
8.	Relaxed	x	0.96	3.71	-106.0 + 1.77S + 0.452W
	(Weightless)	y	0.94	4.54	-139.0 + 2.43S + 0.352W
		z	0.96	1.54	-47.2 + 0.776S + 0.176W

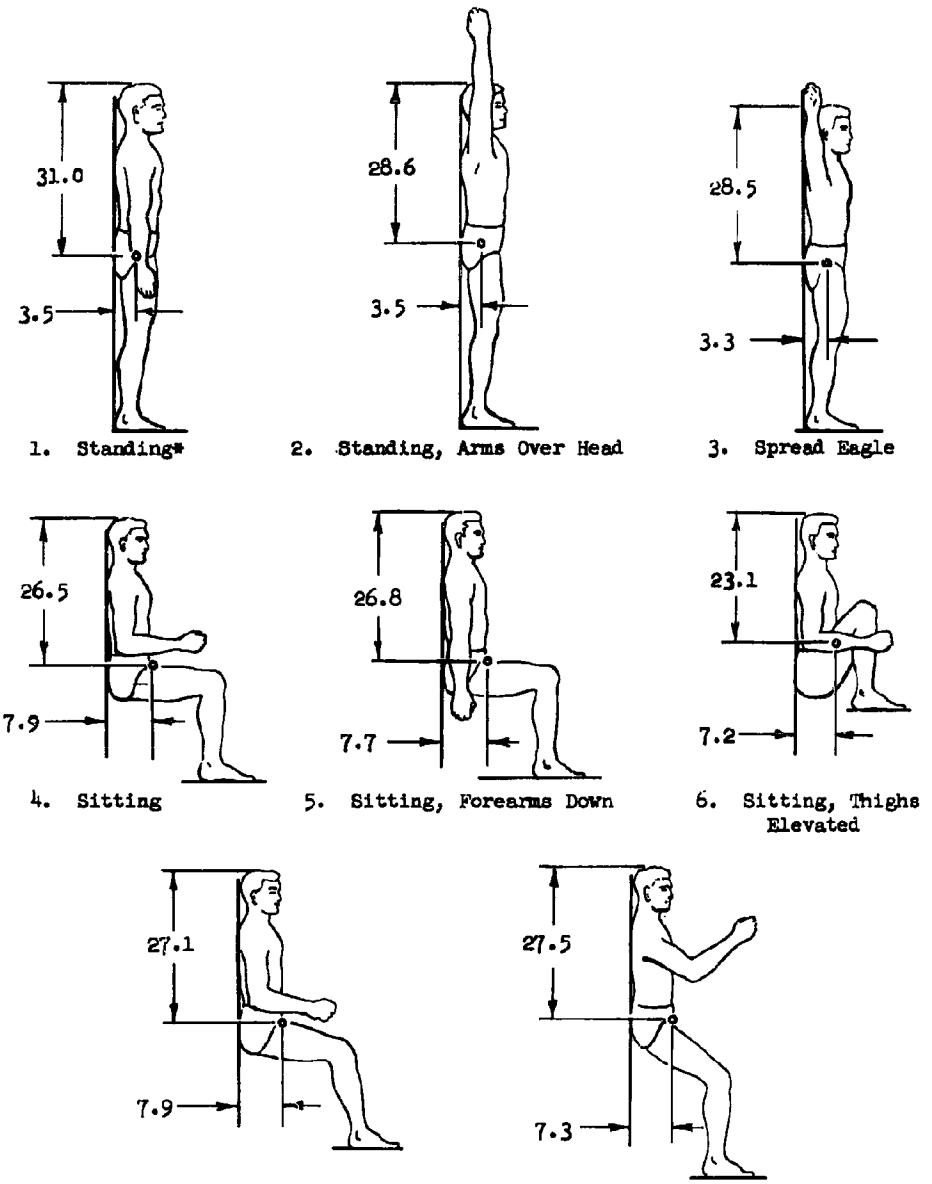
Sample Size 66

$r_{sw} = 0.60$ S.E. = 2.33 in. $S = 54.9 + 0.087W$

* I_o and S.E. in lb.in.sec.^{2}

S in in.

W in lbs.



1. Standing*
2. Standing, Arms Over Head
3. Spread Eagle
4. Sitting
5. Sitting, Forearms Down
6. Sitting, Thighs Elevated
7. Mercury Configuration
8. Relaxed (Weightless)

*Dimensions are in inches.
Body symmetry with respect to the sagittal plane is assumed.

Figure 12. Mean Centers of Gravity

SECTION V

SUMMARY

A study was conducted to determine the moments of inertia and centers of gravity of a sample of 66 living male subjects representative of the Air Force population in stature and weight ($r = 0.6$, S.D. $= 2.3$). Eight positions were investigated: Standing; Standing, Arms Over Head; Spread Eagle; Sitting; Sitting, Forearms Down; Sitting, Thighs Elevated; Mercury Configuration; and Relaxed (Weightless). A set of 50 anthropometric dimensions was taken on each subject, as well as record photographs in each position. The experimental procedure was based upon the compound pendulum. Results of a brief statistical analysis indicate the following:

1. Moment of inertia correlates very well with subject stature and weight in all positions and axes. Multiple linear correlation coefficients ranged between 0.77 and 0.98. Since standard errors were small, the derived regression equations constitute a useful tool for the prediction of subject moment of inertia from stature and weight alone.

2. The moments of inertia for all positions ranged from 6 to 211 lb. in sec.^{2}, with means from 11 to 152 lb. in sec.^{2}. The data as a whole are consistent, changing in magnitude of I_o as body position shifts.

3. Centers of gravity data exhibit the same consistency; mean cg shifts relate as expected to changes in limb position.

The data contained in this report provide a basis for total-body dynamic analysis. Relative to the test sample or other similar populations, individual centers of gravity can now be estimated and moments of inertia computed from easily obtainable anthropometric dimensions.

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APPENDIX I

STATISTICAL DATA

SYMBOLS USED IN PRINTOUT

A, B	Regression equation constants, stature vs. weight
A(X), A(Y),...C(Z)	Regression equation constants with respect to denoted axis for single and multiple moment-of-inertia correlations
AV	Arithmetic mean of the sample
AVL(X)	Arithmetic mean of the centers of gravity along the X-axis measured with respect to the back plane
AVL(Y)	Arithmetic mean of the centers of gravity along the Y-axis; equal to one-half the average bispinous distance
AVL(Z)	Arithmetic mean of the centers of gravity along the Z-axis measured with respect to the top of the head
AVI(X), AVI(Y), AVI(Z)	Arithmetic means of the moments of inertia with respect to the X, Y and Z axes respectively
R(X), R(Y), R(Z)	Correlation coefficients with respect to X, Y and Z axes for single and multiple moment-of-inertia correlations
RHWT	Correlation coefficient, stature vs. weight
S(X), S(Y), S(Z)	Standard errors of estimates with respect to the X, Y and Z axes for single and multiple moment-of-inertia correlations
SD	Standard deviations from the mean
SDL(X), SDL(Y), SDL(Z)	Standard deviations of the centers of gravity from AVL(X), AVL(Y) and AVL(Z) respectively
SDI(X), SDI(Y), SDI(Z)	Standard deviations of the moments of inertia from AVI(X), AVI(Y) and AVI(Z) respectively
SHWT	Standard error of estimate, stature vs. weight
STAT	Stature
WT	Subject weight

ARITHMETIC MEANS AND STANDARD DEVIATIONS

POSITION	AVL(X)	AVL(Y)	AVL(Z)	SDL(X)	SDL(Y)	SDL(Z)
1 STANDING	350+01	480+01	310+02	200-00	386-00	145+01
2 STANDING, ARMS OVER HEAD	349+01	480+01	286+02	221-00	386-00	133+01
3 SPREAD EAGLE	332+01	480+01	285+02	194-00	386-00	190+01
4 SITTING	794+01	480+01	265+02	360-00	386-00	114+01
5 SITTING, FOREARMS DOWN	772+01	480+01	268+02	339-00	386-00	116+01
6 SITTING, THIGHS ELEVATED	724+01	480+01	231+02	368-00	386-00	784+00
7 MERCURY CONFIGURATION	790+01	480+01	271+02	343-00	386-00	114+01
8 RELAXED (WEIGHTLESS)	729+01	480+01	275+02	327-00	386-00	144+01

POSITION	AVI(X)	AVI(Y)	AVI(Z)	SDI(X)	SDI(Y)	SDI(Z)
1 STANDING	115+03	103+03	113+02	193+02	179+02	224+01
2 STANDING, ARMS OVER HEAD	152+03	137+03	111+02	261+02	253+02	194+01
3 SPREAD EAGLE	151+03	114+03	366+02	271+02	213+02	787+01
4 SITTING	611+02	666+02	335+02	103+02	116+02	578+01
5 SITTING, FOREARMS DOWN	624+02	681+02	338+02	974+01	120+02	587+01
6 SITTING, THIGHS ELEVATED	391+02	380+02	263+02	598+01	576+01	509+01
7 MERCURY CONFIGURATION	658+02	752+02	342+02	103+02	140+02	555+01
8 RELAXED (WEIGHTLESS)	922+02	882+02	359+02	133+02	133+02	538+01

AVAGE 33.2 SDAGE 7.2 AVSTAT 69.4 SDSTAT 2.9 AVWT 166.4 SDWT 19.8

N = 66

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

MULTIPLE LINEAR CORRELATION

MOMENT OF INERTIA VS. STATURE AND WEIGHT

POSITION	R(X)	R(Y)	R(Z)	S(X)	S(Y)	S(Z)
1 STANDING	976+00	955+00	927+00	418+01	527+01	838+00
2 STANDING, ARMS OVER HEAD	977+00	962+00	892+00	563+01	689+01	874+00
3 SPREAD EAGLE	984+00	956+00	934+00	490+01	624+01	282+01
4 SITTING	921+00	921+00	968+00	401+01	451+01	145+01
5 SITTING, FOREARMS DOWN	913+00	920+00	973+00	398+01	467+01	136+01
6 SITTING, THIGHS ELEVATED	885+00	773+00	920+00	279+01	366+01	200+01
7 MERCURY CONFIGURATION	931+00	935+00	955+00	375+01	496+01	164+01
8 RELAXED (WEIGHTLESS)	960+00	940+00	958+00	371+01	454+01	154+01

POSITION	A(X)	A(Y)	A(Z)	B(X)	B(Y)	B(Z)	C(X)	C(Y)	C(Z)
1 STANDING	-232+03	-212+03	-604+00	377+01	343+01	-982-01	512+00	460-00	112-00
2 STANDING, ARMS OVER HEAD	-328+03	-332+03	140+01	536+01	534+01	-851-01	652+00	589+00	939-01
3 SPREAD EAGLE	-353+03	-270+03	-101+03	563+01	430+01	152+01	677+00	516+00	191-00
4 SITTING	-916+02	-135+03	-528+02	143+01	226+01	760+00	322-00	268-00	201-00
5 SITTING, FOREARMS DOWN	-787+02	-127+03	-537+02	129+01	205+01	765+00	309-00	321-00	206-00
6 SITTING, THIGHS ELEVATED	-338+02	-222+02	-304+02	543+00	434-00	328-00	212-00	180-00	204-00
7 MERCURY CONFIGURATION	-943+02	-175+03	-450+02	157+01	285+01	668+00	308-00	318-00	197-00
8 RELAXED (WEIGHTLESS)	-106+03	-139+03	-472+02	177+01	243+01	776+00	452-00	352-00	176-00

N = 66

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SIMPLE LINEAR CORRELATION

MOMENT OF INERTIA VS. STATURE

POSITION	R(X)	R(Y)	R(Z)	S(X)	S(Y)	S(Z)
1 STANDING	881+00	863+00	468-00	917+01	902+01	198+01
2 STANDING, ARMS OVER HEAD	892+00	888+00	446-00	118+02	116+02	173+01
3 SPREAD EAGLE	900+00	874+00	850+00	118+02	103+02	415+01
4 SITTING	774+00	844+00	794+00	651+01	621+01	351+01
5 SITTING, FOREARMS DOWN	761+00	815+00	795+00	632+01	692+01	356+01
6 SITTING, THIGHS ELEVATED	683+00	590+00	662+00	437+01	465+01	381+01
7 MERCURY CONFIGURATION	799+00	862+00	770+00	618+01	708+01	354+01
8 RELAXED (WEIGHTLESS)	792+00	841+00	805+00	810+01	722+01	319+01

POSITION	A(X)	A(Y)	A(Z)	B(X)	B(Y)	B(Z)
1 STANDING	-292+03	-266+03	-137+02	586+01	530+01	360-00
2 STANDING, ARMS OVER HEAD	-404+03	-400+03	-953+01	802+01	774+01	297-00
3 SPREAD EAGLE	-431+03	-330+03	-123+03	839+01	640+01	230+01
4 SITTING	-129+03	-166+03	-761+02	274+01	336+01	158+01
5 SITTING, FOREARMS DOWN	-115+03	-165+03	-777+02	255+01	335+01	161+01
6 SITTING, THIGHS ELEVATED	-584+02	-432+02	-542+02	140+01	117+01	116+01
7 MERCURY CONFIGURATION	-130+03	-212+03	-679+02	282+01	414+01	147+01
8 RELAXED (WEIGHTLESS)	-158+03	-180+03	-676+02	361+01	386+01	149+01

N = 66

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SIMPLE LINEAR CORRELATION

MOMENT OF INERTIA VS. WEIGHT

POSITION	R(X)	R(Y)	R(Z)	S(X)	S(Y)	S(Z)
1 STANDING	864+00	844+00	921+00	974+01	958+01	869+00
2 STANDING, ARMS OVER HEAD	851+00	827+00	886+00	137+02	142+02	897+00
3 SPREAD EAGLE	856+00	832+00	818+00	140+02	118+02	453+01
4 SITTING	862+00	800+00	918+00	522+01	694+01	229+01
5 SITTING, FOREARMS DOWN	859+00	829+00	924+00	499+01	668+01	225+01
6 SITTING, THIGHS ELEVATED	859+00	752+00	907+00	306+01	380+01	214+01
7 MERCURY CONFIGURATION	860+00	805+00	913+00	524+01	829+01	227+01
8 RELAXED (WEIGHTLESS)	908+00	839+00	897+00	555+01	726+01	238+01

POSITION	A(X)	A(Y)	A(Z)	B(X)	B(Y)	B(Z)
1 STANDING	-250+02	-239+02	-599+01	842+00	760+00	104-00
2 STANDING, ARMS OVER HEAD	-344+02	-386+02	-327+01	112+01	106+01	865-01
3 SPREAD EAGLE	-435+02	-340+02	-173+02	117+01	892+00	324-00
4 SITTING	-132+02	-109+02	-110+02	447-00	466-00	267-00
5 SITTING, FOREARMS DOWN	-777+01	-150+02	-117+02	422-00	499-00	273-00
6 SITTING, THIGHS ELEVATED	-397+01	161+01	-124+02	259-00	218-00	233-00
7 MERCURY CONFIGURATION	-831+01	-191+02	-831+01	445-00	567+00	256-00
8 RELAXED (WEIGHTLESS)	-871+01	-563+01	-458+01	607+00	564+00	243-00

RHWT 0.597 SHWT 2.333 A 54.9 B 0.087

N = 66

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

APPENDIX II

SUBJECT DATA

The computed moments of inertia and centers of gravity for the individual subjects together with the corresponding anthropometric dimensions are presented in the following pages. The data are for the most part self-explanatory. Definitions of the symbols and abbreviations are reproduced here for the convenience of the reader. Floating point numbers are read conventionally, e.g., 274+02 means 0.274×10^2.

L(X) Distance to the center of gravity of the subject as measured along the X-axis from the back plane.

L(Y) Distance to the center of gravity of the subject measured along the Y-axis from the iliac crest. Since body symmetry with respect to the sagittal plane is assumed, L(Y) is equal to one-half the bispinous breadth.

L(Z) Distance to the subject center of gravity measured along the Z-axis from the top of the head.

I(X) Moment of inertia about the X-axis through the subject's center of gravity.

I(Y) Moment of inertia about the Y-axis through the subject's center of gravity.

I(Z) Moment of inertia about the Z-axis through the subject's center of gravity.

ABBREVIATIONS OF ANTHROPOMETRIC DIMENSIONS

Ankle C	Ankle Circumference
Axilarm C	Axillary Arm Circumference
Biacrom D	Biacromial Diameter
Bicep C	Biceps Circumference (Extended)
Bispin B	Bispinous Breadth
Butpop L	Buttock-popliteal Length
Butt C	Buttock Circumference
Butt D	Buttock Depth
Calf C	Calf Circumference
Cervic H	Cervicale Height
Chest B	Chest Breadth
Chest C	Chest Circumference
Chest D	Chest Depth
Elbow C	Elbow Circumference (Extended)
Fist C	Fist Circumference
Foot B	Foot Breadth
Foot L	Foot Length
Forearm C	Forearm Circumference (Extended)
Hand B	Hand Breadth at Metacarpale
Hand L	Hand Length
Head B	Head Breadth
Head C	Head Circumference
Head L	Head Length
Hip B	Hip Breadth
Hip B Sit	Hip Breadth, Sitting
Iliac H	Iliac Spine Height
Juxta S	Juxtanipple Skinfold
Knee C	Knee Circumference, Standing
Lowarm L	Lower Arm Length
Lowthigh C	Lower Thigh Circumference
Malx S	Midaxillary Line, Xyphoid Skinfold
Shldr H	Shoulder Height (Acromial Height)
Sit H	Sitting Height
Span	Span
Sphyri H	Sphyrion Height
Substern H	Substernale Height
Supstern H	Suprasternale Height
Thigh C	Thigh Circumference
Tibiale H	Tibiale Height
Tricep S	Triceps Skinfold
Trochan H	Trochanteric Height
Uparm L	Upper Arm Length
Waist B	Waist Breadth
Waist C	Waist Circumference
Waist D	Waist Depth
Waist H	Waist Height
Wrist C	Wrist Circumference

SUBJECT NUMBER 1 AGE 28.9 STATURE 72.2 WEIGHT 173.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	362+01	531+01	322+02	132+03	119+03	131+02
2 STANDING, ARMS OVER HEAD	352+01	531+01	299+02	174+03	159+03	125+02
3 SPREAD EAGLE	334+01	531+01	295+02	172+03	135+03	419+02
4 SITTING	854+01	531+01	272+02	616+02	735+02	387+02
5 SITTING, FOREARMS DOWN	830+01	531+01	276+02	635+02	749+02	387+02
6 SITTING, THIGHS ELEVATED	770+01	531+01	239+02	414+02	373+02	299+02
7 MERCURY CONFIGURATION	850+01	531+01	283+02	668+02	853+02	404+02
8 RELAXED (WEIGHTLESS)	765+01	531+01	281+02	999+02	995+02	387+02

CERVIC H	61.7	SHLDR H	60.2	SUPSTERN H	59.0	SUBSTERN H	51.3	WAIST H	47.0
ILIAC H	42.3	TROCHAN H	40.3	TIBIALE H	20.9	UPARM L	14.7	LOWARM L	10.9
CHEST D	10.0	WAIST D	9.1	BUTT D	10.4	CHEST B	13.0	WAIST B	11.6
HIP B	14.1	AXILARM C	12.5	BICEP C	10.9	ELBOW C	10.5	FOREARM C	10.6
WRIST C	6.6	FIST C	11.7	CHEST C	38.3	WAIST C	32.7	BUTT C	40.6
THIGH C	23.0	LOWTHIGH C	15.5	KNEE C	14.8	CALF C	15.4	ANKLE C	8.9
SPHYRI H	2.7	FOOT L	10.6	FOOT B	4.0	SPAN	73.2	SIT H	36.8
BIACROM D	14.2	HIP B SIT	15.2	BUTPOP L	20.7	HAND L	7.5	HAND B	3.4
HEAD C	22.8	HEAD L	8.0	HEAD B	6.3	MALX S	0.7	JUXTA S	0.4
TRICEP S	0.8	BISPIN B	10.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 2 AGE 32.7 STATURE 73.3 WEIGHT 203.2

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	382+01	516+01	325+02	147+03	129+03	174+02
2 STANDING, ARMS OVER HEAD	409+01	516+01	296+02	196+03	175+03	158+02
3 SPREAD EAGLE	360+01	516+01	294+02	197+03	149+03	475+02
4 SITTING	825+01	516+01	274+02	783+02	812+02	428+02
5 SITTING, FOREARMS DOWN	802+01	516+01	276+02	854+02	860+02	439+02
6 SITTING, THIGHS ELEVATED	805+01	516+01	231+02	467+02	492+02	414+02
7 MERCURY CONFIGURATION	829+01	516+01	279+02	818+02	949+02	430+02
8 RELAXED (WEIGHTLESS)	770+01	516+01	281+02	113+03	104+03	435+02

CERVIC H	63.9	SHLDR H	61.5	SUPSTERN H	60.2	SUBSTERN H	51.2	WAIST H	48.3
ILIAC H	41.5	TROCHAN H	37.7	TIBIALE H	20.4	UPARM L	14.6	LOWARM L	11.3
CHEST D	10.6	WAIST D	9.9	BUTT D	11.0	CHEST B	14.3	WAIST B	13.1
HIP B	14.2	AXILARM C	14.7	BICEP C	13.4	ELBOW C	11.8	FOREARM C	12.3
WRIST C	11.4	FIST C	11.4	CHEST C	49.7	WAIST C	36.1	BUTT C	53.5
THIGH C	24.9	LOWTHIGH C	16.3	KNEE C	15.9	CALF C	14.7	ANKLE C	9.1
SPHYRI H	2.8	FOOT L	10.7	FOOT B	3.8	SPAN	74.6	SIT H	38.0
BIACROM D	13.1	HIP B SIT	15.2	BUTPOP L	20.9	HAND L	7.9	HAND B	3.4
HEAD C	22.5	HEAD L	8.0	HEAD B	5.9	MALX S	0.6	JUXTA S	0.8
TRICEP S	0.6	BISPIN B	10.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 3 AGE 43.2 STATURE 69.8 WEIGHT 158.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	327+01	467+01	309+02	110+03	971+02	932+01
2 STANDING, ARMS OVER HEAD	337+01	467+01	286+02	147+03	134+03	106+02
3 SPREAD EAGLE	312+01	467+01	287+02	145+03	107+03	367+02
4 SITTING	779+01	467+01	263+02	540+02	609+02	308+02
5 SITTING, FOREARMS DOWN	750+01	467+01	267+02	570+02	587+02	306+02
6 SITTING, THIGHS ELEVATED	721+01	467+01	227+02	366+02	340+02	255+02
7 MERCURY CONFIGURATION	773+01	467+01	268+02	614+02	716+02	316+02
8 RELAXED (WEIGHTLESS)	720+01	467+01	271+02	848+02	780+02	359+02

CERVIC H	59.9	SHLDR H	58.6	SUPSTERN H	57.5	SUBSTERN H	50.3	WAIST H	45.5
ILIAC H	40.2	TROCHAN H	39.5	TIBIALE H	20.7	UPARM L	14.2	LOWARM L	11.3
CHEST D	9.3	WAIST D	9.4	BUTT D	9.7	CHEST B	12.6	WAIST B	11.1
HIP B	13.5	AXILARM C	11.9	BICEP C	10.6	ELBOW C	10.6	FOREARM C	11.2
WRIST C	6.9	FIST C	11.6	CHEST C	38.0	WAIST C	32.4	BUTT C	38.2
THIGH C	21.7	LOWTHIGH C	15.6	KNEE C	15.6	CALF C	13.8	ANKLE C	8.1
SPHYRI H	2.8	FOOT L	10.5	FOOT B	3.8	SPAN	72.8	SIT H	35.8
BIACROM D	12.8	HIP B SIT	14.7	BUTPOP L	18.7	HAND L	7.9	HAND B	3.7
HEAD C	23.1	HEAD L	8.3	HEAD B	6.3	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.5	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 4 AGE 30.6 STATURE 66.9 WEIGHT 161.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	365+01	451+01	295+02	106+03	938+02	106+02
2 STANDING, ARMS OVER HEAD	364+01	451+01	275+02	135+03	120+03	115+02
3 SPREAD EAGLE	340+01	451+01	276+02	129+03	955+02	343+02
4 SITTING	785+01	451+01	259+02	613+02	613+02	309+02
5 SITTING, FOREARMS DOWN	767+01	451+01	262+02	645+02	624+02	312+02
6 SITTING, THIGHS ELEVATED	712+01	451+01	230+02	388+02	394+02	250+02
7 MERCURY CONFIGURATION	762+01	451+01	264+02	660+02	698+02	314+02
8 RELAXED (WEIGHTLESS)	676+01	451+01	268+02	864+02	813+02	321+02

CERVIC H	56.3	SHLDR H	55.6	SUPSTERN H	54.5	SUBSTERN H	47.8	WAIST H	42.2
ILIAC H	36.6	TROCHAN H	33.5	TIBIALE H	18.0	UPARM L	12.8	LOWARM L	9.8
CHEST D	9.3	WAIST D	8.3	BUTT D	10.5	CHEST B	13.3	WAIST B	11.6
HIP B	13.8	AXILARM C	13.6	BICEP C	11.7	ELBOW C	10.4	FOREARM C	10.5
WRIST C	6.7	FIST C	11.2	CHEST C	38.5	WAIST C	32.3	BUTT C	39.1
THIGH C	25.6	LOWTHIGH C	15.9	KNEE C	15.2	CALF C	15.2	ANKLE C	8.7
SPHYRI H	3.0	FOOT L	9.6	FOOT B	3.5	SPAN	65.7	SIT H	35.6
BIACROM D	11.1	HIP B SIT	14.4	BUTPOP L	18.9	HAND L	7.0	HAND B	3.3
HEAD C	22.2	HEAD L	7.7	HEAD B	6.2	MALX S	0.7	JUXTA S	0.5
TRICEP S	0.8	BISPIN B	9.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 5 AGE 30.1 STATURE 67.6 WEIGHT 169.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	328+01	522+01	310+02	113+03	103+03	112+02
2 STANDING, ARMS OVER HEAD	319+01	522+01	287+02	147+03	135+03	110+02
3 SPREAD EAGLE	310+01	522+01	285+02	145+03	117+03	376+02
4 SITTING	791+01	522+01	266+02	595+02	680+02	355+02
5 SITTING, FOREARMS DOWN	764+01	522+01	270+02	601+02	607+02	357+02
6 SITTING, THIGHS ELEVATED	724+01	522+01	235+02	388+02	352+02	282+02
7 MERCURY CONFIGURATION	789+01	522+01	273+02	622+02	746+02	359+02
8 RELAXED (WEIGHTLESS)	696+01	522+01	279+02	892+02	906+02	348+02

CERVIC H	58.2	SHLDR H	55.8	SUPSTERN H	55.0	SUBSTERN H	48.3	WAIST H	44.2
ILIAC H	38.5	TROCHAN H	37.2	TIBIALE H	17.6	UPARM L	12.5	LOWARM L	10.4
CHEST D	8.8	WAIST D	9.1	BUTT D	9.6	CHEST B	12.9	WAIST B	11.7
HIP B	14.0	AXILARM C	12.6	BICEP C	12.0	ELBOW C	10.2	FOREARM C	10.6
WRIST C	6.9	FIST C	11.6	CHEST C	36.8	WAIST C	32.6	BUTT C	39.8
THIGH C	23.2	LOWTHIGH C	17.0	KNEE C	14.6	CALF C	15.3	ANKLE C	9.1
SPHYRI H	2.7	FOOT L	10.6	FOOT B	4.1	SPAN	71.2	SIT H	35.2
BIACROM D	13.2	HIP B SIT	15.0	BUTPOP L	18.8	HAND L	7.5	HAND B	3.5
HEAD C	23.1	HEAD L	8.3	HEAD B	6.2	MALX S	0.4	JUXTA S	0.6
TRICEP S	0.7	BISPIN B	10.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 6 AGE 33.1 STATURE 71.5 WEIGHT 203.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	381+01	561+01	318+02	144+03	129+03	142+02
2 STANDING, ARMS OVER HEAD	367+01	561+01	294+02	188+03	172+03	138+02
3 SPREAD EAGLE	356+01	561+01	295+02	187+03	142+03	510+02
4 SITTING	855+01	561+01	273+02	699+02	795+02	449+02
5 SITTING, FOREARMS DOWN	829+01	561+01	276+02	712+02	802+02	448+02
6 SITTING, THIGHS ELEVATED	775+01	561+01	234+02	489+02	419+02	367+02
7 MERCURY CONFIGURATION	858+01	561+01	280+02	777+02	932+02	469+02
8 RELAXED (WEIGHTLESS)	765+01	561+01	280+02	113+03	109+03	427+02

CERVIC H	61.5	SHLDR H	59.3	SUPSTERN H	58.4	SUBSTERN H	51.1	WAIST H	46.4
ILIAC H	40.2	TROCHAN H	39.3	TIBIALE H	20.3	UPARM L	14.5	LOWARM L	11.1
CHEST D	10.8	WAIST D	9.8	BUTT D	11.4	CHEST B	14.0	WAIST B	12.8
HIP B	14.5	AXILARM C	13.6	BICEP C	12.4	ELBOW C	11.0	FOREARM C	11.6
WRIST C	7.0	FIST C	11.8	CHEST C	41.1	WAIST C	36.5	BUTT C	41.1
THIGH C	23.6	LOWTHIGH C	18.9	KNEE C	16.7	CALF C	17.3	ANKLE C	9.9
SPHYRI H	2.5	FOOT L	11.0	FOOT B	4.1	SPAN	73.0	SIT H	36.2
BIACROM D	12.4	HIP B SIT	16.5	BUTPOP L	20.0	HAND L	7.8	HAND B	3.7
HEAD C	23.4	HEAD L	8.1	HEAD B	6.4	MALX S	0.9	JUXTA S	0.6
TRICEP S	0.8	BISPIN B	11.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 7 AGE 22.9 STATURE 67.4 WEIGHT 147.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	350+01	425+01	298+02	956+02	819+02	103+02
2 STANDING, ARMS OVER HEAD	349+01	425+01	275+02	126+03	110+03	102+02
3 SPREAD EAGLE	318+01	425+01	272+02	125+03	903+02	299+02
4 SITTING	764+01	425+01	246+02	501+02	538+02	275+02
5 SITTING, FOREARMS DOWN	739+01	425+01	248+02	500+02	543+02	265+02
6 SITTING, THIGHS ELEVATED	703+01	425+01	217+02	329+02	304+02	215+02
7 MERCURY CONFIGURATION	757+01	425+01	250+02	570+02	673+02	272+02
8 RELAXED (WEIGHTLESS)	665+01	425+01	258+02	823+02	798+02	310+02

CERVIC H	57.9	SHLDR H	56.3	SUPSTERN H	54.5	SUBSTERN H	48.5	WAIST H	43.7
ILIAC H	38.2	TROCHAN H	36.5	TIBIALE H	19.2	UPARM L	14.0	LOWARM L	10.6
CHEST D	9.5	WAIST D	8.7	BUTT D	9.7	CHEST B	12.6	WAIST B	10.9
HIP B	13.3	AXILARM C	12.0	BICEP C	10.8	ELBOW C	11.7	FOREARM C	10.9
WRIST C	6.1	FIST C	11.3	CHEST C	37.6	WAIST C	31.3	BUTT C	37.4
THIGH C	21.3	LOWTHIGH C	14.9	KNEE C	14.1	CALF C	13.8	ANKLE C	8.0
SPHYRI H	2.7	FOOT L	10.5	FOOT B	3.5	SPAN	70.8	SIT H	33.9
BIACROM D	12.5	HIP B SIT	13.5	BUTPOP L	18.7	HAND L	7.8	HAND B	3.1
HEAD C	22.8	HEAD L	8.0	HEAD B	6.5	MALX S	0.2	JUXTA S	0.2
TRICEP S	0.2	BISPIN B	8.5						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 8 AGE 34.1 STATURE 72.6 WEIGHT 188.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	365+01	516+01	317+02	138+03	124+03	143+02
2 STANDING, ARMS OVER HEAD	360+01	516+01	291+02	186+03	173+03	135+02
3 SPREAD EAGLE	347+01	516+01	292+02	184+03	138+03	449+02
4 SITTING	820+01	516+01	276+02	731+02	745+02	388+02
5 SITTING, FOREARMS DOWN	800+01	516+01	278+02	733+02	780+02	406+02
6 SITTING, THIGHS ELEVATED	753+01	516+01	239+02	448+02	463+02	312+02
7 MERCURY CONFIGURATION	832+01	516+01	279+02	782+02	884+02	406+02
8 RELAXED (WEIGHTLESS)	741+01	516+01	282+02	106+03	996+02	444+02

CERVIC H	62.2	SHLDR H	60.7	SUPSTERN H	59.7	SUBSTERN H	51.5	WAIST H	46.5
ILIAC H	41.7	TROCHAN H	40.6	TIBIALE H	20.8	UPARM L	14.8	LOWARM L	11.7
CHEST D	10.5	WAIST D	10.0	BUTT D	10.2	CHEST B	14.4	WAIST B	12.9
HIP B	14.3	AXILARM C	13.7	BICEP C	12.5	ELBOW C	11.4	FOREARM C	11.6
WRIST C	11.5	FIST C	12.5	CHEST C	41.6	WAIST C	36.7	BUTT C	40.1
THIGH C	21.9	LOWTHIGH C	16.3	KNEE C	15.7	CALF C	14.4	ANKLE C	9.2
SPHYRI H	3.1	FOOT L	10.9	FOOT B	3.9	SPAN	75.3	SIT H	37.4
BIACROM D	13.0	HIP B SIT	15.5	BUTPOP L	19.4	HAND L	7.9	HAND B	3.8
HEAD C	22.7	HEAD L	8.0	HEAD B	6.3	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.6	BISPIN B	10.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 9 AGE 27.4 STATURE 67.6 WEIGHT 152.2

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	351+01	441+01	297+02	974+02	904+02	951+01
2 STANDING, ARMS OVER HEAD	352+01	441+01	275+02	130+03	120+03	833+01
3 SPREAD EAGLE	342+01	441+01	277+02	128+03	991+02	284+02
4 SITTING	768+01	441+01	275+02	438+02	562+02	292+02
5 SITTING, FOREARMS DOWN	772+01	441+01	278+02	580+02	593+02	295+02
6 SITTING, THIGHS ELEVATED	715+01	441+01	228+02	442+02	308+02	228+02
7 MERCURY CONFIGURATION	769+01	441+01	278+02	592+02	662+02	316+02
8 RELAXED (WEIGHTLESS)	688+01	441+01	267+02	848+02	823+02	306+02

CERVIC H	57.1	SHLDR H	55.7	SUPSTERN H	55.0	SUBSTERN H	47.7	WAIST H	42.5
ILIAC H	37.3	TROCHAN H	33.0	TIBIALE H	17.9	UPARM L	13.5	LOWARM L	10.6
CHEST D	9.4	WAIST D	7.7	BUTT D	9.3	CHEST B	12.1	WAIST B	10.9
HIP B	13.3	AXILARM C	12.3	BICEP C	11.0	ELBOW C	10.4	FOREARM C	10.5
WRIST C	6.4	FIST C	11.6	CHEST C	36.8	WAIST C	30.1	BUTT C	37.8
THIGH C	22.6	LOWTHIGH C	14.9	KNEE C	14.2	CALF C	14.4	ANKLE C	8.3
SPHYRI H	2.5	FOOT L	10.2	FOOT B	3.8	SPAN	69.5	SIT H	35.6
BIACROM D	11.2	HIP B SIT	14.1	BUTPOP L	19.1	HAND L	7.5	HAND B	3.4
HEAD C	22.8	HEAD L	8.2	HEAD B	6.1	MALX S	0.4	JUXTA S	0.4
TRICEP S	0.5	BISPIN B	8.8						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 10 AGE 48.6 STATURE 67.9 WEIGHT 197.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	389+01	504+01	302+02	128+03	119+03	157+02
2 STANDING, ARMS OVER HEAD	370+01	504+01	278+02	168+03	154+03	141+02
3 SPREAD EAGLE	366+01	504+01	278+02	171+03	131+03	429+02
4 SITTING	781+01	504+01	264+02	735+02	757+02	372+02
5 SITTING, FOREARMS DOWN	759+01	504+01	265+02	726+02	809+02	375+02
6 SITTING, THIGHS ELEVATED	774+01	504+01	225+02	479+02	503+02	339+02
7 MERCURY CONFIGURATION	782+01	504+01	269+02	799+02	876+02	390+02
8 RELAXED (WEIGHTLESS)	714+01	504+01	268+02	110+03	990+02	401+02

CERVIC H	58.2	SHLDR H	56.5	SUPSTERN H	55.0	SUBSTERN H	46.9	WAIST H	43.7
ILIAC H	37.3	TROCHAN H	36.0	TIBIALE H	19.0	UPARM L	14.0	LOWARM L	10.5
CHEST D	10.4	WAIST D	11.2	BUTT D	11.4	CHEST B	14.5	WAIST B	12.9
HIP B	14.8	AXILARM C	14.8	BICEP C	13.0	ELBOW C	12.0	FOREARM C	12.7
WRIST C	7.8	FIST C	12.3	CHEST C	42.7	WAIST C	37.9	BUTT C	42.3
THIGH C	24.1	LOWTHIGH C	17.6	KNEE C	16.9	CALF C	16.3	ANKLE C	11.6
SPHYRI H	3.0	FOOT L	10.9	FOOT B	3.9	SPAN	72.1	SIT H	35.6
BIACROM D	13.1	HIP B SIT	16.3	BUTPOP L	19.1	HAND L	7.8	HAND B	3.8
HEAD C	22.1	HEAD L	8.3	HEAD B	5.9	MALX S	0.8	JUXTA S	0.6
TRICEP S	1.1	BISPIN B	10.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 11 AGE 33.5 STATURE 62.7 WEIGHT 132.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	341+01	480+01	277+02	761+02	666+02	791+01
2 STANDING, ARMS OVER HEAD	371+01	480+01	253+02	101+03	914+02	939+01
3 SPREAD EAGLE	317+01	480+01	256+02	963+02	716+02	250+02
4 SITTING	719+01	480+01	245+02	453+02	479+02	219+02
5 SITTING, FOREARMS DOWN	695+01	480+01	247+02	473+02	504+02	224+02
6 SITTING, THIGHS ELEVATED	648+01	480+01	219+02	295+02	293+02	169+02
7 MERCURY CONFIGURATION	719+01	480+01	251+02	472+02	500+02	234+02
8 RELAXED (WEIGHTLESS)	675+01	480+01	254+02	674+02	633+02	250+02

CERVIC H	53.4	SHLDR H	51.7	SUPSTERN H	51.2	SUBSTERN H	43.1	WAIST H	39.6
ILIAC H	34.4	TROCHAN H	32.7	TIBIALE H	17.5	UPARM L	12.2	LOWARM L	9.8
CHEST D	8.6	WAIST D	7.8	BUTT D	9.8	CHEST B	11.6	WAIST B	10.7
HIP B	13.2	AXILARM C	12.2	BICEP C	11.3	ELBOW C	10.2	FOREARM C	10.4
WRIST C	6.3	FIST C	11.1	CHEST C	34.3	WAIST C	29.5	BUTT C	36.0
THIGH C	20.9	LOWTHIGH C	15.0	KNEE C	14.1	CALF C	13.4	ANKLE C	8.1
SPHYRI H	2.9	FOOT L	9.1	FOOT B	3.7	SPAN	64.8	SIT H	33.3
BIACROM D	12.0	HIP B SIT	13.9	BUTPOP L	16.6	HAND L	7.0	HAND B	3.1
HEAD C	21.7	HEAD L	7.5	HEAD B	6.3	MALX S	0.7	JUXTA S	0.9
TRICEP S	0.9	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 12 AGE 29.8 STATURE 69.7 WEIGHT 149.0

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	335+01	455+01	311+02	103+03	997+02	964+01
2 STANDING, ARMS OVER HEAD	332+01	455+01	288+02	138+03	125+03	993+01
3 SPREAD EAGLE	326+01	455+01	283+02	135+03	994+02	323+02
4 SITTING	788+01	455+01	265+02	538+02	559+02	303+02
5 SITTING, FOREARMS DOWN	771+01	455+01	267+02	545+02	636+02	312+02
6 SITTING, THIGHS ELEVATED	719+01	455+01	232+02	346+02	376+02	228+02
7 MERCURY CONFIGURATION	791+01	455+01	271+02	591+02	643+02	307+02
8 RELAXED (WEIGHTLESS)	767+01	455+01	274+02	827+02	758+02	324+02

CERVIC H	59.9	SHLDR H	58.8	SUPSTERN H	57.2	SUBSTERN H	50.2	WAIST H	44.4
ILIAC H	39.6	TROCHAN H	37.3	TIBIALE H	19.3	UPARM L	13.7	LOWARM L	10.8
CHEST D	9.3	WAIST D	8.1	BUTT D	9.6	CHEST B	13.4	WAIST B	11.4
HIP B	13.4	AXILARM C	11.9	BICEP C	10.8	ELBOW C	10.4	FOREARM C	10.4
WRIST C	6.3	FIST C	10.9	CHEST C	38.2	WAIST C	31.6	BUTT C	37.4
THIGH C	21.3	LOWTHIGH C	15.0	KNEE C	14.3	CALF C	13.3	ANKLE C	7.7
SPHYRI H	2.6	FOOT L	10.1	FOOT B	3.9	SPAN	70.2	SIT H	35.9
BIACROM D	11.5	HIP B SIT	13.9	BUTPOP L	19.1	HAND L	7.5	HAND B	3.4
HEAD C	22.8	HEAD L	8.2	HEAD B	6.3	MALX S	0.3	JUXTA S	0.3
TRICEP S	0.4	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 13 AGE 42.4 STATURE 64.6 WEIGHT 133.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	343+01	480+01	283+02	926+02	785+02	824+01
2 STANDING, ARMS OVER HEAD	341+01	480+01	267+02	109+03	873+02	972+01
3 SPREAD EAGLE	329+01	480+01	258+02	107+03	906+02	239+02
4 SITTING	763+01	480+01	242+02	426+02	523+02	241+02
5 SITTING, FOREARMS DOWN	742+01	480+01	250+02	446+02	407+02	243+02
6 SITTING, THIGHS ELEVATED	674+01	480+01	215+02	277+02	314+02	175+02
7 MERCURY CONFIGURATION	756+01	430+01	250+02	463+02	500+02	251+02
8 RELAXED (WEIGHTLESS)	719+01	480+01	255+02	698+02	663+02	279+02

CERVIC H	55.2	SHLDR H	53.5	SUPSTERN H	52.7	SUBSTERN H	45.4	WAIST H	41.4
ILIAC H	37.2	TROCHAN H	36.0	TIBIALE H	18.4	UPARM L	13.3	LOWARM L	9.7
CHEST D	9.1	WAIST D	8.7	BUTT D	9.5	CHEST B	12.2	WAIST B	10.6
HIP B	13.5	AXILARM C	11.1	BICEP C	10.6	ELBOW C	9.6	FOREARM C	9.8
WRIST C	6.3	FIST C	10.9	CHEST C	35.9	WAIST C	31.0	BUTT C	36.9
THIGH C	20.2	LOWTHIGH C	14.8	KNEE C	14.7	CALF C	13.7	ANKLE C	8.1
SPHYRI H	2.7	FOOT L	9.7	FOOT B	3.5	SPAN	67.8	SIT H	33.7
BIACROM D	12.6	HIP B SIT	13.9	BUTPOP L	18.0	HAND L	7.0	HAND B	3.2
HEAD C	22.0	HEAD L	7.9	HEAD B	5.9	MALX S	0.5	JUXTA S	0.4
TRICEP S	0.6	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 14 AGE 36.2 STATURE 68.1 WEIGHT 146.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	325+01	407+01	304+02	960+02	892+02	941+01
2 STANDING, ARMS OVER HEAD	335+01	407+01	280+02	127+03	119+03	990+01
3 SPREAD EAGLE	310+01	407+01	271+02	126+03	913+02	290+02
4 SITTING	760+01	407+01	259+02	535+02	576+02	289+02
5 SITTING, FOREARMS DOWN	741+01	407+01	262+02	575+02	572+02	290+02
6 SITTING, THIGHS ELEVATED	687+01	407+01	221+02	311+02	335+02	230+02
7 MERCURY CONFIGURATION	763+01	407+01	262+02	571+02	666+02	304+02
8 RELAXED (WEIGHTLESS)	719+01	407+01	267+02	791+02	782+02	296+02

CERVIC H	57.9	SHLDR H	56.2	SUPSTERN H	55.6	SUBSTERN H	49.0	WAIST H	43.0
ILIAC H	38.7	TROCHAN H	38.1	TIBIALE H	19.3	UPARM L	14.0	LOWARM L	10.7
CHEST D	9.7	WAIST D	9.3	BUTT D	9.9	CHEST B	12.6	WAIST B	11.2
HIP B	13.1	AXILARM C	12.2	BICEP C	11.4	ELBOW C	10.4	FOREARM C	10.6
WRIST C	6.5	FIST C	10.8	CHEST C	37.4	WAIST C	32.7	BUTT C	37.2
THIGH C	20.9	LOWTHIGH C	15.4	KNEE C	14.2	CALF C	14.0	ANKLE C	8.5
SPHYRI H	2.6	FOOT L	10.5	FOOT B	3.6	SPAN	70.2	SIT H	35.5
BIACROM D	12.2	HIP B SIT	14.2	BUTPOP L	18.6	HAND L	7.4	HAND B	3.3
HEAD C	22.0	HEAD L	7.8	HEAD B	6.1	MALX S	0.5	JUXTA S	0.6
TRICEP S	0.4	BISPIN B	8.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 15 AGE 30.5 STATURE 72.6 WEIGHT 172.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	331+01	459+01	322+02	134+03	122+03	118+02
2 STANDING, ARMS OVER HEAD	323+01	459+01	298+02	173+03	155+03	111+02
3 SPREAD EAGLE	313+01	459+01	290+02	175+03	132+03	462+02
4 SITTING	817+01	459+01	275+02	749+02	820+02	378+02
5 SITTING, FOREARMS DOWN	784+01	459+01	278+02	726+02	797+02	373+02
6 SITTING, THIGHS ELEVATED	677+01	459+01	230+02	415+02	401+02	213+02
7 MERCURY CONFIGURATION	808+01	459+01	281+02	727+02	845+02	377+02
8 RELAXED (WEIGHTLESS)	768+01	459+01	275+02	100+03	102+03	403+02

CERVIC H	62.5	SHLDR H	61.1	SUPSTERN H	59.9	SUBSTERN H	50.8	WAIST H	47.4
ILIAC H	41.7	TROCHAN H	39.1	TIBIALE H	20.4	UPARM L	14.2	LOWARM L	11.1
CHEST D	9.6	WAIST D	8.9	BUTT D	10.2	CHEST B	13.3	WAIST B	11.7
HIP B	13.4	AXILARM C	12.2	BICEP C	11.3	ELBOW C	10.4	FOREARM C	10.6
WRIST C	6.8	FIST C	12.1	CHEST C	39.1	WAIST C	33.0	BUTT C	37.8
THIGH C	20.9	LOWTHIGH C	14.9	KNEE C	14.9	CALF C	15.2	ANKLE C	8.7
SPHYRI H	2.4	FOOT L	11.5	FOOT B	3.9	SPAN	74.2	SIT H	36.6
BIACROM D	12.9	HIP B SIT	14.7	BUTPOP L	19.9	HAND L	7.6	HAND B	3.6
HEAD C	23.5	HEAD L	8.7	HEAD B	6.1	MALX S	0.5	JUXTA S	0.6
TRICEP S	0.7	BISPIN B	9.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 16 AGE 39.9 STATURE 67.4 WEIGHT 159.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	338+01	470+01	305+02	103+03	884+02	106+02
2 STANDING, ARMS OVER HEAD	356+01	470+01	282+02	136+03	119+03	105+02
3 SPREAD EAGLE	342+01	470+01	281+02	133+03	974+02	312+02
4 SITTING	771+01	470+01	264+02	541+02	649+02	295+02
5 SITTING, FOREARMS DOWN	750+01	470+01	266+02	595+02	668+02	298+02
6 SITTING, THIGHS ELEVATED	714+01	470+01	229+02	350+02	405+02	239+02
7 MERCURY CONFIGURATION	772+01	470+01	272+02	601+02	691+02	306+02
8 RELAXED (WEIGHTLESS)	723+01	470+01	273+02	823+02	791+02	323+02

CERVIC H	58.0	SHLDR H	56.9	SUPSTERN H	55.6	SUBSTERN H	47.3	WAIST H	43.5
ILIAC H	37.3	TROCHAN H	34.8	TIBIALE H	18.9	UPARM L	13.3	LOWARM L	10.0
CHEST D	9.7	WAIST D	8.7	BUTT D	10.6	CHEST B	13.0	WAIST B	11.9
HIP B	13.3	AXILARM C	12.2	BICEP C	11.8	ELBOW C	10.4	FOREARM C	11.0
WRIST C	6.6	FIST C	11.5	CHEST C	37.6	WAIST C	33.1	BUTT C	38.9
THIGH C	22.6	LOWTHIGH C	15.2	KNEE C	15.3	CALF C	14.6	ANKLE C	8.7
SPHYRI H	2.8	FOOT L	9.8	FOOT B	35.8	SPAN	67.6	SIT H	35.7
BIACROM D	12.0	HIP B SIT	14.3	BUTPOP L	18.3	HAND L	7.2	HAND B	3.4
HEAD C	22.2	HEAD L	8.0	HEAD B	6.2	MALX S	0.5	JUXTA S	0.5
TRICEP S	0.7	BISPIN B	9.4						

(WEIGHT IN LBS, LENG H IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 17 AGE 27.6 STATURE 69.1 WEIGHT 203.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	375+01	565+01	315+02	139+03	122+03	156+02
2 STANDING, ARMS OVER HEAD	372+01	565+01	291+02	183+03	164+03	149+02
3 SPREAD EAGLE	356+01	565+01	291+02	181+03	140+03	486+02
4 SITTING	827+01	565+01	255+02	782+02	818+02	424+02
5 SITTING, FOREARMS DOWN	809+01	565+01	255+02	769+02	885+02	433+02
6 SITTING, THIGHS ELEVATED	755+01	565+01	232+02	444+02	472+02	336+02
7 MERCURY CONFIGURATION	811+01	565+01	271+02	815+02	911+02	422+02
8 RELAXED (WEIGHTLESS)	730+01	565+01	281+02	111+03	111+03	447+02

CERVIC H	59.1	SHLDR H	57.4	SUPSTERN H	56.3	SUBSTERN H	48.6	WAIST H	45.2
ILIAC H	42.5	TROCHAN H	35.7	TIBIALE H	18.8	UPARM L	13.7	LOWARM L	10.4
CHEST D	10.4	WAIST D	10.4	BUTT D	10.4	CHEST B	13.9	WAIST B	13.0
HIP B	15.1	AXILARM C	14.1	BICEP C	12.7	ELBOW C	11.0	FOREARM C	11.2
WRIST C	7.5	FIST C	12.2	CHEST C	42.6	WAIST C	37.6	BUTT C	43.3
THIGH C	24.7	LOWTHIGH C	18.4	KNEE C	16.8	CALF C	16.7	ANKLE C	10.0
SPHYRI H	2.6	FOOT L	10.9	FOOT B	3.9	SPAN	70.1	SIT H	34.1
BIACROM D	12.9	HIP B SIT	16.5	BUTPOP L	19.9	HAND L	7.5	HAND B	3.3
HEAD C	22.9	HEAD L	7.8	HEAD B	6.0	MALX S	1.1	JUXTA S	1.0
TRICEP S	1.4	BISPIN B	11.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 18 AGE 43.6 STATURE 71.2 WEIGHT 185.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	371+01	543+01	314+02	118+03	958+02	108+02
2 STANDING, ARMS OVER HEAD	363+01	543+01	291+02	156+03	133+03	996+01
3 SPREAD EAGLE	368+01	543+01	289+02	163+03	118+03	360+02
4 SITTING	779+01	543+01	267+02	708+02	628+02	362+02
5 SITTING, FOREARMS DOWN	769+01	543+01	273+02	731+02	603+02	385+02
6 SITTING, THIGHS ELEVATED	746+01	543+01	230+02	434+02	333+02	303+02
7 MERCURY CONFIGURATION	775+01	543+01	274+02	727+02	730+02	369+02
8 RELAXED (WEIGHTLESS)	675+01	543+01	287+02	993+02	908+02	365+02

CERVIC H	61.4	SHLDR H	59.3	SUPSTERN H	58.6	SUBSTERN H	50.2	WAIST H	46.8
ILIAC H	40.4	TROCHAN H	36.0	TIBIALE H	17.8	UPARM L	14.1	LOWARM L	10.7
CHEST D	10.2	WAIST D	11.4	BUTT D	10.4	CHEST B	14.3	WAIST B	13.3
HIP B	14.5	AXILARM C	14.1	BICEP C	12.0	ELBOW C	10.5	FOREARM C	10.5
WRIST C	6.5	FIST C	11.4	CHEST C	42.2	WAIST C	42.5	BUTT C	40.8
THIGH C	23.6	LOWTHIGH C	15.9	KNEE C	15.8	CALF C	15.1	ANKLE C	8.9
SPHYRI H	2.4	FOOT L	10.4	FOOT B	3.7	SPAN	70.5	SIT H	37.3
BIACROM D	12.8	HIP B SIT	15.7	BUTPOP L	17.8	HAND L	7.0	HAND B	3.1
HEAD C	23.5	HEAD L	8.0	HEAD B	6.6	MALX S	0.9	JUXTA S	1.2
TRICEP S	1.2	BISPIN B	10.9						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 19 AGE 30.6 STATURE 67.6 WEIGHT 138.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	313+01	472+01	304+02	909+02	810+02	842+01
2 STANDING, ARMS OVER HEAD	312+01	472+01	283+02	121+03	108+03	940+01
3 SPREAD EAGLE	294+01	472+01	281+02	117+03	841+02	260+02
4 SITTING	746+01	472+01	261+02	452+02	552+02	251+02
5 SITTING, FOREARMS DOWN	725+01	472+01	265+02	519+02	561+02	256+02
6 SITTING, THIGHS ELEVATED	680+01	472+01	233+02	305+02	328+02	190+02
7 MERCURY CONFIGURATION	760+01	472+01	279+02	544+02	448+02	259+02
8 RELAXED (WEIGHTLESS)	729+01	472+01	272+02	739+02	714+02	275+02

CERVIC H	57.9	SHLDR H	56.4	SUPSTERN H	54.9	SUBSTERN H	47.5	WAIST H	43.0
ILIAC H	37.4	TROCHAN H	35.5	TIBIALE H	17.5	UPARM L	13.5	LOWARM L	10.2
CHEST D	9.1	WAIST D	7.9	BUTT D	8.7	CHEST B	12.4	WAIST B	10.4
HIP B	13.0	AXILARM C	11.8	BICEP C	11.1	ELBOW C	9.8	FOREARM C	10.4
WRIST C	6.4	FIST C	11.6	CHEST C	35.0	WAIST C	28.9	BUTT C	35.3
THIGH C	20.6	LOWTHIGH C	15.4	KNEE C	14.1	CALF C	14.0	ANKLE C	8.3
SPHYRI H	2.8	FOOT L	10.0	FOOT B	3.9	SPAN	68.1	SIT H	35.7
BIACROM D	12.6	H P B SIT	14.4	BUTPOP L	18.2	HAND L	7.2	HAND B	3.3
HEAD C	21.3	HEAD L	7.4	HEAD B	6.1	MALX S	0.3	JUXTA S	0.4
TRICEP S	0.6	BISPIN B	9.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 20 AGE 33.0 STATURE 71.3 WEIGHT 142.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	328+01	480+01	316+02	112+03	963+02	951+01
2 STANDING, ARMS OVER HEAD	321+01	480+01	288+02	148+03	136+03	865+01
3 SPREAD EAGLE	310+01	480+01	290+02	145+03	108+03	352+02
4 SITTING	806+01	480+01	265+02	478+02	633+02	297+02
5 SITTING, FOREARMS DOWN	780+01	480+01	267+02	553+02	683+02	301+02
6 SITTING, THIGHS ELEVATED	732+01	480+01	229+02	373+02	343+02	229+02
7 MERCURY CONFIGURATION	814+01	480+01	271+02	641+02	680+02	307+02
8 RELAXED (WEIGHTLESS)	728+01	480+01	273+02	830+02	777+02	321+02

CERVIC H	61.3	SHLDR H	60.1	SUPSTERN H	57.5	SUBSTERN H	52.2	WAIST H	45.2
ILIAC H	41.4	TROCHAN H	40.6	TIBIALE H	20.3	UPARM L	14.3	LOWARM L	10.9
CHEST D	8.6	WAIST D	7.4	BUTT D	8.4	CHEST B	11.8	WAIST B	10.9
HIP B	13.1	AXILARM C	10.9	BICEP C	10.4	ELBOW C	10.2	FOREARM C	10.2
WRIST C	6.9	FIST C	11.1	CHEST C	35.2	WAIST C	29.8	BUTT C	35.0
THIGH C	19.3	LOWTHIGH C	14.2	KNEE C	14.3	CALF C	13.4	ANKLE C	8.4
SPHYRI H	3.1	FOOT L	10.4	FOOT B	3.9	SPAN	74.8	SIT H	35.3
BIACROM D	13.4	HIP B SIT	14.0	BUTPOP L	19.9	HAND L	7.7	HAND B	3.2
HEAD C	22.8	HEAD L	8.1	HEAD B	6.3	MALX S	0.3	JUXTA S	0.2
TRICEP S	0.6	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 21 AGE 35.6 STATURE 72.3 WEIGHT 210.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	392+01	504+01	312+02	145+03	130+03	168+02
2 STANDING, ARMS OVER HEAD	371+01	504+01	293+02	191+03	170+03	138+02
3 SPREAD EAGLE	350+01	504+01	288+02	187+03	153+03	470+02
4 SITTING	828+01	504+01	272+02	789+02	809+02	436+02
5 SITTING, FOREARMS DOWN	804+01	504+01	273+02	817+02	920+02	442+02
6 SITTING, THIGHS ELEVATED	767+01	504+01	231+02	466+02	396+02	334+02
7 MERCURY CONFIGURATION	799+01	504+01	278+02	871+02	895+02	420+02
8 RELAXED (WEIGHTLESS)	728+01	504+01	277+02	117+03	108+03	447+02

CERVIC H	62.4	SHLDR H	60.9	SUPSTERN H	60.0	SUBSTERN H	50.7	WAIST H	50.0
ILIAC H	40.6	TROCHAN H	38.5	TIBIALE H	20.5	UPARM L	14.0	LOWARM L	11.1
CHEST D	10.4	WAIST D	10.9	BUTT D	10.5	CHEST B	15.6	WAIST B	13.2
HIP B	15.5	AXILARM C	13.2	BICEP C	11.9	ELBOW C	11.0	FOREARM C	11.5
WRIST C	7.1	FIST C	11.6	CHEST C	43.4	WAIST C	38.9	BUTT C	38.9
THIGH C	24.7	LOWTHIGH C	17.2	KNEE C	16.4	CALF C	16.4	ANKLE C	11.8
SPHYRI H	3.2	FOOT L	10.4	FOOT B	3.9	SPAN	73.9	SIT H	36.8
BIACROM D	14.3	HIP B SIT	16.3	BUTPOP L	20.0	HAND L	7.8	HAND B	3.2
HEAD C	23.3	HEAD L	8.4	HEAD B	6.3	MALX S	0.9	JUXTA S	1.1
TRICEP S	0.9	BISPIN B	10.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 22 AGE 39.4 STATURE 71.6 WEIGHT 173.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	339+01	455+01	315+02	127+03	113+03	117+02
2 STANDING, ARMS OVER HEAD	348+01	455+01	286+02	168+03	150+03	126+02
3 SPREAD EAGLE	322+01	455+01	275+02	171+03	134+03	411+02
4 SITTING	841+01	455+01	271+02	661+02	700+02	385+02
5 SITTING, FOREARMS DOWN	816+01	455+01	275+02	562+02	712+02	403+02
6 SITTING, THIGHS ELEVATED	765+01	455+01	233+02	411+02	413+02	305+02
7 MERCURY CONFIGURATION	830+01	455+01	275+02	613+02	797+02	400+02
8 RELAXED (WEIGHTLESS)	777+01	455+01	277+02	976+02	887+02	403+02

CERVIC H	61.4	SHLDR H	59.1	SUPSTERN H	59.0	SUBSTERN H	50.3	WAIST H	43.7
ILIAC H	40.9	TROCHAN H	39.1	TIBIALE H	19.8	UPARM L	15.0	LOWARM L	11.7
CHEST D	9.3	WAIST D	8.5	BUTT D	10.2	CHEST B	13.7	WAIST B	11.7
HIP B	13.8	AXILARM C	12.4	BICEP C	11.7	ELBOW C	11.4	FOREARM C	11.3
WRIST C	7.1	FIST C	11.6	CHEST C	41.3	WAIST C	32.7	BUTT C	38.9
THIGH C	21.6	LOWTHIGH C	16.5	KNEE C	15.8	CALF C	14.3	ANKLE C	8.8
SPHYRI H	2.5	FOOT L	11.1	FOOT B	3.8	SPAN	76.8	SIT H	36.3
BIACROM D	14.4	HIP B SIT	14.7	BUTPOP L	20.1	HAND L	7.8	HAND B	3.3
HEAD C	22.9	HEAD L	8.1	HEAD B	6.1	MALX S	0.6	JUXTA S	0.5
TRICEP S	0.9	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 23 AGE 36.1 STATURE 73.0 WEIGHT 172.2

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	348+01	541+01	322+02	128+03	114+03	118+02
2 STANDING, ARMS OVER HEAD	336+01	541+01	294+02	168+03	153+03	109+02
3 SPREAD EAGLE	327+01	541+01	295+02	172+03	127+03	410+02
4 SITTING	816+01	541+01	281+02	592+02	655+02	338+02
5 SITTING, FOREARMS DOWN	784+01	541+01	283+02	562+02	672+02	344+02
6 SITTING, THIGHS ELEVATED	719+01	541+01	234+02	334+02	316+02	238+02
7 MERCURY CONFIGURATION	777+01	541+01	283+02	657+02	783+02	328+02
8 RELAXED (WEIGHTLESS)	743+01	541+01	277+02	105+03	973+02	402+02

CERVIC H	62.7	SHLDR H	60.6	SUPSTERN H	59.8	SUBSTERN H	50.8	WAIST H	46.0
ILIAC H	40.7	TROCHAN H	39.2	TIBIALE H	20.6	UPARM L	13.7	LOWARM L	11.5
CHEST D	10.3	WAIST D	9.3	BUTT D	10.6	CHEST B	12.7	WAIST B	12.0
HIP B	14.2	AXILARM C	13.4	BICEP C	12.8	ELBOW C	11.2	FOREARM C	11.5
WRIST C	7.1	FIST C	12.4	CHEST C	37.8	WAIST C	34.1	BUTT C	39.8
THIGH C	21.7	LOWTHIGH C	15.4	KNEE C	15.4	CALF C	14.6	ANKLE C	8.5
SPHYRI H	2.7	FOOT L	11.6	FOOT B	3.9	SPAN	75.0	SIT H	37.2
BIACROM D	12.3	HIP B SIT	14.8	BUTPOP L	20.6	HAND L	8.6	HAND B	3.5
HEAD C	23.5	HEAD L	8.3	HEAD B	6.3	MALX S	0.6	JUXTA S	0.5
TRICEP S	0.7	BISPIN B	10.8						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 24 AGE 29.7 STATURE 67.7 WEIGHT 152.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	339+01	490+01	310+02	100+03	896+02	945+01
2 STANDING, ARMS OVER HEAD	342+01	490+01	287+02	130+03	118+03	974+01
3 SPREAD EAGLE	318+01	490+01	286+02	132+03	975+02	335+02
4 SITTING	795+01	490+01	263+02	548+02	606+02	309+02
5 SITTING, FOREARMS DOWN	770+01	490+01	267+02	560+02	603+02	311+02
6 SITTING, THIGHS ELEVATED	723+01	490+01	229+02	370+02	366+02	246+02
7 MERCURY CONFIGURATION	801+01	490+01	271+02	579+02	637+02	329+02
8 RELAXED (WEIGHTLESS)	732+01	490+01	268+02	799+02	757+02	328+02

CERVIC H	58.1	SHLDR H	55.5	SUPSTERN H	55.2	SUBSTERN H	45.9	WAIST H	43.3
ILIAC H	38.6	TROCHAN H	35.9	TIBIALE H	19.0	UPARM L	13.3	LOWARM L	10.2
CHEST D	8.3	WAIST D	8.6	BUTT D	9.8	CHEST B	12.2	WAIST B	11.7
HIP B	14.1	AXILARM C	11.5	BICEP C	11.5	ELBOW C	10.2	FOREARM C	10.6
WRIST C	6.3	FIST C	11.2	CHEST C	34.1	WAIST C	32.8	BUTT C	39.8
THIGH C	23.2	LOWTHIGH C	16.3	KNEE C	14.8	CALF C	13.9	ANKLE C	12.8
SPHYRI H	2.4	FOOT L	10.6	FOOT B	3.9	SPAN	69.8	SIT H	34.8
BIACROM D	13.3	HIP B SIT	15.5	BUTPOP L	18.4	HAND L	7.6	HAND B	3.5
HEAD C	21.3	HEAD L	7.3	HEAD B	6.0	MALX S	0.5	JUXTA S	0.6
TRICEP S	0.5	BISPIN B	9.8						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 25 AGE 37.6 STATURE 67.0 WEIGHT 153.0

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	337+01	465+01	304+02	994+02	866+02	100+02
2 STANDING, ARMS OVER HEAD	334+01	465+01	278+02	133+03	120+03	108+02
3 SPREAD EAGLE	316+01	465+01	278+02	131+03	995+02	311+02
4 SITTING	754+01	465+01	264+02	582+02	630+02	269+02
5 SITTING, FOREARMS DOWN	726+01	465+01	267+02	549+02	622+02	269+02
6 SITTING, THIGHS ELEVATED	677+01	465+01	230+02	358+02	357+02	210+02
7 MERCURY CONFIGURATION	765+01	465+01	273+02	639+02	686+02	290+02
8 RELAXED (WEIGHTLESS)	691+01	465+01	275+02	917+02	807+02	344+02

CERVIC H	57.2	SHLDR H	55.6	SUPSTERN H	55.0	SUBSTERN H	47.1	WAIST H	42.6
ILIAC H	37.8	TROCHAN H	33.9	TIBIALE H	18.4	UPARM L	13.7	LOWARM L	10.0
CHEST D	8.9	WAIST D	8.5	BUTT D	9.3	CHEST B	12.6	WAIST B	11.3
HIP B	13.5	AXILARM C	12.0	BICEP C	11.5	ELBOW C	10.2	FOREARM C	10.6
WRIST C	6.9	FIST C	11.4	CHEST C	36.6	WAIST C	31.9	BUTT C	38.9
THIGH C	22.4	LOWTHIGH C	15.6	KNEE C	15.0	CALF C	15.0	ANKLE C	8.6
SPHYRI H	2.8	FOOT L	10.0	FOOT B	3.7	SPAN	70.3	SIT H	35.3
BIACROM D	12.7	HIP B SIT	14.5	BUTPOP L	19.1	HAND L	7.4	HAND B	3.4
HEAD C	22.6	HEAD L	7.8	HEAD B	6.5	MALX S	0.5	JUXTA S	0.5
TRICEP S	0.6	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 26 AGE 19.4 STATURE 69.1 WEIGHT 139.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	325+01	469+01	310+02	101+03	908+02	841+01
2 STANDING, ARMS OVER HEAD	328+01	469+01	286+02	136+03	119+03	906+01
3 SPREAD EAGLE	334+01	469+01	286+02	134+03	998+02	304+02
4 SITTING	790+01	469+01	269+02	535+02	601+02	286+02
5 SITTING, FOREARMS DOWN	763+01	469+01	271+02	546+02	644+02	288+02
6 SITTING, THIGHS ELEVATED	713+01	469+01	231+02	322+02	342+02	239+02
7 MERCURY CONFIGURATION	775+01	469+01	277+02	606+02	688+02	283+02
8 RELAXED (WEIGHTLESS)	741+01	469+01	276+02	805+02	814+02	300+02

CERVIC H	59.2	SHLDR H	57.6	SUPSTERN H	55.8	SUBSTERN H	48.1	WAIST H	43.6
ILIAC H	38.4	TROCHAN H	35.1	TIBIALE H	18.5	UPARM L	13.3	LOWARM L	10.7
CHEST D	8.0	WAIST D	7.4	BUTT D	9.1	CHEST B	12.0	WAIST B	10.7
HIP B	12.8	AXILARM C	10.9	BICEP C	10.4	ELBOW C	10.4	FOREARM C	10.5
WRIST C	6.6	FIST C	11.8	CHEST C	34.3	WAIST C	28.9	BUTT C	36.3
THIGH C	19.8	LOWTHIGH C	13.9	KNEE C	14.1	CALF C	13.6	ANKLE C	8.6
SPHYRI H	2.9	FOOT L	11.0	FOOT B	3.9	SPAN	69.8	SIT H	36.1
BIACROM D	13.6	HIP B SIT	13.7	BUTPOP L	19.4	HAND L	7.5	HAND B	3.5
HEAD C	22.4	HEAD L	8.0	HEAD B	5.9	MALX S	0.2	JUXTA S	0.1
TRICEP S	0.2	BISPIN B	9.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 27 AGE 25.8 STATURE 69.9 WEIGHT 163.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	332+01	459+01	313+02	114+03	978+02	107+02
2 STANDING, ARMS OVER HEAD	333+01	459+01	289+02	157+03	140+03	102+02
3 SPREAD EAGLE	313+01	459+01	281+02	152+03	117+03	354+02
4 SITTING	761+01	459+01	273+02	706+02	741+02	330+02
5 SITTING, FOREARMS DOWN	748+01	459+01	277+02	684+02	714+02	329+02
6 SITTING, THIGHS ELEVATED	658+01	459+01	231+02	423+02	367+02	221+02
7 MERCURY CONFIGURATION	766+01	459+01	278+02	741+02	786+02	346+02
8 RELAXED (WEIGHTLESS)	706+01	459+01	277+02	988+02	899+02	379+02

CERVIC H	59.1	SHLDR H	57.3	SUPSTERN H	55.9	SUBSTERN H	47.6	WAIST H	43.5
ILIAC H	38.5	TROCHAN H	37.2	TIBIALE H	19.5	UPARM L	14.2	LOWARM L	10.6
CHEST D	9.7	WAIST D	8.1	BUTT D	10.0	CHEST B	12.9	WAIST B	11.8
HIP B	13.0	AXILARM C	12.6	BICEP C	11.4	ELBOW C	10.6	FOREARM C	11.4
WRIST C	7.6	FIST C	12.1	CHEST C	38.6	WAIST C	32.3	BUTT C	38.4
THIGH C	21.3	LOWTHIGH C	15.7	KNEE C	15.2	CALF C	15.1	ANKLE C	9.1
SPHYRI H	2.8	FOOT L	10.7	FOOT B	3.9	SPAN	72.4	SIT H	36.5
BIACROM D	13.6	HIP B SIT	14.7	BUTPOP L	18.6	HAND L	7.6	HAND B	3.8
HEAD C	22.1	HEAD L	7.6	HEAD B	6.5	MALX S	0.5	JUXTA S	0.6
TRICEP S	0.4	BISPIN B	9.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 28 AGE 36.6 STATURE 70.9 WEIGHT 189.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	395+01	516+01	310+02	131+03	131+03	136+02
2 STANDING, ARMS OVER HEAD	410+01	516+01	294+02	177+03	155+03	132+02
3 SPREAD EAGLE	369+01	516+01	291+02	174+03	128+03	464+02
4 SITTING	830+01	516+01	263+02	688+02	766+02	394+02
5 SITTING, FOREARMS DOWN	807+01	516+01	268+02	681+02	765+02	397+02
6 SITTING, THIGHS ELEVATED	775+01	516+01	230+02	463+02	468+02	330+02
7 MERCURY CONFIGURATION	812+01	516+01	271+02	706+02	859+02	390+02
8 RELAXED (WEIGHTLESS)	794+01	516+01	277+02	100+03	892+02	442+02

CERVIC H	61.9	SHLDR H	60.1	SUPSTERN H	58.2	SUBSTERN H	51.9	WAIST H	46.0
ILIAC H	41.4	TROCHAN H	38.9	TIBIALE H	20.2	UPARM L	14.8	LOWARM L	11.4
CHEST D	10.4	WAIST D	10.2	BUTT D	10.7	CHEST B	13.7	WAIST B	12.3
HIP B	14.4	AXILARM C	13.6	BICEP C	12.5	ELBOW C	11.2	FOREARM C	11.3
WRIST C	7.4	FIST C	12.2	CHEST C	40.8	WAIST C	35.8	BUTT C	40.4
THIGH C	23.1	LOWTHIGH C	16.5	KNEE C	15.8	CALF C	15.4	ANKLE C	8.9
SPHYRI H	2.9	FOOT L	10.4	FOOT B	4.2	SPAN	73.3	SIT H	36.0
BIACROM D	12.7	HIP B SIT	14.8	BUTPOP L	20.3	HAND L	7.8	HAND B	3.2
HEAD C	23.0	HEAD L	8.0	HEAD B	6.3	MALX S	0.8	JUXTA S	1.0
TRICEP S	1.1	BISPIN B	10.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 29 AGE 21.0 STATURE 74.1 WEIGHT 151.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	316+01	429+01	338+02	129+03	115+03	810+01
2 STANDING, ARMS OVER HEAD	317+01	429+01	312+02	174+03	157+03	833+01
3 SPREAD EAGLE	308+01	429+01	306+02	169+03	126+03	380+02
4 SITTING	822+01	429+01	289+02	743+02	773+02	319+02
5 SITTING, FOREARMS DOWN	797+01	429+01	294+02	718+02	740+02	328+02
6 SITTING, THIGHS ELEVATED	720+01	429+01	247+02	404+02	404+02	242+02
7 MERCURY CONFIGURATION	828+01	429+01	296+02	780+02	858+02	349+02
8 RELAXED (WEIGHTLESS)	737+01	429+01	300+02	984+02	995+02	373+02

CERVIC H	62.7	SHLDR H	62.2	SUPSTERN H	59.7	SUBSTERN H	52.3	WAIST H	47.6
ILIAC H	42.5	TROCHAN H	38.5	TIBIALE H	20.6	UPARM L	15.2	LOWARM L	11.9
CHEST D	8.4	WAIST D	7.1	BUTT D	9.0	CHEST B	12.0	WAIST B	9.6
HIP B	13.1	AXILARM C	11.7	BICEP C	10.7	ELBOW C	9.6	FOREARM C	10.0
WRIST C	7.1	FIST C	11.3	CHEST C	35.4	WAIST C	27.0	BUTT C	35.5
THIGH C	20.5	LOWTHIGH C	14.2	KNEE C	14.3	CALF C	14.8	ANKLE C	9.5
SPHYRI H	3.1	FOOT L	10.8	FOOT B	3.9	SPAN	74.4	SIT H	37.5
BIACROM D	10.3	HIP B SIT	13.0	BUTPOP L	20.9	HAND L	8.0	HAND B	3.7
HEAD C	22.4	HEAD L	8.0	HEAD B	6.0	MALX S	0.1	JUXTA S	0.1
TRICEP S	0.3	BISPIN B	8.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 30 AGE 26.3 STATURE 69.3 WEIGHT 157.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	334+01	500+01	308+02	108+03	929+02	967+01
2 STANDING, ARMS OVER HEAD	336+01	500+01	283+02	147+03	130+03	990+01
3 SPREAD EAGLE	335+01	500+01	282+02	138+03	108+03	310+02
4 SITTING	799+01	500+01	259+02	563+02	583+02	314+02
5 SITTING, FOREARMS DOWN	773+01	500+01	260+02	562+02	665+02	318+02
6 SITTING, THIGHS ELEVATED	725+01	500+01	225+02	356+02	367+02	250+02
7 MERCURY CONFIGURATION	803+01	500+01	263+02	614+02	698+02	329+02
8 RELAXED (WEIGHTLESS)	718+01	500+01	268+02	857+02	786+02	326+02

CERVIC H	58.7	SHLDR H	57.2	SUPSTERN H	55.7	SUBSTERN H	49.3	WAIST H	43.7
ILIAC H	38.8	TROCHAN H	35.9	TIBIALE H	19.4	UPARM L	13.4	LOWARM L	10.1
CHEST D	8.5	WAIST D	7.8	BUTT D	9.6	CHEST B	13.7	WAIST B	11.2
HIP B	13.6	AXILARM C	12.2	BICEP C	11.5	ELBOW C	10.4	FOREARM C	10.7
WRIST C	6.7	FIST C	11.2	CHEST C	37.5	WAIST C	31.1	BUTT C	37.6
THIGH C	22.2	LOWTHIGH C	15.4	KNEE C	15.0	CALF C	14.8	ANKLE C	8.9
SPHYRI H	2.6	FOOT L	10.3	FOOT B	3.9	SPAN	70.1	SIT H	35.3
BIACROM D	13.0	HIP B SIT	13.9	BUTPOP L	18.7	HAND L	7.6	HAND B	3.5
HEAD C	21.9	HEAD L	7.7	HEAD B	6.1	MALX S	0.3	JUXTA S	0.3
TRICEP S	0.3	BISPIN B	10.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 31 AGE 30.2 STATURE 68.8 WEIGHT 174.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	370+01	431+01	301+02	110+03	988+02	128+02
2 STANDING, ARMS OVER HEAD	363+01	431+01	279+02	141+03	131+03	118+02
3 SPREAD EAGLE	360+01	431+01	278+02	145+03	108+03	361+02
4 SITTING	787+01	431+01	264+02	606+02	625+02	332+02
5 SITTING, FOREARMS DOWN	761+01	431+01	265+02	674+02	681+02	328+02
6 SITTING, THIGHS ELEVATED	707+01	431+01	227+02	421+02	417+02	243+02
7 MERCURY CONFIGURATION	781+01	431+01	265+02	664+02	777+02	333+02
8 RELAXED (WEIGHTLESS)	737+01	431+01	266+02	929+02	867+02	361+02

CERVIC H	59.3	SHLDR H	57.7	SUPSTERN H	57.0	SUBSTERN H	48.6	WAIST H	44.0
ILIAC H	38.9	TROCHAN H	36.5	TIBIALE H	19.4	UPARM L	13.5	LOWARM L	11.3
CHEST D	10.8	WAIST D	9.4	BUTT D	10.8	CHEST B	13.0	WAIST B	12.0
HIP B	13.5	AXILARM C	13.0	BICEP C	11.7	ELBOW C	11.1	FOREARM C	11.2
WRIST C	7.0	FIST C	11.5	CHEST C	40.9	WAIST C	35.0	BUTT C	40.2
THIGH C	22.8	LOWTHIGH C	16.1	KNEE C	15.5	CALF C	14.2	ANKLE C	8.8
SPHYRI H	2.9	FOOT L	10.6	FOOT B	3.7	SPAN	72.4	SIT H	35.9
BIACROM D	13.3	HIP B SIT	14.7	BUTPOP L	18.9	HAND L	7.6	HAND B	3.5
HEAD C	22.2	HEAD L	7.8	HEAD B	6.3	MALX S	0.5	JUXTA S	0.7
TRICEP S	0.4	BISPIN B	8.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 32 AGE 24.2 STATURE 68.7 WEIGHT 152.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	323+01	484+01	314+02	103+03	905+02	935+01
2 STANDING, ARMS OVER HEAD	323+01	484+01	290+02	141+03	126+03	109+02
3 SPREAD EAGLE	304+01	484+01	275+02	137+03	102+03	342+02
4 SITTING	797+01	484+01	260+02	554+02	595+02	309+02
5 SITTING, FOREARMS DOWN	775+01	484+01	264+02	563+02	588+02	314+02
6 SITTING, THIGHS ELEVATED	726+01	484+01	229+02	375+02	323+02	245+02
7 MERCURY CONFIGURATION	801+01	484+01	263+02	604+02	693+02	318+02
8 RELAXED (WEIGHTLESS)	730+01	484+01	265+02	823+02	814+02	340+02

CERVIC H	58.1	SHLDR H	56.9	SUPSTERN H	55.7	SUBSTERN H	47.4	WAIST H	43.6
ILIAC H	38.7	TROCHAN H	35.6	TIBIALE H	18.8	UPARM L	13.7	LOWARM L	10.3
CHEST D	9.2	WAIST D	8.2	BUTT D	9.7	CHEST B	12.3	WAIST B	11.1
HIP B	12.9	AXILARM C	12.1	BICEP C	11.2	ELBOW C	10.7	FOREARM C	11.2
WRIST C	6.9	FIST C	11.6	CHEST C	38.1	WAIST C	31.5	BUTT C	36.7
THIGH C	21.1	LOWTHIGH C	15.7	KNEE C	14.1	CALF C	14.2	ANKLE C	8.8
SPHYRI H	2.9	FOOT L	10.1	FOOT B	3.8	SPAN	70.9	SIT H	35.8
BIACROM D	12.3	HIP B SIT	13.8	BUTPOP L	18.5	HAND L	7.6	HAND B	3.5
HEAD C	22.4	HEAD L	7.9	HEAD B	6.0	MALX S	0.3	JUXTA S	0.3
TRICEP S	0.3	BISPIN B	9.7						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 33 AGE 27.3 STATURE 68.9 WEIGHT 174.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	345+01	447+01	314+02	122+03	113+03	124+02
2 STANDING, ARMS OVER HEAD	337+01	447+01	289+02	163+03	149+03	137+02
3 SPREAD EAGLE	290+01	447+01	290+02	161+03	124+03	325+02
4 SITTING	819+01	447+01	271+02	646+02	681+02	357+02
5 SITTING, FOREARMS DOWN	794+01	447+01	274+02	619+02	679+02	361+02
6 SITTING, THIGHS ELEVATED	733+01	447+01	234+02	400+02	385+02	275+02
7 MERCURY CONFIGURATION	818+01	447+01	277+02	682+02	785+02	374+02
8 RELAXED (WEIGHTLESS)	725+01	447+01	279+02	964+02	936+02	395+02

CERVIC H	58.8	SHLDR H	57.0	SUPSTERN H	56.0	SUBSTERN H	47.6	WAIST H	43.5
ILIAC H	38.6	TROCHAN H	36.5	TIBIALE H	18.8	UPARM L	13.2	LOWARM L	10.7
CHEST D	10.3	WAIST D	8.9	BUTT D	10.4	CHEST B	14.4	WAIST B	12.2
HIP B	14.4	AXILARM C	13.2	BICEP C	12.2	ELBOW C	11.0	FOREARM C	11.5
WRIST C	7.1	FIST C	12.6	CHEST C	42.1	WAIST C	33.1	BUTT C	40.0
THIGH C	25.4	LOWTHIGH C	16.6	KNEE C	15.6	CALF C	15.7	ANKLE C	9.8
SPHYRI H	2.6	FOOT L	11.1	FOOT B	4.3	SPAN	71.6	SIT H	35.3
BIACROM D	13.4	H P B SIT	14.3	BUTPOP L	20.0	HAND L	8.0	HAND B	3.6
HEAD C	23.0	HEAD L	8.0	HEAD B	6.4	MALX S	0.4	JUXTA S	0.3
TRICEP S	0.6	BISPIN B	8.9						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 34 AGE 52.2 STATURE 68.3 WEIGHT 151.0

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	333+01	514+01	296+02	975+02	786+02	992+01
2 STANDING, ARMS OVER HEAD	335+01	514+01	270+02	123+03	109+03	107+02
3 SPREAD EAGLE	333+01	514+01	267+02	126+03	105+03	278+02
4 SITTING	745+01	514+01	252+02	525+02	642+02	300+02
5 SITTING, FOREARMS DOWN	722+01	514+01	259+02	562+02	527+02	300+02
6 SITTING, THIGHS ELEVATED	656+01	514+01	223+02	375+02	277+02	212+02
7 MERCURY CONFIGURATION	736+01	514+01	259+02	553+02	570+02	298+02
8 RELAXED (WEIGHTLESS)	738+01	514+01	262+02	771+02	736+02	339+02

CERVIC H	58.9	SHLDR H	56.6	SUPSTERN H	55.7	SUBSTERN H	47.4	WAIST H	44.4
ILIAC H	39.6	TROCHAN H	36.0	TIBIALE H	18.8	UPARM L	14.2	LOWARM L	10.5
CHEST D	10.0	WAIST D	9.8	BUTT D	9.2	CHEST B	12.6	WAIST B	11.5
HIP B	13.7	AXILARM C	12.4	BICEP C	11.4	ELBOW C	10.4	FOREARM C	10.4
WRIST C	6.5	FIST C	11.2	CHEST C	37.8	WAIST C	34.3	BUTT C	38.1
THIGH C	21.1	LOWTHIGH C	14.2	KNEE C	13.7	CALF C	12.8	ANKLE C	8.1
SPHYRI H	2.5	FOOT L	10.0	FOOT B	3.5	SPAN	71.5	SIT H	34.8
BIACROM C	13.3	HIP B SIT	14.3	BUTPOP L	19.5	HAND L	7.3	HAND B	3.1
HEAD C	23.0	HEAD L	7.8	HEAD B	6.5	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.4	BISPIN B	10.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 35 AGE 40.4 STATURE 67.7 WEIGHT 167.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	364+01	461+01	300+02	109+03	917+02	124+02
2 STANDING, ARMS OVER HEAD	354+01	461+01	275+02	144+03	127+03	113+02
3 SPREAD EAGLE	356+01	461+01	272+02	140+03	109+03	315+02
4 SITTING	798+01	461+01	255+02	565+02	571+02	322+02
5 SITTING, FOREARMS DOWN	772+01	461+01	258+02	553+02	601+02	330+02
6 SITTING, THIGHS ELEVATED	731+01	461+01	228+02	381+02	331+02	264+02
7 MERCURY CONFIGURATION	802+01	461+01	260+02	604+02	718+02	340+02
8 RELAXED (WEIGHTLESS)	742+01	461+01	268+02	873+02	820+02	345+02

CERVIC H	58.3	SHLDR H	57.2	SUPSTERN H	55.6	SUBSTERN H	47.9	WAIST H	43.1
ILIAC H	37.5	TROCHAN H	36.1	TIBIALE H	19.2	UPARM L	13.1	LOWARM L	10.1
CHEST D	10.4	WAIST D	9.8	BUTT D	10.8	CHEST B	13.5	WAIST B	12.4
HIP B	13.8	AXILARM C	13.3	BICEP C	11.9	ELBOW C	11.2	FOREARM C	11.5
WRIST C	7.2	FIST C	12.0	CHEST C	40.0	WAIST C	35.8	BUTT C	38.8
THIGH C	23.0	LOWTHIGH C	16.2	KNEE C	15.4	CALF C	14.9	ANKLE C	8.9
SPHYRI H	2.8	FOOT L	10.5	FOOT B	3.9	SPAN	68.0	SIT H	33.8
BIACROM D	12.0	HIP B SIT	14.0	BUTPOP L	19.1	HAND L	7.4	HAND B	3.6
HEAD C	22.4	HEAD L	8.3	HEAD B	6.1	MALX S	0.6	JUXTA S	0.7
TRICEP S	0.5	BISPIN B	9.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 36 AGE 30.9 STATURE 67.7 WEIGHT 162.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	358+01	457+01	307+02	109+03	988+02	110+02
2 STANDING, ARMS OVER HEAD	334+01	457+01	285+02	140+03	127+03	940+01
3 SPREAD EAGLE	320+01	457+01	283+02	135+03	998+02	361+02
4 SITTING	767+01	457+01	262+02	597+02	637+02	310+02
5 SITTING, FOREARMS DOWN	753+01	457+01	264+02	586+02	681+02	316+02
6 SITTING, THIGHS ELEVATED	695+01	457+01	234+02	394+02	326+02	237+02
7 MERCURY CONFIGURATION	771+01	457+01	266+02	593+02	738+02	327+02
8 RELAXED (WEIGHTLESS)	682+01	457+01	311+02	880+02	835+02	331+02

CERVIC H	58.3	SHLDR H	55.9	SUPSTERN H	55.1	SUBSTERN H	47.2	WAIST H	43.1
ILIAC H	38.6	TROCHAN H	36.0	TIBIALE H	18.6	UPARM L	13.4	LOWARM L	10.4
CHEST D	9.5	WAIST D	9.8	BUTT D	10.3	CHEST B	13.4	WAIST B	11.5
HIP B	13.8	AXILARM C	12.8	BICEP C	11.3	ELBOW C	10.4	FOREARM C	10.6
WRIST C	6.8	FIST C	11.3	CHEST C	39.4	WAIST C	34.6	BUTT C	39.8
THIGH C	22.4	LOWTHIGH C	16.6	KNEE C	16.0	CALF C	14.8	ANKLE C	8.6
SPHYRI H	3.0	FOOT L	10.2	FOOT B	3.7	SPAN	67.9	SIT H	35.3
BIACROM D	11.1	HIP B SIT	14.7	BUTPOP L	19.6	HAND L	7.2	HAND B	3.5
HEAD C	22.8	HEAD L	9.8	HEAD B	6.3	MALX S	0.7	JUXTA S	0.7
TRICEP S	0.7	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 37 AGE 31.5 STATURE 70.6 WEIGHT 176.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	366+01	506+01	315+02	120+03	106+03	126+02
2 STANDING, ARMS OVER HEAD	358+01	506+01	291+02	163+03	146+03	118+02
3 SPREAD EAGLE	353+01	506+01	292+02	164+03	116+03	415+02
4 SITTING	780+01	506+01	275+02	664+02	722+02	343+02
5 SITTING, FOREARMS DOWN	757+01	506+01	279+02	709+02	710+02	353+02
6 SITTING, THIGHS ELEVATED	706+01	506+01	242+02	464+02	417+02	267+02
7 MERCURY CONFIGURATION	770+01	506+01	282+02	710+02	793+02	332+02
8 RELAXED (WEIGHTLESS)	707+01	506+01	280+02	103+03	886+02	375+02

CERVIC H	60.6	SHLDR H	59.3	SUPSTERN H	58.1	SUBSTERN H	49.4	WAIST H	44.8
ILIAC H	38.8	TROCHAN H	36.9	TIBIALE H	19.6	UPARM L	13.6	LOWARM L	10.5
CHEST D	10.1	WAIST D	9.2	BUTT D	10.5	CHEST B	12.9	WAIST B	11.6
HIP B	14.0	AXILARM C	12.9	BICEP C	12.0	ELBOW C	10.8	FOREARM C	11.4
WRIST C	7.4	FIST C	11.8	CHEST C	39.8	WAIST C	33.7	BUTT C	40.7
THIGH C	21.7	LOWTHIGH C	15.7	KNEE C	15.9	CALF C	13.9	ANKLE C	9.1
SPHYRI H	3.1	FOOT L	10.8	FOOT B	4.0	SPAN	71.8	SIT H	37.8
BIACROM D	12.9	HIP B SIT	15.3	BUTPOP L	19.6	HAND L	7.7	HAND B	3.5
HEAD C	22.5	HEAD L	8.1	HEAD B	5.9	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.4	BISPIN B	10.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 38 AGE 24.6 STATURE 69.5 WEIGHT 158.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	350+01	482+01	311+02	109+03	104+03	108+02
2 STANDING, ARMS OVER HEAD	341+01	482+01	291+02	145+03	129+03	905+01
3 SPREAD EAGLE	323+01	482+01	290+02	144+03	108+03	341+02
4 SITTING	819+01	482+01	259+02	535+02	628+02	325+02
5 SITTING, FOREARMS DOWN	795+01	482+01	262+02	565+02	647+02	324+02
6 SITTING, THIGHS ELEVATED	758+01	482+01	228+02	343+02	366+02	254+02
7 MERCURY CONFIGURATION	819+01	482+01	265+02	597+02	760+02	346+02
8 RELAXED (WEIGHTLESS)	753+01	482+01	271+02	815+02	823+02	339+02

CERVIC H	60.1	SHLDR H	57.1	SUPSTERN H	56.4	SUBSTERN H	48.7	WAIST H	43.8
ILIAC H	39.3	TROCHAN H	37.5	TIBIALE H	19.9	UPARM L	13.6	LOWARM L	10.5
CHEST D	8.9	WAIST D	9.0	BUTT D	10.1	CHEST B	13.0	WAIST B	11.4
HIP B	14.0	AXILARM C	12.4	BICEP C	11.2	ELBOW C	10.3	FOREARM C	10.6
WRIST C	6.8	FIST C	10.9	CHEST C	37.5	WAIST C	32.5	BUTT C	38.9
THIGH C	23.4	LOWTHIGH C	16.2	KNEE C	15.4	CALF C	14.6	ANKLE C	8.9
SPHYRI H	2.9	FOOT L	10.3	FOOT B	3.7	SPAN	70.9	SIT H	34.4
BIACROM D	13.0	HIP B SIT	14.1	BUTPOP L	19.3	HAND L	7.4	HAND B	3.3
HEAD C	22.6	HEAD L	7.7	HEAD B	6.5	MALX S	0.6	JUXTA S	0.7
TRICEP S	0.7	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 39 AGE 27.1 STATURE 65.3 WEIGHT 154.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	328+01	459+01	294+02	963+02	858+02	100+02
2 STANDING, ARMS OVER HEAD	318+01	459+01	272+02	130+03	111+03	961+01
3 SPREAD EAGLE	323+01	459+01	267+02	126+03	927+02	295+02
4 SITTING	764+01	459+01	259+02	528+02	529+02	288+02
5 SITTING, FOREARMS DOWN	738+01	459+01	262+02	556+02	577+02	290+02
6 SITTING, THIGHS ELEVATED	690+01	459+01	223+02	295+02	326+02	220+02
7 MERCURY CONFIGURATION	743+01	459+01	266+02	556+02	553+02	276+02
8 RELAXED (WEIGHTLESS)	735+01	459+01	342+02	835+02	748+02	328+02

CERVIC H	55.4	SHLDR H	53.1	SUPSTERN H	53.4	SUBSTERN H	44.9	WAIST H	41.7
ILIAC H	36.8	TROCHAN H	32.0	TIBIALE H	17.4	UPARM L	12.9	LOWARM L	10.0
CHEST D	9.7	WAIST D	7.7	BUTT D	10.1	CHEST B	12.8	WAIST B	11.3
HIP B	13.5	AXILARM C	12.6	BICEP C	12.1	ELBOW C	10.8	FOREARM C	11.3
WRIST C	6.6	FIST C	11.8	CHEST C	39.4	WAIST C	32.3	BUTT C	39.0
THIGH C	22.5	LOWTHIGH C	15.9	KNEE C	14.6	CALF C	14.6	ANKLE C	8.8
SPHYRI H	2.8	FOOT L	9.8	FOOT B	4.0	SPAN	68.0	SIT H	33.7
BIACROM D	13.1	H P B SIT	13.1	BUTPOP L	18.7	HAND L	6.9	HAND B	3.3
HEAD C	22.4	HEAD L	8.1	HEAD B	6.0	MALX S	0.4	JUXTA S	0.5
TRICEP S	0.4	BISPIN B	9.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 40 AGE 38.1 STATURE 67.4 WEIGHT 169.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	361+01	463+01	299+02	105+03	918+02	114+02
2 STANDING, ARMS OVER HEAD	368+01	463+01	272+02	139+03	127+03	126+02
3 SPREAD EAGLE	349+01	463+01	269+02	138+03	105+03	329+02
4 SITTING	767+01	463+01	255+02	568+02	626+02	309+02
5 SITTING, FOREARMS DOWN	746+01	463+01	258+02	593+02	607+02	313+02
6 SITTING, THIGHS ELEVATED	714+01	463+01	227+02	381+02	382+02	253+02
7 MERCURY CONFIGURATION	776+01	463+01	262+02	612+02	653+02	339+02
8 RELAXED (WEIGHTLESS)	718+01	463+01	264+02	968+02	810+02	324+02

CERVIC H	57.7	SHLDR H	57.0	SUPSTERN H	55.0	SUBSTERN H	47.5	WAIST H	43.3
ILIAC H	37.1	TROCHAN H	33.3	TIBIALE H	17.6	UPARM L	13.8	LOWARM L	10.1
CHEST D	10.5	WAIST D	9.2	BUTT D	10.6	CHEST B	12.5	WAIST B	11.5
HIP B	14.5	AXILARM C	12.6	BICEP C	11.0	ELBOW C	10.7	FOREARM C	11.3
WRIST C	6.8	FIST C	11.4	CHEST C	42.5	WAIST C	34.3	BUTT C	40.9
THIGH C	23.2	LOWTHIGH C	15.4	KNEE C	15.6	CALF C	14.4	ANKLE C	8.3
SPHYRI H	2.6	FOOT L	10.0	FOOT B	3.5	SPAN	67.4	SIT H	35.5
BIACROM D	13.0	HIP B SIT	15.4	BUTPOP L	20.0	HAND L	6.9	HAND B	3.4
HEAD C	21.4	HEAD L	7.5	HEAD B	6.1	MALX S	1.0	JUXTA S	0.9
TRICEP S	0.8	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 41 AGE 26.1 STATURE 68.8 WEIGHT 150.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	332+01	425+01	313+02	110+03	990+02	850+01
2 STANDING, ARMS OVER HEAD	332+01	425+01	285+02	148+03	137+03	989+01
3 SPREAD EAGLE	315+01	425+01	290+02	145+03	109+03	345+02
4 SITTING	805+01	425+01	265+02	560+02	614+02	295+02
5 SITTING, FOREARMS DOWN	772+01	425+01	268+02	549+02	605+02	295+02
6 SITTING, THIGHS ELEVATED	708+01	425+01	232+02	348+02	348+02	210+02
7 MERCURY CONFIGURATION	807+01	425+01	271+02	574+02	680+02	318+02
8 RELAXED (WEIGHTLESS)	713+01	425+01	265+02	875+02	894+02	327+02

CERVIC H	58.6	SHLDR H	56.4	SUPSTERN H	55.6	SUBSTERN H	47.1	WAIST H	42.7
ILIAC H	39.2	TROCHAN H	35.0	TIBIALE H	18.5	UPARM L	13.8	LOWARM L	10.7
CHEST D	9.1	WAIST D	7.5	BUTT D	9.3	CHEST B	13.1	WAIST B	10.7
HIP B	12.6	AXILARM C	11.6	BICEP C	10.8	ELBOW C	10.2	FOREARM C	10.9
WRIST C	6.9	FIST C	11.6	CHEST C	38.7	WAIST C	29.3	BUTT C	36.8
THIGH C	20.5	LOWTHIGH C	15.6	KNEE C	15.0	CALF C	14.7	ANKLE C	9.1
SPHYRI H	2.6	FOOT L	10.4	FOOT B	3.9	SPAN	72.2	SIT H	35.7
BIACROM D	13.5	HIP B SIT	13.3	BUTPOP L	19.7	HAND L	7.3	HAND B	3.7
HEAD C	22.9	HEAD L	8.0	HEAD B	6.5	MALX S	0.2	JUXTA S	0.1
TRICEP S	0.2	BISPIN B	8.5						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 42 AGE 30.3 STATURE 68.8 WEIGHT 168.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	334+01	526+01	314+02	115+03	104+03	106+02
2 STANDING, ARMS OVER HEAD	347+01	526+01	291+02	151+03	139+03	127+02
3 SPREAD EAGLE	308+01	526+01	286+02	149+03	112+03	357+02
4 SITTING	763+01	526+01	273+02	619+02	671+02	328+02
5 SITTING, FOREARMS DOWN	741+01	526+01	277+02	625+02	671+02	333+02
6 SITTING, THIGHS ELEVATED	688+01	526+01	237+02	389+02	415+02	260+02
7 MERCURY CONFIGURATION	775+01	526+01	279+02	674+02	769+02	356+02
8 RELAXED (WEIGHTLESS)	751+01	526+01	276+02	993+02	932+02	380+02

CERVIC H	58.3	SHLDR H	56.6	SUPSTERN H	56.0	SUBSTERN H	47.5	WAIST H	43.0
ILIAC H	37.3	TROCHAN H	37.2	TIBIALE H	18.6	UPARM L	13.0	LOWARM L	9.5
CHEST D	9.3	WAIST D	8.8	BUTT D	9.9	CHEST B	14.0	WAIST B	11.3
HIP B	13.9	AXILARM C	13.2	BICEP C	11.9	ELBOW C	11.1	FOREARM C	11.7
WRIST C	7.1	FIST C	11.2	CHEST C	41.3	WAIST C	32.7	BUTT C	39.0
THIGH C	22.5	LOWTHIGH C	16.3	KNEE C	15.6	CALF C	15.5	ANKLE C	9.1
SPHYRI H	2.6	FOOT L	10.5	FOOT B	4.2	SPAN	68.8	SIT H	36.5
BIACROM D	12.8	HIP B SIT	14.6	BUTPOP L	19.0	HAND L	7.7	HAND B	3.5
HEAD C	23.1	HEAD L	7.8	HEAD B	6.7	MALX S	0.4	JUXTA S	0.4
TRICEP S	0.4	BISPIN B	10.5						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 43 AGE 33.4 STATURE 66.3 WEIGHT 164.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	364+01	482+01	296+02	105+03	894+02	121+02
2 STANDING, ARMS OVER HEAD	352+01	482+01	276+02	133+03	114+03	115+02
3 SPREAD EAGLE	343+01	482+01	274+02	131+03	983+02	302+02
4 SITTING	766+01	482+01	259+02	595+02	589+02	301+02
5 SITTING, FOREARMS DOWN	743+01	482+01	261+02	578+02	626+02	298+02
6 SITTING, THIGHS ELEVATED	714+01	482+01	225+02	376+02	384+02	259+02
7 MERCURY CONFIGURATION	771+01	482+01	267+02	624+02	690+02	321+02
8 RELAXED (WEIGHTLESS)	722+01	482+01	268+02	920+02	856+02	356+02

CERVIC H	56.4	SHLDR H	54.7	SUPSTERN H	54.9	SUBSTERN H	45.7	WAIST H	41.9
ILIAC H	36.3	TROCHAN H	33.1	TIBIALE H	17.5	UPARM L	13.0	LOWARM L	9.5
CHEST D	10.3	WAIST D	9.2	BUTT D	9.8	CHEST B	13.1	WAIST B	12.3
HIP B	13.5	AXILARM C	13.8	BICEP C	12.2	ELBOW C	11.3	FOREARM C	11.4
WRIST C	7.3	FIST C	12.1	CHEST C	40.2	WAIST C	34.6	BUTT C	39.2
THIGH C	22.5	LOWTHIGH C	16.2	KNEE C	15.9	CALF C	14.8	ANKLE C	9.2
SPHYRI H	2.4	FOOT L	10.2	FOOT B	4.1	SPAN	66.1	SIT H	34.4
BIACROM D	12.6	HIP B SIT	14.4	BUTPOP L	19.0	HAND L	7.0	HAND B	3.8
HEAD C	22.2	HEAD L	7.8	HEAD B	5.9	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.5	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 44 AGE 51.5 STATURE 70.7 WEIGHT 206.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	365+01	482+01	322+02	141+03	125+03	150+02
2 STANDING, ARMS OVER HEAD	365+01	482+01	296+02	183+03	170+03	157+02
3 SPREAD EAGLE	360+01	482+01	300+02	183+03	135+03	389+02
4 SITTING	833+01	482+01	272+02	713+02	782+02	440+02
5 SITTING, FOREARMS DOWN	810+01	482+01	274+02	704+02	852+02	448+02
6 SITTING, THIGHS ELEVATED	764+01	482+01	242+02	490+02	450+02	348+02
7 MERCURY CONFIGURATION	829+01	482+01	277+02	795+02	912+02	435+02
8 RELAXED (WEIGHTLESS)	763+01	482+01	288+02	114+03	108+03	436+02

CERVIC H	59.7	SHLDR H	58.9	SUPSTERN H	58.7	SUBSTERN H	48.6	WAIST H	44.3
ILIAC H	39.1	TROCHAN H	35.9	TIBIALE H	18.9	UPARM L	14.9	LOWARM L	10.4
CHEST D	11.5	WAIST D	10.2	BUTT D	11.9	CHEST B	15.4	WAIST B	13.3
HIP B	15.6	AXILARM C	14.8	BICEP C	12.9	ELBOW C	11.3	FOREARM C	11.7
WRIST C	7.1	FIST C	12.4	CHEST C	46.7	WAIST C	37.8	BUTT C	45.0
THIGH C	26.3	LOWTHIGH C	18.1	KNEE C	16.5	CALF C	17.0	ANKLE C	9.5
SPHYRI H	2.6	FOOT L	10.9	FOOT B	3.9	SPAN	72.5	SIT H	35.7
BIACROM D	12.2	HIP B SIT	16.8	BUTPOP L	21.2	HAND L	7.3	HAND B	3.5
HEAD C	23.5	HEAD L	8.4	HEAD B	6.4	MALX S	0.9	JUXTA S	0.7
TRICEP S	0.9	BISPIN B	9.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 45 AGE 40.8 STATURE 70.9 WEIGHT 151.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	335+01	404+01	315+02	110+03	101+03	880+01
2 STANDING, ARMS OVER HEAD	351+01	404+01	283+02	145+03	148+03	1[illegible]+02
3 SPREAD EAGLE	322+01	404+01	288+02	149+03	120+03	340+02
4 SITTING	828+01	404+01	268+02	566+02	646+02	338+02
5 SITTING, FOREARMS DOWN	003+01	404+01	273+02	569+02	671+02	329+02
6 SITTING, THIGHS ELEVATED	743+01	404+01	233+02	380+02	404+02	250+02
7 MERCURY CONFIGURATION	817+01	404+01	274+02	619+02	775+02	325+02
8 RELAXED (WEIGHTLESS)	759+01	404+01	278+02	848+02	887+02	343+02

CERVIC H	60.7	SHLDR H	60.4	SUPSTERN H	58.0	SUBSTERN H	49.6	WAIST H	46.3
ILIAC H	40.6	TROCHAN H	37.1	TIBIALE H	20.2	UPARM L	14.3	LOWARM L	10.4
CHEST D	8.7	WAIST D	8.1	BUTT D	9.4	CHEST B	11.6	WAIST B	10.6
HIP B	12.8	AXILARM C	11.4	BICEP C	10.4	ELBOW C	9.7	FOREARM C	10.2
WRIST C	6.7	FIST C	11.2	CHEST C	36.2	WAIST C	30.3	BUTT C	36.8
THIGH C	20.4	LOWTHIGH C	14.8	KNEE C	14.6	CALF C	14.2	ANKLE C	8.6
SPHYRI H	2.8	FOOT L	10.7	FOOT B	3.7	SPAN	70.3	SIT H	36.7
BIACROM D	12.3	HIP B SIT	13.8	BUTPOP L	19.5	HAND L	7.5	HAND B	3.4
HEAD C	23.4	HEAD L	8.4	HEAD B	6.4	MALX S	0.3	JUXTA S	0.3
TRICEP S	0.3	BISPIN B	8.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 46 AGE 32.2 STATURE 67.1 WEIGHT 174.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	376+01	498+01	294+02	108+03	940+02	115+02
2 STANDING, ARMS OVER HEAD	369+01	498+01	270+02	137+03	134+03	123+02
3 SPREAD EAGLE	366+01	498+01	268+02	143+03	110+03	323+02
4 SITTING	795+01	498+01	257+02	581+02	635+02	339+02
5 SITTING, FOREARMS DOWN	752+01	498+01	261+02	635+02	654+02	337+02
6 SITTING, THIGHS ELEVATED	741+01	498+01	218+02	390+02	390+02	279+02
7 MERCURY CONFIGURATION	781+01	498+01	262+02	634+02	650+02	349+02
8 RELAXED (WEIGHTLESS)	693+01	498+01	262+02	880+02	853+02	361+02

CERVIC H	57.9	SHLDR H	55.9	SUPSTERN H	55.2	SUBSTERN H	47.8	WAIST H	44.1
ILIAC H	38.2	TROCHAN H	34.5	TIBIALE H	18.3	UPARM L	14.1	LOWARM L	10.6
CHEST D	9.9	WAIST D	9.5	BUTT D	11.8	CHEST B	14.0	WAIST B	12.7
HIP B	14.2	AXILARM C	13.2	BICEP C	11.7	ELBOW C	10.6	FOREARM C	10.8
WRIST C	7.0	FIST C	10.6	CHEST C	42.3	WAIST C	36.4	BUTT C	43.7
THIGH C	23.6	LOWTHIGH C	15.7	KNEE C	15.2	CALF C	14.7	ANKLE C	9.0
SPHYRI H	2.7	FOOT L	10.3	FOOT B	3.5	SPAN	71.6	SIT H	34.6
BIACROM D	12.0	HIP B SIT	15.7	BUTPOP L	19.5	HAND L	7.5	HAND B	3.3
HEAD C	22.9	HEAD L	7.9	HEAD B	6.6	MALX S	1.0	JUXTA S	1.1
TRICEP S	0.9	BISPIN B	10.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 47 AGE 19.5 STATURE 73.4 WEIGHT 157.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	314+01	598+01	338+02	122+03	108+03	101+02
2 STANDING, ARMS OVER HEAD	294+01	598+01	315+02	158+03	145+03	946+01
3 SPREAD EAGLE	293+01	598+01	311+02	160+03	124+03	420+02
4 SITTING	799+01	598+01	291+02	658+02	724+02	345+02
5 SITTING, FOREARMS DOWN	780+01	598+01	294+02	676+02	726+02	352+02
6 SITTING, THIGHS ELEVATED	740+01	598+01	251+02	429+02	418+02	283+02
7 MERCURY CONFIGURATION	786+01	598+01	298+02	714+02	855+02	339+02
8 RELAXED (WEIGHTLESS)	733+01	598+01	302+02	972+02	962+02	373+02

CERVIC H	62.8	SHLDR H	61.0	SUPSTERN H	59.5	SUBSTERN H	50.5	WAIST H	45.1
ILIAC H	40.0	TROCHAN H	38.0	TIBIALE H	17.6	UPARM L	14.1	LOWARM L	10.6
CHEST D	9.0	WAIST D	8.1	BUTT D	9.4	CHEST B	12.5	WAIST B	11.1
HIP B	14.2	AXILARM C	10.8	BICEP C	10.5	ELBOW C	10.1	FOREARM C	10.0
WRIST C	6.4	FIST C	10.6	CHEST C	36.8	WAIST C	32.0	BUTT C	39.6
THIGH C	21.9	LOWTHIGH C	15.2	KNEE C	15.4	CALF C	14.9	ANKLE C	8.9
SPHYRI H	2.6	FOOT L	11.3	FOOT B	3.7	SPAN	71.8	SIT H	38.6
BIACROM D	12.8	HIP B SIT	15.0	BUTPOP L	20.5	HAND L	7.3	HAND B	3.3
HEAD C	22.6	HEAD L	7.9	HEAD B	6.1	MALX S	0.4	JUXTA S	0.3
TRICEP S	0.3	BISPIN B	12.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 48 AGE 24.6 STATURE 70.4 WEIGHT 141.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	349+01	465+01	320+02	106+03	920+02	101+02
2 STANDING, ARMS OVER HEAD	372+01	465+01	296+02	141+03	126+03	941+01
3 SPREAD EAGLE	320+01	465+01	290+02	138+03	986+02	354+02
4 SITTING	791+01	465+01	275+02	595+02	620+02	301+02
5 SITTING, FOREARMS DOWN	766+01	465+01	278+02	571+02	673+02	308+02
6 SITTING, THIGHS ELEVATED	692+01	465+01	241+02	361+02	371+02	213+02
7 MERCURY CONFIGURATION	781+01	465+01	282+02	649+02	753+02	301+02
8 RELAXED (WEIGHTLESS)	711+01	465+01	280+02	880+02	860+02	311+02

CERVIC H	60.3	SHLDR H	59.1	SUPSTERN H	57.2	SUBSTERN H	50.0	WAIST H	44.4
ILIAC H	38.9	TROCHAN H	35.8	TIBIALE H	18.6	UPARM L	14.3	LOWARM L	10.7
CHEST D	9.8	WAIST D	7.7	BUTT D	9.1	CHEST B	11.9	WAIST B	10.2
HIP B	13.5	AXILARM C	10.7	BICEP C	9.9	ELBOW C	10.0	FOREARM C	10.1
WRIST C	6.6	FIST C	10.6	CHEST C	35.4	WAIST C	29.3	BUTT C	36.3
THIGH C	19.5	LOWTHIGH C	14.0	KNEE C	14.3	CALF C	13.6	ANKLE C	8.8
SPHYRI H	2.9	FOOT L	10.6	FOOT B	3.7	SPAN	71.5	SIT H	36.7
BIACROM D	13.7	HIP B SIT	13.5	BUTPOP L	19.8	HAND L	7.7	HAND B	3.6
HEAD C	21.9	HEAD L	7.6	HEAD B	5.8	MALX S	0.2	JUXTA S	0.2
TRICEP S	0.2	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 49 AGE 38.2 STATURE 68.7 WEIGHT 166.3

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	397+01	486+01	307+02	113+03	940+02	140+02
2 STANDING, ARMS OVER HEAD	370+01	486+01	283+02	143+03	121+03	116+02
3 SPREAD EAGLE	333+01	486+01	275+02	151+03	108+03	372+02
4 SITTING	826+01	486+01	266+02	602+02	584+02	555+02
5 SITTING, FOREARMS DOWN	801+01	486+01	268+02	638+02	648+02	348+02
6 SITTING, THIGHS ELEVATED	741+01	486+01	227+02	367+02	359+02	265+02
7 MERCURY CONFIGURATION	791+01	486+01	271+02	703+02	743+02	338+02
8 RELAXED (WEIGHTLESS)	718+01	486+01	266+02	852+02	876+02	340+02

CERVIC H	58.0	SHLDR H	56.7	SUPSTERN H	55.8	SUBSTERN H	48.1	WAIST H	43.6
ILIAC H	38.1	TROCHAN H	35.1	TIBIALE H	18.8	UPARM L	13.7	LOWARM L	10.6
CHEST D	9.6	WAIST D	9.8	BUTT D	10.4	CHEST B	13.1	WAIST B	12.2
HIP B	13.9	AXILARM C	13.0	BICEP C	11.9	ELBOW C	10.7	FOREARM C	11.2
WRIST C	6.7	FIST C	11.8	CHEST C	38.0	WAIST C	35.0	BUTT C	39.0
THIGH C	21.2	LOWTHIGH C	15.6	KNEE C	15.8	CALF C	15.4	ANKLE C	8.8
SPHYRI H	2.9	FOOT L	10.8	FOOT B	3.9	SPAN	71.2	SIT H	35.6
BIACROM D	12.4	HIP B SIT	15.0	BUTPOP L	19.9	HAND L	7.7	HAND B	3.6
HEAD C	23.3	HEAD L	8.1	HEAD B	6.3	MALX S	0.6	JUXTA S	0.6
TRICEP S	0.7	BISPIN B	9.7						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 50 AGE 30.4 STATURE 75.8 WEIGHT 190.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	362+01	463+01	338+02	160+03	146+03	135+02
2 STANDING, ARMS OVER HEAD	347+01	463+01	309+02	209+03	196+03	127+02
3 SPREAD EAGLE	337+01	463+01	310+02	217+03	160+03	544+02
4 SITTING	899+01	463+01	282+02	758+02	943+02	466+02
5 SITTING, FOREARMS DOWN	870+01	463+01	288+02	786+02	928+02	465+02
6 SITTING, THIGHS ELEVATED	828+01	463+01	241+02	461+02	426+02	373+02
7 MERCURY CONFIGURATION	885+01	463+01	269+02	815+02	111+03	469+02
8 RELAXED (WEIGHTLESS)	788+01	463+01	285+02	113+03	118+03	482+02

CERVIC H	65.2	SHLDR H	63.7	SUPSTERN H	62.5	SUBSTERN H	53.6	WAIST H	48.7
ILIAC H	45.0	TROCHAN H	39.9	TIBIALE H	21.9	UPARM L	15.6	LOWARM L	12.3
CHEST D	9.0	WAIST D	8.3	BUTT D	10.4	CHEST B	13.4	WAIST B	11.8
HIP B	14.4	AXILARM C	12.5	BICEP C	12.2	ELBOW C	11.7	FOREARM C	12.2
WRIST C	7.4	FIST C	12.1	CHEST C	38.6	WAIST C	32.5	BUTT C	40.6
THIGH C	23.0	LOWTHIGH C	16.5	KNEE C	16.1	CALF C	14.9	ANKLE C	9.3
SPHYRI H	3.0	FOOT L	12.1	FOOT B	3.9	SPAN	78.6	SIT H	36.8
BIACROM D	12.6	HIP B SIT	14.8	BUTPOP L	22.0	HAND L	8.4	HAND B	3.8
HEAD C	22.4	HEAD L	8.1	HEAD B	6.1	MALX S	0.2	JUXTA S	0.2
TRICEP S	0.3	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 51 AGE 49.6 STATURE 68.6 WEIGHT 169.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	372+01	463+01	314+02	119+03	101+03	137+02
2 STANDING, ARMS OVER HEAD	357+01	463+01	288+02	155+03	141+03	113+02
3 SPREAD EAGLE	337+01	463+01	286+02	150+03	117+03	345+02
4 SITTING	788+01	463+01	268+02	595+02	686+02	335+02
5 SITTING, FOREARMS DOWN	768+01	463+01	273+02	635+02	649+02	345+02
6 SITTING, THIGHS ELEVATED	715+01	463+01	235+02	410+02	426+02	279+02
7 MERCURY CONFIGURATION	793+01	463+01	280+02	693+02	756+02	352+02
8 RELAXED (WEIGHTLESS)	719+01	463+01	278+02	925+02	843+02	358+02

CERVIC H	60.0	SHLDR H	58.5	SUPSTERN H	57.0	SUBSTERN H	50.1	WAIST H	45.6
ILIAC H	39.3	TROCHAN H	38.0	TIBIALE H	18.8	UPARM L	13.1	LOWARM L	11.1
CHEST D	9.6	WAIST D	9.4	BUTT D	9.8	CHEST B	13.5	WAIST B	12.4
HIP B	14.2	AXILARM C	12.9	BICEP C	12.3	ELBOW C	10.6	FOREARM C	10.9
WRIST C	11.2	FIST C	11.4	CHEST C	37.4	WAIST C	38.6	BUTT C	39.4
THIGH C	39.0	LOWTHIGH C	15.6	KNEE C	15.4	CALF C	14.2	ANKLE C	9.1
SPHYRI H	2.6	FOOT L	10.7	FOOT B	3.9	SPAN	69.9	SIT H	35.3
BIACROM D	14.8	HIP B SIT	13.9	BUTPOP L	20.3	HAND L	7.6	HAND B	3.8
HEAD C	22.3	HEAD L	7.7	HEAD B	6.1	MALX S	0.5	JUXTA S	0.4
TRICEP S	0.5	BISPIN B	9.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 52 AGE 31.2 STATURE 73.2 WEIGHT 197.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	366+01	528+01	320+02	140+03	123+03	140+02
2 STANDING, ARMS OVER HEAD	354+01	528+01	294+02	194+03	171+03	125+02
3 SPREAD EAGLE	350+01	529+01	295+02	187+03	141+03	462+02
4 SITTING	772+01	528+01	282+02	828+02	898+02	401+02
5 SITTING, FOREARMS DOWN	752+01	528+01	287+02	829+02	814+02	407+02
6 SITTING, THIGHS ELEVATED	697+01	528+01	246+02	560+02	547+02	309+02
7 MERCURY CONFIGURATION	777+01	528+01	287+02	880+02	998+02	396+02
8 RELAXED (WEIGHTLESS)	740+01	528+01	289+02	118+03	108+03	426+02

CERVIC H	62.6	SHLDR H	61.0	SUPSTERN H	59.6	SUBSTERN H	51.5	WAIST H	46.9
ILIAC H	40.4	TROCHAN H	35.9	TIBIALE H	19.7	UPARM L	15.3	LOWARM L	11.2
CHEST D	10.2	WAIST D	10.3	BUTT D	11.5	CHEST B	13.8	WAIST B	12.8
HIP B	14.5	AXILARM C	14.2	BICEP C	12.2	ELBOW C	11.2	FOREARM C	11.4
WRIST C	7.6	FIST C	11.1	CHEST C	42.0	WAIST C	36.0	BUTT C	41.7
THIGH C	24.2	LOWTHIGH C	17.3	KNEE C	16.3	CALF C	14.5	ANKLE C	9.2
SPHYRI H	3.3	FOOT L	10.9	FOOT B	4.1	SPAN	75.1	SIT H	38.9
BIACROM D	13.3	HIP B SIT	15.7	BUTPOP L	19.8	HAND L	7.9	HAND B	3.5
HEAD C	22.6	HEAD L	7.9	HEAD B	6.2	MALX S	0.9	JUXTA S	1.0
TRICEP S	0.6	BISPIN B	10.6						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 53 AGE 23.7 STATURE 76.2 WEIGHT 193.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	335+01	498+01	351+02	165+03	145+03	134+02
2 STANDING, ARMS OVER HEAD	332+01	498+01	323+02	218+03	208+03	130+02
3 SPREAD EAGLE	328+01	498+01	305+02	221+03	172+03	584+02
4 SITTING	844+01	498+01	292+02	838+02	101+03	442+02
5 SITTING, FOREARMS DOWN	821+01	498+01	297+02	840+02	969+02	447+02
6 SITTING, THIGHS ELEVATED	763+01	498+01	245+02	510+02	502+02	348+02
7 MERCURY CONFIGURATION	846+01	498+01	296+02	873+02	112+03	468+02
8 RELAXED (WEIGHTLESS)	783+01	498+01	302+02	118+03	122+03	463+02

CERVIC H	65.9	SHLDR H	63.6	SUPSTERN H	63.2	SUBSTERN H	53.3	WAIST H	48.8
ILIAC H	43.5	TROCHAN H	39.6	TIBIALE H	21.7	UPARM L	16.1	LOWARM L	11.8
CHEST D	8.9	WAIST D	8.6	BUTT D	10.4	CHEST B	13.7	WAIST B	13.0
HIP B	15.2	AXILARM C	12.2	BICEP C	11.4	ELBOW C	11.2	FOREARM C	11.2
WRIST C	7.4	FIST C	12.9	CHEST C	39.0	WAIST C	35.0	BUTT C	41.5
THIGH C	23.3	LOWTHIGH C	15.8	KNEE C	15.6	CALF C	15.5	ANKLE C	9.3
SPHYRI H	3.0	FOOT L	11.8	FOOT B	4.3	SPAN	80.7	SIT H	37.7
BIACROM D	12.4	HIP B SIT	15.6	BUTPOP L	22.5	HAND L	8.2	HAND B	3.6
HEAD C	23.1	HEAD L	8.4	HEAD B	5.7	MALX S	0.5	JUXTA S	0.5
TRICEP S	0.5	BISPIN B	10.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 54 AGE 32.0 STATURE 70.7 WEIGHT 174.6

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	346+01	469+01	309+02	120+03	113+03	119+02
2 STANDING, ARMS OVER HEAD	344+01	469+01	286+02	160+03	139+03	114+02
3 SPREAD EAGLE	327+01	469+01	288+02	160+03	120+03	371+02
4 SITTING	799+01	469+01	266+02	640+02	718+02	351+02
5 SITTING, FOREARMS DOWN	771+01	469+01	271+02	660+02	696+02	350+02
6 SITTING, THIGHS ELEVATED	726+01	469+01	234+02	392+02	357+02	284+02
7 MERCURY CONFIGURATION	804+01	469+01	271+02	664+02	759+02	360+02
8 RELAXED (WEIGHTLESS)	727+01	469+01	274+02	933+02	878+02	357+02

CERVIC H	60.3	SHLDR H	58.1	SUPSTERN H	57.8	SUBSTERN H	49.3	WAIST H	45.0
ILIAC H	40.5	TROCHAN H	36.2	TIBIALE H	19.7	UPARM L	13.8	LOWARM L	10.9
CHEST D	9.5	WAIST D	9.3	BUTT D	11.1	CHEST B	13.3	WAIST B	11.6
HIP B	13.7	AXILARM C	12.8	BICEP C	12.3	ELBOW C	11.0	FOREARM C	11.3
WRIST C	6.5	FIST C	11.2	CHEST C	39.0	WAIST C	34.1	BUTT C	39.4
THIGH C	23.2	LOWTHIGH C	15.9	KNEE C	15.7	CALF C	15.7	ANKLE C	8.8
SPHYRI H	3.0	FOOT L	10.7	FOOT B	3.8	SPAN	72.6	SIT H	35.0
BIACROM D	13.3	HIP B SIT	14.7	BUTPOP L	20.0	HAND L	7.6	HAND B	3.4
HEAD C	23.3	HEAD L	8.2	HEAD B	6.3	MALX S	0.5	JUXTA S	0.5
TRICEP S	0.7	BISPIN B	9.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 55 AGE 34.7 STATURE 69.7 WEIGHT 150.0

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	343+01	453+01	314+02	111+03	928+02	988+01
2 STANDING, ARMS OVER HEAD	337+01	453+01	285+02	151+03	134+03	915+01
3 SPREAD EAGLE	341+01	453+01	282+02	149+03	116+03	350+02
4 SITTING	791+01	453+01	264+02	600+02	646+02	296+02
5 SITTING, FOREARMS DOWN	764+01	453+01	266+02	600+02	713+02	296+02
6 SITTING, THIGHS ELEVATED	707+01	453+01	229+02	355+02	374+02	219+02
7 MERCURY CONFIGURATION	770+01	453+01	270+02	651+02	790+02	294+02
8 RELAXED (WEIGHTLESS)	738+01	453+01	270+02	859+02	862+02	343+02

CERVIC H	59.8	SHLDR H	58.0	SUPSTERN H	57.1	SUBSTERN H	48.9	WAIST H	44.7
ILIAC H	39.1	TROCHAN H	36.2	TIBIALE H	19.9	UPARM L	13.8	LOWARM L	11.1
CHEST D	9.6	WAIST D	8.3	BUTT D	9.2	CHEST B	12.5	WAIST B	10.5
HIP B	13.2	AXILARM C	11.8	BICEP C	10.9	ELBOW C	11.2	FOREARM C	11.2
WRIST C	6.9	FIST C	11.9	CHEST C	37.8	WAIST C	30.7	BUTT C	36.1
THIGH C	20.1	LOWTHIGH C	15.0	KNEE C	15.1	CALF C	14.6	ANKLE C	8.8
SPHYRI H	3.0	FOOT L	10.8	FOOT B	3.9	SPAN	72.1	SIT H	35.4
BIACROM D	13.8	HIP B SIT	13.7	BUTPOP L	19.9	HAND L	7.7	HAND B	3.7
HEAD C	22.6	HEAD L	8.0	HEAD B	6.1	MALX S	0.2	JUXTA S	0.2
TRICEP S	0.2	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 56 AGE 42.0 STATURE 63.4 WEIGHT 159.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	364+01	508+01	280+02	900+02	755+02	113+02
2 STANDING, ARMS OVER HEAD	352+01	508+01	260+02	124+03	104+03	100+02
3 SPREAD EAGLE	353+01	508+01	254+02	115+03	890+02	290+02
4 SITTING	721+01	508+01	250+02	522+02	562+02	276+02
5 SITTING, FOREARMS DOWN	701+01	508+01	254+02	541+02	545+02	278+02
6 SITTING, THIGHS ELEVATED	674+01	508+01	220+02	362+02	370+02	222+02
7 MERCURY CONFIGURATION	717+01	508+01	257+02	564+02	567+02	285+02
8 RELAXED (WEIGHTLESS)	653+01	508+01	253+02	728+02	721+02	294+02

CERVIC H	53.9	SHLDR H	52.5	SUPSTERN H	52.0	SUBSTERN H	42.8	WAIST H	39.5
ILIAC H	34.4	TROCHAN H	31.9	TIBIALE H	16.4	UPARM L	12.4	LOWARM L	9.6
CHEST D	9.8	WAIST D	9.6	BUTT D	10.4	CHEST B	13.0	WAIST B	12.2
HIP B	13.5	AXILARM C	13.1	BICEP C	12.2	ELBOW C	11.0	FOREARM C	11.3
WRIST C	6.7	FIST C	11.8	CHEST C	39.6	WAIST C	35.2	BUTT C	38.4
THIGH C	23.3	LOWTHIGH C	15.9	KNEE C	15.0	CALF C	14.0	ANKLE C	8.1
SPHYRI H	2.4	FOOT L	10.1	FOOT B	3.5	SPAN	64.8	SIT H	33.6
BIACROM D	13.7	HIP B SIT	13.8	BUTPOP L	16.9	HAND L	7.3	HAND B	3.5
HEAD C	23.0	HEAD L	7.8	HEAD B	6.5	MALX S	0.7	JUXTA S	0.0
TRICEP S	0.5	BISPIN B	10.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 57 AGE 38.2 STATURE 67.6 WEIGHT 161.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	367+01	419+01	301+02	103+03	955+02	112+02
2 STANDING, ARMS OVER HEAD	422+01	419+01	285+02	134+03	111+03	110+02
3 SPREAD EAGLE	347+01	419+01	279+02	137+03	902+02	329+02
4 SITTING	820+01	419+01	253+02	513+02	521+02	317+02
5 SITTING, FOREARMS DOWN	801+01	419+01	253+02	534+02	642+02	321+02
6 SITTING, THIGHS ELEVATED	772+01	419+01	228+02	308+02	273+02	266+02
7 MERCURY CONFIGURATION	827+01	419+01	260+02	562+02	686+02	333+02
8 RELAXED (WEIGHTLESS)	775+01	419+01	257+02	833+02	766+02	332+02

CERVIC H	57.2	SHLDR H	56.5	SUPSTERN H	55.0	SUBSTERN H	48.8	WAIST H	43.7
ILIAC H	39.6	TROCHAN H	35.2	TIBIALE H	17.4	UPARM L	13.6	LOWARM L	10.5
CHEST D	10.6	WAIST D	9.2	BUTT D	9.3	CHEST B	13.1	WAIST B	12.0
HIP B	13.9	AXILARM C	12.4	BICEP C	11.7	ELBOW C	11.0	FOREARM C	10.9
WRIST C	10.3	FIST C	11.2	CHEST C	39.6	WAIST C	34.3	BUTT C	39.4
THIGH C	23.9	LOWTHIGH C	16.1	KNEE C	14.5	CALF C	15.1	ANKLE C	9.2
SPHYRI H	2.5	FOOT L	10.2	FOOT B	3.6	SPAN	67.7	SIT H	33.0
BIACROM D	12.4	HIP B SIT	13.9	BUTPOP L	20.2	HAND L	7.1	HAND B	3.6
HEAD C	22.0	HEAD L	7.2	HEAD B	6.0	MALX S	0.5	JUXTA S	0.4
TRICEP S	0.6	BISPIN B	8.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 58 AGE 38.0 STATURE 70.4 WEIGHT 168.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	346+01	469+01	312+02	114+03	108+03	111+02
2 STANDING, ARMS OVER HEAD	348+01	469+01	288+02	156+03	141+03	109+02
3 SPREAD EAGLE	316+01	469+01	399+02	151+03	119+03	358+02
4 SITTING	761+01	469+01	259+02	597+02	691+02	350+02
5 SITTING, FOREARMS DOWN	785+01	469+01	255+02	616+02	662+02	347+02
6 SITTING, THIGHS ELEVATED	769+01	469+01	233+02	370+02	374+02	277+02
7 MERCURY CONFIGURATION	779+01	469+01	262+02	607+02	725+02	346+02
8 RELAXED (WEIGHTLESS)	728+01	469+01	277+02	899+02	879+02	359+02

CERVIC H	60.6	SHLDR H	58.5	SUPSTERN H	57.8	SUBSTERN H	49.4	WAIST H	45.7
ILIAC H	38.9	TROCHAN H	36.2	TIBIALE H	19.6	UPARM L	14.3	LOWARM L	10.4
CHEST D	9.4	WAIST D	9.2	BUTT D	11.0	CHEST B	13.4	WAIST B	11.6
HIP B	13.7	AXILARM C	12.6	BICEP C	11.2	ELBOW C	10.8	FOREARM C	11.2
WRIST C	7.1	FIST C	11.5	CHEST C	38.4	WAIST C	33.3	BUTT C	39.8
THIGH C	23.0	LOWTHIGH C	16.1	KNEE C	15.7	CALF C	14.3	ANKLE C	8.9
SPHYRI H	2.7	FOOT L	10.1	FOOT B	3.9	SPAN	69.4	SIT H	35.9
BIACROM D	12.2	HIP B SIT	14.2	BUTPOP L	20.4	HAND L	7.4	HAND B	3.4
HEAD C	22.0	HEAD L	7.7	HEAD B	6.1	MALX S	0.8	JUXTA S	0.8
TRICEP S	0.6	BISPIN B	9.4						

(WEIGHT IN LBS, LENG H IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 59 AGE 36.4 STATURE 72.0 WEIGHT 179.1

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	356+01	474+01	326+02	130+03	120+03	115+02
2 STANDING, ARMS OVER HEAD	344+01	474+01	302+02	177+03	159+03	117+02
3 SPREAD EAGLE	319+01	474+01	298+02	178+03	145+03	420+02
4 SITTING	851+01	474+01	278+02	698+02	807+02	399+02
5 SITTING, FOREARMS DOWN	822+01	474+01	278+02	619+02	865+02	399+02
6 SITTING, THIGHS ELEVATED	744+01	474+01	240+02	421+02	402+02	292+02
7 MERCURY CONFIGURATION	829+01	474+01	284+02	725+02	898+02	388+02
8 RELAXED (WEIGHTLESS)	777+01	474+01	282+02	105+03	101+03	408+02

CERVIC H	61.5	SHLDR H	59.3	SUPSTERN H	58.6	SUBSTERN H	49.8	WAIST H	45.6
ILIAC H	40.9	TROCHAN H	37.1	TIBIALE H	20.6	UPARM L	14.4	LOWARM L	10.7
CHEST D	9.2	WAIST D	8.4	BUTT D	10.0	CHEST B	13.5	WAIST B	11.9
HIP B	14.2	AXILARM C	13.0	BICEP C	12.3	ELBOW C	11.3	FOREARM C	11.7
WRIST C	6.9	FIST C	12.0	CHEST C	39.4	WAIST C	33.0	BUTT C	39.8
THIGH C	22.4	LOWTHIGH C	16.5	KNEE C	16.5	CALF C	15.6	ANKLE C	9.3
SPHYRI H	2.8	FOOT L	10.8	FOOT B	4.3	SPAN	72.8	SIT H	37.2
BIACROM D	13.0	HIP B SIT	14.8	BUTPOP L	20.4	HAND L	7.6	HAND B	3.7
HEAD C	23.4	HEAD L	8.2	HEAD B	6.2	MALX S	0.5	JUXTA S	0.5
TRICEP S	0.6	BISPIN B	9.5						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 60 AGE 31.0 STATURE 65.5 WEIGHT 134.4

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	345+01	453+01	288+02	792+02	752+02	673+01
2 STANDING, ARMS OVER HEAD	364+01	453+01	262+02	107+03	101+03	617+01
3 SPREAD EAGLE	325+01	453+01	264+02	108+03	819+02	267+02
4 SITTING	727+01	453+01	249+02	448+02	474+02	237+02
5 SITTING, FOREARMS DOWN	715+01	453+01	252+02	463+02	530+02	234+02
6 SITTING, THIGHS ELEVATED	660+01	453+01	221+02	267+02	291+02	178+02
7 MERCURY CONFIGURATION	735+01	453+01	251+02	465+02	519+02	255+02
8 RELAXED (WEIGHTLESS)	715+01	453+01	253+02	726+02	674+02	284+02

CERVIC H	55.8	SHLDR H	54.3	SUPSTERN H	53.2	SUBSTERN H	46.1	WAIST H	41.0
ILIAC H	36.7	TROCHAN H	33.9	TIBIALE H	16.7	UPARM L	13.0	LOWARM L	10.0
CHEST D	8.8	WAIST D	8.2	BUTT D	9.5	CHEST B	12.0	WAIST B	11.2
HIP B	12.8	AXILARM C	12.1	BICEP C	10.8	ELBOW C	9.9	FOREARM C	9.6
WRIST C	6.2	FIST C	10.2	CHEST C	36.2	WAIST C	31.5	BUTT C	36.2
THIGH C	20.0	LOWTHIGH C	13.7	KNEE C	14.1	CALF C	12.4	ANKLE C	7.9
SPHYRI H	2.4	FOOT L	10.0	FOOT B	3.5	SPAN	67.6	SIT H	34.4
BIACROM D	12.1	HIP B SIT	13.6	BUTPOP L	18.7	HAND L	7.0	HAND B	3.2
HEAD C	22.0	HEAD L	7.4	HEAD B	6.4	MALX S	0.8	JUXTA S	0.7
TRICEP S	0.5	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 61 AGE 40.0 STATURE 75.3 WEIGHT 199.5

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	362+01	510+01	329+02	153+03	139+03	136+02
2 STANDING, ARMS OVER HEAD	357+01	510+01	298+02	207+03	195+03	145+02
3 SPREAD EAGLE	355+01	510+01	298+02	210+03	155+03	537+02
4 SITTING	847+01	510+01	285+02	834+02	903+02	450+02
5 SITTING, FOREARMS DOWN	816+01	510+01	285+02	821+02	990+02	448+02
6 SITTING, THIGHS ELEVATED	766+01	510+01	243+02	506+02	440+02	344+02
7 MERCURY CONFIGURATION	839+01	510+01	290+02	879+02	104+03	434+02
8 RELAXED (WEIGHTLESS)	783+01	510+01	285+02	118+03	120+03	484+02

CERVIC H	64.8	SHLDR H	62.3	SUPSTERN H	61.5	SUBSTERN H	52.8	WAIST H	48.9
ILIAC H	43.2	TROCHAN H	39.5	TIBIALE H	21.3	UPARM L	14.9	LOWARM L	11.4
CHEST D	10.3	WAIST D	10.5	BUTT D	10.8	CHEST B	13.5	WAIST B	12.5
HIP B	14.5	AXILARM C	13.1	BICEP C	11.5	ELBOW C	11.6	FOREARM C	11.9
WRIST C	7.4	FIST C	12.6	CHEST C	40.2	WAIST C	37.1	BUTT C	41.9
THIGH C	22.8	LOWTHIGH C	16.3	KNEE C	15.9	CALF C	15.0	ANKLE C	9.2
SPHYRI H	3.0	FOOT L	10.7	FOOT B	3.9	SPAN	78.6	SIT H	37.5
BIACROM D	13.9	H P B SIT	15.9	BUTPOP L	21.3	HAND L	8.1	HAND B	3.8
HEAD C	22.9	HEAD L	7.7	HEAD B	6.5	MALX S	0.8	JUXTA S	0.7
TRICEP S	0.4	BISPIN B	10.2						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 62 AGE 32.3 STATURE 69.9 WEIGHT 178.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	360+01	451+01	314+02	122+03	107+03	121+02
2 STANDING, ARMS OVER HEAD	373+01	451+01	291+02	162+03	142+03	130+02
3 SPREAD EAGLE	346+01	451+01	292+02	162+03	119+03	410+02
4 SITTING	788+01	451+01	266+02	646+02	647+02	325+02
5 SITTING, FOREARMS DOWN	768+01	451+01	269+02	618+02	702+02	336+02
6 SITTING, THIGHS ELEVATED	723+01	451+01	234+02	427+02	379+02	275+02
7 MERCURY CONFIGURATION	795+01	451+01	267+02	671+02	794+02	349+02
8 RELAXED (WEIGHTLESS)	746+01	451+01	281+02	954+02	934+02	365+02

CERVIC H	59.6	SHLDR H	57.5	SUPSTERN H	56.9	SUBSTERN H	47.9	WAIST H	44.7
ILIAC H	38.8	TROCHAN H	35.0	TIBIALE H	19.2	UPARM L	13.8	LOWARM L	10.9
CHEST D	10.0	WAIST D	8.8	BUTT D	10.5	CHEST B	13.1	WAIST B	12.2
HIP B	13.6	AXILARM C	13.2	BICEP C	11.7	ELBOW C	10.3	FOREARM C	10.6
WRIST C	6.9	FIST C	11.2	CHEST C	41.7	WAIST C	34.2	BUTT C	40.2
THIGH C	24.4	LOWTHIGH C	16.9	KNEE C	15.2	CALF C	15.4	ANKLE C	9.3
SPHYRI H	2.6	FOOT L	10.6	FOOT B	3.7	SPAN	72.2	SIT H	36.9
BIACROM D	13.4	HIP B SIT	14.7	BUTPOP L	19.6	HAND L	7.7	HAND B	3.3
HEAD C	23.0	HEAD L	8.1	HEAD B	6.1	MALX S	0.8	JUXTA S	0.8
TRICEP S	0.8	BISPIN B	9.0						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 63 AGE 28.7 STATURE 73.9 WEIGHT 181.2

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	338+01	504+01	332+02	147+03	125+03	123+02
2 STANDING, ARMS OVER HEAD	336+01	504+01	301+02	195+03	177+03	124+02
3 SPREAD EAGLE	323+01	504+01	303+02	187+03	150+03	528+02
4 SITTING	838+01	504+01	275+02	717+02	829+02	417+02
5 SITTING, FOREARMS DOWN	803+01	504+01	279+02	781+02	828+02	415+02
6 SITTING, THIGHS ELEVATED	729+01	504+01	237+02	430+02	446+02	304+02
7 MERCURY CONFIGURATION	818+01	504+01	280+02	771+02	917+02	403+02
8 RELAXED (WEIGHTLESS)	765+01	504+01	278+02	109+03	108+03	419+02

CERVIC H	63.6	SHLDR H	61.7	SUPSTERN H	60.4	SUBSTERN H	51.0	WAIST H	47.8
ILIAC H	42.5	TROCHAN H	38.9	TIBIALE H	20.9	UPARM L	14.9	LOWARM L	11.7
CHEST D	9.8	WAIST D	8.7	BUTT D	9.1	CHEST B	13.8	WAIST B	11.7
HIP B	14.1	AXILARM C	12.7	BICEP C	12.9	ELBOW C	11.2	FOREARM C	12.0
WRIST C	7.3	FIST C	12.6	CHEST C	40.7	WAIST C	33.1	BUTT C	39.4
THIGH C	22.4	LOWTHIGH C	15.6	KNEE C	15.3	CALF C	15.4	ANKLE C	9.4
SPHYRI H	26.1	FOOT L	11.5	FOOT B	3.9	SPAN	76.6	SIT H	36.9
BIACROM D	13.0	HIP B SIT	14.7	BUTPOP L	21.1	HAND L	11.8	HAND B	3.8
HEAD C	23.2	HEAD L	8.2	HEAD B	6.3	MALX S	0.3	JUXTA S	0.2
TRICEP S	0.3	BISPIN B	10.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 64 AGE 34.5 STATURE 66.1 WEIGHT 163.7

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	358+01	453+01	279+02	990+02	914+02	111+02
2 STANDING, ARMS OVER HEAD	348+01	453+01	254+02	129+03	119+03	108+02
3 SPREAD EAGLE	347+01	453+01	263+02	128+03	882+02	284+02
4 SITTING	745+01	453+01	243+02	565+02	595+02	298+02
5 SITTING, FOREARMS DOWN	731+01	453+01	245+02	558+02	609+02	297+02
6 SITTING, THIGHS ELEVATED	689+01	453+01	212+02	371+02	390+02	251+02
7 MERCURY CONFIGURATION	739+01	453+01	248+02	584+02	619+02	318+02
8 RELAXED (WEIGHTLESS)	671+01	453+01	258+02	821+02	762+02	313+02

CERVIC H	57.4	SHLDR H	55.2	SUPSTERN H	54.4	SUBSTERN H	47.2	WAIST H	42.0
ILIAC H	37.2	TROCHAN H	34.1	TIBIALE H	17.8	UPARM L	13.3	LOWARM L	9.8
CHEST D	9.9	WAIST D	8.6	BUTT D	10.1	CHEST B	14.6	WAIST B	13.0
HIP B	12.7	AXILARM C	14.7	BICEP C	12.8	ELBOW C	10.6	FOREARM C	10.8
WRIST C	6.4	FIST C	10.6	CHEST C	42.5	WAIST C	34.6	BUTT C	37.4
THIGH C	22.6	LOWTHIGH C	15.3	KNEE C	14.3	CALF C	14.2	ANKLE C	8.5
SPHYRI H	2.7	FOOT L	9.4	FOOT B	3.5	SPAN	66.6	SIT H	34.6
BIACROM D	13.0	HIP B SIT	14.2	BUTPOP L	18.3	HAND L	6.7	HAND B	3.3
HEAD C	22.6	HEAD L	7.7	HEAD B	6.3	MALX S	0.7	JUXTA S	0.7
TRICEP S	0.4	BISPIN B	9.1						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 65 AGE 29.4 STATURE 67.1 WEIGHT 142.9

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	341+01	415+01	293+02	926+02	884+02	879+01
2 STANDING, ARMS OVER HEAD	333+01	415+01	270+02	126+03	108+03	787+01
3 SPREAD EAGLE	320+01	415+01	272+02	124+03	987+02	277+02
4 SITTING	804+01	415+01	254+02	534+02	557+02	272+02
5 SITTING, FOREARMS DOWN	781+01	415+01	261+02	555+02	535+02	282+02
6 SITTING, THIGHS ELEVATED	746+01	415+01	222+02	332+02	341+02	235+02
7 MERCURY CONFIGURATION	790+01	415+01	259+02	540+02	698+02	279+02
8 RELAXED (WEIGHTLESS)	724+01	415+01	267+02	789+02	785+02	295+02

CERVIC H	57.2	SHLDR H	55.0	SUPSTERN H	54.5	SUBSTERN H	46.4	WAIST H	42.9
ILIAC H	38.4	TROCHAN H	34.1	TIBIALE H	17.8	UPARM L	13.0	LOWARM L	10.1
CHEST D	8.7	WAIST D	7.9	BUTT D	9.4	CHEST B	12.4	WAIST B	10.8
HIP B	12.0	AXILARM C	11.0	BICEP C	11.3	ELBOW C	10.2	FOREARM C	11.0
WRIST C	6.5	FIST C	10.8	CHEST C	35.4	WAIST C	30.0	BUTT C	35.4
THIGH C	20.3	LOWTHIGH C	14.9	KNEE C	14.7	CALF C	14.6	ANKLE C	8.7
SPHYRI H	2.6	FOOT L	10.3	FOOT B	3.7	SPAN	67.4	SIT H	34.1
BIACROM D	12.8	HIP B SIT	13.3	BUTPOP L	19.3	HAND L	7.3	HAND B	3.2
HEAD C	23.3	HEAD L	8.2	HEAD B	6.3	MALX S	0.2	JUXTA S	0.2
TRICEP S	0.2	BISPIN B	8.3						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

SUBJECT NUMBER 66 AGE 31.0 STATURE 63.0 WEIGHT 129.8

POSITION	L(X)	L(Y)	L(Z)	I(X)	I(Y)	I(Z)
1 STANDING	337+01	518+01	281+02	754+02	691+02	797+01
2 STANDING, ARMS OVER HEAD	336+01	518+01	262+02	100+03	925+02	774+01
3 SPREAD EAGLE	329+01	518+01	257+02	939+02	774+02	206+02
4 SITTING	716+01	518+01	239+02	430+02	404+02	214+02
5 SITTING, FOREARMS DOWN	699+01	518+01	243+02	441+02	427+02	221+02
6 SITTING, THIGHS ELEVATED	670+01	518+01	220+02	310+02	274+02	177+02
7 MERCURY CONFIGURATION	707+01	518+01	244+02	441+02	479+02	217+02
8 RELAXED (WEIGHTLESS)	671+01	518+01	249+02	632+02	619+02	256+02

CERVIC H	53.3	SHLDR H	52.4	SUPSTERN H	50.3	SUBSTERN H	44.7	WAIST H	39.5
ILIAC H	35.8	TROCHAN H	35.5	TIBIALE H	16.0	UPARM L	11.9	LOWARM L	9.2
CHEST D	9.1	WAIST D	7.8	BUTT D	9.2	CHEST B	12.0	WAIST B	10.6
HIP B	13.1	AXILARM C	11.4	BICEP C	11.5	ELBOW C	10.0	FOREARM C	10.0
WRIST C	6.1	FIST C	11.2	CHEST C	36.7	WAIST C	30.6	BUTT C	35.2
THIGH C	20.5	LOWTHIGH C	15.5	KNEE C	13.9	CALF C	13.5	ANKLE C	8.3
SPHYRI H	2.8	FOOT L	9.4	FOOT B	3.7	SPAN	63.5	SIT H	33.6
BIACROM D	12.0	HIP B SIT	13.3	BUTPOP L	16.7	HAND L	6.6	HAND B	3.2
HEAD C	22.5	HEAD L	8.2	HEAD B	6.0	MALX S	0.8	JUXTA S	0.6
TRICEP S	0.5	BISPIN B	10.4						

(WEIGHT IN LBS, LENGTH IN INCHES, MOMENT OF INERTIA IN LB-IN-(SEC)SQ)

APPENDIX III

DESCRIPTION OF ANTHROPOMETRIC DIMENSIONS

1. ANKLE CIRCUMFERENCE: Subject stands. Holding the tape slightly above the projections of the ankle bones, measure the minimum circumference of the right ankle (reference 7).

2. AXILLARY ARM CIRCUMFERENCE: Subject stands, right arm initially raised and then lowered after the tape is in place. Holding the tape in a horizontal plane and as high as possible in the armpit, measure the circumference of the upper arm (reference 7).

3. BIACROMIAL DIAMETER: Subject sits erect, upper arms hanging at sides and forearms extended horizontally. Using the anthropometer, measure between points marked at the ends of the shoulders (acromion to acromion) (reference 7, Appendix IV).

4. BICEPS CIRCUMFERENCE (Extended): Subject stands with right arm extended at side. Holding the tape in a horizontal plane, measure the maximum circumference of the biceps muscle.

5. BISPINOUS BREADTH: Subject stands erect. Using the anthropometer measure the distance between the anterior superior spines of the ilium (most anterior bony projections of the hip bone) previously marked (Appendix IV).

6. BUTTOCK-POPLITEAL LENGTH: Subject sits with knees bent at right angles. Measure the maximum horizontal distance from the point of intersection of the right angle behind the right knee (popliteal area) to the buttocks.

7. BUTTOCK CIRCUMFERENCE: Subject stands erect. Holding the tape in a horizontal plane, measure the circumference of the buttocks at the level of the greatest rearward protrusion (reference 7).

8. BUTTOCK DEPTH: Subject stands erect. Holding the anthropometer horizontally at the subject's right side, measure the depth of the buttocks at the level of the greatest rearward protrusion (reference 7).

9. CALF CIRCUMFERENCE: Subject stands. Holding the tape in a horizontal plane, measure the maximum circumference of the right calf (reference 7).

10. CERVICALE HEIGHT: Subject stands erect. Using the anthropometer, measure the vertical distance from the floor to the point marked on the bony projection (the 7th cervical vertebra) at the posterior base of the neck (reference 7).

11. CHEST BREADTH Subject stands erect with arms initially raised and then lowered after the anthropometer is placed. Measure the chest breadth at the level of the nipples, during normal breathing (reference 7).

12. CHEST CIRCUMFERENCE Subject stands erect with arms initially raised and then lowered after the tape is in place. Holding the tape in a horizontal plane at the level of the nipples, measure the maximum circumference of the chest during normal breathing (reference 7).

13. CHEST DEPTH Subject stands erect with arms initially raised and then lowered after the instrument is in place. Holding the anthropometer horizontally on the subject's right side, at the level of the nipples, measure the chest depth during normal breathing (reference 7).

14. ELBOW CIRCUMFERENCE (Extended) Subject stands with right arm extended. Measure the elbow circumference holding the tape over the olecranon.

15. FIST CIRCUMFERENCE Subject makes a tight fist with right hand, thumb lying across the end of the fist. Measure the fist circumference with tape passing over the thumb and the knuckles (reference 7).

16. FOOT BREADTH Subject stands with right foot in the foot box, weight equally distributed, the foot just touching the side and rear walls, and long axis of the foot parallel to the side wall. Using the scale on the base of the foot box, measure the widest breadth of the foot (reference 7).

17. FOOT LENGTH Subject stands with right foot in the foot box, weight equally distributed, foot just touching the side and rear walls, and long axis of the foot parallel to the side wall. Using the scale on the base of the foot box, measure the length of the foot along the long axis (reference 7).

18. FOREARM CIRCUMFERENCE (Extended) Subject stands, right arm extended. Measure the maximum circumference of the forearm with tape.

19. HAND BREADTH AT METACARPALE Subject extends right hand. With the bar of sliding caliper across the palm, measure the maximum breadth across the distal ends of the metacarpal bones (knuckles) (reference 7).

20. HAND LENGTH Subject extends right hand. With the bar of the sliding caliper lying across the palm, measure the hand length from the proximal edge of the navicular bone at the wrist to the tip of the middle finger (reference 7).

21. HEAD BREADTH Using spreading calipers, measure the maximum breadth of the head in a plane perpendicular to the mid-sagittal plane (reference 7).

22. HEAD CIRCUMFERENCE: With tape passing above (not including) the brow ridges, measure the maximum circumference of the head (reference 7).

23. HEAD LENGTH: Using spreading calipers, measure the maximum length of the head from glabella to the occipital region (reference 7).

24. HIP BREADTH: Subject stands erect. Holding the anthropometer horizontally, measure the maximum breadth of the hips (reference 7).

25. HIP BREADTH, SITTING: Subject sits erect. Holding the anthropometer horizontally, measure the maximum breadth of the hips (reference 7).

26. ILIAC SPINE HEIGHT: Subject stands erect. Using the anthropometer measure the vertical distance from the floor to the mark of the anterior superior spine of the ilium on the right side (Appendix IV).

27. JUXTANIPPLE SKINFOLD: Subject stands erect. Using skinfold calipers measure the skinfold thickness just adjacent to the right nipple, along the line between the anterior crease of the axilla and the nipple. Grasp skinfold between thumb and index finger, enough to include two thicknesses of skin and subcutaneous fat but not muscle or fascia. Apply calipers 1 cm from fingers holding skinfold, and at a depth from the edge of the skinfold equal to the thickness of the fold. Skinfold thickness is taken in the vertical plane except when lines of Linn result in torsion of the skinfold, and then the skinfold is taken along these lines (reference 9).

28. KNEE CIRCUMFERENCE, STANDING: Subject stands. Measure the right knee circumference at the mid-patella level holding the tape in a horizontal plane.

29. LOWER ARM LENGTH: Subject stands with right arm extended at side. Using an anthropometer measure the distance along the long axis of the lower arm between points marked at radiale and stylion (Appendix IV).

30. LOWER THIGH CIRCUMFERENCE: Subject stands. Holding the tape in a horizontal plane measure the circumference of the lower thigh just above the right knee (reference 7).

31. MIDAXILLARY LINE, XYPHOID SKINFOLD: Subject stands erect. Using skinfold calipers measure the skinfold thickness in the mid-axillary line at the level of the xyphoid on the right side of the body. Grasp skinfold between thumb and index finger, enough to include two thicknesses of skin and subcutaneous fat but not muscle or fascia. Apply calipers 1 cm from fingers holding skinfold, and at a depth from the edge of the skinfold equal to the thickness of the fold. Skinfold thickness is taken in the vertical plane except when lines of Linn result in torsion of the skinfold, and then the skinfold is taken along these lines (reference 9).

32. SHOULDER HEIGHT (Acromial Height): Subject stands erect. Using the anthropometer, measure the vertical distance from the floor to the right acromion, previously marked (reference 7).

33. SITTING HEIGHT: Subject sits erect, head oriented in the Frankfort plane and feet resting on a surface so that knees are bent at about right angles. Using the anthropometer, measure the vertical distance from the sitting surface to the top of the head by placing the anthropometer firmly against the scalp (reference 7).

34. SPAN: Subject stands erect against a previously-calibrated rear wall with arms extended laterally at their maximum. With one hand touching a surface perpendicular to the rear wall, measure the maximum span by placing a block against the finger tips of the other hand (reference 7).

35. SPHYRION HEIGHT: Subject stands with legs slightly apart. Using measuring block measure the vertical distance from floor to sphyrion previously marked (Appendix IV).

36. STATURE: Subject stands erect with head oriented in the Frankfort plane. Using the anthropometer measure the vertical distance from the floor to the top of the head by placing the anthropometer firmly against the scalp (reference 7).

37. SUBSTERNALE HEIGHT: Subject stands erect. Using the anthropometer measure the vertical distance from the floor to a marked point at the lower edge of the breastbone (substernale) (reference 7, Appendix IV).

38. SUPRASTERNALE HEIGHT: Subject stands erect. Using the anthropometer, measure the vertical distance from the floor to the marked point at the upper edge of the breastbone (suprasternale)(reference 7, Appendix IV).

39. THIGH CIRCUMFERENCE: Subject stands with legs slightly apart. Holding the tape in a horizontal plane just below the lowest point in the gluteal furrow. Measure the circumference of the right thigh (reference 7).

40. TIBIALE HEIGHT: Subject stands with legs slightly apart. Using the anthropometer measure the vertical distance from floor to right tibiale previously located and marked (Appendix IV).

41. TRICEPS SKINFOLD: Subject stands with right upper arm extended forward and elbow in 90° flexion. Mark the posterior midpoint between the tip of the acromion and olecranon. Grasp skinfold between thumb and index fingers, enough to include two thickness of skin and subcutaneous fat but not muscle or fascia. Allowing the right arm to extend straight at the side, apply calipers 1 cm from fingers holding skinfold, and at a depth from the edge of the skinfold equal to the thickness of the fold. Skinfold thickness is taken in the vertical plane except when lines of Linn result in torsion of the skinfold and then the skinfold is taken along these lines (reference 9).

42. TROCHANTERIC HEIGHT: Subject stands erect. Using the anthropometer measure the vertical distance from the floor to trochanterion previously marked on the right side (Appendix IV).

43. UPPER ARM LENGTH: Subject stands with right arm extended at side. Using an anthropometer measure the distance along the long axis of the upper arm, between the points previously marked at acromion and at radiale (Appendix IV).

44. WAIST BREADTH: Subject stands erect with abdomen relaxed. Using the anthropometer, measure the minimum horizontal distance between the points marking the most lateral indentation in the abdomenal region (reference 7).

45. WAIST CIRCUMFERENCE: Subject stands erect with abdomen relaxed. Using the tape, measure the minimum circumference around the abdomenal region, passing over the most lateral indentation waist points (reference 7).

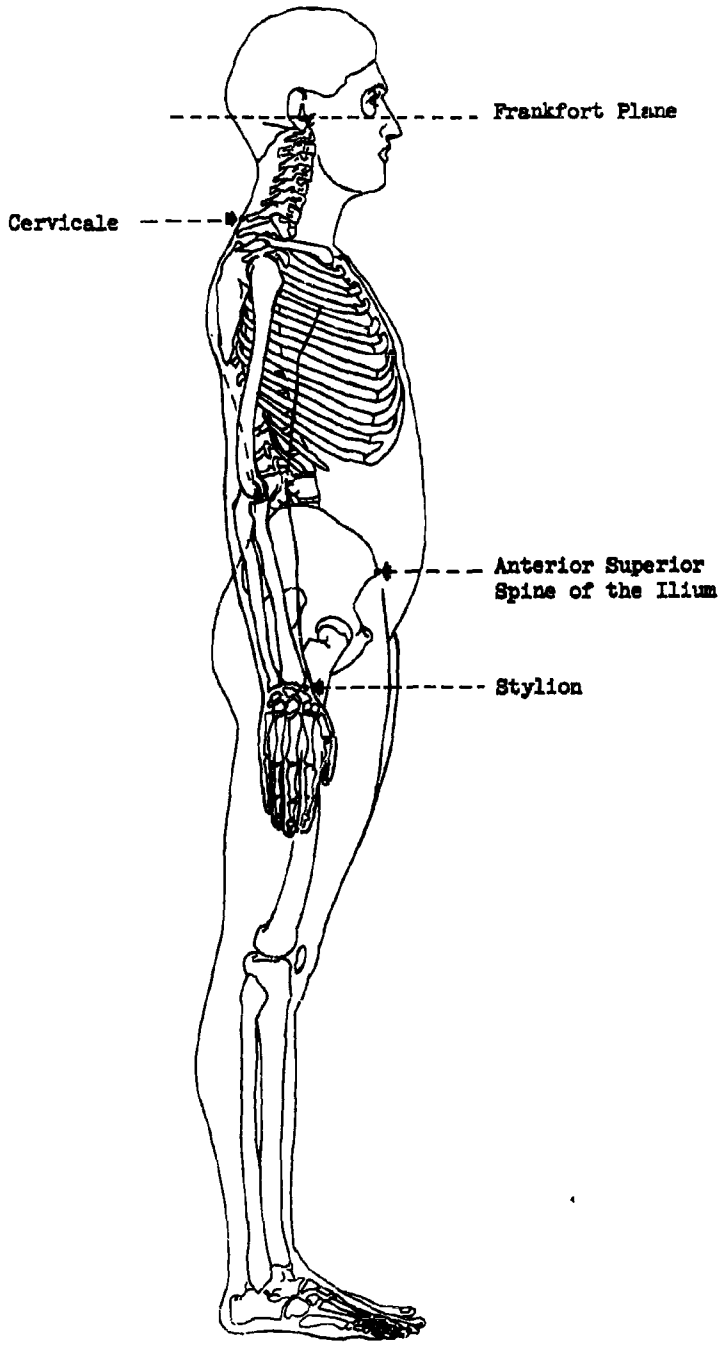
46. WAIST DEPTH: Subject stands erect with abdomen relaxed. Holding the anthropometer horizontally on the subject's right side, measure the anterior to posterior distance of the abdomen at the level of the most lateral indentation waist points (reference 7).

47. WAIST HEIGHT: Subject stands erect. Using the anthropometer, measure the vertical distance from the floor to the most lateral indentation point in the abdomenal region on the right side (reference 7).

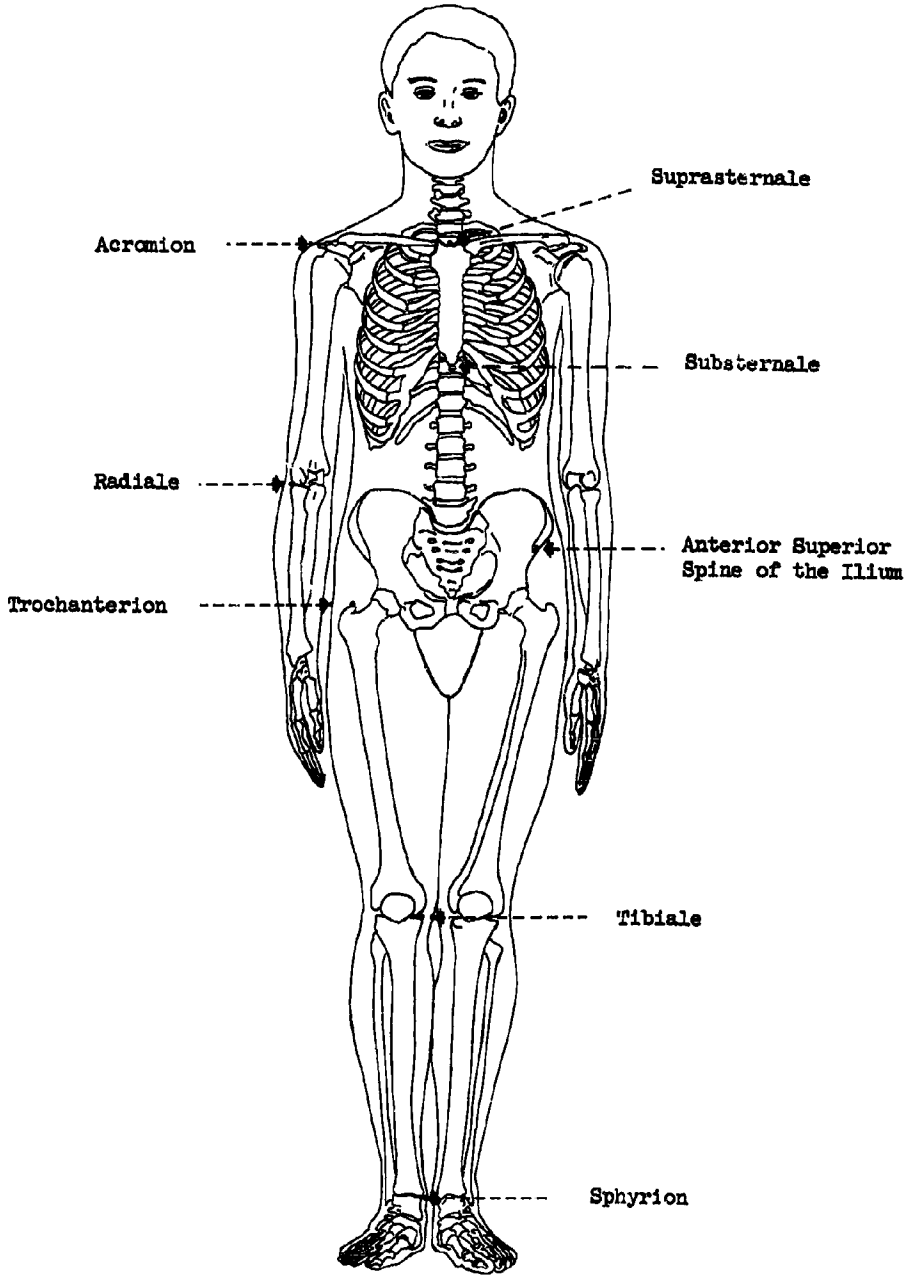
48. WRIST CIRCUMFERENCE: Right arm and hand extended. Passing the tape just proximal of the styloid process of the ulna, measure the minimum circumference of the wrist (reference 7).

APPENDIX IV

SKELETAL ANTHROPOMETRIC POINTS



SKELETAL ANTHROPOMETRIC POINTS



Aerospace Medical Division
6570th Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio
Rpt. No. AMRL-TDR-63-36. MOMENTS OF INERTIA AND CENTERS OF GRAVITY OF THE LIVING HUMAN BODY. Final report, May 1963, v + 62 pp, incl illus., tables, 11 refs.
Unclassified report

A study was conducted to determine the moments of inertia and centers of gravity of a sample of 66 living male subjects representative of the Air Force population in stature and weight. Eight body positions were investigated: Standing; Standing, Arms Over Head; Spread Eagle; Sitting; Sitting, Forearms Down; Sitting, Thighs Elevated; Mercury Configuration; Relaxed (Weightless). The procedure was based upon the compound pendulum having a theoretical accuracy of approximately ±2 to ±8 per cent depending upon position and axis. Orthogonal axes, defined as the intersections of the sagittal, frontal, and transverse planes through the standing body, were designated as X, Y, and Z. A set of 50 anthropometric dimensions was taken on each subject, as well as photographs of each subject in each position. Results of the study show that the average moment of inertia varied in this sample from 11 lb. in sec.^{2} about the Z axis to 152 lb. in sec.^{2} about the X axis. Linear regression analysis of moments of inertia vs. stature and weight yielded correlation coefficients ranging between 0.77 and 0.98

(over)

UNCLASSIFIED

1. Anthropology
2. Anthropometry
3. Body (Anatomy)
4. Weightlessness
5. Human Engineering

I. AFSC Project 7184, Task 718408
II. Contract AF 33(657)-7848
II. North American Aviation, Inc., Los Angeles, Calif.

IV. Santschi, W. R.
DuBois, J.
Omoto, C.
V. In DDC collection
VI. Aval fr OTS: $1.75

UNCLASSIFIED

Aerospace Medical Division
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I. AFSC Project 7184, Task 718408
II. Contract AF 33(657)-7848
II. North American Aviation, Inc., Los Angeles, Calif.

IV. Santschi, W. R.
DuBois, J.
Omoto, C.
V. In DDC collection
VI. Aval fr OTS: $1.75

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