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THE STRUCTURE DETERMINATION OF THREE INORGANIC AND TWO ORGANIC COMPOUNDS BY X-RAY DIFFRACTION.

By

ANTHONY MERCER.

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Department of CHEMISTRY

The University of British Columbia
2075 Wesbrook Place
Vancouver, Canada
V6T 1W5

Date 4 JULY 1977

Abstract

This thesis deals with the current methods available for X-ray structure determination and with the crystal and molecular structure determination of five compounds using these methods. The five compounds are

1) [2,3-Bis(dimethylarsino)-1,1,1,4,4,4-hexafluorobut-2-ene-As,As]tricarbonyldiiodotungsten(II), $Me_2AsC(CF_3):C(CF_3)AsMe_2WI_2(CO)_3$

2) Dimethylammonium trichlorotris(dimethylsulphoxide)-ruthenate(II), $[((CH_3)_2SO)_3RuCl_3]^-[(CH_3)_2NH_2]^+$

3) Dichlorotetrakis(dimethylsulphoxide)ruthenium(II), $(Me_2SO)_4RuCl_2$

4) 1,3,7-Trimethyl-2,6-dioxypurine hydrochloride dihydrate (caffeine hydrochloride dihydrate), $C_8H_{11}ClN_4O_2.2H_2O$

5) 1-Acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-pyrroline, $C_{24}H_{30}N_2O_{13}$

The structures of compounds 1), 2), and 3) were determined by Patterson syntheses, compound 4) by centrosymmetric direct methods and compound 5) by non-centrosymmetric direct methods. All structures were then refined using full-matrix least-squares procedures. The relevant crystal data for all five compounds can be found in Table A

In the tungsten compound [1)] the tungsten atom is seven-coordinate with a distorted capped octahedral environment, the capping group being a carbonyl. The capped face consists of the two remaining carbonyl groups and one of the arsenic atoms from the bidentate ligand. The uncapped face contains the two iodine atoms and the remaining arsenic

Table A

Crystal data for the five compounds examined

	Space Group	Unit Cell Dimensions		Final R Factor
1)	$P2_1/c$	a = 15.37(2) b = 9.529(1) c = 15.967(3)	α = 90.0 β = 112.03(2) γ = 90.0	0.067
2)	$Pn2_1a$	a = 27.459(5) b = 9.925(1) c = 14.266(3)	α = 90.0 β = 90.0 γ = 90.0	0.045
3)	$P2_1/n$	a = 8.939(3) b = 18.045(7) c = 11.363(3)	α = 90.0 β = 91.52(2) γ = 90.0	0.041
4)	$P2_1/c$	a = 12.391(4) b = 6.524(1) c = 17.167(6)	α = 90.0 β = 118.82(3) γ = 90.0	0.064
5)	$P2_1$	a = 19.629(5) b = 7.504(2) c = 9.830(2)	α = 90.0 β = 90.53(2) γ = 90.0	0.079

atom.

The structure of the ruthenium compound [2)] consists of two crystallcgraphically non-equivalent anions in the asymmetric unit linked by hydrogen bonding via dimethylammonium cations. The coordination geometry about the structurally similar anions is essentially that of an octahedron with the DMSO ligands being bonded to Ru via the sulphur atoms.

The co-ordination geometry about the ruthenium atom for compound 3) is essentially octahedral with *cis* chlorine atoms. Of the four DMSO ligands three are S-bonded and one is O-bonded, the O-bonded ligand being *trans* to a S-bonded ligand.

For caffeine hydrochloride [4)] the fused ring system is essentially planar and protonated at the 9-position. The crystal contains two types of hydrogen bonding involving O-H...Cl and N-H...O interactions.

The structure of compound 5) consists of a pyranose ring in the chair conformation with the four O-acetyl substituents in equatorial positions; the pyranose ring is connected to a planar pyrroline ring via a β-oxygen bridge.

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GENERAL INTRODUCTION

This thesis deals principally with the structure determination by single crystal X-ray diffraction of five compounds in their crystalline state. It illustrates by both theoretical and practical discussion the three major methods presently available for structure determination viz. the Patterson heavy atom synthesis, centrosymmetric direct methods, and non-centrosymmetric direct methods, and also contains a brief description of the practical aspects of X-ray crystallography.

Chapter 1 deals with the practical aspects and is designed to explain some of the terms used in the experimental sections of Chapters 2-6, and also give the non-crystallographic reader of this thesis a limited background to crystallography. All crystallographic symbols and nomenclature appearing throughout this thesis have their conventional meanings described in the "International Tables for X-ray Crystallography" (1).

Chapters 2-6 contain the description of the methods of structure analysis used, with a discussion of the resulting molecular and crystal structures found, for the five compounds examined. [2,3-bis(dimethylarsino)-1,1,1,4,4,4-hexafluoro-but-2-ene-As,As]tricarbonyldiiodotungsten(II), dimethylammonium trichlorotris(dimethylsulphoxide)ruthenate(II), and dichlorotetrakis(dimethylsulphoxide)ruthenium(II) were all solved using Patterson syntheses, 1,3,7-trimethyl-2,6-dioxypurine hydrochloride dihydrate was solved by centrosymmetric direct methods, and 1-acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-

pyrroline was solved using non-centrosymmetric direct methods. These methods are discussed in detail for the tungsten, purine and pyrroline compounds repectively.

For each of the five crystal structures the least-squares refinement was based on the minimization of $\Sigma\, \underline{w}(\underline{F}o-\underline{F}c)^2$ where $\underline{F}o$ and $\underline{F}c$ are the observed and calculated structure factors and $\underline{w}$ is the assigned weighting factor. The anisotropic thermal factors employed in the refinement are $\underline{U}_{ij}$ in the expression:

$$\underline{f} = \underline{f}^{\circ}\exp[-2\pi^2(\underline{U}_{11}\underline{h}^2\underline{a}^{*2} + \underline{U}_{22}\underline{k}^2\underline{b}^{*2} + \underline{U}_{33}\underline{\ell}^2\underline{c}^{*2} + 2\underline{U}_{12}\underline{hk}\underline{a}^*\underline{b}^* + 2\underline{U}_{13}\underline{h\ell}\underline{a}^*\underline{c}^* + 2\underline{U}_{23}\underline{k\ell}\underline{b}^*\underline{c}^*)]$$

where $\underline{f}^{\circ}$ is the tabulated scattering factor and $\underline{f}$ is that corrected for thermal motion. The isotropic thermal parameters have the form:

$$\underline{f} = \underline{f}^{\circ}\exp[-\underline{B}(\sin\theta/\lambda)^2]$$

where $\underline{B}$ is related to the mean-square displacement, $\underline{U}^2$, of the atom from its mean position by the expression:

$$\underline{B} = 8\pi^2\underline{U}^2.$$

CHAPTER 1

AN INTRODUCTION TO X-RAY CRYSTALLOGRAPHY

A) A PRACTICAL VIEWPOINT

X-ray crystallography has grown from its infancy some 60 years ago to become what many would feel is the present day definitive means of structure determination. From the complex pattern of diffracted X-ray intensities a crystallographer is usually able to piece together the internal structure of the single crystal chosen for study. The end results contain information valuable to both theoretical and practical scientists and as such are rarely equalled in terms of accuracy and reliability. Although the principles of X-ray crystallography are well established and are discussed in several standard texts (2-6), the brief synopsis of crystallographic terms and ideas given in this chapter, and the outline of the practical aspects of obtaining the necessary data, should be very useful to the non-crystallographer reading this thesis.

Often a good X-ray crystallographic structure determination will depend upon the skill of the synthetic chemist to produce a suitable crystal. A satisfactory crystal would be uniform in internal structure, single (i.e. not twinned), with a reasonable size and shape. The perfect size and shape are difficult to define since they depend on a balance of contradictory factors (e.g. a larger size produces more intensity but introduces absorption effects that must be corrected); one equation for the optimum thickness is that $t_{opt} = 2/\mu$ where μ is the linear absorption coefficient. For organic compounds $\mu < 10 cm^{-1}$ (for Cu$K\alpha$ radiation) giving a $t_{opt} = 0.2cm$ which is a large crystal indeed. A more general

rule is that a uniform cross-section crystal of size 0.1 to 0.3 mm is preferred. Obviously it is easier to work with room temperature and air stable crystals though techniques have been developed so that the structures of thermal- and air-unstable crystals can still be determined.

Once suitable crystals have been found, one is attached to the end of a glass fibre, with a little non-reactive adhesive, and mounted on a goniometer head. The goniometer head is specially designed to enable simple alignment of the crystal. It has two arcs which allow the crystal to be tipped by $\pm 20^{\circ}$ in each of two perpendicular planes, and two perpendicular slides which allow for lateral movement of the crystal.

The crystallographer must now complete two distinct operations on the crystal. Firstly it is necessary to determine the size and shape of the unit cell which also provides additional information on the internal symmetry of the crystal. Without this 'geometry' information it would be impossible to undertake the second part which entails knowing the position of all diffracted X-rays and measuring the intensity of these 'reflections', since it is these intensities that can be ultimately related to the distribution of diffracting electrons in the unit cell, in other words the crystal structure.

Bragg's Law (7) for X-ray diffraction from a crystal is given by:

$$n\lambda = 2d\sin\theta$$

where n is an integer, λ is the wavelength of X-ray

radiation, d is the interplanar spacing, and θ is the angle between the incident beam and the particular crystal plane being considered. The planes that are 'reflecting' the X-rays are named by Miller indices, which relate to the intercepts any plane makes on a set of reference axes $\underline{a}$, $\underline{b}$, and $\underline{c}$. If these intercepts are $1/\underline{h}$, $1/\underline{k}$, $1/\underline{\ell}$ (fractions of the unit cell edge) then the plane is said to have Miller indices of $(\underline{h},\underline{k},\underline{\ell})$. Rearranging Bragg's Law gives

$$\sin\theta = \frac{n\lambda}{2} \cdot \frac{1}{d}$$

and a simplified view of diffraction can be obtained by considering a direct relationship between sinθ and 1/d which is the construct of Ewald (8), in his reciprocal lattice. A reciprocal lattice can be defined by considering the normals to all possible direct lattice planes $(\underline{h},\underline{k},\underline{\ell})$ drawn from the origin. Each normal is terminated at a point a distance $1/d_{\underline{hk\ell}}$ from the origin, where $d_{\underline{hk\ell}}$ is the perpendicular distance between planes of the set $(\underline{h},\underline{k},\underline{\ell})$. Now the diffracting planes have been replaced by points and a reciprocal lattice with axes $\underline{a}^*$, $\underline{b}^*$ and $\underline{c}^*$, compared to the real axes $\underline{a}$, $\underline{b}$ and $\underline{c}$, has been produced. Combining the reciprocal lattice with the sphere of reflection allows for a simple visualization of the diffraction process (fig. 1). Whenever a reciprocal lattice point coincides with the surface of the sphere the conditions for Bragg reflection are fulfilled for the corresponding set of planes in direct space and a diffracted ray passes from the centre of the sphere through this point of contact.

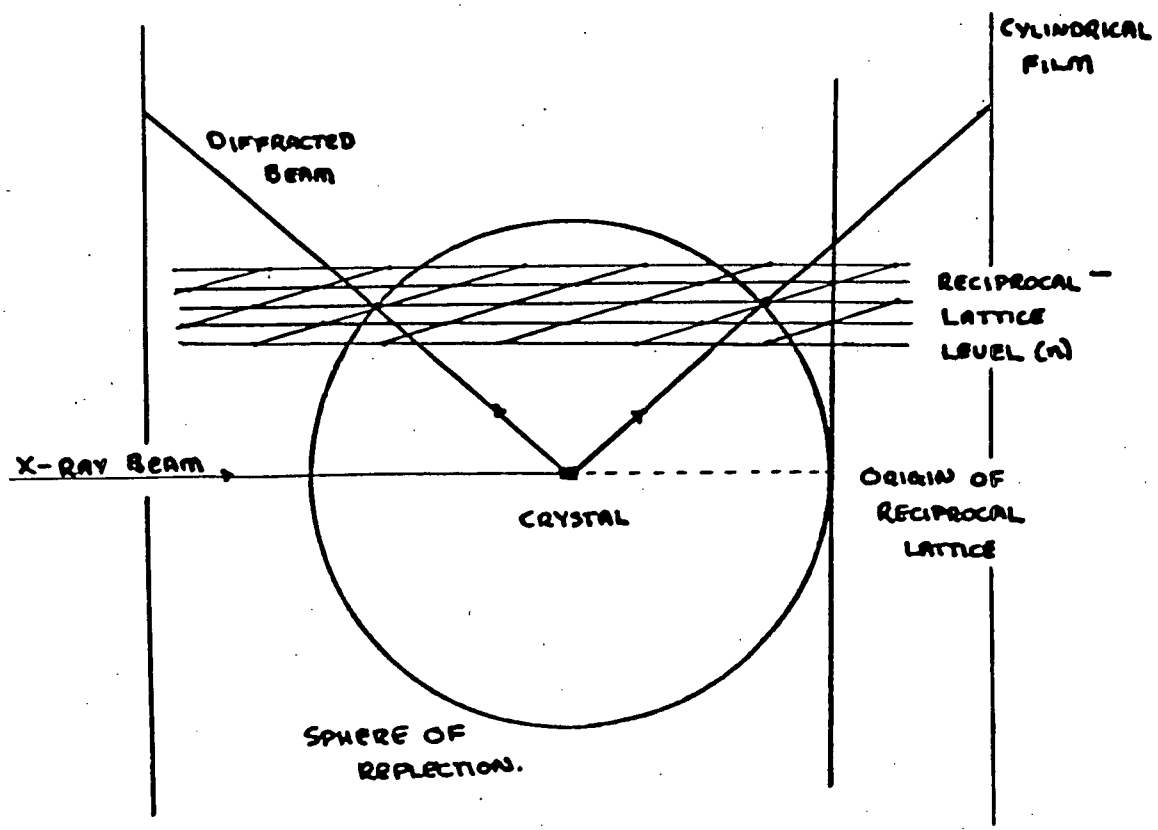


Figure 1 Schematic drawing of a reciprocal lattice level (n) intersecting the sphere of reflection. Diffracted rays pass from the centre of the sphere through the intersecting points. As the crystal rotates other points in the reciprocal lattice level contact the sphere but always on the circle. Extended rays will meet the cylindrical film at the same height if the crystal is correctly aligned.

The application of these concepts can be seen in the methods used for determining the geometry of the unit cell. For this either a Weissenberg or a Precession camera, but usually both as they are complementary, can be used. In a Weissenberg camera a cylinder of film is co-axial with a real rotation axis (e.g. c), the rotation axis being perpendicular to the X-ray beam. By the reciprocal lattice definition, the a*b* planes (i.e. hk0, hk1, hk2, etc.) of reciprocal lattice points must be perpendicular to the rotation axis and parallel to the beam (fig. 1). On oscillation these points will cut the sphere in a circle, and should, when the diffracted rays through these intersecting points are extended, meet the film at the same height. Then on unrolling and developing the diffracted spots will lie on straight lines or rows on the film. Errors in alignment of the real axis will appear and can be corrected, and as the separation of the rows on the film is a function of the identity period of the lattice this repeat distance can be determined.

A plane of reflections (e.g. hk0) contains information about the axes a* and b* but in a compressed unseparable form and as previously stated appears as a row on the film. If, however, this or any similar row is isolated (using a screen) and the film is moved while the crystal is rotating the a* and b* axes will intersect the sphere of reflection at different times and should appear on the film in different places. This is the basis of the Weissenberg technique and it provides the necessary additional unit cell information;

e.g. as the distance travelled by the film is linearly related to the angle rotated by the crystal (1mm = 2°), by a measurement of the distance apart of the axes a* and b* on the film the angle γ^* can be determined.

The disadvantage of the Weissenberg method is that it produces a distorted view of the reciprocal lattice. The Buerger precession camera overcomes this by a complex machining which duplicates the motion of one reciprocal lattice plane (again isolated, by the placement of a screen and the film) by the motion of the film, producing an undistorted view of the reciprocal lattice. Obviously this produces similar 'geometric' information, though the extent of reciprocal space available is less than that of the Weissenberg camera.

The Weissenberg and precession photographs also provide symmetry information in the form of 'systematic absences' which often allows for the determination of the crystallographic space group. The 230 space groups arise from the distinct combinations of the possible symmetry elements i.e., rotation axes (e.g. a two fold rotation designated by the symbol 2), mirror planes (m), rotation-inversion axes (e.g. $\bar{2}$), screw axes (e.g. 2_1, a rotation plus translation), and glide planes (e.g. a, a mirror plus translation) with the 14 Bravais lattices. The presence of screw axes, glide planes, and centered lattices lead to systematic absences, i.e. reflections that are systematically missing on the film. The combination of systematic absences and symmetry on the photograph provide the information from which the space

group can be determined. Sometimes it is not possible to uniquely define the space group from the photographs e.g. $\underline{P}2_1$ and $\underline{P}2_1/\underline{m}$ have the same systematic absences i.e. on the $0\underline{k}0$ row every odd numbered $\underline{k}$ reflection is missing. This absence is related to the presence of the two screw axis (2_1) in the group. The additional symmetry element $\underline{m}$ in $\underline{P}2_1/\underline{m}$ produces no absences and hence the two groups are indistinguishable. Fortunately this causes few problems in the final structure determination process.

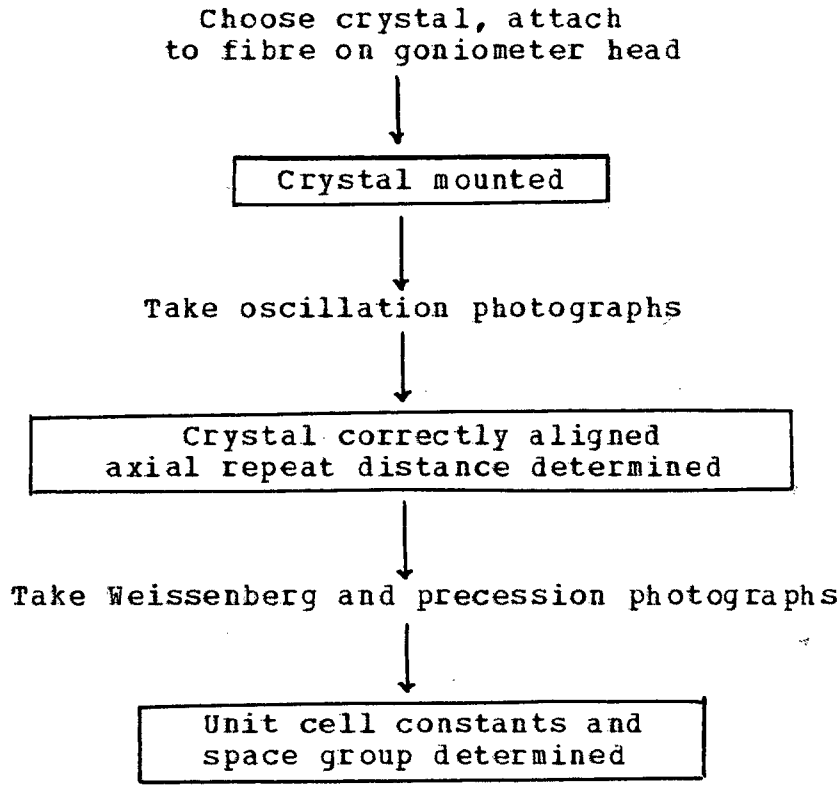
Another important piece of information is $\underline{Z}$ the number of molecules per unit cell, which is usually found by measuring the density of the crystals by flotation methods. Using the density, the total molecular weight of the cell contents can be calculated and then compared with the molecular weight of the compound. This comparison should produce close to an integer ratio, even if the molecular weight is only known approximately, which corresponds to the number of molecules in the cell.

Each space group has a characteristic number of asymmetric units which generally contain one molecule, so that $\underline{Z}$ may assist in determining or confirming the space group. Unfortunately, asymmetric units can contain more (Chapter 3) or less than one molecule. In practice if the space group is still in question, the usual approach is to attempt the solution in each of the possible space groups and see which one succeeds.

The film techniques have produced the following data about the crystal: the three axial lengths $\underline{a}$, $\underline{b}$, and $\underline{c}$

(reciprocal dimensions can be easily transformed into real lattice dimensions by the use of standard equations), the three angles $\underline{\alpha}$, $\underline{\beta}$, and $\underline{\gamma}$, and the probable space group. With all this information it is now possible to proceed with the second stage which involves measuring the intensity of every independent reflection. From the lattice parameters and the space group a computer can easily calculate settings for the crystal and detector, with respect to the incident beam, such that the intensity of all the desired reflections can be measured. The crystal is transfered to the diffractometer and accurately aligned using the intensity of axial reflections. Then the maximum position of several prominent reflections (chosen from the previously taken photographs) is carefully determined so that the cell dimensions can be more accurately refined. A new set of values for the relative positions of crystal and detector can then be determined. To measure the intensity of each reflection the detector is initially positioned to one side of the maximum so that the background can be measured. The detector then scans through the reflection peak, recording the intensity, and finally measures the background on the other side. Usually from the intensity data based on all the measured reflections it is possible to determine the structure of the crystal. A brief summary of these practical procedures is illustrated in the flow diagram Figure 2.

A) Geometry of diffraction measurements



B) Intensity of diffraction data

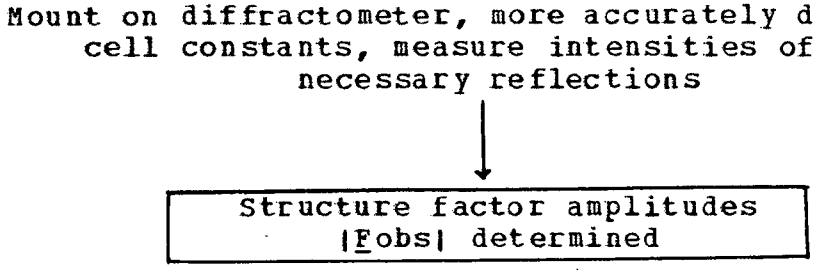


Figure 2 Flow chart illustrating the important steps in the practical aspects of X-ray crystallography

B) A THEORETICAL VIEWPOINT

An atom (n) with fractional co-ordinates x, y, z referred to unit cell axes a, b, and c will scatter X-radiation with an amplitude f_n, and a phase constant, relative to the origin, dependent on its position in the cell. The atomic scattering factor varies with the type of atom and its value is dependent upon $\sin\theta/\lambda$ for the reflection being considered (values can be obtained from tables). Further corrections are made for the thermal motion of the atom (f is tabulated for stationary atoms) as mentioned in the general introduction.

If there is more than one atom then the resultant from a combination of these diffracted waves is called the structure factor and can be expressed for a general plane (h,k,ℓ) as

$$F(hk\ell) = \sum_{j=1}^{n} f_j \exp[\, 2\pi i (hx_j + ky_j + \ell z_j)\,]$$

where the summation is over all atoms in the unit cell. An equivalent expression is

$$F(hk\ell) = \sum_{j=1}^{n} f_j \,[\cos 2\pi(hx_j + ky_j + \ell z_j) + i\sin 2\pi(hx_j + ky_j + \ell z_j)\,]$$

i.e. $F(hk\ell)$ can be represented as a complex number

$$F(hk\ell) = A + iB$$

$$\text{or } F(hk\ell) = |F_{hk\ell}|\,(\cos\alpha + i\sin\alpha)$$

hence the complex resultant is characterised by an amplitude $|F|$ and a phase constant α given by

$$|F| = \sqrt{A^2 + B^2} \quad \text{and} \quad \alpha = \tan^{-1} B/A.$$

The measured intensity $I_{hk\ell}$ unfortunately only tells us about $|F_{hk\ell}|$ and not about $\alpha_{hk\ell}$ since generally

$$\underline{I}_{hk\ell} \propto |\underline{F}_{hk\ell}|^2 .$$

This lack of knowledge about phases is called 'the phase problem' and its affect only becomes apparent when it is realized that if the structure factors are Fourier transforms of the periodic electron density of the crystal lattice then the electron density must be the Fourier transform of the structure factors. The general expression is

$$\rho(\underline{x}\underline{y}\underline{z}) = \frac{1}{\underline{V}} \sum_{\underline{h}} \sum_{\underline{k}} \sum_{\underline{\ell}} \underline{F}(\underline{h}\underline{k}\underline{\ell}) \exp\left[-2\pi i(\underline{h}\underline{x} + \underline{k}\underline{y} + \underline{\ell}\underline{z})\right]$$

hence once the structure factors $\underline{F}(\underline{h}\underline{k}\underline{\ell})$ are known the above series can be summed to give a representation of the entire crystal structure. Three major methods are presently used to overcome the fact that $\underline{I}_{hk\ell}$ gives information on $|\underline{F}_{hk\ell}|$ and not $\underline{\alpha}_{hk\ell}$ and they are discussed in the following chapters; Patterson heavy atom methods are discussed in Chapter 2, centrosymmetric direct methods in Chapter 5, and noncentrosymmetric direct methods in Chapter 6.

CHAPTER 2

CRYSTAL AND MOLECULAR STRUCTURE OF [2,3-BIS(DIMETHYLARSINO)-1,1,1,4,4,4-HEXAFLUOROBUT-2-ENE-AS,AS]TRICARBONYLDIIODOTUNGSTEN(II)

INTRODUCTION

Preliminary n. m. r. data on [2,3-bis(dimethylarsino)-1,1,1,4,4,4-hexafluorobut-2-ene-As,As]tricarbonyldiiodotungsten(II) seemed consistent with stereochemical nonrigidity (9), the existence of which has also been observed for seven-coordinate tantalum (10). The X-ray crystal structure of $Me_2AsC(CF_3):C(CF_3)AsMe_2WI_2(CO)_3$ was undertaken to provide information, which could indicate the geometry of the most probable transition state, for the exchange processes occuring in solution.

EXPERIMENTAL

[2,3-bis(dimethylarsino)-1,1,1,4,4,4-hexafluorobut-2-ene-As,As]tricarbonyldiiodotungsten(II) was prepared by the dropwise addition of iodine to $Me_2AsC(CF_3):C(CF_3)AsMe_2W(CO)_4$, in CH_2Cl_2, with vigorous stirring under a N_2 atmosphere.

Recrystallization from methylene chloride/hexane gave yellow plates. The crystal chosen for study was mounted with b parallel to the goniostat axis and was ca. 0.2 mm in length with a cross section of 0.2 x 0.04 mm. Unit-cell and space group data were obtained from film and diffractometer measurements. Unit-cell parameters were refined by a least-squares treatment of $\sin^2\theta$ values for 24 reflections measured on a diffractometer with MoKα radiation.

Crystal Data. $C_{11}H_{12}As_2F_6I_2O_3W$, $M = 893.40$ Monoclinic, $a = 15.37(2)$, $b = 9.529(1)$, $c = 15.967(3)$ Å, $\beta = 112.03(2)°$, $U = 2168(2)$ Å^3, $D_m = 2.737(3)$ gcm^{-3}, $Z = 4$,

D_c = 2.735(4) gcm^{-3}, F(000) = 1608 (20°C, MoKα, λ = 0.71069 Å, μ = 118 cm^{-1}). Absent reflections: h0l, l≠2n and 0k0, k≠2n define uniquely the space group $P2_1/c$ (C_{2h}^5, No. 14).

Intensities were measured on a Datex-automated General Electric XRD 6 diffractometer, with a scintillation counter, Mo Kα (zirconium filter and pulse height analyser), and a θ-2θ scan at 2° min^{-1} over a range of (1.80 + 0.86 tan θ) degrees in 2θ, with 20 s background counts being measured at each end of the scan. Data were measured to 2θ = 45° (minimum interplanar spacing 0.93 Å). A check reflection was monitored every 50 reflections throughout the data collection. The greatest deviation from the initial value was +10.1% and the final intensity was 1.007 times the initial value. Lorentz and polarization corrections were applied, and the structure amplitudes were derived. Of the 2778 independent reflections measured, 942 had intensities less than $3\sigma(I)$ above background where $\sigma^2(I) = S + B + (0.05S)^2$ with S = scan count and B = time averaged background count. These reflections were classified as unobserved and given zero weight in the refinement.

Structure analysis

As previously stated in Chapter 1 the electron density at a point (x,y,z) can be represented by a three dimensional Fourier series with the structure factors F_{hkl} as coefficients

$$\rho(x,y,z) = \frac{1}{V}\sum_h\sum_k\sum_l F(h,k,l)\exp[-2\pi i(hx + ky + lz)].$$

F_{hkl} contains both an amplitude $|F_{hkl}|$ and a phase α_{hkl} but the intensity information only gives data on the

$|\underline{F}_{hk\ell}|$'s, hence the phase information is unknown.

Patterson (11) solved this problem by use of a Fourier series with the phaseless quantities $|\underline{F}_{hk\ell}|^2$ as coefficients i.e.

$$\rho(\underline{x},\underline{y},\underline{z}) = \frac{1}{\underline{V}} \sum_{h} \sum_{k} \sum_{\ell} |\underline{F}_{hk\ell}|^2 \cos 2\pi(h\underline{x} + k\underline{y} + \ell\underline{z}).$$

This summation produced a map which contained peaks at positions corresponding to the interatomic vectors i.e. for co-ordinates $\underline{u}$,$\underline{v}$,$\underline{w}$ on the Patterson map there exist atoms $\underline{x}_1,\underline{y}_1,\underline{z}_1$ and $\underline{x}_2,\underline{y}_2,\underline{z}_2$ such that

$$\underline{u} = \underline{x}_1 - \underline{x}_2 \qquad \underline{v} = \underline{y}_1 - \underline{y}_2 \quad \text{and} \quad \underline{w} = \underline{z}_1 - \underline{z}_2$$

where $\underline{x}_2,\underline{y}_2,\underline{z}_2$ may be a symmetry related position of $\underline{x}_1,\underline{y}_1,\underline{z}_1$.

At first glance the Patterson synthesis appears to provide a simple solution to the phase problem. However, if there are N atcms in the cell, there will be $N(N-1)/2$ distinct Patterson vectors contained in a cell of the same size. This leads to a great deal of overlap and makes interpretation virtually impossible especially for structures involving many atoms of the same weight because in addition the height of the vector peak is proportional to the product of the atomic numbers of the atoms to which it corresponds. A consequence of this is that vectors between relatively 'heavy' atoms will appear larger than vectors between the lighter atoms, and here lies the key to the solution of the phase problem for certain molecules.

If a molecule contains a few 'heavy' atoms the Patterson function will give information on this part of the molecule.

If the heavy atom(s) comprise the larger share of the structure factor, a first approximation to the phases may be obtained i.e. analytically

$$\underline{F}_{hk\ell} = \sum \underline{f}_{HEAVY_j} \exp[2\pi i (h\underline{x}_{H_j} + k\underline{y}_{H_j} + \ell \underline{z}_{H_j})] + \sum \underline{f}_{LIGHT_j} \exp[2\pi i (h\underline{x}_{L_j} + k\underline{y}_{L_j} + \ell \underline{z}_{L_j})]$$

if $\underline{f}_{H_j} \gg \underline{f}_{L_j}$

then $\underline{F}_{hk\ell} \simeq \sum \underline{f}_{H_j} \exp[2\pi i (h\underline{x}_{H_j} + k\underline{y}_{H_j} + \ell \underline{z}_{H_j})]$.

If this first approximation is used in the Fourier summation the difference map produced may provide the positions of another part of the molecule. These positions of new atoms can be added to the old ones and used to improve the phases. The process is then repeated and it is hoped that this iterative procedure will result in the determination of the complete structure. This process of finding successive pieces of the structure is essentially the basis for all structure determinations including the direct methods described in Chapters 5 and 6.

For this compound and the two ruthenium compounds (discussed in Chapters 3 and 4) the largest peaks on the Patterson syntheses would be expected to be between the single heavy atoms and their symmetry related positions in all three cases. Once the tungsten and ruthenium positions were determined the iterative procedure was used to find the rest of the molecules.

Even the process of finding the heavy atoms is somewhat simplified by the phenomenon first pointed out by Harker (12). He showed that useful information is contained in certain planes and lines in the Patterson map which give rise

to vectors with one or two constant co-ordinates due to the presence of symmetry (other than centres) in the crystal.

For example the tungsten compound's space group was $P2_1/c$ which has four molecules in the unit cell. Due to the symmetry elements of the group any atom that occurs at the general position x,y,z (I) will also occur at the symmetry related positions $\bar{x},\bar{y},\bar{z}$ (II); $\bar{x},1/2+y,1/2-z$ (III); and $x,1/2-y,1/2+z$ (IV). The Patterson function contains peaks which correspond to the vectors between these symmetry related positions. e.g. the vector between position (I) and (III) is either

$$(x,1/2-y,1/2+z) - (x,y,z) = (0,1/2-2y,1/2)$$

or

$$(x,y,z) - (x,1/2-y,1/2+z) = (0,-1/2+2y,-1/2)$$

as 1/2 is equivalent to -1/2 the two vectors become

$0,1/2-2y,1/2$ and $0,1/2+2y,1/2$ i.e. $0,1/2 \pm 2y,1/2$

(note that these two vectors were related by a centre of symmetry hence all Patterson functions must be centrosymmetric). Table 1 gives the general vectors between all the four symmetry related positions (I), (II), (III), and (IV) in its first column. A search of the Patterson map was then undertaken to see if any of the peaks corresponded to these vectors which would be expected to be between the symmetry related tungsten atoms. The second column of this table indicates the respective peaks found on the map. Column three gives the possible values for the co-ordinates x,y,z of the tungsten atom. The map was also examined for the presence of W-I vectors and I-I vectors and from an overall

Table 1

Vectors between the symmetry related positions for the Space Group $\underline{P}2_1/\underline{c}$ and the possible solutions to the Patterson function for the tungsten compound

General vectors for Space Group $\underline{P}2_1/\underline{c}$	Peak on Patterson function	Possible solution
0, 1/2±2y, 1/2	#2* 0.00, 0.28, 0.50	1/2±2y = 0.28 2y = 0.22 or 0.78
±2x, 1/2, 1/2±2z	#3 0.35, 0.50, 0.27	± 2x = 0.35 2x = 0.35 or 0.65 1/2±2z = 0.27 2z = 0.23 or 0.77
±2x, ±2y, ±2z	#16 0.65, 0.22, 0.23	2x = 0.65 or 0.35 2y = 0.23 or 0.78 2z = 0.23 or 0.77

* Peaks were ordered by size, i.e. #2 was the second highest

examination it was deduced that

$$2\underline{x} = 1.35,\ 2\underline{y} = 0.78, \text{ and } 2\underline{z} = 0.77$$

or

$$\underline{x} = 0.68,\ \underline{y} = 0.39, \text{ and } \underline{z} = 0.38$$

would be the values for the co-ordinates of the tungsten atom. One cycle of full-matrix least-squares refinement varying the isotropic thermal parameters and position of the tungsten atom produced an $\underline{R}$ factor of 0.54. A difference Fourier revealed the positions of the two iodine and the two arsenic atoms and a further two cycles varying the positional and anisotropic thermal parameters reduced $\underline{R}$ to 0.20. A difference map at this stage revealed the positions of the remaining 20 atoms, but two further cycles with anisotropic thermal parameters for the five 'heavy' atoms and isotropic thermal parameters for the remaining atoms reduced $\underline{R}$ to only 0.16. Due to the high value of μ ($118cm^{-3}$) and the size of the crystal it was believed that such a high discrepency at this stage was probably due to neglecting the effects of absorption when calculating the structure amplitudes. An absorption correction using the computer program BICABS was therefore attempted (13). The faces of the crystal were carefully indexed and the dimensions measured. The values used in the correction are given in Table 2. Two cycles of refinement with the same atom parameters used in the last cycles, but the new structure amplitudes corrected for absorption, produced an $\underline{R}$ factor of 0.076. Convergence was finally reached after two more cycles, using an anomalous dispersion correction and anisotropic thermal parameters for the W, I, and As atoms, and isotropic

Table 2

Crystal dimensions and indices of the faces used in the absorption correction

h	k	l	Distance to Centroid (cm.)
0	1	0	0.0228
-4	-12	11	0.0197
1	0	0	0.0045
-1	0	0	0.0045
-1	0	1	0.0207
1	0	-1	0.0207

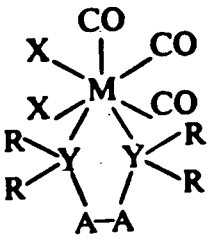
thermal parameters for the remaining atoms, at $\underline{R}$ = 0.067 for the 1823 observed reflections. (The thirteen highest intensity reflections 102, 106, 204, 202, 204, 306, 504, 502, 604, 114, 514, 025, and 225 were not included in the $\underline{R}$ factor calculation due to probable instrumental error.)

The scattering factors were taken from ref. 14 and anomalous scattering corrections from ref. 15. The weighting scheme: $\sqrt{\underline{w}} = 1$ if $|\underline{F}o| \leq 74.3$; $\sqrt{\underline{w}} = 74.3/|\underline{F}o|$ if $|\underline{F}o| > 74.3$ and $\sqrt{\underline{w}} = 0.0$ for unobserved reflections gave constant average values of $\underline{w}(\underline{F}o-\underline{F}c)^2$ over ranges of $|\underline{F}o|$ and was employed in the final stages of refinement.

The two CF groups on the chelate ring had high isotropic temperature factors; however an $\underline{F}o$ electron density map calculated using the phases from all the other found atoms did not reveal any evidence of disorder in the groups or individual atoms.

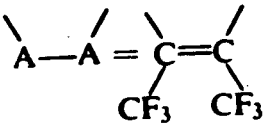
The final positional and thermal parameters are given in Tables 3 and 4 respectively. Measured and calculated structure factors are available from the U.B.C. Library.

RESULTS AND DISCUSSION



1
M = W
X = I
Y = As
R = CH_3

2
M = Mo
X = Br
Y = P
R = C_6H_5



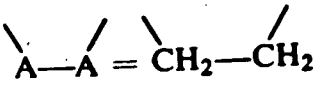


Figure 3

Schematic diagram of compounds (1) and (2) from text

The seven-coordinate geometry about the tungsten atom in (1), [2,3-bis(dimethylarsino)-1,1,1,4,4,4-hexafluorobut-2-ene-As,As]tricarbonyldiiodotungsten(II) is similar to that found for (2) dibromotricarbonyl[1,2-bis(diphenylphosphino) ethane]molybdenum(II)-1-acetone (16) (Figure 3), this type of geometry being described as a considerably distorted capped octahedron. In this molecule the capping group is one of the carbonyls [C(3)-O(3)], the three atoms defining the capped face are C(1), C(2) and As(1), while the uncapped face consists of the two iodine atoms I(1) and I(2) and the remaining arsenic atom As(2). Figure 4 shows a projection down the W-C(3) bond. Although it would also be possible to describe the tungsten environment in terms of various distorted capped trigonal prisms (17), a detailed analysis of

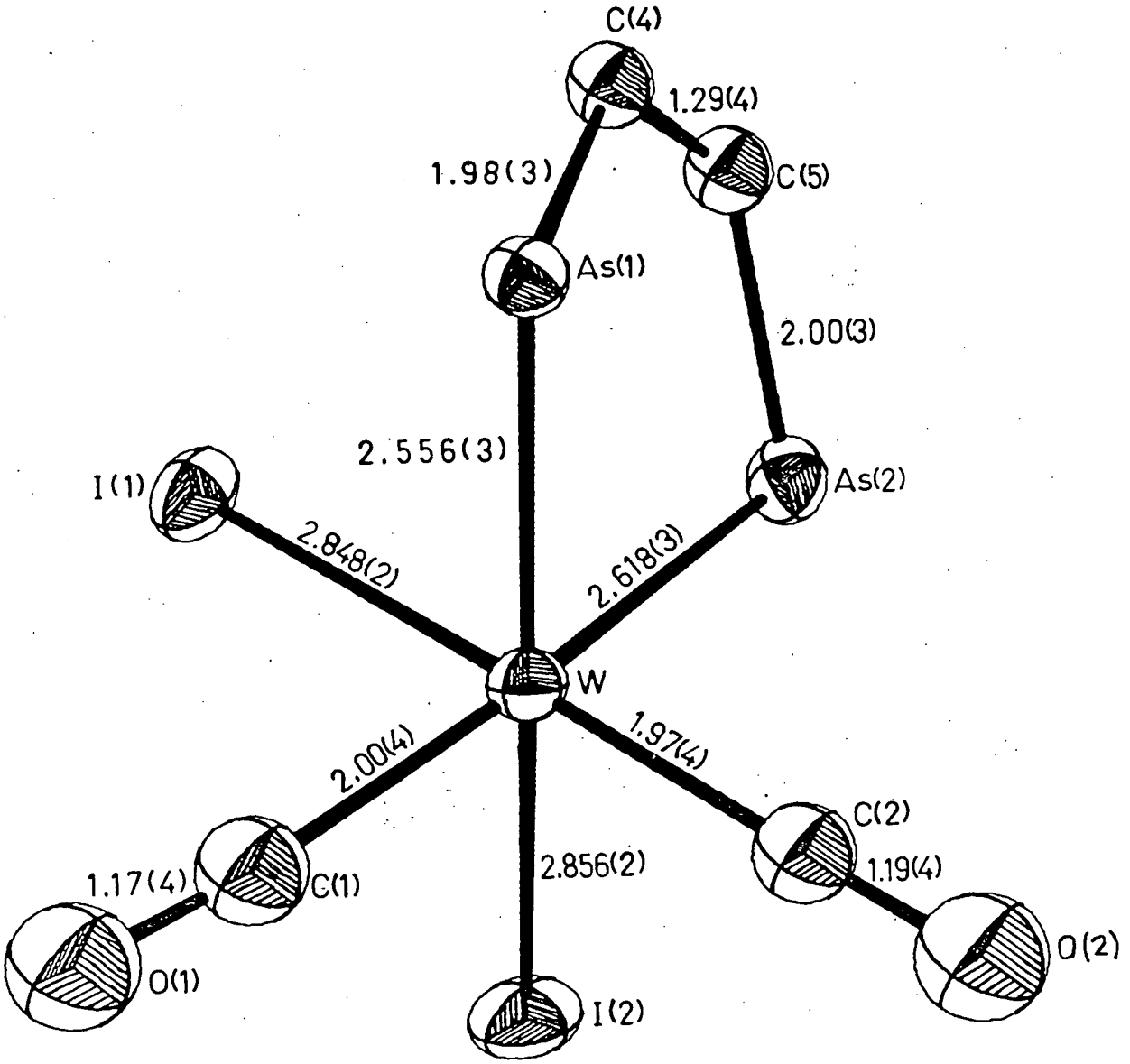


Figure 4

Projection of the coordination sphere of the molecule viewed down the vector from the carbonyl group in the capping position (omitted from the diagram) to the tungsten atom.

Table 3

Final positional parameters (fractional X 10^4) with standard deviations in parentheses

Atom	x	y	z
W	6733(1)	3932(1)	3840(1)
I(1)	8344(1)	3338(2)	3427(1)
I(2)	5627(1)	2858(3)	2094(1)
As(1)	8053(2)	4102(3)	5396(2)
As(2)	6956(2)	1347(3)	4439(2)
F(1)	9743(20)	3296(32)	7073(19)
F(2)	10241(19)	2691(29)	6121(18)
F(3)	9903(23)	1333(36)	7008(23)
F(4)	7815(25)	-1202(36)	5435(22)
F(5)	9209(26)	-663(39)	5574(24)
F(6)	8701(23)	-530(37)	6578(24)
O(1)	6742(20)	6410(31)	2526(19)
O(2)	4737(21)	3648(31)	3926(19)
O(3)	6362(17)	6556(26)	4800(16)
C(1)	6688(24)	5473(39)	2978(23)
C(2)	5494(22)	3788(33)	3893(20)
C(3)	6485(25)	5613(40)	4431(24)
C(4)	8686(18)	2270(28)	5757(17)
C(5)	8218(19)	1142(30)	5422(18)
C(6)	9677(23)	2355(36)	6418(21)
C(7)	8525(40)	-394(58)	5735(36)
C(8)	8997(22)	5506(34)	5546(21)
C(9)	7715(23)	4521(37)	6430(21)
C(10)	6981(25)	-73(40)	3550(24)
C(11)	6092(24)	535(38)	4927(22)

Table 4

Final thermal parameters and their estimated standard deviations

a) Anisotropic thermal parameters (U_{ij} (Å^2) X 10^2)

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
W	4.18(6)	6.27(7)	4.15(6)	0.16(5)	1.49(4)	0.17(5)
I(1)	5.68(11)	9.35(15)	6.56(12)	-1.14(10)	3.27(9)	-1.43(10)
I(2)	6.39(12)	14.10(22)	5.15(11)	-0.22(13)	0.57(9)	-1.10(12)
As(1)	5.12(14)	4.59(15)	4.62(14)	-0.18(12)	1.50(11)	-0.11(11)
As(2)	6.37(17)	5.87(18)	5.61(16)	-1.83(14)	2.21(13)	-0.74(13)

(b) Isotropic thermal parameters (U x 10^3)

Atom	U(Å^2)	Atom	U(Å^2)
F(1)	11.7(7)	C(2)	5.8(6)
F(2)	11.0(7)	C(3)	7.0(8)
F(3)	13.6(9)	C(4)	4.5(5)
F(4)	13.5(9)	C(5)	4.9(6)
F(5)	15(1)	C(6)	5.9(7)
F(6)	13.6(9)	C(7)	11(1)
O(1)	9.3(7)	C(8)	6.1(7)
O(2)	9.5(7)	C(9)	6.5(7)
O(3)	7.4(5)	C(10)	7.4(8)
C(1)	6.9(8)	C(11)	6.9(7)

differences between the basic polyhedra available for seven-coordinate molecules (18), indicates that in this type of molecule the ideal angle between the two larger coordinated atoms is 180° for a pentagonal bipyramid, ca. 90° for a capped octahedron, and 81.5° for a capped trigonal prism. From the I-W-I angle of 87.3° the choice of the capped octahedron would appear to describe the observed geometry most exactly. Figure 5 shows a general stereoscopic view of the molecule, with the atom labelling scheme. Individual bond lengths and angles, with standard deviations are given in Tables 5 and 6 respectively.

The angles subtended at the tungsten atom between the unique carbon atom C(3) and the atoms in the capped face, and those between C(3) and the atoms in the uncapped face, average to 74 and 128° respectively. These angles are very similar to those found in other capped octahedral structures, i.e. 73.6 and 125.5° in (2), and 73 and 128° for [bis-(diphenylarsino)methane]dibromodicarbonylmolybdenum(II) (19). Similarly the angles subtended at the central metal atom by pairs of atoms in the capped, and pairs in the uncapped faces for both molecules (1) and (2) are comparable. In (1) they are an average of 112 and 86° respectively, while in (2) the mean values are 112.3 and 89.7°.

Another feature of a distorted capped octahedron (17) demonstrated by this molecule, is the close non-bonded contacts made between the capping group and the three atoms in the capped face. Hence in (1), C(3) is 2.46, 2.26, and 2.73 Å away from C(1), C(2), and As(1), compared to 2.29,

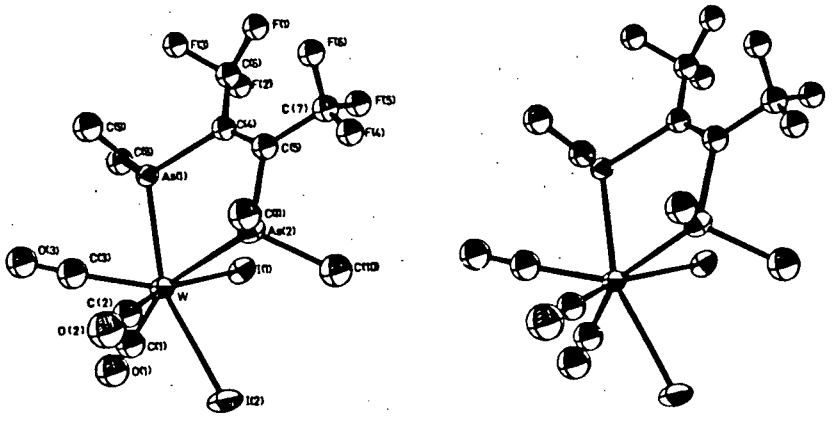


Figure 5

A general stereoscopic view of the molecule showing the crystallographic numbering scheme.

Table 5

Bond lengths (Å) with standard deviations in parentheses

Bond	Length (Å)	Bond	Length (Å)
W-I(1)	2.848(2)	C(1)-O(1)	1.17(4)
W-I(2)	2.856(2)	C(2)-O(2)	1.19(4)
W-As(1)	2.556(3)	C(3)-O(3)	1.13(4)
W-As(2)	2.618(3)	C(4)-C(5)	1.29(4)
W-C(1)	2.00(4)	C(4)-C(6)	1.50(4)
W-C(2)	1.97(4)	C(5)-C(7)	1.56(6)
W-C(3)	1.94(3)	C(6)-F(1)	1.35(4)
As(1)-C(4)	1.98(3)	C(6)-F(2)	1.31(4)
As(1)-C(8)	1.92(3)	C(6)-F(3)	1.18(4)
As(1)-C(9)	1.95(3)	C(7)-F(4)	1.27(5)
As(2)-C(5)	2.00(3)	C(7)-F(5)	1.20(5)
As(2)-C(10)	1.97(4)	C(7)-F(6)	1.28(5)
As(2)-C(11)	1.93(3)		

Table 6

Bond angles (deg.) with standard deviations in parentheses.

Bonds	Angle	Bonds	Angle
I(1)-W-I(2)	87.3(1)	W-As(2)-C(5)	110(1)
I(1)-W-As(1)	78.2(1)	W-As(2)-C(10)	115(1)
I(1)-W-As(2)	83.8(1)	W-As(2)-C(11)	120(1)
I(1)-W-C(1)	78(1)	C(5)-As(2)-C(10)	103(1)
I(1)-W-C(2)	161(1)	C(5)-As(2)-C(11)	105(1)
I(1)-W-C(3)	128(1)	C(10)-As(2)-C(11)	103(1)
I(2)-W-As(1)	159.4(1)	As(1)-C(4)-C(5)	119(2)
I(2)-W-As(2)	88.2(1)	As(1)-C(4)-C(6)	115(2)
I(2)-W-C(1)	75(1)	C(5)-C(4)-C(6)	127(3)
I(2)-W-C(2)	77(1)	As(2)-C(5)-C(4)	118(2)
I(2)-W-C(3)	128(1)	As(2)-C(5)-C(7)	116(3)
As(1)-W-As(2)	75.9(1)	C(4)-C(5)-C(7)	126(3)
As(1)-W-C(1)	116(1)	W-C(1)-O(1)	174(3)
As(1)-W-C(2)	113(1)	W-C(2)-O(2)	178(3)
As(1)-W-C(3)	73(1)	W-C(3)-O(3)	177(3)
As(2)-W-C(1)	155(1)	C(4)-C(6)-F(1)	110(3)
As(2)-W-C(2)	85(1)	C(4)-C(6)-F(2)	116(3)
As(2)-W-C(3)	128(1)	C(4)-C(6)-F(3)	113(3)
C(1)-W-C(2)	108(1)	F(1)-C(6)-F(2)	106(3)
C(1)-W-C(3)	77(1)	F(1)-C(6)-F(3)	91(3)
C(2)-W-C(3)	71(1)	F(2)-C(6)-F(3)	117(3)
W-As(1)-C(4)	111(1)	C(5)-C(7)-F(4)	109(4)
W-As(1)-C(8)	117(1)	C(5)-C(7)-F(5)	108(5)
W-As(1)-C(9)	118(1)	C(5)-C(7)-F(6)	111(4)
C(4)-As(1)-C(8)	108(1)	F(4)-C(7)-F(5)	119(5)
C(4)-As(1)-C(9)	101(1)	F(4)-C(7)-F(6)	99(5)
C(8)-As(1)-C(9)	100(1)	F(5)-C(7)-F(6)	110(5)

2.29, and 2.70 Å for the respective C(1) to C(2), C(3), and P(1) distances in molecule (2).

The angle subtended at the central tungsten atom by the bidentate ligand is 75.9(1)°. This is similar to those subtended by the mutually cis atoms of the capped and uncapped faces (the mean value of the six such angles being 78°). The ligand therefore seems ideally suited to occupy an edge of the capped octahedron. The three angles mutually trans are also very similar being 155, 159, and 161°, giving the geometry around the tungsten (see Figure 4) a reasonable C_{3v} symmetry.

The tungsten-iodine distances of 2.848(2) and 2,856(2) Å would appear to be the first determinations of W-I bond lengths in a seven-coordinate environment. Tungsten-bromine distances in similar environments (20 and 21) have already been found to have a mean value of 2.65 Å. Using a bromine covalent radius of 1.14 Å (22) we can estimate a W single bond radius of 1.51 Å for this compound. With use of 1.33 Å (22) for the iodine covalent radius, a predicted W-I bond length would be 2.84 Å, in reasonable agreement with the value found (mean value 2.852(2) Å). Assuming the radii of Mo(II) and W(II) are similar the value of 2.862 Å found for the Mo-I distance in $Mo(CNR)_6I^+$ (23) is also very close to these measured and predicted values. A similar argument predicts a W-As bond length of 2.73 Å, compared to the 2.556(3) and 2.618(3) Å found experimentally. This significant shortening is thought to be due to some double bond character in the W-As bonds caused by ($d\pi$-$d\pi$) back

donation from the central metal atom. The two W-As bonds are also significantly different from each other, which can be explained by consideration of the respective trans ligands. A trans ligand can affect the extent of back donation from the metal, hence the I(2) atom trans to As(1), is not as strong a $d\pi$ accepting group as the C(1)-O(1) group trans to As(2) which should result in a greater back donation to As(1). This will cause a shortening of the W-As(1) bond with respect to the W-As(2) bond, the difference found being 0.062 Å.

The W-C and C-O distances (mean values 1.97(4) and 1.16(4) Å) and the W-C-O angles (mean value 176(3)°) are similar to those found in other compounds with carbonyls joined to tungsten (24).

The five membered ring is in a 'puckered' conformation. Table 7 gives the equation of a weighted least-squares mean plane, with deviations of the atoms from the plane, and values for the dihedral angles in the ring. This type of 'puckered' conformation, with both carbon atoms on the same side of the weighted least-squares mean plane for the five membered ring, has been found in other compounds (25). The bend in the ring is probably to increase contacts between the methyl groups on the arsenic atoms and the adjacent carbonyl groups rather than the methyl-iodine contacts (26).

Neither the carbon-carbon double bond length of 1.29(4) Å (expected 1.34 Å) (27), nor the W-As-C bond angle mean value of 110.5° (expected tetrahedral value of 109.5°) and the As-C-C bond angles, mean value of 118.5° (expected for sp^2 hybridized carbons of 120.0°) are significantly different

Table 7

a) Equation of weighted least-squares mean plane* for the five membered ring

Atom	Δ (Å)	Δ/σ
W	0.0015	1.404
As(2)	-0.0105	3.822
As(2)	-0.0127	3.970
C(4)	0.7055	24.447
C(5)	0.6139	20.574

* plane: $0.894\underline{X} - 0.151\underline{Y} - 0.421\underline{Z} = 4.240$, where $\underline{X}$, $\underline{Y}$, and $\underline{Z}$ are orthogonal angstrom coordinates derived as follows

$$\begin{bmatrix}\underline{X}\\ \underline{Y}\\ \underline{Z}\end{bmatrix} = \begin{bmatrix}\underline{a} & 0 & \underline{c}\cos\beta\\ 0 & \underline{b} & 0\\ 0 & 0 & \underline{c}\sin\beta\end{bmatrix} \begin{bmatrix}x\\ y\\ z\end{bmatrix}$$

b) Dihedral angles in the five membered ring

Atom 1	Atom 2	Atom 3	Atom 4	Angle (deg.)
As(2)	W	As(1)	C(4)	23(1)
As(1)	W	As(2)	C(5)	-20(1)
W	As(1)	C(4)	C(5)	-26(2)
W	As(2)	C(5)	C(4)	12(2)
As(1)	C(4)	C(5)	As(2)	8(2)

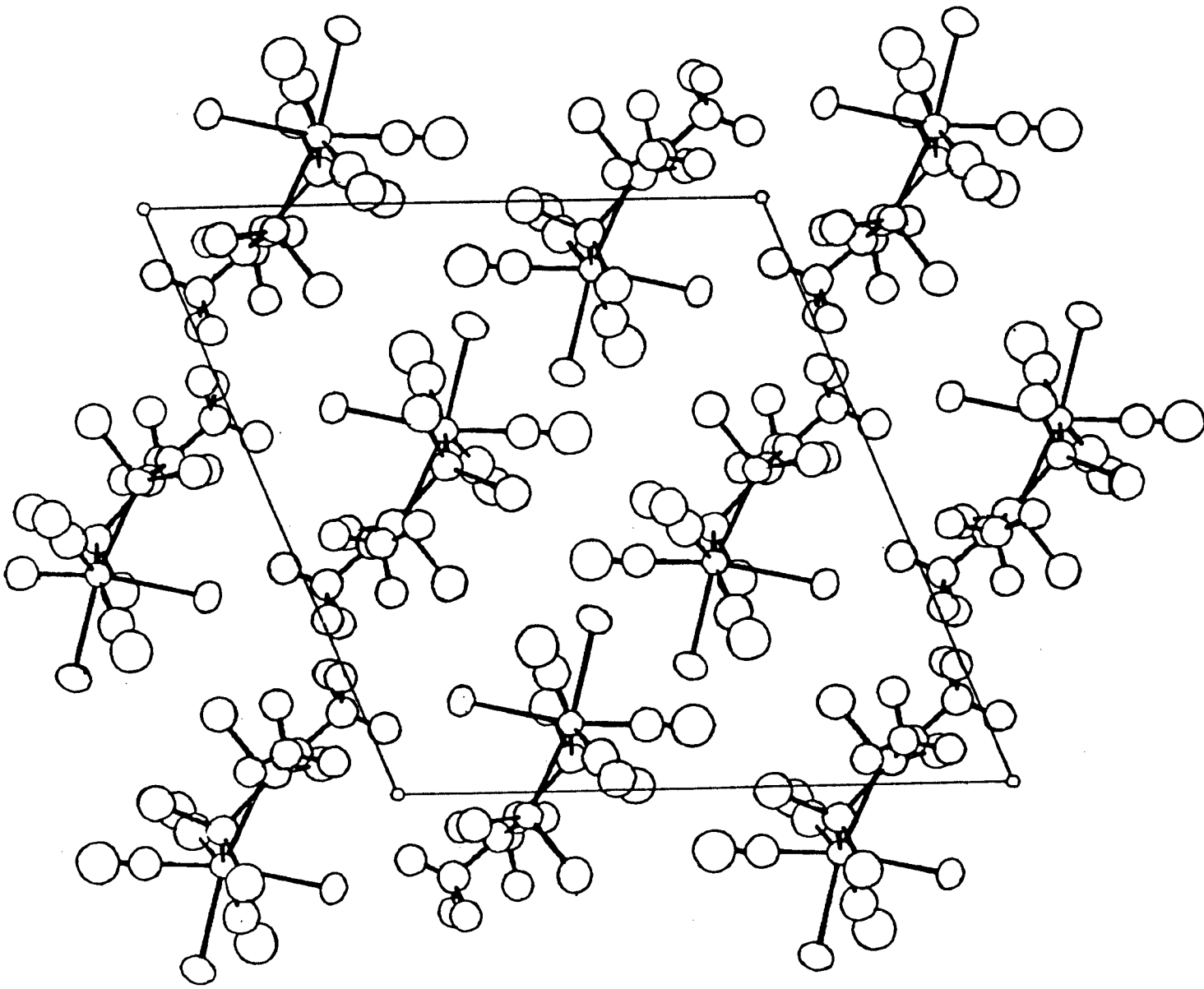


Figure 6

A projection of the structure down the b axis.

from their stated expected values. Both the As(1)-C(4) and As(2)-C(5) bond distances of 1.98(3) and 2.00(3) Å are similar to the As-CH_3 bond lengths (mean, 1.98(3) Å) as is found in other similar ligands (28).

From the relative uncertainty of the positions of the two CF_3 groups, it seems unreasonable to attempt any meaningful discussion of their bond lengths and angles.

The intermolecular packing appears to be governed solely by van der Waals interactions. A projection of the structure down the b axis is shown in Figure 6.

The n.m.r. data for this compound (9) indicated that molecular rearrangement must be occuring in solution. The crystal structure would suggest that the process involves rapid scrambling of the carbonyl groups and the iodine atoms, and simultaneous migration of the capping group over the faces of the $[As_2C_2I_2]$ octahedron. The sharpness of the spectra at -70°C indicates that the limiting spectrum corresponding to the solid state structure would be reached only at a much lower temperature.

CHAPTER 3

CRYSTAL AND MOLECULAR STRUCTURE OF DIMETHYLAMMONIUM TRICHLOROTRIS(DIMETHYLSULPHOXIDE)-RUTHENATE(II).

INTRODUCTION

From the results of the infrared and ^1H n.m.r. spectral data on dimethylammonium trichlorotris-(dimethylsulphoxide)ruthenate(II) (29) it was thought that all three dimethylsulphoxide ligands were S-bonded and that the anion was in the fac-configuration. The X-ray crystallographic study was undertaken to verify this assignment and determine structural parameters which could be useful in explaining the catalytic properties of these materials.

EXPERIMENTAL

Ruthenium trichloride trihydrate (1g, 39% Ru) and dimethylsulphoxide (1ml) were heated at 80°C in NN'-dimethylacetamide (20ml) under 1 atm hydrogen for 4h. The resulting red solution was set aside at room temperature (or concentrated to 10ml and cooled) and gave a bright yellow product which was washed with ether, and vacuum dried. Recrystallization of $[((CH_3)_2SO)_3\ RuCl_3]\ [(CH_3)_2NH_2]$ from dimethylacetamide gave yellow cubes. The crystal chosen for study was mounted with c parallel to the goniostat axis and was ca. 0.3 mm in length with a cross section of 0.25 x 0.25 mm. Unit cell and space group data were obtained from film and diffractometer measurements. The unit-cell parameters were refined by a least-squares treatment of $\sin^2\theta$ values for 20 reflections measured on a diffractometer with Mo$K\alpha$

radiation.

Crystal Data. $C_8H_{26}Cl_3NO_3RuS_3$, M = 487.9 Orthorhombic, a = 27.459(5), b = 9.925(1), c = 14.266(3) Å, U = 3887(1) Å^3, D_m = 1.67(1) gcm^{-3}, Z = 8, D_c = 1.667(5) gcm^{-3}, F(000) = 1984 (20 °C, Mo$K\alpha$, λ = 0.71069 Å, μ = 15.036 cm^{-1}). Absent reflections: 0kl, k+l ≠ 2n, hk0, h ≠ 2n define the space group as either Pnma (D_{2h}^{16}, No. 62) or Pn2$_1$a (C_{2v}^{9}, No. 33).

Intensities were measured on a Datex-automated General Electric XRD 6 diffractometer, with a scintillation counter, Mo $K\alpha$ (zirconium filter and pulse height analyser), and a θ-2θ scan at 2° min^{-1} over a range of (1.80 + 0.86 tan θ) degrees in 2θ, with 10 s background counts being measured at each end of the scan. Data were measured to 2θ = 45° (minimum interplanar spacing 0.93 Å). A check reflection was monitored every 50 reflections throughout the data collection. The greatest deviation from the initial value was +11.1% and the final intensity was 1.067 times the initial value. Lorentz and polarization corrections were applied, and the structure amplitudes were derived. No absorption correction was applied due to the low value of μ, and the fairly uniform shape of the crystal. Of the 2637 independent reflections measured, 676 had intensities less than $3\sigma(I)$ above background where $\sigma^2(I) = S + B + (0.05S)^2$ with S = scan count and B = time averaged background count. These reflections were classified as unobserved and given zero weight in the refinement.

STRUCTURE ANALYSIS

In a similar manner to that described in the previous

chapter a Patterson function was used to solve the structure of the compound. However, the initial attempt to solve the structure in the space group *Pnma* required a maximum at 0,0.5-2y,0 in the Patterson function. The three-dimensional Patterson map revealed no such peak other than the origin. If this was the case the *y* coordinate for the Ru atom would have to be 0.25, locating the atom on the crystallographic mirror plane. Although the anion could possess mirror symmetry, an attempt was then made to solve the structure in the non-centric space group, $Pn2_1a$. Since this space group has only four equivalent positions, there must be two crystallographically non-equivalent molecules in the asymmetric unit. In $Pn2_1a$ the heavy atom vectors on the Patterson map are to be found on the Harker plane 2*x*, 1/2, 2*y*. Examination of the map gave the *x* and *z* coordinates of Ru(1) and Ru(2), but left their *y* values unspecified. In this space group, however, there is no unique origin point along the *b* axis so Ru(2) was arbitrarily assigned the *y* coordinate 0.000, which was kept constant throughout the later refinements. One cycle of full-matrix least-squares refinement of the positional and isotropic thermal parameters for these two ruthenium atoms produced an *R* factor of 0.45. A difference Fourier revealed the positions of the six chlorine and six sulphur atoms. Two further cycles for these fourteen atoms still varying the positional and isotropic thermal parameters gave an *R* value of 0.19. The difference map at this stage revealed the positions of the remaining 24 oxygen, nitrogen and carbon atoms. After several more cycles

convergence was finally reached, using an anomalous scattering correction for the Ru, Cl, and S atoms, and varying the positional and anisotropic thermal parameters for all the atoms, at $\underline{R} = 0.045$ for 1943 observed reflections (the following reflections were removed from the data set in the final stages of refinement due to suspected errors resulting from extinction, absorption, and instrument malfunction: 4 0 0, 2 4 0, 19 0 1, 21 0 1, 2 1 1, 10 0 2, 17 1 2, 14 0 3, 4 0 4, 9 0 4, 12 0 4, 3 0 5, 2 3 5, 8 0 7, 10 6 7, 19 0 8, 0 1 9, and 1 0 14.)

Due to the additional expense involved in further refinement for a structure with so many variables, bearing in mind the reason behind the investigation, and the inherent difficulty with so many heavy atoms present, no attempt was made to determine or refine the positions of the hydrogen atoms in the $RuCl_3(Me_2SO)_3$ molecules. The positions of the hydrogen atoms bonded directly to the nitrogen atoms in the cations were calculated (assuming a N-H bond length of 0.99 Å and a H-N-H angle of 108°.) to give an idea of the interionic bonding. These atoms were not included in the structure refinement.

The scattering factors were taken from ref. 14 and anomalous scattering corrections (15) were applied for the Ru, Cl and S atoms. The weighting scheme: $\sqrt{\underline{w}} = 1$ if $|\underline{Fo}| \leq 65$; $\sqrt{\underline{w}} = 65/|\underline{Fo}|$ if $|\underline{Fo}| > 65$ and $\sqrt{\underline{w}} = 0.0$ for unobserved reflections gave constant average values of $\underline{w}(\underline{Fo}-\underline{Fc})^2$ over ranges of $|\underline{Fo}|$ and was used in the final stages of refinement. The final positional and thermal

Table 8

Final positional parameters (fractional x 10^4)

with estimated standard deviations in parentheses

Atom	x	y	z
Ru(1)	2560(0)	4849(2)	3945(1)
Ru(2)	283(0)	0	2858(1)
Cl(11)	1670(1)	4795(6)	3851(3)
Cl(12)	2489(2)	3399(5)	5299(3)
Cl(13)	2563(2)	2834(5)	2997(3)
Cl(21)	1094(2)	10090(8)	2176(3)
Cl(22)	469(2)	2095(6)	3640(4)
Cl(23)	640(2)	8823(7)	4181(4)
S(11)	3381(1)	4766(6)	3943(3)
S(12)	2556(2)	6598(5)	4961(3)
S(13)	2548(2)	6206(5)	2680(3)
S(21)	9543(1)	10104(7)	3556(3)
S(22)	16(2)	1123(6)	1567(3)
S(23)	128(2)	7954(6)	2231(4)
O(111)	3657(5)	5966(14)	4246(11)
O(121)	2672(5)	7981(14)	4620(9)
O(131)	3026(5)	6846(13)	2425(9)
O(211)	9154(4)	9221(15)	3198(10)
O(221)	9487(6)	1271(18)	1434(10)
O(231)	9823(7)	7888(17)	1401(11)
C(111)	3606(8)	3435(22)	4669(18)
C(112)	3638(8)	4336(23)	2772(15)
C(121)	2948(7)	6334(20)	5956(12)
C(122)	1970(8)	6759(27)	5528(16)
C(131)	2335(9)	5372(22)	1655(13)
C(132)	2105(8)	7535(20)	2752(14)
C(211)	9575(7)	-125(37)	4788(11)
C(212)	9299(6)	1795(26)	3530(17)
C(221)	293(13)	2769(24)	1510(21)
C(222)	233(9)	491(27)	499(15)
C(231)	9857(9)	6784(28)	3017(20)
C(232)	675(11)	7074(24)	2026(26)
N(1)	3646(6)	8809(18)	3556(13)
N(2)	1569(6)	1629(15)	4378(12)
C(11)	3297(8)	9802(28)	3173(17)
C(12)	3790(10)	9068(28)	4564(17)
C(21)	1870(7)	413(19)	4212(16)
C(22)	1378(9)	1719(22)	5336(14)
H(11)	3944	8818	3163
H(12)	3500	7900	3513
H(21)	1768	2438	4248
H(22)	1292	1624	3934

Table 9

Final thermal parameters and

their estimated standard deviations

Anisotropic thermal parameters (U_{ij} x 10^2 Å^2)

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Ru(1)	3.28(8)	2.10(6)	1.82(5)	-0.11(8)	-0.07(4)	0.04(6)
Ru(2)	2.82(8)	3.56(7)	2.81(6)	-0.40(6)	-0.12(6)	0.37(9)
Cl(11)	3.5(2)	4.1(3)	4.2(2)	-0.5(3)	-0.2(2)	0.5(3)
Cl(12)	6.5(3)	3.2(3)	2.7(2)	-1.1(2)	-0.9(2)	1.4(2)
Cl(13)	6.5(3)	2.7(2)	3.4(2)	0.1(2)	-1.2(2)	-0.5(2)
Cl(21)	3.4(2)	7.5(3)	5.3(2)	-0.4(3)	0.9(2)	0.5(3)
Cl(22)	4.6(3)	4.5(3)	6.4(3)	-0.8(2)	-1.4(3)	-1.3(3)
Cl(23)	5.5(3)	6.9(4)	4.9(3)	0.1(3)	-1.3(3)	2.0(3)
S(11)	3.2(2)	3.4(3)	3.7(2)	0.8(2)	0.1(3)	-0.9(2)
S(12)	3.0(2)	3.2(2)	1.9(2)	-0.2(2)	0.3(2)	-0.0(2)
S(13)	4.3(3)	2.1(2)	1.9(2)	0.1(2)	0.4(2)	0.1(2)
S(21)	3.4(2)	5.1(3)	3.0(2)	-0.4(3)	0.2(2)	0.5(2)
S(22)	4.7(3)	4.5(3)	3.6(3)	0.3(2)	-0.7(2)	1.3(2)
S(23)	5.7(3)	3.8(3)	5.6(3)	-0.4(2)	-1.3(3)	0.3(3)
O(111)	2.5(7)	4.4(9)	9(1)	-1.0(6)	0.6(7)	-0.8(8)
O(121)	5.5(8)	3.4(7)	4.5(7)	-0.7(6)	0.3(6)	0.0(7)
O(131)	4.8(8)	3.9(8)	4.1(7)	-1.2(7)	0.5(6)	1.0(6)
O(211)	2.1(7)	7.2(9)	6.0(8)	-1.6(7)	0.4(6)	0.4(8)
O(221)	7(1)	9(1)	4.3(8)	3(1)	-1.6(8)	0.0(9)
O(231)	13(1)	5(1)	5.8(9)	-0(1)	-3(1)	-0.2(8)
C(111)	4(1)	5(1)	9(2)	2(1)	-2(1)	1(1)
C(112)	5(1)	6(1)	6(1)	2(1)	-1(1)	-3(1)
C(121)	5(1)	4(1)	3(1)	-1(1)	-1.1(9)	-0.3(9)
C(122)	4(1)	9(2)	5(1)	-3(1)	3(1)	-2(1)
C(131)	9(2)	5(1)	2.5(9)	2(1)	-2(1)	-0.6(9)
C(132)	6(1)	4(1)	5(1)	1(1)	-0(1)	2(1)
C(211)	6(1)	11(2)	2.7(9)	1(2)	1.6(8)	1(2)
C(212)	1.2(9)	9(2)	9(2)	2(1)	1(1)	-4(1)
C(221)	16(3)	4(2)	10(2)	-3(2)	-2(2)	3(1)
C(222)	7(1)	10(2)	3(1)	1(1)	-0(1)	0(1)
C(231)	7(2)	8(2)	10(2)	-3(1)	-3(2)	5(2)
C(232)	9(2)	3(1)	18(3)	0(1)	-2(2)	-0(2)
N(1)	5(1)	3.4(9)	8(1)	1.0(9)	2(1)	0.6(9)
N(2)	3.9(9)	2.4(9)	6(1)	0.7(7)	0.8(8)	-0.6(8)
C(11)	6(1)	6(2)	9(1)	1(1)	3(1)	2(2)
C(21)	3(1)	4(1)	9(2)	0.6(8)	-0(1)	-1(1)
C(12)	10(2)	8(2)	6(1)	-3(2)	-0(1)	0(1)
C(22)	7(2)	6(2)	3(1)	-1(1)	-1(1)	-0(1)

parameters are given in Tables 8 and 9 respectively. Measured and calculated structure factors are available from the U.B.C. Library.

RESULTS AND DISCUSSION

The structure consists of two crystallographically non-equivalent anions in the asymmetric unit, linked by two non-equivalent dimethylammonium cations. The atom labelling scheme is illustrated in Figure 7. Most corresponding bond lengths and angles are not significantly different between the two independent formula units, as can be seen from Tables 10 and 11. All three DMSO ligands are coordinated through the sulphur atoms, the coordination geometry about the ruthenium atoms being essentially that of an octahedron, with each DMSO ligand having a chlorine atom in a trans position. Slight distortion does occur, presumably due to steric interference between the DMSO groups, the Cl-Ru-Cl angles being slightly smaller than 90° [87.1-88.3(2)°, mean 87.6°] while those for S-Ru-S are slightly larger [92.0-93.4(2)°, mean 92.6°].

The Ru-S bond lengths [2.252-2.273(5) Å, mean 2.261 Å] are significantly longer while the S-O distances [1.45-1.50(1) Å, mean 1.48 Å] are shorter than those found in [$Ru(NH_3)_5DMSO^{2+}$ $2PF_6^-$] (30) i.e. 2.188(3) Å and 1.527(8) Å respectively. These changes in bond length indicate a decrease in the possible $d\pi$-$p\pi$ back donation from the central metal to the sulphur atom caused by the competition from the other DMSO ligands for the available π-donor orbitals. Similar effects are seen for trans-$PdCl_2(DMSO)_2$ [Pd-S 2.299(2) Å, and S-O 1.476(5) Å] (31) and cis-

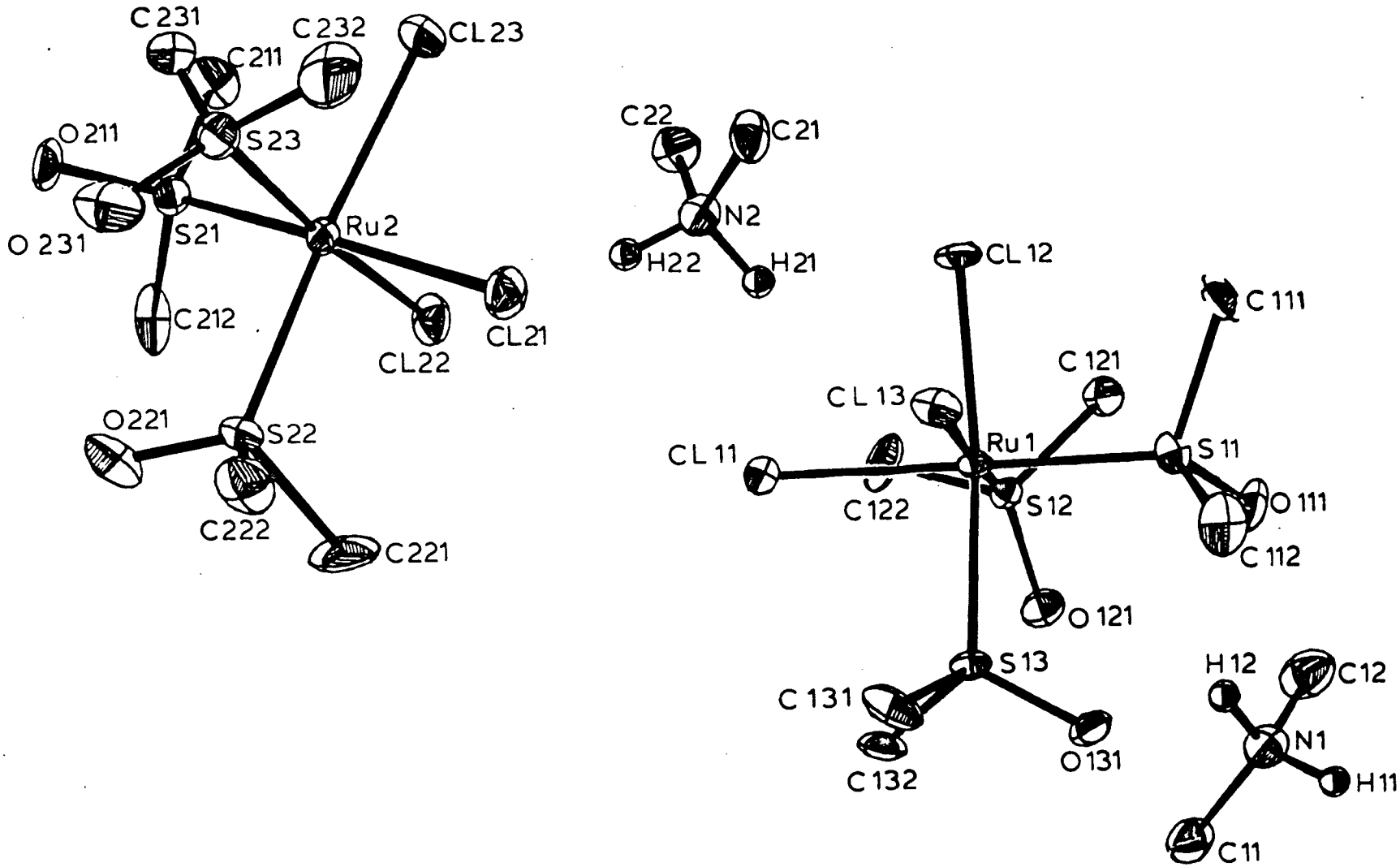


Figure 7

A general view of the structure showing the crystallographic numbering scheme.

Table 10

Bond Lengths (Å) with standard deviations in parentheses.

Bond	Length (Å)	Bond	Length (Å)
Ru(1) -Cl(11)	2.450(4)	Ru(2) -Cl(21)	2.430(4)
Ru(1) -Cl(12)	2.417(4)	Ru(2) -Cl(22)	2.414(5)
Ru(1) -Cl(13)	2.415(5)	Ru(2) -Cl(23)	2.427(5)
Ru(1) -S(11)	2.256(4)	Ru(2) -S(21)	2.267(4)
Ru(1) -S(12)	2.261(5)	Ru(2) -S(22)	2.273(5)
Ru(1) -S(13)	2.252(4)	Ru(2) -S(23)	2.260(5)
S(11) -O(111)	1.48(1)	S(21) -O(211)	1.47(1)
S(12) -O(121)	1.49(1)	S(22) -O(221)	1.47(2)
S(13) -O(131)	1.50(1)	S(23) -O(231)	1.45(2)
S(11) -C(111)	1.79(2)	S(21) -C(211)	1.77(2)
S(11) -C(112)	1.86(2)	S(21) -C(212)	1.81(2)
S(12) -C(121)	1.80(2)	S(22) -C(221)	1.80(2)
S(12) -C(122)	1.81(2)	S(22) -C(222)	1.75(2)
S(13) -C(131)	1.78(2)	S(23) -C(231)	1.78(3)
S(13) -C(132)	1.80(2)	S(23) -C(232)	1.76(3)
N(1) -C(11)	1.48(3)	N(2) -C(21)	1.48(2)
N(1) -C(12)	1.51(3)	N(2) -C(22)	1.47(3)

Table 11

Bond angles (deg) with standard deviations in parentheses.

Bonds	Angle (deg)	Bonds	Angle (deg)
Cl(11)-Ru(1)-Cl(12)	87.1(2)	Cl(21)-Ru(2)-Cl(22)	87.7(2)
Cl(11)-Ru(1)-Cl(13)	87.4(2)	Cl(21)-Ru(2)-Cl(23)	87.7(2)
Cl(11)-Ru(1)-S(11)	175.4(2)	Cl(21)-Ru(2)-S(21)	174.7(2)
Cl(11)-Ru(1)-S(12)	92.7(2)	Cl(21)-Ru(2)-S(22)	87.3(2)
Cl(11)-Ru(1)-S(13)	87.4(2)	Cl(21)-Ru(2)-S(23)	92.7(2)
Cl(12)-Ru(1)-Cl(13)	87.4(2)	Cl(22)-Ru(2)-Cl(23)	88.3(2)
Cl(12)-Ru(1)-S(11)	93.4(2)	Cl(22)-Ru(2)-S(21)	86.9(2)
Cl(12)-Ru(1)-S(12)	86.8(2)	Cl(22)-Ru(2)-S(22)	91.2(2)
Cl(12)-Ru(1)-S(13)	174.5(2)	Cl(22)-Ru(2)-S(23)	175.4(2)
Cl(13)-Ru(1)-S(11)	88.0(2)	Cl(23)-Ru(2)-S(21)	92.4(2)
Cl(13)-Ru(1)-S(12)	174.2(2)	Cl(23)-Ru(2)-S(22)	175.0(2)
Cl(13)-Ru(1)-S(13)	92.6(2)	Cl(23)-Ru(2)-S(23)	87.2(2)
S(11)-Ru(1)-S(12)	92.0(2)	S(21)-Ru(2)-S(22)	92.5(2)
S(11)-Ru(1)-S(13)	92.0(2)	S(21)-Ru(2)-S(23)	92.6(2)
S(12)-Ru(1)-S(13)	93.1(2)	S(22)-Ru(2)-S(23)	93.4(2)
Ru(1)-S(11)-O(111)	118.9(6)	Ru(2)-S(21)-O(211)	118.1(6)
Ru(1)-S(12)-O(121)	119.8(5)	Ru(2)-S(22)-O(221)	118.2(7)
Ru(1)-S(13)-O(131)	115.7(5)	Ru(2)-S(23)-O(231)	118.2(7)
Ru(1)-S(11)-C(111)	111.8(8)	Ru(2)-S(21)-C(211)	112.6(6)
Ru(1)-S(11)-C(112)	112.8(7)	Ru(2)-S(21)-C(212)	111.4(7)
Ru(1)-S(12)-C(121)	113.0(7)	Ru(2)-S(22)-C(221)	110(1)
Ru(1)-S(12)-C(122)	111.1(8)	Ru(2)-S(22)-C(222)	114.8(8)
Ru(1)-S(13)-C(131)	112.7(8)	Ru(2)-S(23)-C(231)	115(1)
Ru(1)-S(13)-C(132)	113.8(7)	Ru(2)-S(23)-C(232)	110(1)
O(111)-S(11)-C(111)	104.4(9)	O(211)-S(21)-C(211)	108(1)
O(111)-S(11)-C(112)	104.6(9)	O(211)-S(21)-C(212)	106(1)
O(121)-S(12)-C(121)	105.3(8)	O(221)-S(22)-C(221)	109(1)
O(121)-S(12)-C(122)	105(1)	O(221)-S(22)-C(222)	105(1)
O(131)-S(13)-C(131)	107(1)	O(231)-S(23)-C(231)	104(1)
O(131)-S(13)-C(132)	107.1(9)	O(231)-S(23)-C(232)	110(1)
C(111)-S(11)-C(112)	103(1)	C(211)-S(21)-C(212)	99(1)
C(121)-S(12)-C(122)	101(1)	C(221)-S(22)-C(222)	98(1)
C(131)-S(13)-C(132)	100(1)	C(231)-S(23)-C(232)	98(1)
C(11)-N(1)-C(12)	114(2)	C(21)-N(2)-C(22)	113(2)

$Pd(NO_3)_2(DMSO)_2$ [Pd-S 2.231(3) Å, and S-O 1.463(7) Å] (32). The strong trans effect of sulphur-bonded DMSO ligands (33) is illustrated in the Ru-Cl bond distances [2.414-2.450(4) Å, mean 2.426 Å] which are significantly longer than those for the mutually trans chlorine atoms [mean 2.390(7) Å] in the octahedral complex $RuCl_3(N_2C_6H_4(CH_3))(P(C_6H_5)_2)_2 \cdot (CH_3)_2O$ (34).

The geometry about the sulphur atoms is the expected distorted tetrahedron with values of 115.7-119.8(5)°, mean 118.2°, for the Ru-S-O angles, and 110-115(1)°, mean 112°, for the Ru-S-C angles. The values of the O-S-C angles [104-110(1)°, mean 106°], the C-S-C angles [98-103(1)°, mean 100°], and the S-C bond lengths [1.75-1.86(2) Å, mean 1.79 Å] are very similar to those found for free DMSO [107°, 98° and 1.80-1.82(1) Å respectively] (35).

The hydrogen atoms attached to the nitrogen atoms in the dimethylammonium cations are involved in hydrogen bonding to both non-equivalent anions, forming a chain-like structure throughout the crystal lattice. H(11) and H(12) take part in N-H . . . . O hydrogen bonding, while H(21) and H(22) are involved in N-H . . . Cl hydrogen bonding. Although heavy atom separations do not uniquely define the presence of hydrogen bonding, they can give a reasonable indication, values of typical heavy atom contact distances being 2.9 Å and 3.3 Å for N . . . . O. and N . . . Cl hydrogen bonded atoms (36 and 37). From Table 12 it can be seen that several of the separations are well above these values, tending to

Table 12

Values of O . . . N, O . . . H, Cl . . . N and Cl . . . H intermolecular contacts.

Atoms	Distance (Å)	Atoms	Distance (Å)
O(111)-N(1)	2.99(2)	O(111)-H(12)	2.2
O(121)-N(1)	3.18(2)	O(121)-H(12)	2.8
O(131)-N(1)	3.05(3)	O(131)-H(12)	2.3
O(211)-N(1)	2.89(2)	O(211)-H(11)	2.1
O(221)-N(1)	3.36(3)	O(221)-H(11)	2.9
O(231)-N(1)	3.36(3)	O(231)-H(11)	2.7
Cl(11)-N(2)	3.24(3)	Cl(11)-H(21)	2.4
Cl(12)-N(2)	3.35(3)	Cl(12)-H(21)	2.7
Cl(13)-N(2)	3.57(4)	Cl(13)-H(21)	2.8
Cl(21)-N(2)	3.73(4)	Cl(21)-H(22)	3.0
Cl(22)-N(2)	3.23(3)	Cl(22)-H(22)	2.3
Cl(23)-N(2)	3.79(4)	Cl(23)-H(22)	3.3

Due to the hydrogen positions being calculated the errors in the O . . . H, and Cl . . . H distances are subject to speculation.

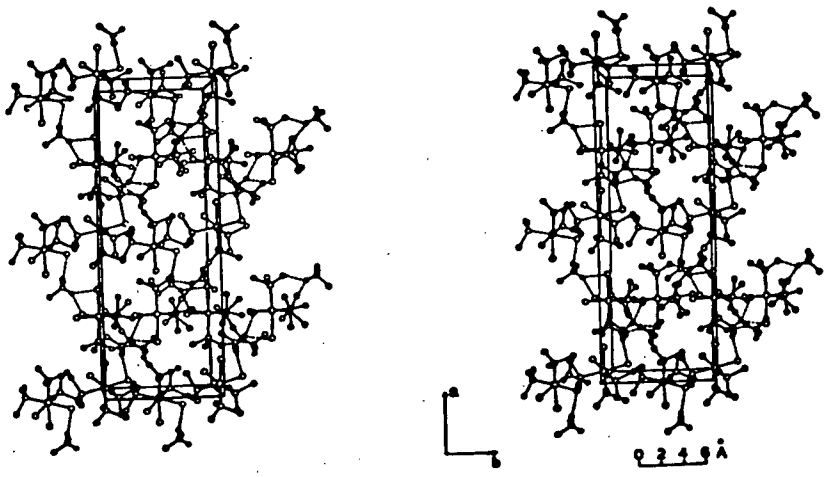


Figure 8

A stereoscopic diagram of the unit cell viewed down c; hydrogen bonds are indicated by dotted lines.

rule out the presence of hydrogen bonding for these chlorine and oxygen atoms. Unfortunately the hydrogen positions must be somewhat speculative, but the trends indicated from the O . . . H and Cl . . . H separations support the findings for the heavy atom contacts. Typical observed H . . . O and H . . . Cl distances are 2.0 Å and 2.4 Å compared to 2.6 Å and 3.0 Å for van der Waals contact only. The overall results would indicate the presence of at least six hydrogen bonds N(1)-H(12) . . . O(111), N(1)-H(12) . . . O(131), N(1)-H(11) . . . O(211), N(2)-H(21) . . . Cl(11), N(2)-H(21) . . . Cl(12) and N(2)-H(22) . . . Cl(22). Figure 8 shows the contents of the unit cell viewed along c with these hydrogen bonds indicated by the dotted lines.

CHAPTER 4

CRYSTAL AND MOLECULAR STRUCTURE OF DICHLOROTETRAKIS(DIMETHYLSULPHOXIDE)RUTHENIUM(II)

INTRODUCTION

Infrared and ^1H n.m.r. spectral data on dichlorotetrakis(dimethylsulphoxide)ruthenium(II) indicated the possibility of a mixture of S-bonded and O-bonded dimethylsulphoxide ligands (38). The X-ray crystallographic study of $[(Me_2SO)_4RuCl_2]$ was undertaken to verify this unusual assignment, and provide additional information to that gained from the structure presented in Chapter 3 (29) on ruthenium dimethylsulphoxide complexes.

EXPERIMENTAL

1g of ruthenium trichloride was refluxed in methanol (20ml) under hydrogen (1 atm) for approximately 8hr producing a blue solution. 4ml of dimethylsulphoxide were then added and the refluxing continued for a further 2 hours finally producing a red solution. Cooling and recrystallization of $(Me_2SO)_4RuCl_2$ from methanol gave yellow cubes. The crystal chosen for study was mounted with c* parallel to the goniostat axis and had dimensions of ca 0.20 x 0.20 x 0.25 mm. Unit-cell and space group data were obtained from film and diffractometer measurements. The unit-cell parameters were refined by a least-squares treatment of $\sin^2\theta$ values for 21 reflections measured on a diffractometer with Mo $K\alpha$ radiation.

Crystal Data. $C_8H_{24}Cl_2O_4RuS_4$, M = 484.54, monoclinic, a = 8.939(3), b = 18.045(7), c = 11.363(3) Å, β = 91.52(2)° U = 1832(1) Å^3, D_m = 1.74(1) gcm^{-3} Z = 4, D_c = 1.76(1) gcm^{-3}, F(000) = 984 (20°C, Mo $K\alpha$, λ = 0.71069 Å, μ = 15.66 cm^{-1}).

Absent reflections: $h0l$, $h+l \neq 2n$, $0k0$, $k \neq 2n$ define uniquely the space group $P2_1/n$ (C_{2h}^5, No. 14).

Intensities were measured on a Datex-automated General Electric XRD 6 diffractometer, with a scintillation counter, Mo $K\alpha$ (zirconium filter and pulse height analyser), and a θ-2θ scan at 2° min^{-1} over a range of $(1.80 + 0.86 \tan\theta)$ degrees in 2θ, with 20 s background counts being measured at each end of the scan. Data were measured to $2\theta = 45^\circ$ (minimum interplanar spacing 0.93 Å). A check reflexion was monitored every 50 reflections throughout the data collection. The greatest deviation from the initial value was +7.8% and the final intensity was 0.962 times the initial value. Lorentz and polarization corrections were applied, and the structure amplitudes were derived. No absorption correction was applied due to the low value of μ, and the fairly uniform shape of the crystal. Of the 3231 independent reflections measured, 511 had intensities less than $3\sigma(I)$ above background where $\sigma^2(I) = S + B + (0.05S)^2$ with S = scan count and B = time averaged background count. These reflections were classified as unobserved and given zero weight in the refinement.

STRUCTURE ANALYSIS

The position of the ruthenium atom was again determined from the three-dimensional Patterson function. One cycle of full-matrix least-squares refinement of the positional and isotropic thermal parameters for the ruthenium atom gave a R value of 0.48. The positions of the two chlorine atoms and the four sulphur atoms were revealed from a difference

Fourier, and two further isotropic cycles lowered $\underline{R}$ to 0.20. Another difference map then revealed the positions of the remaining non-hydrogen atoms. A further three cycles using an anomalous scattering correction for the Ru, Cl, and S atoms, and refining the positional and anisotropic thermal parameters for all the atoms, lowered $\underline{R}$ to 0.047. A final difference Fourier performed at this stage indicated the positions of eleven of the twenty-four hydrogens, and the remaining thirteen positions were calculated allowing for minimum intramolecular interactions (see Table 13). The final conventional $\underline{R}$ factor for the 2720 observed reflections was $\underline{R}$ = 0.041. (15 reflections were given zero weight in the final stages of refinement due to suspected errors resulting from extinction, absorption, or instrument malfunction: 1 2 4, 3 0 1, 4 2 1, 3 4 1, 2 0 0, 4 0 0, 3 2 0, 1 6 0, 0 8 0, 1 8 1, 4 0 2, 1 0 3, 0 2 3, 0 0 4, 0 2 5).

The scattering factors of ref. 14 were used for the non-hydrogen atoms and those of ref. 39 for the hydrogen atoms. Anomalous scattering corrections (15) were applied for the Ru, Cl, and S atoms. The weighting scheme: $\sqrt{w} = |Fo|/12.8$ if $|Fo| \leq 12.8$, $\sqrt{w} = 1$ if $22.6 < |Fo| > 12.8$, $\sqrt{w} = 22.6/|Fo|$ if $|Fo| \geq 22.6$ and $\sqrt{w} = 0.0$ for unobserved reflections gave constant average values of $w(Fo-Fc)^2$ over ranges of $|Fo|$ and was employed in the final stages of refinement. The final positional and thermal parameters are given in Tables 13 and 14 respectively. Measured and calculated structure amplitudes are available from U.B.C. Library.

Table 13

Final positional parameters (fractional x 10^4)

with estimated standard deviations in parentheses

Atom	x	y	z
Ru	2484.2(4)	1217.5(2)	2654.5(3)
Cl(1)	5001(1)	701(1)	2652(1)
Cl(2)	1570(1)	9972(1)	3040(1)
S(1)	2361(2)	1051(1)	690(1)
S(2)	3332(1)	2403(1)	2507(1)
S(3)	63(1)	1591(1)	2791(1)
S(4)	3528(1)	766(1)	5290(1)
O(1)	1036(6)	1302(3)	9984(4)
O(2)	3041(6)	2800(2)	1379(4)
O(3)	9657(5)	2378(2)	2577(4)
O(4)	2765(4)	1377(2)	4515(3)
C(11)	3980(8)	1413(4)	9964(5)
C(12)	2596(9)	96(4)	349(6)
C(21)	5292(7)	2486(4)	2867(8)
C(22)	2660(7)	2982(3)	3649(6)
C(31)	9396(7)	1365(4)	4216(6)
C(32)	8809(6)	1047(4)	1886(6)
C(41)	2524(8)	843(5)	6619(6)
C(42)	5262(8)	1176(4)	5778(7)
H(111)	3600	1851	10
H(112)*	4819	1075	77
H(113)*	3739	1460	-887
H(121)*	2055	-219	896
H(122)	2488	95	-500
H(123)*	3686	-39	420
H(211)	6027	2329	2347
H(212)	5577	3058	3184
H(213)*	5432	2480	3753
H(221)*	1597	2888	3775
H(222)	2950	3004	4429
H(223)	3081	3456	3520
H(311)	-47	1638	4969
H(312)*	-1516	1654	4370
H(313)*	-869	832	4241
H(321)*	-754	959	1111
H(322)	-1170	490	2150
H(323)*	-2150	1307	1770
H(411)	2392	1321	7080
H(412)	1447	1197	6664
H(413)*	2915	490	7211
H(421)	4397	1421	6023
H(422)*	5795	829	6304
H(423)*	5867	1287	5100

*calculated positions

Table 14

Final thermal parameters and

their estimated standard deviations

(a) Anisotropic thermal parameters (U_{ij} x 10^2 Å^2)

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Ru	2.08(2)	2.59(2)	3.21(2)	0.00(1)	0.09(1)	0.10(1)
Cl(1)	2.33(6)	4.38(7)	5.74(8)	0.62(5)	0.20(5)	0.09(5)
Cl(2)	3.72(6)	2.96(6)	5.42(7)	-0.58(5)	-0.01(5)	0.39(5)
S(1)	3.82(7)	5.23(7)	3.34(6)	0.03(6)	-0.03(5)	0.16(5)
S(2)	4.00(7)	2.75(6)	5.49(7)	-0.28(5)	1.06(5)	0.20(5)
S(3)	2.39(6)	3.84(7)	4.92(7)	0.39(5)	0.28(5)	0.19(5)
S(4)	4.00(7)	3.51(6)	3.75(6)	0.19(5)	-0.62(5)	-0.22(5)
O(1)	5.62(29)	12.78(51)	4.73(24)	1.51(26)	-1.56(21)	1.86(26)
O(2)	10.47(39)	4.19(24)	6.45(28)	0.83(25)	2.49(26)	1.74(21)
O(3)	4.18(21)	4.08(22)	9.27(32)	1.78(18)	0.15(20)	0.75(21)
O(4)	4.09(20)	3.95(19)	3.39(16)	0.52(15)	-0.27(14)	-0.11(14)
C(11)	6.89(42)	5.78(36)	4.93(32)	0.76(31)	2.52(29)	1.01(28)
C(12)	9.73(54)	6.32(43)	5.34(35)	-1.56(39)	1.23(34)	-2.07(32)
C(21)	3.82(34)	5.88(41)	13.62(70)	-2.27(31)	1.04(38)	-2.00(43)
C(22)	6.14(38)	3.79(31)	7.86(41)	-1.15(26)	1.54(31)	-1.85(28)
C(31)	4.18(33)	7.34(43)	6.08(36)	0.69(29)	1.93(27)	0.14(31)
C(32)	2.44(26)	7.20(40)	7.31(40)	-0.20(26)	-0.81(24)	-0.78(32)
C(41)	7.67(46)	8.00(48)	4.62(33)	2.60(38)	0.90(31)	1.65(32)
C(42)	4.35(34)	6.22(41)	7.42(42)	0.14(27)	-2.56(30)	-0.10(30)

(b) Isotropic thermal parameters (U x 100)

Atom	U (Å^2)
All Hydrogens	6.3

RESULTS AND DISCUSSION

The co-ordination geometry about the ruthenium atom is essentially octahedral with *cis* chlorine atoms. Of the four DMSO ligands, three are sulphur-bonded and one is oxygen-bonded, the O-bonded ligand being *trans* to one of the S-bonded ligands (S(1)). The atom labelling scheme and a general view of the molecule are illustrated in Figure 9. Individual bond lengths and angles, with standard deviations, are given in Tables 15 and 16 respectively.

Slight distortion does occur, the angles subtended at the central ruthenium atom between the three mutually *cis* S-bonded ligands being larger than 90°[92.6-94.9°, mean 94(1)°], while the values for the Cl-Ru-Cl, and the two Cl-Ru-O angles are slightly less than 90°[87.8-88.7°, mean 88.2(5)°]. Equations of selected least-squares mean-planes with deviations of the atoms from these planes are given in Table 17. This distortion appears to be governed primarily by steric factors associated with the S-bonded DMSO groups.

The Ru-Cl bond lengths, 2.435(1) Å, are significantly longer than would be expected for a purely σ-donor ligand. Typical values of mean Ru-Cl bond lengths in octahedral complexes with *trans* chlorine atoms are 2.390(7) Å in $RuCl_3(N_2C_6H_4(CH_3))(P(C_6H_5)_2)_2 \cdot (CH_3)_2O$ (34) and 2.398(7) Å in $RuCl_3(NO)(PMePh_2)_2$ (40). This lengthening is an indication of the strong *trans* effect of a S-bonded DMSO ligand (33).

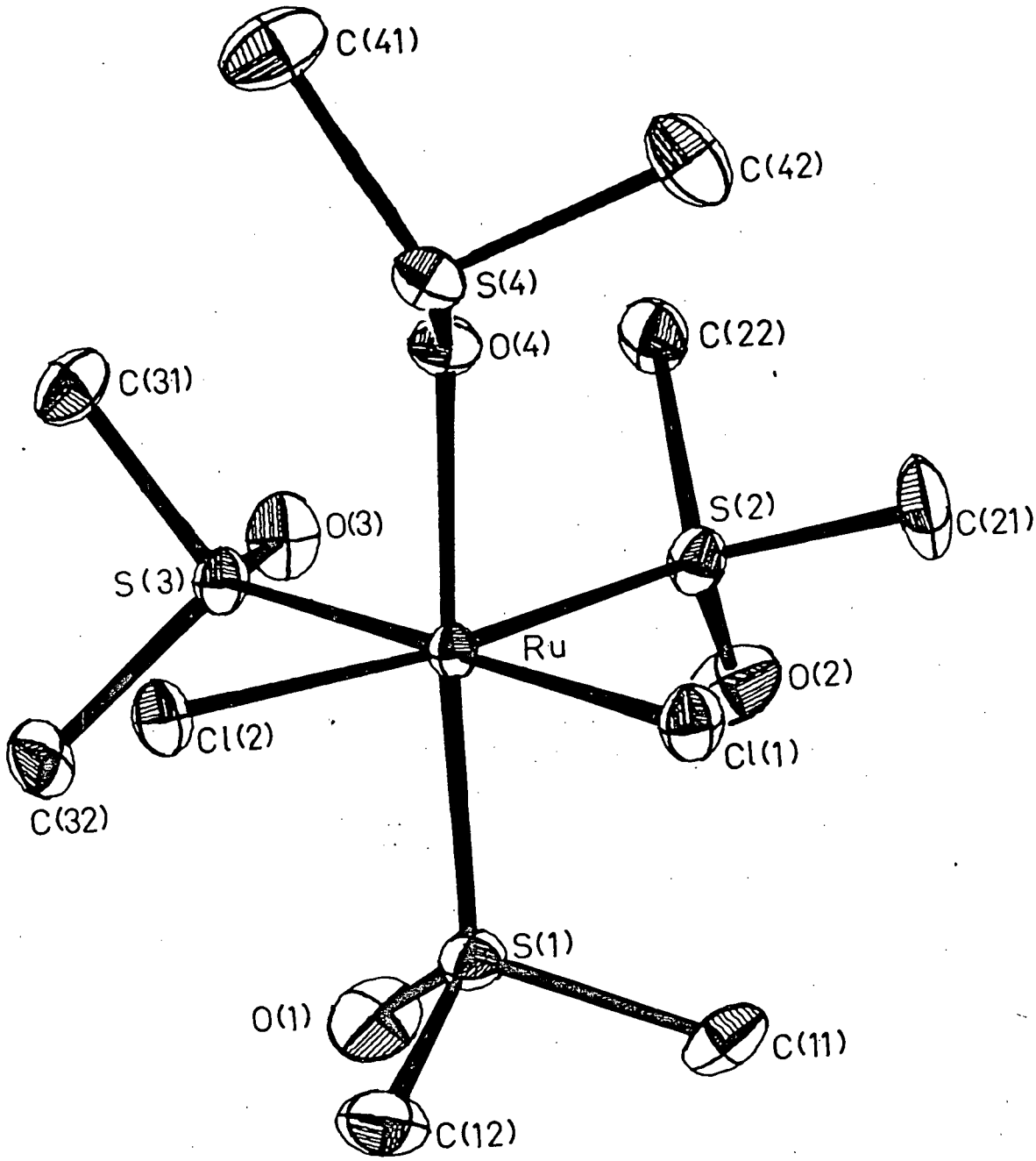


Figure 9

A general view of the structure showing the crystallographic numbering scheme.

Table 15

Bond lengths (Å) with standard deviations in parentheses

Bond	Length (Å)	Bond	Length (Å)
Ru -Cl(1)	2.435(1)	S(1)-C(11)	1.779(8)
Ru -Cl(2)	2.435(1)	S(1)-C(12)	1.808(6)
Ru -S(1)	2.252(1)	S(2)-C(21)	1.795(7)
Ru -S(2)	2.277(1)	S(2)-C(21)	1.783(6)
Ru -S(3)	2.276(1)	S(3)-C(31)	1.787(6)
Ru -O(4)	2.142(3)	S(3)-C(32)	1.794(6)
S(1)-O(1)	1.483(5)	O(4)-S(4)	1.557(4)
S(2)-O(2)	1.485(5)	S(4)-C(41)	1.783(6)
S(3)-O(3)	1.485(5)	S(4)-C(42)	1.793(6)

Table 16

Bond angles (deg) with standard deviations in parentheses.

Bonds	Angle	Bonds	Angle
Cl(1)-Ru -Cl(2)	87.78(5)	Ru -S(2)-C(22)	112.2(2)
Cl(1)-Ru -S(1)	88.22(5)	Ru -S(3)-C(31)	109.6(2)
Cl(1)-Ru -S(2)	92.90(5)	Ru -S(3)-C(32)	112.3(2)
Cl(1)-Ru -S(3)	173.49(5)	Ru -S(1)-O(1)	120.9(2)
Cl(1)-Ru -O(4)	88.2(1)	Ru -S(2)-O(2)	117.7(2)
Cl(2)-Ru -S(1)	92.69(5)	Ru -S(3)-O(3)	120.1(2)
Cl(2)-Ru -S(2)	173.85(5)	C(11)-S(1)-C(12)	98.6(3)
Cl(2)-Ru -S(3)	86.38(5)	C(21)-S(2)-C(22)	97.5(3)
Cl(2)-Ru -O(4)	88.7(1)	C(31)-S(2)-C(32)	100.1(3)
S(1) -Ru -S(2)	93.44(5)	C(11)-S(1)-O(1)	106.3(3)
S(1) -Ru -S(3)	94.91(5)	C(12)-S(1)-O(1)	106.0(4)
S(1) -Ru -O(4)	176.1(1)	C(21)-S(2)-O(2)	107.7(4)
S(2) -Ru -S(3)	92.61(5)	C(22)-S(2)-O(2)	106.9(3)
S(2) -Ru -O(4)	85.2(1)	C(31)-S(3)-O(3)	106.3(3)
S(3) -Ru -O(4)	88.8(1)	C(32)-S(3)-O(3)	106.4(3)
Ru -S(1)-C(11)	112.6(2)	Ru -O(4)-S(4)	120.0(2)
Ru -S(1)-C(12)	110.0(2)	O(4) -S(4)-C(41)	101.6(3)
Ru -S(2)-C(21)	112.7(2)	O(4) -S(4)-C(42)	104.2(3)
		C(41)-S(4)-C(42)	99.0(4)

Table 17

Selected Weighted Least-Squares mean planes for $RuCl_2(Me_2SO)_4$

Plane through Ru, Cl(2), S(1), S(2), and O(4)
0.999X + 0.049Y - 0.013Z = 2.249

Atom	Distance (Å)
Ru	-0.042(1)
Cl(2)	-0.100(1)
S(1)	-0.079(1)
S(2)	0.826(1)
O(4)	0.139(4)

Plane through Ru, Cl(1), S(1), S(3), and O(4)
0.335X + 0.933Y - 0.129Z = 2.365

Atom	Distance (Å)
Ru	0.013(1)
Cl(1)	-0.102(1)
S(1)	0.003(1)
S(3)	-0.104(1)
O(4)	0.075(4)

Plane through Ru, Cl(1), Cl(2), S(2), and S(3)
-0.043X + 0.024Y - 0.999Z = -3.0537

Atom	Distance (Å)
Ru	0.0009(3)
Cl(1)	-0.166(1)
Cl(2)	-0.027(1)
S(3)	0.186(1)
S(3)	-0.042(1)

In the interaction between the Ru and S atoms, the sulphur atom appears to be behaving as a weak π-acceptor, as a shortening of the bond between a metal atom and a σ-donor ligand should be observed if the σ-donor is trans to a strong π-acceptor. For example in $[Ru(NO)Cl_5]^{2-}$ the equatorial Ru-Cl distances average 2.376(2) Å while the chlorine atom trans to the nitrosyl group is significantly shorter at 2.357(1) Å (41).

However evidence supporting some π-acceptor nature can be obtained from the Ru-S distances in the S-bonded DMSO ligands, which are trans to the two chlorine atoms. The mean value of 2.277(1) Å found for the Ru-S bond lengths indicates the presence of some $d\pi$-$p\pi$ back donation from the central metal to the sulphur atom, assuming the single bond covalent radii for ruthenium and sulphur are 1.33 and 1.04 Å respectively (22). However, this back donation is considerably less than that found in $[Ru(NH_3)_5(Me_2SO)]^{2+}$ (30), where the Ru-S distance is 2.188(3) Å. The increased back donation found in the mono-sulphoxide is due to the lack of competition for the available π-donor orbitals from other π-acceptor ligands in the co-ordination sphere. A comparison of similar bond lengths and angles for $[RuCl_3(Me_2SO)_3]^-$ (Chapter 3, ref. 29), $[Ru(NH_3)_5(Me_2SO)]^{2+}$ (30), and free DMSO (35) with those of $RuCl_2(Me_2SO)_4$ can be found in Table 18.

Examples of the change in co-ordinating atom with the variation of the number of DMSO ligands attached are somewhat limited. In four-co-ordinate palladium complexes steric

influences appear to be of most importance (42). $[Pd(Me_2SO)_2Cl_2]$ has exclusively sulphur-bonding, $[Pd(Me_2SO)_4]^{2+}$ has both sulphur and oxygen-bonded ligands in a cis configuration. As the size of the ligand increases mixed trans structures are produced, i.e. in the propyl and butyl cationic species, while only oxygen-bonded ligands occur in the iso-pentyl complex $[Pd(Pe_2SO)_4]^{2+}$. This change in co-ordination is paralleled in these octahedral systems. $[RuCl_3(Me_2SO)_3]^-$ (Chapter 3) has an all S-bonded cis structure, while the inclusion of another DMSO ligand approaches the $[Pd(Me_2SO)_4]^{2+}$ situation, such that steric influences prohibit the formation of an all sulphur-bonded complex, but electronic effects keep the S-bonded ligands in a cis configuration. The decrease in central metal size in going from ruthenium to iron increases the steric interactions considerably, i.e. $[FeCl_2(Me_2SO)_2]^+$ has a trans configuration in which all the DMSO ligands are oxygen-bonded (43).

The Ru-S bond length for the S-bonded dimethylsulphoxide ligand trans to the O-bonded sulphoxide is 2.252(1) Å. This slight yet significant shortening (compared to 2.277(1) Å) is due to the different atoms in the trans positions. The Ru-O distance is 2.142(3) Å and is similar to the value of 2.007(6) Å found for Fe-O (43), considering the difference of covalent radii of the two metals to be approximately 0.12 Å (22).

Table 18

Mean bond lengths and angles for

(I) $[RuCl_3(Me_2SO)_3]^-$

(II) $RuCl_2(Me_2SO)_4$

(III) $[Ru(NH_3)_5(Me_2SO)]^{2+}$

(IV) Free DMSO

	(I)	(II)	(III)	(IV)
A) Bond Lengths (Å)				
Ru-S	2.261(8)	2.277(1)	2.188(3)	-
S-O	1.48(2)	1.485(5)	1.527(7)	1.471-1.531
S-C	1.79(3)	1.790(6)	1.840(8)	1.80-1.82(1)
Ru-Cl	2.43(1)	2.435(1)	-	-
B) Bond Angles (deg)				
Ru-S-O	118(1)	119(1)	114.9(3)	-
Ru-S-C	112(2)	112(1)	116(1)	-
O-S-C	106(2)	106.8(6)	104.2(8)	107
C-S-C	100(2)	99(1)	99.4(6)	98

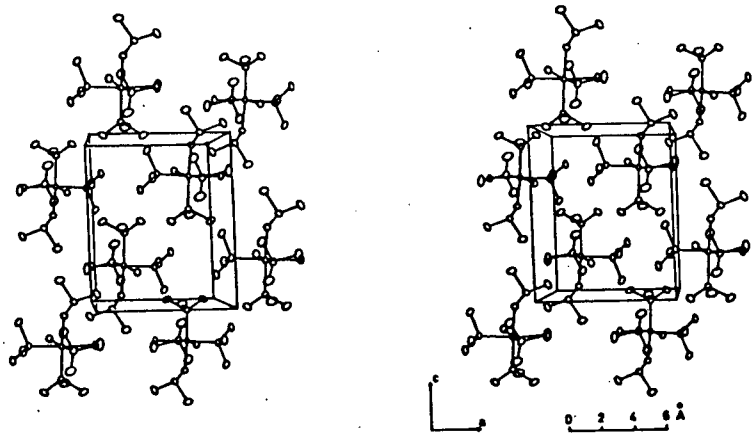


Figure 10

A stereoscopic diagram of the unit cell viewed down b.

There is considerable variation in the sulphur-oxygen distances for the two types of differently co-ordinated dimethylsulphoxide ligands. In the sulphur-bonded ligands the mean value is 1.484(5) Å, while in the oxygen-bonded ligand the distance is 1.557(4) Å. This represents a considerable decrease in the multiple bond character of the sulphur-oxygen linkeage caused by the differences in co-ordination, though this is still somewhat short of the estimated S-O single bond length of 1.70 Å (43).

The molecular geometry of the S-bonded dimethylsulphoxide ligands is very similar to that found in free dimethylsulphoxide (41). The O-S-C angles (mean value 106.6(6)°), C-S-C angles (mean value 99(1)°), and the S-C

bond lengths (mean value 1.79(1) Å) compare with 107°, 98° and 1.80-1.82(1) Å respectively. The corresponding mean values for the O-bonded ligand are also similar being 103(1)°, 99.0(4)° and 1.788(5) Å. The other angles in the distorted tetrahedron have mean values of 112(2)° for Ru-S-C, 120(2)° for Ru-S-O and 120.0(2)° for Ru-O-S. Figure 10 shows a stereoscopic view of the contents of the unit cell viewed down b.

The crystal structures of this compound and the trichlorotris(dimethylsulphoxide) complex (Chapter 3) were consistent with the infrared and ^{1}H n.m.r. spectral data (29) for these compounds.

CHAPTER 5

CRYSTAL AND MOLECULAR STRUCTURE OF 1,3,7-TRIMETHYL-2,6-DIOXYPURINE HYDROCHLORIDE DIHYDRATE (CAFFEINE HYDROCHLORIDE DIHYDRATE)

INTRODUCTION

The crystal structure determination of caffeine hydrochloride dihydrate was undertaken primarily to provide the necessary information to complement an ENDOR study on this compound. The renewed interest in this area is due to the discovery that caffeine will inhibit the post-radiation repair of chromosomal aberrations in irradiated DNA (44).

EXPERIMENTAL

The white nearly trigonal prismatic crystals were grown by evaporation from a saturated solution of caffeine in hydrochloric acid. The crystal chosen for study (ca 0.4 X 0.3 X 0.2 mm.) was mounted with b parallel to the goniostat axis. Unit-cell and space group data were obtained from film and diffractometer measurements. The unit-cell parameters were refined by a least-squares treatment of $\sin^2\theta$ values for 22 reflections measured on a diffractometer with Cu $K\alpha$ radiation.

Crystal Data. $C_8H_{11}ClN_4O_2.2H_2O$, M = 266.7, monoclinic, a = 12.391(4), b = 6.524(1), c = 17.167(6) Å, β = 118.82(3)°, U = 1215.9(8) Å^3, D_m = 1.46, D_c = 1.457 g cm^{-3}, Z = 4, F(000) = 560. Space group $P2_1/c$ (C_{2h}^5, No 14) from absent reflections $h0l$, $l \neq 2n$ and $0k0$, $k \neq 2n$. μ(Cu$K\alpha$ radiation) = 29.19 cm^{-1}.

Intensities were measured on a Datex-automated General Electric XRD 6 diffractometer, with a scintillation counter, Cu $K\alpha$ (nickel filter and pulse height analyser), and a θ-2θ scan at 2° min^{-1} over a range of (1.80 + 0.86 tan θ) degrees

in 2θ, with 10 s background counts being measured at each end of the scan. Data were measured to 2θ = 140° (minimum interplanar spacing 0.82 Å). A check reflection was monitored every 40 reflections throughout the data collection. The greatest deviation from the initial value was +21.1% and the final intensity was 0.85 times the initial value. Lorentz and polarization corrections were applied, and the structure amplitudes were derived. No absorption correction was applied due to the low value of μ and the fairly uniform shape of the crystal. Of the 2208 independent reflections measured, 451 had intensities less than $3\sigma(\underline{I})$ above background where $\sigma^2(\underline{I}) = \underline{S} + \underline{B} + (0.05\underline{S})^2$ with $\underline{S}$ = scan count and $\underline{B}$ = time averaged background count. These reflections were classified as unobserved and given zero weight in the refinement.

STRUCTURE ANALYSIS

Although the Patterson synthesis is very useful for compounds with one or a few 'heavy atoms', it is unsuitable for molecules in which many atoms have the same or similar atomic numbers, because no vectors will stand out on the Patterson Fourier map. Fortunately alternate 'direct methods' have been developed which rely on probability relationships between the phases of the 'stronger' reflections.

In direct methods, normalized factors $|\underline{E}_H|$ are used which are essentially geometrical structure factors only, rather than containing, as does $|\underline{F}_H|$, the effects of atomic scattering factors and atomic thermal motion. They can be calculated as follows

$$|\underline{E}_H|^2 = \frac{|\underline{F}_H|^2}{\epsilon \sum_j \underline{f}_{j,H}^2}$$

where ϵ is an integer symmetry factor which depends upon the space group extinctions. Hauptman and Karle (45) developed probability relationships, based on Sayre's work, which could be used to determine the phases of reflections. Basically, as seen in the equation

$$\phi_H = \phi_K + \phi_{H-K}$$

one estimate of the phase of H can be obtained from the phase addition of two reflections whose indices when added together give the indices of H. The weight to be given to this indication is equal to the product of the two normalised structure factors $|\underline{E}_K|$ and $|\underline{E}_{H-K}|$; the best estimate of the phase ϕ_H will be the weighted sum of all the indications. Obviously relationships between large $|\underline{E}_K|$ and $|\underline{E}_{H-K}|$'s will dominate the summations due to their weight and should produce a phase value somewhere near that for the whole summation.

For a centrosymmetric space group (e.g. $\underline{P}2_1/\underline{c}$, this compound) the phases can only be 0 or π, corresponding to the sign of + or −. Sayres equations then become

$$\underline{S}_H \sim \underline{S}\left(\sum_K \underline{E}_K \cdot \underline{E}_{H-K}\right)$$

where $\underline{S}$ means 'the sign of', $\sim$ means 'probably equal to', and the relationship is known as a Σ-2 (referred to as a Sigma Two) relationship. That is the Σ-2 relationship for the reflection 4,2,1 is made up of the sum of all the pairs of reflections whose indices add to 4,2,1 e.g. 4,1,0, and 0,1,1; 8,6,4 and −4,−4,−3; 1,1,1 and 3,1,0; etc.

The probability, $\underline{P}$, of the sign $\underline{S}$ being correct is given for each reflection by

$$\underline{P} = 0.5 + 0.5\tanh\left| \sigma_3/\sigma_2^{3/2} \underline{E}_H \cdot \sum_K \underline{E}_K \cdot \underline{E}_{H-K} \right|$$

where $\sigma_3/\sigma_2^{3/2}$ is a constant dependent on the contents of the unit cell.

A computer program developed by Long (46) was used to determine the structure of caffeine hydrochloride using these ideas. The program prepared a list of Σ-2 relationships between the 297 reflections with $|\underline{E}| > 1.50$. Three of the largest $|\underline{E}|$'s were chosen with indices conforming to the parity rules derived from the space group (for $\underline{P}2_1/\underline{c}$ the sums of indices of any pair, and the sum of indices of all three could not produce the parity even,even,even) and by assigning positive signs to these reflections the origin was specified. Four more reflections (see Table 19 for the complete list), each having a large $|\underline{E}|$ and many Σ-2 relationships, were then selected and allowed to take on both + and - signs in turn producing sixteen (2^4) starting sets of signs. When Sayre's equation is applied to any starting set, additional signs are determined, which in turn are used to determine more signs, and to redetermine those already predicted. In this case newly determined signs were not used to determine signs of additional reflections until the next cycle. This process is reiterated until there are no new additions or changes to the list.

A consistency index $\underline{U}$ is defined as

$$\underline{U} = \frac{\langle | \underline{E}_H \cdot \sum_K \underline{E}_K \cdot \underline{E}_{H-K} | \rangle}{\langle | \underline{E}_H | \cdot \sum_K | \underline{E}_K | | \underline{E}_{H-K} | \rangle}$$

Table 19

Basic starting set of reflections for

$ClC_8N_4O_2H_{11} \cdot 2H_2O$

	h	k	l	|E|	
1)	-3	1	1	2.70	origin determining
2)	-7	2	2	3.33	origin determining
3)	-4	1	2	2.42	origin determining
4)	2	5	3	3.08	
5)	-2	5	11	3.17	
6)	-7	2	4	2.29	
7)	-9	3	1	2.82	

where < > means the average value over all H.

The true solution will usually have the highest consistency index, require the least number of cycles and converge to a set of signs which are approximately equally distributed between positive and negative. The results of the 16 starting sets are given in Table 20, and set 15 is outstanding in that it converged in 5 cycles with a very high consistency index of 0.92 and had 156 positive and 141 negative signs. An E map was computed using the 297 assigned values of $\underline{E}$ from this set. The positions of the 17 non-hydrogen atoms were indicated from the 17 highest peaks on the map. Two cycles of full-matrix least-squares refinement produced an $\underline{R}$ factor of 0.129 with isotropic temperature factors, while a further cycle using anisotropic temperature factors lowered the $\underline{R}$ factor to 0.088. A difference Fourier computed at this stage revealed the positions of the 15 hydrogen atoms. Further refinement with an anomalous scattering correction for the chlorine atom, anisotropic temperature factors for the non-hydrogen atoms, isotropic temperature factors for the hydrogen atoms and an overall extinction coefficient correction produced convergence at $\underline{R}$ = 0.064 for 1752 reflections with $\underline{I} \geq 3\sigma(\underline{I})$ (5 reflections were given zero weight in the final stages of refinement due to suspected instrumental errors, -1 0 2, 1 2 16, -1 4 2, -3 6 12, -7 5 4). The atomic scattering factors for Cl, O, N, and C were taken from ref. 14, anomalous scattering correction from ref. 15, and scattering factors for the hydrogen atoms from ref. 39. The weighting

Table 20

Comparison of the 16 solutions from Long's sign determination program.

Set	Signs of 7 reflections	Number of cycles	Number of pluses	Number of minuses	Consistency index U
1	+++++++	7	267	30	0.850
2	++++++-	10	142	155	0.608
3	+++++-+	10	182	115	0.685
4	+++++--	7	147	150	0.684
5	++++-++	6	143	154	0.717
6	++++-+-	7	140	157	0.534
7	++++--+	9	156	141	0.598
8	++++---	8	142	155	0.522
9	+++-+++	10	150	147	0.658
10	+++-++-	8	148	149	0.523
11	+++-+-+	9	139	158	0.713
12	+++-+--	7	140	157	0.510
13	+++--++	12	149	148	0.752
14	+++--+-	7	150	147	0.641
15	+++---+	5	156	141	0.917
16	+++----	12	144	153	0.532

scheme $\underline{w} = 1/\sigma^2(\underline{F})$ where $\sigma^2(\underline{F})$ is derived from the previously defined $\sigma^2(\underline{I})$, gave constant average values of $\underline{w}(\underline{F}o-\underline{F}c)^2$ over ranges of $|\underline{F}o|$ and was employed in the final stages of refinement. The final positional and thermal parameters appear in Tables 21 and 22 respectively. Measured and calculated structure factors are available from the U.B.C. Library.

THERMAL MOTION AND CORRECTION OF MOLECULAR GEOMETRY

The ellipsoids of thermal motion for the non-hydrogen atoms (excluding the chloride ion and the water molecules) are shown in Fig. 11. The thermal motion has been analysed in terms of the rigid-body modes of translation ($\underline{T}$), libration ($\underline{L}$), and screw ($\underline{S}$) motion (47) using the computer program MGTLS. The r.m.s. standard deviation in the temperature factors $\underline{U}_{ij}$ is 0.0017 $\mathring{A}^2$ indicating that the whole molecule (r.m.s. $\Delta\underline{U}_{ij}$=0.0022 $\mathring{A}^2$) is a reasonable rigid-body and that the thermal motion of the 9-membered fused ring system is remarkably well described by the rigid-body thermal parameters given in Table 23 (r.m.s. $\Delta\underline{U}_{ij}$= 0.0015 $\mathring{A}^2$).

The bond distances in the fused ring system have been corrected for libration (48 and 49) using shape parameters $\underline{q}^2$ of 0.08 for all the atoms involved. Independent motion corrections based on the $\Delta\underline{U}_{ij}$ (50 and 51) have been applied to the bond lengths for the non-hydrogen atoms attached to the fused ring system. The corrected and uncorrected bond lengths appear in Table 24. Bond angles, given in Table 25, changed by no more than 0.05°, thus the corrected angles are not reported.

Table 21

Final positional parameters (fractional x 10^4, Cl x 10^5, H x 10^3)

with estimated standard deviations in parentheses

Atom	x	y	z
Cl	98388 (8)	48847(15)	35370 (6)
O(11)	6620 (2)	2332 (4)	1275 (2)
O(13)	5748 (2)	6992 (4)	2885 (2)
O(1)'	9101 (3)	7633 (5)	4695 (2)
O(2)'	8592 (3)	5884 (6)	1420 (2)
N(1)	6241 (2)	4670 (4)	2095 (2)
N(3)	7359 (2)	1630 (4)	2740 (2)
N(7)	7063 (2)	4033 (4)	4459 (2)
N(9)	7905 (3)	1232 (5)	4306 (2)
C(2)	6733 (3)	2827 (5)	1994 (2)
C(4)	7381 (3)	2219 (5)	3503 (2)
C(5)	6851 (3)	3971 (5)	3586 (2)
C(6)	6228 (3)	5376 (5)	2865 (2)
C(8)	7693 (3)	2367 (5)	4872 (2)
C(10)	5591 (4)	5916 (8)	1279 (3)
C(12)	8067 (5)	-150 (7)	2705 (3)
C(14)	6647 (4)	5653 (6)	4848 (3)
H(11)'	937 (4)	721 (7)	522 (3)
H(12)'	927 (5)	692 (9)	432 (4)
H(21)'	888 (4)	540 (8)	198 (3)
H(22)'	905 (7)	724 (13)	149 (4)
H(1)	792 (2)	205 (4)	547 (2)
H(2)	832 (4)	4 (7)	442 (3)
H(3)	543 (4)	727 (8)	149 (3)
H(4)	479 (6)	520 (10)	87 (4)
H(5)	610 (5)	609 (9)	96 (4)
H(6)	806 (5)	-18 (9)	218 (4)
H(7)	779 (6)	-137 (12)	282 (5)
H(8)	885 (5)	-16 (8)	329 (4)
H(9)	696 (4)	548 (7)	545 (3)
H(10)	584 (5)	584 (8)	449 (3)
H(11)	700 (4)	704 (8)	473 (3)

' indicates water molecule

Table 22

Final thermal parameters and their estimated standard deviations

(a) Anisotropic thermal parameters (U_{ij} x 10^3, x 10^4 for Cl $Å^2$)

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Cl	606(6)	468(6)	479(5)	72(4)	271(4)	22(4)
O(11)	73(2)	53(2)	43(1)	-1(1)	35(1)	-5(1)
O(13)	62(2)	44(2)	56(2)	25(1)	32(1)	11(1)
O(1)'	75(2)	43(2)	56(2)	22(1)	37(2)	10(1)
O(2)'	72(2)	63(2)	50(2)	-13(2)	20(2)	2(1)
N(1)	37(1)	40(2)	36(1)	2(1)	19(1)	5(1)
N(3)	39(1)	33(1)	43(2)	1(1)	24(1)	-5(1)
N(7)	37(1)	30(1)	38(1)	1(1)	21(1)	-1(1)
N(9)	40(1)	33(2)	41(2)	3(1)	20(1)	3(1)
C(2)	38(2)	43(2)	39(2)	-7(1)	22(1)	-4(1)
C(4)	31(1)	31(2)	39(2)	-2(1)	18(1)	-1(1)
C(5)	34(2)	27(2)	37(2)	0(1)	20(1)	2(1)
C(6)	34(2)	38(2)	42(2)	2(1)	21(1)	5(1)
C(8)	38(2)	38(2)	32(2)	-1(1)	14(1)	2(1)
C(10)	64(3)	62(3)	42(2)	16(2)	24(2)	12(2)
C(12)	68(3)	41(2)	65(3)	18(2)	40(2)	-2(2)
C(14)	59(2)	42(2)	45(2)	6(2)	32(2)	-3(2)

(b) Isotropic thermal parameters (U x 10^3)

Atom	U ($Å^2$)	Atom	U ($Å^2$)
H(11)'	59(12)	H(5)	103(17)
H(12)'	97(18)	H(6)	99(19)
H(21)'	74(14)	H(7)	133(27)
H(22)'	152(26)	H(8)	89(16)
H(1)	17(7)	H(9)	69(13)
H(2)	60(13)	H(10)	79(15)
H(3)	79(14)	H(11)	79(14)
H(4)	122(23)		

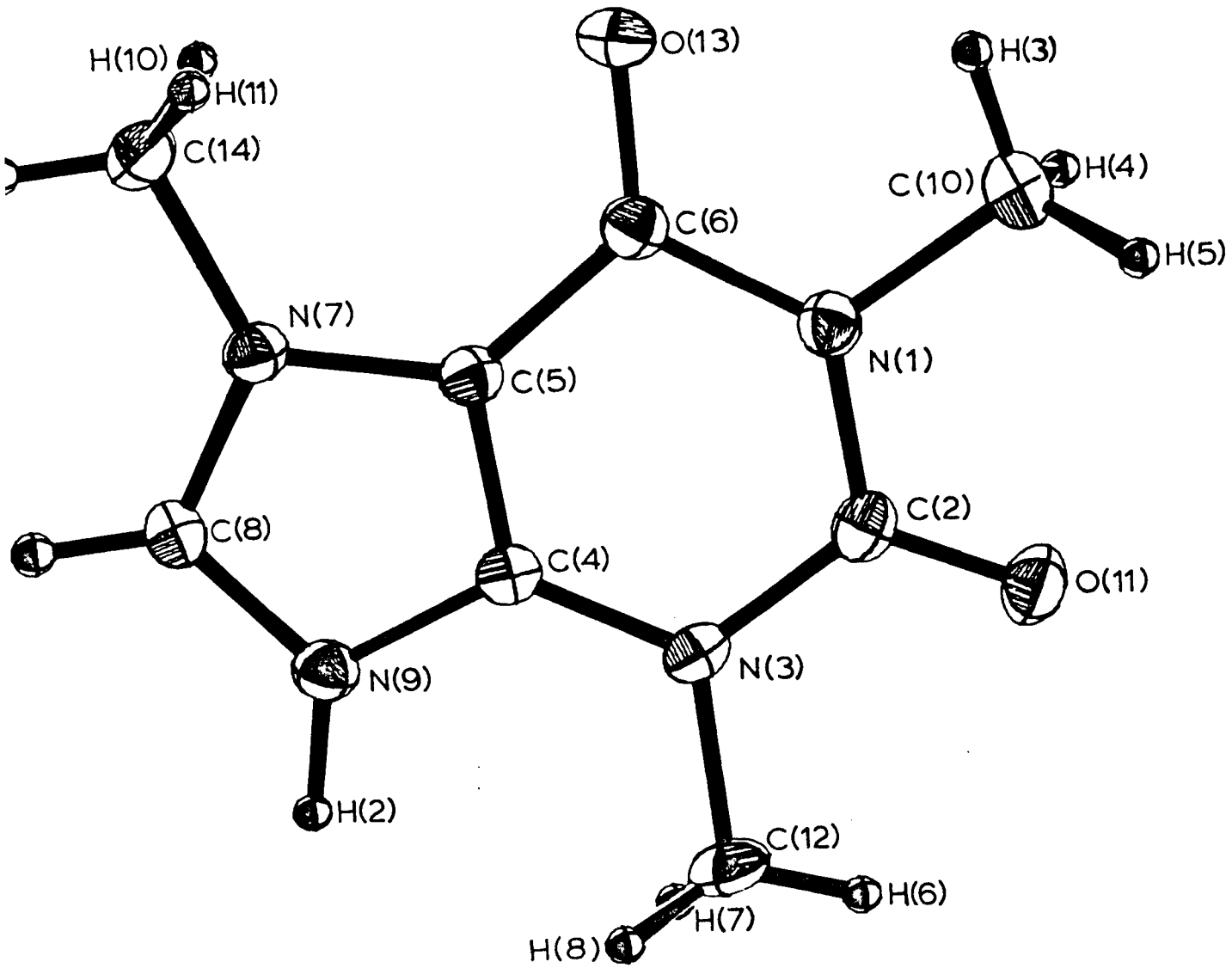


Figure 11

A general view of the structure showing the crystallographic numbering scheme

Table 23

Rigid-body thermal parameters for the 9-membered fused ring system

$\underline{L}$ (x 10 deg^2)	$\begin{bmatrix} 81\,(11) & 22\,(9) & -37\,(13) \\ & 58\,(12) & -6\,(11) \\ & & 96\,(35) \end{bmatrix}$
Principal axes of $\underline{L}$	
r.m.s. amplitude	Direction cosines (x10^3)
3.6°	643 247 -725
2.6	389 709 588
2.0	659 -660 360
Principal axes of $\underline{T}$	
r.m.s. amplitude	Direction cosines (x10^3)
0.19(Å)	18 -82 996
0.17	355 -931 -83
0.17	935 355 12
r.m.s. ΔU_{ij} (Å^2)	0.0015

*Axes of reference are orthogonal Angstrom axes. E.s.d.'s of components of $\underline{L}$ are given in parentheses in units of the last places shown.

Table 24

Bond Lengths (Å) with standard deviations in parentheses

Bond	uncorr.	corr.	Bond	uncorr.
N(1)-C(2)	1.396(4)	1.400	C(8)-H(1)	0.95(3)
C(2)-N(3)	1.376(4)	1.379	N(9)-H(2)	0.92(5)
N(3)-C(4)	1.351(4)	1.354	C(10)-H(3)	1.01(5)
C(4)-C(5)	1.360(4)	1.363	C(10)-H(4)	1.02(7)
C(5)-C(6)	1.431(5)	1.434	C(10)-H(5)	1.02(6)
C(6)-N(1)	1.407(4)	1.410	C(12)-H(6)	0.89(6)
C(4)-N(9)	1.369(4)	1.372	C(12)-H(7)	0.92(8)
N(9)-C(8)	1.343(4)	1.346	C(12)-H(8)	1.00(6)
C(8)-N(7)	1.327(4)	1.330	C(14)-H(9)	0.92(5)
N(7)-C(5)	1.392(4)	1.394	C(14)-H(10)	0.89(5)
N(1)-C(10)	1.477(5)	1.477	C(14)-H(11)	1.07(5)
N(3)-C(12)	1.474(5)	1.476	O(1)'-H(11)'	0.84(4)
N(7)-C(14)	1.469(5)	1.471	O(1)'-H(12)'	0.89(6)
C(2)-O(11)	1.217(4)	1.218	O(2)'-H(21)'	0.90(5)
C(6)-O(13)	1.218(4)	1.220	O(2)'-H(22)'	1.03(8)

Table 25

Bond angles (deg.) with standard deviations in parentheses

a) Angles for the non-hydrogen atoms and H(1) and H(2)

Bond	Angle	Bond	Angle
N(1)-C(2)-N(3)	117.2(3)	C(2)-N(3)-C(12)	119.2(3)
C(2)-N(3)-C(4)	118.6(3)	C(4)-N(3)-C(12)	121.9(3)
N(3)-C(4)-C(5)	123.8(3)	N(3)-C(4)-N(9)	128.4(3)
C(4)-C(5)-C(6)	122.3(3)	N(7)-C(5)-C(6)	131.0(3)
C(5)-C(6)-N(1)	111.0(3)	C(5)-C(6)-O(13)	126.7(3)
C(6)-N(1)-C(2)	127.0(3)	N(1)-C(6)-O(13)	122.4(3)
C(4)-C(5)-N(7)	106.8(3)	C(6)-N(1)-C(10)	117.6(3)
C(5)-N(7)-C(8)	107.9(3)	C(2)-N(1)-C(10)	115.3(3)
N(7)-C(8)-N(9)	109.6(3)	C(5)-N(7)-C(14)	125.8(3)
C(8)-N(9)-C(4)	107.8(3)	C(8)-N(7)-C(14)	126.3(3)
N(9)-C(4)-C(5)	107.9(3)	N(7)-C(8)-H(1)	123(2)
N(1)-C(2)-O(11)	120.7(3)	N(9)-C(8)-H(1)	127(2)
N(3)-C(2)-O(11)	122.0(3)	C(8)-N(9)-H(2)	128(2)
		C(4)-N(9)-H(2)	124(2)

b) Angles involving hydrogen atoms not attached directly to the fused ring system

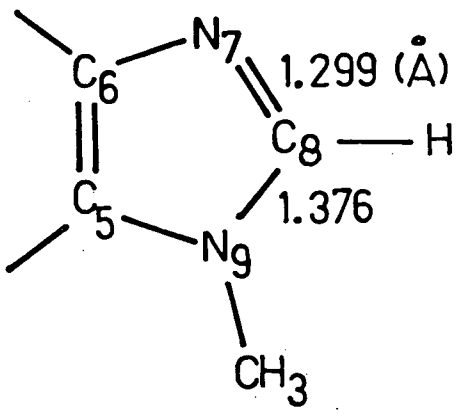
Bond	Angle	Bond	Angle
N(1)-C(10)-H(3)	105(3)	H(6)-C(12)-H(8)	122(5)
N(1)-C(10)-H(4)	108(4)	H(7)-C(12)-H(8)	94(5)
N(1)-C(10)-H(5)	112(3)	N(7)-C(14)-H(9)	112(3)
H(3)-C(10)-H(4)	111(4)	N(7)-C(14)-H(10)	108(3)
H(3)-C(10)-H(5)	111(4)	N(7)-C(14)-H(11)	105(2)
H(4)-C(10)-H(5)	109(5)	H(9)-C(14)-H(10)	121(4)
N(3)-C(12)-H(6)	110(4)	H(9)-C(14)-H(11)	109(4)
N(3)-C(12)-H(7)	113(5)	H(10)-C(14)-H(11)	100(4)
N(3)-C(12)-H(8)	106(3)	H(11)'-O(1)'-H(12)'	119(4)
H(6)-C(12)-H(7)	111(6)	H(21)'-O(2)'-H(22)'	105(5)

RESULTS AND DISCUSSION

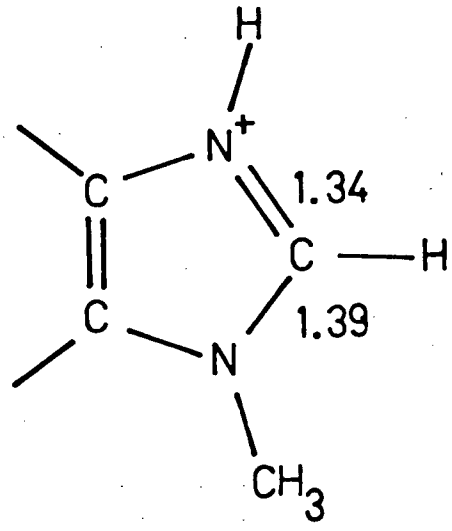
1,3,7-Trimethyl-2,6-dioxypurine hydrochloride dihydrate (caffeine hydrochloride dihydrate) contains a caffeine molecule protonated at N(9). The caffeine molecule is hydrogen bonded to only one of the water molecules, by a strong N-H...O hydrogen bond. Both water molecules are, however, hydrogen bonded to the chloride ion (O-H...Cl). The atom numbering scheme can be seen in Fig. 11, except for the chloride ion Cl and the water molecules, H(11)'-O(1)'-H(12)' and H(21)'-O(2)'-H(22)'.

The effect of protonation on the bond lengths between atoms in the fused ring system is somewhat difficult to determine. The initial structure determination for caffeine (52) has fairly inaccurate bond lengths, and modifications to the structure may have resulted in the N(9) adduct studied by Shefter (53). Even so it can be said that, in terms of bond distances, a direct comparison indicates little significant difference between the protonated and non-protonated species. This might have been expected as Taylor (54) and Kistenmacher and Shigematsu (55) found parallel results for adenine compounds.

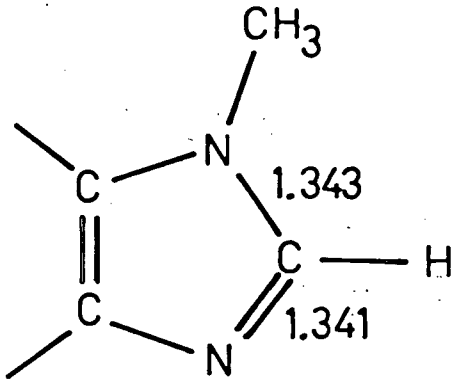
Fig. 12 does however illustrate one interesting anomaly. An affect of protonation on compound (I), isocaffeine (56), would be expected to be a lengthening of the C-N double bond. This is indeed found in (II), methylguanine hydrobromide (59), but this bond is still shorter than the other C-N bonds. Protonation in the caffeine system, i.e. from (III), caffeine:5-chlorosalicylic acid adduct (53), also results in



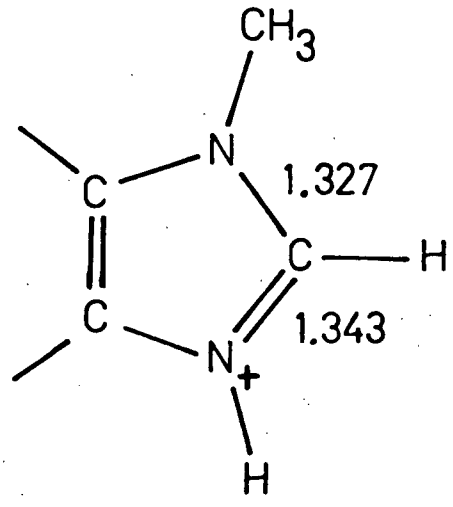
(I)



(II)



(III)



(IV)

Figure 12

Bond lengths and representation of the imidazole ring for (I) Isocaffeine, (II) Methylguanine hydrobromide, (III) Caffeine:5-chlorosalicylic acid adduct, and (IV) Caffeine hydrochloride dihydrate

a lengthening of the C-N double bond, but now, as shown in (IV), this study, a shortening of the N(7)-C(8) bond also occurs. A similar result can be found in another protonated [also at N(9)] caffeine-like derivative, 7-methylxanthine hydrochloride monohydrate (58) which has a N(7)-C(8) distance of 1.325 Å and a C(8)-N(9) distance of 1.338 Å. Such findings indicate that the simple pictures drawn in Fig. 12 are inadequate in representing the protonated species, and that considerable electronic rearrangement must be occurring close to the protonated centre. This rearrangement does not seem to transfer to the rest of the molecule judging by the similarity between the remaining corresponding bond lengths in the protonated and non-protonated species.

For the angles, significant changes do occur but only in the imidazole ring, a situation parallel to that found by Kistenmacher and Sorrell (58). Table 26 illustrates the endocyclic imidazole bond angles for several purine derivatives. (III) cafeine adduct (53), (V) theobromine (59), (VI) 7-methyladenine dihydrochloride (60), (VII) 7-methylxanthine hydrochloride (58) and (IV) this study. Compounds (III) and (V) are unprotonated, while (IV), (VI), and (VII) are protonated at N(9). The changes in angles found on protonation are quite large, being up to 7.6° [comparing N(9)-C(4)-C(5) in (IV) and (V)]. Compounds (IV) and (VII) are very similar, as is to be expected since there should be little effect on the imidazole ring due to the different substituents at N(1) and N(3) [hydrogen atoms for (VII), methyl groups for (IV)] in the pyrimidine ring.

Table 26

A comparison of the endocyclic imidazole bond angles for several purine derivatives

Atoms	Angles				
	(III)	(V)	(VI)	(VII)	(IV)
C(4)-C(5)-N(7)	106.0	106.1	105.9	106.6	106.8
C(5)-N(7)-C(8)	105.4	105.0	107.3	107.5	107.9
N(7)-C(8)-N(9)	113.6	114.2	110.7	110.3	109.6
C(8)-N(9)-C(4)	103.4	103.2	108.1	107.5	107.8
N(9)-C(4)-C(5)	111.6	115.5	108.1	108.2	107.9

(III) Caffeine:5-chlorosalicylic acid adduct

(V) Theobromine

(VI) 7-Methyladenine dihydrochloride

(VII) 7-Methylxanthine hydrochloride

(IV) Caffeine hydrochloride dihydrate , this study.

The mean planes calculated for caffeine hydrochloride indicate that the protonated caffeine molecule is essentially planar. A plane calculated using all the non-hydrogen atoms in the caffeine molecule, and H(1) and H(2), indicates a maximum deviation of only 0.19 Å [for C(12)]. For the fused ring atoms only, a comparison of the deviations found with their standard deviations shows the six-membered ring to be puckered, and the five-membered ring to be planar within experimental error. Table 27 gives the mean planes and distances from the atoms to these planes.

Caffeine hydrochloride, like several other purine type derivatives (61) e.g. hypoxanthine hydrochloride monohydrate (Table 27), is also bent along the C(4)-C(5) bond, the angle between the imidazole and the pyrimidine ring for caffeine hydrochloride being about 0.85°.

The crystal contains two types of hydrogen bonds. O-H...Cl hydrogen bonds occur between the water molecules and the chloride ion, and N-H...O hydrogen bonds occur between the ring hydrogen H(2) and the water oxygen atom O(1)'. The hydrogen bond between H(2) and O(1)' is very strong H...O, 1.76(5) Å, N-H...O angle, 176(4)°, and is probably due to the very acidic nature of this proton. The proposition that N-H...O hydrogen bonding exists between the caffeine molecule and one of the water molecules is further supported by the water H-O-H angles. For water 1, strongly hydrogen bonded, the angle is distorted, being 119(5)°, whereas for water 2 the angle is close to normal, being 105(5)°. Table 28 gives the distances and angles for the postulated intermolecular

Table 27

Equations of selected weighted least-squares mean planes with deviations (Å) of the atoms from the planes

1) Calculated using N(1),N(3),C(2),C(4),C(5), and C(6)

$0.833X + 0.487Y + 0.264Z = 7.296$.*

	Hypoxanthine hydrochloride monohydrate	Caffeine hydrochloride dihydrate
N(1)	0.0013	-0.0148(32)
N(3)	-0.0006	-0.0145(32)
C(2)	-0.0011	0.0334(38)
C(4)	0.0020	-0.0020(35)
C(5)	-0.0017	0.0123(36)
C(6)	0.0001	-0.0015(38)
other atoms		
N(7)	-0.0183	0.0288(31)
C(8)	-0.0297	0.0279(38)
N(9)	-0.0111	0.0051(33)

2) Calculated using N(7),N(9),C(4),C(5),C(8).

$0.825X + 0.493Y + 0.275Z = 7.318$

N(7)	-0.0010(30)
N(9)	-0.0013(33)
C(4)	0.0006(35)
C(5)	0.0004(36)
C(8)	0.0020(37)

Angle between planes 1) and 2) for the caffeine molecule is equal to 0.85°

* X,Y, and Z are orthogonal coordinates in Å w.r.t. a,b,c*.

Table 28

Distances and angles in the interatomic contacts of the type D-H...A

D	H	A	D-H (Å)	H...A (Å)	D...A (Å)	D-H...A (°)
O(1)'	H(11)	Cl	0.84(8)	2.32(5)	3.12(1)	162(4)
O(1)'	H(12)	Cl	0.89(6)	2.23(6)	3.12(1)	172(5)
O(2)'	H(21)	Cl	0.90(5)	2.37(5)	3.24(1)	167(4)
O(2)'	H(22)	Cl	1.03(9)	2.22(8)	3.24(1)	169(6)
N(9)	H(2)	O(1)'	0.92(5)	1.76(5)	2.684(4)	176(4)

' indicates water molecules

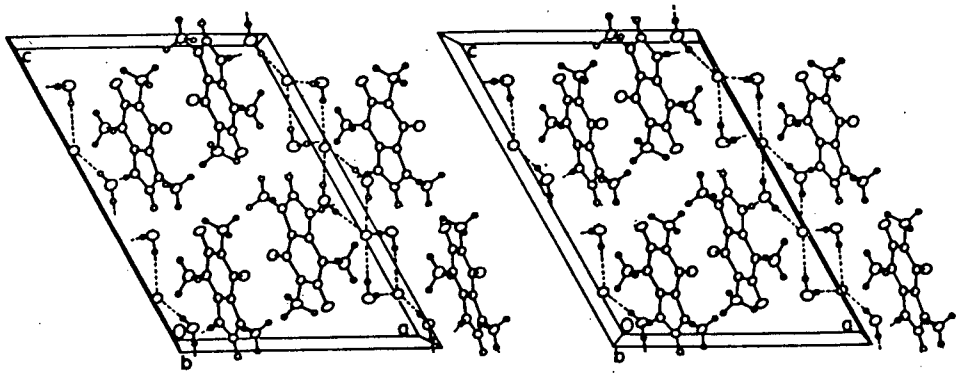


Figure 13

A stereoscopic diagram of the unit-cell viewed down b, showing the postulated hydrogen bonding as dashed lines.

bonding for this compound. A stereoview of the packing of the molecules in the crystal lattice, and the postulated intermolecular hydrogen bonding can be seen in Fig. 13.

In these crystals, unlike many other purine type derivatives, there appears to be no significant stacking of layers of molecules and hence no significant dipole overlap of hetero C-O and C-N bonds contributing to the stability of the crystal.

The crystal structure determination was useful because it allowed for a correlation between the proton and nitrogen hyperfine coupling tensors, determined from the ENDOR spectroscopy on the X-irradiated crystal, and the molecular structure (62).

CHAPTER 6

CRYSTAL AND MOLECULAR STRUCTURE OF 1-ACETYL-3-BENZAMIDO-2-KETO-4-(2,3,4,6-TETRA-O-ACETYL-β-D-GLUCOPYRANOSYLOXY)-Δ^3-PYRROLINE

INTRODUCTION

From reactions of glycosyl bromide with 2-phenyloxazol-5-one (63) a β-glycoside considered to be 3-benzamido-1-benzoyl-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyl-oxy)-Δ^3-pyrroline was produced. On refluxing with acetic anhydride and sodium acetate in pyridine, one benzoate group was exchanged for an acetate group giving 1-acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-pyrroline. The crystal structure was undertaken to verify the initial assignment of structure based upon mass spectrum, n.m.r., and chemical data.

EXPERIMENTAL

Recrystallization of 1-acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-pyrroline from hexane-acetone gave colourless rectangular crystals. The crystal chosen for study was mounted with b parallel to the goniostat axis and had dimensions of ca 0.20 X 0.20 X 0.07 mm. Unit-cell and space group data were obtained from film and diffractometer measurements. The unit-cell parameters were refined by a least-squares treatment of $\sin^2\theta$ values for 19 reflections measured on a diffractometer with Cu Kα radiation.

Crystal Data $C_{27}H_{30}N_2O_{13}$, M = 590.54, monoclinic, a = 19.629(5), b = 7.504(2), c = 9.830(2) Å, β = 90.53(2)°, U = 1447.8(6) Å^3, Z = 2, D_c = 1.35(1) gcm^{-3}, F(000) = 620 (20°C, Cu Kα, λ = 1.5418 Å, μ = 9.4 cm^{-1}). Absent reflections 0k0, k ≠ 2n define the space group $P2_1$ (C_2^2, No. 4).

Intensities were measured on a Datex-automated General Electric XRD 6 diffractometer, with a scintillation counter, Cu $\underline{K}\alpha$ (nickel filter and pulse height analyser), and a θ-2θ scan at 2° min^{-1} over a range of $(1.80 + 0.86 \tan\theta)$ degrees in 2θ, with 10 s background counts being measured at each end of the scan. Data were measured to $2\theta = 120^\circ$ (minimum interplanar spacing 0.89 Å). A check reflection was monitored every 40 reflections throughout the data collection. The greatest deviation from the initial value was -4.5% and the final intensity was 1.04 times the initial value. Lorentz and polarization corrections were applied, and the structure amplitudes were derived. No absorption correction was applied due to the low value of μ. Of the 2336 independent reflections measured, 498 had intensities less than $3\sigma(\underline{I})$ above background where $\sigma^2(\underline{I}) = \underline{S} + \underline{B} + (0.05\underline{S})^2$ with $\underline{S}$ = scan count and $\underline{B}$ = time averaged background count. These reflections were classified as unobserved and given zero weight in the refinement.

STRUCTURE ANALYSIS

As previously demonstrated in chapter 5, methods are available for the statistical determination of the phases of the structure factors directly from the structure amplitudes. The basis for these direct methods was discussed in chapter 5 for the centrosymmetric case in which the phases could only have values of 0 or π (corresponding to + or - signs). When the space group is non-centrosymmetric the phases can have general values and cannot always be added together numerically. Fortunately J. Karle and I. Karle (64) have been

able to generalise the procedure already illustrated in the previous structure, to include the acentric structure. The procedure is very similar to that for centric structures; normalised structure factors were calculated and the 373 reflections with $|\underline{E}| > 1.35$ were chosen as the basis for the solution. Of these the 70 reflections with the largest $|\underline{E}|$'s were searched for Σ-2 relationships and a manual expansion was attempted. The origin in $\underline{P}2_1$ could be defined by the reflections 13 0 -6, 1 0 -9 and 3 1 1 which were given phases of zero. The manual expansion indicated that if any three reflections out of a group of six prominent reflections were given symbols then the phases of the majority of the 70 largest reflections could be determined in terms of these assigned symbols. After several unsuccessful runs using all 373 reflections the combination of origin, enantimorph fixing, and symbol reflections given in Table 29 produced satisfactory results. That is the solution involved using the previously mentioned origin reflections, fixing the enantimorph by allowing the phase of reflection 1 4 4 to only vary between 0 and 500 mc, and giving the reflections 5 6 -1 and 4 1 1 various combinations of the phases 0, 250, 500, and 750 mc, leading to sixteen (2^4) sets as indicated in Table 30. These sets were used as input to a computer program which determines phases using the tangent formula (given on page 98) of Karle and Hauptman (ref 65 and 66), as the simple Sayre relationship cannot be used for non-centrosymmetric structures.

Table 29

Basic starting set of reflections for
1-Acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-pyrroline

h	k	ℓ	|E|	phase (mc)	
13	0	-6	3.30	0	origin determining
1	0	-9	2.85	0	origin determining
3	1	1	2.72	0	origin determining
1	4	4	2.49	250	
5	6	-1	2.47	a	
4	1	1	2.67	b	

Table 30

Results for the sixteen starting sets in the phase determining procedure

Set	a (mc)	b (mc)	t	α	Rk	N*
1	0	0	0.52	116	0.33	328
2	0	250	0.78	226	0.28	349
3	0	500	0.80	227	0.27	348
4	0	750	0.65	166	0.31	343
5	250	0	0.80	224	0.30	344
6	250	250	0.56	121	0.32	340
7	250	500	0.65	152	0.32	343
8	250	750	0.55	119	0.32	326
9	500	0	0.79	223	0.29	345
10	500	250	0.60	141	0.31	336
11	500	500	0.59	169	0.24	358
12	500	750	0.56	115	0.37	324
13	750	0	0.64	159	0.32	339
14	750	250	0.56	125	0.33	333
15	750	500	0.72	200	0.29	343
16	750	750	0.58	160	0.24	349

* Total N = 373

$$\tan \phi_H = \frac{\sum_K |\underline{E}_K \underline{E}_{H-K}| \sin(\phi_K + \phi_{H-K})}{\sum_K |\underline{E}_K \underline{E}_{H-K}| \cos(\phi_K + \phi_{H-K})} = \frac{A}{B}$$

Each reflection is examined in descending order of $|\underline{E}|$, and a phase is determined for it from the previously known phases of pairs of Σ-2 related reflections. The phases calculated in the first cycle can then be used in the second cycle to give more and better approximations to the correct phases. This process is continued until most of the phases have been determined and there is little change in the values of the calculated phases from cycle to cycle.

Before a new phase was accepted various criteria must be satisfied; the consistencies $\underline{t}_H$ and $\underline{\alpha}$ of the new phase had to exceed the arbitrary values 0.25 and 4.0 respectively, where

$$\underline{t}_H = \frac{\sqrt{A^2 + B^2}}{\sum_K |\underline{E}_K| \cdot |\underline{E}_{H-K}|} \qquad \underline{\alpha} = |\underline{E}_H| \cdot \sqrt{A^2 + B^2}$$

If a new phase angle satisfies these criteria, it is used in the determination of the phases of other reflections in the following cycle. If the phase angle in two successive cycles is different by 250 mc, then the phase is considered to be unknown in the following cycle and therefore cannot be used in the determination of other phases, but it is then recalculated in the next cycle. The final values of $\underline{t}$, and the reliability index RKarle ($\underline{Rk}$), given by

$$\underline{Rk} = \frac{\sum_H ||\underline{E}_H|obs - |\underline{E}_H|calc|}{\sum_H |\underline{E}_H|obs}$$

where $|E_H|$calc are derived from use of the tangent formula, for the sixteen starting sets, are given in Table 30. Both sets 11 and 16 looked promising but the E map was

calculated from set 11 as this had the greater number of phases determined (N). The E map based on set 11 gave positions for 36 of the 42 heavy atoms in its top 50 peaks. Fixing the y co-ordinate of atom O(1) at 0.8300 to define the origin in the space group $P2_1$, and refining the remaining positional and isotropic thermal parameters for these 36 atoms, gave an R factor of 0.230. A difference Fourier revealed the positions of the remaining heavy atoms and two further cycles of full-matrix least-squares refinement with anisotropic thermal parameters for all the non-hydrogen atoms reduced R to 0.090. A difference Fourier at this stage positively revealed the positions of only 17 of the 30 hydrogen atoms. The remaining hydrogen atoms were given calculated positions. Due to the excessive expense and the nature of the problem, the refinement was concluded after two more cycles, varying only the heavy atom positional parameters and anisotropic temperature factors, but including the hydrogen atom positions and isotropic temperature factors, $U = 63 \times 10^{-3}$ Å^2, in the refinement. The final R value was 0.079 for 1838 reflections with $I \geq 3\sigma(I)$.

The atomic scattering factors and anomalous scattering correction for the C, N, and O atoms were taken from ref 14 and ref 15 respectively, and the scattering factors for the hydrogen atoms from ref 39. The weighting scheme: $w = 1/\sigma^2(F)$ where $\sigma^2(F)$ is derived from the previously defined $\sigma^2(I)$ gave uniform average values of $w(Fo-Fc)^2$ over ranges of $|Fo|$ and was employed in the final stages of refinement.

An attempt was made to determine the absolute configuration of the molecule through anomalous scattering of the non-hydrogen atoms. The enantimorph in Table 31, (A), and that generated by changing y to -y, (B), were both refined and Hamilton's test (67) applied to the resulting R factor ratios. Unfortunately neither (A) nor (B) was proved to be significantly more correct. (A) was therefore chosen in view of the chemical evidence. The final positional and thermal parameters appear in Tables 31 and 32 respectively. Measured and calculated structure factors are available from the U.B.C. Library.

RESULTS AND DISCUSSION

Fig. 14 shows a general stereoview of 1-acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glucopyranosyloxy)-Δ^3-pyrroline, with the crystallographic numbering scheme. Complete lists of bond lengths and angles are given in Tables 33 and 34 respectively. As expected the six-membered ring is in the chair conformation with equatorial substituents at positions 2, 3, 4, and 5. Table 35 gives a weighted least-squares mean plane for this ring and its molecular geometry is compared with similar compounds, 2,3,4,6- tetra-O-acetyl-1-cyano-β-D-galactopyranose (68) and tetra-O-acetyl-α-D-mannopyranosyl chloride (69), in Table 36. The average values for the bond lengths [C-C, 1.53(2); C-O, 1.45(2) Å], bond angles [112(3)°] and range of torsion angles [51.7(7)-69.8(7)°] are very close to those given by Kim and Jeffrey (70) as typical of other pyranose rings.

The O-acetyl groups attached to C(2), C(3), C(4), and

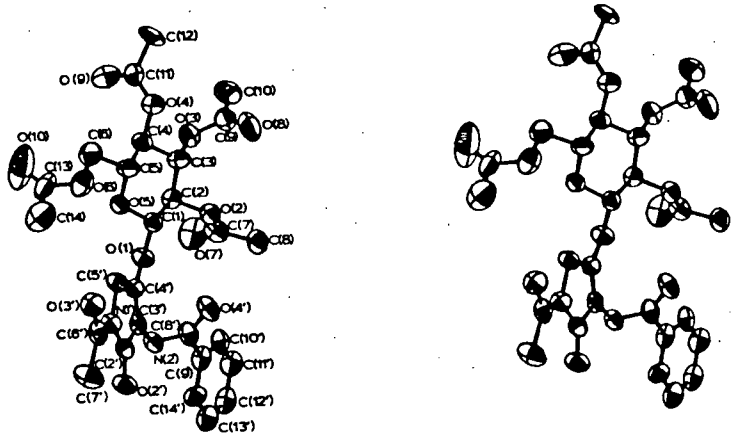


Figure 14(A)

A general stereoview of the molecule showing the crystallographic numbering scheme

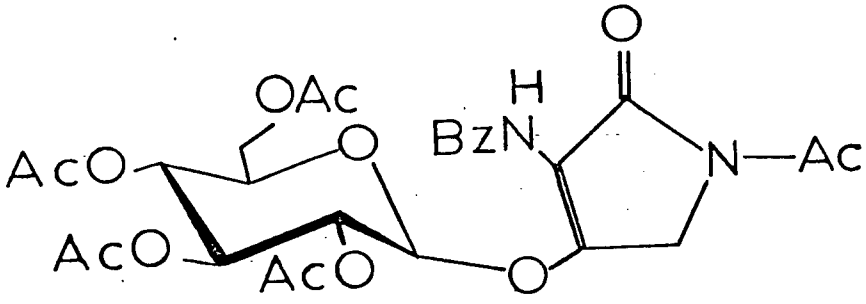


Figure 14(B)

Diagram of the conventional chemical structure

Table 31

Final positional parameters (fractional x 10^4, H x 10^3) with estimated standard deviations in parentheses

Atom	x	y	z
O(1)	2462(3)	8300	6742(5)
O(2)	2438(3)	8305(10)	3798(5)
O(3)	3746(3)	6996(11)	2761(5)
O(4)	4063(3)	3691(12)	3854(6)
O(5)	3194(3)	5947(10)	6654(5)
O(6)	3368(3)	2618(11)	7897(6)
O(7)	2739(4)	11172(13)	4098(9)
O(8)	3049(5)	5920(16)	1173(7)
O(9)	5138(4)	4203(16)	4410(8)
O(10)	4195(5)	2094(28)	9253(10)
O(2')	742(3)	8638(10)	10065(5)
O(3')	1556(3)	3482(11)	10067(5)
O(4')	1241(3)	10214(10)	5670(5)
N(1')	1500(3)	6368(11)	9479(6)
N(2')	1378(3)	10750(11)	7937(6)
C(1)	2696(4)	6858(13)	5925(7)
C(2)	3000(4)	7716(12)	4623(7)
C(3)	3336(4)	6195(14)	3829(8)
C(4)	3818(4)	5135(13)	4706(8)
C(5)	3423(4)	4384(14)	5914(8)
C(6)	3842(4)	3291(15)	6881(8)
C(7)	2370(5)	10137(16)	3593(9)
C(8)	1794(5)	10462(15)	2640(9)
C(9)	3557(6)	6639(16)	1459(8)
C(10)	4101(6)	7327(21)	504(10)
C(11)	4714(5)	3471(18)	3740(8)
C(12)	4883(6)	2091(23)	2708(8)
C(13)	3622(5)	2117(19)	9044(11)
C(14)	3068(5)	1436(20)	9977(10)
C(2')	1204(4)	8038(13)	9377(7)
C(3')	1570(4)	8985(13)	8274(7)
C(4')	2019(4)	7866(13)	7753(7)
C(5')	2012(4)	6118(13)	8459(7)
C(6')	1296(4)	4929(15)	10268(7)
C(7')	802(5)	5234(16)	11396(8)
C(8')	1183(4)	11165(15)	6638(8)
C(9')	900(4)	13067(13)	6494(8)
C(10')	1083(5)	14088(15)	5355(8)
C(11')	820(5)	15805(16)	5214(10)
C(12')	369(5)	16449(16)	6158(11)
C(13')	174(5)	15410(16)	7285(9)
C(14')	445(4)	13764(14)	7439(9)
H(1)	229	615	555
H(2)	341	844	486
H(3)	293	544	324
H(4)	425	590	502

Table 31 (continued)

Atom	X	Y	Z
H(5)	302	357	543
H(6A)	431	326	707
H(6B)*	409	216	633
H(8A)*	164	924	212
H(8B)*	135	1101	316
H(8C)*	195	1142	185
H(10A)	449	780	127
H(10B)*	432	619	-4
H(10C)*	387	820	-24
H(12A)*	442	127	248
H(12B)	474	217	190
H(12C)	544	172	269
H(14A)	260	111	905
H(14B)*	317	2	1025
H(14C)*	306	218	1092
H(5'A)	246	551	858
H(5'B)*	188	503	776
H(7'A)	51	600	1147
H(7'B)	32	537	1074
H(7'C)	105	525	221
H(10')*	142	1354	459
H(11')	99	1613	424
H(12')*	16	1782	604
H(13')	-12	1600	826
H(14')*	31	1293	832
H(N2')	106	1000	795

* calculated positions

Table 32

Final thermal parameters and
their standard deviations in parentheses
Anisotropic thermal parameters (U_{ij} x 10^3 Å^2)

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
O(1)	71(3)	35(3)	48(3)	1(3)	10(2)	-4(3)
O(2)	71(4)	40(4)	43(3)	3(3)	-3(2)	1(3)
O(3)	71(4)	68(4)	50(3)	-3(3)	4(3)	1(3)
O(4)	64(4)	77(5)	67(3)	13(4)	0(3)	-14(4)
O(5)	62(3)	51(4)	40(3)	10(3)	-2(2)	-5(3)
O(6)	69(4)	68(5)	78(4)	-1(4)	-11(3)	17(4)
O(7)	123(6)	44(4)	127(6)	-21(5)	-24(5)	14(5)
O(8)	133(7)	147(9)	49(4)	-8(7)	-13(4)	-10(5)
O(9)	75(5)	145(9)	109(6)	29(5)	7(4)	-17(6)
O(10)	86(6)	414(25)	127(7)	-6(9)	-10(5)	136(12)
O(2')	85(4)	45(4)	54(3)	17(3)	18(3)	3(3)
O(3')	85(4)	35(4)	62(3)	15(3)	5(3)	6(3)
O(4')	106(5)	44(4)	43(3)	3(4)	-2(3)	3(3)
N(1')	67(4)	29(4)	50(4)	12(3)	2(3)	0(3)
N(2')	73(4)	34(4)	49(4)	2(4)	-3(3)	6(3)
C(1)	50(4)	50(5)	40(4)	0(4)	-5(3)	4(4)
C(2)	45(4)	41(5)	46(4)	-9(4)	-2(3)	5(4)
C(3)	55(5)	48(5)	55(4)	-3(4)	6(4)	6(4)
C(4)	54(5)	40(5)	55(4)	3(4)	2(4)	-9(4)
C(5)	56(5)	50(5)	55(4)	11(4)	4(4)	1(4)
C(6)	55(5)	68(7)	71(5)	15(5)	5(4)	12(5)
C(7)	96(7)	45(6)	52(5)	-7(6)	7(5)	20(5)
C(8)	103(7)	55(6)	61(5)	15(6)	-8(5)	10(5)
C(9)	87(7)	73(8)	45(5)	6(6)	-9(5)	-8(5)
C(10)	106(8)	125(11)	64(6)	26(8)	19(6)	14(7)
C(11)	74(7)	94(8)	45(5)	26(7)	-5(4)	-1(5)
C(12)	114(9)	181(13)	41(5)	69(9)	-7(5)	-27(7)
C(13)	48(6)	110(9)	92(7)	15(6)	-18(5)	24(7)
C(14)	90(7)	109(10)	84(7)	4(7)	0(6)	34(7)
C(2')	60(5)	42(5)	43(4)	-9(4)	-1(4)	-4(4)
C(3')	68(5)	38(5)	37(4)	15(4)	-14(4)	2(4)
C(4')	54(4)	31(5)	48(4)	0(4)	2(4)	4(4)
C(5')	58(5)	38(5)	48(4)	8(4)	3(4)	-5(4)
C(6')	77(6)	43(5)	39(4)	0(5)	-5(4)	8(4)
C(7')	97(7)	65(6)	49(5)	7(6)	14(5)	10(5)
C(8')	76(6)	49(5)	43(5)	-11(5)	-6(4)	7(5)
C(9')	61(5)	38(5)	61(5)	-5(4)	-14(4)	8(4)
C(10')	76(6)	55(6)	49(4)	-9(5)	-14(4)	2(4)
C(11')	91(7)	48(6)	76(6)	-2(6)	-16(6)	12(5)
C(12')	86(7)	42(6)	99(8)	0(5)	-36(6)	6(6)
C(13')	76(6)	55(7)	74(6)	5(5)	-13(5)	-1(5)
C(14')	60(5)	45(6)	66(5)	8(5)	-4(4)	-4(5)

* All H atoms had isotropic thermal parameters U = 63 X 10^{-3} Å^2

Table 33

Bond lengths (Å) with standard deviations in parentheses

Bond	Length (Å)	Bond	Length (Å)
C(1)-C(2)	1.55(1)	C(1)-O(1)	1.43(1)
C(2)-C(3)	1.54(1)	O(1)-C(4')	1.37(1)
C(3)-C(4)	1.50(1)	C(4')-C(5')	1.48(1)
C(4)-C(5)	1.53(1)	C(5')-N(1')	1.44(1)
C(5)-O(5)	1.45(1)	N(1')-C(2')	1.39(1)
O(5)-C(1)	1.39(1)	C(2')-C(3')	1.49(1)
C(5)-C(6)	1.50(1)	C(3')-C(4')	1.32(1)
C(2)-O(2)	1.43(1)	N(1')-C(6')	1.39(1)
C(3)-O(3)	1.46(1)	C(6')-O(3')	1.22(1)
C(4)-O(4)	1.45(1)	C(6')-C(7')	1.50(1)
C(6)-O(6)	1.46(1)	C(2')-O(2')	1.22(1)
O(2)-C(7)	1.40(1)	C(3')-N(2')	1.42(1)
O(3)-C(9)	1.36(1)	N(2')-C(8')	1.37(1)
O(4)-C(11)	1.29(1)	C(8')-O(4')	1.20(1)
O(5)-C(13)	1.29(1)	C(8')-C(9')	1.54(1)
C(7)-O(7)	1.17(1)	C(9')-C(10')	1.41(1)
C(9)-O(8)	1.17(1)	C(10')-C(11')	1.39(1)
C(11)-O(9)	1.19(1)	C(11')-C(12')	1.38(1)
C(13)-O(10)	1.14(1)	C(12')-C(13')	1.41(1)
C(7)-C(8)	1.48(1)	C(13')-C(14')	1.35(1)
C(9)-C(10)	1.52(1)	C(14')-C(9')	1.40(1)
C(11)-C(12)	1.49(1)	C(13)-C(14)	1.52(1)

Table 34

Bond angles (deg.) with standard deviations in parentheses

Bonds	Angles	Bonds	Angles
C(1)-C(2)-C(3)	106.3(6)	O(1)-C(1)-C(2)	106.1(6)
C(2)-C(3)-C(4)	111.9(6)	O(1)-C(1)-O(5)	108.2(5)
C(3)-C(4)-C(5)	108.5(6)	C(1)-O(1)-C(4')	116.1(6)
C(4)-C(5)-O(5)	114.4(6)	O(1)-C(4')-C(5')	124.0(7)
C(5)-O(5)-C(1)	111.0(5)	O(1)-C(4')-C(3')	124.1(7)
O(5)-C(1)-C(2)	110.8(6)	C(4')-C(5')-N(1')	102.7(6)
C(1)-C(2)-O(2)	107.2(5)	C(5')-N(1')-C(2')	111.3(6)
C(3)-C(2)-O(2)	105.9(6)	N(1')-C(2')-C(3')	106.2(7)
C(2)-C(3)-O(3)	107.6(7)	C(2')-C(3')-C(4')	107.9(7)
C(4)-C(3)-O(3)	106.3(6)	C(3')-C(4')-C(5')	111.8(6)
C(3)-C(4)-O(4)	105.9(6)	C(5')-N(1')-C(6')	119.6(7)
C(5)-C(4)-O(4)	110.2(7)	C(2')-N(1')-C(6')	128.3(7)
C(4)-C(5)-C(6)	114.4(6)	N(1')-C(6')-O(3')	118.6(7)
O(5)-C(5)-C(6)	107.1(6)	N(1')-C(6')-C(7')	119.1(8)
C(5)-C(6)-O(6)	105.9(6)	O(3')-C(6')-C(7')	122.1(8)
C(2)-O(2)-C(7)	117.2(7)	N(1')-C(2')-O(2')	127.4(7)
C(3)-O(3)-C(9)	116.7(7)	C(3')-C(2')-O(2')	126.4(8)
C(4)-O(4)-C(11)	118.5(8)	C(2')-C(3')-N(2')	119.2(7)
C(6)-O(6)-C(13)	117.2(7)	C(4')-C(3')-N(2')	132.8(8)
O(2)-C(7)-C(8)	108.9(8)	C(3')-N(2')-C(8')	120.3(7)
O(3)-C(9)-C(10)	109.2(9)	N(2')-C(8')-O(4')	125.4(9)
O(4)-C(11)-C(12)	112(1)	N(2')-C(8')-C(9')	113.3(8)
O(5)-C(13)-C(14)	110.7(8)	O(4')-C(8')-C(9')	121.2(7)
O(2)-C(7)-O(7)	122.4(9)	C(8')-C(9')-C(10')	119.0(8)
O(3)-C(9)-O(8)	123.0(9)	C(8')-C(9')-C(14')	121.2(8)
O(4)-C(11)-O(9)	125(1)	C(9')-C(10')-C(11')	119.0(9)
O(6)-C(13)-O(10)	122(1)	C(10')-C(11')-C(12')	120(1)
O(7)-C(7)-C(8)	128.7(9)	C(11')-C(12')-C(13')	121(1)
O(8)-C(9)-C(10)	127.8(9)	C(12')-C(13')-C(14')	119(1)
O(9)-C(11)-C(12)	122.6(9)	C(13')-C(14')-C(9')	121.4(9)
O(10)-C(13)-C(14)	127(1)	C(14')-C(9')-C(10')	119.7(8)

Table 35

Weighted least-squares mean planes

a) Distances (Å) of relevant atoms from the planes with standard deviations in parentheses

Plane 1: Calculated using O(5),C(2),C(3) and C(5)

Atom	Distance (Å)	Atom	Distance (Å)	Atom	Distance (Å)
O(5)	-0.030(6)	C(2)	0.050(8)	C(3)	-0.060(8)
C(5)	0.061(8)	C(1)	0.700(8)	C(4)	-0.740(8)

Plane 2: O(2),O(7),C(7) and C(8)

O(2)	0.001(5)	O(7)	0.003(8)	C(7)	-0.010(9)
C(8)	0.003(9)	C(2)	0.081(7)		

Plane 3: O(3),O(8),C(9) and C(10)

O(3)	0.000(8)	O(8)	0.001(11)	C(9)	-0.002(12)
C(10)	0.001(15)	C(3)	-0.205(10)		

Plane 4: O(4),O(9),C(11) and C(12)

O(4)	-0.002(7)	O(9)	-0.005(10)	C(11)	0.018(11)
C(12)	-0.007(14)	C(4)	0.172(9)		

Plane 5: O(6),O(10),C(6),C(13) and C(14)

O(6)	0.005(8)	O(10)	0.017(20)	C(6)	-0.003(11)
C(13)	-0.025(14)	C(14)	0.004(14)	C(5)	-0.479(10)

Plane 6: N(1'),C(2'),C(3'),C(4') and C(5')

N(1')	-0.014(6)	C(2')	0.022(8)	C(3')	-0.013(8)
C(4')	0.002(8)	C(5')	0.011(8)	O(1)	-0.062(4)
O(2')	0.050(6)	N(2')	0.007(7)	C(6')	0.128(8)

Plane 7: O(4'),N(2'),C(8') and C(9')

O(4')	0.003(7)	N(2')	0.003(7)	C(8')	-0.016(9)
C(9')	0.004(8)	C(3')	-0.178(8)		

Plane 8: C(9'),C(10'),C(11'),C(12'),C(13') and C(14')

C(9')	-0.004(8)	C(10')	0.013(9)	C(11')	-0.011(11)
C(12')	-0.002(11)	C(13')	0.010(10)	C(14')	-0.005(9)
C(8')	0.041(9)				

b) Dihedral angles between selected planes

Plane	Plane	Angle (deg.)	Plane	Plane	Angle (deg.)
1	2	118	1	6	34
1	3	83	6	7	130
1	4	103	6	8	9
1	5	39	7	8	138

Table 35 (continued)

c) Equations of planes: $lX + mY + nZ = p$ where X, Y and Z are orthogonal angstrom coordinates derived as follows

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} a & 0 & c\cos\beta \\ 0 & b & 0 \\ 0 & 0 & c\sin\beta \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

Plane	l	m	n	p
1	0.924	0.365	0.115	8.086
2	-0.624	0.063	0.779	0.335
3	-0.466	0.883	-0.052	1.076
4	-0.048	-0.719	0.694	0.258
5	-0.091	0.923	0.374	4.122
6	0.681	0.340	0.649	9.603
7	0.920	0.354	-0.166	3.979
8	0.761	0.379	0.526	8.375

Table 36

Comparison of structural data for the pyranose ring

Bond	Distance (Å) I	II	III
C(1)-C(2)	1.55(1)	1.528(7)	1.529(9)
C(2)-C(3)	1.54(1)	1.500(7)	1.56(1)
C(3)-C(4)	1.50(1)	1.523(6)	1.476(9)
C(4)-C(5)	1.53(1)	1.503(7)	1.524(9)
C(5)-O(5)	1.45(1)	1.441(6)	1.443(9)
O(5)-C(1)	1.39(1)	1.413(5)	1.366(9)
Bond	**Angle (deg.) I**	**II**	**III**
O(5)-C(1)-C(2)	110.8(6)	108.9(3)	116(1)
C(1)-C(2)-C(3)	106.3(6)	110.9(4)	109(1)
C(2)-C(3)-C(4)	111.9(6)	112.2(4)	110(1)
C(3)-C(4)-C(5)	108.5(6)	109.4(4)	111(1)
C(4)-C(5)-O(5)	114.4(6)	110.9(4)	109(1)
C(5)-O(5)-C(1)	111.0(5)	111.0(4)	117(1)
Bond	**Torsion Angles (deg.) I**	**II**	**III**
C(1)-C(2)-C(3)-C(4)	-51.7(7)	-50.5	49
C(2)-C(3)-C(4)-C(5)	58.3(8)	49.3	57
C(3)-C(4)-C(5)-O(5)	-63.0(7)	-55.3	57
C(4)-C(5)-O(5)-C(1)	69.8(7)	65.0	53
C(5)-O(5)-C(1)-C(2)	-68.0(7)	-64.1	49
O(5)-C(1)-C(2)-C(3)	55.6(7)	56.8	45

I — 1-Acetyl-3-benzamido-2-keto-4-(2,3,4,6-tetra-O-acetyl-β-D-glycopyranosyloxy)-Δ^3-pyrroline.

II — 2,3,4,6-Tetra-O-acetyl-1-cyano-β-D-galactopyranose.

III — Tetra-O-acetyl-α-D-mannopyranosyl chloride

C(6) are planar (Table 35). The average values for the bond lengths [Cring-O, 1.45(2); O-C, 1.33(2); C=O, 1.17(2); and C-Cmethyl, 1.50(2) Å] and angles [Cring-O-C, 117(1); O-C=O, 123(1); O-C-Cmethyl, 110(1); and O=C-Cmethyl, 127(2)°] are close to the values expected for such groups. It should also be mentioned that the terminal atoms on these O-acetyl groups exhibit extensive thermal motion (see Table 32), in particular atom O(10). This is somewhat expected due to the length of these chains, and the lack of very strong inter- or intramolecular bonding which might help to constrain these atoms.

The mean plane calculated for the 5-membered pyrroline ring (linked to the pyranose ring by a β-oxygen bridge) shows it to be planar within experimental error (Table 35). Other studies on pyrroline rings (71 and 72) found mean values for N(1')-C(2'), N(1')-C(5'), and C(2')-O(2') of 1.343(5), 1.456(8) and 1.230(3) Å respectively. The corresponding values for this compound are 1.39(1), 1.44(1) and 1.22(1) Å. Any shortening in the first two distances is probably due to the acetyl substituent on N(1'). The values for the C(2')-C(3'), C(4')-C(5'), and C(3')-C(4') bond distances of 1.48(1), 1.49(1) and 1.32(1) Å are very similar to those found by Boeyens and Kruger (73) [1.52, 1.52, and 1.31 Å]. The range of intra-annular angles for the pyrroline ring is from 102.7 to 111.8°.

Weighted least-squares mean planes calculated for the benzamido group, the acetyl group attached to N(1'), and the benzene ring show them to be planar (Table 35). Again the

Table 37

A) Intermolecular C-H...O interactions (distances in Å and angles in deg.)

D-H...A	H...A	D...A	D-H...A
C(7')-H(7'B)...O(2')[1]	2.57(1)	3.53(1)	142(1)
C(8)-H(8C)...O(3')[2]	2.46(1)	3.42(1)	146(1)
C(5)-H(5)...O(7)[3]	2.29(1)	3.28(1)	148(1)
C(10)-H(10A)...O(10)[4]	2.68(1)	3.36(1)	117(1)

B) Intramolecular O...H contacts

O(2')...H(N2')	2.41(1)
O(2')...H(7'A)	2.46(1)
O(3')...H(14A)	2.91(1)
O(4')...H(8B)	2.55(1)
O(4')...H(10')	2.47(1)
O(7)...H(2)	2.55(1)
O(8)...H(3)	2.08(1)
O(9)...H(4)	2.25(1)
O(10)...H(6A)	2.33(1)

[1]	-x,	-1/2+y,	1-z
[2]	x,	1+y,	-1+z
[3]	x,	-1+y,	z
[4]	1-x,	1/2+y,	1-z

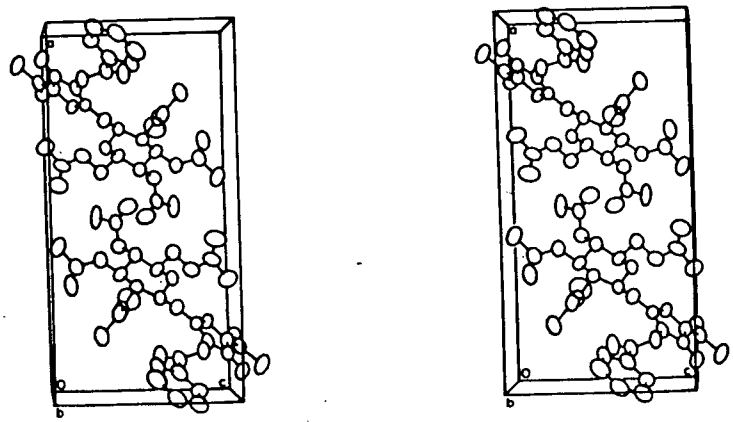


Figure 15

A stereoscopic diagram of the unit-cell viewed down b

bond lengths and angles are as expected for these groups.

In the crystal there are extensive numbers of close H...O intra- and intermolecular contacts which are summarized in Table 37. Of particular note is the significantly longer H(2)...O(7) contact compared to the other axial hydrogen, acetyl oxygen contacts. This difference is probably due to steric constraints induced by a postulated intermolecular hydrogen bond between O(7) and H(5). A stereoview of the packing of the molecules in the crystal lattice can be seen in Fig. 15.

The crystal structure determination for this compound indicated that the structure suggested by the mass spectrum, n.m.r., and other chemical data was in fact correct.

SUMMARY

The aim of this research has been to determine the structures of the five molecules previously described. The structure determinations themselves involved the utilization of the three major methods currently available in X-ray crystallography for overcoming the phase problem and thereby deducing the crystal and molecular structure.

For any compound the choice of the most suitable method for structure determination is essentially determined by the nature of the compound itself. Patterson methods, described in Chapter 2, involve a process in which it is essential that the molecule contain one or more 'heavy' atoms. The tungsten and the two ruthenium compounds (Chapters 2, 3, and 4) with their heavy metal atoms were therefore ideal for this method.

If, however, a molecule contains only atoms which have the same or similar atomic numbers, e.g. most organic molecules, the Patterson synthesis is unsuitable. Although it may be possible to produce heavy atom derivatives of these molecules and hence use the Patterson method, alternate 'direct methods' have fortunately been developed which make it possible to determine the structures directly. The structure of the caffeine and pyrroline derivatives described in Chapters 5 and 6 were determined by use of these direct methods. The actual method used depends upon the space group of the compound. The caffeine structure was therefore determined by centrosymmetric direct methods (it crystallized in the centrosymmetric space group $\underline{P}2_1/\underline{c}$) while the structure of the pyrroline compound was solved by non-centrosymmetric direct methods (it crystallized in the non-centrosymmetric

space group $\underline{P}2_1$).

Although the five compounds were essentially unrelated; and any meaningful correlation in terms of bonding, intermolecular interactions, etc., was impossible, the results for the individual molecules were both interesting and useful.

The analysis of the seven-coordinate tungsten compound (Chapter 2) showed it to have a distorted capped octahedral geometry. The tungsten-iodine distances of 2.848(2) and 2.856(2) Å appeared to be the first determinations of W-I bond lengths in a seven-coordinate environment.

The two ruthenium compounds had very similar octahedral structures. The tris complex (Chapter 3) had all three DMSO ligands sulphur-bonded in a cis configuration. In the tetrakis compound (Chapter 4) the extra ligand replaced one of the chlorine atoms but was coordinated through the oxygen atom. It is thought that steric influences prohibit the formation of an all sulphur-bonded complex, but electronic effects keep the S-bonded ligands in the cis configuration.

Caffeine hydrochloride dihydrate (Chapter 5) contained a planar caffeine molecule protonated at N(9). Of particular interest was the effect of protonation on the bond lengths between atoms in the fused ring system. It is believed that considerable rearrangement must be occuring close to the protonated centre, but that this rearrangement does not seem to be transferred to the rest of the molecule.

The molecular geometry in the pyrroline compound (Chapter 6) was very similar to that found for other related

compounds. This compound did, however, exhibit extensive numbers of close C-H...O intra- and intermolecular contacts. Some degree of hydrogen bonding was also shown by another two of the compounds studied. The ruthenium anions in Chapter 3 were linked in a chain like structure throughout the lattice to the dimethylammonium cations via N-H...O and N-H...Cl hydrogen bonds, while the caffeine crystals contained O-H...Cl and N-H...O hydrogen bonds.

References

1. International Tables for X-ray Crystallography, vols. I-III, Kynoch Press, Birmingham. Vol. I, 1952; vol. II, 1959; and vol. III, 1962.

2. G.H. Stout and L.H. Jensen. X-ray Structure Determination: A Practical Guide. The MacMillan Company; London, 1968.

3. M.J. Buerger. Crystal Structure Analysis. J. Wiley and Sons, Inc., New York, 1960.

4. M.J. Buerger. Vector Space. J. Wiley and Sons, Inc., 1959.

5. M.M. Woolfson. X-ray Crystallography. Cambridge University Press, 1970.

6. H. Lipson and W. Cochran. The Crystalline State, vol. III: The Determination of Crystal Structures, 3rd. edn.. G. Bell and Sons, Ltd., London, 1966.

7. W.L. Bragg. Proc. Camb. Phil. Soc., 1913, 17, 43.

8. P.P. Ewald. Z. Krist., 1921, 56, 129.

9. L. Mihichuk and W.R. Cullen. Can. J. Chem., 1976, 54, 2548.

10. P. Meakin, L.J. Guggenberger, F.N. Tebbe, and J.P. Jesson. Inorg. Chem., 1974, 13, 1025.

11. A.L. Patterson. Z. Krist., 1935, A90, 517.

12. D. Harker. J. Chem. Phys., 1936, 4, 381.

13. P. Coppens, L. Leiserowitz, and D. Rabinovich. Acta cryst., 1965, 18, 1035.

14. D.T. Cromer and J.B. Mann. Acta Cryst., 1968, A24, 321.

15. D.T. Cromer and D. Liberman. J. Chem. Phys., 1970, 53, 1891.

16. M.G.B. Drew. J. Chem. Soc. Dalton, 1972, 1329.

17. (a) R.B. King. J. Am. Chem. Soc., 1970, 92, 6455. (b) E.L. Muetterties and C.N. Wright. Quart. Rev., 1967, 21, 109.

18. M.G.B. Drew and J.D. Wilkins. J. Chem. Soc. Dalton, 1973, 1830.

19. M.G.B. Drew. J. Chem. Soc. Dalton, 1972, 626.

20. M.G.B. Drew, A.W. Johans, A.P. Wolters, and I.B. Tomkins. Chem. Comm., 1971, 819.

21. M.G.B. Drew and A.P. Wolters. Chem. Comm., 1972, 457.

22. L. Pauling. 'Nature of the Chemical Bond', 3rd edn., Cornell University Press, Ithaca, New York, 1960, p 224-225 and 249.

23. D.F. Lewis and S.J. Lippard. Inorg. Chem., 1972, 11, 621.

24. (a) J.B. Wilford and H.M. Powell. J. Chem. Soc. (A), 1969, 8.
(b) M. Elder and D. Hall. Inorg. Chem., 1969, 8, 1273.

25. (a) M.R. Churchill and T.A. O'Brien. J. Chem. Soc. (A), 1970, 206.
(b) J.H. Cross and R.H. Fenn. J. Chem. Soc. (A), 1970, 3109.

26. M.G.B. Drew and J.D. Wilkins. J. Chem. Soc. Dalton, 1973, 2667.

27. Chem. Soc. Special Publ. No. 11, 1958 and No. 18, 1965.

28. I.W. Nowell, S. Rettig, and J. Trotter. J. Chem. Soc. Dalton, 1972, 2381.

29. R.S. McMillan, A. Mercer, B.R. James, and J. Trotter. J. Chem. Soc. Dalton, 1975, 1006.

30. F.C. March and G. Ferguson. Can. J. Chem., 1971, 49, 3590.

31. M.J. Bennett, F.A. Cotton, B.L. Weaver, R.J. Williams, and W.H. Watson. Acta cryst., 1967, 23, 788.

32. D.A. Langs, C.R. Hare, and R.G. Little. Chem. Comm., 1967, 1080.

33. Y.N. Kukushkin, M.A. Kuz'mina, and A.F. U'yugina. Radiokhimiya, 1968, 10(4), 470.

34. J.V. McArdle, A.J. Schultz, B.J. Corden, and R. Eisenberg. Inorg. Chem., 1973, 12, 1676.

35. W.L. Reynolds. 'Progress in Inorganic Chemistry' Edited by S.J. Lippard. John Wiley and Sons, Inc., 1970, 12, 1.

36. W.C. Hamilton and J.A. Ibers. 'Hydrogen Bonding in Solids' W.A. Benjamin, 1968, p. 16.

37. G.C. Pimental and A.L. McClellan. Annu. Rev. Phys. Chem., 1971, 22, 347.

38. I.P. Evans, A. Spencer, and G. Wilkinson. J. Chem. Soc. Dalton, 1973, 204.

39. R.F. Stewart, E.R. Davidson, and W.T. Simpson. J. Chem. Phys., 1965, 42, 3175.

40. A.J. Schultz, R.L. Henry, J. Reed, and R. Eisenberg. Inorg. Chem., 1974, 13, 732.

41. J.T. Veal and D.J. Hodgson. Inorg. Chem., 1972, 11, 1420.

42. J.H. Price, R.F. Schramm, and B.B. Wayland. Chem. Commun., 1970, 1377.

43. M.J. Bennett, F.A. Cotton, and D.L. Weaver . Nature, 1966, 212, 287.

44. A.G. Konoplyannikov. Med. Radiol., 1975, 20(1), 38.

45. (a) D. Sayre. Acta Cryst., 1952, 5, 60.
(b) H. Hauptman and J. Karle. Solution of the Phase Problem. 1. The Centrosymmetric Crystal. A.C.A. Monograph No. 3. Polycrystal Book Service, Pittsburgh, 1953.

46. R.E. Long. Ph.D. Thesis, U.C.L.A., 1965.

47. V. Schomaker and K.N. Trueblood. Acta Cryst., 1968, B24, 63.

48. D.W.J. Criuckshank. Acta Cryst., 1956, 9, 747; Acta Cryst., 1956, 6, 754.

49. D.W.J. Cruickshank. Acta Cryst., 1961, 14, 896.

50. W.R. Busing and H.A. Levy. Acta Cryst., 1964, 17, 142.

51. C.K. Johnson. Crystallographic Computing. Munksguard, Copenhagen, 1970, pp. 207-226.

52. D.J. Sutor. Acta Cryst., 1958, 11, 453.

53. E. Shefter. J. Pharm. Sci., 1968, 57, 1163.

54. M.R. Taylor. Acta Cryst., 1973, B29, 884.

55. T.J. Kistenmacher and T. Shigematsu. Acta Cryst., 1974, B30, 1528

56. H. Rasmussen and E. Sletten. Acta Chem. Scand., 1973, 27, 2757.

57. H.m. Sobell and K. Tomita. Acta Cryst., 1964, 17, 126.

58. T.J. Kistenmacher and T. Sorrell. Acta Cryst., 1975, B31, 489.

59. E. Shefter, T.F. Brennan, and P. Sackman. Chem. Pharm. Bull., 1971, 19, 746.

60. T.J. Kistenmacher and T. Shigematsu. Acta Cryst., 1975, B31, 211.

61. J. Sletten and L.H. Jensen. Acta Cryst., 1969, B25, 1608.

62. D. Lennard. Ph.D. Thesis, U.B.C., 1977.

63. A. Rosenthal and A.J. Brink. J. Carbhydrates. Nucleosides. Nucleotides, 1975, 2(4&5), 343.

64. J. Karle and I.L. Karle. Acta Cryst., 1966, 21, 849.

65. J. Karle and H. Hauptman. Acta Cryst., 1956, 9, 635.

66. M.G.B. Drew, D.H. Templeton, and A. Zalkin. Acta Cryst., 1969, B25, 261; M.G.B. Drew. private communication.

67. W.C. Hamilton. Acta Cryst., 1965, 18, 502.

68. C. Foces-foces, F.H. Cano, and S. Garcia-blanco. Acta Cryst., 1976, B32, 964.

69. P. Herpin, R. Famery, J. Auge, S. David, and L. Guibe. Acta Cryst., 1976, B32, 209.

70. S.H. Kim and G.A. Jeffrey. Acta Cryst., 1967, 22, 537.

71. L. Fanfani, A. Nunzi, P.F. Zanazzi, and A.R. Zanzari. Acta Cryst., 1974, B30, 127.

72. L. Dupont, O. Dideberg, and A. Welter. Acta Cryst., 1975, B31, 1018.

73. J.C.A. Boeyens and G.J. Kruger. Acta Cryst., 1970, B26, 668.

THE STRUCTURE DETERMINATION OF THREE INORGANIC AND TWO ORGANIC COMPOUNDS BY X-RAY DIFFRACTION.

By

ANTHONY MERCER.

B.Sc., University of Bristol, England, 1972.

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We accept this thesis as conforming to the required standard.

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JUNE 1977.

(2,3-Bis(dimethylarsino)-1,1,1,4,4,4-hexafluorobut-2-ene-As,As)tricarbonyl-diiodotungsten(II)

Anthony Mercer and James Trotter

Observed and calculated structure factor amplitudes (reflections with intensity < $3\sigma(I)$ are marked with an asterisk).

H	K	L	FO	FC	H	K	L	FO	FC
0	0	2	83.31	50.20	4	0	12	55.09	49.16
0	0	4	252.25	209.28	5	0	-14	56.04	57.08
0	0	6	22.58*	5.70	5	0	-12	29.03	25.80
0	0	8	16.39*	10.12	5	0	-10	154.55	152.81
0	0	10	23.99	24.91	5	0	-8	47.16	50.26
0	0	12	186.74	179.12	5	0	-6	265.36	224.45
0	0	14	25.29*	27.56	5	0	0	0.00*	12.07
1	0	-14	34.70	40.04	5	0	2	248.26	272.36
1	0	-12	118.35	113.40	5	0	4	14.93*	13.86
1	0	-10	130.59	137.38	5	0	6	93.35	94.57
1	0	-8	46.69	52.02	5	0	8	125.78	116.24
1	0	-6	188.65	189.89	5	0	10	55.72	46.89
1	0	-4	91.47	86.32	5	0	12	10.82*	23.48
1	0	2	287.92	229.15	6	0	-14	50.92	48.43
1	0	4	16.05	10.96	6	0	-12	24.35*	19.60
1	0	8	56.22	55.28	6	0	-10	112.57	112.05
1	0	10	158.41	156.61	6	0	-8	5.71*	13.09
1	0	12	95.10	96.58	6	0	-6	30.70	31.27
1	0	14	20.24*	15.08	6	0	-2	17.01*	17.49
2	0	-14	183.92	182.45	6	0	0	413.13	388.03
2	0	-12	42.07	45.19	6	0	2	149.64	161.14
2	0	-10	41.61	45.01	6	0	4	95.40	86.08
2	0	-8	36.41	39.37	6	0	6	12.74*	4.23
2	0	-6	31.74	34.02	6	0	8	174.00	176.67
2	0	0	244.11	249.09	6	0	10	27.74*	34.88
2	0	2	33.09	40.46	6	0	12	36.11	22.93
2	0	6	68.05	67.13	7	0	-14	50.81	54.71
2	0	8	41.20	42.63	7	0	-12	15.62*	19.52
2	0	10	219.83	209.24	7	0	-10	25.74	21.72
2	0	12	81.56	83.18	7	0	-8	81.67	79.39
2	0	14	22.47*	7.08	7	0	-6	257.23	226.89
3	0	-14	25.17	18.29	7	0	-4	19.71*	9.61
3	0	-12	72.46	69.94	7	0	-2	128.63	119.22
3	0	-10	122.45	130.59	7	0	0	138.46	126.18
3	0	-8	368.61	317.23	7	0	2	404.91	392.64
3	0	-4	38.02	22.62	7	0	4	11.99*	1.64
3	0	-2	108.28	103.01	7	0	6	211.37	196.32
3	0	0	46.31*	75.08	7	0	8	57.47	53.07
3	0	2	186.19	201.41	7	0	10	18.97*	8.38
3	0	4	275.08	238.99	8	0	-14	108.19	110.64
3	0	6	89.80	85.67	8	0	-12	55.52	55.81
3	0	8	21.21*	27.37	8	0	-10	86.02	84.01
3	0	10	117.85	113.78	8	0	-8	176.99	171.76
3	0	12	84.81	80.70	8	0	-6	126.82	129.94
3	0	14	66.17	71.10	8	0	-4	39.83	40.33
4	0	-14	151.54	157.32	8	0	-2	17.84*	19.90
4	0	-12	50.08	53.08	8	0	0	395.37	382.12
4	0	-10	239.08	234.94	8	0	2	0.00*	7.03
4	0	-8	230.99	223.48	8	0	4	61.64	66.46
4	0	-6	90.77	94.54	8	0	6	41.87	46.63
4	0	-4	326.81	312.41	8	0	8	86.44	77.77
4	0	-2	367.98	311.76	8	0	10	32.86	31.28
4	0	0	115.12	146.76	9	0	-14	19.08*	13.80
4	0	2	335.17	315.37	9	0	-12	152.58	154.91
4	0	4	96.34	79.59	9	0	-10	204.41	201.03
4	0	6	140.24	147.29	9	0	-8	151.98	142.45
4	0	8	82.78	82.45	9	0	-6	65.23	49.23
4	0	10	161.64	162.37	9	0	-4	67.73	59.12

H	K	L	FO	FC
9	0	-2	86.22	92.11
9	0	0	163.55	153.83
9	0	2	13.03*	13.68
9	0	4	18.43*	15.97
9	0	6	145.10	154.32
9	0	8	30.00*	28.05
10	0	-14	141.62	142.81
10	0	-12	60.94	59.03
10	0	-10	48.09	45.77
10	0	-8	145.17	139.78
10	0	-6	205.83	186.70
10	0	-4	259.76	243.68
10	0	-2	215.31	203.77
10	0	0	16.68*	21.11
10	0	2	60.92	65.39
10	0	4	84.76	74.07
10	0	6	77.87	66.42
10	0	8	13.44*	1.30
11	0	-14	0.00*	8.52
11	0	-12	24.20*	22.97
11	0	-10	89.24	88.74
11	0	-8	197.83	192.37
11	0	-6	222.89	213.49
11	0	-4	104.56	110.40
11	0	-2	133.31	131.31
11	0	0	31.70*	43.80
11	0	2	62.53	60.69
11	0	4	116.72	106.46
11	0	6	39.01	39.31
12	0	-14	35.09	29.77
12	0	-12	17.89*	6.97
12	0	-10	49.62	48.79
12	0	-8	114.59	113.39
12	0	-6	32.01	24.94
12	0	-4	162.50	166.46
12	0	-2	156.34	167.87
12	0	0	103.67	103.78
12	0	2	56.96	54.01
12	0	4	103.87	89.19
12	0	6	60.17	46.35
13	0	-14	14.71*	8.22
13	0	-12	73.70	73.09
13	0	-10	35.62	33.73
13	0	-8	25.21*	24.53
13	0	-6	65.47	63.17
13	0	-4	108.94	103.64
13	0	-2	150.63	147.27
13	0	0	0.00*	6.61
13	0	2	136.59	124.02
13	0	4	0.00*	2.27
14	0	-12	31.91	28.26
14	0	-10	60.71	52.18
14	0	-8	37.97	37.73
14	0	-6	48.44	48.15
14	0	-4	135.36	133.00
14	0	-2	3.36*	7.22
14	0	0	80.99	70.52
14	0	2	39.23	32.87

H	K	L	FO	FC
15	0	-12	81.72	80.94
15	0	-10	44.66	36.78
15	0	-8	105.68	101.18
15	0	-6	20.60*	3.89
15	0	-4	42.94	50.58
15	0	-2	24.88*	13.52
15	0	0	22.55*	6.07
0	-1	1	236.54	192.10
0	-1	2	242.78	204.34
0	-1	3	188.28	164.27
0	-1	4	144.52	137.36
0	-1	5	161.72	148.28
0	-1	6	372.87	311.87
0	-1	7	150.98	146.34
0	-1	8	129.68	121.61
0	-1	9	87.28	87.73
0	-1	10	44.37	40.68
0	-1	11	36.05	30.62
0	-1	12	0.00*	9.32
0	-1	13	88.58	82.66
0	-1	14	0.00*	5.03
0	-1	15	45.88	45.80
1	-1	-15	14.58*	18.41
1	-1	-14	44.74	44.03
1	-1	-13	62.13	60.79
1	-1	-12	38.71	38.84
1	-1	-11	51.06	51.07
1	-1	-10	24.39	25.46
1	-1	-9	93.29	88.28
1	-1	-8	0.00*	9.41
1	-1	-7	219.26	194.37
1	-1	-6	133.23	122.01
1	-1	-5	66.74	72.61
1	-1	-4	34.22	34.40
1	-1	-3	84.86	89.89
1	-1	-2	53.87	54.47
1	-1	-1	187.36	160.05
1	-1	0	451.01	475.80
1	-1	1	266.44	256.11
1	-1	2	38.71	29.31
1	-1	3	8.28*	5.07
1	-1	5	375.95	324.34
1	-1	6	172.78	166.94
1	-1	7	129.58	127.62
1	-1	8	15.44*	16.24
1	-1	9	73.42	74.71
1	-1	10	52.30	43.33
1	-1	11	79.65	80.63
1	-1	12	104.59	103.81
1	-1	13	12.03*	9.74
1	-1	14	14.65*	7.22
1	-1	15	12.03*	18.37
2	-1	-15	83.46	82.54
2	-1	-14	30.63	30.37
2	-1	-13	65.68	64.70
2	-1	-12	98.96	99.10
2	-1	-11	137.62	134.20
2	-1	-10	104.78	103.35

H	K	L	FO	FC
2	-1	-9	90.04	86.60
2	-1	-8	110.14	98.08
2	-1	-7	67.20	73.06
2	-1	-6	183.82	181.65
2	-1	-5	41.85	41.05
2	-1	-4	135.14	127.51
2	-1	-3	57.34	59.03
2	-1	-2	353.49	303.61
2	-1	-1	210.03	175.93
2	-1	0	98.22	90.87
2	-1	1	37.84	40.94
2	-1	2	251.86	234.57
2	-1	3	190.32	164.00
2	-1	4	151.20	143.23
2	-1	5	39.73	27.12
2	-1	6	110.81	112.15
2	-1	7	162.50	161.03
2	-1	8	40.46	40.38
2	-1	9	31.11	32.92
2	-1	10	164.57	152.67
2	-1	11	154.36	145.81
2	-1	12	111.26	112.17
2	-1	13	38.90	39.94
2	-1	14	28.45	25.03
3	-1	-15	26.30*	23.16
3	-1	-14	165.14	160.40
3	-1	-13	102.52	104.43
3	-1	-12	83.03	81.35
3	-1	-11	34.85	31.31
3	-1	-10	21.58	22.82
3	-1	-9	254.95	235.06
3	-1	-8	97.87	101.33
3	-1	-7	95.05	93.16
3	-1	-6	50.80	41.18
3	-1	-5	101.19	95.81
3	-1	-4	147.50	142.24
3	-1	-3	43.94	50.62
3	-1	-2	276.93	244.42
3	-1	-1	73.99	79.51
3	-1	0	56.14	74.83
3	-1	1	75.34	74.36
3	-1	2	170.07	163.85
3	-1	3	122.39	131.31
3	-1	4	265.66	243.20
3	-1	5	190.06	183.19
3	-1	6	52.72	57.58
3	-1	7	39.49	39.71
3	-1	8	122.70	119.34
3	-1	9	173.80	168.77
3	-1	10	163.94	161.85
3	-1	11	32.98	27.26
3	-1	12	19.79*	10.95
3	-1	13	34.62	36.08
3	-1	14	32.71	29.24
4	-1	-15	73.13	73.55
4	-1	-14	52.29	56.87
4	-1	-13	41.95	36.93
4	-1	-12	25.75	23.80
4	-1	-11	165.78	165.43
4	-1	-10	54.30	51.60
4	-1	-9	62.28	59.43
4	-1	-8	140.16	133.37
4	-1	-7	168.15	166.82
4	-1	-6	261.08	227.45
4	-1	-5	43.23	29.60
4	-1	-4	297.31	263.10
4	-1	-3	216.60	181.25
4	-1	-2	380.37	335.74
4	-1	-1	12.50*	21.43
4	-1	0	138.25	145.48
4	-1	1	79.45	87.38
4	-1	2	48.42	54.85
4	-1	3	69.71	75.24
4	-1	4	55.65	67.39
4	-1	5	38.18	34.47
4	-1	6	50.46	49.00
4	-1	7	93.39	92.47
4	-1	8	65.12	63.82
4	-1	9	70.54	66.28
4	-1	10	13.21*	9.92
4	-1	11	97.78	92.17
4	-1	12	0.00*	5.10
4	-1	13	0.00*	3.25
5	-1	-15	24.63	16.30
5	-1	-14	25.22	27.44
5	-1	-13	22.23*	23.43
5	-1	-12	22.04	19.14
5	-1	-11	81.04	79.31
5	-1	-10	195.27	190.29
5	-1	-9	272.89	247.94
5	-1	-8	158.27	155.44
5	-1	-7	42.84	45.88
5	-1	-6	36.09	38.46
5	-1	-5	264.25	230.90
5	-1	-3	40.44	33.21
5	-1	-2	62.68	48.83
5	-1	-1	102.54	102.56
5	-1	0	79.09	81.76
5	-1	1	173.80	186.28
5	-1	2	267.75	276.07
5	-1	3	201.31	195.41
5	-1	4	121.30	114.79
5	-1	5	21.95*	23.97
5	-1	6	85.32	81.91
5	-1	7	97.03	93.51
5	-1	8	30.26	30.47
5	-1	9	86.76	83.97
5	-1	10	19.37*	7.80
5	-1	11	21.12*	11.35
5	-1	12	46.62	40.26
5	-1	13	33.70	30.47
6	-1	-15	20.14*	19.37
6	-1	-14	20.79*	19.42
6	-1	-13	84.85	84.12
6	-1	-12	48.62	53.56
6	-1	-11	85.34	89.29

H	K	L	FO	FC
6	-1	-10	85.31	88.38
6	-1	-9	59.77	60.25
6	-1	-8	46.45	48.13
6	-1	-7	97.18	100.09
6	-1	-6	161.78	154.18
6	-1	-5	41.82	40.73
6	-1	-4	139.06	129.98
6	-1	-3	149.97	141.10
6	-1	-2	224.96	232.04
6	-1	-1	125.84	127.43
6	-1	0	136.54	138.88
6	-1	1	202.59	217.90
6	-1	2	228.54	259.24
6	-1	3	111.49	116.39
6	-1	4	81.66	94.97
6	-1	5	75.13	70.04
6	-1	6	0.00*	19.15
6	-1	7	48.56	45.59
6	-1	8	11.95*	12.68
6	-1	9	81.26	81.25
6	-1	10	18.00*	7.52
6	-1	11	27.35*	25.45
6	-1	12	32.41	28.68
7	-1	-15	35.10	37.91
7	-1	-14	56.15	52.47
7	-1	-13	73.75	72.72
7	-1	-12	30.00	32.09
7	-1	-11	116.51	117.42
7	-1	-10	21.76*	19.15
7	-1	-9	17.16*	13.14
7	-1	-8	167.21	158.54
7	-1	-7	95.03	96.01
7	-1	-6	75.88	87.30
7	-1	-5	184.21	173.21
7	-1	-4	219.75	214.60
7	-1	-3	33.11	35.59
7	-1	-2	11.43*	6.09
7	-1	-1	33.11	28.95
7	-1	0	301.70	311.99
7	-1	1	225.94	227.71
7	-1	2	24.86*	3.52
7	-1	3	71.68	68.40
7	-1	4	0.02*	12.48
7	-1	5	122.85	122.71
7	-1	6	11.69*	17.23
7	-1	7	139.19	130.78
7	-1	8	119.27	115.88
7	-1	9	12.21*	10.85
7	-1	10	41.57	40.32
7	-1	11	29.52	20.42
8	-1	-15	99.52	96.18
8	-1	-14	43.74	40.20
8	-1	-13	87.83	85.77
8	-1	-12	66.67	68.76
8	-1	-11	70.51	72.53
8	-1	-10	116.92	120.52
8	-1	-9	52.56	54.28
8	-1	-8	42.07	29.31
8	-1	-7	24.54	14.05
8	-1	-6	80.75	70.90
8	-1	-5	52.38	49.44
8	-1	-4	123.38	113.72
8	-1	-3	17.94*	9.34
8	-1	-2	63.29	62.54
8	-1	-1	113.95	119.37
8	-1	0	48.89	51.01
8	-1	1	61.90	62.89
8	-1	2	123.54	108.71
8	-1	3	93.66	91.88
8	-1	4	34.96	52.77
8	-1	5	51.83	55.48
8	-1	6	168.21	168.09
8	-1	7	112.30	115.48
8	-1	8	69.42	70.63
8	-1	9	38.25	37.18
8	-1	10	14.68*	22.79
9	-1	-15	11.29*	7.31
9	-1	-14	84.01	86.05
9	-1	-13	109.73	115.26
9	-1	-12	14.88*	8.69
9	-1	-11	56.24	60.97
9	-1	-10	57.90	58.90
9	-1	-9	151.00	150.33
9	-1	-8	72.00	74.50
9	-1	-7	133.50	128.09
9	-1	-6	170.48	158.04
9	-1	-5	26.04	31.18
9	-1	-4	160.20	165.80
9	-1	-3	46.25	48.01
9	-1	-2	32.36	31.34
9	-1	-1	64.48	69.14
9	-1	0	130.04	128.88
9	-1	1	78.74	77.29
9	-1	2	63.48	57.40
9	-1	3	48.44	38.47
9	-1	4	104.02	96.58
9	-1	5	160.54	155.58
9	-1	6	69.72	72.23
9	-1	7	46.26	44.75
9	-1	8	0.00*	5.19
9	-1	9	37.09	38.89
10	-1	-15	84.75	82.02
10	-1	-14	28.89	22.58
10	-1	-13	38.07	39.08
10	-1	-12	85.26	89.56
10	-1	-11	115.02	117.51
10	-1	-10	112.55	112.93
10	-1	-9	13.54*	21.32
10	-1	-8	127.98	123.60
10	-1	-7	140.42	137.48
10	-1	-6	182.42	173.37
10	-1	-5	25.26*	20.95
10	-1	-4	30.40	33.31
10	-1	-3	117.02	114.18
10	-1	-2	17.35*	5.08
10	-1	-1	45.98	44.75

H	K	L	FO	FC
10	-1	0	88.54	84.68
10	-1	1	66.56	67.13
10	-1	2	32.01	20.35
10	-1	3	27.93*	33.26
10	-1	4	32.82*	31.19
10	-1	5	31.07*	33.07
10	-1	6	0.00*	1.60
10	-1	7	52.06	47.72
10	-1	8	26.30*	16.91
11	-1	-15	11.72*	21.63
11	-1	-14	72.28	75.26
11	-1	-13	66.28	70.25
11	-1	-12	29.09*	37.72
11	-1	-11	30.48*	33.44
11	-1	-10	21.73*	35.65
11	-1	-9	158.29	158.65
11	-1	-8	93.88	91.16
11	-1	-7	43.55	45.24
11	-1	-6	40.34	38.95
11	-1	-5	72.11	70.73
11	-1	-4	137.29	133.54
11	-1	-3	41.28	26.53
11	-1	-2	150.10	159.90
11	-1	-1	95.79	103.10
11	-1	0	104.09	101.94
11	-1	1	79.07	77.27
11	-1	2	36.07	25.14
11	-1	3	115.40	114.93
11	-1	4	0.00*	14.30
11	-1	5	53.13	50.67
11	-1	6	31.97*	20.34
11	-1	7	21.85*	10.75
12	-1	-15	14.09*	25.62
12	-1	-14	0.00*	4.12
12	-1	-13	32.33	31.52
12	-1	-12	30.68	25.21
12	-1	-11	50.28	49.38
12	-1	-10	0.00*	9.76
12	-1	-9	0.00*	4.16
12	-1	-8	76.49	73.69
12	-1	-7	68.53	73.44
12	-1	-6	96.89	99.04
12	-1	-5	51.89	56.25
12	-1	-4	94.35	99.17
12	-1	-3	120.25	128.70
12	-1	-2	152.26	158.96
12	-1	-1	49.40	52.24
12	-1	0	25.31*	12.37
12	-1	1	70.27	72.25
12	-1	2	48.24	39.92
12	-1	3	24.19*	26.24
12	-1	4	41.32	36.73
12	-1	5	44.09	47.97
12	-1	6	39.78	32.06
13	-1	-14	26.14*	31.79
13	-1	-13	32.07	31.30
13	-1	-12	43.12	39.60
13	-1	-11	58.68	64.84
13	-1	-10	18.29*	23.14
13	-1	-9	68.75	65.93
13	-1	-8	30.27*	29.18
13	-1	-7	13.48*	14.55
13	-1	-6	0.00*	7.67
13	-1	-5	59.13	58.71
13	-1	-4	111.44	110.59
13	-1	-3	25.96*	24.10
13	-1	-2	50.22	41.82
13	-1	-1	31.93	25.76
13	-1	0	35.30	42.65
13	-1	1	85.87	86.22
13	-1	2	70.85	66.09
13	-1	3	92.86	91.00
13	-1	4	64.87	64.98
14	-1	-13	61.14	58.30
14	-1	-12	48.30	43.85
14	-1	-11	16.00*	10.33
14	-1	-10	17.18*	3.76
14	-1	-9	36.97	28.93
14	-1	-8	67.40	63.75
14	-1	-7	32.44*	31.33
14	-1	-6	0.00*	8.72
14	-1	-5	49.33	49.91
14	-1	-4	15.08*	17.73
14	-1	-3	39.06	30.17
14	-1	-2	34.83	30.99
14	-1	-1	51.54	51.31
14	-1	0	40.83	32.12
14	-1	1	59.00	44.31
14	-1	2	92.12	88.23
15	-1	-12	25.12*	15.42
15	-1	-11	57.36	61.50
15	-1	-10	77.03	71.80
15	-1	-9	49.15	43.90
15	-1	-8	77.52	73.03
15	-1	-7	23.54*	28.26
15	-1	-6	42.50	44.03
15	-1	-5	21.80*	8.26
15	-1	-4	17.90*	25.66
15	-1	-3	15.09*	10.30
15	-1	-2	33.33	17.32
15	-1	-1	42.04	28.36
15	-1	0	44.81	43.11
0	-2	0	76.85	96.57
0	-2	1	317.16	258.97
0	-2	2	274.32	229.66
0	-2	3	41.47	29.19
0	-2	4	42.83	35.48
0	-2	6	31.67	34.52
0	-2	7	248.81	224.42
0	-2	8	41.84	48.31
0	-2	9	19.02*	11.73
0	-2	10	29.79	31.97
0	-2	11	110.51	105.78
0	-2	12	17.09*	2.63
0	-2	13	16.38*	18.56
0	-2	14	67.88	68.04

H	K	L	FO	FC
0	-2	15	13.64*	13.64
1	-2	-15	85.10	85.53
1	-2	-14	0.00*	2.53
1	-2	-13	89.94	89.83
1	-2	-12	20.55*	22.25
1	-2	-11	98.33	101.64
1	-2	-10	80.71	80.04
1	-2	-9	64.89	58.66
1	-2	-8	200.23	198.35
1	-2	-7	88.77	80.55
1	-2	-6	38.41	41.69
1	-2	-5	158.27	142.45
1	-2	-4	92.10	98.90
1	-2	-3	185.03	165.98
1	-2	-2	92.35	94.75
1	-2	-1	367.83	307.57
1	-2	0	41.30*	50.99
1	-2	1	131.57	122.06
1	-2	2	33.34	38.59
1	-2	3	323.04	288.39
1	-2	4	174.89	179.60
1	-2	5	122.19	123.32
1	-2	6	16.95*	19.88
1	-2	7	309.91	277.26
1	-2	8	52.20	48.01
1	-2	9	94.27	87.37
1	-2	10	9.98*	9.80
1	-2	11	141.39	140.65
1	-2	12	72.66	76.89
1	-2	13	45.91	51.55
1	-2	14	44.74	46.43
1	-2	15	27.04	18.34
2	-2	-15	21.49*	19.43
2	-2	-14	8.39*	6.67
2	-2	-13	129.60	131.51
2	-2	-12	79.65	83.65
2	-2	-11	4.37*	12.80
2	-2	-10	102.29	106.79
2	-2	-9	205.12	196.69
2	-2	-8	16.68*	1.14
2	-2	-7	224.40	214.33
2	-2	-6	13.69*	25.40
2	-2	-5	5.65*	4.59
2	-2	-4	77.04	76.19
2	-2	-3	66.25	57.42
2	-2	-2	163.64	156.27
2	-2	-1	128.20	122.72
2	-2	0	165.49	206.49
2	-2	1	104.37	108.80
2	-2	2	293.23	280.32
2	-2	3	31.46	29.89
2	-2	4	106.23	101.78
2	-2	6	64.19	63.77
2	-2	7	78.53	78.47
2	-2	8	0.00*	3.62
2	-2	9	207.51	198.91
2	-2	10	12.80*	1.55
2	-2	11	52.38	52.58
2	-2	12	58.80	59.46
2	-2	13	24.06*	29.46
2	-2	14	24.51*	15.87
3	-2	-15	91.49	96.90
3	-2	-14	8.83*	7.13
3	-2	-13	15.41*	21.38
3	-2	-12	11.73*	7.26
3	-2	-11	191.74	191.54
3	-2	-10	68.63	67.03
3	-2	-9	100.97	101.21
3	-2	-8	37.76	36.66
3	-2	-7	213.99	197.26
3	-2	-6	167.19	160.77
3	-2	-5	20.99	23.49
3	-2	-4	197.24	170.90
3	-2	-3	134.45	122.49
3	-2	-2	46.56	51.18
3	-2	-1	37.90	29.51
3	-2	0	91.34	95.19
3	-2	1	80.10	94.66
3	-2	2	126.68	142.29
3	-2	3	158.43	154.99
3	-2	4	8.21*	14.49
3	-2	5	84.28	80.93
3	-2	6	78.35	78.26
3	-2	7	158.77	155.41
3	-2	8	76.44	77.04
3	-2	9	0.00*	3.17
3	-2	10	8.70*	8.29
3	-2	11	156.59	156.08
3	-2	12	7.81*	1.86
3	-2	13	31.11	33.94
3	-2	14	28.84*	25.74
4	-2	-15	19.51*	11.58
4	-2	-14	22.42*	24.82
4	-2	-13	102.41	105.86
4	-2	-12	17.98*	23.07
4	-2	-11	54.78	56.99
4	-2	-10	44.00	37.75
4	-2	-9	379.25	356.75
4	-2	-8	127.80	128.06
4	-2	-7	20.69	13.22
4	-2	-6	99.77	103.34
4	-2	-5	232.80	207.13
4	-2	-4	28.42*	54.28
4	-2	-3	56.46	53.18
4	-2	-2	54.64	63.34
4	-2	-1	17.06*	18.53
4	-2	0	0.00*	26.50
4	-2	1	123.35	151.41
4	-2	2	61.93	73.13
4	-2	3	219.20	221.50
4	-2	4	64.17	59.68
4	-2	5	74.64	70.83
4	-2	6	133.94	136.81
4	-2	7	30.57	24.82
4	-2	8	112.96	108.96
4	-2	9	203.09	191.68

H	K	L	FO	FC
4	-2	10	26.41	15.37
4	-2	11	27.76	25.80
4	-2	12	20.07*	2.28
4	-2	13	61.01	55.48
5	-2	-15	31.89	39.44
5	-2	-14	0.00*	2.73
5	-2	-13	67.85	69.49
5	-2	-12	26.65	28.58
5	-2	-11	174.98	175.95
5	-2	-10	23.67	26.83
5	-2	-9	11.48*	5.73
5	-2	-8	21.57	14.28
5	-2	-7	236.01	220.44
5	-2	-6	91.36	82.36
5	-2	-5	50.17	51.67
5	-2	-4	85.54	73.53
5	-2	-3	416.29	387.36
5	-2	-2	164.19	172.93
5	-2	-1	143.13	144.41
5	-2	0	90.44	99.39
5	-2	1	143.51	146.14
5	-2	2	26.52	22.07
5	-2	3	85.09	96.77
5	-2	4	154.02	163.21
5	-2	5	71.78	73.05
5	-2	6	97.53	93.05
5	-2	7	27.84	30.05
5	-2	8	23.06*	7.57
5	-2	9	110.92	105.37
5	-2	10	36.14	38.98
5	-2	11	69.78	71.67
5	-2	12	34.64	31.83
6	-2	-15	33.41	41.58
6	-2	-14	6.25*	2.83
6	-2	-13	52.72	53.94
6	-2	-12	91.51	91.75
6	-2	-11	110.02	109.74
6	-2	-10	35.93	38.35
6	-2	-9	177.84	173.08
6	-2	-8	30.76	37.39
6	-2	-7	32.74	19.53
6	-2	-6	125.42	123.68
6	-2	-5	392.85	341.93
6	-2	-4	71.56	71.90
6	-2	-3	92.03	81.00
6	-2	-2	105.44	96.17
6	-2	-1	63.54	62.96
6	-2	0	39.54	40.01
6	-2	1	229.92	225.61
6	-2	2	24.13*	15.77
6	-2	3	175.95	193.79
6	-2	4	24.14*	17.47
6	-2	5	124.64	129.63
6	-2	6	0.00*	16.02
6	-2	7	187.09	180.35
6	-2	8	32.27	31.40
6	-2	9	13.40*	14.23
6	-2	10	87.25	81.56
6	-2	11	0.00*	5.84
6	-2	12	41.45	41.47
7	-2	-15	97.35	96.02
7	-2	-14	58.61	56.74
7	-2	-13	83.65	84.04
7	-2	-12	71.73	72.86
7	-2	-11	14.52*	17.26
7	-2	-10	33.12	31.78
7	-2	-9	58.14	59.47
7	-2	-8	49.35	46.75
7	-2	-7	72.39	61.12
7	-2	-6	15.75*	17.45
7	-2	-5	107.89	103.73
7	-2	-4	62.96	54.58
7	-2	-3	96.06	100.52
7	-2	-2	69.36	74.42
7	-2	-1	98.20	100.55
7	-2	0	158.92	162.31
7	-2	1	204.38	208.82
7	-2	2	49.03	42.04
7	-2	3	156.17	161.20
7	-2	4	15.21*	6.73
7	-2	5	82.69	87.61
7	-2	6	19.32*	5.81
7	-2	7	149.17	149.25
7	-2	8	79.06	75.18
7	-2	9	57.79	60.89
7	-2	10	39.78	38.75
7	-2	11	8.99*	9.25
8	-2	-15	19.64*	19.86
8	-2	-14	37.60	41.90
8	-2	-13	128.66	134.95
8	-2	-12	0.00*	4.42
8	-2	-11	121.20	127.04
8	-2	-10	27.54	24.38
8	-2	-9	106.50	104.06
8	-2	-8	53.07	52.39
8	-2	-7	116.37	107.33
8	-2	-6	90.82	80.16
8	-2	-5	103.58	93.63
8	-2	-4	80.98	77.85
8	-2	-3	49.20	43.51
8	-2	-2	159.56	155.90
8	-2	-1	32.92	35.30
8	-2	0	39.57	43.10
8	-2	1	181.33	183.86
8	-2	2	43.54	43.82
8	-2	3	34.26	34.40
8	-2	4	18.32*	16.66
8	-2	5	196.06	204.21
8	-2	6	27.91*	21.12
8	-2	7	98.19	99.60
8	-2	8	23.77*	26.57
8	-2	9	47.19	43.80
8	-2	10	16.96*	21.76
9	-2	-15	120.19	119.86
9	-2	-14	26.15*	27.93
9	-2	-13	87.59	89.56

H	K	L	FO	FC
9	-2	-12	22.18*	21.98
9	-2	-11	161.26	167.93
9	-2	-10	69.88	70.10
9	-2	-9	35.21	31.96
9	-2	-8	80.18	81.40
9	-2	-7	104.32	100.51
9	-2	-6	80.16	75.93
9	-2	-5	20.35*	19.93
9	-2	-4	49.66	41.46
9	-2	-3	84.18	85.46
9	-2	-2	21.24*	16.98
9	-2	-1	97.29	95.06
9	-2	0	17.20*	8.57
9	-2	1	15.89*	9.17
9	-2	2	46.20	47.92
9	-2	3	68.44	66.95
9	-2	4	109.12	116.41
9	-2	5	0.00*	25.61
9	-2	6	13.84*	4.68
9	-2	7	120.86	117.66
9	-2	8	8.33*	5.55
9	-2	9	37.26	31.04
10	-2	-15	14.25*	7.68
10	-2	-14	15.46*	11.17
10	-2	-13	131.03	135.25
10	-2	-12	22.48*	23.32
10	-2	-11	0.00*	10.36
10	-2	-10	0.00*	17.18
10	-2	-9	204.26	203.15
10	-2	-8	18.92*	25.01
10	-2	-7	112.65	107.20
10	-2	-6	46.57	44.65
10	-2	-5	115.42	106.42
10	-2	-4	47.43	33.35
10	-2	-3	55.56	63.67
10	-2	-2	50.46	54.57
10	-2	-1	112.10	125.28
10	-2	0	85.83	83.10
10	-2	1	35.51	30.56
10	-2	2	88.43	88.28
10	-2	3	82.95	71.40
10	-2	4	55.60	50.35
10	-2	5	123.66	128.00
10	-2	6	30.04*	3.72
10	-2	7	28.10*	7.46
10	-2	8	0.00*	5.66
11	-2	-15	57.77	53.68
11	-2	-14	35.81	32.73
11	-2	-13	24.02*	5.62
11	-2	-12	9.30*	19.42
11	-2	-11	114.96	114.51
11	-2	-10	66.37	69.66
11	-2	-9	40.38	40.11
11	-2	-8	34.16	33.52
11	-2	-7	165.56	165.51
11	-2	-6	75.72	76.87
11	-2	-5	78.31	68.59
11	-2	-4	28.65*	23.90
11	-2	-3	161.60	161.55
11	-2	-2	36.70	25.10
11	-2	-1	51.48	52.69
11	-2	0	28.49*	29.83
11	-2	1	83.96	82.69
11	-2	2	42.28	44.98
11	-2	3	18.32*	7.22
11	-2	4	14.39*	12.84
11	-2	5	77.36	74.61
11	-2	6	40.78	35.51
11	-2	7	0.00*	14.99
12	-2	-15	35.54	34.25
12	-2	-14	5.11*	10.72
12	-2	-13	14.77*	19.74
12	-2	-12	41.07	42.59
12	-2	-11	42.94	45.18
12	-2	-10	44.32	39.18
12	-2	-9	144.09	146.76
12	-2	-8	16.46*	12.84
12	-2	-7	23.99*	22.19
12	-2	-6	10.89*	5.33
12	-2	-5	85.73	87.73
12	-2	-4	60.83	56.51
12	-2	-3	31.92*	38.13
12	-2	-2	21.68*	18.38
12	-2	-1	92.92	100.35
12	-2	0	0.00*	10.30
12	-2	1	97.64	97.01
12	-2	2	11.54*	4.60
12	-2	3	136.84	139.80
12	-2	4	41.99	31.51
12	-2	5	18.53*	13.68
13	-2	-14	10.05*	5.55
13	-2	-13	59.73	59.41
13	-2	-12	23.29*	23.62
13	-2	-11	10.19*	16.96
13	-2	-10	53.24	51.00
13	-2	-9	19.06*	16.81
13	-2	-8	0.00*	6.41
13	-2	-7	31.28	28.64
13	-2	-6	52.02	52.64
13	-2	-5	27.89*	30.08
13	-2	-4	48.66	43.85
13	-2	-3	90.12	104.80
13	-2	-2	38.67	33.89
13	-2	-1	66.57	71.07
13	-2	0	0.00*	11.14
13	-2	1	87.67	84.31
13	-2	2	0.00*	8.44
13	-2	3	63.90	63.71
13	-2	4	26.00*	22.76
14	-2	-13	82.31	81.67
14	-2	-12	36.08	37.96
14	-2	-11	74.87	74.50
14	-2	-10	0.00*	12.22
14	-2	-9	0.00*	1.58
14	-2	-8	23.56*	29.48
14	-2	-7	20.42*	12.96

H	K	L	FO	FC
14	-2	-6	56.48	53.15
14	-2	-5	28.27*	32.67
14	-2	-4	16.82*	3.24
14	-2	-3	23.03*	31.73
14	-2	-2	0.00*	3.71
14	-2	-1	0.00*	4.06
14	-2	0	14.97*	28.02
14	-2	1	85.13	88.19
14	-2	2	24.78*	20.86
15	-2	-11	49.00	54.50
15	-2	-10	0.00*	11.93
15	-2	-9	33.94	28.96
15	-2	-8	25.69*	13.12
15	-2	-7	69.79	63.65
15	-2	-6	31.64*	29.63
15	-2	-5	39.95	35.82
15	-2	-4	18.20*	6.54
15	-2	-3	37.49	33.69
15	-2	-2	33.50	30.40
15	-2	-1	29.68*	31.94
15	-2	0	59.41	51.95
0	-3	1	99.71	99.94
0	-3	2	335.62	306.17
0	-3	3	197.85	171.71
0	-3	4	26.84	20.23
0	-3	5	103.79	100.85
0	-3	6	122.60	126.62
0	-3	7	221.62	217.05
0	-3	8	176.37	165.50
0	-3	9	17.62*	19.02
0	-3	10	77.07	74.80
0	-3	11	18.46*	15.27
0	-3	12	24.59*	31.13
0	-3	13	10.36*	7.61
0	-3	14	45.62	54.45
0	-3	15	45.79	43.08
1	-3	-15	19.13*	21.48
1	-3	-14	123.22	122.35
1	-3	-13	48.69	49.22
1	-3	-12	67.92	68.10
1	-3	-11	19.02*	10.15
1	-3	-10	70.81	73.73
1	-3	-9	4.51*	3.26
1	-3	-8	13.92*	11.53
1	-3	-7	94.13	90.25
1	-3	-6	10.25*	11.90
1	-3	-5	75.60	73.54
1	-3	-4	169.39	162.69
1	-3	-3	82.44	87.51
1	-3	-2	311.86	280.99
1	-3	-1	237.59	212.00
1	-3	0	205.64	229.00
1	-3	1	170.72	160.30
1	-3	2	36.28	45.92
1	-3	3	98.93	100.19
1	-3	4	82.41	91.14
1	-3	5	308.56	279.61
1	-3	6	66.71	66.68
1	-3	7	20.19*	15.41
1	-3	8	123.66	130.58
1	-3	9	99.26	91.36
1	-3	10	95.67	98.85
1	-3	11	41.15	41.17
1	-3	12	104.32	103.18
1	-3	13	14.02*	5.36
1	-3	14	38.41	42.47
2	-3	-15	34.87	32.91
2	-3	-14	0.00*	10.27
2	-3	-13	14.54*	13.21
2	-3	-12	34.52	32.69
2	-3	-11	131.56	135.30
2	-3	-10	43.74	39.72
2	-3	-9	21.51	17.32
2	-3	-8	149.73	148.27
2	-3	-7	58.52	55.75
2	-3	-6	98.67	86.03
2	-3	-5	84.94	88.94
2	-3	-4	295.52	269.39
2	-3	-3	225.11	205.70
2	-3	-2	80.61	74.81
2	-3	-1	26.98	18.25
2	-3	0	98.47	95.40
2	-3	1	17.12*	5.25
2	-3	2	114.76	97.69
2	-3	3	101.56	97.94
2	-3	4	171.71	166.69
2	-3	5	0.00*	4.22
2	-3	6	189.02	186.83
2	-3	7	133.52	138.99
2	-3	8	87.27	83.40
2	-3	9	65.95	63.89
2	-3	10	18.27*	18.69
2	-3	11	109.67	108.12
2	-3	12	24.19*	13.45
2	-3	13	14.61*	2.43
2	-3	14	47.39	46.26
3	-3	-15	32.75	23.49
3	-3	-14	55.08	61.51
3	-3	-13	106.10	110.43
3	-3	-12	27.99	23.20
3	-3	-11	39.35	34.64
3	-3	-10	115.10	115.13
3	-3	-9	151.76	150.13
3	-3	-8	22.29	23.31
3	-3	-7	20.28	18.04
3	-3	-6	125.19	140.16
3	-3	-5	23.16	15.58
3	-3	-4	223.74	203.20
3	-3	-3	39.16	33.41
3	-3	-2	223.05	206.21
3	-3	-1	17.67*	3.71
3	-3	0	206.92	226.72
3	-3	1	84.28	109.00
3	-3	2	189.97	206.64
3	-3	3	56.51	56.55
3	-3	4	110.23	117.76

H	K	L	FO	FC
3	-3	5	90.78	90.38
3	-3	6	73.52	75.24
3	-3	7	49.17	51.91
3	-3	8	57.03	68.92
3	-3	9	168.00	161.98
3	-3	10	98.80	94.40
3	-3	11	4.06*	5.59
3	-3	12	90.21	93.04
3	-3	13	15.38*	24.87
4	-3	-15	41.96	39.52
4	-3	-14	13.53*	5.74
4	-3	-13	21.71*	25.18
4	-3	-12	50.53	51.13
4	-3	-11	92.58	96.61
4	-3	-10	143.64	148.88
4	-3	-9	54.87	57.82
4	-3	-8	87.12	84.81
4	-3	-7	239.03	237.17
4	-3	-6	129.68	119.67
4	-3	-5	27.59	26.57
4	-3	-4	165.46	160.44
4	-3	-3	99.31	100.34
4	-3	-2	31.30	39.95
4	-3	-1	191.84	206.10
4	-3	0	149.74	175.24
4	-3	1	38.21	38.54
4	-3	2	145.74	148.79
4	-3	3	0.00*	16.53
4	-3	4	137.91	142.71
4	-3	5	17.99*	15.14
4	-3	6	33.80	40.44
4	-3	7	77.63	76.02
4	-3	8	81.62	83.94
4	-3	9	13.90*	17.66
4	-3	10	68.03	67.65
4	-3	11	39.36	40.32
4	-3	12	71.44	73.30
4	-3	13	33.11	30.38
5	-3	-15	9.05*	2.89
5	-3	-14	33.90	32.31
5	-3	-13	10.82*	4.91
5	-3	-12	114.17	117.17
5	-3	-11	21.34*	24.89
5	-3	-10	0.00*	3.65
5	-3	-9	209.61	205.70
5	-3	-8	12.81*	12.94
5	-3	-7	20.09*	4.55
5	-3	-6	29.91	25.90
5	-3	-5	174.67	166.22
5	-3	-4	253.89	233.31
5	-3	-3	38.88	34.05
5	-3	-2	222.55	206.00
5	-3	-1	19.55*	21.05
5	-3	0	162.89	181.22
5	-3	1	91.99	100.88
5	-3	2	118.08	127.17
5	-3	3	110.04	119.64
5	-3	4	87.53	95.83
5	-3	5	80.25	72.64
5	-3	6	40.20	38.50
5	-3	7	36.79	30.35
5	-3	8	81.39	76.78
5	-3	9	33.32	25.83
5	-3	10	98.13	101.60
5	-3	11	28.94*	31.62
5	-3	12	43.24	43.00
6	-3	-15	22.31*	33.42
6	-3	-14	38.62	43.29
6	-3	-13	7.06*	6.65
6	-3	-12	74.48	79.06
6	-3	-11	56.74	59.72
6	-3	-10	47.80	50.15
6	-3	-9	40.45	40.70
6	-3	-8	16.52*	11.89
6	-3	-7	128.56	130.14
6	-3	-6	275.96	267.67
6	-3	-5	37.36	40.82
6	-3	-4	40.80	36.35
6	-3	-3	135.52	127.97
6	-3	-2	129.12	141.06
6	-3	-1	70.96	69.58
6	-3	0	56.62	67.24
6	-3	1	142.68	141.09
6	-3	2	73.27	82.98
6	-3	3	187.86	210.20
6	-3	4	102.92	108.09
6	-3	5	27.96	29.51
6	-3	6	138.92	142.43
6	-3	7	35.31	32.92
6	-3	8	64.21	57.59
6	-3	9	4.70*	16.51
6	-3	10	33.06	26.98
6	-3	11	22.91*	22.02
7	-3	-15	12.21*	18.50
7	-3	-14	72.40	75.84
7	-3	-13	65.56	68.01
7	-3	-12	64.22	66.09
7	-3	-11	30.10	27.47
7	-3	-10	12.92*	10.94
7	-3	-9	6.32*	2.29
7	-3	-8	58.49	55.92
7	-3	-7	51.99	55.75
7	-3	-6	210.19	196.30
7	-3	-5	183.33	181.59
7	-3	-4	137.07	137.86
7	-3	-3	32.82	34.96
7	-3	-2	73.66	66.54
7	-3	-1	81.36	92.35
7	-3	0	182.19	195.99
7	-3	1	128.20	136.95
7	-3	2	132.29	137.97
7	-3	3	19.30*	35.25
7	-3	4	80.25	92.36
7	-3	5	79.07	83.87
7	-3	6	70.44	67.93
7	-3	7	90.00	89.08

H	K	L	FO	FC
7	-3	8	45.31	45.45
7	-3	9	46.67	43.84
7	-3	10	15.34*	11.07
8	-3	-15	78.60	81.48
8	-3	-14	8.88*	11.61
8	-3	-13	20.74*	20.82
8	-3	-12	63.73	70.69
8	-3	-11	75.68	85.08
8	-3	-10	27.87	24.48
8	-3	-9	18.34*	8.87
8	-3	-8	194.60	200.24
8	-3	-7	36.26	41.16
8	-3	-6	71.51	67.44
8	-3	-5	0.02*	12.36
8	-3	-4	43.76	43.65
8	-3	-3	39.98	39.63
8	-3	-2	111.51	118.34
8	-3	-1	22.67*	23.93
8	-3	0	65.80	73.31
8	-3	1	27.51*	29.96
8	-3	2	107.89	106.42
8	-3	3	67.00	66.59
8	-3	4	109.76	116.21
8	-3	5	93.10	96.57
8	-3	6	60.77	58.44
8	-3	7	98.58	106.02
8	-3	8	20.19*	22.18
8	-3	9	17.80*	14.76
8	-3	10	46.77	51.61
9	-3	-15	18.87*	4.15
9	-3	-14	91.74	93.72
9	-3	-13	78.48	87.13
9	-3	-12	15.84*	6.24
9	-3	-11	30.89	35.78
9	-3	-10	48.94	49.91
9	-3	-9	93.63	99.25
9	-3	-8	82.74	81.91
9	-3	-7	36.51	37.34
9	-3	-6	88.89	89.58
9	-3	-5	61.84	58.37
9	-3	-4	34.42	29.73
9	-3	-3	100.87	111.73
9	-3	-2	212.82	226.53
9	-3	-1	36.75	38.31
9	-3	0	113.20	114.07
9	-3	1	0.00*	5.17
9	-3	2	34.20	32.95
9	-3	3	30.62*	22.05
9	-3	4	19.31*	13.62
9	-3	5	90.63	102.02
9	-3	6	33.79*	31.90
9	-3	7	6.59*	13.96
9	-3	8	51.44	52.71
9	-3	9	13.71*	27.03
10	-3	-15	21.02*	31.09
10	-3	-14	45.10	51.27
10	-3	-13	41.78	37.72
10	-3	-12	7.77*	14.49
10	-3	-11	109.62	114.85
10	-3	-10	89.48	92.54
10	-3	-9	29.35	38.55
10	-3	-8	107.99	108.70
10	-3	-7	116.66	118.87
10	-3	-6	12.56*	10.27
10	-3	-5	52.78	55.19
10	-3	-4	143.69	149.82
10	-3	-3	32.04*	21.23
10	-3	-2	56.76	57.20
10	-3	-1	43.33	38.48
10	-3	0	45.56	48.18
10	-3	1	52.18	53.80
10	-3	2	17.36*	0.38
10	-3	3	27.93*	5.15
10	-3	4	91.92	93.42
10	-3	5	21.92*	14.47
10	-3	6	50.95	50.09
10	-3	7	24.22*	25.45
11	-3	-15	8.01*	10.95
11	-3	-14	0.00*	18.53
11	-3	-13	53.24	56.71
11	-3	-12	22.14*	19.21
11	-3	-11	16.63*	12.18
11	-3	-10	33.76	23.58
11	-3	-9	94.98	96.67
11	-3	-8	87.23	83.96
11	-3	-7	11.96*	24.20
11	-3	-6	38.57	40.76
11	-3	-5	64.30	64.61
11	-3	-4	155.59	166.58
11	-3	-3	24.59*	15.48
11	-3	-2	87.92	98.33
11	-3	-1	75.77	85.33
11	-3	0	37.88	33.56
11	-3	1	89.33	89.68
11	-3	2	65.25	70.78
11	-3	3	41.45	37.35
11	-3	4	22.55*	19.83
11	-3	5	0.00*	2.72
11	-3	6	51.39	40.22
12	-3	-14	14.20*	15.59
12	-3	-13	0.00*	8.80
12	-3	-12	21.27*	24.30
12	-3	-11	23.47*	23.65
12	-3	-10	103.49	111.95
12	-3	-9	52.89	52.51
12	-3	-8	0.00*	8.56
12	-3	-7	74.69	80.31
12	-3	-6	79.31	87.65
12	-3	-5	23.94*	14.91
12	-3	-4	0.00*	18.62
12	-3	-3	73.25	79.48
12	-3	-2	29.62*	32.13
12	-3	-1	70.16	71.31
12	-3	0	50.25	44.13
12	-3	1	37.97	37.47
12	-3	2	91.06	89.52

H	K	L	FO	FC
12	-3	3	39.74	33.20
12	-3	4	39.69	34.24
12	-3	5	35.95*	40.91
13	-3	-13	26.68*	35.27
13	-3	-12	44.21	49.80
13	-3	-11	18.76*	11.92
13	-3	-10	56.04	50.02
13	-3	-9	51.48	43.79
13	-3	-8	34.09	31.82
13	-3	-7	27.52*	24.25
13	-3	-6	67.68	59.49
13	-3	-5	34.81*	42.44
13	-3	-4	124.78	124.47
13	-3	-3	19.18*	6.70
13	-3	-2	38.07	33.26
13	-3	-1	32.31	29.24
13	-3	0	85.45	83.44
13	-3	1	37.01	31.84
13	-3	2	18.06*	6.46
13	-3	3	72.38	65.30
14	-3	-12	73.28	75.03
14	-3	-11	26.30*	22.62
14	-3	-10	32.85	27.51
14	-3	-9	27.26*	7.38
14	-3	-8	36.43	39.29
14	-3	-7	32.68*	14.53
14	-3	-6	75.26	82.78
14	-3	-5	36.92*	34.64
14	-3	-4	26.20*	24.66
14	-3	-3	26.36*	18.84
14	-3	-2	51.82	49.37
14	-3	-1	26.83*	3.75
14	-3	0	51.39	48.94
14	-3	1	48.42	44.75
15	-3	-10	19.66*	26.78
15	-3	-9	49.48	45.98
15	-3	-8	29.47*	3.57
15	-3	-7	0.00*	18.32
15	-3	-6	99.19	97.51
15	-3	-5	29.47*	10.43
15	-3	-4	25.60*	33.18
15	-3	-3	0.00*	16.57
15	-3	-2	34.17*	42.79
15	-3	-1	22.50*	5.62
0	-4	0	368.82	341.67
0	-4	1	147.33	134.08
0	-4	2	181.35	157.81
0	-4	3	46.87	45.82
0	-4	4	140.06	135.62
0	-4	5	17.27*	5.40
0	-4	6	20.75*	31.33
0	-4	7	160.17	157.40
0	-4	8	53.95	48.19
0	-4	9	0.00*	15.83
0	-4	10	42.70	47.77
0	-4	11	30.12	31.18
0	-4	12	62.73	57.72
0	-4	13	22.58*	18.52
0	-4	14	77.68	77.81
1	-4	-15	18.68*	16.25
1	-4	-14	7.34*	9.27
1	-4	-13	47.43	50.78
1	-4	-12	22.46*	17.87
1	-4	-11	74.39	67.28
1	-4	-10	21.47*	21.93
1	-4	-9	134.50	128.20
1	-4	-8	121.71	124.64
1	-4	-7	63.75	61.18
1	-4	-6	36.55	39.53
1	-4	-5	99.80	100.34
1	-4	-4	115.56	129.02
1	-4	-3	176.97	178.46
1	-4	-2	146.24	129.47
1	-4	-1	123.81	113.42
1	-4	0	36.42*	39.47
1	-4	1	97.77	102.62
1	-4	2	319.79	314.07
1	-4	3	62.17	60.95
1	-4	4	109.03	117.49
1	-4	5	13.57*	8.08
1	-4	6	169.82	158.82
1	-4	7	47.20	50.73
1	-4	8	23.09	20.12
1	-4	9	19.57*	6.07
1	-4	10	35.87	40.40
1	-4	11	16.20*	5.16
1	-4	12	4.00*	3.17
1	-4	13	85.43	88.92
1	-4	14	59.55	61.61
2	-4	-15	27.22*	16.61
2	-4	-14	97.22	94.65
2	-4	-13	27.98	25.99
2	-4	-12	32.40	35.44
2	-4	-11	61.57	58.15
2	-4	-10	92.83	89.09
2	-4	-9	91.91	90.80
2	-4	-8	58.17	64.74
2	-4	-7	112.96	112.28
2	-4	-6	35.48	27.84
2	-4	-5	17.40*	13.01
2	-4	-4	92.62	76.13
2	-4	-3	144.19	141.42
2	-4	-2	240.62	217.67
2	-4	-1	35.21	39.87
2	-4	0	243.77	268.59
2	-4	1	74.96	79.58
2	-4	2	78.79	84.96
2	-4	3	179.62	184.56
2	-4	4	131.30	134.86
2	-4	5	9.74*	8.69
2	-4	6	38.34	32.23
2	-4	7	45.78	41.79
2	-4	8	54.06	55.74
2	-4	9	12.20*	13.79
2	-4	10	114.14	112.47
2	-4	11	38.37	39.51

H	K	L	FO	FC
2	-4	12	88.19	89.28
2	-4	13	15.68*	16.48
3	-4	-15	34.87	30.28
3	-4	-14	11.45*	6.72
3	-4	-13	23.90	16.46
3	-4	-12	74.08	75.80
3	-4	-11	11.58*	4.54
3	-4	-10	99.49	102.54
3	-4	-9	28.83	24.93
3	-4	-8	63.20	64.24
3	-4	-7	70.26	73.44
3	-4	-6	71.12	69.18
3	-4	-5	116.85	104.26
3	-4	-4	146.10	122.56
3	-4	-3	195.24	185.25
3	-4	-2	13.62*	13.73
3	-4	-1	228.64	225.76
3	-4	0	113.48	134.79
3	-4	1	151.73	167.14
3	-4	2	15.52*	8.23
3	-4	3	52.15	49.39
3	-4	4	51.92	38.47
3	-4	5	9.96*	3.54
3	-4	6	152.68	155.37
3	-4	7	24.84	24.15
3	-4	8	71.14	79.91
3	-4	9	77.84	76.73
3	-4	10	39.22	36.61
3	-4	11	31.49	29.00
3	-4	12	50.99	58.60
3	-4	13	17.77*	3.77
4	-4	-15	32.66	32.92
4	-4	-14	65.81	68.61
4	-4	-13	29.90	26.13
4	-4	-12	42.60	43.01
4	-4	-11	58.46	63.22
4	-4	-10	69.22	71.33
4	-4	-9	9.74*	5.06
4	-4	-8	50.16	51.74
4	-4	-7	94.56	96.66
4	-4	-6	69.05	74.33
4	-4	-5	82.11	89.87
4	-4	-4	320.43	306.85
4	-4	-3	76.65	73.16
4	-4	-2	177.93	159.28
4	-4	-1	18.47*	5.68
4	-4	0	38.99*	37.38
4	-4	1	67.26	68.63
4	-4	2	111.88	109.05
4	-4	3	84.13	90.84
4	-4	4	134.36	130.21
4	-4	5	148.40	144.07
4	-4	6	43.73	35.10
4	-4	7	121.66	117.79
4	-4	8	63.78	58.75
4	-4	9	0.00*	5.40
4	-4	10	61.91	68.94
4	-4	11	14.92*	10.53
4	-4	12	32.29	20.97
5	-4	-15	7.08*	13.75
5	-4	-14	21.21*	19.16
5	-4	-13	33.17	36.63
5	-4	-12	20.25*	18.96
5	-4	-11	24.96	13.75
5	-4	-10	62.34	67.54
5	-4	-9	0.00*	1.74
5	-4	-8	66.60	71.53
5	-4	-7	29.86	35.68
5	-4	-6	247.39	230.85
5	-4	-5	109.95	110.08
5	-4	-4	59.63	54.36
5	-4	-3	22.28*	18.94
5	-4	-2	138.38	145.88
5	-4	-1	100.38	104.88
5	-4	0	83.36	93.79
5	-4	1	82.85	88.71
5	-4	2	99.12	115.08
5	-4	3	144.37	151.81
5	-4	4	105.89	108.53
5	-4	5	64.96	72.24
5	-4	6	29.35	38.34
5	-4	7	32.42	31.54
5	-4	8	31.77	29.22
5	-4	9	52.73	50.87
5	-4	10	0.00*	18.45
5	-4	11	27.32*	26.28
6	-4	-15	6.10*	11.15
6	-4	-14	0.00*	2.39
6	-4	-13	7.47*	14.01
6	-4	-12	64.88	62.42
6	-4	-11	113.65	120.39
6	-4	-10	13.84*	21.21
6	-4	-9	0.00*	1.90
6	-4	-8	66.09	61.78
6	-4	-7	137.57	140.28
6	-4	-6	105.52	101.61
6	-4	-5	50.97	48.87
6	-4	-4	205.87	189.87
6	-4	-3	62.80	63.92
6	-4	-2	101.57	107.33
6	-4	-1	18.88*	8.03
6	-4	0	240.72	265.91
6	-4	1	22.16*	29.20
6	-4	2	82.89	92.17
6	-4	3	57.66	58.69
6	-4	4	23.24*	24.70
6	-4	5	15.22*	17.57
6	-4	6	43.31	44.85
6	-4	7	28.94	34.96
6	-4	8	30.74	34.06
6	-4	9	63.88	62.77
6	-4	10	31.30	37.00
6	-4	11	46.13	41.59
7	-4	-15	28.55	30.69
7	-4	-14	27.91	29.32
7	-4	-13	85.01	89.63

H	K	L	FO	FC
7	-4	-12	53.22	57.36
7	-4	-11	15.13*	22.81
7	-4	-10	18.47*	4.96
7	-4	-9	55.04	50.98
7	-4	-8	73.86	74.55
7	-4	-7	56.73	56.46
7	-4	-6	91.05	96.94
7	-4	-5	116.02	117.32
7	-4	-4	11.86*	15.63
7	-4	-3	22.24*	14.94
7	-4	-2	185.71	176.70
7	-4	-1	130.90	145.04
7	-4	0	43.47	52.39
7	-4	1	7.11*	6.48
7	-4	2	132.86	127.00
7	-4	3	61.07	68.37
7	-4	4	19.45*	2.13
7	-4	5	10.50*	12.01
7	-4	6	90.87	85.21
7	-4	7	31.09	21.72
7	-4	8	19.93*	9.96
7	-4	9	59.57	54.64
7	-4	10	54.62	57.55
8	-4	-15	14.40*	11.88
8	-4	-14	92.06	92.53
8	-4	-13	0.00*	8.66
8	-4	-12	15.25*	6.68
8	-4	-11	26.14	22.36
8	-4	-10	26.41	24.03
8	-4	-9	10.77*	7.08
8	-4	-8	45.22	44.29
8	-4	-7	165.10	158.65
8	-4	-6	132.50	126.59
8	-4	-5	23.41*	25.03
8	-4	-4	86.84	88.63
8	-4	-3	110.54	117.96
8	-4	-2	122.29	129.33
8	-4	-1	103.47	110.51
8	-4	0	140.98	151.75
8	-4	1	33.89	36.24
8	-4	2	59.94	58.32
8	-4	3	0.00*	2.63
8	-4	4	73.36	82.22
8	-4	5	32.25	36.38
8	-4	6	36.20	40.82
8	-4	7	22.28*	26.42
8	-4	8	64.13	56.84
8	-4	9	0.00*	2.00
9	-4	-15	23.23*	22.74
9	-4	-14	15.39*	20.34
9	-4	-13	6.35*	12.59
9	-4	-12	45.48	49.94
9	-4	-11	68.30	65.26
9	-4	-10	47.89	51.42
9	-4	-9	53.06	48.31
9	-4	-8	146.61	150.96
9	-4	-7	42.29	40.92
9	-4	-6	43.89	41.33
9	-4	-5	72.99	68.92
9	-4	-4	98.59	97.16
9	-4	-3	87.88	87.07
9	-4	-2	11.23*	13.56
9	-4	-1	97.06	101.95
9	-4	0	39.97	35.42
9	-4	1	3.70*	21.80
9	-4	2	78.14	82.93
9	-4	3	66.74	64.85
9	-4	4	74.03	72.30
9	-4	5	60.64	52.91
9	-4	6	44.55	48.02
9	-4	7	0.00*	7.98
9	-4	8	37.75	35.09
10	-4	-14	52.41	59.10
10	-4	-13	20.89*	16.45
10	-4	-12	0.00*	3.74
10	-4	-11	24.51*	18.68
10	-4	-10	59.52	58.66
10	-4	-9	34.39	37.74
10	-4	-8	121.83	126.13
10	-4	-7	34.94	31.82
10	-4	-6	73.91	82.00
10	-4	-5	15.21*	21.25
10	-4	-4	94.98	102.36
10	-4	-3	68.98	67.94
10	-4	-2	120.89	129.91
10	-4	-1	11.04*	20.37
10	-4	0	54.30	52.42
10	-4	1	93.07	98.76
10	-4	2	52.98	53.97
10	-4	3	82.25	86.35
10	-4	4	22.31*	4.72
10	-4	5	39.40	39.08
10	-4	6	23.91*	17.64
10	-4	7	17.13*	5.13
11	-4	-14	22.76*	18.09
11	-4	-13	19.23*	23.89
11	-4	-12	22.50*	16.71
11	-4	-11	18.02*	2.92
11	-4	-10	96.84	95.05
11	-4	-9	61.26	61.43
11	-4	-8	39.02	42.15
11	-4	-7	41.50	42.20
11	-4	-6	90.53	94.01
11	-4	-5	0.00*	4.42
11	-4	-4	84.03	90.95
11	-4	-3	44.06	44.73
11	-4	-2	68.65	74.12
11	-4	-1	68.75	72.21
11	-4	0	54.64	48.03
11	-4	1	27.45*	26.72
11	-4	2	52.71	57.86
11	-4	3	22.13*	21.50
11	-4	4	4.29*	20.04
11	-4	5	13.20*	2.53
12	-4	-13	19.04*	6.49
12	-4	-12	14.57*	17.22

H	K	L	FO	FC	H	K	L	FO	FC
12	-4	-11	68.38	69.64	0	-5	11	20.31*	27.16
12	-4	-10	12.88*	8.69	0	-5	12	35.30	32.79
12	-4	-9	16.52*	5.16	0	-5	13	101.92	98.39
12	-4	-8	57.24	56.00	1	-5	-14	29.34	21.19
12	-4	-7	41.51	29.42	1	-5	-13	36.72	39.87
12	-4	-6	24.79*	19.25	1	-5	-12	14.25*	7.00
12	-4	-5	0.00*	14.03	1	-5	-11	73.30	75.45
12	-4	-4	153.80	156.62	1	-5	-10	27.10	22.19
12	-4	-3	32.92*	29.99	1	-5	-9	79.49	88.63
12	-4	-2	52.63	68.30	1	-5	-8	83.16	87.00
12	-4	-1	24.61*	9.53	1	-5	-7	178.41	171.09
12	-4	0	60.14	60.15	1	-5	-6	51.26	58.22
12	-4	1	0.00*	1.87	1	-5	-5	96.81	92.46
12	-4	2	24.98*	18.30	1	-5	-4	71.75	70.38
12	-4	3	33.13	24.96	1	-5	-3	187.98	186.39
12	-4	4	24.20*	17.23	1	-5	-2	25.61	26.06
13	-4	-12	37.23	37.10	1	-5	-1	48.29	46.92
13	-4	-11	25.40*	22.40	1	-5	0	116.40	121.48
13	-4	-10	38.75	30.66	1	-5	1	83.39	88.44
13	-4	-9	50.59	46.66	1	-5	2	25.37	14.95
13	-4	-8	12.13*	11.23	1	-5	3	70.09	77.91
13	-4	-7	20.36*	7.63	1	-5	4	112.23	103.31
13	-4	-6	92.61	96.39	1	-5	5	111.97	115.58
13	-4	-5	110.00	109.10	1	-5	6	11.52*	22.61
13	-4	-4	17.27*	8.46	1	-5	7	159.50	162.95
13	-4	-3	0.00*	5.57	1	-5	8	15.71*	25.03
13	-4	-2	55.66	59.91	1	-5	9	65.72	66.03
13	-4	-1	13.87*	3.24	1	-5	10	50.87	56.59
13	-4	0	23.89*	16.81	1	-5	11	52.09	59.43
13	-4	1	17.50*	3.71	1	-5	12	20.00*	9.11
13	-4	2	62.25	62.44	1	-5	13	5.19*	3.87
14	-4	-11	48.47	48.00	2	-5	-14	6.46*	4.88
14	-4	-10	43.87	40.91	2	-5	-13	41.86	41.23
14	-4	-9	11.62*	17.27	2	-5	-12	26.11	21.59
14	-4	-8	15.66*	2.85	2	-5	-11	26.38	30.61
14	-4	-7	63.15	64.92	2	-5	-10	27.63	23.63
14	-4	-6	68.67	71.64	2	-5	-9	112.91	119.19
14	-4	-5	34.12*	15.32	2	-5	-8	62.51	66.28
14	-4	-4	58.32	60.95	2	-5	-7	22.21	27.51
14	-4	-3	27.15*	31.18	2	-5	-6	94.54	105.82
14	-4	-2	18.59*	12.25	2	-5	-5	171.16	165.71
14	-4	-1	25.36*	8.29	2	-5	-4	42.11	35.54
14	-4	0	70.70	69.47	2	-5	-3	163.31	170.32
15	-4	-8	66.04	71.23	2	-5	-2	17.45*	3.36
15	-4	-7	28.25*	18.88	2	-5	-1	151.10	148.33
15	-4	-6	0.00*	9.49	2	-5	0	28.78*	40.61
15	-4	-5	59.54	58.96	2	-5	1	12.23*	19.69
15	-4	-4	40.05	27.68	2	-5	2	152.55	150.78
0	-5	1	128.16	139.97	2	-5	3	132.73	139.58
0	-5	2	180.36	184.42	2	-5	4	37.49	29.75
0	-5	3	75.80	67.41	2	-5	5	7.23*	4.51
0	-5	4	0.00*	5.28	2	-5	6	44.28	43.27
0	-5	5	57.08	64.73	2	-5	7	104.81	110.91
0	-5	6	0.00*	9.53	2	-5	8	42.19	42.83
0	-5	7	22.62*	17.48	2	-5	9	35.69	32.94
0	-5	8	37.52	36.59	2	-5	10	17.18*	10.74
0	-5	9	123.81	129.89	2	-5	11	41.51	44.04
0	-5	10	15.00*	5.63	2	-5	12	37.06	41.61

H	K	L	FO	FC
2	-5	13	59.41	57.58
3	-5	-14	36.77	34.26
3	-5	-13	19.44*	11.73
3	-5	-12	17.70*	6.07
3	-5	-11	20.21*	20.05
3	-5	-10	14.19*	21.86
3	-5	-9	132.57	134.10
3	-5	-8	57.28	61.14
3	-5	-7	158.51	157.30
3	-5	-6	17.76*	13.69
3	-5	-5	102.01	100.66
3	-5	-4	112.04	120.16
3	-5	-3	106.73	101.34
3	-5	-2	34.76	20.98
3	-5	-1	0.00*	10.71
3	-5	0	5.97*	27.69
3	-5	1	99.48	104.52
3	-5	2	9.65*	3.43
3	-5	3	182.58	188.14
3	-5	4	71.15	69.08
3	-5	5	170.60	166.78
3	-5	6	5.72*	8.03
3	-5	7	71.72	67.92
3	-5	8	28.09	28.62
3	-5	9	47.68	52.58
3	-5	10	6.47*	3.05
3	-5	11	37.19	35.99
3	-5	12	16.42*	8.32
4	-5	-14	23.31*	8.76
4	-5	-13	0.00*	10.85
4	-5	-12	71.67	75.70
4	-5	-11	94.42	104.27
4	-5	-10	9.56*	2.53
4	-5	-9	13.51*	3.46
4	-5	-8	31.21	29.30
4	-5	-7	31.05	31.28
4	-5	-6	103.15	102.09
4	-5	-5	12.71*	4.21
4	-5	-4	0.00*	7.00
4	-5	-3	101.49	96.97
4	-5	-2	96.88	84.90
4	-5	-1	150.00	151.89
4	-5	0	70.95	82.46
4	-5	1	172.43	198.76
4	-5	2	45.92	48.07
4	-5	3	68.05	71.78
4	-5	4	70.84	73.41
4	-5	6	45.46	50.69
4	-5	7	48.36	49.90
4	-5	8	26.35	22.33
4	-5	9	52.89	60.05
4	-5	10	12.48*	14.28
4	-5	11	82.67	83.68
5	-5	-15	25.01*	35.32
5	-5	-14	40.09	42.43
5	-5	-13	32.49	27.60
5	-5	-12	8.39*	0.21
5	-5	-11	129.87	132.89
5	-5	-9	64.44	74.36
5	-5	-8	24.89	29.90
5	-5	-7	14.63*	12.35
5	-5	-6	35.27	28.87
5	-5	-5	119.45	116.20
5	-5	-4	129.15	123.34
5	-5	-3	88.69	78.22
5	-5	-2	48.01	39.94
5	-5	-1	80.66	83.39
5	-5	0	97.94	109.59
5	-5	1	71.91	76.04
5	-5	2	29.95*	33.27
5	-5	3	115.28	122.67
5	-5	4	14.31*	5.08
5	-5	5	69.78	77.81
5	-5	6	32.52	28.79
5	-5	7	118.10	120.73
5	-5	8	26.47*	21.14
5	-5	9	81.79	79.66
5	-5	10	23.87*	13.65
5	-5	11	46.72	45.66
6	-5	-15	15.73*	9.28
6	-5	-14	0.00*	5.89
6	-5	-12	24.28*	31.99
6	-5	-11	34.80	38.35
6	-5	-10	57.73	61.11
6	-5	-9	34.10	32.80
6	-5	-8	43.59	43.95
6	-5	-7	50.03	54.92
6	-5	-6	26.65*	26.43
6	-5	-5	118.16	120.83
6	-5	-3	54.56	52.82
6	-5	-2	166.57	173.31
6	-5	-1	93.36	97.51
6	-5	0	48.02	53.26
6	-5	1	66.13	67.94
6	-5	2	25.02*	28.12
6	-5	3	51.93	52.66
6	-5	4	4.43*	10.30
6	-5	5	105.36	108.89
6	-5	6	25.49*	18.85
6	-5	7	20.83*	22.57
6	-5	8	42.57	48.73
6	-5	9	89.02	84.52
6	-5	10	22.06*	14.49
7	-5	-14	8.63*	4.75
7	-5	-13	29.66	33.12
7	-5	-12	34.22	39.23
7	-5	-11	106.76	111.18
7	-5	-10	19.21*	12.99
7	-5	-9	29.66	33.87
7	-5	-8	27.58	20.20
7	-5	-7	193.64	184.79
7	-5	-6	14.30*	7.55
7	-5	-5	35.87	29.30
7	-5	-4	47.30	49.41
7	-5	-3	45.20	41.61
7	-5	-2	27.11*	27.30

H	K	L	FO	FC	H	K	L	FO	FC
7	-5	-1	33.68*	33.49	10	-5	-8	0.00*	6.36
7	-5	0	80.41	93.59	10	-5	-7	30.03	28.13
7	-5	1	82.28	93.17	10	-5	-6	76.93	74.59
7	-5	2	36.11	35.54	10	-5	-5	40.91	44.60
7	-5	3	62.58	78.45	10	-5	-4	49.20	50.19
7	-5	4	53.36	55.43	10	-5	-3	110.55	113.83
7	-5	5	91.96	95.47	10	-5	-2	32.79*	46.00
7	-5	6	21.16*	32.70	10	-5	-1	59.82	66.28
7	-5	7	59.95	68.08	10	-5	0	28.28*	11.39
7	-5	8	23.94*	3.59	10	-5	1	31.85*	38.55
7	-5	9	20.51*	23.75	10	-5	2	35.28	24.28
8	-5	-14	17.86*	6.93	10	-5	3	54.30	62.02
8	-5	-13	86.87	88.45	10	-5	4	45.71	36.89
8	-5	-12	4.07*	6.74	10	-5	5	28.97*	35.29
8	-5	-11	15.49*	8.65	10	-5	6	0.00*	2.30
8	-5	-10	40.76	35.71	11	-5	-13	19.32*	26.53
8	-5	-9	100.08	109.76	11	-5	-12	24.62*	18.34
8	-5	-8	21.87*	4.45	11	-5	-11	37.00	44.18
8	-5	-7	52.38	56.07	11	-5	-10	32.00	24.49
8	-5	-4	23.64*	5.61	11	-5	-9	82.24	86.41
8	-5	-3	27.75*	23.89	11	-5	-8	34.71	38.07
8	-5	-2	65.54	70.28	11	-5	-7	22.37*	15.40
8	-5	-1	147.63	163.08	11	-5	-6	38.44	39.22
8	-5	0	41.58	43.83	11	-5	-5	35.28	39.10
8	-5	2	66.82	75.31	11	-5	-4	73.69	73.63
8	-5	3	101.12	102.30	11	-5	-3	39.41	29.42
8	-5	4	20.28*	12.18	11	-5	-2	24.92*	12.37
8	-5	5	34.37	28.86	11	-5	-1	40.24	32.81
8	-5	6	15.64*	3.47	11	-5	0	30.73*	22.71
8	-5	7	31.84*	35.26	11	-5	1	20.10*	25.39
8	-5	8	7.04*	22.00	11	-5	2	8.80*	5.97
9	-5	-14	28.32*	26.86	11	-5	3	100.56	99.40
9	-5	-13	59.10	62.89	11	-5	4	10.43*	2.64
9	-5	-12	24.63*	22.31	12	-5	-12	6.77*	20.20
9	-5	-11	36.88	37.09	12	-5	-11	47.45	51.86
9	-5	-10	29.93	25.57	12	-5	-10	11.79*	14.79
9	-5	-9	69.58	73.91	12	-5	-9	50.97	54.53
9	-5	-8	74.11	76.34	12	-5	-8	13.72*	5.23
9	-5	-7	104.03	104.59	12	-5	-6	40.62	45.15
9	-5	-6	0.00*	6.49	12	-5	-5	66.93	70.47
9	-5	-5	27.35*	28.00	12	-5	-4	31.59*	33.70
9	-5	-4	13.72*	21.62	12	-5	-3	46.77	45.24
9	-5	-3	99.05	99.84	12	-5	-2	38.10	41.88
9	-5	-2	27.86*	19.89	12	-5	-1	19.20*	9.36
9	-5	-1	81.34	94.01	12	-5	0	20.59*	31.26
9	-5	0	28.22*	23.76	12	-5	1	59.16	64.09
9	-5	1	99.95	100.15	12	-5	2	14.16*	15.69
9	-5	2	27.03*	26.46	12	-5	3	0.00*	3.63
9	-5	3	60.30	68.65	13	-5	-11	89.12	94.34
9	-5	4	40.28	31.50	13	-5	-10	25.47*	8.40
9	-5	5	82.33	91.50	13	-5	-9	34.04	31.45
9	-5	6	0.00*	15.01	13	-5	-8	0.00*	13.19
9	-5	7	40.55	39.89	13	-5	-7	48.68	44.17
10	-5	-13	6.72*	8.04	13	-5	-6	34.73*	20.99
10	-5	-12	24.02*	31.44	13	-5	-5	34.55*	16.79
10	-5	-11	31.43	33.64	13	-5	-4	27.55*	26.85
10	-5	-10	27.36*	30.72	13	-5	-3	37.35	43.96
10	-5	-9	20.05*	15.56	13	-5	-2	28.55*	28.21

H	K	L	FO	FC
13	-5	-1	17.99*	16.86
13	-5	0	33.75*	42.80
13	-5	1	78.79	78.23
14	-5	-8	8.50*	11.32
14	-5	-7	22.81*	3.70
14	-5	-6	23.90*	5.18
14	-5	-5	91.38	88.75
14	-5	-4	0.00*	8.10
14	-5	-3	25.49*	9.30
14	-5	-2	37.11	33.49
0	-6	0	78.57	71.71
0	-6	1	17.46*	20.58
0	-6	2	78.48	78.62
0	-6	3	59.40	61.77
0	-6	4	15.11*	6.82
0	-6	5	122.47	117.76
0	-6	6	64.77	66.50
0	-6	7	100.57	106.49
0	-6	8	45.52	45.83
0	-6	9	24.54*	22.17
0	-6	10	36.36	36.88
0	-6	11	44.82	47.70
0	-6	12	75.22	74.61
1	-6	-13	25.18*	27.71
1	-6	-12	47.49	42.93
1	-6	-11	21.44*	20.88
1	-6	-10	11.26*	16.68
1	-6	-9	115.48	114.44
1	-6	-8	131.15	132.28
1	-6	-7	24.71	23.46
1	-6	-6	111.13	116.05
1	-6	-5	75.05	76.23
1	-6	-4	47.87	42.65
1	-6	-3	0.00*	3.71
1	-6	-2	7.63*	20.07
1	-6	-1	28.68	23.67
1	-6	0	0.00*	36.49
1	-6	1	60.32	54.29
1	-6	2	81.33	82.81
1	-6	3	135.31	136.24
1	-6	4	54.17	55.35
1	-6	5	15.98*	6.09
1	-6	6	85.59	83.76
1	-6	7	75.17	75.47
1	-6	8	63.05	63.13
1	-6	9	49.23	49.00
1	-6	10	36.18	43.94
1	-6	11	15.67*	3.98
1	-6	12	40.39	39.92
2	-6	-13	33.55	35.22
2	-6	-12	30.83	30.14
2	-6	-11	59.75	54.08
2	-6	-10	47.44	47.98
2	-6	-9	102.44	103.62
2	-6	-8	69.48	66.32
2	-6	-7	77.28	78.23
2	-6	-6	83.29	76.35
2	-6	-5	33.73	33.38
2	-6	-4	10.48*	9.03
2	-6	-3	74.07	67.71
2	-6	-2	202.02	182.14
2	-6	-1	16.85*	8.61
2	-6	0	33.65*	35.05
2	-6	1	75.79	80.55
2	-6	2	74.18	74.64
2	-6	3	117.41	109.94
2	-6	4	20.40*	5.08
2	-6	5	89.76	90.23
2	-6	6	21.41*	22.40
2	-6	7	19.60*	21.50
2	-6	8	18.87*	19.10
2	-6	9	70.01	75.17
2	-6	10	18.91*	13.07
2	-6	11	40.55	40.68
2	-6	12	52.94	51.85
3	-6	-13	9.86*	6.92
3	-6	-12	19.49*	16.78
3	-6	-11	93.43	93.00
3	-6	-10	23.15*	26.17
3	-6	-9	13.33*	17.22
3	-6	-8	100.75	106.87
3	-6	-7	32.64	34.46
3	-6	-6	63.53	61.01
3	-6	-5	90.05	91.34
3	-6	-4	134.85	127.05
3	-6	-3	58.73	47.05
3	-6	-2	73.06	63.57
3	-6	-1	41.28	35.79
3	-6	0	47.41	59.14
3	-6	1	73.30	87.90
3	-6	2	60.69	66.07
3	-6	3	32.45	25.81
3	-6	4	154.58	159.53
3	-6	5	15.12*	23.08
3	-6	6	0.00*	4.79
3	-6	7	107.92	109.91
3	-6	8	41.93	41.57
3	-6	9	12.37*	12.71
3	-6	10	33.83	27.98
3	-6	11	55.04	51.25
4	-6	-13	29.25	33.19
4	-6	-12	33.38	35.95
4	-6	-11	24.11*	27.87
4	-6	-10	19.88*	24.07
4	-6	-9	80.05	84.24
4	-6	-8	19.39*	24.56
4	-6	-7	86.84	80.56
4	-6	-6	9.56*	12.96
4	-6	-5	109.06	105.78
4	-6	-4	20.83*	6.22
4	-6	-3	27.09	22.68
4	-6	-2	128.55	128.83
4	-6	-1	17.11*	18.91
4	-6	0	21.51*	13.38
4	-6	1	33.26	15.09
4	-6	2	117.58	123.28

H	K	L	FO	FC
4	-6	3	75.03	73.82
4	-6	4	0.00*	5.97
4	-6	5	85.99	92.28
4	-6	6	56.90	50.77
4	-6	7	80.19	80.55
4	-6	8	33.61	36.74
4	-6	9	51.86	51.68
4	-6	10	65.98	67.69
5	-6	-13	37.32	38.28
5	-6	-12	48.78	52.18
5	-6	-11	63.59	61.03
5	-6	-10	82.83	87.78
5	-6	-9	19.90*	16.28
5	-6	-8	12.11*	17.85
5	-6	-7	105.52	102.92
5	-6	-6	26.34	25.97
5	-6	-5	13.98*	20.59
5	-6	-4	61.43	60.70
5	-6	-3	0.00*	22.26
5	-6	-2	56.72	64.31
5	-6	-1	21.12*	4.48
5	-6	0	17.81*	3.32
5	-6	1	53.83	62.96
5	-6	2	40.37	47.62
5	-6	3	17.60*	6.55
5	-6	4	89.66	93.34
5	-6	5	106.47	106.68
5	-6	6	37.12	38.46
5	-6	7	11.86*	12.43
5	-6	8	86.76	88.25
5	-6	9	30.30*	25.56
5	-6	10	9.86*	4.00
6	-6	-13	14.08*	9.30
6	-6	-12	82.98	83.76
6	-6	-11	88.60	87.70
6	-6	-10	14.54*	19.88
6	-6	-9	56.63	52.33
6	-6	-8	21.52*	20.66
6	-6	-7	53.01	56.10
6	-6	-6	73.86	69.00
6	-6	-5	40.97	40.08
6	-6	-4	62.50	57.23
6	-6	-3	24.76*	15.11
6	-6	-2	9.89*	24.65
6	-6	-1	45.00	46.71
6	-6	0	23.91*	11.45
6	-6	1	96.23	96.98
6	-6	2	61.20	62.78
6	-6	3	65.93	67.34
6	-6	4	20.19*	6.23
6	-6	5	36.21	41.23
6	-6	6	31.76*	29.52
6	-6	7	45.20	45.95
6	-6	8	52.96	54.82
6	-6	9	45.46	43.64
7	-6	-13	82.72	76.99
7	-6	-12	57.27	59.70
7	-6	-11	7.47*	12.24
7	-6	-10	75.80	75.41
7	-6	-9	66.82	66.89
7	-6	-8	82.35	84.42
7	-6	-7	39.20	35.56
7	-6	-6	103.29	102.92
7	-6	-5	31.23	31.67
7	-6	-4	39.54	28.17
7	-6	-3	59.21	55.19
7	-6	-2	5.35*	23.72
7	-6	-1	86.21	91.01
7	-6	0	49.28	62.18
7	-6	1	16.97*	11.78
7	-6	2	4.44*	21.14
7	-6	3	68.45	75.05
7	-6	4	13.48*	14.85
7	-6	5	42.49	40.88
7	-6	6	43.95	46.69
7	-6	7	26.12*	22.08
7	-6	8	63.33	54.16
8	-6	-13	59.56	60.48
8	-6	-12	62.07	62.11
8	-6	-11	54.88	54.94
8	-6	-10	30.75	27.28
8	-6	-9	4.06*	3.53
8	-6	-8	42.60	46.29
8	-6	-7	65.21	69.29
8	-6	-6	96.59	89.67
8	-6	-5	28.70*	26.28
8	-6	-4	46.08	37.56
8	-6	-3	48.00	52.82
8	-6	-2	100.79	99.93
8	-6	-1	52.53	55.07
8	-6	0	36.82	49.60
8	-6	1	51.42	52.28
8	-6	2	36.87*	31.08
8	-6	3	19.81*	17.35
8	-6	4	22.12*	21.49
8	-6	5	69.36	82.14
8	-6	6	31.62*	27.80
8	-6	7	46.71	41.43
9	-6	-13	13.38*	17.60
9	-6	-12	23.61*	19.00
9	-6	-11	34.43	40.42
9	-6	-10	0.00*	2.71
9	-6	-9	70.58	69.77
9	-6	-8	73.37	72.99
9	-6	-7	35.08	35.29
9	-6	-6	87.30	89.43
9	-6	-5	43.89	38.93
9	-6	-4	34.18	41.23
9	-6	-3	37.02	35.10
9	-6	-2	18.74*	13.63
9	-6	-1	33.02*	24.74
9	-6	0	79.17	83.12
9	-6	1	26.07*	17.26
9	-6	2	18.03*	18.72
9	-6	3	77.27	86.19
9	-6	4	81.52	79.06

H	K	L	FO	FC
9	-6	5	38.31	27.43
9	-6	6	36.55	34.98
10	-6	-12	13.79*	15.70
10	-6	-11	29.27	22.06
10	-6	-10	7.03*	2.97
10	-6	-9	77.68	75.39
10	-6	-8	25.47*	11.12
10	-6	-7	22.12*	19.48
10	-6	-6	25.27*	22.31
10	-6	-5	0.00*	13.11
10	-6	-4	23.81*	3.98
10	-6	-3	0.00*	4.41
10	-6	-2	86.38	87.80
10	-6	-1	43.21	42.03
10	-6	0	34.39	32.14
10	-6	1	44.33	40.20
10	-6	2	34.94*	42.41
10	-6	3	71.93	70.65
10	-6	4	27.64*	9.99
11	-6	-11	58.54	58.59
11	-6	-10	55.40	59.21
11	-6	-9	18.64*	9.89
11	-6	-8	35.92	31.50
11	-6	-7	30.60	21.50
11	-6	-6	27.49*	16.82
11	-6	-5	0.00*	9.40
11	-6	-4	0.00*	7.38
11	-6	-3	38.71*	45.45
11	-6	-2	10.78*	14.24
11	-6	-1	21.99*	10.27
11	-6	0	0.00*	21.18
11	-6	1	64.74	56.64
11	-6	2	28.25*	27.79
11	-6	3	0.00*	3.31
12	-6	-10	0.00*	16.48
12	-6	-9	36.80	40.15
12	-6	-8	35.90	31.71
12	-6	-7	25.19*	7.51
12	-6	-6	38.19	37.52
12	-6	-5	28.84*	32.12
12	-6	-4	22.88*	30.38
12	-6	-3	36.37*	43.79
12	-6	-2	18.80*	17.76
12	-6	-1	24.31*	22.97
12	-6	0	24.06*	6.65
12	-6	1	47.25	39.93
13	-6	-8	27.84*	20.17
13	-6	-7	32.09*	30.26
13	-6	-6	30.07*	33.64
13	-6	-5	33.99*	37.59
13	-6	-4	21.03*	18.49
13	-6	-3	8.76*	5.12
13	-6	-2	25.38*	2.36
0	-7	1	52.93	48.38
0	-7	2	49.36	52.21
0	-7	3	87.14	82.38
0	-7	4	25.54	21.80
0	-7	5	36.45	31.48
0	-7	6	79.01	83.67
0	-7	7	13.99*	21.05
0	-7	8	78.16	75.97
0	-7	9	35.74	38.31
0	-7	10	47.49	44.17
0	-7	11	22.64*	29.71
1	-7	-12	54.38	55.25
1	-7	-11	17.24*	11.79
1	-7	-10	43.87	44.50
1	-7	-9	14.60*	2.50
1	-7	-8	46.04	45.18
1	-7	-7	38.32	36.47
1	-7	-6	85.17	89.78
1	-7	-5	46.01	46.41
1	-7	-4	29.09	19.24
1	-7	-3	10.63*	7.06
1	-7	-2	165.21	158.59
1	-7	-1	17.30*	2.88
1	-7	0	111.67	113.86
1	-7	1	21.84*	3.61
1	-7	2	22.06*	20.71
1	-7	3	0.00*	10.46
1	-7	4	46.37	48.73
1	-7	5	20.40*	3.38
1	-7	6	27.47	22.90
1	-7	7	12.82*	6.03
1	-7	8	22.70*	22.89
1	-7	9	58.28	55.59
1	-7	10	0.00*	2.88
1	-7	11	2.59*	2.25
2	-7	-12	36.06	31.40
2	-7	-11	35.49	34.42
2	-7	-10	13.26*	8.48
2	-7	-9	17.01*	8.97
2	-7	-8	108.64	107.40
2	-7	-7	3.69*	6.60
2	-7	-6	51.17	55.27
2	-7	-5	46.77	36.92
2	-7	-4	123.34	121.84
2	-7	-3	52.87	53.30
2	-7	-2	69.75	62.85
2	-7	-1	122.51	110.52
2	-7	0	81.40	97.47
2	-7	1	11.96*	12.31
2	-7	2	20.46*	12.60
2	-7	3	13.00*	4.54
2	-7	4	83.58	88.94
2	-7	5	16.20*	16.55
2	-7	6	46.23	50.71
2	-7	7	77.16	78.06
2	-7	8	28.96	21.22
2	-7	9	0.00*	8.98
2	-7	10	36.92	38.22
3	-7	-12	20.68*	2.37
3	-7	-11	21.66*	27.23
3	-7	-10	51.08	50.03
3	-7	-9	24.01*	22.14
3	-7	-8	10.40*	17.06

H	K	L	FO	FC
3	-7	-7	0.00*	11.40
3	-7	-6	49.42	48.03
3	-7	-5	0.00*	3.45
3	-7	-4	38.86	34.55
3	-7	-3	69.53	64.30
3	-7	-2	185.20	175.59
3	-7	-1	52.88	52.92
3	-7	0	34.18*	33.34
3	-7	1	17.12*	2.86
3	-7	2	120.09	124.90
3	-7	3	25.68*	21.10
3	-7	4	35.55	29.07
3	-7	5	17.26*	8.14
3	-7	6	39.54	42.22
3	-7	7	32.76	26.30
3	-7	8	16.93*	20.18
3	-7	9	3.49*	11.99
3	-7	10	54.78	52.27
4	-7	-12	2.92*	8.20
4	-7	-11	36.77	30.77
4	-7	-10	50.54	50.29
4	-7	-9	11.62*	17.44
4	-7	-8	36.53	38.47
4	-7	-7	61.74	57.76
4	-7	-6	18.35*	22.61
4	-7	-5	43.16	39.68
4	-7	-4	108.19	105.40
4	-7	-3	88.58	80.23
4	-7	-2	18.50*	18.00
4	-7	-1	47.32	40.86
4	-7	0	89.06	99.23
4	-7	1	11.54*	4.48
4	-7	2	22.12*	23.90
4	-7	3	63.75	72.31
4	-7	4	107.40	116.00
4	-7	5	19.77*	20.60
4	-7	6	11.90*	17.55
4	-7	7	40.40	38.12
4	-7	8	63.91	68.74
4	-7	9	31.02	31.16
5	-7	-12	55.10	58.53
5	-7	-11	17.06*	3.29
5	-7	-10	17.94*	2.11
5	-7	-9	22.62*	15.68
5	-7	-8	16.75*	22.72
5	-7	-7	31.46	30.96
5	-7	-6	29.16	23.90
5	-7	-5	10.86*	12.67
5	-7	-4	74.84	75.16
5	-7	-3	22.19*	2.22
5	-7	-2	72.39	71.90
5	-7	-1	22.38*	21.30
5	-7	0	37.17	45.46
5	-7	1	37.92*	46.54
5	-7	2	98.81	110.08
5	-7	3	37.28	41.88
5	-7	4	12.99*	3.48
5	-7	5	11.14*	8.70
5	-7	6	44.89	45.31
5	-7	7	27.95*	1.01
5	-7	8	37.51	41.75
6	-7	-12	43.73	43.33
6	-7	-11	26.14*	21.92
6	-7	-10	72.31	69.38
6	-7	-9	0.00*	1.38
6	-7	-8	56.91	55.91
6	-7	-7	87.32	81.64
6	-7	-6	88.98	87.89
6	-7	-5	47.90	42.26
6	-7	-4	15.53*	3.33
6	-7	-3	17.83*	7.21
6	-7	-2	29.76*	32.95
6	-7	-1	0.00*	12.17
6	-7	0	0.00*	12.31
6	-7	1	65.60	58.27
6	-7	2	31.84*	43.41
6	-7	3	43.03	50.89
6	-7	4	38.20	43.16
6	-7	5	41.84	44.36
6	-7	6	42.59	38.86
6	-7	7	0.00*	0.51
7	-7	-12	61.63	64.77
7	-7	-11	20.23*	7.10
7	-7	-10	31.20	35.43
7	-7	-9	29.93	25.04
7	-7	-8	43.91	44.30
7	-7	-7	20.91*	10.35
7	-7	-6	92.31	90.78
7	-7	-5	0.00*	6.29
7	-7	-4	75.79	77.26
7	-7	-3	25.79*	22.06
7	-7	-2	63.02	64.54
7	-7	-1	22.02*	9.66
7	-7	0	67.26	78.57
7	-7	1	22.28*	6.45
7	-7	2	25.04*	15.14
7	-7	3	21.64*	8.09
7	-7	4	19.74*	12.92
7	-7	5	36.73	35.06
7	-7	6	13.22*	6.65
8	-7	-11	20.48*	28.95
8	-7	-10	31.95	18.33
8	-7	-9	34.83	36.87
8	-7	-8	93.37	92.33
8	-7	-7	23.29*	14.54
8	-7	-6	83.78	76.32
8	-7	-5	45.71	44.84
8	-7	-4	61.66	65.48
8	-7	-3	36.31*	40.37
8	-7	-2	59.50	46.24
8	-7	-1	35.49*	41.32
8	-7	0	58.83	68.12
8	-7	1	33.39*	34.38
8	-7	2	37.78*	32.97
8	-7	3	55.52	55.70
8	-7	4	33.69*	43.59

H	K	L	FO	FC
8	-7	5	25.15*	1.16
9	-7	-11	14.94*	14.19
9	-7	-10	28.50*	26.15
9	-7	-9	0.00*	5.93
9	-7	-8	0.00*	4.72
9	-7	-7	35.55	26.82
9	-7	-6	83.28	80.19
9	-7	-5	9.83*	10.08
9	-7	-4	24.08*	24.36
9	-7	-3	0.00*	4.06
9	-7	-2	103.50	110.42
9	-7	-1	33.09*	4.38
9	-7	0	49.63	56.31
9	-7	1	17.53*	12.04
9	-7	2	49.00	49.90
9	-7	3	0.00*	1.70
9	-7	4	0.00*	2.57
10	-7	-10	38.06	40.58
10	-7	-9	27.83*	23.87
10	-7	-8	56.90	52.87
10	-7	-7	23.03*	1.49
10	-7	-6	26.16*	9.65
10	-7	-5	0.00*	12.26
10	-7	-4	61.13	58.74
10	-7	-3	26.53*	19.27
10	-7	-2	0.00*	14.65
10	-7	-1	66.56	68.91
10	-7	0	60.24	61.03
10	-7	1	12.90*	14.08
10	-7	2	5.56*	8.25
11	-7	-9	0.00*	6.46
11	-7	-8	46.98	39.32
11	-7	-7	19.77*	0.68
11	-7	-6	0.00*	7.00
11	-7	-5	24.87*	14.89
11	-7	-4	22.25*	36.02
11	-7	-3	30.83*	28.32
11	-7	-2	58.58	62.13
11	-7	-1	26.81*	8.04
11	-7	0	0.00*	8.68
12	-7	-6	51.52	47.64
12	-7	-5	37.51	26.14
12	-7	-4	0.00*	8.99
0	-8	0	47.83	53.74
0	-8	1	42.74	35.52
0	-8	2	36.22	27.08
0	-8	3	22.26*	22.57
0	-8	4	31.84	35.70
0	-8	5	15.62*	13.88
0	-8	6	41.43	39.33
0	-8	7	83.50	78.92
0	-8	8	24.07*	17.53
0	-8	9	24.95*	24.10
1	-8	-10	31.12	27.30
1	-8	-9	36.72	34.54
1	-8	-8	29.70	24.11
1	-8	-7	12.04*	6.19
1	-8	-6	12.88*	3.50
1	-8	-5	49.89	45.45
1	-8	-4	70.50	68.22
1	-8	-3	57.19	60.20
1	-8	-2	41.22	41.14
1	-8	-1	135.47	124.29
1	-8	0	44.29*	39.79
1	-8	1	21.29*	23.06
1	-8	2	62.74	60.93
1	-8	3	18.43*	8.94
1	-8	4	5.87*	12.77
1	-8	5	47.70	42.26
1	-8	6	19.02*	12.18
1	-8	7	0.00*	8.76
1	-8	8	0.00*	5.25
1	-8	9	8.93*	15.80
2	-8	-10	22.52*	20.22
2	-8	-9	25.07*	27.78
2	-8	-8	9.93*	3.72
2	-8	-7	90.32	88.22
2	-8	-6	54.43	51.81
2	-8	-5	34.87	32.02
2	-8	-4	0.00*	1.66
2	-8	-3	88.72	81.60
2	-8	-2	95.12	78.86
2	-8	-1	53.08	45.19
2	-8	0	47.81*	36.86
2	-8	1	36.24	40.73
2	-8	2	27.29*	43.00
2	-8	3	31.56	27.46
2	-8	4	7.25*	18.92
2	-8	5	62.21	67.99
2	-8	6	18.82*	10.95
2	-8	7	16.30*	21.13
2	-8	8	3.44*	2.42
2	-8	9	0.00*	7.45
3	-8	-10	13.39*	14.80
3	-8	-9	44.53	38.73
3	-8	-8	24.41*	11.90
3	-8	-7	21.98*	16.86
3	-8	-6	8.93*	11.46
3	-8	-5	16.01*	3.01
3	-8	-4	77.12	67.65
3	-8	-3	87.41	83.43
3	-8	-2	26.71*	1.39
3	-8	-1	101.87	101.65
3	-8	0	76.85	87.66
3	-8	1	32.48*	40.72
3	-8	2	12.79*	31.86
3	-8	3	85.26	79.13
3	-8	4	31.48	28.10
3	-8	5	22.19*	15.83
3	-8	6	6.86*	2.26
3	-8	7	21.58*	15.85
3	-8	8	27.77*	26.24
4	-8	-10	16.54*	2.64
4	-8	-9	40.48	37.44
4	-8	-8	0.00*	12.66
4	-8	-7	0.00*	5.71

H	K	L	FO	FC
4	-8	-6	16.33*	18.32
4	-8	-5	18.77*	23.62
4	-8	-4	47.31	35.27
4	-8	-3	62.05	56.95
4	-8	-2	65.86	66.13
4	-8	-1	48.52	43.90
4	-8	0	28.79*	8.17
4	-8	1	45.68	30.05
4	-8	2	57.59	55.09
4	-8	3	83.30	93.67
4	-8	4	30.04*	18.68
4	-8	5	44.46	43.25
4	-8	6	28.23*	30.33
4	-8	7	8.87*	19.50
5	-8	-10	0.00*	9.99
5	-8	-9	24.73*	19.84
5	-8	-8	20.87*	13.03
5	-8	-7	8.60*	20.47
5	-8	-6	37.31	37.55
5	-8	-5	31.32	35.73
5	-8	-4	9.53*	6.70
5	-8	-3	70.89	71.81
5	-8	-2	32.15*	38.19
5	-8	-1	30.95*	9.40
5	-8	0	46.11	62.26
5	-8	1	79.38	74.34
5	-8	2	27.81*	11.28
5	-8	3	48.57	55.20
5	-8	4	30.76*	31.47
5	-8	5	22.41*	9.90
5	-8	6	6.51*	9.61
6	-8	-10	28.39	19.16
6	-8	-9	7.71*	8.41
6	-8	-8	32.10	21.78
6	-8	-7	57.96	52.67
6	-8	-6	38.03	32.76
6	-8	-5	36.69	33.76
6	-8	-4	50.34	46.80
6	-8	-3	34.47	19.35
6	-8	-2	0.00*	8.71
6	-8	-1	0.00*	7.20
6	-8	0	44.50	37.80
6	-8	1	39.53*	17.88
6	-8	2	34.88*	30.88
6	-8	3	53.93	58.77
6	-8	4	22.64*	6.52
6	-8	5	31.30*	20.17
7	-8	-10	17.38*	8.85
7	-8	-9	36.43	33.37
7	-8	-8	31.71	38.65
7	-8	-7	24.03*	29.52
7	-8	-6	30.36*	28.00
7	-8	-5	95.03	87.93
7	-8	-4	51.25	46.36
7	-8	-3	19.07*	15.46
7	-8	-2	52.30	59.56
7	-8	-1	45.40	53.18
7	-8	0	16.21*	5.04
7	-8	1	37.43*	53.41
7	-8	2	15.45*	14.02
7	-8	3	0.00*	12.20
7	-8	4	0.00*	3.86
8	-8	-9	31.10	22.16
8	-8	-8	8.42*	13.98
8	-8	-7	74.90	70.27
8	-8	-6	51.85	52.42
8	-8	-5	24.66*	3.11
8	-8	-4	34.43*	33.34
8	-8	-3	40.01	37.40
8	-8	-2	32.90*	45.69
8	-8	-1	0.00*	23.64
8	-8	0	37.22*	36.53
8	-8	1	59.22	62.43
8	-8	2	24.42*	13.32
8	-8	3	23.79*	11.75
9	-8	-8	21.02*	26.84
9	-8	-7	33.52	24.81
9	-8	-6	17.71*	8.36
9	-8	-5	50.89	44.85
9	-8	-4	66.42	60.07
9	-8	-3	48.11	46.15
9	-8	-2	27.45*	33.37
9	-8	-1	95.12	94.73
9	-8	0	16.66*	29.15
9	-8	1	0.00*	7.53
10	-8	-6	24.39*	27.65
10	-8	-5	26.98*	14.87
10	-8	-4	0.00*	2.33
10	-8	-3	26.46*	25.94
10	-8	-2	38.45*	37.90
0	-9	1	22.86*	25.12
0	-9	2	16.76*	17.09
0	-9	3	0.00*	3.12
0	-9	4	31.71	37.16
0	-9	5	56.50	54.28
0	-9	6	65.92	57.59
0	-9	7	18.92*	13.43
1	-9	-7	85.08	78.43
1	-9	-6	18.14*	4.75
1	-9	-5	0.00*	10.75
1	-9	-4	16.39*	5.04
1	-9	-3	52.40	49.48
1	-9	-2	20.72*	7.07
1	-9	-1	0.00*	6.69
1	-9	0	19.25*	19.64
1	-9	1	30.04*	39.05
1	-9	2	16.34*	9.03
1	-9	3	0.00*	2.69
1	-9	4	0.00*	3.03
1	-9	5	43.55	43.46
1	-9	6	0.00*	7.12
1	-9	7	15.89*	33.95
2	-9	-8	49.87	43.64
2	-9	-7	25.35*	26.11
2	-9	-6	43.09	41.74
2	-9	-5	66.01	54.54

H	K	L	FO	FC	H	K	L	FO	FC
2	-9	-4	15.20*	14.95	5	-9	2	19.22*	12.36
2	-9	-3	24.70*	24.98	5	-9	3	60.16	66.81
2	-9	-2	24.28*	18.27	5	-9	4	20.27*	9.21
2	-9	-1	71.33	65.82	6	-9	-7	7.97*	5.47
2	-9	0	14.41*	17.75	6	-9	-6	30.78	19.18
2	-9	1	40.49	31.99	6	-9	-5	41.32	42.20
2	-9	2	45.33	41.75	6	-9	-4	33.91*	36.73
2	-9	3	43.49	41.34	6	-9	-3	10.77*	16.11
2	-9	4	42.83	47.40	6	-9	-2	49.75	34.45
2	-9	5	20.15*	14.23	6	-9	-1	0.00*	19.94
2	-9	6	40.33	30.53	6	-9	0	38.73	26.57
3	-9	-8	21.21*	13.57	6	-9	1	46.57	38.51
3	-9	-7	42.68	42.03	6	-9	2	35.19*	32.49
3	-9	-6	0.00*	2.21	7	-9	-6	22.26*	0.68
3	-9	-5	26.12*	25.84	7	-9	-5	27.60*	10.74
3	-9	-4	0.00*	2.55	7	-9	-4	0.00*	4.63
3	-9	-3	70.94	58.42	7	-9	-3	42.35	39.44
3	-9	-2	34.42	23.03	7	-9	-2	6.36*	5.22
3	-9	-1	40.90*	47.90	7	-9	-1	30.56*	7.14
3	-9	0	19.23*	0.37	7	-9	0	24.07*	12.42
3	-9	1	43.09	32.22	0	-10	0	39.57	36.42
3	-9	2	0.00*	7.54	0	-10	1	9.26*	7.40
3	-9	3	45.41	52.72	0	-10	2	10.14*	13.92
3	-9	4	11.87*	3.40	0	-10	3	13.54*	9.37
3	-9	5	52.36	51.76	1	-10	-3	15.48*	16.65
4	-9	-8	43.72	34.89	1	-10	-2	31.31	24.97
4	-9	-7	35.59	29.18	1	-10	-1	13.59*	11.83
4	-9	-6	0.00*	7.27	1	-10	0	43.85*	12.98
4	-9	-5	28.87	21.56	1	-10	1	41.34	33.19
4	-9	-4	29.39*	18.80	1	-10	2	0.00*	2.60
4	-9	-3	54.10	50.68	1	-10	3	5.37*	14.76
4	-9	-2	28.48*	28.18	2	-10	-3	28.47	18.96
4	-9	-1	23.97*	30.20	2	-10	-2	58.91	48.51
4	-9	0	41.86*	35.86	2	-10	-1	32.68*	24.89
4	-9	1	41.08*	45.08	2	-10	0	44.73*	23.56
4	-9	2	50.70	44.50	2	-10	1	31.55*	16.95
4	-9	3	39.94	43.55	2	-10	2	18.78*	17.26
4	-9	4	35.46	33.11	3	-10	-3	30.62*	17.20
4	-9	5	41.88	44.80	3	-10	-2	30.59*	18.62
5	-9	-7	16.73*	18.49	3	-10	-1	3.02*	0.37
5	-9	-6	19.96*	3.30	3	-10	0	37.16*	13.33
5	-9	-5	23.09*	24.64	4	-5	5	77.04	76.62
5	-9	-4	19.44*	8.65	5	-5	-10	35.38	27.66
5	-9	-3	0.00*	7.40	6	-5	-13	107.56	109.68
5	-9	-2	24.37*	5.06	6	-5	-4	17.39*	12.33
5	-9	-1	20.73*	16.35	8	-5	-6	75.60	79.70
5	-9	0	0.00*	8.38	8	-5	-5	86.74	83.54
5	-9	1	20.79*	12.34	8	-5	1	28.35*	19.79

Dimethylammonium trichlorotris(dimethylsulphoxide) ruthenate(II)

Anthony Mercer and James Trotter.

Observed and calculated structure amplitudes

(reflections with intensity < 3 (I) are marked with an asterisk).

The following planes which had |Fo-Fc| > 3 (F) were given zero weight in the final stages of refinement due to suspected errors resulting from extinction, absorption, or instrument malfunction:

h	k	l	Fo	Fc
4	0	0	367.5	544.8
2	4	0	45.8	60.4
19	0	1	50.0	66.3
21	0	1	52.4	66.0
2	1	1	303.9	494.4
10	0	2	113.6	142.5
17	1	2	26.2	8.7
14	0	3	77.4	94.4
4	0	4	43.8	62.2
9	0	4	64.8	92.0
12	0	4	54.4	70.2
3	0	5	96.3	72.6
2	3	5	63.0	44.3
8	0	7	37.9	18.6
10	6	7	28.2	11.2
19	0	8	74.9	90.8
0	1	9	61.4	42.1
1	0	14	38.4	4.1

H	K	L	FO	FC	H	K	L	FO	FC
6	0	0	0.00*	110.09	8	4	0	131.65	133.23
8	0	0	292.18	309.19	10	4	0	115.25	117.86
10	0	0	357.89	400.62	12	4	0	17.30*	13.80
12	0	0	164.03	172.55	14	4	0	236.08	227.54
14	0	0	252.85	262.08	16	4	0	138.41	131.62
16	0	0	116.78	116.14	18	4	0	40.71	33.32
18	0	0	137.67	144.95	20	4	0	47.00	46.67
20	0	0	102.57	93.97	22	4	0	82.17	79.88
22	0	0	146.10	143.18	24	4	0	47.84	46.87
24	0	0	96.27	94.51	26	4	0	9.70*	2.52
26	0	0	59.84	56.50	2	5	0	65.76	57.87
28	0	0	44.54	46.22	4	5	0	97.16	91.92
2	1	0	140.02	150.64	6	5	0	62.21	52.25
4	1	0	54.74	55.32	8	5	0	62.97	60.92
6	1	0	73.35	67.32	10	5	0	172.78	157.77
8	1	0	91.36	79.80	12	5	0	103.32	105.58
10	1	0	257.53	242.48	14	5	0	110.74	105.40
12	1	0	63.03	63.43	16	5	0	37.13	38.44
14	1	0	134.59	122.02	18	5	0	31.78	26.18
16	1	0	38.09	38.47	20	5	0	59.76	62.20
18	1	0	88.24	87.76	22	5	0	53.83	50.66
20	1	0	70.99	73.78	24	5	0	97.50	96.92
22	1	0	65.45	64.81	0	6	0	361.13	328.04
24	1	0	145.46	142.13	2	6	0	151.22	137.90
26	1	0	44.64	46.54	4	6	0	232.35	213.43
28	1	0	105.82	102.62	6	6	0	38.81	43.09
0	2	0	279.75	285.41	8	6	0	196.51	185.64
2	2	0	10.37*	10.17	10	6	0	166.85	165.58
4	2	0	114.75	91.52	12	6	0	179.29	172.33
6	2	0	78.07	64.51	14	6	0	188.81	188.30
8	2	0	56.75	48.25	16	6	0	35.28	34.23
10	2	0	129.18	132.94	18	6	0	83.81	84.63
12	2	0	52.38	55.30	20	6	0	45.45	41.39
14	2	0	215.50	213.85	22	6	0	113.77	111.54
16	2	0	90.67	91.94	24	6	0	66.05	64.72
18	2	0	43.02	44.01	2	7	0	36.45	35.72
20	2	0	77.98	79.82	4	7	0	22.99*	21.19
22	2	0	88.23	82.33	6	7	0	38.03	35.37
24	2	0	34.42	37.87	8	7	0	0.00*	2.40
26	2	0	16.41*	24.22	10	7	0	86.30	87.34
28	2	0	26.86*	26.45	12	7	0	36.32	39.05
2	3	0	40.60	31.19	14	7	0	93.13	92.75
4	3	0	114.48	115.34	16	7	0	0.00*	7.15
6	3	0	65.86	78.88	18	7	0	39.41	43.87
8	3	0	49.02	51.73	20	7	0	51.49	45.09
10	3	0	124.48	141.70	0	8	0	173.56	170.81
12	3	0	118.97	127.58	2	8	0	48.31	50.66
14	3	0	99.49	107.51	4	8	0	90.15	96.66
16	3	0	52.22	50.01	6	8	0	28.87	25.12
18	3	0	49.97	51.29	8	8	0	61.40	62.85
20	3	0	38.53	34.62	10	8	0	106.07	103.22
22	3	0	28.89	24.92	12	8	0	50.41	50.24
24	3	0	125.42	120.27	14	8	0	97.74	91.09
26	3	0	76.50	76.89	16	8	0	0.00*	18.24
28	3	0	66.03	61.56	18	8	0	37.85	40.71
0	4	0	284.46	271.97	2	9	0	24.02*	19.53
4	4	0	211.21	205.48	4	9	0	47.77	44.88
6	4	0	48.24	59.07	6	9	0	63.52	59.39

H	K	L	FO	FC
8	9	0	19.56*	13.50
10	9	0	66.79	65.47
12	9	0	40.60	44.61
14	9	0	50.58	47.37
0	10	0	145.77	137.79
2	10	0	87.15	87.78
4	10	0	76.94	74.93
6	10	0	6.59*	9.11
8	10	0	42.59	41.70
2	0	1	12.29*	26.69
3	0	1	64.43	77.13
4	0	1	168.74	174.69
5	0	1	0.00*	47.73
6	0	1	138.63	127.14
7	0	1	102.01	106.93
8	0	1	114.11	142.65
9	0	1	247.89	246.95
10	0	1	61.21*	89.66
11	0	1	0.00*	44.38
12	0	1	212.09	213.91
13	0	1	125.26	127.32
14	0	1	0.00*	27.39
15	0	1	32.04*	35.45
16	0	1	44.04	47.13
17	0	1	73.46	77.51
18	0	1	5.24*	42.14
20	0	1	103.73	101.38
22	0	1	65.75	71.92
23	0	1	51.68	53.28
24	0	1	0.00*	10.15
25	0	1	46.88	50.09
26	0	1	117.61	116.36
27	0	1	0.00*	51.17
28	0	1	0.00*	0.92
29	0	1	46.93	48.95
0	1	1	193.85	192.75
1	1	1	221.24	255.31
3	1	1	170.99	185.76
4	1	1	28.19	29.28
5	1	1	114.80	103.90
6	1	1	120.08	128.19
7	1	1	114.27	123.66
8	1	1	117.49	100.72
9	1	1	161.64	162.22
10	1	1	163.26	160.74
11	1	1	160.31	158.22
12	1	1	199.66	193.65
13	1	1	149.13	142.71
14	1	1	49.02	47.33
15	1	1	88.17	87.97
16	1	1	120.08	114.65
17	1	1	47.56	45.47
18	1	1	38.75	35.38
19	1	1	82.87	77.04
20	1	1	78.80	77.76
21	1	1	66.64	63.60
22	1	1	34.02	27.97
23	1	1	66.16	65.66
24	1	1	71.84	66.55
25	1	1	85.04	83.46
26	1	1	50.78	47.98
27	1	1	2.84*	14.11
28	1	1	23.71*	21.83
29	1	1	26.18*	29.38
1	2	1	39.19	42.00
2	2	1	31.80	36.09
3	2	1	140.17	129.51
4	2	1	38.57	29.47
5	2	1	42.33	38.44
6	2	1	59.64	55.91
7	2	1	74.94	63.93
8	2	1	40.63	37.71
9	2	1	37.81	37.60
10	2	1	101.01	102.72
11	2	1	31.99	31.09
12	2	1	160.54	164.32
13	2	1	62.77	58.46
14	2	1	55.43	58.24
15	2	1	25.54	27.27
16	2	1	31.04	35.09
17	2	1	51.28	52.09
18	2	1	25.77	19.66
19	2	1	11.35*	5.89
20	2	1	22.64*	21.29
21	2	1	32.28	30.42
22	2	1	63.43	56.76
23	2	1	35.07	34.93
24	2	1	75.67	71.90
25	2	1	33.72	33.35
26	2	1	117.75	111.64
27	2	1	16.35*	25.80
28	2	1	48.37	45.83
0	3	1	50.16	36.05
1	3	1	84.12	84.90
2	3	1	166.07	144.54
3	3	1	137.12	125.81
4	3	1	20.88	32.61
5	3	1	17.56*	14.64
6	3	1	155.04	160.77
7	3	1	61.37	56.83
8	3	1	17.37*	29.34
9	3	1	58.84	49.34
10	3	1	118.53	117.10
11	3	1	99.48	100.63
12	3	1	156.86	160.54
13	3	1	67.78	67.40
14	3	1	118.70	121.61
15	3	1	39.76	38.71
16	3	1	99.61	100.40
17	3	1	77.78	79.90
18	3	1	92.84	94.75
19	3	1	19.86*	16.18
20	3	1	68.11	63.27
21	3	1	22.88*	20.90
22	3	1	23.43*	22.62
23	3	1	12.07*	18.42

H	K	L	FO	FC
24	3	1	57.01	54.78
25	3	1	33.87	30.56
26	3	1	23.78*	17.91
27	3	1	41.21	32.33
1	4	1	126.27	101.88
2	4	1	110.04	97.45
3	4	1	45.54	46.18
4	4	1	94.79	89.95
5	4	1	33.58	33.35
6	4	1	47.91	46.03
7	4	1	66.47	62.22
8	4	1	90.19	89.94
9	4	1	24.62	21.26
10	4	1	112.93	110.03
11	4	1	16.24*	13.39
12	4	1	139.79	131.36
13	4	1	90.96	87.38
14	4	1	48.74	37.74
15	4	1	32.90	34.77
16	4	1	70.49	60.07
17	4	1	42.08	43.14
18	4	1	33.44	31.64
19	4	1	26.60	23.56
20	4	1	6.81*	8.34
21	4	1	0.00*	4.89
22	4	1	63.43	61.60
23	4	1	77.11	73.75
24	4	1	26.69*	29.18
25	4	1	25.90*	24.40
26	4	1	78.47	74.70
0	5	1	117.30	106.97
1	5	1	160.52	141.69
2	5	1	236.35	231.18
3	5	1	99.69	91.52
4	5	1	51.37	46.25
5	5	1	78.57	78.91
6	5	1	90.05	99.73
7	5	1	85.26	78.66
8	5	1	48.44	41.30
9	5	1	51.04	51.90
10	5	1	93.39	94.81
11	5	1	146.23	140.84
12	5	1	159.73	149.62
13	5	1	76.61	79.29
14	5	1	103.53	105.38
15	5	1	88.83	86.34
16	5	1	110.14	107.17
17	5	1	30.68	34.23
18	5	1	39.24	40.79
19	5	1	20.35*	20.09
20	5	1	66.52	65.44
21	5	1	76.71	74.34
22	5	1	33.33	29.76
23	5	1	51.26	50.66
24	5	1	52.78	52.77
25	5	1	37.85	37.69
1	6	1	101.07	85.87
2	6	1	53.18	52.21
3	6	1	42.27	33.69
4	6	1	66.15	67.21
5	6	1	55.70	49.47
6	6	1	20.26*	26.88
7	6	1	64.73	60.06
8	6	1	77.15	73.71
9	6	1	40.78	38.33
10	6	1	65.16	68.01
11	6	1	39.03	37.50
12	6	1	106.16	106.43
13	6	1	61.90	63.06
14	6	1	40.83	48.09
15	6	1	33.18	29.03
16	6	1	72.31	72.27
17	6	1	63.82	62.57
18	6	1	21.77*	22.02
19	6	1	25.12*	24.46
20	6	1	37.96	35.60
21	6	1	51.89	53.56
22	6	1	56.82	54.45
23	6	1	48.42	49.97
0	7	1	87.66	85.45
1	7	1	158.20	146.00
2	7	1	124.01	108.57
3	7	1	101.39	90.23
4	7	1	15.62*	7.46
5	7	1	88.99	84.11
6	7	1	66.11	57.22
7	7	1	67.88	64.16
8	7	1	26.22	26.03
9	7	1	93.09	86.99
10	7	1	82.22	77.31
11	7	1	105.82	100.77
12	7	1	95.25	95.08
13	7	1	60.75	58.81
14	7	1	55.29	52.08
15	7	1	76.38	75.17
16	7	1	59.20	55.45
17	7	1	22.95*	20.86
18	7	1	37.25	32.92
19	7	1	44.43	43.10
20	7	1	49.62	45.63
21	7	1	46.92	45.50
1	8	1	18.60*	15.08
2	8	1	27.51	27.32
3	8	1	41.10	37.80
4	8	1	42.41	35.53
5	8	1	0.00*	3.84
6	8	1	36.93	31.20
7	8	1	20.62*	14.92
8	8	1	33.77	31.61
9	8	1	28.13	25.22
10	8	1	37.32	34.84
11	8	1	21.18*	3.98
12	8	1	75.47	71.81
13	8	1	31.84	30.38
14	8	1	32.98	31.63
15	8	1	15.06*	17.08

H	K	L	FO	FC
16	8	1	43.56	39.94
17	8	1	18.00*	17.28
18	8	1	29.98	29.47
19	8	1	0.00*	0.78
0	9	1	68.21	64.56
1	9	1	62.16	60.64
2	9	1	155.77	149.54
3	9	1	53.56	53.15
4	9	1	22.26*	10.73
5	9	1	31.33	25.35
6	9	1	94.14	91.56
7	9	1	27.88*	28.98
8	9	1	37.54	36.46
9	9	1	39.21	37.60
10	9	1	55.43	52.53
11	9	1	48.76	48.62
12	9	1	90.28	89.13
13	9	1	45.90	46.68
14	9	1	21.05*	17.28
15	9	1	24.01*	15.75
1	10	1	12.40*	9.19
2	10	1	12.27*	17.35
3	10	1	21.75*	18.61
4	10	1	49.95	49.99
5	10	1	15.53*	8.22
6	10	1	24.00*	25.51
7	10	1	0.00*	10.61
8	10	1	59.22	53.78
9	10	1	31.23	29.92
0	0	2	202.12	187.70
1	0	2	300.48	348.79
2	0	2	268.97	306.24
3	0	2	106.50	104.01
4	0	2	136.94	135.31
5	0	2	0.00*	55.72
6	0	2	101.62	105.74
7	0	2	0.00*	17.04
8	0	2	0.00*	20.33
9	0	2	252.84	253.45
11	0	2	224.22	218.21
12	0	2	9.39*	71.13
13	0	2	124.27	121.63
14	0	2	6.65*	50.32
15	0	2	88.28	93.83
16	0	2	93.53	95.28
17	0	2	7.21*	35.58
18	0	2	18.33*	25.99
19	0	2	21.91*	31.61
20	0	2	60.55	61.22
21	0	2	23.06*	34.35
22	0	2	0.00*	28.16
23	0	2	86.35	82.63
24	0	2	0.00*	34.14
25	0	2	21.94*	32.53
26	0	2	0.00*	16.11
27	0	2	57.92	55.47
28	0	2	0.00*	14.88
1	1	2	121.56	116.84
2	1	2	47.90	43.27
3	1	2	45.72	47.69
4	1	2	102.73	94.27
5	1	2	17.63*	17.91
6	1	2	64.10	59.76
7	1	2	134.22	128.19
8	1	2	77.55	72.46
9	1	2	78.95	77.94
10	1	2	184.34	175.46
11	1	2	164.60	161.03
12	1	2	172.26	163.01
13	1	2	43.17	42.04
14	1	2	74.62	64.15
15	1	2	93.33	92.27
16	1	2	13.63*	14.50
18	1	2	41.79	40.66
19	1	2	101.68	99.13
20	1	2	16.22*	2.48
21	1	2	53.32	47.03
22	1	2	36.46	39.01
23	1	2	71.09	68.08
24	1	2	56.37	54.47
25	1	2	49.90	48.69
26	1	2	67.49	65.99
27	1	2	41.61	40.95
28	1	2	25.05*	23.84
0	2	2	92.74	80.68
1	2	2	217.23	205.98
2	2	2	67.14	76.86
3	2	2	128.25	136.10
4	2	2	85.81	74.59
5	2	2	31.69	36.49
6	2	2	86.41	94.00
7	2	2	7.72*	9.77
8	2	2	46.67	37.77
9	2	2	102.01	108.29
10	2	2	37.77	39.05
11	2	2	113.43	114.29
12	2	2	79.01	79.96
13	2	2	173.45	172.47
14	2	2	101.27	95.23
15	2	2	13.21*	9.74
16	2	2	107.12	105.60
17	2	2	97.51	95.44
18	2	2	56.13	52.70
19	2	2	39.87	36.96
20	2	2	63.17	61.66
21	2	2	47.98	44.59
22	2	2	34.29	32.73
23	2	2	105.26	97.38
24	2	2	36.15	34.90
25	2	2	22.43*	10.83
26	2	2	10.29*	13.17
27	2	2	69.92	62.66
28	2	2	34.10	30.27
1	3	2	146.47	129.72
2	3	2	113.62	98.91
3	3	2	158.00	140.47

H	K	L	FO	FC	H	K	L	FO	FC
4	3	2	151.98	140.51	8	5	2	65.44	59.81
5	3	2	144.25	120.48	9	5	2	27.44	30.11
6	3	2	50.26	37.92	10	5	2	102.30	92.62
7	3	2	53.88	51.85	11	5	2	99.84	90.57
8	3	2	123.37	126.51	12	5	2	102.54	97.97
9	3	2	84.30	79.93	13	5	2	37.11	38.11
10	3	2	78.83	84.99	14	5	2	41.57	43.27
11	3	2	71.64	71.87	15	5	2	75.40	67.82
12	3	2	58.97	63.81	16	5	2	43.81	41.05
13	3	2	45.52	43.40	17	5	2	10.76*	17.49
14	3	2	55.55	54.02	18	5	2	14.53*	1.98
15	3	2	70.50	69.15	19	5	2	33.50	31.58
16	3	2	11.28*	21.48	20	5	2	12.03*	8.43
17	3	2	29.43	30.43	21	5	2	70.68	63.19
18	3	2	52.29	43.27	22	5	2	25.98*	24.57
19	3	2	70.92	68.59	23	5	2	40.45	39.16
20	3	2	17.98*	12.62	24	5	2	31.41	29.08
21	3	2	58.87	56.20	25	5	2	70.16	62.70
22	3	2	66.37	60.30	0	6	2	57.30	56.99
23	3	2	27.60*	27.45	1	6	2	149.48	133.08
24	3	2	55.54	49.74	2	6	2	196.24	172.04
25	3	2	54.10	51.49	3	6	2	130.88	123.13
26	3	2	85.33	81.45	4	6	2	77.82	75.02
27	3	2	26.18*	25.67	5	6	2	49.76	45.95
0	4	2	210.64	207.61	6	6	2	106.32	91.87
1	4	2	192.66	171.45	7	6	2	62.95	65.37
2	4	2	103.83	112.56	8	6	2	80.71	82.46
3	4	2	208.94	191.47	9	6	2	113.29	107.73
4	4	2	73.38	78.73	10	6	2	79.05	74.25
5	4	2	77.28	77.78	11	6	2	115.92	115.14
6	4	2	22.48*	27.13	12	6	2	122.46	121.51
7	4	2	44.50	45.30	13	6	2	146.19	144.87
8	4	2	73.22	75.78	14	6	2	6.91*	20.48
9	4	2	133.87	133.83	15	6	2	38.62	38.23
10	4	2	24.71	15.70	16	6	2	92.79	92.48
11	4	2	101.12	95.95	17	6	2	18.55*	19.46
12	4	2	96.17	93.31	18	6	2	17.05*	19.71
13	4	2	195.25	187.89	19	6	2	25.78*	22.76
14	4	2	73.14	66.09	20	6	2	86.22	81.29
15	4	2	53.26	47.91	21	6	2	26.97*	29.93
16	4	2	63.04	61.34	22	6	2	0.00*	7.72
17	4	2	57.35	54.47	23	6	2	75.40	71.74
18	4	2	53.49	48.21	1	7	2	55.04	54.60
19	4	2	38.41	39.73	2	7	2	21.69*	15.84
20	4	2	55.93	52.95	3	7	2	61.65	57.83
21	4	2	42.46	41.85	4	7	2	72.55	68.58
22	4	2	64.36	64.08	5	7	2	50.13	48.67
23	4	2	97.43	94.95	6	7	2	33.90	33.10
24	4	2	39.56	38.80	7	7	2	20.97*	13.44
25	4	2	44.75	42.87	8	7	2	50.67	47.64
26	4	2	7.95*	14.92	9	7	2	33.11	33.10
1	5	2	106.19	104.09	10	7	2	30.05	31.60
2	5	2	75.56	65.81	11	7	2	52.88	50.97
3	5	2	90.43	85.33	12	7	2	84.73	80.75
4	5	2	87.60	76.69	13	7	2	23.55*	19.78
5	5	2	85.62	84.10	14	7	2	23.28*	20.50
6	5	2	102.82	93.15	15	7	2	58.45	57.23
7	5	2	21.33*	19.35	16	7	2	24.20*	15.57

H	K	L	FO	FC	H	K	L	FO	FC
17	7	2	0.00*	11.77	12	0	3	45.42	61.89
18	7	2	28.29*	31.13	13	0	3	95.86	102.55
19	7	2	60.82	57.81	15	0	3	70.33	67.17
20	7	2	21.28*	8.96	16	0	3	0.00*	14.87
21	7	2	16.55*	13.82	17	0	3	99.64	100.97
0	8	2	79.06	81.00	18	0	3	0.00*	25.69
1	8	2	110.97	100.89	19	0	3	46.50	49.05
2	8	2	30.06	28.66	20	0	3	39.96	42.38
3	8	2	43.47	39.32	21	0	3	46.04	50.51
4	8	2	54.92	56.56	22	0	3	0.00*	3.66
5	8	2	52.84	52.96	23	0	3	0.00*	23.52
6	8	2	11.54*	9.26	24	0	3	70.44	67.95
7	8	2	29.57	32.44	25	0	3	0.00*	15.57
8	8	2	51.85	54.21	26	0	3	0.00*	9.80
9	8	2	80.35	77.44	27	0	3	0.00*	1.18
10	8	2	23.62*	21.78	28	0	3	42.31	42.08
11	8	2	72.70	68.81	0	1	3	195.60	208.83
12	8	2	36.98	28.24	1	1	3	77.36	89.91
13	8	2	74.93	70.12	2	1	3	54.44	54.40
14	8	2	60.51	60.23	3	1	3	27.34	24.48
15	8	2	29.86	25.19	4	1	3	81.89	78.56
16	8	2	38.48	33.37	5	1	3	160.63	148.98
17	8	2	50.28	50.36	6	1	3	113.86	117.24
18	8	2	38.47	37.25	7	1	3	128.78	109.38
1	9	2	25.59*	33.23	8	1	3	183.44	170.18
2	9	2	29.99	27.00	9	1	3	87.86	76.15
3	9	2	27.23*	28.48	10	1	3	99.90	91.98
4	9	2	23.43*	21.34	11	1	3	110.21	102.76
5	9	2	15.33*	12.63	12	1	3	96.58	90.69
6	9	2	42.80	37.63	13	1	3	20.98*	29.04
7	9	2	40.41	38.31	14	1	3	160.64	153.21
8	9	2	31.20	35.51	15	1	3	70.27	64.73
9	9	2	15.57*	23.27	16	1	3	86.21	81.56
10	9	2	67.74	65.44	17	1	3	38.26	32.02
11	9	2	70.73	66.59	18	1	3	60.29	55.84
12	9	2	27.80*	30.42	19	1	3	21.43*	17.20
13	9	2	29.95	24.17	20	1	3	57.15	54.10
14	9	2	54.63	54.44	21	1	3	51.00	48.42
0	10	2	92.13	90.78	22	1	3	98.64	92.81
1	10	2	101.46	97.99	23	1	3	0.00*	10.43
2	10	2	37.46	31.18	24	1	3	37.77	31.88
3	10	2	58.62	55.76	25	1	3	58.35	53.84
4	10	2	62.39	59.91	26	1	3	17.84*	25.81
5	10	2	60.66	59.65	27	1	3	52.48	49.84
6	10	2	14.96*	20.08	28	1	3	6.47*	18.89
7	10	2	41.82	39.19	1	2	3	110.58	105.54
8	10	2	34.44	38.26	2	2	3	73.40	84.14
1	0	3	0.00*	29.38	3	2	3	145.15	133.60
2	0	3	82.54	80.40	4	2	3	133.54	131.22
3	0	3	85.86	82.08	5	2	3	66.46	65.71
4	0	3	90.57	85.26	6	2	3	85.64	85.39
5	0	3	0.00*	26.58	7	2	3	74.56	66.39
6	0	3	0.00*	6.48	8	2	3	60.85	59.04
7	0	3	81.54	89.95	9	2	3	48.32	51.39
8	0	3	0.00*	66.84	10	2	3	165.23	155.51
9	0	3	0.00*	119.14	11	2	3	52.80	58.06
10	0	3	244.73	239.60	12	2	3	42.53	41.23
11	0	3	0.00*	69.57	13	2	3	71.86	69.21

H	K	L	FO	FC
14	2	3	72.02	73.02
15	2	3	40.15	42.77
16	2	3	95.97	88.57
17	2	3	98.26	95.71
18	2	3	19.92*	15.34
19	2	3	61.65	57.98
20	2	3	77.47	69.77
21	2	3	62.05	56.16
22	2	3	30.04	25.65
23	2	3	34.26	31.77
24	2	3	118.06	108.38
25	2	3	28.59*	25.62
26	2	3	41.86	37.45
27	2	3	25.73*	26.87
28	2	3	52.56	49.66
0	3	3	434.78	440.67
1	3	3	137.48	133.09
2	3	3	198.28	208.75
3	3	3	50.96	58.97
4	3	3	201.21	197.81
5	3	3	56.80	55.30
6	3	3	103.78	116.40
7	3	3	88.67	99.83
8	3	3	96.73	97.72
9	3	3	49.04	42.40
10	3	3	160.55	177.37
11	3	3	119.96	135.02
12	3	3	142.58	148.56
13	3	3	8.04*	4.29
14	3	3	180.90	196.05
15	3	3	128.55	137.43
16	3	3	0.00*	8.83
17	3	3	6.64*	14.24
18	3	3	70.56	73.21
19	3	3	51.93	56.98
20	3	3	33.47	35.01
21	3	3	65.12	66.14
22	3	3	137.01	143.78
23	3	3	16.25*	18.65
24	3	3	40.74	50.55
25	3	3	74.70	73.52
26	3	3	26.01*	22.31
27	3	3	19.48*	21.42
1	4	3	125.46	126.15
2	4	3	86.04	86.69
3	4	3	127.25	130.83
4	4	3	76.43	80.10
5	4	3	76.68	87.19
6	4	3	127.40	129.78
7	4	3	44.28	48.03
8	4	3	39.77	39.47
9	4	3	55.89	52.37
10	4	3	100.59	100.82
11	4	3	42.28	37.70
12	4	3	24.60	23.82
13	4	3	59.74	58.12
14	4	3	85.64	84.06
15	4	3	3.08*	10.54
16	4	3	38.01	39.56
17	4	3	51.30	52.79
18	4	3	23.45*	29.83
19	4	3	14.31*	18.90
20	4	3	30.34	26.98
21	4	3	0.00*	17.94
22	4	3	34.68	32.70
23	4	3	41.65	44.93
24	4	3	96.32	101.37
25	4	3	13.88*	22.26
26	4	3	13.86*	6.58
0	5	3	228.38	236.92
1	5	3	90.58	87.72
2	5	3	29.06	20.90
3	5	3	69.62	66.39
4	5	3	106.31	117.17
5	5	3	45.91	42.82
6	5	3	13.26*	11.69
7	5	3	100.34	95.51
8	5	3	112.32	117.60
9	5	3	47.22	48.70
10	5	3	88.68	88.18
11	5	3	93.36	91.66
12	5	3	102.84	107.08
13	5	3	31.74	33.21
14	5	3	103.28	102.98
15	5	3	42.21	43.27
16	5	3	0.00*	10.63
17	5	3	28.00	29.08
18	5	3	44.36	47.16
19	5	3	3.57*	14.58
20	5	3	2.66*	12.02
21	5	3	33.09	39.67
22	5	3	104.05	106.91
23	5	3	21.79*	18.72
24	5	3	23.21*	23.68
25	5	3	34.98	31.84
1	6	3	105.04	97.20
2	6	3	46.54	45.84
3	6	3	111.53	108.09
4	6	3	76.14	78.55
5	6	3	72.51	71.53
6	6	3	84.19	86.62
7	6	3	27.42	23.62
8	6	3	41.04	45.55
9	6	3	18.64*	22.72
10	6	3	88.40	94.23
11	6	3	27.88	31.81
12	6	3	21.22*	22.25
13	6	3	20.08*	27.39
14	6	3	58.12	62.87
15	6	3	24.76*	20.97
16	6	3	31.84	28.89
17	6	3	30.96	32.09
18	6	3	27.29*	29.26
19	6	3	33.55	32.97
20	6	3	45.47	45.17
21	6	3	26.30*	27.57

H	K	L	FO	FC
22	6	3	29.30	27.79
23	6	3	0.00*	3.43
0	7	3	160.59	154.57
1	7	3	46.05	44.73
2	7	3	36.52	34.59
3	7	3	51.01	54.83
4	7	3	60.64	61.89
5	7	3	34.94	38.90
6	7	3	24.76*	30.72
7	7	3	21.12*	19.40
8	7	3	53.55	58.09
9	7	3	52.87	54.02
10	7	3	71.24	81.23
11	7	3	18.95*	30.14
12	7	3	35.69	36.29
13	7	3	49.03	56.52
14	7	3	81.24	90.78
15	7	3	23.57*	31.44
16	7	3	13.03*	24.75
17	7	3	47.06	53.87
18	7	3	38.87	45.63
19	7	3	17.60*	7.81
20	7	3	22.97*	9.88
21	7	3	24.68*	22.96
1	8	3	20.20*	24.24
2	8	3	30.46	33.85
3	8	3	30.90	37.03
4	8	3	30.23	31.75
5	8	3	14.68*	21.59
6	8	3	30.34	36.42
7	8	3	11.75*	19.89
8	8	3	33.00	33.60
9	8	3	29.93	30.84
10	8	3	59.29	63.01
11	8	3	1.11*	11.49
12	8	3	48.45	49.20
13	8	3	43.05	52.19
14	8	3	22.00*	27.42
15	8	3	24.25*	18.76
16	8	3	23.95*	22.56
17	8	3	50.43	52.42
18	8	3	0.00*	20.43
0	9	3	91.79	98.47
1	9	3	64.92	66.96
2	9	3	83.58	86.98
3	9	3	86.80	93.98
4	9	3	38.60	44.00
5	9	3	41.38	40.98
6	9	3	32.20	34.58
7	9	3	86.00	92.30
8	9	3	48.21	50.63
9	9	3	34.16	31.41
10	9	3	60.57	65.86
11	9	3	71.96	76.29
12	9	3	46.40	49.09
13	9	3	42.34	48.89
14	9	3	56.85	60.24
1	10	3	16.80*	19.03
2	10	3	15.76*	21.43
3	10	3	14.50*	17.93
4	10	3	9.24*	24.36
5	10	3	19.76*	2.28
6	10	3	20.24*	24.22
7	10	3	14.79*	7.66
0	0	4	61.50	61.92
1	0	4	66.14	66.81
2	0	4	20.19*	43.32
3	0	4	98.05	94.92
5	0	4	76.69	84.89
6	0	4	24.64*	38.90
7	0	4	93.59	97.84
8	0	4	144.03	148.69
10	0	4	101.52	121.77
11	0	4	99.20	110.92
13	0	4	9.06*	34.20
14	0	4	38.98	41.36
15	0	4	0.00*	13.07
16	0	4	39.37	38.81
17	0	4	0.00*	10.62
18	0	4	117.98	118.92
19	0	4	30.45*	64.49
20	0	4	45.97	56.12
21	0	4	45.26	52.84
22	0	4	42.67	51.05
23	0	4	0.00*	43.53
24	0	4	71.19	78.16
25	0	4	0.00*	28.66
26	0	4	0.00*	5.80
27	0	4	54.81	51.04
28	0	4	0.00*	27.75
1	1	4	43.54	43.32
2	1	4	100.10	101.44
3	1	4	142.58	146.00
4	1	4	91.95	95.18
5	1	4	60.00	61.98
6	1	4	50.19	50.12
7	1	4	22.19	17.77
8	1	4	139.49	139.13
9	1	4	63.63	60.39
10	1	4	84.62	85.51
11	1	4	54.14	51.62
12	1	4	109.92	110.69
13	1	4	76.29	76.69
14	1	4	0.00*	7.36
15	1	4	71.75	75.88
16	1	4	32.85	35.15
17	1	4	113.20	120.51
18	1	4	45.75	44.43
19	1	4	78.27	75.44
20	1	4	20.31*	19.17
21	1	4	63.03	62.43
22	1	4	50.70	56.55
23	1	4	24.99*	17.88
24	1	4	48.93	49.93
25	1	4	32.15	32.66
26	1	4	47.71	50.19

H	K	L	FO	FC
27	1	4	13.82*	7.84
28	1	4	32.59	29.66
0	2	4	173.00	182.37
1	2	4	156.13	155.70
2	2	4	349.27	352.35
3	2	4	144.01	144.15
4	2	4	98.40	107.18
5	2	4	44.17	57.54
6	2	4	100.39	100.94
7	2	4	193.52	206.62
8	2	4	85.12	91.66
9	2	4	53.82	50.62
10	2	4	132.77	135.63
11	2	4	141.75	150.40
12	2	4	215.81	225.53
13	2	4	17.56*	15.57
14	2	4	57.49	59.78
15	2	4	126.70	132.81
16	2	4	108.41	112.32
17	2	4	16.72*	7.71
18	2	4	51.91	48.28
19	2	4	44.43	48.77
20	2	4	90.18	93.35
21	2	4	68.89	66.08
22	2	4	60.77	62.63
23	2	4	0.00*	3.04
24	2	4	83.94	85.35
25	2	4	57.63	60.92
26	2	4	42.63	41.68
27	2	4	24.42*	29.20
1	3	4	147.81	133.31
2	3	4	49.48	50.45
3	3	4	156.79	144.87
4	3	4	129.11	138.34
5	3	4	102.08	97.53
6	3	4	98.46	101.85
7	3	4	105.78	96.10
8	3	4	89.03	92.65
9	3	4	37.37	42.43
10	3	4	32.70	35.09
11	3	4	50.81	50.36
12	3	4	91.95	96.31
13	3	4	49.22	53.32
14	3	4	64.69	60.39
15	3	4	46.79	45.43
16	3	4	47.99	48.37
17	3	4	94.36	93.60
18	3	4	80.45	83.39
19	3	4	31.82	29.43
20	3	4	41.56	44.17
21	3	4	48.76	46.75
22	3	4	98.54	96.92
23	3	4	45.05	45.70
24	3	4	37.51	38.25
25	3	4	35.94	32.44
26	3	4	76.82	75.58
0	4	4	132.40	122.97
1	4	4	79.19	78.08
2	4	4	245.72	252.13
3	4	4	125.89	120.33
4	4	4	95.25	88.06
5	4	4	62.17	59.42
6	4	4	116.41	127.70
7	4	4	130.08	136.14
8	4	4	74.67	73.30
9	4	4	26.14	20.04
10	4	4	199.87	205.99
11	4	4	107.78	114.88
12	4	4	156.89	164.44
13	4	4	60.84	59.34
14	4	4	115.34	120.03
15	4	4	74.54	72.47
16	4	4	76.13	77.19
17	4	4	24.30*	15.00
18	4	4	27.47	30.52
19	4	4	25.23*	24.12
20	4	4	91.82	96.90
21	4	4	64.51	64.58
22	4	4	33.74	33.30
23	4	4	46.43	50.59
24	4	4	87.43	88.69
25	4	4	45.48	46.82
1	5	4	86.33	97.99
2	5	4	46.73	47.72
3	5	4	105.07	109.08
4	5	4	52.50	51.64
5	5	4	56.33	57.93
6	5	4	54.66	52.85
7	5	4	29.21	20.73
8	5	4	74.67	75.10
9	5	4	39.15	38.37
10	5	4	44.01	42.71
11	5	4	56.71	60.09
12	5	4	109.99	112.23
13	5	4	27.56	25.72
14	5	4	4.64*	10.41
15	5	4	16.90*	23.49
16	5	4	54.76	56.07
17	5	4	32.52	30.93
18	5	4	21.84*	15.46
19	5	4	36.07	37.21
20	5	4	44.97	45.15
21	5	4	19.73*	26.47
22	5	4	45.45	43.71
23	5	4	16.21*	10.78
24	5	4	7.86*	4.63
0	6	4	18.41*	14.64
1	6	4	41.95	39.79
2	6	4	98.38	97.21
3	6	4	56.95	61.98
4	6	4	32.46	24.48
5	6	4	39.98	37.91
6	6	4	55.92	57.97
7	6	4	74.92	76.92
8	6	4	22.94*	21.90
9	6	4	33.50	41.28

H	K	L	FO	FC	H	K	L	FO	FC
10	6	4	65.26	66.55	8	9	4	40.26	41.56
11	6	4	68.51	78.06	9	9	4	10.19*	20.59
12	6	4	69.06	71.77	10	9	4	33.92	34.44
13	6	4	29.15	31.73	11	9	4	34.01	37.43
14	6	4	0.00*	7.17	12	9	4	54.54	55.61
15	6	4	51.24	57.60	13	9	4	34.45	36.16
16	6	4	18.04*	25.53	0	10	4	59.85	66.86
17	6	4	9.49*	20.25	1	10	4	27.28*	31.14
18	6	4	44.79	43.95	2	10	4	81.93	82.22
19	6	4	0.00*	4.80	3	10	4	26.30*	24.21
20	6	4	31.09	33.34	4	10	4	27.47*	26.67
21	6	4	48.03	47.48	5	10	4	19.45*	18.77
22	6	4	31.30	28.91	1	0	5	0.00*	22.48
1	7	4	32.95	36.80	2	0	5	37.86	46.40
2	7	4	40.66	40.95	4	0	5	150.15	153.05
3	7	4	68.65	69.26	5	0	5	98.58	88.92
4	7	4	53.99	55.27	6	0	5	77.55	75.61
5	7	4	45.42	49.93	7	0	5	26.55	36.54
6	7	4	35.87	33.88	8	0	5	91.39	82.80
7	7	4	46.84	50.34	9	0	5	11.60*	17.04
8	7	4	58.01	61.14	10	0	5	0.00*	10.11
9	7	4	24.93*	30.12	11	0	5	47.31	55.74
10	7	4	38.76	37.03	12	0	5	54.41	61.95
11	7	4	0.00*	6.53	13	0	5	16.65*	39.71
12	7	4	36.80	34.42	14	0	5	0.00*	35.10
13	7	4	64.04	66.09	15	0	5	73.39	75.13
14	7	4	32.61	30.77	16	0	5	0.00*	19.43
15	7	4	12.88*	13.59	17	0	5	128.18	129.02
16	7	4	26.76	28.52	18	0	5	0.00*	9.17
17	7	4	62.09	65.36	19	0	5	93.04	93.11
18	7	4	35.68	40.49	20	0	5	0.00*	39.21
19	7	4	21.45*	20.94	21	0	5	21.16*	30.88
20	7	4	28.13	24.68	22	0	5	0.00*	18.47
0	8	4	113.29	109.67	23	0	5	21.51*	24.95
1	8	4	20.19*	21.85	24	0	5	0.00*	22.13
2	8	4	77.82	78.94	25	0	5	16.71*	20.27
3	8	4	38.10	35.26	26	0	5	35.41	36.29
4	8	4	53.06	45.67	27	0	5	7.75*	23.30
5	8	4	23.35*	19.10	0	1	5	210.91	207.60
6	8	4	19.98*	18.30	1	1	5	139.50	133.82
7	8	4	58.27	60.02	2	1	5	45.35	46.12
8	8	4	58.40	52.89	3	1	5	105.28	103.93
9	8	4	34.45	32.59	4	1	5	149.00	147.20
10	8	4	57.54	56.70	5	1	5	65.31	61.77
11	8	4	60.91	57.40	6	1	5	73.23	69.04
12	8	4	87.94	87.70	7	1	5	113.75	115.08
13	8	4	24.34*	23.38	8	1	5	38.59	37.44
14	8	4	35.06	39.28	9	1	5	174.42	175.30
15	8	4	44.44	42.21	10	1	5	51.74	57.03
16	8	4	51.99	54.21	11	1	5	29.89	33.02
17	8	4	7.71*	14.28	12	1	5	27.11	29.76
1	9	4	31.52	23.61	13	1	5	129.56	135.20
2	9	4	14.59*	16.52	14	1	5	82.01	81.76
3	9	4	25.59*	28.03	15	1	5	43.38	44.58
4	9	4	23.55*	34.97	16	1	5	88.12	88.43
5	9	4	26.97*	30.52	17	1	5	54.17	54.61
6	9	4	24.57*	29.08	18	1	5	28.60	25.68
7	9	4	0.00*	12.23	19	1	5	36.44	37.15

H	K	L	FO	FC	H	K	L	FO	FC
20	1	5	78.67	74.54	24	3	5	0.00*	17.45
21	1	5	0.00*	21.35	25	3	5	44.10	40.62
22	1	5	84.42	84.19	26	3	5	14.50*	6.04
23	1	5	97.96	98.12	1	4	5	88.64	87.91
24	1	5	46.84	48.00	2	4	5	31.34	32.38
25	1	5	6.61*	4.34	3	4	5	88.68	99.59
26	1	5	12.21*	10.33	4	4	5	17.70*	15.65
27	1	5	39.85	41.84	5	4	5	77.98	87.17
1	2	5	129.97	119.02	6	4	5	48.48	47.64
2	2	5	84.20	78.77	7	4	5	0.00*	10.32
3	2	5	132.26	131.89	8	4	5	50.61	49.71
4	2	5	87.31	81.73	9	4	5	44.93	39.00
5	2	5	106.05	106.04	10	4	5	89.87	88.62
6	2	5	102.27	106.59	11	4	5	75.17	74.62
7	2	5	20.29*	14.21	12	4	5	78.07	75.78
8	2	5	44.30	44.36	13	4	5	43.92	43.46
9	2	5	18.14*	26.60	14	4	5	48.00	47.67
10	2	5	60.08	61.44	15	4	5	73.93	74.24
11	2	5	108.75	113.77	16	4	5	14.09*	6.09
12	2	5	35.27	22.61	17	4	5	18.85*	21.70
13	2	5	46.32	43.92	18	4	5	18.37*	17.52
14	2	5	27.87	25.20	19	4	5	94.16	91.86
15	2	5	129.58	132.41	20	4	5	20.77*	25.50
16	2	5	63.43	60.34	21	4	5	7.83*	18.44
17	2	5	38.41	37.81	22	4	5	0.00*	14.03
18	2	5	39.14	38.77	23	4	5	80.78	80.52
19	2	5	129.63	125.80	24	4	5	37.29	35.53
20	2	5	47.30	51.04	25	4	5	34.91	35.22
21	2	5	42.28	39.67	0	5	5	107.60	107.24
22	2	5	18.23*	21.07	1	5	5	118.43	119.41
23	2	5	79.29	79.74	2	5	5	33.43	32.75
24	2	5	29.60	32.49	3	5	5	24.19	26.12
25	2	5	67.21	67.22	4	5	5	86.96	84.16
26	2	5	0.00*	18.71	5	5	5	99.70	97.19
27	2	5	51.06	52.00	6	5	5	51.66	54.95
0	3	5	150.73	131.77	7	5	5	58.53	50.51
1	3	5	272.46	269.23	8	5	5	130.66	128.83
3	3	5	182.74	172.46	9	5	5	99.02	97.23
4	3	5	45.45	34.52	10	5	5	11.10*	13.61
5	3	5	237.75	249.62	11	5	5	66.67	72.20
6	3	5	0.00*	33.33	12	5	5	87.80	88.42
7	3	5	41.51	37.09	13	5	5	84.20	82.97
8	3	5	52.37	48.68	14	5	5	31.00	28.76
9	3	5	280.92	298.85	15	5	5	20.63*	11.21
10	3	5	21.68*	20.53	16	5	5	36.25	40.23
11	3	5	167.24	160.70	17	5	5	32.45	26.78
12	3	5	51.10	48.18	18	5	5	38.40	41.36
13	3	5	238.51	247.81	19	5	5	29.16	28.08
14	3	5	37.76	33.68	20	5	5	17.05*	18.73
15	3	5	77.11	69.21	21	5	5	14.11*	16.45
16	3	5	51.47	49.06	22	5	5	37.44	34.39
17	3	5	80.84	87.73	23	5	5	82.14	80.51
18	3	5	36.49	33.68	1	6	5	52.58	47.96
19	3	5	68.26	66.14	2	6	5	29.55	28.10
20	3	5	30.63	28.72	3	6	5	67.52	61.39
21	3	5	64.37	63.64	4	6	5	46.94	49.77
22	3	5	27.40*	27.30	5	6	5	74.42	64.10
23	3	5	118.61	114.63	6	6	5	33.69	31.87

H	K	L	FO	FC	H	K	L	FO	FC
7	6	5	36.23	38.48	6	9	5	18.46*	22.78
8	6	5	54.55	56.14	7	9	5	37.21	38.38
9	6	5	36.14	34.75	8	9	5	17.58*	13.71
10	6	5	41.53	46.62	9	9	5	90.86	89.28
11	6	5	52.71	58.81	10	9	5	28.57	32.72
12	6	5	24.92*	27.28	11	9	5	56.73	61.61
13	6	5	8.55*	15.35	0	0	6	83.97	86.33
14	6	5	9.91*	15.37	1	0	6	89.35	93.46
15	6	5	52.09	58.16	2	0	6	136.93	130.41
16	6	5	29.86	25.11	3	0	6	31.12	30.01
17	6	5	33.29	35.93	4	0	6	24.83*	24.62
18	6	5	22.42*	18.28	5	0	6	45.41	44.82
19	6	5	71.85	72.50	6	0	6	15.88*	8.68
20	6	5	13.97*	10.26	7	0	6	75.73	83.41
21	6	5	12.92*	10.38	8	0	6	8.59*	5.90
22	6	5	15.76*	11.70	9	0	6	31.63	37.21
0	7	5	40.65	42.13	10	0	6	0.00*	18.84
1	7	5	112.73	112.02	11	0	6	108.73	117.53
2	7	5	16.78*	18.76	12	0	6	12.58*	25.03
3	7	5	37.94	35.65	13	0	6	42.85	50.70
4	7	5	5.85*	9.75	14	0	6	0.00*	32.32
5	7	5	76.75	83.64	15	0	6	67.68	67.93
6	7	5	0.00*	10.56	16	0	6	0.00*	8.92
7	7	5	47.76	49.72	17	0	6	0.00*	1.33
8	7	5	21.79*	20.54	18	0	6	34.48	35.68
9	7	5	107.25	112.61	19	0	6	8.39*	19.16
10	7	5	27.45	28.16	20	0	6	0.00*	14.58
11	7	5	71.30	70.68	21	0	6	78.90	94.92
12	7	5	12.27*	9.68	22	0	6	77.48	91.45
13	7	5	93.29	101.94	23	0	6	0.00*	9.51
14	7	5	35.91	36.04	24	0	6	0.00*	16.90
15	7	5	33.81	34.58	25	0	6	68.75	74.06
16	7	5	27.31	25.23	26	0	6	0.00*	24.08
17	7	5	14.20*	25.19	1	1	6	75.09	82.17
18	7	5	17.54*	19.37	2	1	6	148.32	142.57
19	7	5	29.85	30.49	3	1	6	69.92	83.64
1	8	5	48.40	50.74	4	1	6	69.97	72.44
2	8	5	43.26	46.75	5	1	6	86.49	93.17
3	8	5	41.23	44.65	6	1	6	79.97	90.07
4	8	5	30.50	31.23	7	1	6	52.20	58.51
5	8	5	52.41	62.90	8	1	6	37.93	33.46
6	8	5	35.32	35.51	9	1	6	46.49	49.81
7	8	5	14.05*	14.66	10	1	6	39.52	45.09
8	8	5	34.28	39.14	11	1	6	33.27	40.32
9	8	5	21.58*	33.25	12	1	6	39.16	38.13
10	8	5	26.59	24.84	13	1	6	49.13	46.14
11	8	5	54.20	54.31	14	1	6	29.69	30.63
12	8	5	0.00*	1.96	15	1	6	14.58*	13.25
13	8	5	36.06	39.51	16	1	6	33.91	33.86
14	8	5	24.93*	24.77	17	1	6	99.05	105.07
15	8	5	61.44	59.80	18	1	6	30.31	31.93
16	8	5	12.24*	9.48	19	1	6	62.91	64.82
0	9	5	22.08*	19.02	20	1	6	29.98	34.46
1	9	5	96.46	100.26	21	1	6	70.69	73.18
2	9	5	22.17*	26.54	22	1	6	24.89*	25.62
3	9	5	56.90	62.81	23	1	6	25.22*	24.14
4	9	5	26.97*	30.91	24	1	6	39.99	41.65
5	9	5	52.84	53.82	25	1	6	41.66	39.22

H	K	L	FO	FC
26	1	6	14.41*	23.36
0	2	6	144.55	155.89
1	2	6	150.52	153.87
2	2	6	135.36	133.03
3	2	6	191.25	200.66
4	2	6	88.96	87.62
5	2	6	71.81	80.80
6	2	6	68.01	71.10
7	2	6	217.17	239.42
8	2	6	96.63	103.02
9	2	6	57.36	60.67
10	2	6	115.08	119.82
11	2	6	191.66	203.96
12	2	6	96.95	96.36
13	2	6	96.15	97.27
14	2	6	102.19	100.47
15	2	6	76.38	76.80
16	2	6	56.34	56.92
17	2	6	38.99	42.08
18	2	6	78.34	81.73
19	2	6	14.91*	9.66
20	2	6	12.35*	16.76
21	2	6	84.34	85.70
22	2	6	66.75	72.61
23	2	6	41.59	41.31
24	2	6	25.79*	16.23
25	2	6	45.92	48.87
26	2	6	31.19	29.12
1	3	6	73.07	69.61
2	3	6	14.25*	20.70
3	3	6	122.69	119.82
4	3	6	14.83*	12.35
5	3	6	79.57	72.24
6	3	6	33.98	31.04
7	3	6	50.02	50.07
8	3	6	19.91*	23.81
9	3	6	42.91	49.21
10	3	6	76.28	77.18
11	3	6	29.83	26.50
12	3	6	17.10*	31.27
13	3	6	65.76	71.71
14	3	6	41.61	43.25
15	3	6	17.22*	16.70
16	3	6	73.50	78.37
17	3	6	102.48	104.57
18	3	6	18.01*	11.20
19	3	6	42.19	43.19
20	3	6	52.69	55.13
21	3	6	93.95	95.84
22	3	6	13.02*	21.61
23	3	6	25.26*	26.92
24	3	6	43.64	42.78
25	3	6	63.43	62.11
0	4	6	80.25	85.94
1	4	6	101.93	107.03
2	4	6	69.54	68.84
3	4	6	75.47	76.53
4	4	6	64.13	68.97
5	4	6	77.47	73.23
6	4	6	20.97*	18.44
7	4	6	118.04	119.24
8	4	6	106.77	110.89
9	4	6	30.75	23.89
10	4	6	23.95*	21.58
11	4	6	126.56	128.10
12	4	6	87.23	90.44
13	4	6	32.56	36.62
14	4	6	39.79	39.30
15	4	6	63.08	65.40
16	4	6	17.67*	17.62
17	4	6	18.85*	24.07
18	4	6	30.39	24.10
19	4	6	32.60	38.48
20	4	6	17.53*	20.60
21	4	6	75.96	84.15
22	4	6	35.46	36.07
23	4	6	5.94*	10.58
24	4	6	30.10	28.71
1	5	6	16.42*	24.91
2	5	6	14.13*	17.03
3	5	6	39.63	45.73
4	5	6	18.46*	16.07
5	5	6	35.56	39.68
6	5	6	38.50	42.94
7	5	6	37.91	37.06
8	5	6	24.90*	31.55
9	5	6	38.13	31.66
10	5	6	45.34	51.31
11	5	6	20.60*	24.88
12	5	6	42.37	38.14
13	5	6	53.52	55.35
14	5	6	39.89	46.85
15	5	6	26.62*	31.72
16	5	6	15.86*	20.78
17	5	6	91.30	94.33
18	5	6	11.66*	18.93
19	5	6	56.35	58.36
20	5	6	15.84*	8.37
21	5	6	85.64	88.19
22	5	6	18.47*	10.99
23	5	6	19.28*	15.99
0	6	6	56.27	56.85
1	6	6	107.65	104.01
2	6	6	59.73	65.30
3	6	6	109.29	110.07
4	6	6	26.43	22.98
5	6	6	39.41	39.02
6	6	6	12.91*	30.19
7	6	6	133.15	144.89
8	6	6	39.84	41.49
9	6	6	16.41*	2.29
10	6	6	59.96	63.74
11	6	6	106.05	111.58
12	6	6	33.46	37.40
13	6	6	38.64	37.76
14	6	6	37.66	37.52

H	K	L	FO	FC	H	K	L	FO	FC
15	6	6	72.00	77.45	9	0	7	11.36*	5.41
16	6	6	20.18*	11.23	10	0	7	34.18	33.61
17	6	6	32.10	26.58	11	0	7	24.12*	19.23
18	6	6	23.38*	21.50	12	0	7	34.46	30.24
19	6	6	28.14	29.84	13	0	7	0.00*	4.35
20	6	6	18.85*	11.49	14	0	7	44.41	49.88
21	6	6	73.28	73.17	15	0	7	0.00*	4.68
1	7	6	62.88	63.07	16	0	7	0.00*	33.73
2	7	6	28.20	22.47	17	0	7	76.14	79.64
3	7	6	66.30	68.52	18	0	7	0.00*	22.86
4	7	6	26.68*	25.15	19	0	7	63.15	68.83
5	7	6	59.45	59.91	20	0	7	0.00*	33.09
6	7	6	32.28	32.58	21	0	7	54.39	55.37
7	7	6	34.50	36.66	22	0	7	41.92	50.48
8	7	6	18.11*	8.92	23	0	7	29.56*	42.22
9	7	6	20.72*	27.04	24	0	7	43.52	51.34
10	7	6	32.46	30.54	25	0	7	0.00*	18.60
11	7	6	0.00*	12.79	0	1	7	235.61	243.23
12	7	6	29.84	28.40	1	1	7	24.59*	17.55
13	7	6	47.35	54.16	2	1	7	154.68	154.87
14	7	6	33.99	34.47	3	1	7	79.53	75.13
15	7	6	26.84*	29.14	4	1	7	112.51	111.44
16	7	6	39.15	44.57	5	1	7	116.18	115.23
17	7	6	56.17	61.43	6	1	7	64.35	62.52
18	7	6	15.39*	17.47	7	1	7	174.27	179.13
0	8	6	80.44	80.07	8	1	7	100.90	103.47
1	8	6	96.50	99.11	9	1	7	84.01	83.79
2	8	6	91.21	90.05	10	1	7	137.33	137.52
3	8	6	80.22	81.24	11	1	7	28.50	34.58
4	8	6	54.78	55.02	12	1	7	165.46	165.53
5	8	6	79.89	82.82	13	1	7	86.29	87.88
6	8	6	80.73	87.29	14	1	7	107.84	109.21
7	8	6	91.72	95.27	15	1	7	49.23	45.51
8	8	6	56.59	56.49	16	1	7	47.94	51.17
9	8	6	64.13	63.38	17	1	7	48.72	53.64
10	8	6	83.41	85.67	18	1	7	27.32*	34.22
11	8	6	116.62	119.10	19	1	7	8.22*	18.98
12	8	6	54.51	55.54	20	1	7	55.90	56.22
13	8	6	44.17	44.64	21	1	7	50.20	48.69
14	8	6	59.28	63.47	22	1	7	57.61	56.56
15	8	6	61.64	63.46	23	1	7	36.99	43.46
1	9	6	22.93*	30.59	24	1	7	73.30	74.90
2	9	6	12.15*	16.91	25	1	7	25.32*	35.10
3	9	6	35.26	36.43	1	2	7	61.81	62.49
4	9	6	15.95*	23.04	2	2	7	28.27	30.49
5	9	6	24.16*	30.40	3	2	7	121.03	122.85
6	9	6	25.93*	24.10	4	2	7	30.79	27.47
7	9	6	17.06*	22.70	5	2	7	107.16	102.94
8	9	6	0.00*	4.63	6	2	7	34.64	35.00
9	9	6	17.88*	5.91	7	2	7	51.95	50.40
10	9	6	24.04*	31.98	8	2	7	25.87	27.52
1	0	7	63.38	63.42	9	2	7	53.28	48.22
2	0	7	59.38	57.29	10	2	7	74.90	77.53
3	0	7	91.47	97.81	11	2	7	47.92	46.37
4	0	7	50.53	42.38	12	2	7	62.89	65.96
5	0	7	118.72	115.80	13	2	7	24.72*	27.00
6	0	7	0.00*	2.72	14	2	7	65.73	67.84
7	0	7	22.41*	30.99	15	2	7	29.20	35.64

H	K	L	FO	FC
16	2	7	32.04	32.32
17	2	7	59.79	60.17
18	2	7	50.09	52.68
19	2	7	80.66	81.25
20	2	7	45.13	45.53
21	2	7	44.35	43.26
22	2	7	59.78	59.93
23	2	7	25.12*	29.26
24	2	7	40.07	44.69
25	2	7	32.53	34.27
0	3	7	153.09	145.53
1	3	7	41.84	38.18
2	3	7	72.77	83.78
3	3	7	72.32	74.13
4	3	7	24.56	22.99
5	3	7	105.37	112.90
6	3	7	10.89*	18.09
7	3	7	187.54	189.33
8	3	7	37.68	32.05
9	3	7	106.79	113.62
10	3	7	104.60	114.56
11	3	7	99.80	104.24
12	3	7	82.75	84.83
13	3	7	39.94	45.13
14	3	7	59.21	57.13
15	3	7	31.96	30.51
16	3	7	17.70*	8.16
17	3	7	36.11	40.23
18	3	7	18.35*	11.08
19	3	7	38.53	37.32
20	3	7	13.37*	20.21
21	3	7	66.97	68.59
22	3	7	46.69	41.30
23	3	7	20.64*	14.00
24	3	7	44.83	46.23
1	4	7	25.35	18.91
2	4	7	18.53*	15.72
3	4	7	31.17	37.18
4	4	7	34.57	31.34
5	4	7	54.64	57.31
6	4	7	2.05*	9.12
7	4	7	38.66	36.11
8	4	7	38.92	37.47
9	4	7	38.64	38.29
10	4	7	26.04	23.72
11	4	7	15.31*	6.23
12	4	7	48.97	51.75
13	4	7	44.83	42.75
14	4	7	26.82*	31.72
15	4	7	48.40	46.94
16	4	7	16.07*	12.41
17	4	7	105.24	108.29
18	4	7	29.10	34.19
19	4	7	95.30	92.93
20	4	7	21.21*	27.40
21	4	7	67.03	69.65
22	4	7	46.01	48.06
23	4	7	36.97	34.09
0	5	7	107.17	110.80
1	5	7	23.27*	24.58
2	5	7	123.95	115.04
3	5	7	18.25*	14.37
4	5	7	32.56	38.18
5	5	7	36.61	42.94
6	5	7	40.85	36.53
7	5	7	74.70	73.06
8	5	7	0.00*	4.40
9	5	7	75.71	73.09
10	5	7	78.78	78.00
11	5	7	28.37	25.84
12	5	7	69.90	74.78
13	5	7	32.15	24.71
14	5	7	54.47	55.11
15	5	7	16.68*	14.13
16	5	7	0.00*	11.83
17	5	7	21.93*	11.86
18	5	7	9.81*	21.25
19	5	7	45.24	46.69
20	5	7	23.31*	14.79
21	5	7	55.78	55.07
1	6	7	29.67	27.52
2	6	7	0.00*	12.84
3	6	7	44.46	48.61
4	6	7	7.45*	12.56
5	6	7	49.40	44.00
6	6	7	13.00*	16.82
7	6	7	31.70	26.45
8	6	7	29.17	30.34
9	6	7	15.46*	12.12
11	6	7	31.34	35.85
12	6	7	34.82	36.22
13	6	7	37.62	36.24
14	6	7	33.29	34.22
15	6	7	47.85	52.85
16	6	7	28.01	24.31
17	6	7	59.00	59.12
18	6	7	14.79*	25.78
19	6	7	85.36	86.29
0	7	7	157.48	155.16
1	7	7	49.05	50.37
2	7	7	111.71	114.62
3	7	7	42.15	38.06
4	7	7	108.20	107.49
5	7	7	101.10	101.69
6	7	7	60.34	63.98
7	7	7	80.01	86.22
8	7	7	100.09	101.36
9	7	7	103.55	104.85
10	7	7	112.05	118.80
11	7	7	35.32	39.26
12	7	7	123.21	123.52
13	7	7	48.38	47.58
14	7	7	85.83	86.97
15	7	7	14.37*	17.21
16	7	7	57.88	57.47
17	7	7	25.07*	25.70

H	K	L	FO	FC	H	K	L	FO	FC
1	8	7	64.99	69.51	14	1	8	35.49	41.95
2	8	7	6.85*	7.06	15	1	8	54.33	55.66
3	8	7	59.70	67.60	16	1	8	31.72	30.50
4	8	7	13.21*	10.48	17	1	8	16.16*	21.98
5	8	7	36.61	41.00	18	1	8	32.00	33.15
6	8	7	9.90*	2.17	19	1	8	107.83	106.20
7	8	7	32.07	30.71	20	1	8	34.03	36.56
8	8	7	13.35*	24.71	21	1	8	17.59*	14.26
9	8	7	25.19*	26.55	22	1	8	45.07	46.28
10	8	7	31.33	29.63	23	1	8	63.54	63.30
11	8	7	20.44*	18.74	24	1	8	31.43	33.94
12	8	7	25.76*	31.05	0	2	8	76.78	77.07
13	8	7	19.75*	7.27	1	2	8	125.09	122.51
0	9	7	72.84	73.18	2	2	8	113.73	109.39
1	9	7	48.15	43.71	3	2	8	19.64*	11.04
2	9	7	71.38	71.02	4	2	8	53.04	60.66
3	9	7	59.37	61.04	5	2	8	173.44	171.26
4	9	7	37.87	38.78	6	2	8	107.13	99.18
5	9	7	6.07*	2.36	7	2	8	115.41	116.88
6	9	7	4.57*	17.23	8	2	8	43.34	41.86
7	9	7	74.12	78.76	9	2	8	180.25	182.82
0	0	8	105.64	109.85	10	2	8	92.57	92.52
1	0	8	210.05	206.24	11	2	8	57.46	56.17
2	0	8	93.99	90.28	12	2	8	78.51	79.66
3	0	8	101.86	95.39	13	2	8	106.63	107.97
4	0	8	105.12	90.23	14	2	8	48.20	49.25
5	0	8	214.33	216.31	15	2	8	29.09	36.39
6	0	8	41.57	41.86	16	2	8	50.35	48.09
7	0	8	7.28*	8.38	17	2	8	29.25	26.42
8	0	8	44.04	40.94	18	2	8	16.03*	19.58
9	0	8	209.51	208.04	19	2	8	47.53	43.33
10	0	8	106.89	110.34	20	2	8	41.27	40.95
11	0	8	127.26	124.00	21	2	8	27.54*	24.25
12	0	8	51.70	59.23	22	2	8	28.05	27.67
13	0	8	138.57	142.07	23	2	8	58.00	55.88
14	0	8	74.90	79.33	24	2	8	38.18	40.23
15	0	8	57.78	54.57	1	3	8	43.15	42.96
16	0	8	24.30*	46.93	2	3	8	24.89	28.37
17	0	8	71.54	70.92	3	3	8	58.27	55.81
18	0	8	0.00*	3.73	4	3	8	29.63	28.33
20	0	8	69.45	73.46	5	3	8	105.48	104.38
21	0	8	0.00*	0.52	6	3	8	55.13	58.17
22	0	8	0.00*	16.32	7	3	8	31.81	29.62
23	0	8	103.30	106.73	8	3	8	28.58	32.11
24	0	8	62.67	71.13	9	3	8	14.49*	22.37
1	1	8	109.15	101.35	10	3	8	22.17*	18.59
2	1	8	35.67	28.76	11	3	8	14.79*	18.41
3	1	8	77.55	81.48	12	3	8	42.05	45.69
4	1	8	55.91	51.57	13	3	8	6.61*	12.15
5	1	8	96.23	98.43	14	3	8	25.90*	15.95
6	1	8	54.35	49.80	15	3	8	65.27	66.96
7	1	8	96.61	94.38	16	3	8	21.90*	7.78
8	1	8	86.99	82.92	17	3	8	67.86	70.99
9	1	8	31.86	30.59	18	3	8	21.37*	24.07
10	1	8	12.88*	13.51	19	3	8	87.15	92.02
11	1	8	63.89	64.09	20	3	8	24.83*	29.47
12	1	8	37.62	38.09	21	3	8	45.21	42.56
13	1	8	47.00	49.64	22	3	8	15.23*	12.28

H	K	L	FO	FC	H	K	L	FO	FC
23	3	8	58.36	60.39	14	6	8	44.57	42.45
0	4	8	88.89	86.05	15	6	8	50.93	48.44
1	4	8	84.27	82.15	16	6	8	45.82	48.16
2	4	8	69.77	63.67	17	6	8	16.19*	22.90
3	4	8	36.46	35.03	18	6	8	7.30*	15.52
4	4	8	54.59	56.28	1	7	8	64.44	61.94
5	4	8	89.07	90.58	2	7	8	9.05*	19.62
6	4	8	37.64	33.38	3	7	8	65.85	68.80
7	4	8	77.75	78.62	4	7	8	38.56	39.38
8	4	8	38.49	38.64	5	7	8	53.49	52.80
9	4	8	114.52	116.17	6	7	8	0.00*	17.46
10	4	8	63.85	65.68	7	7	8	20.76*	19.52
11	4	8	14.60*	9.17	8	7	8	38.08	42.37
12	4	8	19.93*	21.45	9	7	8	23.18*	19.80
13	4	8	68.74	67.75	10	7	8	5.79*	12.97
14	4	8	49.36	51.34	11	7	8	14.32*	17.84
15	4	8	32.44	33.63	12	7	8	28.15*	30.65
16	4	8	10.43*	18.42	13	7	8	26.35*	28.76
17	4	8	8.13*	6.82	14	7	8	25.19*	27.75
18	4	8	41.43	42.91	15	7	8	48.74	45.03
19	4	8	53.48	59.21	0	8	8	65.93	64.48
20	4	8	18.35*	22.66	1	8	8	84.18	84.48
21	4	8	20.88*	27.05	2	8	8	49.71	54.60
22	4	8	12.86*	16.14	3	8	8	50.70	54.48
1	5	8	25.51*	26.89	4	8	8	23.78*	22.16
2	5	8	8.37*	12.84	5	8	8	97.39	104.36
3	5	8	18.80*	11.25	6	8	8	17.63*	26.01
4	5	8	14.63*	10.32	7	8	8	42.34	44.77
5	5	8	45.80	48.22	8	8	8	29.64*	24.32
6	5	8	21.74*	17.84	9	8	8	95.28	98.95
7	5	8	10.21*	14.37	10	8	8	40.96	46.12
8	5	8	21.73*	26.62	11	8	8	38.43	39.08
9	5	8	18.38*	24.23	1	0	9	63.63	56.88
10	5	8	20.24*	19.58	2	0	9	67.30	62.35
11	5	8	56.32	57.63	3	0	9	108.75	107.30
12	5	8	40.57	39.37	4	0	9	62.75	61.61
13	5	8	24.63*	26.30	5	0	9	55.11	63.31
14	5	8	12.29*	19.93	6	0	9	63.62	67.23
15	5	8	97.87	102.01	7	0	9	66.80	66.12
16	5	8	16.53*	9.90	8	0	9	37.36	36.19
17	5	8	63.01	63.67	9	0	9	50.24	44.98
18	5	8	23.24*	25.62	10	0	9	30.14*	30.60
19	5	8	94.58	94.80	11	0	9	26.08*	25.47
20	5	8	16.84*	23.11	12	0	9	26.15*	12.91
0	6	8	90.95	93.14	13	0	9	82.17	87.16
1	6	8	98.94	96.68	14	0	9	32.10*	38.84
2	6	8	74.84	74.48	15	0	9	12.81*	13.78
3	6	8	58.40	53.96	16	0	9	0.00*	20.24
4	6	8	40.07	45.24	17	0	9	98.37	104.30
5	6	8	111.05	113.74	18	0	9	4.00*	10.53
6	6	8	63.73	62.63	19	0	9	9.77*	2.77
7	6	8	63.76	61.96	20	0	9	0.00*	3.66
8	6	8	38.91	38.95	21	0	9	91.93	91.11
9	6	8	130.92	134.60	22	0	9	0.00*	3.47
10	6	8	74.87	72.45	23	0	9	68.35	65.95
11	6	8	63.62	60.90	1	1	9	197.07	185.37
12	6	8	76.46	76.87	2	1	9	143.41	137.25
13	6	8	90.54	91.99	3	1	9	161.81	158.74

H	K	L	FO	FC	H	K	L	FO	FC
4	1	9	73.10	71.01	16	3	9	23.82*	23.52
5	1	9	0.00*	16.01	17	3	9	26.74	24.89
6	1	9	51.31	54.20	18	3	9	15.96*	17.75
7	1	9	179.29	181.65	19	3	9	12.89*	13.93
8	1	9	107.14	103.32	20	3	9	31.64	33.07
9	1	9	51.53	50.05	21	3	9	47.40	44.34
10	1	9	61.54	60.99	22	3	9	8.66*	8.71
11	1	9	188.25	189.04	1	4	9	27.24	27.17
12	1	9	49.30	52.27	2	4	9	17.88*	14.24
13	1	9	74.51	73.93	3	4	9	39.58	42.61
14	1	9	48.67	46.76	4	4	9	33.32	33.60
15	1	9	109.04	109.51	5	4	9	44.57	44.99
16	1	9	48.11	47.63	6	4	9	20.59*	24.33
17	1	9	0.00*	16.97	7	4	9	16.26*	16.91
18	1	9	58.82	57.45	8	4	9	44.63	40.79
19	1	9	24.31*	27.97	9	4	9	41.15	40.93
20	1	9	59.00	57.67	10	4	9	30.46	32.34
21	1	9	100.24	98.49	11	4	9	34.08	33.94
22	1	9	46.93	46.90	12	4	9	63.03	62.35
23	1	9	35.67	34.15	13	4	9	56.39	60.89
1	2	9	80.92	78.51	14	4	9	20.03*	9.50
2	2	9	19.93*	17.89	15	4	9	42.81	43.39
3	2	9	115.31	109.56	16	4	9	30.28	30.11
4	2	9	92.38	92.48	17	4	9	81.34	85.40
5	2	9	79.00	79.95	18	4	9	35.45	36.13
6	2	9	69.47	67.02	19	4	9	52.79	50.76
7	2	9	67.79	67.41	20	4	9	0.00*	4.86
8	2	9	52.84	56.15	0	5	9	58.55	53.56
9	2	9	28.47	29.98	1	5	9	125.46	125.52
10	2	9	44.29	45.56	2	5	9	51.78	53.58
11	2	9	29.75	30.50	3	5	9	107.13	106.70
12	2	9	32.50	32.58	4	5	9	58.53	57.81
13	2	9	42.21	42.43	5	5	9	43.95	44.29
14	2	9	30.98	32.10	6	5	9	97.31	100.55
15	2	9	26.96*	29.56	7	5	9	108.09	112.11
16	2	9	25.88*	24.02	8	5	9	20.81*	14.07
17	2	9	73.69	72.38	9	5	9	78.30	80.69
18	2	9	38.13	35.62	10	5	9	78.03	84.15
19	2	9	49.69	44.56	11	5	9	132.63	131.22
20	2	9	21.74*	21.70	12	5	9	40.87	36.62
21	2	9	70.33	67.89	13	5	9	90.95	86.42
22	2	9	0.00*	11.20	14	5	9	33.08	34.72
0	3	9	36.48	32.75	15	5	9	54.35	54.52
1	3	9	77.94	74.15	16	5	9	49.75	47.35
2	3	9	44.73	37.40	17	5	9	35.37	34.49
3	3	9	70.19	67.28	18	5	9	0.00*	13.94
4	3	9	31.83	28.01	19	5	9	15.82*	19.19
5	3	9	77.64	78.93	1	6	9	38.06	32.16
6	3	9	19.15*	17.79	2	6	9	40.39	39.86
7	3	9	95.96	94.92	3	6	9	59.22	56.63
8	3	9	28.51	27.30	4	6	9	33.52	33.37
9	3	9	49.19	51.46	5	6	9	27.48	24.31
10	3	9	24.22*	21.18	6	6	9	36.21	35.78
11	3	9	104.17	106.32	7	6	9	24.28*	21.00
12	3	9	20.37*	20.74	8	6	9	33.19	36.93
13	3	9	14.06*	16.12	9	6	9	45.62	50.44
14	3	9	37.13	41.18	10	6	9	36.49	37.20
15	3	9	60.56	60.74	11	6	9	28.51*	31.47

H	K	L	FO	FC
12	6	9	22.27*	23.24
13	6	9	57.27	59.71
14	6	9	15.35*	11.97
15	6	9	31.73	31.54
16	6	9	20.50*	8.27
0	7	9	51.64	53.11
1	7	9	96.06	95.55
2	7	9	28.11*	24.48
3	7	9	90.55	90.90
4	7	9	23.49*	28.61
5	7	9	28.06*	28.57
6	7	9	19.43*	14.76
7	7	9	96.43	96.47
8	7	9	23.25*	18.55
9	7	9	23.77*	29.42
10	7	9	3.16*	6.70
11	7	9	108.69	109.02
12	7	9	29.28	27.26
13	7	9	48.49	49.21
1	8	9	51.00	52.20
2	8	9	27.75*	30.43
3	8	9	50.72	50.76
4	8	9	40.65	39.26
5	8	9	35.38	33.25
6	8	9	39.00	31.79
7	8	9	38.42	43.01
8	8	9	28.83*	29.94
0	0	10	124.64	114.87
1	0	10	63.12	60.90
2	0	10	125.57	126.05
3	0	10	47.31	45.64
4	0	10	83.96	83.11
5	0	10	70.24	68.80
6	0	10	75.51	79.01
7	0	10	34.06	29.65
8	0	10	93.72	90.46
9	0	10	84.56	87.00
10	0	10	88.90	90.62
11	0	10	22.41*	4.30
12	0	10	111.72	110.74
13	0	10	68.36	71.64
14	0	10	114.81	114.90
15	0	10	19.35*	14.80
16	0	10	12.33*	8.92
17	0	10	0.00*	2.34
18	0	10	82.41	80.93
19	0	10	38.52	38.71
20	0	10	14.11*	16.26
21	0	10	0.00*	38.46
22	0	10	110.41	108.04
1	1	10	58.54	59.12
2	1	10	68.59	66.07
3	1	10	107.95	99.04
4	1	10	40.74	39.21
5	1	10	74.92	70.94
6	1	10	80.97	78.63
7	1	10	22.13*	15.47
8	1	10	22.34*	24.60
9	1	10	9.45*	3.46
10	1	10	83.50	82.06
11	1	10	54.79	54.80
12	1	10	21.04*	23.25
13	1	10	24.34*	24.75
14	1	10	53.24	46.84
15	1	10	64.63	59.25
16	1	10	52.44	52.51
17	1	10	49.36	47.99
18	1	10	23.35*	23.07
19	1	10	57.45	54.77
20	1	10	47.03	46.23
21	1	10	15.59*	12.80
0	2	10	157.10	149.66
1	2	10	58.39	56.99
2	2	10	47.96	47.99
3	2	10	51.74	47.79
4	2	10	54.65	52.30
5	2	10	105.23	101.25
6	2	10	19.61*	17.68
7	2	10	40.22	39.26
8	2	10	43.49	39.48
9	2	10	90.05	91.92
10	2	10	50.81	49.34
11	2	10	40.39	40.73
12	2	10	50.59	52.29
13	2	10	96.81	92.79
14	2	10	70.61	72.50
15	2	10	49.46	52.34
16	2	10	28.78	27.88
17	2	10	51.30	49.71
18	2	10	49.44	44.71
19	2	10	15.85*	14.48
20	2	10	20.05*	16.92
21	2	10	40.30	37.68
1	3	10	70.10	70.35
2	3	10	38.89	35.32
3	3	10	68.68	69.37
4	3	10	34.09	32.46
5	3	10	50.06	53.23
6	3	10	50.13	50.48
7	3	10	34.72	31.77
8	3	10	48.14	49.74
9	3	10	0.00*	16.60
10	3	10	51.12	52.45
11	3	10	37.49	38.99
12	3	10	18.30*	15.43
13	3	10	24.15*	25.15
14	3	10	27.76*	29.82
15	3	10	25.17*	26.08
16	3	10	30.69	32.81
17	3	10	49.96	52.42
18	3	10	24.77*	20.42
19	3	10	46.10	45.48
20	3	10	30.79	26.69
0	4	10	153.40	155.62
1	4	10	57.63	50.96
2	4	10	74.74	66.46

H	K	L	FO	FC	H	K	L	FO	FC
3	4	10	21.01*	6.64	10	7	10	36.13	34.88
4	4	10	92.77	95.95	1	0	11	19.69*	20.42
5	4	10	55.12	51.44	2	0	11	25.87*	22.67
6	4	10	25.84*	19.20	3	0	11	7.41*	1.25
7	4	10	57.16	57.78	4	0	11	55.56	53.74
8	4	10	116.59	120.03	5	0	11	58.81	60.61
9	4	10	59.23	59.01	6	0	11	23.15*	30.93
10	4	10	66.43	65.32	7	0	11	21.25*	24.26
11	4	10	5.72*	13.47	8	0	11	69.83	68.06
12	4	10	106.36	104.94	9	0	11	39.83	42.52
13	4	10	48.43	44.45	10	0	11	20.38*	20.62
14	4	10	76.31	77.86	11	0	11	65.74	63.92
15	4	10	33.42	34.44	12	0	11	104.19	103.26
16	4	10	21.75*	20.03	13	0	11	28.48*	27.32
17	4	10	26.35*	13.23	14	0	11	29.44*	22.97
18	4	10	47.51	48.14	15	0	11	66.55	69.62
19	4	10	22.79*	14.02	16	0	11	37.82	42.67
1	5	10	46.96	45.39	17	0	11	20.04*	24.61
2	5	10	24.64*	21.19	18	0	11	50.26	49.35
3	5	10	49.14	44.61	19	0	11	24.73*	24.30
4	5	10	28.51	25.68	20	0	11	6.16*	23.02
5	5	10	0.00*	7.23	0	1	11	66.61	60.65
6	5	10	64.43	61.33	1	1	11	41.89	37.48
7	5	10	28.77	29.85	2	1	11	106.57	101.89
8	5	10	20.72*	21.23	3	1	11	44.97	39.81
9	5	10	53.82	52.58	4	1	11	20.30*	18.47
10	5	10	80.78	75.98	5	1	11	43.26	42.43
11	5	10	61.24	56.79	6	1	11	31.40	32.48
12	5	10	8.33*	18.53	7	1	11	26.71	21.06
13	5	10	29.93*	36.74	8	1	11	21.05*	23.90
14	5	10	73.03	71.29	9	1	11	65.25	65.47
15	5	10	34.12	33.36	10	1	11	69.16	70.54
16	5	10	47.70	43.96	11	1	11	8.10*	10.24
17	5	10	42.71	42.06	12	1	11	110.40	109.68
0	6	10	129.32	125.48	13	1	11	53.51	53.23
1	6	10	53.36	54.52	14	1	11	5.54*	20.21
2	6	10	83.18	82.52	15	1	11	21.39*	16.59
3	6	10	34.58	32.61	16	1	11	75.07	72.68
4	6	10	88.42	85.12	17	1	11	18.58*	22.54
5	6	10	35.42	39.34	18	1	11	46.62	43.03
6	6	10	45.95	44.46	19	1	11	38.34	35.75
7	6	10	52.35	54.33	1	2	11	64.56	62.83
8	6	10	76.22	77.61	2	2	11	26.78*	31.11
9	6	10	48.04	44.39	3	2	11	49.59	51.82
10	6	10	78.39	78.83	4	2	11	51.32	48.69
11	6	10	40.31	43.72	5	2	11	63.97	61.46
12	6	10	65.73	62.65	6	2	11	29.19	29.51
13	6	10	38.31	39.88	7	2	11	27.41	24.47
14	6	10	80.20	80.06	8	2	11	62.13	64.67
1	7	10	44.30	46.73	9	2	11	0.00*	10.97
2	7	10	18.73*	29.54	10	2	11	38.34	33.22
3	7	10	47.19	47.23	11	2	11	31.83	29.44
4	7	10	39.68	39.91	12	2	11	59.47	59.73
5	7	10	48.24	47.37	13	2	11	8.96*	10.30
6	7	10	52.38	48.89	14	2	11	19.20*	13.74
7	7	10	23.23*	19.06	15	2	11	64.38	64.07
8	7	10	22.59*	19.31	16	2	11	0.00*	13.90
9	7	10	26.85*	22.56	17	2	11	20.15*	15.90

H	K	L	FO	FC
18	2	11	25.97*	27.05
19	2	11	40.22	37.29
0	3	11	39.99	39.35
1	3	11	29.16	26.42
2	3	11	141.77	140.43
3	3	11	31.06	32.55
4	3	11	33.14	28.77
5	3	11	51.89	51.67
6	3	11	63.41	59.19
7	3	11	15.09*	7.17
8	3	11	26.34*	23.18
9	3	11	59.60	58.14
10	3	11	79.15	74.45
11	3	11	24.41*	18.32
12	3	11	85.95	85.58
13	3	11	70.33	70.32
14	3	11	38.51	36.28
15	3	11	31.88	25.78
16	3	11	57.64	54.28
17	3	11	52.91	51.37
18	3	11	10.94*	8.17
1	4	11	72.03	74.36
2	4	11	20.09*	27.53
3	4	11	36.47	37.70
4	4	11	57.65	56.35
5	4	11	47.17	48.98
6	4	11	27.81	26.41
7	4	11	22.70*	20.28
8	4	11	70.45	67.82
9	4	11	37.59	38.02
10	4	11	0.00*	16.83
11	4	11	50.68	51.12
12	4	11	69.60	63.79
13	4	11	14.75*	13.48
14	4	11	19.91*	10.04
15	4	11	47.00	42.01
16	4	11	27.71*	26.31
0	5	11	80.84	74.30
1	5	11	83.08	84.49
2	5	11	144.67	144.67
3	5	11	57.16	57.08
4	5	11	46.18	42.22
5	5	11	92.07	97.47
6	5	11	66.43	70.04
7	5	11	31.83	26.73
8	5	11	60.61	58.28
9	5	11	82.46	85.33
10	5	11	87.87	91.44
11	5	11	51.34	50.83
12	5	11	96.48	98.50
13	5	11	58.12	61.08
14	5	11	37.14	43.58
1	6	11	48.52	52.43
2	6	11	20.99*	20.11
3	6	11	38.45	41.20
4	6	11	44.26	46.30
5	6	11	37.07	39.51
6	6	11	38.86	39.13
7	6	11	14.74*	4.39
8	6	11	42.50	43.83
9	6	11	15.13*	11.98
10	6	11	27.97	25.16
11	6	11	32.76	32.63
0	7	11	32.09	30.90
1	7	11	10.67*	11.56
2	7	11	49.40	49.25
3	7	11	31.09	27.54
4	7	11	11.93*	18.94
5	7	11	16.62*	8.52
0	0	12	88.21	89.30
1	0	12	70.03	70.34
2	0	12	43.68	42.48
3	0	12	66.44	64.27
4	0	12	34.50	32.61
5	0	12	18.26*	11.77
6	0	12	18.87*	33.37
7	0	12	48.22	49.22
8	0	12	32.10	30.30
9	0	12	30.88*	26.55
10	0	12	31.67*	29.10
11	0	12	70.94	68.46
12	0	12	40.88	37.62
13	0	12	60.68	61.34
14	0	12	78.70	79.78
15	0	12	40.48	42.06
16	0	12	69.87	65.79
17	0	12	22.83*	10.65
1	1	12	23.61*	26.30
2	1	12	19.53*	14.09
3	1	12	26.25*	26.28
4	1	12	50.87	54.19
5	1	12	17.65*	7.27
6	1	12	31.41	32.27
7	1	12	11.56*	4.12
8	1	12	42.95	44.74
9	1	12	52.54	52.29
10	1	12	79.88	76.40
11	1	12	21.85*	19.19
12	1	12	57.61	56.60
13	1	12	54.97	58.87
14	1	12	40.04	39.92
15	1	12	15.31*	7.67
16	1	12	16.85*	13.36
17	1	12	46.62	46.90
0	2	12	77.73	75.96
1	2	12	98.98	98.66
2	2	12	79.41	78.45
3	2	12	62.60	60.74
4	2	12	58.87	58.06
5	2	12	32.70	31.21
6	2	12	40.40	38.82
7	2	12	55.41	50.56
8	2	12	72.35	73.33
9	2	12	51.70	50.91
10	2	12	20.47*	10.71
11	2	12	94.30	95.10

H	K	L	FO	FC	H	K	L	FO	FC
12	2	12	49.06	49.47	5	0	13	21.97*	6.37
13	2	12	41.90	40.41	6	0	13	47.39	42.72
14	2	12	53.01	55.87	7	0	13	51.61	51.75
15	2	12	68.89	68.70	8	0	13	60.03	59.06
16	2	12	58.11	56.41	9	0	13	35.46	35.91
17	2	12	23.51*	14.07	10	0	13	57.32	59.35
1	3	12	41.74	45.93	11	0	13	45.83	43.61
2	3	12	33.58	29.27	12	0	13	46.06	45.84
3	3	12	72.59	73.49	13	0	13	23.08*	17.30
4	3	12	33.58	35.56	14	0	13	64.60	64.08
5	3	12	26.99	24.45	15	0	13	23.92*	20.93
6	3	12	53.74	52.47	0	1	13	142.19	147.71
7	3	12	35.66	37.33	1	1	13	84.18	84.00
8	3	12	8.36*	12.63	2	1	13	31.28	25.22
9	3	12	28.14*	25.47	3	1	13	58.47	54.64
10	3	12	57.51	57.77	4	1	13	80.31	81.12
11	3	12	27.70*	26.10	5	1	13	59.21	61.28
12	3	12	30.84	31.41	6	1	13	37.39	39.56
13	3	12	46.65	45.95	7	1	13	50.30	52.91
14	3	12	28.72*	31.15	8	1	13	52.03	49.78
15	3	12	20.19*	28.61	9	1	13	55.42	56.96
0	4	12	125.23	124.80	10	1	13	73.99	74.72
1	4	12	126.89	125.94	11	1	13	76.95	75.19
2	4	12	51.70	53.52	12	1	13	16.29*	4.13
3	4	12	101.46	100.10	13	1	13	54.51	56.77
4	4	12	75.76	77.50	14	1	13	91.76	90.10
5	4	12	57.12	56.42	1	2	13	36.69	36.63
6	4	12	39.29	35.82	2	2	13	31.96	30.57
7	4	12	87.71	90.73	3	2	13	38.64	32.10
8	4	12	40.69	37.96	4	2	13	21.46*	16.28
9	4	12	77.19	73.56	5	2	13	23.70*	26.59
10	4	12	22.68*	21.72	6	2	13	30.78	31.96
11	4	12	115.31	115.36	7	2	13	0.00*	6.59
12	4	12	22.37*	28.56	8	2	13	28.18	25.79
13	4	12	71.80	69.04	9	2	13	24.85*	17.36
14	4	12	47.00	42.79	10	2	13	52.78	55.71
1	5	12	36.49	30.50	11	2	13	32.57	31.04
2	5	12	31.96	33.26	12	2	13	30.68	30.36
3	5	12	45.66	40.04	13	2	13	31.00	26.47
4	5	12	55.62	54.03	14	2	13	65.37	66.38
5	5	12	19.91*	7.39	0	3	13	118.76	119.58
6	5	12	46.69	42.92	1	3	13	79.55	77.46
7	5	12	18.98*	12.52	2	3	13	22.45*	31.25
8	5	12	37.44	39.16	3	3	13	66.54	66.79
9	5	12	39.34	41.59	4	3	13	83.02	82.29
10	5	12	56.51	55.85	5	3	13	40.33	41.59
11	5	12	0.00*	9.49	6	3	13	36.98	36.36
0	6	12	60.14	55.80	7	3	13	36.18	33.74
1	6	12	69.38	68.89	8	3	13	56.92	59.57
2	6	12	50.65	50.29	9	3	13	64.04	65.10
3	6	12	39.34	38.11	10	3	13	56.48	56.15
4	6	12	16.13*	16.02	11	3	13	56.65	57.64
5	6	12	29.11	24.54	12	3	13	25.77*	25.10
6	6	12	24.96*	27.36	1	4	13	33.86	28.10
1	0	13	0.00*	0.46	2	4	13	46.20	44.62
2	0	13	40.36	42.40	3	4	13	16.90*	21.65
3	0	13	18.92*	0.80	4	4	13	21.37*	26.94
4	0	13	28.41*	25.74	5	4	13	43.56	37.97

H	K	L	FO	FC	H	K	L	FO	FC
6	4	13	50.60	47.09	9	1	14	28.22*	26.08
7	4	13	0.00*	11.01	10	1	14	35.12	29.92
8	4	13	37.43	32.68	11	1	14	13.81*	22.60
9	4	13	25.69*	27.71	0	2	14	55.99	55.33
10	4	13	52.71	50.34	1	2	14	35.82	32.38
0	5	13	113.69	116.85	2	2	14	120.59	124.71
1	5	13	63.51	63.77	3	2	14	43.18	48.58
2	5	13	53.83	49.73	4	2	14	41.13	43.67
3	5	13	66.36	67.94	5	2	14	42.78	38.00
4	5	13	60.37	60.41	6	2	14	57.05	61.03
5	5	13	29.02*	33.03	7	2	14	35.48	42.21
6	5	13	17.24*	23.15	8	2	14	48.92	53.94
0	0	14	30.83*	22.21	9	2	14	41.11	43.21
2	0	14	159.19	162.28	1	3	14	33.45	31.37
3	0	14	12.20*	9.24	2	3	14	15.22*	13.50
4	0	14	0.00*	11.85	3	3	14	8.52*	8.90
5	0	14	25.83*	13.78	4	3	14	41.00	37.37
6	0	14	53.70	50.84	5	3	14	34.22	31.76
7	0	14	8.19*	21.71	6	3	14	0.00*	6.17
8	0	14	36.25	38.02	7	3	14	10.46*	17.52
9	0	14	19.50*	2.47	0	4	14	26.05*	24.77
10	0	14	32.53*	33.07	1	4	14	40.09	35.15
11	0	14	21.29*	20.11	2	4	14	107.89	109.38
1	1	14	22.09*	18.64	1	0	15	37.48	38.85
2	1	14	30.56	21.43	2	0	15	28.89*	24.62
3	1	14	7.68*	13.42	3	0	15	15.94*	13.05
4	1	14	37.62	37.02	4	0	15	26.90*	24.33
5	1	14	17.61*	5.94	0	1	15	118.59	122.43
6	1	14	20.73*	17.88	1	1	15	67.28	67.44
7	1	14	8.38*	14.98	2	1	15	40.12	38.59
8	1	14	41.38	37.11	3	1	15	50.36	47.71

* DENOTES AN UNOBSERVED REFLECTION

1,3,7-Trimethyl-2,6-dioxypurine Hydrochloride Dihydrate (Caffeine Hydrochloride Dihydrate)

Anthony Mercer and James Trotter.

Observed and calculated structure amplitudes

(reflections with intensity < $3\sigma(I)$ are marked with an asterisk).

The following planes which had $|Fo-Fc| > 3\ (F)$ were given zero weight in the final stages of refinement due to suspected instrumental errors.

h	k	l	Fo	Fc
-1	0	2	70.72	91.91
-1	4	2	6.87	0.36
-7	5	4	4.78	0.20
1	2	16	3.87	0.93
-3	6	12	4.22	1.20

H	K	L	FO	FC	WEIGHT
-13	0	2	10.05	9.88	5.67
-13	0	4	8.14	8.34	5.44
-13	0	6	7.66	7.79	5.72
-13	0	8	12.23	12.89	4.92
-13	0	10	11.23	12.00	5.11
-13	0	12	9.62	10.06	6.05
-13	0	14	13.42	14.30	4.15
-13	0	16	8.44	8.62	5.92
-12	0	2	6.99	6.94	6.37
-12	0	4	15.55	15.51	3.75
-12	0	6	16.58	16.18	3.68
-12	0	8	14.42	15.75	4.20
-12	0	10	3.51*	4.77	0.23
-12	0	12	13.95	13.85	4.35
-12	0	14	7.32	7.40	5.42
-12	0	16	0.95*	1.17	0.03
-12	0	18	18.60	20.11	2.79
-11	0	2	8.13	7.29	6.24
-11	0	4	6.23	5.64	7.01
-11	0	6	16.67	16.79	3.50
-11	0	8	10.88	11.57	4.50
-11	0	10	10.36	10.67	4.89
-11	0	12	24.26	24.19	2.04
-11	0	14	10.93	11.23	5.95
-11	0	16	9.92	9.40	6.57
-11	0	18	6.14	6.11	6.01
-10	0	2	11.10	10.69	5.01
-10	0	4	3.35*	1.53	0.33
-10	0	6	12.68	13.33	4.97
-10	0	8	4.34	5.02	3.46
-10	0	10	16.47	17.06	3.99
-10	0	12	4.51	4.07	5.50
-10	0	14	11.32	11.54	5.80
-10	0	16	12.93	13.85	4.59
-10	0	18	4.91	4.70	4.18
-9	0	2	10.63	10.46	6.22
-9	0	4	31.79	32.17	1.34
-9	0	6	3.25	2.43	3.95
-9	0	8	28.52	28.51	1.60
-9	0	10	7.23	6.82	7.41
-9	0	12	4.37	3.23	3.33
-9	0	14	19.88	20.48	2.94
-9	0	16	14.73	15.51	3.86
-9	0	18	20.02	19.78	2.83
-8	0	2	3.41	4.10	3.91
-8	0	4	34.93	36.94	1.13
-8	0	6	3.54	3.96	6.21
-8	0	8	6.02	5.97	7.71
-8	0	10	3.69	1.95	6.87
-8	0	12	19.78	20.08	2.92
-8	0	14	2.66*	1.83	0.15
-8	0	16	18.53	19.29	3.20
-8	0	18	12.39	12.30	4.87
-7	0	2	19.17	19.88	3.18
-7	0	4	38.70	39.06	0.95
-7	0	6	1.34*	0.82	0.10
-7	0	8	24.63	24.35	2.13
-7	0	10	53.74	54.29	0.50
-7	0	12	22.77	23.75	2.43
-7	0	14	21.90	22.56	2.41
-7	0	16	2.11*	1.24	0.12
-7	0	18	8.15	7.54	6.53
-6	0	2	14.14	14.63	5.24
-6	0	4	64.77	66.43	0.35
-6	0	6	4.34	4.81	5.94
-6	0	8	32.95	33.54	1.30
-6	0	10	22.36	22.22	2.54
-6	0	12	11.79	11.80	4.82
-6	0	14	24.37	24.45	2.08
-6	0	16	22.89	23.11	2.38
-6	0	18	6.79	6.58	6.04
-5	0	2	20.45	20.14	3.06
-5	0	4	41.05	41.75	0.86
-5	0	6	6.11	6.05	8.19
-5	0	8	3.86	4.33	6.30
-5	0	10	32.63	30.23	1.23
-5	0	12	20.41	20.09	2.94
-5	0	14	27.16	27.61	1.72
-5	0	16	4.12	5.05	3.26
-5	0	18	6.75	6.65	5.06
-4	0	2	44.36	45.75	0.74
-4	0	4	4.31	4.57	11.84
-4	0	6	34.72	35.47	1.18
-4	0	8	86.04	87.24	0.20
-4	0	10	33.24	33.44	1.27
-4	0	12	18.81	19.16	3.39
-4	0	14	19.34	19.09	3.13
-4	0	16	3.26*	0.70	0.36
-4	0	18	5.48	4.86	5.35
-3	0	2	72.30	73.10	0.28
-3	0	4	37.51	36.99	1.03
-3	0	6	78.09	79.28	0.24
-3	0	8	20.26	20.56	3.04
-3	0	10	15.46	14.86	4.63
-3	0	12	1.50*	1.61	0.09
-3	0	14	21.49	21.09	2.75
-3	0	16	6.28	6.45	4.33
-3	0	18	17.82	17.52	3.55
-2	0	2	1.84*	0.72	0.60
-2	0	4	47.36	52.90	0.59
-2	0	6	32.74	32.20	1.33
-2	0	8	6.31	6.91	8.53
-2	0	10	2.80*	2.42	0.39
-2	0	12	7.64	7.10	7.14
-2	0	14	8.78	8.85	6.55
-2	0	16	10.30	9.58	6.93
-2	0	18	4.12	4.09	3.49
-1	0	4	3.55	3.61	10.71
-1	0	6	112.12	117.39	0.12
-1	0	8	24.86	25.11	2.16
-1	0	10	39.15	39.24	0.94
-1	0	12	4.20	3.73	5.01
-1	0	14	22.83	23.73	2.28
-1	0	16	8.24	7.30	6.29
-1	0	18	5.36	4.56	5.63
0	0	2	52.74	50.94	0.52

H	K	L	FO	FC	WEIGHT
0	0	4	15.58	14.94	3.55
0	0	6	50.51	51.12	0.55
0	0	8	34.36	32.73	1.16
0	0	10	34.33	32.48	1.18
0	0	12	36.91	35.04	1.02
0	0	14	45.24	44.42	0.69
0	0	16	8.74	8.01	4.47
0	0	18	7.71	7.10	7.41
1	0	0	9.31	9.95	2.10
1	0	2	8.85	6.89	4.91
1	0	4	74.64	74.39	0.27
1	0	6	30.66	29.44	1.48
1	0	8	3.64	3.97	5.47
1	0	10	46.32	45.92	0.68
1	0	12	33.14	32.58	1.25
1	0	14	15.49	15.48	3.89
1	0	16	7.70	7.46	6.22
2	0	0	72.67	72.05	0.27
2	0	2	36.94	36.31	1.05
2	0	4	63.60	62.55	0.36
2	0	6	23.62	25.28	2.34
2	0	8	12.50	11.91	5.58
2	0	10	8.64	8.43	5.76
2	0	12	9.98	9.93	5.39
2	0	14	5.86	4.06	6.88
2	0	16	6.74	6.00	7.05
3	0	0	108.82	96.59	0.13
3	0	2	20.69	18.99	2.95
3	0	4	19.82	19.22	3.17
3	0	6	17.44	17.65	3.76
3	0	8	9.57	8.62	7.18
3	0	10	5.51	5.34	3.59
3	0	12	23.13	21.02	2.34
3	0	14	12.97	12.28	5.25
4	0	0	6.49	7.70	3.03
4	0	2	8.25	8.30	8.75
4	0	4	31.39	30.74	1.40
4	0	6	26.59	26.33	1.85
4	0	8	24.63	24.11	2.12
4	0	10	28.99	28.21	1.53
4	0	12	21.67	20.56	2.46
4	0	14	4.84	3.49	6.25
5	0	0	21.88	20.92	2.61
5	0	2	89.93	83.51	0.18
5	0	4	20.84	19.48	2.86
5	0	6	6.06	5.83	6.02
5	0	8	3.44*	2.87	0.23
5	0	10	4.91	4.74	4.00
5	0	12	10.53	10.70	5.39
6	0	0	14.09	14.36	4.90
6	0	2	20.34	20.03	2.96
6	0	4	27.68	26.86	1.76
6	0	6	23.32	24.00	2.20
6	0	8	2.49*	1.52	0.15
6	0	10	9.30	8.76	6.37
6	0	12	2.61*	1.02	0.22
7	0	0	14.37	14.52	4.98
7	0	2	21.09	19.26	2.75
7	0	4	27.69	26.79	1.72
7	0	6	16.17	16.77	3.56
7	0	8	0.00*	0.92	0.00
7	0	10	11.62	10.73	5.55
8	0	0	7.03	6.02	6.69
8	0	2	29.22	28.45	1.53
8	0	4	12.26	12.64	4.28
8	0	6	13.65	12.86	4.64
8	0	8	4.11	4.09	3.12
8	0	10	3.14*	2.65	0.33
9	0	0	19.54	19.39	2.97
9	0	2	10.11	10.14	5.36
9	0	4	1.91*	0.23	0.09
9	0	6	15.44	14.60	4.11
9	0	8	2.46*	2.32	0.18
10	0	0	6.19	6.29	4.21
10	0	2	0.00*	0.88	0.00
10	0	4	3.16*	0.43	0.40
10	0	6	2.49*	0.59	0.28
11	0	0	4.34	4.09	2.70
11	0	2	19.14	18.24	2.98
11	0	4	1.98*	1.63	0.11
12	0	0	2.32*	1.23	0.18
12	0	2	6.39	6.72	7.10
13	0	0	2.88*	2.63	0.26
-13	1	1	2.17*	2.49	0.14
-13	1	2	7.90	7.89	6.10
-13	1	3	1.55*	0.18	0.07
-13	1	4	6.05	6.57	4.28
-13	1	5	7.97	8.50	4.46
-13	1	6	6.04	5.47	5.79
-13	1	7	3.62	0.57	4.28
-13	1	8	4.09	3.59	3.54
-13	1	9	6.66	6.83	4.93
-13	1	10	3.33*	0.70	0.29
-13	1	11	15.72	17.03	3.46
-13	1	12	7.75	7.85	5.73
-13	1	13	9.65	9.77	6.13
-13	1	14	8.67	9.06	5.65
-13	1	15	5.52	6.35	4.46
-13	1	16	4.60	4.90	4.03
-13	1	17	6.91	7.06	6.16
-12	1	1	4.84	3.69	6.50
-12	1	2	1.37*	0.03	0.06
-12	1	3	2.18*	1.74	0.10
-12	1	4	2.72*	0.52	0.19
-12	1	5	8.24	8.05	5.17
-12	1	6	4.84	3.49	3.96
-12	1	7	7.95	9.39	3.63
-12	1	8	3.65	1.66	3.75
-12	1	9	7.07	6.61	5.66
-12	1	10	6.61	6.19	6.98
-12	1	11	3.29*	2.34	0.25
-12	1	12	7.30	6.53	5.92
-12	1	13	5.87	5.08	6.85
-12	1	14	8.18	8.27	5.48
-12	1	15	8.56	7.80	8.14
-12	1	16	3.44	0.70	4.64

H	K	L	FO	FC	WEIGHT
-12	1	17	3.06*	1.87	0.26
-12	1	18	6.05	6.03	5.96
-11	1	1	11.79	11.13	6.21
-11	1	2	4.80	4.14	3.83
-11	1	3	2.44*	0.99	0.14
-11	1	4	11.12	11.22	4.64
-11	1	5	11.31	11.97	4.72
-11	1	6	4.56	5.94	2.42
-11	1	7	9.06	9.12	5.39
-11	1	8	3.34	1.82	3.47
-11	1	9	3.78	1.23	4.15
-11	1	10	2.51*	1.14	0.16
-11	1	11	4.68	2.82	5.29
-11	1	12	5.82	5.44	4.89
-11	1	13	13.32	13.33	4.71
-11	1	14	5.92	5.76	3.38
-11	1	15	9.94	10.51	4.94
-11	1	16	5.21	3.59	6.75
-11	1	17	10.53	10.88	5.06
-11	1	18	5.14	4.25	6.50
-10	1	1	16.20	15.74	3.55
-10	1	2	9.70	9.49	6.26
-10	1	3	5.19	5.32	4.83
-10	1	4	8.79	8.70	5.07
-10	1	5	26.04	25.17	1.85
-10	1	6	8.30	8.81	5.16
-10	1	7	14.96	13.90	4.23
-10	1	8	6.77	5.52	6.37
-10	1	9	18.72	18.84	3.13
-10	1	10	12.00	12.08	4.86
-10	1	11	24.72	25.78	2.01
-10	1	12	2.24*	1.11	0.14
-10	1	13	3.30*	1.98	0.26
-10	1	14	8.25	7.84	5.14
-10	1	15	16.71	16.53	3.79
-10	1	16	7.81	7.22	4.30
-10	1	17	2.38*	0.86	0.16
-10	1	18	11.40	11.55	5.82
-9	1	1	19.66	19.49	2.84
-9	1	2	2.59*	3.59	0.13
-9	1	3	13.97	13.34	4.64
-9	1	4	2.50*	1.96	0.18
-9	1	5	4.00	3.23	3.55
-9	1	6	13.20	12.40	5.34
-9	1	7	17.55	17.55	3.55
-9	1	8	8.50	7.27	6.46
-9	1	9	12.57	14.17	5.08
-9	1	10	16.01	16.20	3.80
-9	1	11	11.61	11.09	5.42
-9	1	12	7.41	7.46	5.17
-9	1	13	4.32	4.35	2.71
-9	1	14	5.28	4.66	4.26
-9	1	15	15.65	15.38	4.23
-9	1	16	12.32	12.33	5.33
-9	1	17	10.98	10.94	5.29
-9	1	18	3.38*	2.31	0.31
-8	1	1	16.66	15.84	3.85
-8	1	2	4.48	3.80	4.88
-8	1	3	8.08	8.66	6.78
-8	1	4	26.71	25.01	1.86
-8	1	5	18.40	18.75	3.37
-8	1	6	10.89	10.26	5.70
-8	1	7	12.72	12.84	6.00
-8	1	8	0.74*	2.17	0.02
-8	1	9	8.04	8.25	6.37
-8	1	10	28.12	27.37	1.65
-8	1	11	23.64	23.50	2.26
-8	1	12	1.44*	3.37	0.04
-8	1	13	8.87	9.51	4.92
-8	1	14	16.74	16.91	3.57
-8	1	15	5.57	4.53	4.48
-8	1	16	16.63	16.90	3.54
-8	1	17	4.14	1.94	3.76
-8	1	18	3.88	4.29	2.64
-7	1	1	24.72	23.64	2.11
-7	1	2	18.80	18.56	3.32
-7	1	3	13.86	13.97	4.86
-7	1	4	9.18	8.89	7.45
-7	1	5	27.93	28.80	1.74
-7	1	6	12.56	12.40	5.98
-7	1	7	4.93	5.09	6.10
-7	1	8	29.21	29.05	1.60
-7	1	9	13.58	13.05	5.55
-7	1	10	18.00	18.22	3.55
-7	1	11	25.24	25.89	2.00
-7	1	12	8.04	8.14	6.62
-7	1	13	9.43	9.59	6.10
-7	1	14	3.81	2.51	3.26
-7	1	15	13.33	12.93	4.75
-7	1	16	7.85	8.19	5.04
-7	1	17	2.46*	1.09	0.16
-7	1	18	6.45	6.05	6.04
-6	1	1	34.05	32.91	1.20
-6	1	2	27.72	27.49	1.75
-6	1	3	48.63	46.29	0.61
-6	1	4	15.84	15.81	4.28
-6	1	5	16.17	16.21	4.39
-6	1	6	11.17	11.60	6.83
-6	1	7	44.28	46.90	0.73
-6	1	8	2.13*	1.60	0.23
-6	1	9	11.41	10.53	6.68
-6	1	10	13.46	11.94	5.41
-6	1	11	3.61	3.76	4.11
-6	1	12	1.83*	0.49	0.12
-6	1	13	14.39	13.97	4.54
-6	1	14	3.34*	1.22	0.35
-6	1	15	21.53	22.11	2.68
-6	1	16	7.38	6.75	7.29
-6	1	17	16.63	17.04	3.65
-6	1	18	6.67	6.37	6.14
-5	1	1	23.27	22.58	2.42
-5	1	2	12.00	11.88	6.40
-5	1	3	23.86	24.50	2.30
-5	1	4	16.12	15.28	4.48
-5	1	5	16.10	16.32	4.43
-5	1	6	6.28	6.11	8.25

H	K	L	FO	FC	WEIGHT
-5	1	7	31.71	32.24	1.38
-5	1	8	13.06	13.11	5.74
-5	1	9	7.70	6.73	8.34
-5	1	10	15.24	15.16	4.61
-5	1	11	19.93	20.23	3.08
-5	1	12	4.54	4.55	4.65
-5	1	13	7.90	7.79	6.16
-5	1	14	3.26*	3.35	0.22
-5	1	15	10.28	10.45	5.96
-5	1	16	14.10	13.58	4.73
-5	1	17	15.37	15.00	4.11
-5	1	18	4.64	2.84	5.70
-4	1	1	48.32	48.82	0.63
-4	1	2	116.47	115.24	0.11
-4	1	3	39.41	38.98	0.94
-4	1	4	39.68	37.42	0.93
-4	1	5	7.19	7.71	10.56
-4	1	6	33.43	33.31	1.26
-4	1	7	54.85	56.98	0.49
-4	1	8	6.40	6.72	8.63
-4	1	9	14.67	14.83	5.07
-4	1	10	28.00	26.18	1.77
-4	1	11	36.66	37.75	1.04
-4	1	12	20.59	20.87	2.93
-4	1	13	3.00*	3.47	0.23
-4	1	14	11.61	10.88	5.90
-4	1	15	17.15	17.50	3.49
-4	1	16	2.68*	3.02	0.13
-4	1	17	12.61	11.72	5.38
-4	1	18	1.75*	2.80	0.07
-3	1	1	176.28	177.91	0.05
-3	1	2	25.74	23.28	2.11
-3	1	3	75.86	73.93	0.26
-3	1	4	37.51	38.48	1.02
-3	1	5	18.74	18.11	3.79
-3	1	6	25.19	25.02	2.15
-3	1	7	41.41	42.89	0.84
-3	1	8	8.82	8.28	7.46
-3	1	9	14.82	13.61	5.01
-3	1	10	20.95	19.77	2.88
-3	1	11	29.82	30.73	1.53
-3	1	12	20.75	20.47	2.87
-3	1	13	7.56	7.73	5.95
-3	1	14	21.57	21.51	2.49
-3	1	15	26.04	26.40	1.87
-3	1	16	16.43	15.99	4.02
-3	1	17	9.56	8.96	5.45
-3	1	18	7.22	6.70	5.68
-2	1	1	45.08	42.71	0.71
-2	1	2	25.67	25.46	1.81
-2	1	3	37.12	38.85	1.07
-2	1	4	40.01	41.41	0.91
-2	1	5	43.00	44.63	0.78
-2	1	6	20.76	19.59	3.06
-2	1	7	4.12	2.86	6.23
-2	1	8	8.53	9.73	7.41
-2	1	9	15.24	13.76	5.05
-2	1	10	22.42	21.51	2.53
-2	1	11	38.37	38.72	0.97
-2	1	12	2.38*	0.17	0.23
-2	1	13	34.38	34.34	1.18
-2	1	14	14.10	14.53	4.52
-2	1	15	4.89	4.56	3.04
-2	1	16	1.84*	1.28	0.09
-2	1	17	9.51	9.73	5.66
-2	1	18	5.73	5.35	6.48
-1	1	1	48.57	42.93	0.61
-1	1	2	28.53	29.52	1.41
-1	1	3	28.89	31.86	1.63
-1	1	4	22.08	24.75	2.74
-1	1	5	47.80	53.23	0.63
-1	1	6	8.55	8.21	9.79
-1	1	7	51.29	56.06	0.55
-1	1	8	24.70	24.91	2.22
-1	1	9	5.21	4.29	8.49
-1	1	10	10.87	10.51	7.04
-1	1	11	2.14*	1.94	0.19
-1	1	12	3.61	2.04	5.65
-1	1	13	4.54	6.17	2.93
-1	1	14	15.13	15.75	4.30
-1	1	15	9.51	9.52	5.51
-1	1	16	1.94*	0.28	0.11
-1	1	17	7.25	7.05	7.28
-1	1	18	3.50	2.04	4.64
0	1	1	27.60	30.18	1.75
0	1	2	21.13	24.22	2.96
0	1	3	6.63	7.25	13.99
0	1	4	14.79	16.73	5.12
0	1	5	3.03	2.72	6.29
0	1	6	37.51	40.34	1.02
0	1	7	41.99	43.75	0.82
0	1	8	20.48	21.05	3.04
0	1	9	19.87	20.38	3.25
0	1	10	12.67	14.12	5.55
0	1	11	9.56	10.29	5.27
0	1	12	23.24	23.87	2.36
0	1	13	8.26	7.81	7.81
0	1	14	10.44	10.72	6.10
0	1	15	4.04	2.58	4.80
0	1	16	1.97*	0.71	0.13
0	1	17	8.46	8.27	7.18
0	1	18	4.05	3.29	7.36
1	1	0	83.54	82.22	0.21
1	1	1	20.83	21.18	3.13
1	1	2	11.74	12.28	7.72
1	1	3	63.58	69.94	0.36
1	1	4	49.91	53.45	0.58
1	1	5	8.04	8.12	9.51
1	1	6	2.83	2.08	5.93
1	1	7	10.25	12.57	7.32
1	1	8	15.34	15.09	4.68
1	1	9	15.94	16.38	4.62
1	1	10	4.81	3.10	5.00
1	1	11	18.13	18.26	3.44
1	1	12	5.76	3.54	6.89
1	1	13	16.22	16.19	3.89

H	K	L	FO	FC	WEIGHT
1	1	14	7.24	6.92	5.77
1	1	15	3.08*	0.25	0.36
1	1	16	9.56	8.93	7.32
1	1	17	7.96	7.18	8.06
2	1	0	49.39	50.43	0.61
2	1	1	68.70	69.59	0.32
2	1	2	31.20	30.08	1.45
2	1	3	69.94	71.77	0.30
2	1	4	12.00	12.49	7.03
2	1	5	45.82	46.29	0.68
2	1	6	39.08	39.02	0.94
2	1	7	12.39	13.17	6.24
2	1	8	11.07	10.99	6.21
2	1	9	13.97	14.02	5.48
2	1	10	5.74	5.40	6.17
2	1	11	2.93*	2.01	0.24
2	1	12	17.23	16.81	3.46
2	1	13	9.35	9.85	6.08
2	1	14	6.50	6.31	7.40
2	1	15	4.52	3.57	4.72
2	1	16	3.70	2.61	4.94
3	1	0	129.16	129.05	0.09
3	1	1	12.58	12.43	6.80
3	1	2	34.71	35.71	1.18
3	1	3	20.22	21.07	3.11
3	1	4	11.49	11.47	6.99
3	1	5	6.03	5.30	8.79
3	1	6	3.79	2.53	6.21
3	1	7	38.86	39.60	0.95
3	1	8	1.48*	0.77	0.08
3	1	9	12.96	12.75	5.64
3	1	10	2.65*	0.48	0.20
3	1	11	23.37	23.62	2.31
3	1	12	0.00*	0.40	0.00
3	1	13	22.46	22.24	2.34
3	1	14	3.28*	3.39	0.24
3	1	15	3.12*	2.23	0.30
4	1	0	42.74	42.21	0.80
4	1	1	0.00*	1.10	0.01
4	1	2	16.92	18.72	4.16
4	1	3	50.24	50.77	0.58
4	1	4	26.10	26.67	1.95
4	1	5	12.39	12.77	5.96
4	1	6	18.62	18.45	3.46
4	1	7	14.72	15.02	4.81
4	1	8	4.58	5.30	3.71
4	1	9	15.61	15.75	4.13
4	1	10	8.24	8.32	5.97
4	1	11	0.87*	1.48	0.02
4	1	12	12.70	11.96	4.96
4	1	13	6.83	5.67	8.41
4	1	14	8.53	7.66	9.80
5	1	0	2.78*	1.33	0.48
5	1	1	3.23	3.33	3.90
5	1	2	9.41	9.69	8.72
5	1	3	38.07	38.82	0.98
5	1	4	22.78	23.24	2.50
5	1	5	12.53	12.09	5.91
5	1	6	5.66	4.57	6.51
5	1	7	21.08	21.36	2.61
5	1	8	8.22	8.81	5.30
5	1	9	5.53	4.96	4.54
5	1	10	6.29	6.02	5.14
5	1	11	3.26*	2.33	0.26
5	1	12	14.63	14.71	4.72
5	1	13	3.76	3.39	3.67
6	1	0	10.19	10.86	7.58
6	1	1	16.44	16.32	4.47
6	1	2	0.00*	1.17	0.01
6	1	3	7.12	5.73	8.68
6	1	4	4.91	4.30	4.04
6	1	5	6.41	6.36	5.42
6	1	6	7.00	6.71	6.20
6	1	7	16.21	15.73	3.30
6	1	8	4.15	2.90	4.46
6	1	9	2.87*	0.83	0.29
6	1	10	3.28	0.71	3.61
6	1	11	10.96	10.78	5.12
6	1	12	0.00*	0.48	0.00
7	1	0	8.39	8.40	9.06
7	1	1	8.26	7.77	8.53
7	1	2	14.59	14.26	4.89
7	1	3	19.36	19.41	3.08
7	1	4	8.24	8.48	5.79
7	1	5	14.28	14.57	4.81
7	1	6	6.81	6.64	5.56
7	1	7	5.38	4.94	4.42
7	1	8	2.03*	0.50	0.11
7	1	9	17.46	17.63	3.58
7	1	10	4.87	4.45	4.54
7	1	11	2.47*	1.04	0.25
8	1	0	6.01	5.19	5.72
8	1	1	12.87	13.13	4.64
8	1	2	6.71	6.50	6.29
8	1	3	15.30	15.00	4.00
8	1	4	5.67	5.22	4.82
8	1	5	3.93	1.97	4.14
8	1	6	4.82	3.63	5.45
8	1	7	3.51	1.69	3.95
8	1	8	2.76*	0.07	0.24
8	1	9	3.84	3.96	3.68
9	1	0	9.01	8.72	6.50
9	1	1	9.36	9.76	6.26
9	1	2	8.10	8.67	5.09
9	1	3	5.44	6.09	4.47
9	1	4	9.09	9.98	6.10
9	1	5	8.89	8.66	7.59
9	1	6	3.45	0.54	4.26
9	1	7	6.64	6.78	5.29
9	1	8	5.33	4.35	8.24
10	1	0	4.17	2.84	4.50
10	1	1	3.24*	0.34	0.35
10	1	2	6.03	6.04	5.07
10	1	3	12.53	13.23	5.02
10	1	4	3.43*	4.18	0.24
10	1	5	8.03	8.69	6.49

H	K	L	FO	FC	WEIGHT
10	1	6	2.80*	2.61	0.26
11	1	0	3.71	1.41	3.95
11	1	1	7.32	7.97	5.13
11	1	2	5.74	5.27	7.54
11	1	3	0.00*	0.48	0.00
11	1	4	4.36	4.35	6.02
12	1	0	1.95*	1.90	0.13
12	1	1	1.79*	2.32	0.08
12	1	2	5.54	6.12	5.44
13	1	0	2.82*	3.29	0.26
-13	2	1	5.04	4.91	5.59
-13	2	2	1.43*	1.86	0.06
-13	2	3	3.15*	1.91	0.37
-13	2	4	10.61	11.91	5.30
-13	2	5	3.25*	2.97	0.25
-13	2	6	5.42	5.96	4.48
-13	2	7	3.26*	2.04	0.30
-13	2	8	1.63*	1.71	0.06
-13	2	9	4.94	4.24	6.66
-13	2	10	0.00*	0.29	0.00
-13	2	11	1.38*	1.42	0.06
-13	2	12	11.97	12.39	5.25
-13	2	13	6.94	7.88	4.50
-13	2	14	6.53	6.80	6.27
-13	2	15	3.11*	1.01	0.40
-13	2	16	5.06	5.89	5.26
-12	2	1	2.46*	0.76	0.20
-12	2	2	10.52	10.90	5.84
-12	2	3	2.37*	2.15	0.16
-12	2	4	6.44	5.29	5.67
-12	2	5	1.59*	0.39	0.07
-12	2	6	3.76*	4.14	0.24
-12	2	7	2.74*	2.24	0.18
-12	2	8	11.14	12.12	5.20
-12	2	9	4.24	2.99	3.34
-12	2	10	5.34	4.25	6.12
-12	2	11	8.63	8.83	6.17
-12	2	12	9.24	9.83	5.47
-12	2	13	6.15	5.86	7.30
-12	2	14	3.10*	0.98	0.39
-12	2	15	2.35*	0.97	0.15
-12	2	16	6.68	7.47	5.27
-12	2	17	2.19*	2.08	0.13
-12	2	18	2.27*	0.83	0.23
-11	2	1	7.18	6.61	5.78
-11	2	2	2.99*	3.47	0.15
-11	2	3	3.86	4.33	2.73
-11	2	4	3.96	2.40	4.01
-11	2	5	4.74	3.19	5.07
-11	2	6	3.06*	1.97	0.21
-11	2	7	5.25	3.44	5.65
-11	2	8	5.96	5.89	3.83
-11	2	9	3.78	3.36	2.63
-11	2	10	13.08	13.12	4.64
-11	2	11	5.00	4.49	3.93
-11	2	12	24.97	25.34	1.97
-11	2	13	3.78	1.81	3.87
-11	2	14	17.45	17.88	3.30
-11	2	15	2.12*	2.00	0.13
-11	2	16	4.39	3.68	4.24
-11	2	17	2.71*	1.74	0.26
-11	2	18	6.69	7.19	6.01
-10	2	1	9.45	10.06	4.52
-10	2	2	7.24	7.43	4.63
-10	2	3	15.84	16.03	3.57
-10	2	4	16.84	17.02	3.55
-10	2	5	2.01*	2.16	0.08
-10	2	6	8.16	7.79	6.17
-10	2	7	7.89	7.91	4.48
-10	2	8	21.62	22.07	2.38
-10	2	9	9.74	9.09	5.34
-10	2	10	7.24	7.06	5.71
-10	2	11	13.25	14.03	4.64
-10	2	12	8.56	9.20	5.00
-10	2	13	13.88	14.51	4.18
-10	2	14	10.34	11.12	4.65
-10	2	15	4.26	2.57	4.78
-10	2	16	8.64	8.93	5.60
-10	2	17	0.42*	2.52	0.00
-10	2	18	5.20	6.20	5.00
-9	2	1	4.44	3.46	3.83
-9	2	2	7.63	6.96	6.43
-9	2	3	11.16	11.56	5.10
-9	2	4	16.63	16.78	3.64
-9	2	5	4.24	2.80	3.35
-9	2	6	3.41	2.85	3.15
-9	2	7	7.88	7.57	5.98
-9	2	8	20.58	22.11	2.71
-9	2	9	5.60	5.15	5.51
-9	2	10	17.58	17.84	3.22
-9	2	11	9.47	10.28	4.90
-9	2	12	16.07	16.16	3.75
-9	2	13	0.00*	0.69	0.00
-9	2	14	3.98	3.01	4.13
-9	2	15	2.26*	0.04	0.12
-9	2	16	2.66*	1.53	0.18
-9	2	17	5.23	4.35	6.63
-9	2	18	9.11	9.25	6.39
-8	2	1	21.21	20.58	2.65
-8	2	2	14.83	14.69	4.50
-8	2	3	6.70	6.89	6.48
-8	2	4	5.07	3.42	5.32
-8	2	5	8.18	7.41	7.15
-8	2	6	7.83	8.17	8.16
-8	2	7	4.02	3.83	5.05
-8	2	8	13.69	13.75	4.68
-8	2	9	4.54	4.91	3.40
-8	2	10	4.39	3.39	3.67
-8	2	11	4.22	3.01	4.06
-8	2	12	19.11	20.19	3.22
-8	2	13	2.64*	2.07	0.18
-8	2	14	21.64	22.04	2.57
-8	2	15	10.22	10.72	5.11
-8	2	16	5.75	4.93	6.23
-8	2	17	4.90	3.50	5.79
-8	2	18	11.64	11.97	5.63

H	K	L	FO	FC	WEIGHT
-7	2	1	19.97	18.81	3.03
-7	2	2	66.68	62.92	0.33
-7	2	3	41.49	40.07	0.82
-7	2	4	47.72	47.33	0.63
-7	2	5	15.24	14.72	4.62
-7	2	6	27.43	27.07	1.82
-7	2	7	6.69	5.61	7.82
-7	2	8	36.45	36.18	1.05
-7	2	9	11.08	11.14	6.47
-7	2	10	3.01*	2.50	0.27
-7	2	11	6.65	6.66	4.86
-7	2	12	11.97	12.56	5.37
-7	2	13	6.43	5.42	4.92
-7	2	14	6.78	5.99	6.94
-7	2	15	7.54	7.40	4.69
-7	2	16	21.22	22.07	2.55
-7	2	17	4.85	6.15	3.17
-7	2	18	13.02	13.23	4.76
-6	2	1	49.49	47.39	0.58
-6	2	2	27.15	26.35	1.82
-6	2	3	13.51	13.07	5.18
-6	2	4	3.18*	2.63	0.36
-6	2	5	15.15	13.43	4.45
-6	2	6	11.14	12.05	6.84
-6	2	7	9.04	7.97	6.86
-6	2	8	27.16	28.36	1.80
-6	2	9	19.07	18.50	3.27
-6	2	10	8.67	8.25	6.45
-6	2	11	11.91	11.07	5.39
-6	2	12	13.15	13.11	4.77
-6	2	13	13.22	13.86	4.50
-6	2	14	24.40	24.69	2.05
-6	2	15	17.76	18.54	3.28
-6	2	16	17.24	17.78	3.26
-6	2	17	3.81	2.95	2.78
-6	2	18	6.66	7.45	4.23
-5	2	1	5.60	5.99	8.51
-5	2	2	44.41	41.33	0.73
-5	2	3	49.20	44.03	0.60
-5	2	4	7.32	8.04	7.80
-5	2	5	20.94	20.72	2.94
-5	2	6	4.89	4.26	7.41
-5	2	7	12.26	11.58	6.45
-5	2	8	22.36	23.02	2.53
-5	2	9	8.90	8.01	8.23
-5	2	10	41.85	42.99	0.82
-5	2	11	6.09	5.63	6.05
-5	2	12	21.82	22.87	2.47
-5	2	13	23.87	24.37	2.21
-5	2	14	14.67	13.52	4.40
-5	2	15	2.21*	2.49	0.11
-5	2	16	15.79	15.67	3.92
-5	2	17	4.40	3.98	4.84
-5	2	18	15.81	16.64	4.01
-4	2	1	19.44	17.59	3.24
-4	2	2	55.24	49.53	0.48
-4	2	3	12.90	12.36	5.84
-4	2	4	76.55	73.12	0.25
-4	2	5	8.07	8.49	7.79
-4	2	6	12.92	12.40	6.20
-4	2	7	26.05	25.17	1.99
-4	2	8	10.48	11.56	7.34
-4	2	9	33.65	33.18	1.25
-4	2	10	18.25	17.48	3.67
-4	2	11	8.11	7.81	6.99
-4	2	12	6.43	6.98	5.54
-4	2	13	7.57	7.27	7.73
-4	2	14	13.92	14.62	4.49
-4	2	15	6.05	6.24	4.74
-4	2	16	16.90	16.92	3.85
-4	2	17	2.93*	1.60	0.30
-4	2	18	9.41	8.82	6.91
-3	2	1	20.73	18.12	2.98
-3	2	2	16.07	16.47	4.39
-3	2	3	46.35	41.54	0.68
-3	2	4	7.85	8.39	8.40
-3	2	5	1.60*	0.83	0.19
-3	2	6	4.03	3.40	4.62
-3	2	7	11.61	12.32	6.20
-3	2	8	15.42	16.57	4.76
-3	2	9	4.19	4.36	6.26
-3	2	10	20.92	22.22	2.97
-3	2	11	10.26	10.12	6.51
-3	2	12	3.46	3.24	3.15
-3	2	13	27.49	26.71	1.76
-3	2	14	26.37	27.68	1.93
-3	2	15	2.51*	1.21	0.14
-3	2	16	8.72	8.85	4.94
-3	2	17	2.84*	1.71	0.30
-3	2	18	2.36*	0.91	0.19
-2	2	1	0.28*	1.01	0.01
-2	2	2	37.86	33.08	0.99
-2	2	3	16.25	14.67	4.35
-2	2	4	86.09	84.78	0.20
-2	2	5	39.32	41.10	0.92
-2	2	6	46.74	47.46	0.66
-2	2	7	0.00*	2.15	0.01
-2	2	8	1.60*	3.46	0.10
-2	2	9	16.69	15.61	4.06
-2	2	10	30.72	32.03	1.46
-2	2	11	6.65	6.39	6.09
-2	2	12	9.04	8.58	5.83
-2	2	13	5.99	5.51	4.09
-2	2	14	20.97	22.00	2.74
-2	2	15	10.51	11.52	5.58
-2	2	16	6.50	6.52	5.17
-2	2	17	9.13	8.17	7.82
-2	2	18	11.10	10.92	5.83
-1	2	1	13.28	12.70	4.35
-1	2	2	46.37	44.89	0.65
-1	2	3	9.66	9.56	9.14
-1	2	4	55.66	60.91	0.47
-1	2	5	34.76	36.98	1.18
-1	2	6	8.83	10.03	8.03
-1	2	7	42.39	42.80	0.81
-1	2	8	6.65	6.94	8.64

H	K	L	FO	FC	WEIGHT
-1	2	9	22.41	21.86	2.53
-1	2	10	24.77	25.41	2.13
-1	2	11	20.93	21.10	2.70
-1	2	12	1.24*	0.88	0.04
-1	2	13	7.50	6.77	5.80
-1	2	14	6.90	6.06	6.75
-1	2	15	1.32*	0.31	0.04
-1	2	16	4.19	4.17	2.69
-1	2	17	2.97*	0.56	0.42
-1	2	18	2.84*	3.16	0.23
0	2	0	26.51	20.38	1.58
0	2	1	39.84	41.81	0.85
0	2	2	35.92	40.41	1.09
0	2	3	2.76*	3.39	0.42
0	2	4	27.47	33.09	1.81
0	2	5	1.60*	0.34	0.21
0	2	6	2.40*	1.70	0.33
0	2	7	17.36	16.65	3.98
0	2	8	3.26	3.95	3.71
0	2	9	3.90	4.24	3.70
0	2	10	19.47	21.01	3.20
0	2	11	3.46	3.82	3.07
0	2	12	3.70	2.73	2.84
0	2	13	4.46	2.53	4.71
0	2	14	14.85	15.67	4.18
0	2	15	8.10	7.64	7.46
0	2	16	4.68	5.47	2.94
0	2	17	4.00	3.32	3.92
1	2	0	36.01	36.65	1.06
1	2	1	11.53	11.72	7.41
1	2	2	51.48	55.54	0.55
1	2	3	21.39	23.55	2.89
1	2	4	51.94	56.76	0.54
1	2	5	26.50	27.37	1.93
1	2	6	27.34	29.36	1.81
1	2	7	28.45	28.46	1.66
1	2	8	20.79	21.31	2.88
1	2	9	8.61	8.27	6.76
1	2	10	17.55	17.36	3.42
1	2	11	2.07*	1.54	0.12
1	2	12	5.84	4.19	6.08
1	2	13	5.12	3.89	5.19
1	2	14	19.65	20.15	2.92
1	2	15	4.45	3.66	3.91
1	2	17	0.94*	0.19	0.04
2	2	0	55.92	56.26	0.47
2	2	1	2.10*	1.39	0.43
2	2	2	5.20	4.83	5.95
2	2	3	17.33	17.46	4.03
2	2	4	23.23	24.74	2.43
2	2	5	37.80	36.75	1.01
2	2	6	25.15	26.54	2.15
2	2	7	6.44	5.00	7.90
2	2	8	34.29	35.03	1.19
2	2	9	12.99	13.02	5.26
2	2	10	7.24	6.97	6.25
2	2	11	4.80	3.64	5.35
2	2	12	9.08	8.67	7.00
2	2	13	5.75	5.74	3.77
2	2	14	9.56	9.90	5.07
2	2	15	4.33	4.90	3.79
2	2	16	2.62*	0.65	0.37
3	2	0	22.05	23.11	2.72
3	2	1	46.79	46.81	0.66
3	2	2	10.11	9.57	8.27
3	2	3	17.81	17.25	3.84
3	2	4	7.99	6.75	8.57
3	2	5	20.02	20.97	3.06
3	2	6	38.75	39.45	0.95
3	2	7	15.87	16.56	4.12
3	2	8	9.07	8.75	7.08
3	2	9	4.08	4.06	3.56
3	2	10	7.87	7.61	5.82
3	2	11	9.44	9.15	5.00
3	2	12	6.97	6.91	5.41
3	2	13	4.78	5.01	3.24
3	2	14	3.49	2.08	3.35
3	2	15	2.48*	0.86	0.31
4	2	0	2.72*	3.95	0.31
4	2	1	17.63	17.15	3.83
4	2	2	19.59	20.74	3.20
4	2	3	14.51	14.23	5.19
4	2	4	13.70	12.54	5.27
4	2	5	15.36	14.65	4.40
4	2	6	13.55	14.44	5.54
4	2	7	6.59	6.67	6.47
4	2	8	3.21*	0.59	0.38
4	2	9	2.66*	2.83	0.12
4	2	10	17.45	18.82	3.49
4	2	11	4.51	4.49	3.39
4	2	12	0.93*	0.37	0.02
4	2	13	2.57*	1.47	0.22
4	2	14	3.48	2.81	3.59
5	2	0	46.49	49.88	0.67
5	2	1	11.13	10.63	6.83
5	2	2	10.00	10.58	7.91
5	2	3	6.03	5.39	8.72
5	2	4	11.32	11.10	6.81
5	2	5	6.41	6.70	4.83
5	2	6	16.92	16.85	3.99
5	2	7	4.68	3.98	3.91
5	2	8	0.00*	0.86	0.00
5	2	9	4.39	3.07	4.45
5	2	10	2.12*	1.51	0.11
5	2	11	6.59	6.93	4.78
5	2	12	0.00*	0.46	0.00
5	2	13	3.00*	0.27	0.43
6	2	0	44.82	47.34	0.71
6	2	1	3.47	3.37	3.89
6	2	2	14.10	15.10	4.70
6	2	3	4.89	4.44	5.73
6	2	4	11.67	11.10	6.03
6	2	5	5.16	4.48	4.61
6	2	6	22.38	23.49	2.44
6	2	7	2.88*	0.24	0.27
6	2	8	5.04	3.84	5.21

H	K	L	FO	FC	WEIGHT
6	2	9	5.24	4.81	3.36
6	2	10	13.58	13.54	4.89
6	2	11	3.40*	3.16	0.29
6	2	12	9.37	9.68	7.30
7	2	0	13.31	14.30	4.59
7	2	1	2.96*	2.83	0.31
7	2	2	9.94	10.27	5.34
7	2	3	2.74*	0.59	0.21
7	2	4	6.46	5.66	6.85
7	2	5	7.79	7.77	5.64
7	2	6	9.09	9.23	5.73
7	2	7	5.91	6.17	4.65
7	2	8	2.65*	1.33	0.26
7	2	9	2.55*	1.48	0.20
7	2	10	13.17	13.88	4.71
8	2	0	14.65	16.06	4.50
8	2	1	5.78	5.81	4.16
8	2	2	13.95	14.68	4.18
8	2	3	3.46*	4.11	0.19
8	2	4	8.65	8.98	5.70
8	2	5	1.92*	1.21	0.09
8	2	6	4.68	4.86	3.69
8	2	7	3.02*	1.60	0.24
8	2	8	10.43	10.90	5.67
8	2	9	8.86	8.16	10.11
9	2	0	4.53	4.06	3.51
9	2	1	2.90*	0.71	0.27
9	2	2	4.25	2.63	4.25
9	2	3	6.97	7.36	4.29
9	2	4	9.65	10.41	5.21
9	2	5	7.59	7.22	6.23
9	2	6	5.95	5.84	6.15
9	2	7	1.49*	0.90	0.07
10	2	0	11.65	11.54	5.38
10	2	1	8.50	7.24	7.03
10	2	2	15.52	16.66	4.34
10	2	3	7.87	8.48	5.32
10	2	4	3.97	1.86	5.30
10	2	5	3.60	2.41	4.01
10	2	6	6.65	6.16	9.51
11	2	0	7.83	8.13	7.50
11	2	1	4.93	2.82	6.20
11	2	2	11.12	11.56	5.40
11	2	3	3.42	1.89	3.78
11	2	4	6.41	6.04	9.30
12	2	0	10.74	11.26	5.75
12	2	1	4.22	2.27	7.73
12	2	2	5.29	4.25	11.55
-13	3	3	1.76*	2.56	0.10
-13	3	4	4.47	4.36	4.87
-13	3	5	4.83	5.74	4.05
-13	3	6	6.11	6.95	4.96
-13	3	7	2.94*	0.53	0.30
-13	3	8	2.17*	0.25	0.13
-13	3	9	10.81	11.77	4.81
-13	3	10	2.13*	0.32	0.13
-13	3	11	5.85	6.02	4.70
-13	3	12	3.03*	3.06	0.27
-13	3	13	1.57*	1.58	0.09
-13	3	14	1.96*	2.36	0.12
-12	3	1	5.65	7.81	4.12
-12	3	2	3.81	2.12	3.96
-12	3	3	1.96*	0.60	0.10
-12	3	4	14.16	16.99	3.75
-12	3	5	5.81	5.71	5.41
-12	3	6	2.02*	2.24	0.11
-12	3	7	4.61	5.10	3.06
-12	3	8	6.81	7.57	4.79
-12	3	9	9.45	10.20	4.91
-12	3	10	2.93*	2.81	0.17
-12	3	11	10.21	11.30	4.58
-12	3	12	1.49*	2.77	0.05
-12	3	13	4.08	3.66	3.98
-12	3	14	3.04*	1.54	0.31
-12	3	15	5.67	5.56	7.20
-12	3	16	3.70	4.62	2.72
-11	3	1	9.62	10.97	5.09
-11	3	2	10.74	13.85	4.88
-11	3	3	4.41	5.68	2.70
-11	3	4	14.56	17.87	3.82
-11	3	5	8.99	8.37	7.09
-11	3	6	1.14*	1.96	0.02
-11	3	7	9.29	9.63	5.11
-11	3	8	4.25	2.82	4.42
-11	3	9	5.50	4.76	5.91
-11	3	10	9.31	9.81	4.54
-11	3	11	8.79	9.24	5.19
-11	3	12	13.28	13.78	4.41
-11	3	13	4.65	5.17	3.15
-11	3	14	2.95*	0.79	0.24
-11	3	15	7.62	7.81	6.03
-11	3	16	11.52	12.80	5.28
-11	3	17	3.59	3.17	3.68
-10	3	1	4.19	4.16	3.09
-10	3	2	11.00	11.58	5.00
-10	3	3	11.18	11.98	4.49
-10	3	4	16.92	17.68	3.29
-10	3	5	16.11	17.31	3.45
-10	3	6	14.78	14.66	3.93
-10	3	7	3.38*	4.33	0.18
-10	3	8	11.64	11.89	5.44
-10	3	9	6.90	6.20	5.30
-10	3	10	6.61	6.18	5.10
-10	3	11	14.64	15.67	3.95
-10	3	12	6.08	6.35	4.83
-10	3	13	3.82*	4.86	0.23
-10	3	14	2.56*	2.60	0.16
-10	3	15	4.97	4.73	3.93
-10	3	16	9.49	9.33	6.15
-10	3	17	2.70*	1.91	0.28
-10	3	18	2.39*	2.78	0.17
-9	3	1	30.27	29.18	1.44
-9	3	2	21.08	21.15	2.51
-9	3	3	9.42	8.97	4.68
-9	3	4	12.56	12.25	4.53
-9	3	5	10.50	9.68	5.35

H	K	L	FO	FC	WEIGHT
-9	3	6	2.72*	2.50	0.14
-9	3	7	5.90	5.99	4.14
-9	3	8	5.30	2.77	4.54
-9	3	9	3.19*	2.55	0.24
-9	3	10	4.65	4.84	3.72
-9	3	11	2.22*	2.84	0.12
-9	3	12	13.00	12.68	4.66
-9	3	13	13.62	13.44	4.20
-9	3	14	5.86	5.54	6.39
-9	3	15	21.72	22.39	2.52
-9	3	16	6.72	6.11	6.21
-9	3	17	9.21	9.57	5.10
-9	3	18	6.54	6.31	6.84
-8	3	1	19.35	18.28	3.05
-8	3	2	16.69	14.98	3.70
-8	3	3	25.32	25.11	1.92
-8	3	4	1.29*	0.46	0.04
-8	3	5	10.50	8.95	6.47
-8	3	6	12.80	12.65	4.84
-8	3	7	5.90	5.46	4.75
-8	3	8	3.91	3.03	2.70
-8	3	9	14.95	14.56	4.12
-8	3	10	16.49	16.71	3.37
-8	3	11	28.01	28.12	1.67
-8	3	12	12.36	12.39	4.46
-8	3	13	13.15	13.01	5.03
-8	3	14	5.41	5.39	4.29
-8	3	15	3.92*	4.89	0.20
-8	3	16	14.82	14.71	4.15
-8	3	17	8.52	8.85	7.07
-8	3	18	3.18*	0.96	0.38
-7	3	1	13.36	12.41	4.54
-7	3	2	9.88	9.67	5.80
-7	3	3	1.64*	1.39	0.07
-7	3	4	2.55*	1.57	0.19
-7	3	5	27.06	25.69	1.81
-7	3	6	4.21	3.90	3.81
-7	3	7	23.68	23.72	2.18
-7	3	8	3.65	1.65	3.60
-7	3	9	9.98	9.83	6.57
-7	3	10	28.26	29.52	1.61
-7	3	11	25.15	25.79	1.94
-7	3	12	17.51	18.26	3.22
-7	3	13	16.33	16.04	3.77
-7	3	14	9.72	9.57	5.71
-7	3	15	2.17*	3.55	0.08
-7	3	16	8.41	8.71	5.15
-7	3	17	1.51*	0.65	0.07
-7	3	18	4.33	3.81	3.29
-6	3	1	27.67	24.73	1.73
-6	3	2	33.34	30.12	1.21
-6	3	3	7.23	5.24	6.60
-6	3	4	6.11	5.39	6.06
-6	3	5	4.16	4.32	3.33
-6	3	6	30.87	29.39	1.42
-6	3	7	23.39	22.91	2.36
-6	3	8	8.51	7.22	6.29
-6	3	9	8.40	8.01	6.40
-6	3	10	1.42*	0.31	0.05
-6	3	11	3.25*	2.24	0.28
-6	3	12	16.39	17.35	4.04
-6	3	13	13.92	13.34	4.41
-6	3	14	12.34	12.05	4.72
-6	3	15	19.85	20.43	2.86
-6	3	16	6.07	6.42	4.97
-6	3	17	8.01	8.36	5.54
-6	3	18	3.79	3.86	3.02
-5	3	1	32.82	30.26	1.29
-5	3	2	14.28	12.14	4.55
-5	3	3	3.38	4.51	3.21
-5	3	4	2.32*	1.27	0.23
-5	3	5	36.81	34.01	1.04
-5	3	6	20.68	19.52	2.87
-5	3	7	33.54	32.72	1.24
-5	3	8	7.16	7.36	6.87
-5	3	9	7.34	6.96	7.41
-5	3	10	17.78	17.24	3.50
-5	3	11	22.79	23.87	2.36
-5	3	12	7.06	7.35	5.55
-5	3	13	11.53	11.62	5.36
-5	3	14	3.93	4.08	2.50
-5	3	15	14.48	14.52	4.15
-5	3	16	1.61*	0.79	0.06
-5	3	17	6.73	5.87	5.83
-5	3	18	5.36	4.38	7.90
-4	3	1	56.10	49.08	0.46
-4	3	2	33.78	29.94	1.22
-4	3	3	61.11	52.45	0.39
-4	3	4	11.35	9.91	6.07
-4	3	5	2.45*	1.46	0.23
-4	3	6	13.75	11.91	5.29
-4	3	7	7.74	8.46	8.10
-4	3	8	28.69	27.13	1.67
-4	3	9	15.92	15.27	4.36
-4	3	10	10.65	10.31	5.43
-4	3	11	17.71	17.70	3.43
-4	3	12	1.66*	0.35	0.07
-4	3	13	13.87	13.80	4.34
-4	3	14	3.46*	1.05	0.33
-4	3	15	15.12	14.32	4.29
-4	3	16	1.98*	0.29	0.09
-4	3	17	12.46	12.33	5.18
-4	3	18	1.94*	2.36	0.11
-3	3	1	6.71	7.37	6.76
-3	3	2	15.55	12.06	4.49
-3	3	3	27.62	25.51	1.77
-3	3	4	36.67	32.81	1.05
-3	3	5	7.54	6.75	6.85
-3	3	6	33.67	32.49	1.26
-3	3	7	21.51	22.01	2.69
-3	3	8	2.83*	0.39	0.41
-3	3	9	9.93	9.60	6.16
-3	3	10	6.97	6.62	5.92
-3	3	11	9.49	9.58	7.46
-3	3	12	7.12	7.15	5.69
-3	3	13	12.65	12.41	4.65

H	K	L	FO	FC	WEIGHT
-3	3	14	5.49	6.20	3.21
-3	3	15	3.90	1.91	3.72
-3	3	16	7.66	7.64	7.41
-3	3	17	7.87	7.93	5.88
-3	3	18	3.01*	1.95	0.37
-2	3	1	4.19	2.80	5.36
-2	3	2	36.41	31.08	1.08
-2	3	3	2.03*	4.36	0.20
-2	3	4	23.64	22.22	2.43
-2	3	5	24.41	24.84	2.25
-2	3	6	7.19	6.17	8.56
-2	3	7	50.06	50.66	0.58
-2	3	8	4.64	2.81	6.97
-2	3	9	13.04	13.32	5.18
-2	3	10	6.36	6.46	5.38
-2	3	11	17.75	18.15	3.41
-2	3	12	11.79	11.75	4.95
-2	3	13	6.69	6.60	4.98
-2	3	14	18.91	19.87	3.13
-2	3	15	3.67	1.44	3.23
-2	3	16	3.68	2.14	3.76
-2	3	17	3.47*	3.98	0.29
-2	3	18	3.09	1.87	4.18
-1	3	1	55.07	42.79	0.48
-1	3	2	13.12	12.18	5.69
-1	3	3	35.06	34.80	1.16
-1	3	4	5.74	6.15	8.69
-1	3	5	3.77	3.17	4.98
-1	3	6	40.20	39.82	0.89
-1	3	7	17.40	18.49	3.99
-1	3	8	43.45	45.04	0.77
-1	3	9	5.27	3.18	8.06
-1	3	10	10.11	9.62	6.65
-1	3	11	14.67	15.20	4.15
-1	3	12	1.46*	0.39	0.06
-1	3	13	8.34	7.41	6.92
-1	3	14	11.17	12.04	5.02
-1	3	15	12.16	13.15	5.10
-1	3	16	4.73	3.66	6.69
-1	3	17	9.95	9.40	8.06
0	3	1	30.88	33.59	1.46
0	3	2	65.06	68.90	0.35
0	3	3	18.42	19.70	3.62
0	3	4	14.17	13.90	5.64
0	3	5	2.88	2.35	4.66
0	3	6	13.13	13.94	5.42
0	3	7	27.35	28.85	1.82
0	3	8	12.38	13.47	5.87
0	3	9	11.42	12.05	6.34
0	3	10	4.84	6.54	3.62
0	3	11	8.53	9.08	6.09
0	3	12	14.04	15.21	4.71
0	3	13	13.92	14.76	4.41
0	3	14	16.01	16.99	3.96
0	3	15	3.86	2.91	3.38
0	3	16	2.65*	1.38	0.27
1	3	0	19.89	20.18	3.18
1	3	1	13.92	15.06	5.63
1	3	2	12.27	13.03	6.73
1	3	3	30.55	33.99	1.51
1	3	4	12.03	13.40	6.31
1	3	5	3.25	2.11	3.90
1	3	6	12.26	11.99	6.38
1	3	7	17.87	19.52	3.59
1	3	8	13.88	14.00	1.81
1	3	9	6.67	7.28	6.24
1	3	10	7.63	7.93	5.98
1	3	11	12.86	13.84	4.68
1	3	12	2.74*	2.39	0.16
1	3	13	10.30	10.45	6.76
1	3	14	5.43	5.09	4.97
1	3	15	2.87*	2.22	0.28
1	3	16	2.39*	1.75	0.23
2	3	0	13.85	15.54	5.41
2	3	1	14.30	13.91	5.39
2	3	2	16.60	17.86	4.14
2	3	3	31.62	33.45	1.41
2	3	4	7.45	7.80	9.14
2	3	5	6.35	6.78	7.86
2	3	6	3.72	3.42	3.86
2	3	7	24.07	24.81	2.29
2	3	8	13.86	13.76	5.13
2	3	9	10.31	11.93	4.85
2	3	10	13.12	14.36	4.64
2	3	11	6.27	4.61	6.31
2	3	12	5.35	3.46	5.72
2	3	13	4.52	3.10	5.36
2	3	14	4.76	5.10	3.99
2	3	15	3.06*	2.52	0.32
3	3	0	12.79	12.16	6.14
3	3	1	16.03	16.43	4.33
3	3	2	8.48	9.20	7.21
3	3	3	27.40	28.84	1.80
3	3	4	16.99	18.62	3.85
3	3	5	16.28	16.35	4.17
3	3	6	8.96	8.64	7.33
3	3	7	6.85	7.06	6.43
3	3	8	5.47	6.37	4.80
3	3	9	2.30*	2.05	0.13
3	3	10	6.28	6.04	6.35
3	3	11	8.68	9.44	5.89
3	3	12	3.09*	0.33	0.34
3	3	13	7.21	7.11	7.03
3	3	14	5.19	4.55	7.30
4	3	0	11.72	12.07	6.17
4	3	1	2.40*	1.11	0.31
4	3	2	4.62	3.67	7.74
4	3	3	15.40	16.57	4.39
4	3	4	1.56*	0.74	0.08
4	3	5	6.06	6.51	5.34
4	3	6	14.55	14.96	4.81
4	3	7	11.87	13.03	5.06
4	3	8	4.85	3.98	3.77
4	3	9	11.68	11.63	5.40
4	3	10	15.17	16.45	4.13
4	3	11	11.72	11.28	5.81

H	K	L	FO	FC	WEIGHT
4	3	12	4.31	3.94	3.40
4	3	13	9.44	9.79	6.67
5	3	0	17.73	19.21	3.75
5	3	1	7.03	8.74	5.76
5	3	2	11.39	10.89	6.25
5	3	3	14.69	15.53	4.73
5	3	4	2.42*	2.31	0.19
5	3	5	6.54	6.20	4.80
5	3	6	9.31	9.98	4.63
5	3	7	13.25	14.45	4.57
5	3	8	6.09	5.64	6.19
5	3	9	17.31	18.21	3.59
5	3	10	6.75	6.36	7.59
5	3	11	2.35*	1.38	0.19
5	3	12	3.98	3.52	5.53
6	3	0	0.98*	1.72	0.03
6	3	1	12.92	12.85	5.74
6	3	2	6.45	5.76	6.44
6	3	3	16.26	17.55	3.98
6	3	4	20.31	21.88	2.92
6	3	5	3.92*	4.93	0.24
6	3	6	8.82	9.44	4.95
6	3	7	2.97*	0.73	0.28
6	3	8	5.25	5.34	4.34
6	3	9	4.08	4.15	3.58
6	3	10	1.61*	0.33	0.07
6	3	11	1.41*	0.21	0.08
7	3	0	2.43*	0.76	0.19
7	3	1	10.42	11.03	5.54
7	3	2	8.32	8.87	5.23
7	3	3	26.62	28.57	1.80
7	3	4	12.59	13.27	5.15
7	3	5	6.17	7.09	3.83
7	3	6	6.50	6.73	6.71
7	3	7	7.82	9.32	5.20
7	3	8	4.18	3.19	5.47
7	3	9	4.94	4.34	6.08
8	3	0	9.56	10.20	5.16
8	3	1	0.68*	2.74	0.01
8	3	2	13.42	14.09	4.85
8	3	3	7.60	7.98	5.40
8	3	4	8.33	8.59	6.96
8	3	5	8.94	9.78	5.21
8	3	6	2.68*	1.69	0.29
8	3	7	3.88	4.63	3.03
8	3	8	3.19	2.24	3.86
9	3	0	15.14	16.10	3.56
9	3	1	13.15	13.63	4.94
9	3	2	6.22	5.14	6.30
9	3	3	4.15	3.91	3.12
9	3	4	4.90	5.28	4.37
9	3	5	4.68	3.77	6.65
9	3	6	4.90	4.53	6.32
10	3	0	4.16	3.37	4.28
10	3	1	6.83	7.11	5.62
10	3	2	3.54	1.31	4.05
10	3	3	9.89	10.11	6.18
10	3	4	1.55*	1.97	0.08
10	3	5	2.94*	2.29	0.44
11	3	0	12.34	12.80	4.59
11	3	1	5.16	5.64	4.56
11	3	2	3.39	2.34	3.91
11	3	3	4.11	3.90	6.70
12	3	0	2.63*	0.20	0.33
-13	4	8	3.59	4.09	3.41
-13	4	9	2.58*	1.12	0.27
-12	4	2	11.97	13.18	5.29
-12	4	3	2.89*	2.45	0.28
-12	4	4	7.92	8.35	7.16
-12	4	5	5.95	6.59	5.77
-12	4	6	4.79	4.68	4.31
-12	4	7	2.79*	2.05	0.20
-12	4	8	6.19	6.16	6.79
-12	4	9	2.15*	0.87	0.12
-12	4	10	5.23	5.28	6.05
-12	4	11	3.15*	2.61	0.35
-12	4	12	9.42	10.16	5.73
-12	4	13	7.37	7.08	7.55
-12	4	14	2.88*	2.38	0.32
-11	4	1	1.00*	0.33	0.03
-11	4	2	1.78*	0.51	0.08
-11	4	3	9.44	9.43	6.83
-11	4	4	15.85	16.41	3.96
-11	4	5	6.13	6.70	4.43
-11	4	6	2.44*	2.02	0.12
-11	4	7	7.95	8.41	4.53
-11	4	8	4.84	4.73	4.14
-11	4	9	6.58	5.78	5.74
-11	4	10	5.34	4.91	6.59
-11	4	11	1.50*	1.34	0.05
-11	4	12	3.66*	2.85	0.28
-11	4	13	3.75	1.74	5.31
-11	4	14	9.13	9.79	6.15
-11	4	15	3.89	3.44	4.04
-10	4	1	3.38*	2.52	0.21
-10	4	2	6.53	6.34	5.39
-10	4	3	14.38	14.10	4.07
-10	4	4	3.99	0.81	3.99
-10	4	5	7.42	7.85	5.47
-10	4	6	3.09*	0.96	0.20
-10	4	7	5.74	6.14	3.51
-10	4	8	10.43	9.94	5.03
-10	4	9	0.00*	2.55	0.00
-10	4	10	2.70*	2.67	0.16
-10	4	11	6.09	5.02	6.53
-10	4	12	6.24	6.40	4.29
-10	4	13	2.75*	0.72	0.20
-10	4	14	3.97	3.52	2.81
-10	4	15	7.91	8.05	5.65
-10	4	16	7.09	6.57	6.19
-9	4	1	3.32*	3.20	0.17
-9	4	2	18.44	17.26	3.10
-9	4	3	2.42*	0.55	0.12
-9	4	4	3.84	2.17	2.47
-9	4	5	2.08*	2.44	0.07
-9	4	6	5.19	3.70	3.78

H	K	L	FO	FC	WEIGHT
-9	4	7	17.78	17.47	3.21
-9	4	8	23.99	23.82	2.06
-9	4	9	6.94	6.43	5.00
-9	4	10	11.48	11.62	4.80
-9	4	11	3.70	1.16	3.41
-9	4	12	14.52	15.27	3.99
-9	4	13	6.04	6.40	3.96
-9	4	14	2.66*	2.33	0.14
-9	4	15	6.67	6.02	8.25
-9	4	16	11.80	11.70	5.55
-9	4	17	1.73*	0.77	0.11
-8	4	1	9.72	8.24	5.58
-8	4	2	20.39	19.65	2.64
-8	4	3	4.76	2.63	2.71
-8	4	4	26.03	25.35	1.77
-8	4	5	3.53*	2.26	0.19
-8	4	6	6.45	5.08	4.92
-8	4	7	4.39	4.01	3.16
-8	4	8	7.89	7.00	6.77
-8	4	9	4.90	4.25	3.54
-8	4	10	15.51	15.17	4.18
-8	4	11	11.16	11.01	4.80
-8	4	12	15.03	15.85	3.81
-8	4	13	3.60	0.40	3.36
-8	4	14	10.75	10.45	5.84
-8	4	15	0.00*	0.92	0.00
-8	4	16	8.64	8.05	6.20
-8	4	17	4.78	4.23	4.86
-7	4	1	7.56	6.37	5.55
-7	4	2	6.73	6.91	4.39
-7	4	3	8.13	7.71	5.22
-7	4	4	24.73	22.66	2.11
-7	4	5	9.66	9.36	4.70
-7	4	6	3.62*	2.45	0.22
-7	4	7	15.17	15.80	4.19
-7	4	8	11.11	11.75	5.14
-7	4	9	3.02*	1.41	0.20
-7	4	10	11.28	11.44	4.81
-7	4	11	5.71	5.38	3.30
-7	4	12	3.38*	2.25	0.32
-7	4	13	3.95	2.36	3.69
-7	4	14	11.88	12.34	4.87
-7	4	15	0.26*	0.78	0.00
-7	4	16	7.47	6.68	6.78
-7	4	17	0.00*	1.26	0.00
-7	4	18	6.85	6.64	8.17
-6	4	1	1.96*	0.28	0.07
-6	4	2	11.62	10.32	5.33
-6	4	3	2.66*	2.61	0.12
-6	4	4	25.55	24.87	1.96
-6	4	5	0.00*	0.82	0.00
-6	4	6	5.33	3.11	5.00
-6	4	7	15.69	14.19	3.89
-6	4	8	11.58	11.82	4.69
-6	4	9	14.20	13.80	3.62
-6	4	10	4.23	3.44	3.06
-6	4	11	17.02	17.81	3.56
-6	4	12	12.46	12.24	4.57
-6	4	13	3.81	3.07	3.44
-6	4	14	11.91	12.42	4.80
-6	4	15	1.78*	0.30	0.08
-6	4	16	3.56	2.67	4.25
-6	4	17	2.16*	1.46	0.13
-6	4	18	3.48	3.06	3.81
-5	4	1	7.20	5.61	5.76
-5	4	2	2.86*	1.54	0.21
-5	4	3	3.46	0.72	3.38
-5	4	4	13.75	12.91	4.98
-5	4	5	17.31	16.99	3.52
-5	4	6	4.23	4.53	2.66
-5	4	7	8.30	8.24	5.73
-5	4	8	30.23	28.53	1.46
-5	4	9	17.01	16.80	3.51
-5	4	10	2.49*	2.40	0.11
-5	4	11	18.94	18.71	3.26
-5	4	12	4.16	2.94	2.70
-5	4	13	4.04	3.70	2.57
-5	4	14	13.32	13.23	4.47
-5	4	15	5.58	5.70	4.57
-5	4	16	4.92	3.94	4.60
-5	4	17	3.72	2.69	4.02
-4	4	1	24.81	21.69	2.12
-4	4	2	7.56	6.73	5.97
-4	4	3	7.32	6.75	5.23
-4	4	4	21.20	18.03	2.59
-4	4	5	5.75	4.95	5.54
-4	4	6	30.63	28.62	1.45
-4	4	7	8.82	7.84	5.41
-4	4	8	29.41	29.19	1.52
-4	4	9	29.05	29.70	1.53
-4	4	10	33.54	34.18	1.20
-4	4	11	4.64	3.92	3.36
-4	4	12	16.13	15.86	3.73
-4	4	13	5.01	3.54	4.83
-4	4	14	15.80	15.53	4.14
-4	4	15	8.29	7.68	7.38
-4	4	16	4.42	3.13	5.80
-4	4	17	0.19*	0.59	0.00
-3	4	1	24.35	20.06	2.16
-3	4	2	10.06	7.20	7.15
-3	4	3	27.32	24.05	1.78
-3	4	4	27.34	24.68	1.77
-3	4	5	6.77	7.28	5.13
-3	4	6	25.97	24.96	1.97
-3	4	7	12.03	12.03	6.06
-3	4	8	11.12	11.29	6.19
-3	4	9	14.43	14.92	4.21
-3	4	10	4.44	4.26	2.72
-3	4	11	15.74	16.11	3.67
-3	4	12	15.39	15.58	4.20
-3	4	13	7.59	8.06	5.49
-3	4	14	10.18	10.25	5.77
-3	4	15	4.04	3.53	3.24
-3	4	16	0.00*	0.79	0.00
-3	4	17	3.26	0.61	4.02
-2	4	1	14.47	11.91	4.50

H	K	L	FO	FC	WEIGHT
-2	4	2	32.64	27.05	1.28
-2	4	3	3.32*	2.95	0.28
-2	4	4	23.20	22.98	2.38
-2	4	5	11.06	11.08	6.51
-2	4	6	3.76	2.86	4.40
-2	4	7	4.36	4.12	4.75
-2	4	8	7.11	7.49	6.51
-2	4	9	13.80	13.32	5.33
-2	4	10	7.16	6.66	6.93
-2	4	11	3.26*	3.35	0.16
-2	4	12	5.84	5.36	5.72
-2	4	13	3.25*	2.08	0.31
-2	4	14	9.45	9.71	5.19
-2	4	15	2.11*	1.27	0.13
-2	4	16	2.84*	1.39	0.29
-1	4	1	22.48	18.42	2.41
-1	4	3	25.01	23.92	2.11
-1	4	4	21.54	22.25	2.79
-1	4	5	6.77	7.73	6.16
-1	4	6	13.37	13.48	4.73
-1	4	7	2.73*	0.11	0.26
-1	4	8	24.93	25.31	2.08
-1	4	9	7.20	7.10	4.93
-1	4	10	15.57	16.20	4.24
-1	4	11	8.05	8.59	5.53
-1	4	12	8.62	8.35	6.80
-1	4	13	2.84*	1.61	0.26
-1	4	14	15.05	15.07	4.33
-1	4	15	3.17	1.04	4.04
-1	4	16	3.32*	3.44	0.35
0	4	0	60.56	48.96	0.39
0	4	1	25.28	25.30	2.07
0	4	2	17.83	17.49	3.86
0	4	3	9.46	10.05	7.65
0	4	4	4.02	2.80	4.53
0	4	5	3.13*	1.70	0.40
0	4	6	28.47	28.78	1.64
0	4	7	3.00*	2.64	0.28
0	4	8	14.41	15.57	4.24
0	4	9	2.40*	3.18	0.14
0	4	10	2.95*	1.77	0.19
0	4	11	8.50	8.30	6.77
0	4	12	6.00	6.03	6.10
0	4	13	9.77	9.28	7.11
0	4	14	5.80	6.08	4.59
0	4	15	3.83	4.01	3.46
1	4	0	24.18	24.70	2.17
1	4	1	5.15	5.13	5.13
1	4	2	19.50	20.50	3.19
1	4	3	11.00	11.10	6.27
1	4	4	5.70	5.19	6.09
1	4	5	4.58	5.33	3.54
1	4	6	18.69	19.78	3.41
1	4	7	2.10*	2.22	0.13
1	4	8	0.00*	1.07	0.00
1	4	9	2.33*	1.64	0.13
1	4	10	23.81	24.74	2.20
1	4	11	11.46	12.02	5.42
1	4	12	3.38*	3.20	0.25
1	4	13	6.19	6.57	5.74
1	4	14	5.84	6.05	6.84
1	4	15	2.80*	0.37	0.41
2	4	0	30.18	29.01	1.53
2	4	1	2.48*	1.04	0.26
2	4	2	20.05	20.43	3.01
2	4	3	7.98	7.71	7.12
2	4	4	12.32	12.48	5.68
2	4	5	3.31*	3.71	0.26
2	4	6	3.43	1.96	4.03
2	4	7	8.81	9.29	6.15
2	4	8	13.07	14.49	4.63
2	4	9	4.29	3.67	4.25
2	4	10	25.49	26.97	1.94
2	4	11	2.79*	0.46	0.26
2	4	12	1.56*	1.31	0.07
2	4	13	4.93	4.11	5.52
2	4	14	8.20	7.73	9.24
3	4	0	32.07	31.47	1.35
3	4	1	5.66	4.65	9.50
3	4	2	30.91	31.32	1.44
3	4	3	7.85	7.85	6.38
3	4	4	29.91	31.37	1.49
3	4	5	21.10	22.59	2.72
3	4	6	5.21	5.15	4.44
3	4	7	3.21*	1.32	0.33
3	4	8	3.66	2.26	3.39
3	4	9	7.41	7.61	6.78
3	4	10	7.41	6.47	7.11
3	4	11	4.31	4.37	3.71
3	4	12	2.70*	2.81	0.19
3	4	13	8.07	8.31	7.86
4	4	0	1.57*	1.86	0.08
4	4	1	11.40	11.81	5.94
4	4	2	10.09	9.99	6.07
4	4	3	4.28	4.01	4.05
4	4	4	29.66	30.17	1.55
4	4	5	6.39	6.74	4.28
4	4	6	19.01	20.11	3.14
4	4	7	1.13*	1.02	0.03
4	4	8	8.29	8.49	5.66
4	4	9	2.78*	0.14	0.26
4	4	10	4.70	3.57	5.72
4	4	11	3.87	3.19	3.92
4	4	12	7.33	6.95	9.02
5	4	0	22.37	22.04	2.65
5	4	1	15.39	15.64	4.05
5	4	2	29.97	31.46	1.48
5	4	3	13.19	13.47	4.69
5	4	4	3.98	3.23	2.82
5	4	5	6.55	6.20	6.35
5	4	6	15.60	15.83	4.45
5	4	7	2.24*	0.60	0.11
5	4	8	1.21*	2.40	0.03
5	4	9	6.39	6.03	5.89
5	4	10	9.19	9.97	5.83
5	4	11	1.84*	0.92	0.13

H	K	L	FO	FC	WEIGHT
6	4	0	8.11	7.87	7.46
6	4	1	17.08	17.94	3.48
6	4	2	16.11	17.15	3.64
6	4	3	17.00	17.92	3.58
6	4	4	2.13*	3.22	0.07
6	4	5	9.75	9.71	5.65
6	4	6	3.02*	3.00	0.20
6	4	7	4.73	3.65	5.42
6	4	8	2.93*	0.93	0.37
6	4	9	0.00*	0.61	0.00
6	4	10	6.29	6.30	7.95
7	4	0	6.16	5.68	4.77
7	4	1	8.39	8.41	6.80
7	4	2	3.41*	2.42	0.33
7	4	3	9.45	9.07	5.65
7	4	4	6.80	6.73	5.14
7	4	5	6.32	6.27	5.28
7	4	6	5.56	5.29	6.81
7	4	7	1.76*	0.72	0.11
7	4	8	2.32*	0.29	0.24
8	4	0	16.96	17.54	3.58
8	4	1	8.57	8.16	5.62
8	4	2	11.05	11.14	4.96
8	4	3	2.61*	1.92	0.16
8	4	4	1.99*	1.19	0.11
8	4	5	1.92*	0.59	0.12
8	4	6	12.20	13.32	5.56
8	4	7	3.91	3.15	4.66
9	4	0	6.11	5.33	6.40
9	4	1	2.22*	1.70	0.12
9	4	2	7.67	8.14	5.30
9	4	3	2.46*	1.43	0.19
9	4	4	0.00*	0.14	0.00
9	4	5	3.64	3.74	3.85
10	4	0	3.08*	1.91	0.26
10	4	1	4.62	3.99	4.82
10	4	2	7.18	7.08	7.97
10	4	3	4.65	3.76	9.49
11	4	0	6.24	6.08	8.15
11	4	1	4.38	4.27	5.53
-11	5	3	3.36	2.30	3.62
-11	5	4	2.24*	1.06	0.18
-11	5	5	8.39	8.92	5.81
-11	5	6	7.84	8.39	6.25
-11	5	7	7.67	7.11	8.27
-11	5	8	1.99*	0.28	0.13
-11	5	9	7.68	7.83	6.23
-11	5	10	5.19	5.39	4.70
-11	5	11	2.66*	2.57	0.25
-11	5	12	3.02*	2.42	0.35
-10	5	1	6.22	6.49	5.35
-10	5	2	0.00*	1.01	0.00
-10	5	3	0.84*	2.71	0.02
-10	5	4	2.46*	2.17	0.11
-10	5	5	2.33*	2.65	0.10
-10	5	6	5.80	5.22	5.71
-10	5	7	6.31	6.21	6.11
-10	5	8	4.73	4.08	3.59
-10	5	9	2.88*	1.51	0.25
-10	5	10	2.76*	0.64	0.25
-10	5	11	1.19*	1.39	0.04
-10	5	12	4.38	4.18	5.33
-10	5	13	0.00*	1.28	0.00
-10	5	14	3.76	2.04	5.79
-9	5	1	9.88	10.02	5.16
-9	5	2	4.54	4.07	3.02
-9	5	3	3.77	2.13	2.83
-9	5	4	4.62	4.70	2.86
-9	5	5	7.74	7.65	4.89
-9	5	6	3.09*	0.39	0.22
-9	5	7	0.00*	2.68	0.00
-9	5	8	9.30	8.70	7.23
-9	5	9	5.02	6.00	2.69
-9	5	10	9.55	8.78	7.47
-9	5	11	13.59	14.54	4.27
-9	5	12	3.43*	3.15	0.25
-9	5	13	2.72*	1.83	0.19
-9	5	14	0.84*	0.73	0.02
-9	5	15	3.23*	3.67	0.31
-8	5	1	8.21	8.59	3.71
-8	5	2	3.64*	2.56	0.20
-8	5	3	7.13	6.54	4.32
-8	5	4	8.36	7.43	5.62
-8	5	5	9.80	9.72	4.94
-8	5	6	12.83	12.45	4.60
-8	5	7	7.82	8.02	4.59
-8	5	8	13.85	14.31	4.09
-8	5	9	4.41	3.53	2.49
-8	5	10	5.48	4.33	5.96
-8	5	11	1.52*	3.28	0.04
-8	5	12	4.67	2.92	5.71
-8	5	13	5.79	5.74	5.82
-8	5	14	1.79*	1.34	0.09
-8	5	15	8.25	8.51	7.55
-7	5	1	5.63	5.75	2.71
-7	5	2	19.14	19.23	2.73
-7	5	3	11.57	11.41	4.01
-7	5	5	3.09*	1.33	0.20
-7	5	6	3.77*	4.45	0.21
-7	5	7	18.15	16.62	3.11
-7	5	8	2.38*	2.29	0.09
-7	5	9	9.46	9.01	4.78
-7	5	10	7.89	7.45	5.42
-7	5	11	10.51	10.94	4.45
-7	5	12	2.86*	2.59	0.14
-7	5	13	5.48	5.02	4.92
-7	5	14	3.19*	3.04	0.22
-7	5	15	4.98	4.37	6.11
-7	5	16	7.54	7.36	7.08
-6	5	1	23.20	20.42	2.14
-6	5	2	4.61	3.03	2.46
-6	5	3	8.72	8.85	5.51
-6	5	4	3.56*	2.63	0.15
-6	5	5	16.88	16.06	3.38
-6	5	6	2.31*	2.95	0.07
-6	5	7	25.69	24.55	1.94

H	K	L	FO	FC	WEIGHT
-6	5	8	9.98	10.38	4.74
-6	5	9	3.10*	0.71	0.18
-6	5	10	1.97*	1.26	0.08
-6	5	11	17.52	17.18	3.83
-6	5	12	4.95	3.93	5.23
-6	5	13	5.77	5.63	4.94
-6	5	14	2.26*	2.34	0.11
-6	5	15	3.63	2.84	3.78
-6	5	16	4.06	3.21	4.55
-5	5	1	29.66	25.45	1.50
-5	5	2	6.94	7.06	3.59
-5	5	3	11.46	10.44	4.41
-5	5	4	4.07	2.98	2.19
-5	5	5	11.09	10.74	4.90
-5	5	6	18.15	17.18	3.16
-5	5	7	5.51	4.91	4.06
-5	5	8	9.40	10.29	4.76
-5	5	9	4.35	3.60	2.85
-5	5	10	10.04	9.62	5.45
-5	5	11	17.34	18.55	3.30
-5	5	12	4.35	2.35	4.35
-5	5	13	2.95*	2.71	0.20
-5	5	14	2.31*	0.52	0.16
-5	5	15	13.12	12.80	5.11
-5	5	16	3.85	3.53	4.19
-4	5	1	3.00*	1.84	0.10
-4	5	2	24.69	22.72	2.04
-4	5	3	16.47	15.67	3.52
-4	5	4	11.69	9.88	5.51
-4	5	5	15.13	13.61	3.87
-4	5	6	8.99	8.83	4.36
-4	5	7	3.81	1.26	2.52
-4	5	8	11.66	12.29	5.24
-4	5	9	3.97	3.95	2.53
-4	5	10	13.86	13.72	4.61
-4	5	11	3.29*	1.03	0.30
-4	5	12	6.06	6.54	3.70
-4	5	13	6.33	6.69	5.28
-4	5	14	5.34	4.31	6.95
-4	5	15	3.45	2.60	3.56
-4	5	16	4.95	4.95	5.09
-3	5	1	15.62	12.78	3.60
-3	5	2	11.94	10.05	4.71
-3	5	3	21.89	20.00	2.48
-3	5	4	10.77	9.81	4.76
-3	5	5	4.57	2.84	5.07
-3	5	6	7.68	7.00	5.69
-3	5	7	16.30	15.86	3.75
-3	5	8	12.39	11.31	5.63
-3	5	9	3.73*	3.72	0.26
-3	5	10	10.91	10.93	5.33
-3	5	11	5.66	5.28	4.12
-3	5	12	7.95	7.90	5.64
-3	5	13	2.02*	0.59	0.11
-3	5	14	0.00*	0.71	0.00
-3	5	15	3.61	1.92	5.91
-2	5	1	14.44	12.96	3.61
-2	5	2	13.23	11.72	4.00
-2	5	3	5.02	4.18	3.83
-2	5	4	11.82	11.48	4.84
-2	5	5	0.00*	0.52	0.00
-2	5	6	3.29*	2.60	0.25
-2	5	7	10.75	12.03	5.08
-2	5	8	11.11	10.57	4.93
-2	5	9	8.15	8.19	6.75
-2	5	10	3.07*	0.97	0.28
-2	5	11	27.24	27.92	1.79
-2	5	12	14.79	15.50	4.60
-2	5	13	8.87	8.57	7.92
-2	5	14	2.41*	1.24	0.21
-2	5	15	0.00*	0.45	0.01
-1	5	1	4.71	2.06	3.07
-1	5	2	11.23	11.54	4.75
-1	5	3	26.46	26.65	1.83
-1	5	4	3.28*	2.09	0.29
-1	5	5	3.48	0.50	3.81
-1	5	6	12.39	12.65	5.88
-1	5	7	16.86	18.21	3.65
-1	5	8	3.92*	4.61	0.23
-1	5	9	32.43	34.48	1.28
-1	5	10	1.94*	1.75	0.08
-1	5	11	3.32*	2.24	0.34
-1	5	12	4.26	3.34	3.49
-1	5	13	9.90	9.70	6.07
-1	5	14	2.28*	0.92	0.22
0	5	1	2.65*	2.89	0.13
0	5	2	8.00	6.90	6.76
0	5	3	21.92	24.14	2.58
0	5	4	1.71*	0.81	0.09
0	5	5	13.86	14.76	4.26
0	5	6	21.96	24.24	2.44
0	5	7	12.82	13.38	4.63
0	5	8	15.30	15.97	3.98
0	5	9	2.73*	1.78	0.16
0	5	10	9.52	9.27	5.78
0	5	11	6.59	5.27	7.00
0	5	12	3.25	1.64	3.71
0	5	13	4.17	4.93	2.92
0	5	14	3.84	3.35	4.38
1	5	0	5.44	6.14	3.72
1	5	1	20.15	21.16	2.86
1	5	2	10.43	10.65	5.68
1	5	3	4.51	4.73	4.06
1	5	4	22.85	25.53	2.34
1	5	5	11.14	11.51	6.43
1	5	6	6.93	6.62	5.32
1	5	7	13.51	14.68	5.25
1	5	8	2.07*	2.07	0.09
1	5	9	8.27	8.10	6.94
1	5	10	4.33	4.82	3.30
1	5	11	8.94	9.44	6.57
1	5	12	4.01	3.40	4.12
1	5	13	6.33	5.86	10.74
2	5	0	10.05	10.73	5.18
2	5	1	28.21	28.32	1.70
2	5	2	10.11	10.38	5.51

H	K	L	FO	FC	WEIGHT
2	5	3	40.76	43.27	0.86
2	5	4	1.65*	2.15	0.05
2	5	5	12.73	13.55	4.69
2	5	6	3.91	2.42	3.72
2	5	7	12.69	13.90	5.05
2	5	8	5.01	4.10	5.13
2	5	9	8.02	8.62	5.87
2	5	10	4.48	4.65	3.86
2	5	11	6.20	6.01	8.44
2	5	12	3.01*	2.31	0.37
3	5	0	4.51	3.48	3.97
3	5	1	20.91	21.07	2.89
3	5	2	15.42	16.25	4.10
3	5	3	3.52*	2.88	0.27
3	5	4	6.00	5.67	6.15
3	5	5	3.18*	2.92	0.30
3	5	6	13.94	14.48	5.08
3	5	7	7.43	7.67	5.42
3	5	8	2.63*	4.03	0.16
3	5	9	0.00*	1.52	0.00
3	5	10	8.57	8.91	6.98
3	5	11	2.25*	1.41	0.21
4	5	0	5.34	4.73	4.23
4	5	1	3.33*	3.98	0.23
4	5	2	6.12	5.46	5.99
4	5	3	3.53	1.64	3.02
4	5	4	16.92	17.16	3.74
4	5	5	7.96	7.55	6.51
4	5	6	1.83*	0.21	0.07
4	5	7	7.84	8.11	7.02
4	5	8	3.81	3.20	4.17
4	5	9	4.56	3.09	6.29
4	5	10	3.12*	2.95	0.28
5	5	0	2.40*	2.85	0.09
5	5	1	14.48	15.16	3.84
5	5	2	4.76	5.89	2.51
5	5	3	16.61	16.31	4.06
5	5	4	1.97*	2.05	0.08
5	5	5	5.15	5.85	2.94
5	5	6	5.95	5.40	6.35
5	5	7	5.79	5.89	5.25
5	5	8	9.13	9.48	6.31
5	5	9	8.23	8.37	7.40
6	5	0	4.94	3.44	4.66
6	5	1	8.73	8.16	6.53
6	5	2	0.72*	0.54	0.01
6	5	3	13.83	13.85	4.70
6	5	4	3.28*	2.80	0.33
6	5	5	2.80*	0.72	0.28
6	5	6	7.27	7.41	5.43
6	5	7	8.76	9.36	5.87
6	5	8	3.30*	3.11	0.37
7	5	0	6.88	6.62	7.10
7	5	1	2.82*	2.65	0.16
7	5	2	2.92*	2.22	0.18
7	5	3	9.47	9.93	6.12
7	5	4	2.37*	1.36	0.16
7	5	5	9.28	9.90	5.60
7	5	6	2.85*	0.30	0.33
8	5	0	5.71	4.84	6.09
8	5	1	5.48	4.26	5.90
8	5	2	6.14	6.16	5.36
8	5	3	2.77*	1.66	0.22
8	5	4	1.69*	0.56	0.08
8	5	5	4.24	4.66	3.82
9	5	0	5.38	6.09	3.91
9	5	1	3.57	1.99	3.19
9	5	2	2.55*	2.36	0.18
9	5	3	6.02	6.69	5.77
10	5	0	5.25	4.45	6.86
-9	6	2	5.28	5.46	3.93
-9	6	3	3.76*	4.40	0.21
-9	6	4	5.85	5.90	3.88
-9	6	5	3.94	3.30	3.19
-9	6	6	3.17*	2.59	0.20
-9	6	7	3.81	3.41	3.03
-9	6	8	3.70	2.66	2.98
-9	6	9	2.96*	2.02	0.24
-9	6	10	3.99	3.44	3.13
-8	6	1	2.87*	2.22	0.15
-8	6	2	3.63*	2.10	0.21
-8	6	3	3.09*	0.80	0.19
-8	6	4	9.14	8.84	4.96
-8	6	5	5.90	5.63	4.25
-8	6	6	2.58*	3.74	0.10
-8	6	7	8.32	7.95	4.83
-8	6	8	9.59	8.65	5.85
-8	6	9	1.17*	0.45	0.03
-8	6	10	2.90*	0.47	0.27
-8	6	11	4.09	4.21	3.59
-8	6	12	5.79	5.28	5.32
-7	6	1	7.74	7.38	5.05
-7	6	2	8.02	6.27	4.97
-7	6	3	6.12	6.10	3.20
-7	6	4	4.23	2.47	3.02
-7	6	5	10.60	9.87	5.05
-7	6	6	5.01	4.07	3.86
-7	6	7	1.87*	3.24	0.05
-7	6	8	10.76	10.54	5.36
-7	6	9	4.32	3.95	2.83
-7	6	10	5.23	4.21	4.01
-7	6	11	5.97	5.71	5.17
-7	6	12	1.85*	0.84	0.10
-7	6	13	0.65*	0.77	0.01
-6	6	1	1.90*	0.17	0.05
-6	6	2	9.17	8.21	4.85
-6	6	3	3.75*	3.31	0.16
-6	6	4	2.90*	1.23	0.13
-6	6	5	5.11	4.26	2.86
-6	6	6	5.36	4.09	3.09
-6	6	7	4.01	2.15	2.70
-6	6	8	9.22	9.97	4.44
-6	6	9	5.96	5.32	3.94
-6	6	10	9.49	9.18	4.91
-6	6	11	4.04	3.54	3.68
-6	6	12	3.73	3.73	2.90

H	K	L	FO	FC	WEIGHT
-6	6	13	8.46	8.62	6.54
-5	6	1	4.50	1.93	2.97
-5	6	2	4.30	1.78	2.10
-5	6	3	13.96	12.59	3.88
-5	6	4	13.43	13.01	3.67
-5	6	5	10.64	10.31	4.20
-5	6	6	8.74	8.97	4.59
-5	6	7	2.95*	3.09	0.13
-5	6	8	3.78	1.39	3.49
-5	6	9	2.99*	4.90	0.12
-5	6	10	9.75	10.55	6.18
-5	6	11	10.60	10.56	6.37
-5	6	12	9.64	9.74	5.62
-5	6	13	6.24	5.73	10.00
-4	6	1	6.61	6.21	2.58
-4	6	2	10.57	10.21	3.69
-4	6	3	4.48	3.03	2.18
-4	6	4	15.06	13.62	3.66
-4	6	5	2.71*	1.46	0.10
-4	6	6	0.00*	0.45	0.00
-4	6	7	9.00	8.44	5.67
-4	6	8	6.58	6.19	5.05
-4	6	9	3.92	3.74	2.83
-4	6	10	13.77	13.73	5.06
-4	6	11	0.62*	0.13	0.01
-4	6	12	2.77*	0.85	0.26
-4	6	13	2.64*	1.07	0.29
-3	6	1	4.25*	3.48	0.19
-3	6	2	6.26	5.82	3.02
-3	6	3	11.66	11.36	4.23
-3	6	4	11.49	10.47	4.25
-3	6	5	0.00*	0.72	0.00
-3	6	6	4.02	1.97	3.72
-3	6	7	14.14	15.59	4.52
-3	6	8	11.48	12.41	4.89
-3	6	9	5.58	4.41	6.03
-3	6	10	8.00	7.39	6.24
-3	6	11	3.69	2.99	3.22
-3	6	13	0.00*	1.13	0.00
-2	6	1	11.43	9.05	4.25
-2	6	2	11.66	9.81	4.24
-2	6	3	17.37	16.52	3.28
-2	6	4	17.43	17.87	3.44
-2	6	5	25.99	27.52	1.87
-2	6	6	12.70	13.59	4.54
-2	6	7	13.27	14.25	4.76
-2	6	8	7.50	8.22	5.45
-2	6	9	9.53	10.37	7.07
-2	6	10	10.82	11.75	6.14
-2	6	11	2.84*	0.92	0.24
-2	6	12	5.08	4.94	6.24
-2	6	13	1.60*	0.70	0.11
-1	6	1	18.10	16.81	2.64
-1	6	2	3.47*	2.76	0.17
-1	6	3	3.68*	3.40	0.19
-1	6	4	25.76	27.77	1.90
-1	6	5	10.17	9.95	5.52
-1	6	6	3.94	3.35	2.54
-1	6	7	4.41	4.38	3.10
-1	6	8	4.96	4.54	5.29
-1	6	9	9.62	9.67	7.24
-1	6	10	4.40	4.84	3.99
-1	6	11	2.78*	3.57	0.19
-1	6	12	5.31	4.66	7.34
0	6	0	7.92	6.40	2.67
0	6	1	2.29*	1.68	0.11
0	6	2	22.06	24.30	2.41
0	6	3	3.45*	0.73	0.33
0	6	4	0.00*	1.86	0.00
0	6	5	1.49*	2.60	0.04
0	6	6	6.84	6.34	6.46
0	6	7	3.81	1.16	3.66
0	6	8	1.87*	0.65	0.09
0	6	9	4.71	4.70	4.15
0	6	10	2.09*	2.34	0.11
0	6	11	3.53	3.04	3.67
1	6	0	12.98	13.54	4.13
1	6	1	4.36	4.30	2.98
1	6	2	4.53	2.73	3.13
1	6	3	10.55	10.83	5.46
1	6	4	6.72	4.96	6.27
1	6	5	13.02	13.82	5.44
1	6	6	10.41	11.25	6.55
1	6	7	2.98*	0.17	0.29
1	6	8	15.07	17.14	4.07
1	6	9	4.25	3.11	5.65
1	6	10	9.73	10.55	6.01
1	6	11	2.66*	0.85	0.35
2	6	0	18.16	19.35	3.28
2	6	1	12.86	13.66	4.50
2	6	2	2.50*	1.54	0.13
2	6	3	0.00*	0.33	0.00
2	6	4	9.08	10.02	4.81
2	6	5	1.75*	1.16	0.07
2	6	6	13.40	14.88	4.62
2	6	7	5.23	5.02	4.19
2	6	8	3.42	0.26	3.76
2	6	9	14.81	15.87	4.46
2	6	10	5.35	5.56	5.74
3	6	0	3.43*	2.69	0.16
3	6	1	2.03*	3.18	0.06
3	6	2	11.43	11.96	4.58
3	6	3	2.65*	2.13	0.14
3	6	4	7.96	8.67	4.43
3	6	5	8.16	8.11	6.90
3	6	6	13.32	13.76	4.33
3	6	7	15.15	15.94	4.12
3	6	8	3.61	2.50	3.46
3	6	9	7.59	7.80	7.30
4	6	0	13.79	14.41	4.57
4	6	1	0.00*	1.21	0.00
4	6	2	3.49*	1.74	0.32
4	6	3	2.06*	1.73	0.09
4	6	4	2.33*	3.54	0.09
4	6	5	2.79*	2.68	0.19
4	6	6	7.65	7.82	6.63

H	K	L	FO	FC	WEIGHT
4	6	7	3.36	1.97	3.20
4	6	8	5.95	6.61	6.60
5	6	0	20.20	21.69	2.86
5	6	1	8.13	8.81	4.58
5	6	2	3.76*	2.88	0.28
5	6	3	7.61	6.79	7.30
5	6	4	3.46	1.94	3.75
5	6	5	3.82	1.14	5.02
5	6	6	3.21*	4.09	0.27
6	6	0	5.08	4.63	3.90
6	6	1	12.54	12.55	5.38
6	6	2	1.43*	1.24	0.04
6	6	3	5.64	5.42	5.54
6	6	4	6.34	5.86	6.94
6	6	5	7.99	7.97	7.39
7	6	0	5.52	4.88	6.91
7	6	1	0.00*	2.02	0.00
7	6	2	5.63	5.93	5.02
7	6	3	5.74	5.03	5.95
8	6	0	7.30	7.73	6.59
8	6	1	3.73	2.10	4.71
-7	7	4	3.08*	0.19	0.26
-7	7	5	7.32	8.66	5.26
-7	7	6	1.20*	1.05	0.04
-6	7	1	3.09*	1.64	0.16
-6	7	2	2.95*	3.86	0.12
-6	7	3	7.04	7.16	4.22
-6	7	4	4.74	3.70	3.01
-6	7	5	3.91*	2.86	0.25
-6	7	6	6.18	6.93	3.84
-6	7	7	4.61	3.05	4.69
-6	7	8	2.85*	2.32	0.22
-5	7	1	6.44	6.62	3.46
-5	7	2	5.21	3.63	3.52
-5	7	3	3.23*	1.00	0.15
-5	7	4	4.41	5.12	1.96
-5	7	5	8.50	7.94	4.78
-5	7	6	10.36	11.48	5.11
-5	7	7	15.66	16.61	3.75
-5	7	8	4.87	5.02	3.94
-5	7	9	3.83	3.40	3.93
-4	7	1	11.78	11.80	3.64
-4	7	2	7.07	5.31	4.33
-4	7	3	5.59	5.57	2.46
-4	7	4	18.53	18.98	2.94
-4	7	5	2.45*	2.07	0.08
-4	7	6	2.74*	2.76	0.13
-4	7	7	9.19	9.63	5.60
-4	7	8	2.56*	2.90	0.14
-4	7	9	3.79	2.56	4.72
-3	7	1	2.21*	1.59	0.05
-3	7	2	5.92	5.50	2.45
-3	7	3	9.45	8.29	3.84
-3	7	4	3.23*	2.38	0.15
-3	7	5	6.85	6.33	4.17
-3	7	6	9.86	10.32	4.67
-3	7	7	0.63*	0.74	0.01
-3	7	8	2.81*	1.19	0.27
-3	7	9	4.10	3.79	4.00
-2	7	1	11.02	10.90	3.52
-2	7	2	7.90	7.79	2.90
-2	7	3	5.84	5.30	3.86
-2	7	4	8.00	7.09	6.13
-2	7	5	2.44*	1.42	0.12
-2	7	6	4.31	5.27	2.98
-2	7	7	8.34	8.64	7.15
-2	7	8	6.08	7.33	4.69
-2	7	9	2.00*	1.75	0.13
-1	7	1	4.99	2.79	2.46
-1	7	2	13.24	13.77	3.99
-1	7	3	3.82*	3.66	0.23
-1	7	4	6.21	6.95	4.25
-1	7	5	6.31	6.81	4.54
-1	7	6	4.92	3.40	6.44
-1	7	7	7.83	8.29	6.15
-1	7	8	3.29	2.25	3.41
-1	7	9	4.34	3.67	6.24
0	7	1	5.54	3.70	5.91
0	7	2	5.95	6.80	3.83
0	7	3	9.13	9.79	5.28
0	7	4	2.97*	0.61	0.22
0	7	5	2.04*	2.13	0.09
0	7	6	7.00	7.34	6.72
0	7	7	14.89	15.80	4.78
0	7	8	4.62	4.12	4.83
1	7	0	9.66	10.27	5.16
1	7	1	14.73	15.12	4.29
1	7	2	4.58	3.75	3.62
1	7	3	8.77	9.30	5.38
1	7	4	3.44*	3.71	0.22
1	7	5	9.74	10.30	6.83
1	7	6	3.50*	3.06	0.29
1	7	7	7.89	8.65	8.57
2	7	0	7.86	9.04	4.40
2	7	1	6.21	5.66	7.10
2	7	2	9.10	10.64	5.62
2	7	3	3.17*	2.81	0.27
2	7	4	1.71*	1.47	0.07
2	7	5	3.92	4.07	4.24
2	7	6	1.95*	1.93	0.13
3	7	0	10.47	10.67	7.19
3	7	1	3.91	0.99	4.78
3	7	2	9.55	10.09	6.01
3	7	3	8.08	9.16	7.35
3	7	4	4.48	4.07	5.02
3	7	5	3.95	4.75	3.18
4	7	0	2.38*	0.73	0.17
4	7	1	2.90*	1.05	0.27
4	7	2	2.69*	0.76	0.25
4	7	3	7.43	8.49	6.95
4	7	4	3.48	3.25	3.52
5	7	0	2.98*	1.61	0.31
5	7	1	1.28*	0.88	0.05
5	7	2	2.93*	0.91	0.38
6	7	0	3.08	1.51	3.87

* DENOTES AN UNOBSERVED REFLECTION

Dichlorotetrakis(dimethylsulphoxide)ruthenium(II)

Anthony Mercer and James Trotter

Observed and calculated structure amplitudes

(reflections with intensity < $3\sigma(I)$ are marked with an asterisk).

The following planes which had $|Fo-Fc| > 3\sigma(F)$ were given zero weight in the final stages of refinement due to suspected errors resulting from extinction, absorption, or instrument malfunction:

h	k	l	Fo	Fc
1	2	$\bar{4}$	120.4	197.0
3	0	$\bar{1}$	121.6	222.9
4	2	$\bar{1}$	145.4	207.2
3	4	$\bar{1}$	132.7	182.0
2	0	0	85.5	165.0
4	0	0	143.4	193.6
3	2	0	122.7	181.4
1	6	0	114.1	196.7
0	8	0	130.6	218.0
1	8	1	131.8	187.5
4	0	2	143.0	186.5
1	0	3	100.4	174.7
0	2	3	98.7	189.3
0	0	4	136.5	289.8
0	2	5	126.2	194.8

H	K	L	FO	FC
1	0	-13	6.00*	5.33
3	0	-13	5.74*	4.36
1	1	-13	7.06*	6.33
2	1	-13	6.03*	7.82
3	1	-13	24.74	23.03
2	2	-13	0.00*	0.85
3	2	-13	2.88*	0.70
1	3	-13	13.56	13.06
2	3	-13	12.79	12.55
1	4	-13	11.71	11.47
2	4	-13	16.55	15.35
1	5	-13	13.28	12.94
2	0	-12	32.87	32.97
4	0	-12	25.83	25.17
1	1	-12	16.10	15.48
2	1	-12	6.54*	6.88
3	1	-12	26.19	26.11
4	1	-12	26.98	26.01
5	1	-12	14.74	13.84
1	2	-12	22.34	22.33
2	2	-12	5.01*	5.14
3	2	-12	30.55	29.27
4	2	-12	24.84	24.17
5	2	-12	19.71	19.24
1	3	-12	22.97	23.57
2	3	-12	27.68	28.08
3	3	-12	26.51	26.33
4	3	-12	30.10	28.69
1	4	-12	16.02	16.32
2	4	-12	18.32	17.99
3	4	-12	0.00*	1.34
4	4	-12	16.63	15.97
1	5	-12	32.21	32.34
2	5	-12	21.02	21.64
3	5	-12	29.18	28.53
4	5	-12	33.29	32.25
1	6	-12	6.60*	7.16
2	6	-12	10.81	11.01
3	6	-12	16.96	16.14
4	6	-12	14.37	13.32
1	7	-12	8.34	7.67
2	7	-12	17.53	16.79
3	7	-12	23.00	23.38
1	8	-12	23.81	23.26
2	8	-12	16.43	15.89
3	8	-12	11.68	11.08
1	9	-12	12.54	12.67
2	9	-12	13.26	12.63
1	0	-11	49.53	51.02
3	0	-11	40.09	40.59
5	0	-11	12.25	11.12
1	1	-11	25.79	26.58
2	1	-11	2.11*	0.81
3	1	-11	13.63	14.31
4	1	-11	31.37	31.82
5	1	-11	22.52	21.98
6	1	-11	25.14	24.32
1	2	-11	5.41*	6.66
2	2	-11	41.19	42.85
3	2	-11	1.52*	1.89
4	2	-11	26.18	26.67
5	2	-11	23.73	22.82
6	2	-11	15.64	15.28
1	3	-11	32.68	34.16
2	3	-11	32.15	33.11
3	3	-11	34.63	36.15
4	3	-11	37.29	36.94
5	3	-11	31.22	30.48
6	3	-11	12.25	11.84
1	4	-11	30.90	32.37
2	4	-11	2.03*	4.22
3	4	-11	31.66	32.13
4	4	-11	3.92*	5.18
5	4	-11	20.41	20.19
6	4	-11	6.60*	7.77
1	5	-11	39.11	40.01
2	5	-11	39.52	39.55
3	5	-11	37.66	38.41
4	5	-11	32.29	32.25
5	5	-11	33.47	32.58
1	6	-11	46.56	47.82
2	6	-11	28.50	29.39
3	6	-11	14.68	14.85
4	6	-11	27.90	26.70
5	6	-11	0.00*	0.18
1	7	-11	30.07	30.68
2	7	-11	25.75	25.32
3	7	-11	14.23	15.28
4	7	-11	29.14	28.79
5	7	-11	28.79	27.92
1	8	-11	14.99	14.31
2	8	-11	14.15	14.16
3	8	-11	34.57	34.17
4	8	-11	9.51	10.02
1	9	-11	28.97	28.78
2	9	-11	34.24	33.01
3	9	-11	15.85	15.39
4	9	-11	14.79	14.73
1	10	-11	6.24*	6.76
2	10	-11	20.21	20.46
3	10	-11	6.92*	7.23
1	11	-11	39.05	38.30
2	11	-11	28.81	27.45
3	11	-11	38.36	37.03
1	12	-11	11.96	10.88
2	0	-10	32.42	34.50
4	0	-10	46.00	43.97
6	0	-10	10.75	11.10
1	1	-10	13.10	13.35
2	1	-10	7.71	8.04
3	1	-10	38.54	37.41
4	1	-10	45.32	44.33
5	1	-10	42.75	42.37
6	1	-10	17.45	16.37
7	1	-10	45.27	43.97
1	2	-10	33.77	34.52

H	K	L	FO	FC
2	2	-10	19.32	19.13
3	2	-10	30.52	31.00
4	2	-10	16.19	16.65
5	2	-10	21.74	20.56
6	2	-10	19.42	19.24
7	2	-10	26.96	26.20
1	3	-10	48.97	50.81
2	3	-10	47.35	48.48
3	3	-10	43.13	44.40
4	3	-10	72.69	72.44
5	3	-10	30.97	30.19
6	3	-10	36.32	36.10
7	3	-10	16.79	15.89
1	4	-10	22.75	23.05
2	4	-10	27.68	30.04
3	4	-10	29.74	29.22
4	4	-10	32.95	32.19
5	4	-10	21.07	20.40
6	4	-10	19.65	19.28
7	4	-10	3.30*	4.51
1	5	-10	46.30	48.25
2	5	-10	45.28	45.19
3	5	-10	64.94	65.27
4	5	-10	30.42	30.17
5	5	-10	49.84	49.13
6	5	-10	12.88	12.77
1	6	-10	27.36	27.66
2	6	-10	8.66	9.13
3	6	-10	41.52	42.59
4	6	-10	14.72	14.60
5	6	-10	23.55	22.65
6	6	-10	14.06	14.34
1	7	-10	30.30	30.06
2	7	-10	40.59	41.42
3	7	-10	2.42*	3.82
4	7	-10	28.29	27.93
5	7	-10	13.52	12.74
6	7	-10	41.92	40.68
1	8	-10	18.35	18.75
2	8	-10	44.08	46.07
3	8	-10	19.38	19.80
4	8	-10	33.33	33.78
5	8	-10	13.61	12.75
6	8	-10	13.59	12.97
1	9	-10	42.67	43.19
2	9	-10	14.15	13.08
3	9	-10	20.73	20.51
4	9	-10	0.00*	1.29
5	9	-10	35.92	35.71
1	10	-10	34.46	35.44
2	10	-10	1.15*	2.07
3	10	-10	35.96	37.29
4	10	-10	14.14	13.99
5	10	-10	14.92	13.73
1	11	-10	27.64	28.23
2	11	-10	65.55	65.19
3	11	-10	10.92	10.76
4	11	-10	20.55	20.04
1	12	-10	0.00*	4.45
2	12	-10	27.43	27.82
3	12	-10	0.00*	4.67
4	12	-10	20.54	19.01
1	13	-10	52.20	52.53
2	13	-10	14.22	12.81
3	13	-10	38.82	38.00
1	14	-10	21.03	20.72
1	0	-9	22.18	22.08
3	0	-9	38.38	38.75
5	0	-9	28.46	27.37
7	0	-9	17.21	16.52
1	1	-9	19.28	19.19
2	1	-9	27.07	27.12
3	1	-9	28.53	28.75
4	1	-9	49.35	49.72
5	1	-9	17.54	16.52
6	1	-9	8.03	7.39
7	1	-9	20.23	19.38
8	1	-9	36.14	35.48
1	2	-9	27.77	27.74
2	2	-9	13.90	11.57
3	2	-9	14.78	15.26
4	2	-9	40.76	39.98
5	2	-9	42.49	41.79
6	2	-9	5.56*	6.49
7	2	-9	7.19	7.07
8	2	-9	15.77	14.75
1	3	-9	36.13	38.92
2	3	-9	31.71	34.00
3	3	-9	86.94	88.23
4	3	-9	51.65	51.93
5	3	-9	35.44	36.91
6	3	-9	12.44	11.58
7	3	-9	15.33	15.10
1	4	-9	11.67	11.77
2	4	-9	10.95	12.61
3	4	-9	21.65	21.26
4	4	-9	20.18	20.64
5	4	-9	14.67	13.92
6	4	-9	2.44*	1.44
7	4	-9	21.88	22.04
1	5	-9	25.13	24.88
2	5	-9	68.90	71.81
3	5	-9	30.59	32.40
4	5	-9	50.17	50.46
5	5	-9	40.90	40.45
6	5	-9	16.78	15.99
7	5	-9	8.68	7.66
1	6	-9	28.11	28.44
2	6	-9	33.48	36.34
3	6	-9	24.59	25.27
4	6	-9	23.09	23.42
5	6	-9	1.75*	0.51
6	6	-9	18.77	18.65
7	6	-9	31.01	30.42
1	7	-9	34.30	35.88
2	7	-9	5.51*	4.65

H	K	L	FO	FC	H	K	L	FO	FC
3	7	-9	26.81	28.06	3	2	-8	26.74	29.23
4	7	-9	7.72	7.12	4	2	-8	17.33	17.69
5	7	-9	24.64	24.58	5	2	-8	10.20	11.60
6	7	-9	24.98	24.14	6	2	-8	15.78	16.15
7	7	-9	30.92	29.42	7	2	-8	19.35	18.53
1	8	-9	32.07	33.76	8	2	-8	9.69	8.09
2	8	-9	15.27	15.59	1	3	-8	27.18	26.37
3	8	-9	29.48	31.03	2	3	-8	50.68	50.83
4	8	-9	0.00*	0.87	3	3	-8	32.90	34.96
5	8	-9	7.17	7.13	4	3	-8	38.96	40.54
6	8	-9	5.31*	4.64	5	3	-8	44.41	44.26
7	8	-9	17.81	16.95	6	3	-8	11.49	11.36
1	9	-9	7.61	6.58	7	3	-8	10.38	10.10
2	9	-9	40.40	41.09	8	3	-8	21.78	22.10
3	9	-9	4.96*	3.28	1	4	-8	41.33	42.84
4	9	-9	5.07*	4.25	2	4	-8	30.58	30.61
5	9	-9	21.16	20.23	3	4	-8	4.79*	4.48
6	9	-9	47.84	47.77	4	4	-8	19.20	20.12
1	10	-9	10.30	10.68	5	4	-8	22.90	23.03
2	10	-9	42.51	44.16	6	4	-8	20.72	21.16
3	10	-9	3.96*	3.95	7	4	-8	25.21	25.52
4	10	-9	7.64	6.33	8	4	-8	24.95	25.14
5	10	-9	21.12	21.07	1	5	-8	34.23	34.42
6	10	-9	12.68	11.14	2	5	-8	33.52	34.21
1	11	-9	39.49	41.40	3	5	-8	44.53	46.27
2	11	-9	12.97	13.52	4	5	-8	48.20	48.91
3	11	-9	31.53	31.33	5	5	-8	10.86	11.21
4	11	-9	15.20	15.46	6	5	-8	29.41	29.82
5	11	-9	40.09	40.17	7	5	-8	13.77	12.82
1	12	-9	46.38	46.93	8	5	-8	7.45	8.26
2	12	-9	7.29*	8.32	1	6	-8	17.19	19.15
3	12	-9	14.79	16.56	2	6	-8	29.38	28.98
4	12	-9	6.71*	5.99	3	6	-8	27.13	28.07
5	12	-9	17.92	17.08	4	6	-8	2.24*	5.70
1	13	-9	6.23*	6.54	5	6	-8	26.66	27.96
2	13	-9	51.30	53.53	6	6	-8	39.36	39.14
3	13	-9	20.66	20.67	7	6	-8	38.22	38.09
4	13	-9	20.83	19.62	8	6	-8	15.16	14.27
1	14	-9	14.94	15.01	1	7	-8	23.77	23.39
2	14	-9	17.78	18.27	2	7	-8	27.39	28.38
3	14	-9	1.71*	0.92	3	7	-8	12.56	12.66
4	14	-9	20.34	19.74	4	7	-8	0.00*	2.82
1	15	-9	23.10	23.89	5	7	-8	41.63	40.78
2	15	-9	12.57	13.24	6	7	-8	21.87	21.07
2	0	-8	27.96	29.57	7	7	-8	7.50*	7.23
4	0	-8	39.45	42.27	1	8	-8	20.13	20.26
6	0	-8	3.78*	2.22	2	8	-8	21.54	22.19
8	0	-8	26.21	25.57	3	8	-8	14.40	15.08
1	1	-8	35.65	34.21	4	8	-8	3.49*	5.99
2	1	-8	11.29	10.28	5	8	-8	3.42*	2.10
3	1	-8	17.48	17.60	6	8	-8	41.13	40.46
4	1	-8	22.60	23.04	7	8	-8	19.36	18.44
5	1	-8	3.21*	1.65	1	9	-8	26.06	25.82
6	1	-8	2.88*	5.03	2	9	-8	7.94	7.79
7	1	-8	33.72	33.07	3	9	-8	4.25*	3.97
8	1	-8	40.61	39.98	4	9	-8	29.47	29.64
1	2	-8	31.99	33.60	5	9	-8	23.18	23.21
2	2	-8	27.52	27.60	6	9	-8	31.67	31.58

H	K	L	FO	FC	H	K	L	FO	FC
7	9	-8	29.06	28.61	7	2	-7	13.58	14.17
1	10	-8	25.74	24.86	8	2	-7	59.54	60.33
2	10	-8	5.50*	5.89	9	2	-7	18.86	19.28
3	10	-8	13.45	13.17	1	3	-7	14.92	12.45
4	10	-8	11.07	10.79	2	3	-7	14.15	15.50
5	10	-8	18.40	19.10	3	3	-7	34.53	33.72
6	10	-8	26.04	25.00	4	3	-7	59.15	59.87
7	10	-8	25.82	25.44	5	3	-7	24.46	24.37
1	11	-8	7.53	9.24	6	3	-7	22.44	23.81
2	11	-8	62.59	62.44	7	3	-7	38.79	40.01
3	11	-8	26.86	27.82	8	3	-7	22.95	23.62
4	11	-8	19.40	18.81	9	3	-7	0.00*	0.51
5	11	-8	29.83	30.34	1	4	-7	55.17	58.69
6	11	-8	41.34	40.85	2	4	-7	3.46*	1.16
1	12	-8	6.61*	4.87	3	4	-7	67.39	67.02
2	12	-8	35.94	37.19	4	4	-7	11.02	10.43
3	12	-8	1.99*	2.01	5	4	-7	47.86	46.66
4	12	-8	15.48	15.25	6	4	-7	0.00*	0.54
5	12	-8	8.89	8.77	7	4	-7	48.45	49.90
6	12	-8	38.59	38.05	8	4	-7	14.79	15.06
1	13	-8	25.73	25.66	9	4	-7	36.16	36.95
2	13	-8	24.41	25.38	1	5	-7	77.77	78.27
3	13	-8	41.08	42.13	2	5	-7	11.07	9.90
4	13	-8	17.68	18.61	3	5	-7	37.35	40.02
5	13	-8	40.07	39.39	4	5	-7	33.70	34.21
1	14	-8	27.23	28.39	5	5	-7	50.15	51.60
2	14	-8	8.99	9.62	6	5	-7	23.61	24.06
3	14	-8	9.24	8.83	7	5	-7	2.55*	0.61
4	14	-8	10.43	11.01	8	5	-7	7.41	6.82
5	14	-8	43.99	44.29	1	6	-7	105.83	107.08
1	15	-8	14.77	14.87	2	6	-7	59.41	63.18
2	15	-8	20.84	22.13	3	6	-7	9.21	8.70
3	15	-8	24.96	25.35	4	6	-7	56.94	57.84
4	15	-8	11.71	11.50	5	6	-7	1.73*	2.16
1	16	-8	5.36*	4.32	6	6	-7	62.72	61.15
2	16	-8	20.91	20.59	7	6	-7	25.38	25.93
3	16	-8	5.64*	5.29	8	6	-7	34.67	35.29
1	17	-8	15.77	15.67	1	7	-7	10.50*	8.78
1	0	-7	66.14	70.44	2	7	-7	51.31	54.07
3	0	-7	49.50	51.67	3	7	-7	4.32*	4.72
5	0	-7	28.61	29.64	4	7	-7	22.29	23.56
7	0	-7	54.38	53.10	5	7	-7	2.56*	2.14
9	0	-7	46.41	46.10	6	7	-7	14.41	15.09
1	1	-7	20.60	21.40	7	7	-7	32.52	32.93
2	1	-7	42.50	39.31	8	7	-7	16.76	14.93
3	1	-7	17.00	15.83	1	8	-7	23.69	24.89
4	1	-7	19.05	19.89	2	8	-7	8.54	7.43
5	1	-7	10.75	9.98	3	8	-7	50.36	52.47
6	1	-7	10.44	10.23	4	8	-7	3.76*	2.97
7	1	-7	38.31	37.33	5	8	-7	39.96	39.81
8	1	-7	45.68	45.50	6	8	-7	4.52*	3.79
9	1	-7	22.12	21.69	7	8	-7	41.67	41.92
1	2	-7	19.30	19.36	8	8	-7	7.68	8.31
2	2	-7	38.75	40.16	1	9	-7	67.60	66.83
3	2	-7	48.50	46.71	2	9	-7	25.50	26.49
4	2	-7	60.08	60.38	3	9	-7	22.55	22.50
5	2	-7	32.55	32.14	4	9	-7	15.67	16.36
6	2	-7	31.37	29.93	5	9	-7	31.37	32.14

H	K	L	FO	FC
6	9	-7	25.83	25.41
7	9	-7	20.23	19.93
8	9	-7	13.90	13.93
1	10	-7	1.60*	1.02
2	10	-7	55.21	56.64
3	10	-7	10.46	11.04
4	10	-7	29.04	29.09
5	10	-7	37.31	38.68
6	10	-7	44.37	43.20
7	10	-7	22.24	22.46
1	11	-7	40.72	41.48
2	11	-7	30.97	32.55
3	11	-7	37.08	38.24
4	11	-7	35.62	38.67
5	11	-7	26.39	26.01
6	11	-7	28.20	28.88
7	11	-7	5.33*	3.26
1	12	-7	44.17	47.59
2	12	-7	23.35	24.46
3	12	-7	47.26	47.31
4	12	-7	20.72	21.26
5	12	-7	52.97	52.71
6	12	-7	28.52	30.13
7	12	-7	17.88	18.27
1	13	-7	31.36	33.15
2	13	-7	70.27	72.98
3	13	-7	41.95	43.44
4	13	-7	28.08	27.90
5	13	-7	15.68	16.77
6	13	-7	24.81	25.80
1	14	-7	23.57	25.00
2	14	-7	31.15	33.33
3	14	-7	26.16	27.32
4	14	-7	33.87	34.94
5	14	-7	4.71*	3.00
6	14	-7	42.10	42.09
1	15	-7	23.74	24.85
2	15	-7	23.90	24.45
3	15	-7	16.19	17.12
4	15	-7	15.00	15.43
5	15	-7	7.27*	8.66
1	16	-7	35.51	36.84
2	16	-7	14.98	15.91
3	16	-7	3.22*	4.69
4	16	-7	13.99	14.96
1	17	-7	0.00*	2.27
2	17	-7	8.11	8.46
3	17	-7	16.96	17.30
1	18	-7	8.75	9.44
2	0	-6	18.20	7.97
4	0	-6	130.19	130.57
6	0	-6	49.38	52.09
8	0	-6	79.75	81.44
1	1	-6	18.72	18.17
2	1	-6	18.21	17.03
3	1	-6	40.84	39.96
4	1	-6	63.60	63.50
5	1	-6	13.96	14.10
6	1	-6	6.30	5.88
7	1	-6	35.66	34.90
8	1	-6	42.74	42.59
9	1	-6	16.92	16.30
1	2	-6	63.11	67.94
2	2	-6	55.23	58.92
3	2	-6	119.99	124.38
4	2	-6	1.40*	2.52
5	2	-6	72.48	72.29
6	2	-6	38.00	39.13
7	2	-6	75.28	76.06
8	2	-6	25.85	26.92
9	2	-6	44.68	46.89
1	3	-6	55.14	52.43
2	3	-6	45.43	44.05
3	3	-6	28.26	25.77
4	3	-6	85.19	85.35
5	3	-6	62.99	63.11
6	3	-6	30.40	32.00
7	3	-6	22.01	22.09
8	3	-6	12.37	12.00
9	3	-6	24.44	24.61
1	4	-6	16.00	18.54
2	4	-6	87.83	94.16
3	4	-6	40.38	37.74
4	4	-6	122.63	124.61
5	4	-6	46.40	46.33
6	4	-6	69.04	70.59
7	4	-6	3.26*	2.83
8	4	-6	50.88	52.92
9	4	-6	16.31	17.16
1	5	-6	5.36*	1.95
2	5	-6	46.45	47.08
3	5	-6	89.44	86.55
4	5	-6	36.78	38.37
5	5	-6	49.55	49.93
6	5	-6	19.61	19.76
7	5	-6	39.85	39.80
8	5	-6	16.52	16.40
9	5	-6	5.98*	4.91
1	6	-6	64.85	70.50
2	6	-6	16.07	16.54
3	6	-6	115.28	117.93
4	6	-6	23.06	22.70
5	6	-6	64.06	65.08
6	6	-6	0.00*	0.56
7	6	-6	63.57	64.61
8	6	-6	5.35*	2.49
9	6	-6	37.41	37.36
1	7	-6	91.99	91.51
2	7	-6	28.00	28.96
3	7	-6	11.32	11.46
4	7	-6	16.75	16.93
5	7	-6	17.39	18.28
6	7	-6	34.16	34.17
7	7	-6	4.77*	2.60
8	7	-6	23.48	23.86
1	8	-6	45.86	44.83

H	K	L	FO	FC
2	8	-6	95.97	96.38
3	8	-6	17.50	17.08
4	8	-6	53.08	55.08
5	8	-6	24.31	24.59
6	8	-6	56.77	56.39
7	8	-6	7.77	7.14
8	8	-6	29.42	28.76
1	9	-6	26.57	28.32
2	9	-6	5.17*	4.31
3	9	-6	9.38	10.55
4	9	-6	3.48*	3.70
5	9	-6	3.93*	2.60
6	9	-6	14.02	13.66
7	9	-6	33.32	33.54
8	9	-6	32.62	32.30
1	10	-6	90.41	92.74
2	10	-6	2.70*	3.68
3	10	-6	85.46	87.14
4	10	-6	5.20*	5.17
5	10	-6	28.11	28.50
6	10	-6	51.26	52.42
7	10	-6	26.32	25.99
8	10	-6	15.26	15.31
1	11	-6	24.23	25.33
2	11	-6	60.49	60.98
3	11	-6	11.17	11.27
4	11	-6	2.40*	2.37
5	11	-6	22.57	22.20
6	11	-6	44.16	43.91
7	11	-6	24.00	24.06
1	12	-6	30.33	31.08
2	12	-6	91.87	94.42
3	12	-6	27.87	27.41
4	12	-6	46.64	46.24
5	12	-6	28.38	30.18
6	12	-6	48.04	46.67
7	12	-6	17.45	17.54
1	13	-6	31.07	31.30
2	13	-6	39.89	40.05
3	13	-6	37.77	37.05
4	13	-6	25.21	26.76
5	13	-6	34.63	35.44
6	13	-6	13.01	13.53
7	13	-6	19.70	19.23
1	14	-6	52.20	53.16
2	14	-6	61.77	64.11
3	14	-6	33.91	33.69
4	14	-6	11.21	11.01
5	14	-6	54.11	54.77
6	14	-6	4.16*	0.94
1	15	-6	18.46	18.17
2	15	-6	16.83	18.35
3	15	-6	43.15	44.29
4	15	-6	5.14*	4.02
5	15	-6	2.40*	1.16
6	15	-6	20.68	20.40
1	16	-6	32.23	33.24
2	16	-6	19.42	19.57
3	16	-6	25.03	25.45
4	16	-6	21.77	22.14
5	16	-6	5.90*	6.50
1	17	-6	11.05	12.30
2	17	-6	7.46	8.45
3	17	-6	2.47*	0.60
4	17	-6	13.82	13.79
1	18	-6	37.33	38.78
2	18	-6	8.20	8.83
3	18	-6	12.72	13.64
1	19	-6	0.00*	3.77
1	0	-5	117.28	136.78
3	0	-5	134.78	148.80
5	0	-5	66.57	66.52
7	0	-5	69.68	69.50
9	0	-5	38.96	40.62
1	1	-5	73.97	75.81
2	1	-5	71.58	70.52
3	1	-5	26.11	26.92
4	1	-5	57.62	58.38
5	1	-5	35.39	33.46
6	1	-5	24.11	23.36
7	1	-5	27.96	28.52
8	1	-5	36.91	37.62
9	1	-5	36.77	37.40
1	2	-5	9.32	5.53
2	2	-5	104.08	107.16
3	2	-5	13.40	14.94
4	2	-5	152.06	171.32
5	2	-5	54.70	53.69
6	2	-5	48.95	52.86
7	2	-5	15.29	15.18
8	2	-5	60.84	62.15
9	2	-5	18.38	19.28
1	3	-5	71.60	74.88
2	3	-5	9.45	12.09
3	3	-5	108.73	113.24
4	3	-5	80.16	78.21
5	3	-5	27.81	26.73
6	3	-5	23.72	22.44
7	3	-5	24.15	24.64
8	3	-5	31.16	31.91
9	3	-5	10.44	10.76
1	4	-5	111.07	124.71
2	4	-5	10.52	11.91
3	4	-5	141.39	164.09
4	4	-5	45.64	45.37
5	4	-5	94.32	94.78
6	4	-5	13.47	15.05
7	4	-5	60.38	61.91
8	4	-5	2.86*	1.82
9	4	-5	29.73	29.85
1	5	-5	59.09	59.93
2	5	-5	94.47	98.52
3	5	-5	10.75	12.13
4	5	-5	91.41	91.17
5	5	-5	78.20	75.43
6	5	-5	44.33	43.80

H	K	L	FO	FC	H	K	L	FO	FC
7	5	-5	18.00	18.06	5	12	-5	52.80	51.22
8	5	-5	24.91	25.35	6	12	-5	42.92	43.21
9	5	-5	25.97	26.38	7	12	-5	33.34	33.43
1	6	-5	91.17	91.30	1	13	-5	4.49*	6.82
2	6	-5	91.88	93.86	2	13	-5	50.85	52.02
3	6	-5	44.77	45.58	3	13	-5	36.53	38.24
4	6	-5	76.80	76.48	4	13	-5	41.92	41.40
5	6	-5	28.95	30.01	5	13	-5	2.73*	2.07
6	6	-5	74.40	74.44	6	13	-5	64.87	63.99
7	6	-5	33.50	34.42	7	13	-5	0.00*	2.87
8	6	-5	45.32	44.99	1	14	-5	44.82	46.28
9	6	-5	4.39*	3.08	2	14	-5	49.07	48.51
1	7	-5	57.44	57.15	3	14	-5	28.85	28.73
2	7	-5	22.20	21.98	4	14	-5	30.87	29.80
3	7	-5	39.52	38.69	5	14	-5	8.66*	7.84
4	7	-5	20.44	21.11	6	14	-5	54.83	55.04
5	7	-5	21.38	22.32	7	14	-5	1.10*	1.36
6	7	-5	9.13	7.49	1	15	-5	12.60	14.01
7	7	-5	50.11	49.79	2	15	-5	33.44	34.92
8	7	-5	14.37	12.95	3	15	-5	10.58	10.33
9	7	-5	27.91	27.90	4	15	-5	2.07*	0.41
1	8	-5	107.59	108.57	5	15	-5	18.56	19.91
2	8	-5	48.84	48.80	6	15	-5	14.89	13.55
3	8	-5	70.70	69.22	1	16	-5	54.00	54.35
4	8	-5	13.53	13.86	2	16	-5	14.78	15.16
5	8	-5	27.79	28.17	3	16	-5	15.53	15.00
6	8	-5	17.31	17.44	4	16	-5	15.57	15.79
7	8	-5	66.26	66.87	5	16	-5	35.39	36.78
8	8	-5	3.63*	4.25	1	17	-5	11.30	11.27
9	8	-5	41.76	42.04	2	17	-5	7.82	8.14
1	9	-5	4.15*	6.16	3	17	-5	15.22	15.09
2	9	-5	49.85	51.04	4	17	-5	3.77*	4.45
3	9	-5	35.02	35.11	5	17	-5	20.89	21.60
4	9	-5	1.81*	1.44	1	18	-5	0.00*	2.75
5	9	-5	31.88	31.89	2	18	-5	36.66	37.49
6	9	-5	36.73	36.05	3	18	-5	0.00*	2.31
7	9	-5	9.38	7.14	4	18	-5	33.92	34.47
8	9	-5	25.26	24.60	1	19	-5	14.10	14.99
1	10	-5	3.33*	4.48	2	19	-5	0.00*	3.40
2	10	-5	101.66	101.80	3	19	-5	27.15	27.91
3	10	-5	8.06	9.07	2	0	-4	38.09	27.26
4	10	-5	20.39	21.42	4	0	-4	77.97	77.23
5	10	-5	32.82	33.23	6	0	-4	31.88	31.56
6	10	-5	59.44	58.21	8	0	-4	81.12	82.65
7	10	-5	23.32	23.57	10	0	-4	14.56	14.54
8	10	-5	19.04	19.15	1	1	-4	85.12	88.84
1	11	-5	28.32	28.36	2	1	-4	36.03	36.40
2	11	-5	21.61	20.60	3	1	-4	15.43	15.90
3	11	-5	39.59	39.69	4	1	-4	44.38	44.82
4	11	-5	17.66	18.17	5	1	-4	13.83	15.14
5	11	-5	58.93	57.76	6	1	-4	11.29	12.18
6	11	-5	16.80	15.73	7	1	-4	30.52	32.05
7	11	-5	33.20	34.02	8	1	-4	56.05	57.55
8	11	-5	16.75	16.02	9	1	-4	27.54	28.00
1	12	-5	63.41	65.03	10	1	-4	20.31	21.17
2	12	-5	43.79	43.84	2	2	-4	9.01	8.13
3	12	-5	47.67	46.88	3	2	-4	74.54	82.44
4	12	-5	0.00*	1.32	4	2	-4	3.64*	4.03

H	K	L	FO	FC	H	K	L	FO	FC
5	2	-4	38.63	39.54	6	8	-4	71.30	70.39
6	2	-4	16.79	17.52	7	8	-4	23.80	23.61
7	2	-4	39.27	41.91	8	8	-4	38.25	37.69
8	2	-4	21.52	21.79	9	8	-4	12.40	12.53
9	2	-4	30.69	31.72	1	9	-4	85.79	80.60
10	2	-4	0.00*	1.64	2	9	-4	7.20	6.64
1	3	-4	22.77	24.88	3	9	-4	38.19	37.66
2	3	-4	50.25	51.77	4	9	-4	11.46	11.52
3	3	-4	34.27	30.66	5	9	-4	6.13	7.34
4	3	-4	42.13	42.32	6	9	-4	2.97*	4.00
5	3	-4	73.82	72.38	7	9	-4	24.88	26.03
6	3	-4	18.82	19.96	8	9	-4	13.05	13.58
7	3	-4	7.19	6.44	9	9	-4	20.74	21.16
8	3	-4	27.65	28.55	1	10	-4	93.08	93.75
9	3	-4	28.85	29.33	2	10	-4	4.98*	3.67
10	3	-4	4.71*	6.31	3	10	-4	67.26	69.22
1	4	-4	33.91	40.97	4	10	-4	31.01	30.45
2	4	-4	91.77	92.89	5	10	-4	60.97	61.03
3	4	-4	22.86	24.50	6	10	-4	42.23	39.98
4	4	-4	109.72	113.23	7	10	-4	53.95	52.54
5	4	-4	7.22	6.96	8	10	-4	5.56*	2.86
6	4	-4	50.72	52.13	1	11	-4	29.05	27.48
7	4	-4	27.54	28.62	2	11	-4	92.04	92.82
8	4	-4	46.07	45.72	3	11	-4	13.19	12.77
9	4	-4	14.09	14.72	4	11	-4	54.69	54.38
10	4	-4	4.88*	3.65	5	11	-4	22.92	22.88
1	5	-4	4.60	3.23	6	11	-4	51.18	51.59
2	5	-4	69.47	67.59	7	11	-4	10.46	9.89
3	5	-4	66.84	66.98	8	11	-4	4.24*	1.39
4	5	-4	52.89	51.03	1	12	-4	10.83	11.54
5	5	-4	36.90	37.28	2	12	-4	75.67	76.93
6	5	-4	14.07	14.82	3	12	-4	12.83	12.98
7	5	-4	68.56	70.11	4	12	-4	49.61	50.00
8	5	-4	4.68*	4.88	5	12	-4	30.88	30.47
9	5	-4	12.14	11.74	6	12	-4	87.95	85.32
1	6	-4	70.66	74.01	7	12	-4	12.80	12.13
2	6	-4	41.33	42.79	8	12	-4	16.67	15.22
3	6	-4	39.43	41.54	1	13	-4	21.82	21.62
4	6	-4	12.87	12.53	2	13	-4	19.14	19.30
5	6	-4	59.31	59.10	3	13	-4	67.24	67.42
6	6	-4	42.81	42.05	4	13	-4	8.54	8.84
7	6	-4	61.31	61.86	5	13	-4	52.97	52.50
8	6	-4	25.08	24.70	6	13	-4	0.86*	1.56
9	6	-4	26.85	27.18	7	13	-4	21.01	21.55
1	7	-4	92.27	92.86	1	14	-4	52.96	54.69
2	7	-4	31.45	33.77	2	14	-4	37.21	38.43
3	7	-4	20.89	18.94	3	14	-4	29.43	30.51
4	7	-4	21.94	22.25	4	14	-4	13.58	14.13
5	7	-4	59.53	60.65	5	14	-4	73.07	71.99
6	7	-4	28.67	29.08	6	14	-4	16.92	17.03
7	7	-4	38.72	38.05	7	14	-4	39.56	39.95
8	7	-4	33.22	32.90	1	15	-4	8.32	7.69
9	7	-4	27.21	27.21	2	15	-4	33.21	33.03
1	8	-4	66.85	66.95	3	15	-4	25.65	26.12
2	8	-4	71.88	72.58	4	15	-4	20.70	20.31
3	8	-4	9.44	7.13	5	15	-4	29.08	28.65
4	8	-4	29.22	30.26	6	15	-4	15.17	15.06
5	8	-4	10.17	10.37	7	15	-4	5.30*	5.14

H	K	L	FO	FC
1	16	-4	0.00*	1.65
2	16	-4	46.68	47.66
3	16	-4	11.01	10.89
4	16	-4	32.65	32.38
5	16	-4	1.69*	3.05
6	16	-4	30.34	29.82
1	17	-4	29.20	28.90
2	17	-4	17.46	17.39
3	17	-4	20.03	19.59
4	17	-4	21.96	22.67
5	17	-4	2.98*	1.07
1	18	-4	67.56	68.69
2	18	-4	11.53	12.39
3	18	-4	35.34	36.71
4	18	-4	11.60	11.26
1	19	-4	31.21	32.06
2	19	-4	13.33	13.91
3	19	-4	11.09	11.22
1	20	-4	0.00*	1.76
2	20	-4	44.20	45.50
1	0	-3	65.86	68.14
3	0	-3	31.41	30.49
5	0	-3	22.14	19.19
7	0	-3	54.54	54.27
9	0	-3	53.28	55.46
1	1	-3	17.47	17.76
2	1	-3	41.94	37.77
3	1	-3	29.01	32.00
4	1	-3	39.59	37.85
5	1	-3	34.90	37.21
6	1	-3	18.18	19.17
7	1	-3	39.93	41.54
8	1	-3	13.48	13.80
9	1	-3	31.44	32.42
10	1	-3	0.00*	2.22
1	2	-3	14.03	15.29
2	2	-3	41.64	42.01
3	2	-3	64.43	60.99
4	2	-3	95.54	94.52
5	2	-3	23.07	21.31
6	2	-3	12.30	12.33
7	2	-3	16.71	15.31
8	2	-3	83.48	86.69
9	2	-3	25.79	27.20
10	2	-3	9.33	7.59
1	3	-3	11.00	10.27
2	3	-3	50.75	48.86
3	3	-3	86.49	85.55
4	3	-3	4.40*	2.78
5	3	-3	27.64	30.16
6	3	-3	35.50	34.78
7	3	-3	34.81	34.68
8	3	-3	22.76	23.01
9	3	-3	14.45	15.19
10	3	-3	0.00*	2.74
1	4	-3	56.03	53.05
2	4	-3	74.27	73.73
3	4	-3	95.22	92.99
4	4	-3	18.97	18.18
5	4	-3	105.61	104.04
6	4	-3	4.46*	4.71
7	4	-3	54.11	55.22
8	4	-3	17.23	17.69
9	4	-3	27.79	28.77
10	4	-3	2.84*	2.95
1	5	-3	106.65	124.17
2	5	-3	6.83	7.50
3	5	-3	18.11	18.34
4	5	-3	48.63	46.86
5	5	-3	59.17	57.55
6	5	-3	69.21	68.59
7	5	-3	39.09	40.02
8	5	-3	16.78	17.52
9	5	-3	33.29	33.65
10	5	-3	5.73*	5.51
1	6	-3	49.56	48.61
2	6	-3	48.56	45.70
3	6	-3	3.78*	7.36
4	6	-3	54.71	53.16
5	6	-3	11.95	11.22
6	6	-3	59.22	58.02
7	6	-3	14.74	13.95
8	6	-3	43.88	43.61
9	6	-3	0.00*	1.79
1	7	-3	6.91	5.61
2	7	-3	87.65	80.81
3	7	-3	8.67	6.59
4	7	-3	6.33	3.67
5	7	-3	11.39	11.24
6	7	-3	3.01*	0.52
7	7	-3	36.93	36.62
8	7	-3	4.17*	3.10
9	7	-3	7.96	7.36
1	8	-3	86.38	88.36
2	8	-3	7.01	6.49
3	8	-3	69.43	67.36
4	8	-3	24.16	20.58
5	8	-3	23.22	20.99
6	8	-3	11.62	11.28
7	8	-3	42.35	41.82
8	8	-3	7.17	7.12
9	8	-3	30.15	29.83
1	9	-3	46.11	47.05
2	9	-3	64.51	64.62
3	9	-3	52.56	49.89
4	9	-3	10.93	10.60
5	9	-3	10.63	10.47
6	9	-3	3.56*	2.08
7	9	-3	3.17*	3.04
8	9	-3	3.46*	1.30
9	9	-3	39.35	39.00
1	10	-3	23.05	22.12
2	10	-3	125.87	127.32
3	10	-3	31.59	30.71
4	10	-3	53.81	52.92
5	10	-3	6.05	5.54

H	K	L	FO	FC
6	10	-3	67.84	65.94
7	10	-3	15.78	14.44
8	10	-3	5.86*	3.64
9	10	-3	17.32	18.04
1	11	-3	53.98	53.31
2	11	-3	20.55	22.48
3	11	-3	44.39	45.58
4	11	-3	9.60	9.83
5	11	-3	16.50	15.64
6	11	-3	19.82	19.75
7	11	-3	4.88*	6.94
8	11	-3	28.86	28.82
1	12	-3	53.77	51.70
2	12	-3	24.06	24.62
3	12	-3	85.36	84.99
4	12	-3	5.00*	2.32
5	12	-3	87.55	87.19
6	12	-3	39.68	40.07
7	12	-3	35.03	34.34
8	12	-3	15.59	14.84
1	13	-3	5.49*	7.82
2	13	-3	37.88	38.70
3	13	-3	38.13	39.40
4	13	-3	8.79	7.50
5	13	-3	7.65	8.25
6	13	-3	22.00	21.05
7	13	-3	17.74	17.88
8	13	-3	0.00*	2.31
1	14	-3	23.35	25.00
2	14	-3	71.63	73.56
3	14	-3	54.93	56.32
4	14	-3	46.79	46.97
5	14	-3	10.25	10.67
6	14	-3	61.49	60.52
7	14	-3	7.93	8.66
1	15	-3	24.35	25.53
2	15	-3	28.86	28.88
3	15	-3	13.90	13.69
4	15	-3	10.36	9.28
5	15	-3	12.83	14.29
6	15	-3	4.83*	6.38
7	15	-3	6.85*	6.27
1	16	-3	75.60	76.69
2	16	-3	20.58	21.96
3	16	-3	28.60	29.22
4	16	-3	9.77	9.32
5	16	-3	36.23	36.45
6	16	-3	3.39*	1.32
1	17	-3	36.82	38.30
2	17	-3	17.75	18.32
3	17	-3	17.80	18.56
4	17	-3	2.91*	2.75
5	17	-3	4.65*	3.89
6	17	-3	0.00*	3.54
1	18	-3	4.62*	2.27
2	18	-3	40.71	40.81
3	18	-3	9.64*	9.69
4	18	-3	36.85	37.14
5	18	-3	8.69	7.63
1	19	-3	0.00*	3.44
2	19	-3	20.85	21.27
3	19	-3	18.35	19.21
4	19	-3	1.78*	0.69
1	20	-3	36.57	38.08
2	20	-3	1.74*	1.17
3	20	-3	31.70	33.40
2	0	-2	38.50	33.53
4	0	-2	130.86	144.30
6	0	-2	6.00*	4.37
8	0	-2	100.71	105.44
10	0	-2	26.03	26.83
1	1	-2	29.85	33.47
2	1	-2	56.20	55.60
3	1	-2	64.63	64.69
4	1	-2	6.78	8.37
5	1	-2	25.59	25.28
6	1	-2	4.20*	3.58
7	1	-2	24.30	26.78
8	1	-2	13.80	14.66
9	1	-2	10.79	11.45
10	1	-2	12.30	12.88
1	2	-2	3.75*	7.91
2	2	-2	37.23	37.86
3	2	-2	126.94	156.61
4	2	-2	19.33	19.34
5	2	-2	108.23	113.65
6	2	-2	27.53	28.04
7	2	-2	57.85	58.84
8	2	-2	22.09	21.81
9	2	-2	52.45	56.10
10	2	-2	3.33*	4.79
1	3	-2	30.84	29.65
2	3	-2	49.06	50.19
3	3	-2	77.06	70.32
4	3	-2	45.57	44.35
5	3	-2	57.62	57.28
6	3	-2	7.71	7.25
7	3	-2	3.50*	3.46
8	3	-2	32.78	33.32
9	3	-2	38.31	38.44
10	3	-2	13.52	14.66
1	4	-2	14.22	17.17
2	4	-2	113.85	134.60
3	4	-2	16.41	15.57
4	4	-2	148.13	172.79
5	4	-2	46.23	44.28
6	4	-2	115.74	110.33
7	4	-2	12.01	12.24
8	4	-2	75.55	74.49
9	4	-2	1.60*	1.19
10	4	-2	14.84	15.09
1	5	-2	76.16	75.25
2	5	-2	69.15	65.36
3	5	-2	33.96	31.63
4	5	-2	27.65	27.91
5	5	-2	10.71	5.70

H	K	L	FO	FC
6	5	-2	34.64	33.03
7	5	-2	22.00	21.46
8	5	-2	3.08*	0.56
10	5	-2	4.22*	3.57
1	6	-2	61.31	62.55
2	6	-2	11.42	10.52
3	6	-2	112.42	112.92
4	6	-2	48.12	44.36
5	6	-2	84.24	81.23
6	6	-2	17.38	17.15
7	6	-2	58.55	57.13
8	6	-2	10.43	9.12
9	6	-2	57.27	57.04
10	6	-2	7.39*	7.63
1	7	-2	107.99	115.04
2	7	-2	47.31	45.12
3	7	-2	10.11	5.90
4	7	-2	22.67	21.40
5	7	-2	63.81	58.86
6	7	-2	4.00*	4.57
7	7	-2	21.69	21.42
8	7	-2	5.45*	0.59
9	7	-2	43.69	43.06
1	8	-2	30.15	30.25
2	8	-2	120.01	128.28
3	8	-2	19.36	17.61
4	8	-2	9.05	4.68
5	8	-2	12.68	12.13
6	8	-2	42.12	39.19
7	8	-2	9.54	10.41
8	8	-2	36.23	34.83
9	8	-2	2.27*	1.00
1	9	-2	37.06	34.25
2	9	-2	25.92	26.06
3	9	-2	12.33	11.67
4	9	-2	13.28	12.57
5	9	-2	23.44	21.69
6	9	-2	29.37	28.22
7	9	-2	6.40*	7.27
8	9	-2	40.56	38.58
9	9	-2	6.33*	5.04
1	10	-2	104.36	105.37
2	10	-2	22.00	18.87
3	10	-2	102.20	100.84
4	10	-2	47.23	45.77
5	10	-2	38.65	37.65
6	10	-2	49.21	48.88
7	10	-2	43.13	41.00
8	10	-2	6.70*	4.89
9	10	-2	45.27	43.88
1	11	-2	9.62	9.26
2	11	-2	10.47	9.50
3	11	-2	12.35	8.78
4	11	-2	6.67	4.51
5	11	-2	31.40	31.53
6	11	-2	21.60	21.31
7	11	-2	43.47	42.91
8	11	-2	0.00*	1.95
9	11	-2	27.59	27.62
1	12	-2	6.41	8.92
2	12	-2	126.65	128.38
3	12	-2	5.88*	3.25
4	12	-2	48.21	46.85
5	12	-2	14.66	14.14
6	12	-2	92.99	90.60
7	12	-2	12.18	12.55
8	12	-2	23.67	21.80
1	13	-2	24.21	25.60
2	13	-2	48.31	47.78
3	13	-2	19.79	19.19
4	13	-2	39.34	38.75
5	13	-2	12.22	11.99
6	13	-2	19.91	20.73
7	13	-2	19.66	18.72
8	13	-2	11.47	10.66
1	14	-2	66.18	67.31
2	14	-2	53.31	51.55
3	14	-2	49.31	49.48
4	14	-2	4.98*	3.57
5	14	-2	61.88	61.30
6	14	-2	15.65	15.74
7	14	-2	37.09	36.51
1	15	-2	8.56	8.52
2	15	-2	4.52*	5.60
3	15	-2	85.12	85.83
4	15	-2	9.68	9.07
5	15	-2	5.47*	6.11
6	15	-2	8.97	7.92
7	15	-2	13.40	12.13
1	16	-2	46.66	48.08
2	16	-2	56.90	58.00
3	16	-2	19.70	19.95
4	16	-2	32.93	32.58
5	16	-2	17.19	17.16
6	16	-2	31.43	31.27
1	17	-2	11.26	12.23
2	17	-2	22.11	22.13
3	17	-2	4.29*	3.54
4	17	-2	15.15	15.45
5	17	-2	3.89*	5.66
6	17	-2	11.45	12.20
1	18	-2	51.38	51.99
2	18	-2	2.90*	2.88
3	18	-2	42.58	42.92
4	18	-2	3.60*	3.94
5	18	-2	39.43	39.96
1	19	-2	18.43	19.15
2	19	-2	0.00*	2.31
3	19	-2	17.30	17.78
4	19	-2	13.02	12.83
1	20	-2	3.93*	3.73
2	20	-2	30.79	32.11
3	20	-2	13.81	14.25
1	21	-2	2.50*	0.43
1	0	-1	0.00*	308.78
5	0	-1	63.15	65.93

H	K	L	FO	FC	H	K	L	FO	FC
7	0	-1	51.90	55.56	9	6	-1	13.79	14.78
9	0	-1	73.70	77.21	10	6	-1	49.31	49.31
1	1	-1	13.05	11.48	1	7	-1	37.80	36.00
2	1	-1	10.46	6.17	2	7	-1	38.42	34.59
3	1	-1	30.64	34.08	3	7	-1	7.06	10.74
4	1	-1	29.40	24.46	4	7	-1	61.79	55.08
5	1	-1	28.18	28.60	5	7	-1	46.22	43.57
6	1	-1	40.43	39.62	6	7	-1	8.10	5.00
7	1	-1	2.58*	0.80	7	7	-1	22.53	22.16
8	1	-1	13.04	13.97	8	7	-1	26.97	26.58
9	1	-1	27.85	28.89	9	7	-1	8.78	7.97
10	1	-1	13.38	13.05	10	7	-1	3.73*	1.67
1	2	-1	4.79*	2.92	1	8	-1	127.46	162.08
2	2	-1	96.68	109.38	2	8	-1	55.40	53.66
3	2	-1	29.83	25.37	3	8	-1	97.77	92.13
5	2	-1	21.10	22.31	4	8	-1	6.43	6.34
6	2	-1	62.19	58.91	5	8	-1	40.36	39.04
7	2	-1	10.88	7.64	6	8	-1	14.09	13.49
8	2	-1	106.87	108.22	7	8	-1	73.58	71.94
9	2	-1	16.48	15.94	8	8	-1	1.13*	3.64
10	2	-1	28.26	29.13	9	8	-1	62.09	61.83
1	3	-1	38.01	37.61	1	9	-1	0.00*	1.21
2	3	-1	60.49	57.66	2	9	-1	4.46*	4.75
3	3	-1	109.28	105.04	3	9	-1	33.06	30.08
4	3	-1	38.69	32.38	4	9	-1	15.28	13.82
5	3	-1	54.45	50.17	5	9	-1	44.11	42.41
6	3	-1	23.09	22.59	6	9	-1	7.60	8.31
7	3	-1	7.85	4.52	7	9	-1	3.92*	2.22
8	3	-1	18.41	16.77	8	9	-1	5.71*	3.97
9	3	-1	9.38	8.30	9	9	-1	23.95	22.77
10	3	-1	12.79	12.90	1	10	-1	49.13	47.31
1	4	-1	78.88	78.00	2	10	-1	121.76	123.32
2	4	-1	46.78	45.05	3	10	-1	12.90	11.37
4	4	-1	49.01	45.67	4	10	-1	40.81	38.57
5	4	-1	167.14	194.00	5	10	-1	23.61	24.22
6	4	-1	4.68*	0.28	6	10	-1	112.35	110.29
7	4	-1	94.55	90.14	7	10	-1	20.92	21.24
8	4	-1	9.01	8.96	8	10	-1	44.59	42.89
9	4	-1	67.75	65.96	9	10	-1	25.45	25.33
10	4	-1	3.64*	1.50	1	11	-1	24.40	22.55
1	5	-1	92.56	97.59	2	11	-1	16.78	16.40
2	5	-1	49.43	45.18	3	11	-1	13.00	10.33
3	5	-1	35.31	30.06	4	11	-1	26.51	24.72
4	5	-1	10.56	10.69	5	11	-1	15.68	15.51
5	5	-1	100.90	93.36	6	11	-1	23.88	22.36
6	5	-1	4.64*	4.48	7	11	-1	2.45*	3.96
7	5	-1	42.68	41.64	8	11	-1	26.37	26.31
8	5	-1	15.73	15.80	9	11	-1	5.92*	5.12
9	5	-1	17.09	16.38	1	12	-1	59.93	59.73
10	5	-1	9.14	9.06	2	12	-1	50.36	45.12
1	6	-1	53.80	58.03	3	12	-1	77.33	73.04
2	6	-1	125.99	168.29	4	12	-1	8.14	7.61
3	6	-1	80.68	74.17	5	12	-1	108.08	106.08
4	6	-1	113.38	109.19	6	12	-1	58.75	57.25
5	6	-1	12.37	9.44	7	12	-1	74.94	72.74
6	6	-1	117.40	113.39	8	12	-1	13.24	12.79
7	6	-1	6.52*	6.27	1	13	-1	9.89	10.53
8	6	-1	82.31	80.16	2	13	-1	26.03	26.22

H	K	L	FO	FC	H	K	L	FO	FC
3	13	-1	62.81	63.69	8	1	0	18.41	17.43
4	13	-1	12.60	11.56	9	1	0	7.13*	3.68
5	13	-1	0.00*	4.53	10	1	0	18.74	18.55
6	13	-1	26.35	26.65	0	2	0	4.87*	1.35
7	13	-1	12.27	13.27	1	2	0	0.00*	286.24
8	13	-1	5.68*	5.55	2	2	0	52.25	45.85
1	14	-1	18.55	16.86	4	2	0	23.13	20.00
2	14	-1	77.43	76.73	5	2	0	113.46	107.91
3	14	-1	21.12	22.26	6	2	0	0.00*	1.20
4	14	-1	38.25	37.40	7	2	0	105.10	100.02
5	14	-1	26.53	25.97	8	2	0	29.81	27.15
6	14	-1	71.52	69.13	9	2	0	77.78	75.41
7	14	-1	25.32	25.95	10	2	0	4.72*	8.34
8	14	-1	35.61	35.66	1	3	0	58.33	60.13
1	15	-1	17.06	16.75	2	3	0	0.00*	3.70
2	15	-1	53.57	52.87	3	3	0	87.74	84.16
3	15	-1	7.86	7.61	4	3	0	26.81	27.27
4	15	-1	24.18	24.41	5	3	0	34.04	32.03
5	15	-1	7.15	6.51	6	3	0	42.70	40.45
6	15	-1	11.20	11.02	7	3	0	0.00*	2.85
7	15	-1	13.32	13.31	8	3	0	10.34*	9.25
1	16	-1	81.37	82.19	9	3	0	38.84	37.93
2	16	-1	23.66	23.07	10	3	0	0.00*	0.43
3	16	-1	42.94	42.88	0	4	0	0.00*	204.15
4	16	-1	0.41*	0.87	1	4	0	84.95	97.30
5	16	-1	26.71	26.37	2	4	0	93.58	90.71
6	16	-1	14.19	15.54	3	4	0	56.95	56.76
7	16	-1	28.23	28.56	4	4	0	144.11	167.14
1	17	-1	4.76*	6.92	5	4	0	12.82	12.57
2	17	-1	0.00*	1.50	6	4	0	143.83	140.44
3	17	-1	28.92	29.61	7	4	0	16.48	15.75
4	17	-1	5.35*	4.00	8	4	0	111.63	106.85
5	17	-1	27.68	27.38	9	4	0	16.23	15.74
6	17	-1	3.75*	4.62	10	4	0	25.21	24.71
1	18	-1	21.90	21.82	1	5	0	87.37	88.77
2	18	-1	53.84	55.01	2	5	0	71.83	67.49
3	18	-1	2.03*	1.41	3	5	0	1.72*	2.58
4	18	-1	43.93	45.52	4	5	0	41.10	39.06
5	18	-1	10.28	10.25	5	5	0	43.50	42.31
1	19	-1	0.70*	6.34	6	5	0	0.00*	1.87
2	19	-1	6.69*	8.09	7	5	0	57.78	54.60
3	19	-1	4.08*	3.99	8	5	0	30.66	29.72
4	19	-1	11.11	11.89	9	5	0	9.36	9.87
1	20	-1	28.99	30.45	10	5	0	0.00*	0.96
2	20	-1	2.70*	3.40	0	6	0	83.76	103.25
3	20	-1	42.29	42.93	2	6	0	20.69	17.32
1	21	-1	10.83	11.27	3	6	0	134.47	159.23
2	21	-1	7.36*	7.44	4	6	0	28.94	24.65
6	0	0	8.97*	13.57	5	6	0	130.85	124.77
8	0	0	131.75	128.68	6	6	0	0.00*	0.59
10	0	0	49.22	50.82	7	6	0	95.85	92.39
1	1	0	0.00*	3.79	8	6	0	16.75	16.33
2	1	0	91.35	105.83	9	6	0	52.37	51.43
3	1	0	59.02	52.00	10	6	0	13.69	13.00
4	1	0	64.37	57.83	1	7	0	99.78	110.68
5	1	0	14.85	11.24	2	7	0	41.34	28.20
6	1	0	6.45*	7.14	3	7	0	3.41*	5.61
7	1	0	21.94	22.01	4	7	0	13.22	9.77

H	K	L	FO	FC	H	K	L	FO	FC
5	7	0	35.48	36.63	7	13	0	4.36*	4.18
6	7	0	16.37*	15.95	8	13	0	9.15*	9.21
7	7	0	78.75	76.22	0	14	0	27.71	26.09
8	7	0	24.46	24.42	1	14	0	51.67	51.10
9	7	0	8.74	1.82	2	14	0	29.24	28.94
10	7	0	11.95*	11.50	3	14	0	59.26	57.77
1	8	0	38.68	38.17	4	14	0	29.51	30.51
2	8	0	133.99	158.30	5	14	0	66.95	63.77
3	8	0	42.48	41.42	6	14	0	45.06	44.00
4	8	0	75.51	70.53	7	14	0	45.95	46.19
5	8	0	9.56	9.69	8	14	0	3.36*	0.33
6	8	0	87.55	83.20	1	15	0	24.33	25.44
7	8	0	15.89	15.30	2	15	0	15.94	18.08
8	8	0	37.67	33.94	3	15	0	46.19	48.56
9	8	0	11.29*	12.13	4	15	0	8.98*	8.48
1	9	0	30.88	27.37	5	15	0	22.15	21.09
2	9	0	10.48*	4.92	6	15	0	3.22*	2.15
3	9	0	55.59	51.75	7	15	0	8.52	9.16
4	9	0	11.06	10.69	0	16	0	87.43	87.41
5	9	0	0.00*	2.57	1	16	0	27.80	26.98
6	9	0	21.79	21.66	2	16	0	61.63	61.32
7	9	0	3.89*	2.64	3	16	0	34.36	35.31
8	9	0	3.57*	1.37	4	16	0	32.97	32.14
9	9	0	6.95*	3.47	5	16	0	20.43	19.89
0	10	0	11.55*	13.36	6	16	0	22.64	21.75
1	10	0	90.19	88.41	7	16	0	6.23*	5.86
2	10	0	105.57	101.79	1	17	0	0.00*	0.70
3	10	0	117.30	112.58	2	17	0	25.11	24.64
4	10	0	6.36*	4.41	3	17	0	15.39	15.53
5	10	0	85.20	81.25	4	17	0	17.53	17.35
6	10	0	51.18	49.03	5	17	0	9.13*	9.57
7	10	0	77.14	74.69	6	17	0	0.00*	0.56
8	10	0	11.88	11.98	0	18	0	26.15	24.92
9	10	0	30.26	31.65	1	18	0	61.52	62.34
1	11	0	3.20*	4.73	2	18	0	16.23	16.63
2	11	0	33.80	36.46	3	18	0	42.10	43.61
3	11	0	37.86	37.06	4	18	0	23.06	23.93
4	11	0	24.21	23.18	5	18	0	17.56	17.52
5	11	0	7.35*	6.78	1	19	0	37.56	37.94
6	11	0	0.00*	2.55	2	19	0	0.00*	0.29
7	11	0	5.69*	6.25	3	19	0	25.50	27.22
8	11	0	4.98*	4.34	4	19	0	2.58*	0.81
9	11	0	9.25	8.72	0	20	0	26.05	28.05
0	12	0	0.00*	5.02	1	20	0	0.00*	0.55
1	12	0	4.08*	7.62	2	20	0	23.76	25.49
2	12	0	104.09	101.94	3	20	0	13.55	14.59
3	12	0	40.11	40.35	1	21	0	9.38*	9.95
4	12	0	76.90	75.26	2	21	0	0.00*	1.45
5	12	0	59.97	57.21	1	0	1	0.00*	235.74
6	12	0	127.52	123.80	3	0	1	119.89	159.21
7	12	0	27.15	26.09	5	0	1	48.28	49.84
8	12	0	26.32	26.39	7	0	1	51.31	52.26
1	13	0	0.00*	2.79	9	0	1	44.61	47.91
2	13	0	0.00*	8.34	0	1	1	45.08	39.08
3	13	0	28.77	29.49	1	1	1	26.08	23.30
4	13	0	10.15*	11.68	2	1	1	67.18	64.80
5	13	0	0.00*	2.15	3	1	1	108.72	111.99
6	13	0	15.35	15.61	4	1	1	60.08	61.40

H	K	L	FO	FC	H	K	L	FO	FC
5	1	1	9.18	8.49	8	6	1	47.40	44.26
6	1	1	46.09	45.06	9	6	1	13.35	12.84
7	1	1	3.62*	2.58	10	6	1	40.90	40.49
8	1	1	14.39	13.53	0	7	1	30.99	25.15
9	1	1	16.04	15.67	1	7	1	1.92*	1.21
10	1	1	9.82	9.26	2	7	1	38.02	39.03
0	2	1	0.00*	271.73	3	7	1	3.05*	2.93
1	2	1	52.05	49.55	4	7	1	32.82	30.65
2	2	1	27.68	3.82	5	7	1	4.63*	6.76
3	2	1	47.40	45.34	6	7	1	18.55	16.61
4	2	1	133.86	142.76	7	7	1	25.94	25.33
5	2	1	20.47	16.94	8	7	1	17.25	17.44
6	2	1	53.46	52.42	9	7	1	10.54	11.21
7	2	1	10.46	6.26	0	8	1	15.51	15.74
8	2	1	98.53	95.25	2	8	1	8.75	8.01
9	2	1	7.94*	9.19	3	8	1	135.25	143.44
10	2	1	17.74	18.49	4	8	1	27.99	28.11
0	3	1	5.36	2.72	5	8	1	30.43	28.68
1	3	1	4.33	1.33	6	8	1	23.34	23.55
2	3	1	57.38	50.94	7	8	1	32.07	30.47
3	3	1	109.57	107.67	8	8	1	3.00*	0.59
4	3	1	79.07	70.98	9	8	1	34.72	34.93
5	3	1	39.46	34.46	0	9	1	30.02	27.51
6	3	1	19.01	16.44	1	9	1	48.34	44.88
7	3	1	28.62	27.90	2	9	1	25.50	22.16
8	3	1	23.18	21.07	3	9	1	114.31	111.10
9	3	1	24.97	24.01	4	9	1	41.84	40.05
10	3	1	16.54	16.56	5	9	1	9.21	6.94
0	4	1	24.25	25.63	6	9	1	6.51	7.89
1	4	1	12.91	9.89	7	9	1	15.67	15.07
2	4	1	26.16	26.03	8	9	1	18.62	19.14
3	4	1	71.41	67.06	9	9	1	30.26	31.43
4	4	1	13.43	8.38	0	10	1	90.83	83.57
5	4	1	152.72	160.70	1	10	1	30.00	31.04
6	4	1	23.95	23.24	2	10	1	140.08	152.83
7	4	1	89.54	85.03	3	10	1	37.08	33.40
8	4	1	26.68	26.55	4	10	1	48.11	47.44
9	4	1	50.70	49.98	5	10	1	23.74	23.05
10	4	1	9.42	9.96	6	10	1	76.98	75.61
0	5	1	24.59	23.45	7	10	1	8.41	7.26
1	5	1	102.51	132.30	8	10	1	13.66	11.92
2	5	1	48.09	43.31	9	10	1	7.57	7.47
3	5	1	88.91	85.45	0	11	1	11.12	11.92
4	5	1	14.79	12.93	1	11	1	45.97	40.81
5	5	1	46.96	42.18	2	11	1	68.36	63.10
6	5	1	25.42	23.77	3	11	1	15.45	15.62
7	5	1	43.19	41.04	4	11	1	62.29	62.19
8	5	1	13.75	13.36	5	11	1	0.00*	0.53
9	5	1	23.56	22.37	6	11	1	24.47	24.29
10	5	1	3.05*	0.92	7	11	1	0.00*	2.10
0	6	1	107.82	153.11	8	11	1	22.76	23.73
1	6	1	75.81	72.20	9	11	1	9.07	11.30
2	6	1	125.92	173.72	0	12	1	33.17	30.81
3	6	1	13.47	12.44	1	12	1	64.80	62.23
4	6	1	107.42	104.63	2	12	1	77.37	71.82
5	6	1	2.08*	0.95	3	12	1	100.00	95.20
6	6	1	86.47	83.70	4	12	1	2.63*	1.08
7	6	1	40.68	41.07	5	12	1	90.74	89.72

H	K	L	FO	FC	H	K	L	FO	FC
6	12	1	49.65	48.09	0	21	1	11.00	11.81
7	12	1	59.84	57.19	1	21	1	13.56	13.72
8	12	1	1.92*	3.69	2	21	1	4.55*	2.49
0	13	1	49.30	46.75	0	0	2	0.00*	232.16
1	13	1	34.46	34.26	2	0	2	59.67	59.39
2	13	1	0.00*	3.95	6	0	2	47.35	47.03
3	13	1	0.00*	0.99	8	0	2	49.89	52.34
4	13	1	11.98	10.54	10	0	2	13.99	14.17
5	13	1	26.49	26.01	0	1	2	9.24	13.42
6	13	1	0.83*	3.32	1	1	2	43.66	47.85
7	13	1	2.47*	1.03	2	1	2	2.31*	5.44
8	13	1	19.22	20.14	3	1	2	106.79	109.15
0	14	1	36.54	34.20	4	1	2	47.50	44.61
1	14	1	13.54	14.49	5	1	2	11.53	10.88
2	14	1	97.10	95.43	6	1	2	2.14*	0.29
3	14	1	32.01	32.82	7	1	2	12.72	13.19
4	14	1	54.10	54.78	8	1	2	5.60*	2.68
5	14	1	21.34	21.30	9	1	2	21.20	23.09
6	14	1	65.45	63.48	10	1	2	12.09	12.69
7	14	1	5.11*	5.86	0	2	2	67.23	75.81
0	15	1	29.17	30.07	1	2	2	68.70	72.73
1	15	1	0.00*	0.51	2	2	2	22.50	21.02
2	15	1	10.06	13.20	3	2	2	89.77	89.41
3	15	1	0.00*	1.58	4	2	2	12.83	12.15
4	15	1	21.37	20.31	5	2	2	113.67	108.20
5	15	1	9.67	8.00	6	2	2	3.59*	6.25
6	15	1	10.20	10.59	7	2	2	29.08	28.81
7	15	1	5.88*	6.83	8	2	2	1.94*	0.92
0	16	1	51.52	52.15	9	2	2	34.58	34.49
1	16	1	73.24	72.13	10	2	2	10.89	12.17
2	16	1	56.59	55.73	0	3	2	55.38	60.22
3	16	1	59.88	59.36	1	3	2	45.28	44.44
4	16	1	11.16	10.10	2	3	2	80.24	77.75
5	16	1	21.87	21.58	3	3	2	103.55	102.13
6	16	1	2.07*	1.41	4	3	2	41.20	36.81
7	16	1	34.04	34.26	5	3	2	19.94	17.32
0	17	1	0.00*	4.32	6	3	2	5.04*	1.34
1	17	1	60.41	59.29	7	3	2	18.00	15.80
2	17	1	0.57*	1.48	8	3	2	23.83	23.70
3	17	1	0.00*	0.43	9	3	2	29.95	29.88
4	17	1	0.00*	0.95	10	3	2	2.92*	2.08
5	17	1	25.89	26.02	0	4	2	40.80	43.01
6	17	1	4.65*	5.60	1	4	2	48.96	48.89
0	18	1	61.57	61.95	2	4	2	46.48	40.55
1	18	1	37.92	39.09	3	4	2	46.27	45.50
2	18	1	35.14	34.83	4	4	2	127.40	128.44
3	18	1	28.63	27.33	5	4	2	20.36	20.31
4	18	1	38.09	39.13	6	4	2	73.48	72.24
5	18	1	18.60	18.56	7	4	2	14.15	12.97
0	19	1	20.51	20.43	8	4	2	81.04	79.27
1	19	1	4.46*	4.71	9	4	2	23.45	24.26
2	19	1	37.39	38.67	10	4	2	16.01	14.70
3	19	1	10.74	11.89	0	5	2	62.83	57.39
4	19	1	19.25	20.49	1	5	2	3.38*	0.23
0	20	1	10.64	11.27	2	5	2	15.77	12.04
1	20	1	9.62	10.19	3	5	2	44.44	38.09
2	20	1	0.00*	1.05	4	5	2	6.93	4.36
3	20	1	24.75	26.35	5	5	2	54.61	49.11

H	K	L	FO	FC	H	K	L	FO	FC
6	5	2	22.74	22.21	2	11	2	41.08	40.98
7	5	2	4.01*	4.06	3	11	2	87.08	83.71
8	5	2	12.36	13.63	4	11	2	20.12	19.09
9	5	2	9.18	7.98	5	11	2	18.24	16.99
10	5	2	6.47*	6.79	6	11	2	10.82	11.28
0	6	2	45.81	43.48	7	11	2	8.54	8.54
1	6	2	101.05	102.86	8	11	2	6.85*	7.12
2	6	2	16.20	11.08	0	12	2	9.42	11.63
3	6	2	75.68	71.07	1	12	2	3.06*	1.12
4	6	2	33.41	31.25	2	12	2	86.53	83.91
5	6	2	95.60	89.23	3	12	2	3.89*	4.54
6	6	2	12.33	12.19	4	12	2	32.58	32.92
7	6	2	41.29	39.64	5	12	2	18.67	18.67
8	6	2	2.13*	0.16	6	12	2	91.37	88.15
9	6	2	42.03	42.45	7	12	2	15.32	14.96
10	6	2	7.21*	9.13	8	12	2	44.14	44.29
0	7	2	42.40	43.32	0	13	2	27.65	25.28
1	7	2	8.55	8.89	1	13	2	14.36	13.42
2	7	2	28.15	25.16	2	13	2	2.63*	4.34
3	7	2	53.90	51.27	3	13	2	15.65	14.05
4	7	2	2.85*	3.33	4	13	2	7.08	8.20
5	7	2	71.27	65.36	5	13	2	7.16	7.84
6	7	2	9.52	9.52	6	13	2	14.05	13.55
7	7	2	30.00	30.00	7	13	2	5.68*	4.93
8	7	2	15.75	15.86	8	13	2	5.15*	5.32
9	7	2	5.68*	5.13	0	14	2	21.55	23.45
0	8	2	111.98	120.91	1	14	2	59.38	61.61
1	8	2	8.83	6.92	2	14	2	16.27	15.64
2	8	2	129.33	141.88	3	14	2	64.64	63.13
3	8	2	36.03	33.39	4	14	2	30.41	30.94
4	8	2	25.18	24.79	5	14	2	57.13	57.27
5	8	2	13.87	12.53	6	14	2	20.82	21.96
6	8	2	22.70	22.10	7	14	2	50.08	50.12
7	8	2	8.54	8.91	0	15	2	12.22	12.90
8	8	2	24.84	23.60	1	15	2	27.02	27.23
9	8	2	19.25	19.13	2	15	2	43.88	42.42
0	9	2	48.15	44.64	3	15	2	57.19	57.97
1	9	2	19.86	18.86	4	15	2	4.36*	5.24
2	9	2	65.39	62.42	5	15	2	11.48	11.91
3	9	2	7.95	5.03	6	15	2	0.00*	1.04
4	9	2	33.88	33.49	7	15	2	0.00*	3.93
5	9	2	23.70	21.17	0	16	2	76.33	76.28
6	9	2	5.98*	7.07	1	16	2	46.82	46.98
7	9	2	0.79*	1.72	2	16	2	72.03	72.30
8	9	2	19.91	18.72	3	16	2	0.99*	2.53
9	9	2	9.50	8.26	4	16	2	46.54	47.57
0	10	2	31.08	29.88	5	16	2	7.04	8.01
1	10	2	91.11	90.63	6	16	2	23.04	23.00
2	10	2	74.08	66.89	0	17	2	14.54	14.07
3	10	2	50.70	47.97	1	17	2	27.65	27.79
4	10	2	25.51	25.84	2	17	2	9.02	7.54
5	10	2	25.61	26.70	3	17	2	5.83*	7.63
6	10	2	21.28	21.93	4	17	2	14.32	13.92
7	10	2	48.27	47.07	5	17	2	5.35*	5.80
8	10	2	14.25	14.63	6	17	2	17.49	18.05
9	10	2	44.17	45.36	0	18	2	36.24	36.70
0	11	2	18.47	18.78	1	18	2	45.99	46.46
1	11	2	48.10	45.52	2	18	2	21.80	21.80

H	K	L	FO	FC
3	18	2	55.60	54.87
4	18	2	9.26	7.84
5	18	2	30.54	29.92
0	19	2	0.00*	3.35
1	19	2	19.18	18.57
2	19	2	0.00*	1.39
3	19	2	13.44	13.76
4	19	2	0.00*	0.59
0	20	2	18.58	18.74
1	20	2	2.77*	4.24
2	20	2	28.39	27.93
3	20	2	0.00*	1.62
0	21	2	0.00*	2.00
1	21	2	0.00*	1.67
3	0	3	113.56	117.76
5	0	3	18.39	20.32
7	0	3	7.95	9.83
9	0	3	36.17	38.03
0	1	3	84.54	108.69
1	1	3	68.67	72.74
2	1	3	21.88	20.77
3	1	3	48.15	53.62
4	1	3	57.97	57.92
5	1	3	28.44	26.44
6	1	3	2.06*	1.09
7	1	3	21.71	22.47
8	1	3	26.78	27.76
9	1	3	8.39	8.17
10	1	3	3.96*	5.33
1	2	3	23.64	21.15
2	2	3	69.42	64.58
3	2	3	34.25	32.25
4	2	3	117.20	118.98
5	2	3	3.02*	0.56
6	2	3	3.30*	3.06
7	2	3	14.50	14.08
8	2	3	79.41	80.30
9	2	3	9.50	9.62
10	2	3	30.66	32.15
0	3	3	0.00*	8.06
1	3	3	100.06	117.35
2	3	3	14.72	10.19
3	3	3	36.00	34.35
4	3	3	56.55	52.31
5	3	3	77.68	75.98
6	3	3	7.80	6.79
7	3	3	13.90	14.44
8	3	3	16.46	15.83
9	3	3	25.29	26.04
10	3	3	13.45	14.70
0	4	3	10.45	5.16
1	4	3	52.45	53.53
2	4	3	16.48	15.75
3	4	3	27.11	27.67
4	4	3	6.63	7.24
5	4	3	116.34	111.56
6	4	3	29.15	29.61
7	4	3	74.04	71.93
8	4	3	4.83*	5.62
9	4	3	57.88	57.77
10	4	3	1.82*	2.07
0	5	3	32.82	29.05
1	5	3	9.28	7.36
2	5	3	26.54	24.19
3	5	3	27.05	24.60
4	5	3	89.80	86.51
5	5	3	57.67	53.27
6	5	3	38.47	36.71
7	5	3	48.90	48.90
8	5	3	10.50	9.56
9	5	3	4.06*	0.39
0	6	3	29.03	29.62
1	6	3	13.21	11.55
2	6	3	88.87	85.64
3	6	3	42.23	42.10
4	6	3	75.61	72.22
5	6	3	54.59	51.21
6	6	3	70.81	67.05
7	6	3	20.77	21.06
8	6	3	56.00	54.87
9	6	3	13.15	14.40
0	7	3	85.52	84.04
1	7	3	69.49	69.10
2	7	3	49.96	43.64
3	7	3	33.17	31.83
4	7	3	61.12	60.03
5	7	3	44.65	43.15
6	7	3	24.04	22.38
7	7	3	14.91	14.59
8	7	3	33.91	35.33
9	7	3	7.52	7.50
0	8	3	48.71	43.30
1	8	3	106.48	108.96
2	8	3	42.91	42.05
3	8	3	82.68	82.55
4	8	3	18.36	17.79
5	8	3	45.70	43.85
6	8	3	17.04	17.06
7	8	3	47.63	45.72
8	8	3	11.57	11.38
9	8	3	30.91	30.67
0	9	3	62.86	61.31
1	9	3	2.17*	1.06
2	9	3	72.71	66.29
3	9	3	18.68	17.81
4	9	3	4.56*	2.43
5	9	3	35.58	34.73
6	9	3	26.54	25.60
7	9	3	20.21	21.00
8	9	3	8.94	7.74
9	9	3	15.77	15.95
0	10	3	53.03	53.96
1	10	3	6.70	7.02
2	10	3	79.42	78.33
3	10	3	24.52	23.46
4	10	3	28.84	28.25

H	K	L	FO	FC	H	K	L	FO	FC
5	10	3	3.92*	1.51	3	17	3	0.00*	3.80
6	10	3	82.02	79.64	4	17	3	5.13*	4.20
7	10	3	5.03*	0.65	5	17	3	28.66	29.73
8	10	3	35.22	34.68	0	18	3	69.27	69.55
9	10	3	9.40	10.73	1	18	3	15.37	15.54
0	11	3	6.89	4.92	2	18	3	49.88	49.24
1	11	3	30.28	29.98	3	18	3	9.45*	10.79
2	11	3	13.67	14.08	4	18	3	38.90	39.01
3	11	3	10.44	11.97	5	18	3	21.28	21.61
4	11	3	6.89	6.06	0	19	3	19.93	20.83
5	11	3	8.47	9.91	1	19	3	9.00	9.75
6	11	3	10.62	10.79	2	19	3	17.46	18.11
7	11	3	31.25	30.69	3	19	3	0.00*	0.99
8	11	3	11.98	11.61	4	19	3	20.81	21.03
0	12	3	53.75	53.20	0	20	3	10.56	10.68
1	12	3	12.18	11.45	1	20	3	36.20	35.72
2	12	3	14.97	14.51	2	20	3	8.19	8.77
3	12	3	41.37	41.06	2	0	4	91.33	88.71
4	12	3	16.53	16.03	4	0	4	103.61	104.19
5	12	3	81.20	78.28	6	0	4	28.59	30.35
6	12	3	38.50	37.98	8	0	4	80.48	86.06
7	12	3	83.31	80.07	10	0	4	38.36	41.80
8	12	3	3.22*	1.23	0	1	4	71.44	74.61
0	13	3	10.34	8.37	1	1	4	108.58	149.24
1	13	3	10.48	13.06	2	1	4	26.53	25.50
2	13	3	11.17	12.17	3	1	4	28.87	28.13
3	13	3	44.73	46.17	4	1	4	82.16	82.20
4	13	3	6.05*	4.45	5	1	4	10.95	10.94
5	13	3	0.00*	1.03	6	1	4	5.98	5.15
6	13	3	26.33	24.98	7	1	4	2.04*	1.48
7	13	3	10.21	12.26	8	1	4	15.65	15.14
8	13	3	11.10	11.32	9	1	4	32.55	34.95
0	14	3	28.46	29.63	10	1	4	3.59*	0.81
1	14	3	11.29	11.41	0	2	4	6.18	7.36
2	14	3	69.71	69.02	1	2	4	110.60	143.58
3	14	3	13.82	14.56	2	2	4	42.88	40.38
4	14	3	58.99	57.14	3	2	4	61.94	61.21
5	14	3	9.49	9.47	4	2	4	25.30	25.27
6	14	3	68.37	66.35	5	2	4	94.97	96.08
7	14	3	23.26	22.62	6	2	4	1.79*	0.71
0	15	3	7.90	8.01	7	2	4	80.01	82.18
1	15	3	39.99	38.34	8	2	4	10.43	11.03
2	15	3	18.34	17.51	9	2	4	68.41	71.17
3	15	3	7.09*	9.82	10	2	4	5.07*	5.85
4	15	3	26.57	26.98	0	3	4	70.26	71.99
5	15	3	9.20	8.86	1	3	4	45.00	42.55
6	15	3	2.49*	7.42	2	3	4	42.08	38.87
7	15	3	6.92*	7.62	3	3	4	75.82	71.48
0	16	3	23.37	22.43	4	3	4	55.89	54.86
1	16	3	72.40	73.30	5	3	4	31.60	32.61
2	16	3	8.14	8.04	6	3	4	2.54*	1.13
3	16	3	74.63	74.75	7	3	4	44.86	45.00
4	16	3	0.80*	1.85	8	3	4	33.27	33.91
5	16	3	18.46	18.12	9	3	4	8.24	9.51
6	16	3	9.31	9.46	0	4	4	99.24	105.12
0	17	3	33.30	32.97	1	4	4	66.76	61.80
1	17	3	28.74	29.86	2	4	4	74.20	70.82
2	17	3	24.88	25.41	3	4	4	2.36*	4.44

H	K	L	FO	FC	H	K	L	FC	FC
4	4	4	73.85	73.51	2	10	4	53.91	51.48
5	4	4	24.99	23.63	3	10	4	101.80	100.99
6	4	4	106.98	105.17	4	10	4	10.58	9.96
7	4	4	35.04	35.49	5	10	4	67.08	66.11
8	4	4	97.70	96.60	6	10	4	25.57	25.22
9	4	4	0.00*	0.26	7	10	4	48.89	47.61
0	5	4	9.07	5.81	8	10	4	6.51*	6.63
1	5	4	67.36	64.33	0	11	4	4.35*	1.30
2	5	4	38.65	36.70	1	11	4	28.36	30.85
3	5	4	17.17	17.77	2	11	4	26.54	25.64
4	5	4	24.98	24.41	3	11	4	27.12	26.95
5	5	4	56.14	54.39	4	11	4	10.71	10.68
6	5	4	16.05	16.75	5	11	4	31.12	30.90
7	5	4	16.02	16.37	6	11	4	58.66	57.16
8	5	4	36.68	36.06	7	11	4	13.11	13.60
9	5	4	19.86	20.13	8	11	4	9.82	9.51
0	6	4	54.08	51.10	0	12	4	3.90*	1.42
1	6	4	83.48	80.95	1	12	4	12.77	11.50
2	6	4	49.71	45.12	2	12	4	73.82	72.21
3	6	4	79.77	76.26	3	12	4	21.25	20.12
4	6	4	29.55	28.14	4	12	4	47.63	45.71
5	6	4	109.54	108.33	5	12	4	33.13	32.95
6	6	4	8.73	9.24	6	12	4	89.41	87.99
7	6	4	65.88	64.83	7	12	4	19.03	20.50
8	6	4	31.61	32.40	8	12	4	35.85	34.67
9	6	4	49.33	49.25	0	13	4	10.19	9.19
0	7	4	50.44	50.19	1	13	4	9.76	8.27
1	7	4	42.38	41.76	2	13	4	13.67	13.67
2	7	4	78.21	76.36	3	13	4	12.11	11.81
3	7	4	7.29	7.97	4	13	4	23.78	24.13
4	7	4	54.22	53.15	5	13	4	40.73	41.19
5	7	4	26.44	23.92	6	13	4	0.00*	1.21
6	7	4	34.47	32.79	7	13	4	38.24	38.17
7	7	4	44.99	44.52	0	14	4	3.21*	0.21
8	7	4	5.09*	2.66	1	14	4	35.91	35.89
9	7	4	3.80*	3.39	2	14	4	27.74	27.93
0	8	4	111.96	111.56	3	14	4	76.08	74.46
1	8	4	0.00*	1.97	4	14	4	0.00*	4.92
2	8	4	149.07	169.11	5	14	4	54.68	53.61
3	8	4	27.49	26.36	6	14	4	23.08	23.44
4	8	4	82.21	78.00	7	14	4	47.35	46.88
5	8	4	26.62	26.77	0	15	4	23.64	22.91
6	8	4	73.12	72.93	1	15	4	36.65	36.79
7	8	4	27.90	27.85	2	15	4	30.15	30.86
8	8	4	15.20	15.11	3	15	4	39.29	40.10
9	8	4	3.09*	2.52	4	15	4	27.87	27.80
0	9	4	11.86	12.01	5	15	4	0.00*	4.02
1	9	4	74.34	69.80	6	15	4	30.44	31.22
2	9	4	0.00*	3.76	0	16	4	71.33	70.24
3	9	4	59.49	58.13	1	16	4	24.81	25.17
4	9	4	33.08	30.76	2	16	4	66.26	66.22
5	9	4	21.38	21.27	3	16	4	23.52	24.40
6	9	4	26.99	27.09	4	16	4	43.24	42.19
7	9	4	30.66	30.26	5	16	4	17.64	17.22
8	9	4	8.39	4.99	6	16	4	22.58	21.87
9	9	4	14.38	14.17	0	17	4	0.00*	0.72
0	10	4	48.90	48.08	1	17	4	35.92	35.29
1	10	4	96.36	92.97	2	17	4	19.36	19.55

H	K	L	FO	FC	H	K	L	FO	FC
3	17	4	21.35	21.84	0	5	5	18.92*	20.91
4	17	4	0.00*	3.11	1	5	5	19.06	21.03
5	17	4	13.92	13.29	2	5	5	16.27	17.47
0	18	4	0.00*	3.26	3	5	5	70.96	67.93
1	18	4	37.57	36.93	4	5	5	30.73	28.56
2	18	4	24.73	24.38	5	5	5	12.96*	13.16
3	18	4	36.21	36.96	6	5	5	38.91	39.18
4	18	4	32.17	33.61	7	5	5	25.76	26.60
0	19	4	18.94	19.09	8	5	5	25.11	25.63
1	19	4	9.73	9.86	9	5	5	5.92*	5.95
2	19	4	6.30*	6.88	0	6	5	83.06	80.04
3	19	4	5.18*	6.70	1	6	5	41.97	38.53
0	20	4	35.44	35.92	2	6	5	116.29	117.48
1	20	4	4.88*	5.15	3	6	5	22.17	20.37
2	20	4	12.88	12.78	4	6	5	89.74	86.49
1	0	5	118.65	148.10	5	6	5	12.65	12.16
3	0	5	125.03	136.50	6	6	5	79.48	79.08
5	0	5	127.17	134.44	7	6	5	54.95	55.07
7	0	5	60.54	63.97	8	6	5	49.28	48.86
0	1	5	97.03	106.08	9	6	5	5.21*	3.06
1	1	5	35.11	35.13	0	7	5	18.97	17.80
2	1	5	39.19	42.58	1	7	5	75.09	73.09
3	1	5	68.56	70.97	2	7	5	45.66	45.72
4	1	5	32.83	34.30	3	7	5	62.86	61.68
5	1	5	25.59	24.27	4	7	5	29.75	29.00
6	1	5	6.68	8.16	5	7	5	30.18	28.63
7	1	5	13.00	13.56	6	7	5	8.41	8.53
8	1	5	34.33	35.88	7	7	5	14.47	15.01
9	1	5	14.02	15.28	8	7	5	6.81*	6.91
1	2	5	7.90	7.14	9	7	5	10.61	11.43
2	2	5	96.42	99.34	0	8	5	32.70	32.46
3	2	5	59.33	59.13	1	8	5	142.44	157.34
4	2	5	144.88	156.31	2	8	5	37.10	36.88
5	2	5	42.98	43.67	3	8	5	117.04	113.57
6	2	5	80.85	82.69	4	8	5	33.82	33.91
7	2	5	22.21	21.99	5	8	5	64.93	62.76
8	2	5	77.04	79.40	6	8	5	23.89	23.48
9	2	5	12.62	14.10	7	8	5	27.90	27.20
0	3	5	5.11	1.18	8	8	5	12.32	12.91
1	3	5	76.38	76.43	0	9	5	29.37	28.74
2	3	5	37.27	32.26	1	9	5	5.68*	8.83
3	3	5	28.82	27.77	2	9	5	104.91	99.39
4	3	5	89.91	86.58	3	9	5	94.47	90.74
5	3	5	40.40	39.38	4	9	5	13.82	13.27
6	3	5	31.44	30.77	5	9	5	25.53	23.81
7	3	5	21.13	21.90	6	9	5	31.98	31.89
8	3	5	24.22	25.40	7	9	5	14.09	13.00
9	3	5	45.52	49.15	8	9	5	13.43	14.42
0	4	5	21.03	19.99	0	10	5	98.16	94.57
1	4	5	97.88	102.06	1	10	5	9.32	9.69
2	4	5	27.52	27.34	2	10	5	125.15	122.46
3	4	5	63.07	61.69	3	10	5	50.38	48.86
4	4	5	39.83	38.55	4	10	5	38.27	36.90
5	4	5	135.83	138.70	5	10	5	40.28	39.21
6	4	5	21.51	21.17	6	10	5	47.78	46.41
7	4	5	79.29	79.62	7	10	5	26.64	25.28
8	4	5	26.10	27.09	8	10	5	25.79	24.80
9	4	5	63.35	65.79	0	11	5	28.50	27.42

H	K	L	FO	FC	H	K	L	FO	FC
1	11	5	18.32	17.57	0	0	6	116.17	135.91
2	11	5	34.49	32.45	2	0	6	91.05	94.07
3	11	5	30.11	29.34	4	0	6	145.24	156.29
4	11	5	41.86	40.70	6	0	6	4.64*	9.26
5	11	5	18.33	17.86	8	0	6	23.44	24.48
6	11	5	31.44	31.95	0	1	6	65.16	65.77
7	11	5	15.75	16.13	1	1	6	56.49	55.49
8	11	5	4.10*	1.21	2	1	6	17.43	17.80
0	12	5	11.20	11.28	3	1	6	12.50	13.18
1	12	5	42.14	40.98	4	1	6	62.65	62.27
2	12	5	46.90	45.79	5	1	6	27.84	28.46
3	12	5	43.38	42.06	6	1	6	3.61*	3.59
4	12	5	9.48	9.09	7	1	6	4.91*	5.02
5	12	5	39.07	38.74	8	1	6	15.03	15.40
6	12	5	31.46	31.34	9	1	6	14.08	15.42
7	12	5	44.97	45.17	0	2	6	35.11	36.03
0	13	5	18.38	17.53	1	2	6	104.87	110.30
1	13	5	13.40	12.93	2	2	6	34.60	35.69
2	13	5	41.05	39.25	3	2	6	111.45	116.29
3	13	5	11.94	11.07	4	2	6	57.31	58.39
4	13	5	20.08	19.58	5	2	6	75.62	76.35
5	13	5	17.00	17.00	6	2	6	8.73	8.62
6	13	5	39.87	40.88	7	2	6	31.78	33.35
7	13	5	0.00*	2.66	8	2	6	0.00*	2.91
0	14	5	30.44	28.34	9	2	6	29.61	31.51
1	14	5	47.48	47.28	0	3	6	6.31	7.91
2	14	5	60.96	59.08	1	3	6	10.03	11.53
3	14	5	0.00*	2.27	2	3	6	27.02	26.65
4	14	5	43.61	43.13	3	3	6	53.00	51.63
5	14	5	4.53*	4.30	4	3	6	34.25	32.60
6	14	5	41.03	40.98	5	3	6	30.96	29.95
0	15	5	23.45	22.57	6	3	6	18.74	18.47
1	15	5	38.39	36.99	7	3	6	31.81	32.45
2	15	5	6.32*	8.01	8	3	6	27.98	29.98
3	15	5	43.30	42.91	9	3	6	8.44	10.19
4	15	5	13.77	14.86	0	4	6	81.74	78.07
5	15	5	21.21	22.38	1	4	6	29.72	28.66
6	15	5	0.00*	0.75	2	4	6	71.19	68.50
0	16	5	33.47	33.52	3	4	6	52.05	48.94
1	16	5	40.53	39.76	4	4	6	95.08	93.69
2	16	5	39.70	40.03	5	4	6	7.77	6.09
3	16	5	66.24	65.14	6	4	6	51.54	51.56
4	16	5	7.71	7.48	7	4	6	18.81	19.51
5	16	5	22.04	21.50	8	4	6	50.47	51.43
0	17	5	28.64	29.39	9	4	6	17.21	17.95
1	17	5	17.20	16.46	0	5	6	61.22	62.13
2	17	5	36.81	36.09	1	5	6	13.52	12.11
3	17	5	5.16*	7.49	2	5	6	26.51	26.69
4	17	5	12.64	12.14	3	5	6	13.25	11.81
5	17	5	19.46	19.57	4	5	6	15.09	13.39
0	18	5	39.35	39.90	5	5	6	44.50	44.53
1	18	5	31.54	31.96	6	5	6	0.00*	3.21
2	18	5	18.73	19.00	7	5	6	20.22	20.19
3	18	5	18.11	18.27	8	5	6	29.04	31.03
4	18	5	27.94	28.59	9	5	6	11.89	11.22
0	19	5	2.76*	7.59	0	6	6	59.11	60.18
1	19	5	15.90	16.51	1	6	6	79.23	80.81
2	19	5	6.27*	6.06	2	6	6	16.53	14.42

H	K	L	FO	FC	H	K	L	FO	FC
3	6	6	67.09	65.95	0	13	6	30.49	30.19
4	6	6	14.80	14.81	1	13	6	29.03	28.12
5	6	6	70.12	69.92	2	13	6	29.66	28.33
6	6	6	19.31	18.18	3	13	6	6.91*	5.60
7	6	6	45.92	45.61	4	13	6	9.18	9.09
8	6	6	8.84	9.58	5	13	6	6.99*	5.72
0	7	6	21.38	21.19	6	13	6	18.87	19.27
1	7	6	56.15	56.62	0	14	6	42.14	41.06
2	7	6	58.34	53.27	1	14	6	23.03	22.63
3	7	6	49.09	48.84	2	14	6	20.97	22.09
4	7	6	21.24	21.27	3	14	6	52.88	52.37
5	7	6	29.07	28.35	4	14	6	15.33	15.55
6	7	6	24.77	23.41	5	14	6	30.45	31.96
7	7	6	8.83	8.90	6	14	6	18.08	18.40
8	7	6	6.66*	7.04	0	15	6	26.40	25.62
0	8	6	91.19	86.21	1	15	6	40.49	40.72
1	8	6	22.63	20.56	2	15	6	46.13	44.93
2	8	6	96.09	93.18	3	15	6	2.69*	4.42
3	8	6	60.42	60.60	4	15	6	9.51	9.61
4	8	6	59.51	60.73	5	15	6	26.88	27.71
5	8	6	4.87*	3.67	0	16	6	42.27	40.70
6	8	6	48.07	47.32	1	16	6	38.50	39.14
7	8	6	22.35	22.62	2	16	6	44.76	44.24
8	8	6	21.90	22.06	3	16	6	0.00*	2.23
0	9	6	61.42	57.55	4	16	6	45.97	47.18
1	9	6	54.10	51.87	5	16	6	14.47	15.11
2	9	6	67.78	65.41	0	17	6	3.38*	0.26
3	9	6	35.59	35.47	1	17	6	41.21	41.01
4	9	6	30.07	30.91	2	17	6	15.60	15.04
5	9	6	11.97	12.76	3	17	6	21.07	21.64
6	9	6	15.04	12.35	4	17	6	20.84	21.21
7	9	6	2.66*	0.68	0	18	6	14.12	14.54
8	9	6	12.20	12.06	1	18	6	23.62	23.73
0	10	6	22.39	22.24	2	18	6	14.87	15.79
1	10	6	72.87	70.82	3	18	6	41.36	41.79
2	10	6	46.08	45.99	0	19	6	16.79	16.30
3	10	6	49.35	48.08	1	19	6	0.97*	2.19
4	10	6	32.69	31.36	1	0	7	100.15	105.48
5	10	6	30.79	30.36	3	0	7	50.84	55.58
6	10	6	30.97	31.29	5	0	7	12.45*	10.76
7	10	6	45.56	45.76	7	0	7	16.25*	17.23
8	10	6	0.00*	1.99	0	1	7	71.94	72.95
0	11	6	4.30*	1.09	1	1	7	44.01	43.69
1	11	6	20.35	20.84	2	1	7	22.57	20.22
2	11	6	38.79	37.37	3	1	7	48.49	48.85
3	11	6	44.08	44.39	4	1	7	48.36	47.82
4	11	6	28.62	28.58	5	1	7	15.12	15.10
5	11	6	32.19	30.51	6	1	7	19.22	19.47
6	11	6	16.38	16.98	7	1	7	3.53*	4.26
7	11	6	22.32	22.10	8	1	7	0.00*	2.26
0	12	6	40.17	39.03	0	2	7	100.78	101.59
1	12	6	12.73	12.42	1	2	7	27.36	27.84
2	12	6	34.37	33.12	2	2	7	50.62	49.64
3	12	6	0.00*	3.01	3	2	7	30.12	29.71
4	12	6	19.08	19.46	4	2	7	43.74	43.36
5	12	6	19.01	19.93	5	2	7	4.93*	5.90
6	12	6	50.40	51.26	6	2	7	11.23	7.98
7	12	6	24.93	26.59	7	2	7	12.10	10.94

H	K	L	FO	FC	H	K	L	FO	FC
8	2	7	30.08	31.43	3	9	7	38.84	38.57
0	3	7	56.22	55.94	4	9	7	3.16*	3.22
1	3	7	35.31	35.14	5	9	7	12.34	12.55
2	3	7	19.66	19.52	6	9	7	26.00	25.50
3	3	7	6.78	5.41	7	9	7	35.16	37.13
4	3	7	30.72	32.09	0	10	7	21.80	21.15
5	3	7	19.62	19.68	1	10	7	12.81	12.77
6	3	7	23.34	24.29	2	10	7	46.91	45.26
7	3	7	1.78*	2.82	3	10	7	29.22	28.07
8	3	7	29.23	29.83	4	10	7	31.43	29.96
0	4	7	37.26	38.38	5	10	7	15.03	15.03
1	4	7	72.97	73.21	6	10	7	46.11	44.94
2	4	7	5.39	7.51	7	10	7	14.49	15.78
3	4	7	21.97	22.90	0	11	7	30.53	31.71
4	4	7	2.19*	1.61	1	11	7	0.00*	0.59
5	4	7	35.72	35.59	2	11	7	15.04	13.96
6	4	7	21.06	21.40	3	11	7	1.71*	1.36
7	4	7	34.39	35.35	4	11	7	14.13	13.98
8	4	7	11.07	12.25	5	11	7	1.31*	1.62
0	5	7	6.83	8.38	6	11	7	34.75	35.35
1	5	7	3.38*	4.28	7	11	7	32.77	32.94
2	5	7	9.49	7.60	0	12	7	20.49	18.49
3	5	7	0.00*	0.77	1	12	7	13.91	15.82
4	5	7	22.29	23.24	2	12	7	17.71	17.01
5	5	7	3.07*	2.44	3	12	7	34.57	32.58
6	5	7	20.19	19.87	4	12	7	2.70*	0.25
7	5	7	37.29	38.52	5	12	7	33.83	33.12
8	5	7	11.81	11.11	6	12	7	21.06	22.52
0	6	7	32.59	33.11	0	13	7	4.36*	1.91
1	6	7	26.04	27.76	1	13	7	37.30	36.70
2	6	7	55.37	54.77	2	13	7	4.89*	5.24
3	6	7	19.82	21.12	3	13	7	9.39	8.26
4	6	7	40.77	40.59	4	13	7	8.57	7.52
5	6	7	63.62	63.32	5	13	7	19.07	18.86
6	6	7	47.01	46.61	6	13	7	43.28	42.99
7	6	7	13.92	14.89	0	14	7	15.22*	16.21
8	6	7	21.62	21.80	1	14	7	17.46	16.54
0	7	7	83.89	81.06	2	14	7	32.20	32.01
1	7	7	31.35	30.74	3	14	7	0.00*	2.12
2	7	7	21.32	18.98	4	14	7	38.51	38.27
3	7	7	42.91	42.86	5	14	7	8.41	7.73
4	7	7	1.32*	4.01	0	15	7	36.96	36.04
5	7	7	9.82	9.91	1	15	7	19.90	19.97
6	7	7	11.72	11.46	2	15	7	36.54	36.32
7	7	7	11.67	12.05	3	15	7	19.12	19.13
8	7	7	20.15	21.51	4	15	7	14.21	14.83
0	8	7	36.18	35.65	5	15	7	12.30	12.79
1	8	7	47.03	48.15	0	16	7	4.12*	6.28
2	8	7	29.32	28.28	1	16	7	19.91	20.43
3	8	7	51.32	52.15	2	16	7	18.75	18.53
4	8	7	6.38	3.49	3	16	7	50.92	51.18
5	8	7	46.70	46.04	4	16	7	11.24	11.98
6	8	7	9.15	8.31	0	17	7	26.85	26.69
7	8	7	25.04	25.40	1	17	7	26.51	26.82
8	8	7	3.56*	1.04	2	17	7	30.30	31.40
0	9	7	7.13	8.22	3	17	7	20.78	20.78
1	9	7	23.50	25.03	0	18	7	47.90	48.73
2	9	7	47.60	45.48	1	18	7	3.37*	4.01

H	K	L	FO	FC	H	K	L	FO	FC
0	0	8	59.55	61.08	0	7	8	27.93	27.12
2	0	8	5.11*	5.14	1	7	8	7.75	8.33
4	0	8	30.22	30.79	2	7	8	57.13	54.83
6	0	8	24.95	25.53	3	7	8	44.85	42.12
8	0	8	31.05	32.82	4	7	8	27.54	28.49
0	1	8	73.74	70.87	5	7	8	19.93	19.30
1	1	8	85.65	83.51	6	7	8	37.34	36.15
2	1	8	22.72	22.49	7	7	8	14.26	14.89
3	1	8	35.47	35.97	0	8	8	20.29	21.36
4	1	8	51.53	51.55	1	8	8	33.71	33.76
5	1	8	21.00	19.06	2	8	8	55.80	54.40
6	1	8	9.23	9.17	3	8	8	3.56*	2.92
7	1	8	4.48*	1.17	4	8	8	34.37	33.68
8	1	8	19.95	20.80	5	8	8	24.17	24.65
0	2	8	49.19	48.21	6	8	8	27.25	26.84
1	2	8	39.28	40.18	7	8	8	13.97	13.49
2	2	8	29.77	31.69	0	9	8	6.74	6.09
3	2	8	18.84	18.53	1	9	8	30.80	28.86
4	2	8	18.17	18.00	2	9	8	19.13	17.41
5	2	8	30.59	31.00	3	9	8	61.55	59.77
6	2	8	13.17	13.55	4	9	8	31.98	32.24
7	2	8	33.25	33.45	5	9	8	23.46	22.38
8	2	8	8.74	8.77	6	9	8	23.78	24.52
0	3	8	65.52	63.60	7	9	8	17.45	16.73
1	3	8	5.01*	2.58	0	10	8	40.10	39.02
2	3	8	6.61	5.18	1	10	8	55.52	55.01
3	3	8	15.09	16.10	2	10	8	5.06*	4.57
4	3	8	19.24	17.93	3	10	8	38.41	37.82
5	3	8	22.79	22.54	4	10	8	9.70	9.37
6	3	8	8.26	8.58	5	10	8	27.15	26.11
7	3	8	25.20	26.76	6	10	8	11.33	11.35
8	3	8	34.51	36.16	0	11	8	13.94	12.92
0	4	8	26.88	25.61	1	11	8	10.15	10.14
1	4	8	44.25	42.72	2	11	8	36.83	35.97
2	4	8	9.93	11.31	3	11	8	11.89	10.23
3	4	8	3.02*	1.95	4	11	8	10.26	9.15
4	4	8	13.38	13.03	5	11	8	17.07	17.47
5	4	8	21.80	21.35	6	11	8	50.42	50.00
6	4	8	31.04	31.33	0	12	8	32.53	31.88
7	4	8	24.53	25.36	1	12	8	1.77*	4.41
8	4	8	33.11	34.23	2	12	8	48.83	48.22
0	5	8	10.90	12.12	3	12	8	1.93*	2.68
1	5	8	37.36	36.23	4	12	8	29.11	27.81
2	5	8	10.14	10.12	5	12	8	3.18*	0.37
3	5	8	7.47	6.97	6	12	8	24.05	23.12
4	5	8	24.00	22.09	0	13	8	16.60	16.00
5	5	8	21.97	22.17	1	13	8	5.93*	5.63
6	5	8	19.11	18.81	2	13	8	12.00	11.57
7	5	8	25.63	26.33	3	13	8	18.59	17.69
8	5	8	16.77	17.07	4	13	8	5.68*	3.63
0	6	8	41.19	41.69	5	13	8	28.91	29.51
1	6	8	52.37	54.17	0	14	8	7.91	6.92
2	6	8	28.67	27.65	1	14	8	17.95	17.62
3	6	8	12.63	11.71	2	14	8	22.45	21.34
4	6	8	20.92	20.69	3	14	8	43.93	43.80
5	6	8	43.37	43.35	4	14	8	6.99*	8.52
6	6	8	22.49	23.34	0	15	8	5.36*	4.34
7	6	8	20.48	20.34	1	15	8	32.24	33.41

H	K	L	FO	FC	H	K	L	FO	FC
2	15	8	30.81	30.64	5	6	9	27.34	27.58
3	15	8	3.75*	4.06	6	6	9	33.82	34.59
4	15	8	22.35	21.87	7	6	9	8.80	8.74
0	16	8	26.75	26.13	0	7	9	20.88	21.09
0	16	8	27.29	26.13	1	7	9	50.28	48.54
2	16	8	25.00	24.47	2	7	9	51.30	50.77
3	16	8	8.00*	9.25	3	7	9	58.33	58.21
0	17	8	18.39	17.55	4	7	9	43.69	42.55
1	17	8	30.12	29.85	5	7	9	35.95	35.40
1	0	9	33.24	34.36	6	7	9	2.39*	1.85
3	0	9	44.51	45.75	0	8	9	13.19	13.34
5	0	9	58.87	59.37	1	8	9	49.06	48.13
7	0	9	32.33	32.45	2	8	9	16.45	16.72
0	1	9	56.70	55.42	3	8	9	25.18	25.23
1	1	9	44.59	44.05	4	8	9	13.80	13.39
2	1	9	19.89	21.17	5	8	9	30.11	30.70
3	1	9	45.42	45.96	6	8	9	4.12*	2.03
4	1	9	63.40	64.02	0	9	9	26.72	27.14
5	1	9	44.86	45.33	1	9	9	20.86	20.06
6	1	9	21.09	20.80	2	9	9	82.85	81.14
7	1	9	19.27	20.68	3	9	9	43.67	43.22
0	2	9	16.62	16.24	4	9	9	35.26	34.82
1	2	9	55.16	55.06	5	9	9	10.81	11.41
2	2	9	20.05	20.70	6	9	9	35.55	35.54
3	2	9	18.85	16.77	0	10	9	48.34	47.16
4	2	9	57.28	57.52	1	10	9	25.07	25.28
5	2	9	18.29	18.49	2	10	9	39.19	38.23
6	2	9	34.76	35.24	3	10	9	12.47	12.22
7	2	9	18.52	19.13	4	10	9	15.56	15.46
0	3	9	33.32	34.31	5	10	9	8.98	10.12
1	3	9	39.13	37.74	6	10	9	15.88	16.12
2	3	9	4.70*	5.20	0	11	9	6.10*	4.80
3	3	9	2.36*	1.35	1	11	9	40.80	38.47
4	3	9	39.06	39.16	2	11	9	14.75	13.52
5	3	9	43.87	44.23	3	11	9	46.28	45.22
6	3	9	15.70	15.39	4	11	9	10.49	11.21
7	3	9	30.71	32.23	5	11	9	21.74	21.95
0	4	9	9.48	9.22	0	12	9	0.00*	3.34
1	4	9	30.52	31.35	1	12	9	36.72	36.29
2	4	9	15.81	15.27	2	12	9	3.63*	3.60
3	4	9	19.52	19.54	3	12	9	25.09	25.87
4	4	9	27.23	27.79	4	12	9	3.49*	3.55
5	4	9	41.88	43.03	5	12	9	9.32	9.88
6	4	9	0.00*	0.39	0	13	9	19.63	18.70
7	4	9	25.15	26.04	1	13	9	10.76	9.76
0	5	9	39.18	39.24	2	13	9	43.00	42.77
1	5	9	25.77	25.52	3	13	9	3.61*	2.56
2	5	9	11.43	11.14	4	13	9	11.92	12.22
3	5	9	30.92	30.42	0	14	9	19.85	19.73
4	5	9	31.70	31.03	1	14	9	23.47	23.18
5	5	9	19.51	19.07	2	14	9	19.05	19.12
6	5	9	40.23	41.17	3	14	9	10.09	10.08
7	5	9	11.41	11.12	0	15	9	0.00*	1.58
0	6	9	25.83	26.13	1	15	9	39.23	37.51
1	6	9	21.55	21.12	2	15	9	0.00*	3.01
2	6	9	38.45	38.18	0	16	9	14.65	14.64
3	6	9	21.57	21.71	0	0	10	52.27	51.94
4	6	9	35.97	34.85	2	0	10	67.07	69.81

H	K	L	FO	FC	H	K	L	FO	FC
4	0	10	57.97	58.27	1	9	10	44.90	43.72
6	0	10	27.62	28.69	2	9	10	23.35	22.78
0	1	10	55.85	55.24	3	9	10	58.76	57.44
1	1	10	52.78	53.06	4	9	10	8.50	7.04
2	1	10	37.46	38.10	5	9	10	20.37	20.13
3	1	10	54.88	55.80	0	10	10	7.63*	6.00
4	1	10	64.02	64.90	1	10	10	20.86	20.71
5	1	10	53.99	54.92	2	10	10	0.00*	2.90
6	1	10	22.21	22.87	3	10	10	16.72	17.00
0	2	10	16.86	16.37	4	10	10	18.41	18.83
1	2	10	55.18	55.04	0	11	10	32.47	31.64
2	2	10	5.93*	5.82	1	11	10	18.37	16.90
3	2	10	59.91	60.35	2	11	10	42.86	42.73
4	2	10	21.53	21.50	3	11	10	6.82*	6.42
5	2	10	33.92	34.00	4	11	10	2.17*	1.47
6	2	10	7.43	8.78	0	12	10	20.10	20.18
0	3	10	47.95	48.31	1	12	10	1.33*	3.73
1	3	10	40.51	40.15	2	12	10	17.97	16.21
2	3	10	22.82	24.50	3	12	10	2.94*	3.23
3	3	10	21.90	21.31	0	13	10	8.25	7.99
4	3	10	54.90	54.93	1	13	10	28.02	27.21
5	3	10	23.87	24.00	2	13	10	12.24	11.44
6	3	10	27.37	27.76	0	14	10	12.95	11.58
0	4	10	28.62	27.96	1	14	10	5.67*	2.18
1	4	10	4.81*	4.96	1	0	11	45.96	45.26
2	4	10	54.65	54.68	3	0	11	17.81	18.59
3	4	10	37.23	37.10	5	0	11	13.69	14.10
4	4	10	37.63	37.50	0	1	11	49.77	49.44
5	4	10	11.43	11.55	1	1	11	49.59	48.77
6	4	10	27.66	28.69	2	1	11	34.61	34.90
0	5	10	46.45	45.73	3	1	11	32.33	33.03
1	5	10	45.77	45.59	4	1	11	37.24	38.98
2	5	10	21.00	21.64	5	1	11	26.65	27.46
3	5	10	39.70	38.87	0	2	11	49.13	49.01
4	5	10	16.82	16.02	1	2	11	22.96	22.49
5	5	10	39.19	39.99	2	2	11	34.63	34.83
6	5	10	14.37	13.40	3	2	11	4.32*	0.35
0	6	10	45.51	44.66	4	2	11	13.88	14.25
1	6	10	36.32	36.23	5	2	11	2.93*	0.64
2	6	10	22.25	22.92	0	3	11	52.00	51.50
3	6	10	34.98	35.33	1	3	11	47.28	47.51
4	6	10	12.86	12.62	2	3	11	18.80	18.83
5	6	10	40.82	41.06	3	3	11	20.33	20.25
6	6	10	21.22	21.62	4	3	11	16.28	16.41
0	7	10	42.49	42.74	5	3	11	17.09	17.85
1	7	10	32.42	31.33	0	4	11	24.70	23.78
2	7	10	59.98	59.18	1	4	11	48.18	47.66
3	7	10	25.24	24.31	2	4	11	3.71*	3.67
4	7	10	40.20	40.27	3	4	11	27.71	27.51
5	7	10	10.85	10.74	4	4	11	5.04*	3.59
6	7	10	35.24	36.34	5	4	11	22.21	23.02
0	8	10	18.77	18.29	0	5	11	49.04	48.48
1	8	10	5.94*	6.23	1	5	11	22.29	22.60
2	8	10	26.42	25.44	2	5	11	30.73	30.27
3	8	10	27.86	26.87	3	5	11	8.45	7.87
4	8	10	26.45	26.30	4	5	11	13.55	14.63
5	8	10	7.47*	8.61	5	5	11	25.79	25.87
0	9	10	26.24	25.55	0	6	11	23.19	22.75

H	K	L	FO	FC	H	K	L	FO	FC
1	6	11	21.89	21.13	0	3	12	36.81	36.03
2	6	11	35.97	35.42	1	3	12	25.77	26.29
3	6	11	17.44	17.56	2	3	12	0.00*	2.28
4	6	11	25.19	25.79	3	3	12	10.37	9.95
5	6	11	20.92	21.79	4	3	12	4.93*	5.07
0	7	11	15.90	15.75	0	4	12	21.27	21.03
1	7	11	29.13	28.85	1	4	12	18.67	18.72
2	7	11	16.80	16.96	2	4	12	18.11	17.78
3	7	11	38.64	39.28	3	4	12	10.27	10.00
4	7	11	21.08	21.08	4	4	12	14.59	13.78
0	8	11	27.73	27.91	0	5	12	16.96	17.87
1	8	11	27.09	26.86	1	5	12	18.01	18.04
2	8	11	4.93*	5.95	2	5	12	18.30	18.03
3	8	11	21.29	21.52	3	5	12	3.50*	0.60
4	8	11	10.09	9.12	0	6	12	22.08	21.29
0	9	11	10.59	10.49	1	6	12	22.68	22.29
1	9	11	15.79	15.52	2	6	12	1.74*	0.06
2	9	11	42.27	39.75	3	6	12	8.46	8.09
3	9	11	17.95	17.00	0	7	12	14.57	14.05
4	9	11	17.80	17.20	1	7	12	15.80	15.10
0	10	11	20.32	19.34	2	7	12	23.42	22.24
1	10	11	0.00*	1.12	3	7	12	29.61	28.53
2	10	11	26.72	26.01	0	8	12	22.50	21.93
3	10	11	12.83	12.27	1	8	12	3.65*	2.55
0	11	11	29.65	27.64	2	8	12	11.64	12.06
1	11	11	6.63*	6.38	0	9	12	15.66	15.62
2	11	11	20.94	19.79	1	9	12	10.48	9.64
0	12	11	0.00*	0.65	0	-2	13	7.48*	6.84
1	12	11	17.40	16.41	1	0	13	4.05*	4.34
0	0	12	20.16	19.78	0	1	13	12.50	12.98
2	0	12	5.11*	4.75	1	1	13	15.47	15.22
4	0	12	6.54*	6.93	2	1	13	2.02*	1.40
0	1	12	37.04	35.32	0	2	13	8.73	6.84
1	1	12	23.28	22.73	1	2	13	16.92	16.40
2	1	12	11.20	12.02	2	2	13	5.42*	7.03
3	1	12	7.69	7.27	0	3	13	25.26	24.12
4	1	12	20.69	20.55	1	3	13	5.39*	5.27
0	2	12	11.13	10.64	2	3	13	13.89	13.27
1	2	12	16.90	16.56	0	4	13	5.33*	5.37
2	2	12	20.23	19.35	1	4	13	0.00*	2.93
3	2	12	8.23	7.93	0	5	13	18.99	18.09
4	2	12	8.36	7.82	1	5	13	19.88	19.08

* DENOTES AN UNOBSERVED REFLECTION

1-Acetyl-3-benzamido-2-keto-4-(2,4,4,6-tetra-*O*-acetyl-β-*D*-glucopyranosyloxy)-Δ^3-pyrroline

Anthony Mercer and James Trotter

Observed and calculated structure amplitudes

(reflections with intensity < $3\sigma(I)$ are marked with an asterisk).

H	K	L	FO	FC	WEIGHT
1	0	-11	8.45	8.99	6.18
2	0	-11	6.17	6.22	7.12
1	0	-10	11.92	12.29	4.99
2	0	-10	7.09	8.12	5.28
3	0	-10	8.74	10.32	4.68
4	0	-10	4.07	4.02	2.84
5	0	-10	0.00*	0.42	0.00
6	0	-10	3.89	2.25	4.47
7	0	-10	3.83	3.01	3.53
8	0	-10	2.57*	3.03	0.17
9	0	-10	5.77	6.56	6.54
1	1	-10	9.47	10.23	4.79
2	1	-10	4.45	4.31	3.94
3	1	-10	3.36*	4.19	0.19
4	1	-10	6.89	7.35	5.35
5	1	-10	9.05	10.34	5.44
6	1	-10	4.61	3.23	5.69
7	1	-10	3.35*	3.64	0.26
8	1	-10	3.60	3.13	3.48
9	1	-10	0.00*	0.36	0.00
1	2	-10	3.13*	1.91	0.21
2	2	-10	3.10*	3.61	0.21
3	2	-10	4.90	3.43	5.98
4	2	-10	2.79*	2.11	0.18
5	2	-10	4.10	4.20	3.20
6	2	-10	1.30*	2.67	0.04
7	2	-10	3.36	1.79	4.22
1	3	-10	4.22	3.95	3.50
2	3	-10	2.14*	2.92	0.10
3	3	-10	4.15	3.63	2.95
4	3	-10	6.16	6.90	4.39
5	3	-10	4.47	3.60	4.21
1	0	-9	21.07	21.90	2.56
2	0	-9	12.58	12.08	4.23
3	0	-9	3.04*	3.82	0.19
4	0	-9	2.24*	1.47	0.11
5	0	-9	15.07	16.81	3.60
6	0	-9	3.87	3.48	3.02
7	0	-9	4.14	3.84	3.36
8	0	-9	4.46	5.00	3.11
9	0	-9	10.24	11.14	5.22
10	0	-9	0.00*	1.63	0.00
11	0	-9	4.29	4.36	4.08
12	0	-9	4.86	4.96	4.29
1	1	-9	9.13	10.50	5.08
2	1	-9	2.79*	3.22	0.16
3	1	-9	13.80	15.49	4.24
4	1	-9	3.55*	4.33	0.20
5	1	-9	12.97	14.02	4.39
6	1	-9	7.14	7.47	5.12
7	1	-9	2.85*	5.54	0.11
8	1	-9	4.05	3.77	4.30
9	1	-9	6.53	5.69	5.91
10	1	-9	2.28*	1.93	0.12
11	1	-9	3.81	2.70	3.53
12	1	-9	4.17	2.75	5.67
1	2	-9	5.67	5.25	4.14
2	2	-9	9.18	9.29	5.04
3	2	-9	4.60	5.26	2.67
4	2	-9	6.06	4.67	5.30
5	2	-9	7.36	7.80	6.09
6	2	-9	2.43*	1.98	0.12
7	2	-9	5.25	5.55	3.92
8	2	-9	5.28	4.49	4.91
9	2	-9	2.92*	3.91	0.19
10	2	-9	1.56*	3.04	0.05
11	2	-9	5.98	5.47	6.52
1	3	-9	1.46*	1.18	0.05
2	3	-9	12.78	13.67	4.76
3	3	-9	1.38*	1.94	0.04
4	3	-9	4.87	4.95	3.57
5	3	-9	2.62*	4.97	0.12
6	3	-9	7.83	8.19	5.07
7	3	-9	3.52	2.18	2.95
8	3	-9	2.51*	1.78	0.16
9	3	-9	3.39*	3.32	0.28
10	3	-9	4.59	3.93	5.26
1	4	-9	4.72	4.59	3.14
2	4	-9	0.00*	0.11	0.00
3	4	-9	1.30*	0.63	0.04
4	4	-9	4.96	4.66	4.16
5	4	-9	0.49*	3.19	0.00
6	4	-9	2.71*	2.19	0.16
7	4	-9	2.52*	2.09	0.15
1	0	-8	11.12	10.92	4.29
2	0	-8	4.68	4.81	3.42
3	0	-8	21.30	21.40	2.60
4	0	-8	12.55	12.42	5.73
5	0	-8	4.54	3.77	3.59
6	0	-8	3.72	4.04	3.17
7	0	-8	17.70	18.03	3.51
8	0	-8	17.96	19.31	3.31
9	0	-8	3.96	4.03	2.57
10	0	-8	0.00*	0.57	0.00
11	0	-8	3.65	2.17	3.64
12	0	-8	3.58*	3.04	0.25
13	0	-8	6.58	6.45	6.09
14	0	-8	2.83*	1.64	0.24
15	0	-8	0.94*	1.15	0.02
1	1	-8	4.26	4.58	2.94
2	1	-8	5.59	5.94	3.20
3	1	-8	8.32	10.25	4.95
4	1	-8	7.53	9.21	5.16
5	1	-8	5.24	6.58	3.12
6	1	-8	8.78	10.32	5.26
7	1	-8	5.92	6.46	3.41
8	1	-8	5.41	6.22	3.42
9	1	-8	2.18*	4.67	0.08
10	1	-8	2.62*	2.26	0.14
11	1	-8	3.53*	4.68	0.24
12	1	-8	4.17	3.72	2.88
13	1	-8	4.07	4.87	2.95
14	1	-8	4.10	3.24	5.19
15	1	-8	3.94	3.36	3.50
1	2	-8	7.36	6.35	5.67
2	2	-8	12.56	13.44	4.41

H	K	L	FO	FC	WEIGHT
3	2	-8	12.98	13.67	4.54
4	2	-8	6.83	7.08	6.13
5	2	-8	10.68	10.20	5.64
6	2	-8	16.77	17.26	3.86
7	2	-8	3.23*	3.32	0.21
8	2	-8	3.57*	2.50	0.30
9	2	-8	6.17	6.53	4.52
10	2	-8	5.44	4.67	6.02
11	2	-8	0.62*	0.86	0.01
12	2	-8	3.42*	2.26	0.31
13	2	-8	3.30*	3.05	0.21
14	2	-8	3.51	2.04	3.48
1	3	-8	8.16	8.42	6.37
2	3	-8	6.00	6.38	3.89
3	3	-8	13.14	14.07	4.15
4	3	-8	6.60	6.65	4.22
5	3	-8	10.71	10.38	5.07
6	3	-8	6.11	7.50	3.87
7	3	-8	4.75	4.08	4.06
8	3	-8	3.92	3.05	3.13
9	3	-8	6.46	5.96	5.73
10	3	-8	2.85*	2.93	0.17
11	3	-8	3.31*	2.45	0.30
12	3	-8	3.78*	3.77	0.27
13	3	-8	0.00*	2.23	0.00
1	4	-8	6.52	6.91	3.62
2	4	-8	6.21	6.12	3.93
3	4	-8	7.91	8.72	4.81
4	4	-8	5.38	6.80	3.93
5	4	-8	4.02	3.02	3.28
6	4	-8	5.68	5.03	4.31
7	4	-8	4.36	3.94	3.17
8	4	-8	5.35	6.42	3.66
9	4	-8	4.04	3.37	3.10
10	4	-8	0.00*	1.20	0.00
11	4	-8	3.81	4.00	2.79
1	5	-8	3.55*	3.49	0.22
2	5	-8	4.45	3.55	3.42
3	5	-8	5.94	6.32	3.26
4	5	-8	5.31	5.58	3.28
5	5	-8	3.44*	2.92	0.23
6	5	-8	3.69	2.94	2.87
7	5	-8	3.42*	3.32	0.25
1	0	-7	19.31	18.73	3.14
2	0	-7	3.53	2.13	3.59
3	0	-7	5.19	5.06	4.28
4	0	-7	4.60	4.09	4.06
5	0	-7	0.00*	2.15	0.00
6	0	-7	14.34	16.31	4.60
7	0	-7	3.20*	0.45	0.28
8	0	-7	5.40	6.00	4.14
9	0	-7	13.74	14.44	4.96
10	0	-7	2.46*	1.12	0.14
11	0	-7	10.61	11.05	4.77
12	0	-7	4.99	3.98	5.49
13	0	-7	6.88	7.39	5.87
14	0	-7	5.83	4.36	6.47
15	0	-7	0.00*	2.30	0.00
16	0	-7	2.26*	1.62	0.13
17	0	-7	3.94	2.93	4.29
1	1	-7	5.15	5.20	4.89
2	1	-7	22.19	20.39	2.50
3	1	-7	12.05	11.06	5.11
4	1	-7	8.35	9.25	7.22
5	1	-7	4.18	5.12	3.48
6	1	-7	11.57	11.56	5.66
7	1	-7	9.44	10.49	5.42
8	1	-7	11.68	11.95	5.01
9	1	-7	8.49	9.22	5.40
10	1	-7	20.22	22.62	2.87
11	1	-7	3.06*	3.45	0.19
12	1	-7	8.32	9.68	5.55
13	1	-7	0.00*	0.71	0.00
14	1	-7	2.87*	1.71	0.21
15	1	-7	3.14*	1.39	0.35
16	1	-7	4.21	3.11	5.39
1	2	-7	10.36	11.31	6.67
2	2	-7	9.47	9.58	5.41
3	2	-7	3.64*	4.55	0.26
4	2	-7	6.99	7.44	5.06
5	2	-7	15.03	15.49	4.65
6	2	-7	4.93	4.90	3.73
7	2	-7	19.50	19.68	2.77
8	2	-7	8.11	9.06	5.28
9	2	-7	18.31	19.51	3.17
10	2	-7	4.32	4.55	3.02
11	2	-7	6.15	6.40	4.59
12	2	-7	2.79*	4.33	0.13
13	2	-7	3.97	3.99	2.63
14	2	-7	2.24*	1.76	0.14
15	2	-7	2.22*	1.30	0.16
16	2	-7	2.14*	1.17	0.13
1	3	-7	6.54	6.51	5.01
2	3	-7	6.24	5.78	5.50
3	3	-7	4.68	5.00	3.36
4	3	-7	22.33	23.75	2.47
5	3	-7	5.42	5.08	4.48
6	3	-7	13.44	14.04	4.46
7	3	-7	6.92	7.20	4.61
8	3	-7	8.05	8.77	4.96
9	3	-7	5.72	5.40	4.26
10	3	-7	7.79	7.99	7.27
11	3	-7	4.33	4.96	2.48
12	3	-7	2.31*	2.14	0.12
13	3	-7	1.74*	1.53	0.07
14	3	-7	2.01*	0.91	0.11
15	3	-7	3.61	2.94	3.01
1	4	-7	16.23	19.12	3.60
2	4	-7	8.22	8.17	5.08
3	4	-7	3.31*	3.99	0.19
4	4	-7	4.00*	4.47	0.22
5	4	-7	10.46	10.57	4.74
6	4	-7	5.22	4.09	4.60
7	4	-7	7.06	8.51	3.94
8	4	-7	5.88	6.55	3.73
9	4	-7	6.93	6.44	7.15

H	K	L	FO	FC	WEIGHT
10	4	-7	3.51*	2.74	0.25
11	4	-7	2.76*	4.07	0.17
12	4	-7	4.62	4.66	3.79
13	4	-7	2.43*	1.98	0.17
1	5	-7	5.17	5.68	2.77
2	5	-7	5.78	6.06	4.30
3	5	-7	2.19*	1.81	0.09
4	5	-7	3.85	4.38	2.49
5	5	-7	3.63*	5.41	0.16
6	5	-7	6.35	6.26	4.87
7	5	-7	1.91*	2.67	0.06
8	5	-7	3.52*	4.21	0.22
9	5	-7	4.73	5.07	2.85
10	5	-7	5.06	4.36	3.87
11	5	-7	2.42*	0.81	0.18
1	6	-7	7.05	8.28	4.49
2	6	-7	4.05	4.23	2.62
3	6	-7	4.47	4.88	2.34
4	6	-7	3.67*	5.49	0.22
5	6	-7	6.23	7.88	3.83
6	6	-7	0.28*	0.39	0.00
1	0	-6	9.81	9.74	8.05
2	0	-6	7.68	7.51	7.99
3	0	-6	6.35	4.74	6.06
4	0	-6	21.40	22.41	2.75
5	0	-6	14.92	14.99	4.70
6	0	-6	6.24	4.98	5.46
7	0	-6	19.99	18.79	2.90
8	0	-6	12.15	12.51	5.15
9	0	-6	6.19	7.81	4.95
10	0	-6	5.95	5.71	5.69
11	0	-6	3.38*	3.32	0.28
12	0	-6	2.96*	3.00	0.20
13	0	-6	25.76	28.12	1.81
14	0	-6	6.77	6.67	5.83
15	0	-6	3.83	3.25	3.03
16	0	-6	0.00*	0.96	0.00
17	0	-6	4.45	3.59	5.35
18	0	-6	0.00*	0.89	0.00
1	1	-6	2.81*	1.65	0.27
2	1	-6	11.30	11.30	5.82
3	1	-6	14.86	13.83	4.81
4	1	-6	6.42	6.07	6.08
5	1	-6	16.21	16.45	3.88
6	1	-6	17.77	16.31	3.66
7	1	-6	14.89	13.35	4.59
8	1	-6	3.64	4.35	2.86
9	1	-6	12.59	14.38	6.06
10	1	-6	7.53	8.26	5.67
11	1	-6	8.60	9.77	5.07
12	1	-6	15.54	17.02	4.11
13	1	-6	6.10	6.71	4.66
14	1	-6	2.47*	0.93	0.16
15	1	-6	5.53	6.45	4.10
16	1	-6	3.15*	3.47	0.21
17	1	-6	3.85	2.61	4.51
18	1	-6	3.40	3.15	3.29
1	2	-6	22.79	20.86	2.42
2	2	-6	5.86	4.96	6.63
3	2	-6	2.78*	2.97	0.23
4	2	-6	6.15	5.30	5.11
5	2	-6	4.20	4.80	2.71
6	2	-6	13.46	14.86	4.60
7	2	-6	0.59*	2.08	0.01
8	2	-6	13.90	14.49	4.53
9	2	-6	2.85*	2.22	0.18
10	2	-6	16.48	17.14	3.78
11	2	-6	9.78	9.67	5.42
12	2	-6	3.28*	2.41	0.28
13	2	-6	9.99	9.82	6.27
14	2	-6	4.55	4.70	2.68
15	2	-6	4.72	2.84	5.31
16	2	-6	5.10	4.16	4.05
17	2	-6	3.51	0.95	4.24
1	3	-6	11.95	9.96	5.49
2	3	-6	14.28	12.56	4.52
3	3	-6	4.40	3.93	4.06
4	3	-6	4.54	3.70	4.05
5	3	-6	6.38	5.26	5.54
6	3	-6	5.44	5.29	4.54
7	3	-6	10.67	9.97	5.33
8	3	-6	0.00*	2.24	0.00
9	3	-6	8.02	7.63	5.27
10	3	-6	7.88	6.89	6.50
11	3	-6	6.29	7.09	4.11
12	3	-6	8.98	9.15	5.66
13	3	-6	2.57*	0.51	0.17
14	3	-6	5.78	4.99	4.45
15	3	-6	2.25*	1.82	0.12
16	3	-6	2.90*	1.02	0.27
1	4	-6	12.88	12.46	4.60
2	4	-6	14.90	15.79	4.27
3	4	-6	3.08*	4.26	0.17
4	4	-6	3.44*	5.18	0.20
5	4	-6	3.54*	2.18	0.28
6	4	-6	11.82	12.29	4.52
7	4	-6	7.47	7.95	4.38
8	4	-6	7.88	7.79	5.57
9	4	-6	6.97	6.89	4.47
10	4	-6	6.41	6.83	4.09
11	4	-6	4.08	4.32	2.69
12	4	-6	5.18	4.56	4.68
13	4	-6	6.54	6.87	5.15
14	4	-6	4.21	2.68	4.08
15	4	-6	2.53*	0.54	0.23
1	5	-6	6.32	5.99	4.82
2	5	-6	7.37	8.17	4.70
3	5	-6	15.13	16.31	3.79
4	5	-6	7.35	8.33	3.69
5	5	-6	13.76	14.80	3.83
6	5	-6	13.02	14.54	4.16
7	5	-6	6.67	6.67	4.90
8	5	-6	4.09	3.59	3.35
9	5	-6	4.57	4.31	2.36
10	5	-6	2.31*	2.66	0.10
11	5	-6	3.87	2.67	2.80

H	K	L	FO	FC	WEIGHT
12	5	-6	2.52*	2.79	0.11
13	5	-6	2.83*	2.31	0.23
1	6	-6	5.46	5.69	3.02
2	6	-6	4.04	3.73	2.27
3	6	-6	4.15	3.76	2.40
4	6	-6	2.86*	0.28	0.14
5	6	-6	1.58*	1.40	0.04
6	6	-6	4.86	6.41	3.79
7	6	-6	3.87*	4.58	0.26
8	6	-6	4.44	2.83	3.68
9	6	-6	3.50*	3.39	0.22
1	7	-6	4.66	5.50	2.80
2	7	-6	3.19*	4.22	0.15
1	0	-5	14.38	13.95	5.15
2	0	-5	24.89	23.79	2.14
3	0	-5	26.60	28.39	1.96
4	0	-5	2.80*	3.07	0.40
5	0	-5	18.05	17.95	3.40
6	0	-5	15.88	15.12	4.43
7	0	-5	5.08	5.20	5.71
8	0	-5	5.35	5.39	5.93
9	0	-5	10.28	9.68	7.36
10	0	-5	21.64	20.70	2.57
11	0	-5	3.82	3.18	3.80
12	0	-5	8.33	8.76	6.00
13	0	-5	5.51	5.34	4.77
14	0	-5	11.23	12.20	5.21
15	0	-5	6.71	5.90	5.00
16	0	-5	6.42	7.13	4.75
17	0	-5	2.20*	2.06	0.13
18	0	-5	2.67*	2.36	0.20
19	0	-5	3.39*	2.16	0.34
1	1	-5	2.27*	3.79	0.24
2	1	-5	14.33	13.91	5.12
3	1	-5	18.92	17.68	3.58
4	1	-5	18.93	16.77	3.39
5	1	-5	8.30	7.13	8.10
6	1	-5	21.59	18.83	2.67
7	1	-5	13.05	12.98	5.40
8	1	-5	13.85	14.46	4.91
9	1	-5	2.48*	1.38	0.21
10	1	-5	6.66	6.61	6.85
11	1	-5	3.94	4.86	2.76
12	1	-5	13.55	15.44	4.94
13	1	-5	5.29	5.64	4.44
14	1	-5	8.20	7.76	7.54
15	1	-5	3.63	1.40	3.65
16	1	-5	7.49	8.99	4.65
17	1	-5	4.47	2.67	4.96
18	1	-5	3.20*	1.90	0.28
19	1	-5	0.00*	0.98	0.00
1	2	-5	13.31	11.15	5.55
2	2	-5	17.64	16.44	3.74
3	2	-5	19.51	17.08	3.21
4	2	-5	28.50	26.50	1.66
5	2	-5	16.09	14.45	4.21
6	2	-5	3.92	4.32	4.45
7	2	-5	14.80	13.30	4.39
8	2	-5	17.04	14.31	3.74
9	2	-5	3.10*	2.25	0.26
10	2	-5	2.73*	3.62	0.17
11	2	-5	16.41	16.60	3.89
12	2	-5	6.67	7.24	5.60
13	2	-5	6.54	6.91	4.49
14	2	-5	12.12	13.19	4.60
15	2	-5	9.54	9.80	5.65
16	2	-5	5.71	5.61	4.25
17	2	-5	0.79*	1.85	0.01
18	2	-5	3.33*	2.35	0.32
19	2	-5	1.51*	0.73	0.07
1	3	-5	17.93	17.18	3.51
2	3	-5	7.23	6.67	7.09
3	3	-5	10.90	10.52	5.83
4	3	-5	6.08	5.78	5.76
5	3	-5	8.78	7.34	5.28
6	3	-5	7.97	8.98	6.78
7	3	-5	10.13	9.68	5.47
8	3	-5	13.84	15.19	4.62
9	3	-5	7.33	6.98	5.75
10	3	-5	7.12	7.24	4.72
11	3	-5	6.46	6.63	3.61
12	3	-5	5.06	4.89	3.28
13	3	-5	6.60	7.25	3.75
14	3	-5	6.52	5.95	5.66
15	3	-5	4.83	4.96	2.94
16	3	-5	3.30*	2.82	0.28
17	3	-5	3.51	1.29	3.13
18	3	-5	1.79*	1.10	0.10
1	4	-5	5.22	3.61	3.27
2	4	-5	12.17	11.77	4.36
3	4	-5	12.42	13.36	4.62
4	4	-5	4.22	3.59	3.07
5	4	-5	5.59	6.00	3.74
6	4	-5	3.61*	0.84	0.28
7	4	-5	3.39*	0.81	0.29
8	4	-5	9.33	10.58	5.12
9	4	-5	12.23	12.53	4.45
10	4	-5	5.79	6.09	3.83
11	4	-5	5.97	5.01	5.33
12	4	-5	7.08	7.63	3.96
13	4	-5	7.89	6.71	5.47
14	4	-5	5.12	3.95	4.67
15	4	-5	0.66*	1.65	0.01
16	4	-5	2.10*	1.71	0.12
1	5	-5	4.74	4.68	2.52
2	5	-5	7.19	7.91	4.06
3	5	-5	7.72	7.97	4.23
4	5	-5	18.61	20.50	3.04
5	5	-5	4.38	3.39	2.74
6	5	-5	5.33	5.71	2.66
7	5	-5	5.88	4.43	3.82
8	5	-5	4.97	6.44	2.31
9	5	-5	4.50	3.66	2.61
10	5	-5	3.06*	1.76	0.23
11	5	-5	4.82	3.50	3.50
12	5	-5	3.59*	2.76	0.26

H	K	I	FO	FC	WEIGHT
13	5	-5	3.00*	0.50	0.21
14	5	-5	2.05*	1.39	0.12
1	6	-5	0.00*	2.93	0.00
2	6	-5	2.08*	0.98	0.06
3	6	-5	8.10	8.29	4.87
4	6	-5	9.17	9.94	4.22
5	6	-5	8.20	10.74	3.97
6	6	-5	3.97*	3.87	0.24
7	6	-5	6.99	6.47	3.57
8	6	-5	3.15*	4.40	0.15
9	6	-5	2.94*	0.37	0.19
10	6	-5	3.34*	3.50	0.21
11	6	-5	4.69	4.85	2.65
1	7	-5	2.26*	2.21	0.07
2	7	-5	6.50	7.64	3.65
3	7	-5	4.01*	2.83	0.24
4	7	-5	5.71	6.04	3.27
5	7	-5	1.92*	3.85	0.05
6	7	-5	2.36*	1.70	0.09
7	7	-5	1.87*	0.70	0.07
1	0	-4	29.72	27.09	1.58
2	0	-4	54.80	57.33	0.49
3	0	-4	22.97	24.56	2.51
4	0	-4	42.23	40.70	0.80
5	0	-4	8.01	8.18	10.14
6	0	-4	19.44	20.09	3.28
7	0	-4	19.74	17.04	3.17
8	0	-4	15.42	16.23	4.67
9	0	-4	13.59	12.51	5.20
10	0	-4	4.72	4.72	6.02
11	0	-4	5.86	5.63	8.37
12	0	-4	10.41	9.76	5.89
13	0	-4	3.18*	3.79	0.29
14	0	-4	4.73	4.47	4.98
15	0	-4	4.69	4.43	3.11
16	0	-4	6.83	7.73	4.44
17	0	-4	6.73	6.55	4.92
18	0	-4	0.00*	1.25	0.00
19	0	-4	2.87*	1.51	0.23
20	0	-4	3.79	1.96	3.71
1	1	-4	7.60	6.39	9.25
2	1	-4	46.92	42.98	0.66
3	1	-4	41.69	38.12	0.83
4	1	-4	37.62	36.12	1.01
5	1	-4	24.93	22.44	2.16
6	1	-4	38.67	36.41	0.96
7	1	-4	26.79	26.27	1.88
8	1	-4	17.57	16.23	3.74
9	1	-4	16.15	17.48	4.11
10	1	-4	27.68	27.64	1.73
11	1	-4	9.77	8.70	7.34
12	1	-4	7.24	6.42	6.13
13	1	-4	5.93	6.13	5.72
14	1	-4	7.72	8.58	5.44
15	1	-4	6.00	6.25	5.66
16	1	-4	4.61	4.82	2.77
17	1	-4	7.25	8.17	5.19
18	1	-4	4.33	3.04	4.72
19	1	-4	4.39	4.74	4.09
20	1	-4	4.01	3.96	3.37
1	2	-4	43.40	39.39	0.77
2	2	-4	39.53	34.75	0.92
3	2	-4	21.72	19.99	2.71
4	2	-4	9.44	8.55	7.64
5	2	-4	35.28	30.64	1.14
6	2	-4	31.98	27.46	1.35
7	2	-4	16.82	15.82	4.08
8	2	-4	22.65	21.31	2.47
9	2	-4	8.74	9.55	6.54
10	2	-4	3.71	2.75	3.51
11	2	-4	10.53	9.71	5.78
12	2	-4	5.94	5.19	5.07
13	2	-4	6.55	5.51	4.99
14	2	-4	6.63	6.44	4.63
15	2	-4	6.02	7.31	3.46
16	2	-4	6.35	5.75	5.53
17	2	-4	7.03	6.90	5.11
18	2	-4	3.84	3.25	3.23
19	2	-4	3.58*	3.97	0.24
1	3	-4	17.10	15.10	3.87
2	3	-4	19.64	20.82	3.21
3	3	-4	12.79	12.96	5.34
4	3	-4	27.81	28.02	1.73
5	3	-4	21.05	20.42	2.78
6	3	-4	13.34	13.53	4.88
7	3	-4	14.44	12.63	4.54
8	3	-4	6.02	4.76	4.53
9	3	-4	9.94	11.01	6.03
10	3	-4	5.28	5.28	4.75
11	3	-4	13.80	14.76	4.44
12	3	-4	5.41	5.11	4.64
13	3	-4	6.55	6.16	4.51
14	3	-4	9.78	10.38	5.20
15	3	-4	7.19	8.16	3.99
16	3	-4	10.31	9.34	5.63
17	3	-4	5.18	5.33	3.39
18	3	-4	3.81	2.94	3.53
19	3	-4	5.06	4.50	4.21
1	4	-4	6.25	5.75	5.65
2	4	-4	18.09	19.00	3.26
3	4	-4	8.34	7.64	5.76
4	4	-4	16.26	15.74	3.67
5	4	-4	3.09*	1.84	0.26
6	4	-4	13.43	13.06	4.41
7	4	-4	12.01	12.18	4.89
8	4	-4	6.12	6.20	4.07
9	4	-4	13.06	13.02	4.34
10	4	-4	14.25	14.94	4.16
11	4	-4	7.11	7.39	4.80
12	4	-4	4.33	2.98	2.58
13	4	-4	13.49	12.52	4.32
14	4	-4	10.24	10.18	4.72
15	4	-4	6.68	6.41	5.06
16	4	-4	4.26	2.30	3.92
17	4	-4	3.48	1.67	4.27
1	5	-4	11.97	15.25	4.27

H	K	I	FO	FC	WEIGHT
2	5	-4	6.56	8.31	3.58
3	5	-4	3.76*	4.18	0.20
4	5	-4	4.45	4.69	2.55
5	5	-4	4.82	4.49	3.12
6	5	-4	5.40	6.38	2.45
7	5	-4	10.28	9.41	4.66
8	5	-4	3.53*	4.09	0.22
9	5	-4	10.66	11.25	4.80
10	5	-4	16.33	17.38	3.40
11	5	-4	4.76	4.38	3.39
12	5	-4	7.75	8.13	4.30
13	5	-4	3.08*	1.66	0.16
14	5	-4	4.18	2.64	3.14
15	5	-4	3.86	2.77	3.08
1	6	-4	15.27	17.59	3.49
2	6	-4	10.23	11.14	3.38
3	6	-4	8.21	8.35	4.51
4	6	-4	3.98*	3.37	0.21
5	6	-4	7.14	7.35	3.60
6	6	-4	9.80	9.44	4.32
7	6	-4	12.15	12.82	4.28
8	6	-4	4.60	3.99	2.35
9	6	-4	6.68	6.89	3.83
10	6	-4	3.50*	3.99	0.18
11	6	-4	0.00*	2.63	0.00
12	6	-4	3.08*	2.92	0.19
13	6	-4	2.91*	2.59	0.17
1	7	-4	4.97	4.96	2.39
2	7	-4	4.37*	6.32	0.19
3	7	-4	5.47	3.15	4.25
4	7	-4	8.22	10.59	3.81
5	7	-4	5.91	4.43	4.05
6	7	-4	3.96*	3.52	0.18
7	7	-4	5.33	5.75	2.62
8	7	-4	4.01	4.35	2.34
9	7	-4	3.51*	2.98	0.20
1	0	-3	13.04	13.59	6.53
2	0	-3	38.02	32.90	1.00
3	0	-3	22.52	24.19	2.62
4	0	-3	27.02	25.53	1.91
5	0	-3	24.82	25.70	2.20
6	0	-3	13.56	14.61	5.71
7	0	-3	24.29	25.24	2.30
8	0	-3	25.73	23.71	2.06
9	0	-3	15.40	15.47	4.64
10	0	-3	2.91	0.59	4.85
11	0	-3	19.74	19.95	3.17
12	0	-3	0.00*	1.65	0.00
13	0	-3	15.77	15.87	4.01
14	0	-3	11.27	9.70	5.47
15	0	-3	2.95*	1.96	0.28
16	0	-3	9.61	10.06	5.37
17	0	-3	2.33*	1.15	0.15
18	0	-3	4.77	4.39	4.07
19	0	-3	5.27	5.60	3.93
20	0	-3	5.73	5.74	4.69
21	0	-3	3.50	2.01	3.48
1	1	-3	11.69	12.20	7.67

H	K	L	FO	FC	WEIGHT
2	1	-3	47.01	43.39	0.66
3	1	-3	21.02	23.26	3.00
4	1	-3	14.61	16.12	5.46
5	1	-3	40.41	37.58	0.89
6	1	-3	37.65	36.40	1.01
7	1	-3	21.84	21.94	2.78
8	1	-3	29.54	27.70	1.59
9	1	-3	17.67	17.10	3.80
10	1	-3	4.29	4.30	5.68
11	1	-3	19.45	18.09	3.21
12	1	-3	8.97	8.54	7.15
13	1	-3	6.02	7.18	4.88
14	1	-3	5.64	5.67	5.48
15	1	-3	3.61*	4.36	0.25
16	1	-3	0.00*	0.36	0.00
17	1	-3	6.41	7.37	4.12
18	1	-3	7.89	8.24	4.77
19	1	-3	4.60	4.25	3.33
20	1	-3	5.56	5.34	4.65
21	1	-3	1.20*	1.65	0.05
1	2	-3	28.16	26.22	1.75
2	2	-3	22.08	19.81	2.73
3	2	-3	30.69	29.04	1.47
4	2	-3	38.01	33.93	0.99
5	2	-3	35.09	33.51	1.13
6	2	-3	34.98	34.68	1.17
7	2	-3	24.76	23.62	2.15
8	2	-3	22.55	19.58	2.55
9	2	-3	23.91	22.63	2.33
10	2	-3	13.93	13.84	5.16
11	2	-3	5.51	5.38	5.36
12	2	-3	3.00*	2.13	0.30
13	2	-3	11.41	13.05	4.84
14	2	-3	11.01	10.45	5.98
15	2	-3	2.19*	2.72	0.12
16	2	-3	1.26*	1.16	0.04
17	2	-3	6.63	6.89	4.20
18	2	-3	8.85	9.37	4.60
19	2	-3	7.13	7.99	4.27
20	2	-3	4.86	3.86	5.17
1	3	-3	30.21	30.73	1.51
2	3	-3	34.80	32.25	1.16
3	3	-3	28.94	25.77	1.61
4	3	-3	32.96	28.76	1.29
5	3	-3	17.78	13.94	3.72
6	3	-3	21.69	18.99	2.72
7	3	-3	16.53	14.96	4.05
8	3	-3	21.08	18.71	2.66
9	3	-3	24.12	22.48	2.19
10	3	-3	18.29	16.86	3.32
11	3	-3	11.32	12.03	5.05
12	3	-3	7.84	8.54	5.32
13	3	-3	6.09	6.19	4.56
14	3	-3	12.10	12.99	4.43
15	3	-3	5.77	5.18	5.18
16	3	-3	7.55	7.88	5.29
17	3	-3	12.08	11.39	4.30
18	3	-3	9.86	9.69	5.39

H	K	L	FO	FC	WEIGHT
19	3	-3	2.16*	1.77	0.12
1	4	-3	23.77	21.45	2.20
2	4	-3	24.86	23.53	2.09
3	4	-3	16.92	15.95	3.70
4	4	-3	9.18	8.23	5.43
5	4	-3	8.48	9.36	7.14
6	4	-3	4.04	3.95	3.27
7	4	-3	7.30	6.92	4.73
8	4	-3	8.21	8.37	5.05
9	4	-3	12.21	12.96	5.02
10	4	-3	11.68	11.56	4.90
11	4	-3	4.76	4.13	2.58
12	4	-3	6.48	7.05	3.51
13	4	-3	9.45	9.48	5.17
14	4	-3	10.52	10.32	4.66
15	4	-3	2.55*	0.53	0.13
16	4	-3	4.52	3.36	3.94
17	4	-3	4.30	3.53	3.23
18	4	-3	3.33*	2.25	0.28
1	5	-3	13.88	13.27	4.01
2	5	-3	10.74	10.89	4.57
3	5	-3	16.47	17.57	3.48
4	5	-3	14.71	15.85	3.91
5	5	-3	19.38	21.29	2.72
6	5	-3	7.37	9.15	3.84
7	5	-3	11.06	11.37	4.57
8	5	-3	11.27	11.04	4.68
9	5	-3	15.50	15.47	3.65
10	5	-3	3.92*	3.76	0.19
11	5	-3	12.21	12.17	3.80
12	5	-3	10.85	11.05	4.65
13	5	-3	6.47	6.52	3.61
14	5	-3	5.02	3.27	4.51
15	5	-3	3.68	2.27	3.14
16	5	-3	3.44*	2.70	0.24
1	6	-3	10.06	11.23	3.51
2	6	-3	8.57	8.94	4.03
3	6	-3	14.53	15.43	3.82
4	6	-3	8.73	8.49	4.32
5	6	-3	10.89	11.30	4.44
6	6	-3	1.71*	2.27	0.03
7	6	-3	3.44*	3.40	0.16
8	6	-3	2.91*	2.81	0.12
9	6	-3	0.00*	1.28	0.00
10	6	-3	10.16	10.40	4.70
11	6	-3	4.27	3.50	2.49
12	6	-3	3.67*	4.68	0.20
13	6	-3	7.76	7.86	4.86
14	6	-3	3.41*	3.36	0.18
1	7	-3	2.26*	3.83	0.05
2	7	-3	4.42	5.03	1.91
3	7	-3	7.07	6.95	3.97
4	7	-3	6.50	6.07	2.95
5	7	-3	2.51*	4.97	0.07
6	7	-3	2.44*	3.31	0.08
7	7	-3	5.01	4.41	2.49
8	7	-3	5.81	5.87	3.57
9	7	-3	4.42	3.30	2.61
10	7	-3	4.30	3.22	2.37
1	8	-3	5.89	7.08	2.74
2	8	-3	2.49*	1.74	0.07
3	8	-3	3.47*	2.21	0.15
1	0	-2	10.42	11.87	7.57
2	0	-2	25.02	24.66	2.17
3	0	-2	19.75	22.77	3.40
4	0	-2	34.40	33.89	1.22
5	0	-2	44.42	46.03	0.74
6	0	-2	45.76	46.14	0.69
7	0	-2	40.36	42.66	0.89
8	0	-2	15.76	14.89	4.71
9	0	-2	17.54	17.90	3.94
10	0	-2	8.71	9.00	8.79
11	0	-2	2.18*	0.06	0.28
12	0	-2	11.91	11.28	6.03
13	0	-2	9.88	10.26	6.10
14	0	-2	13.75	14.32	4.67
15	0	-2	4.59	5.82	4.29
16	0	-2	2.26*	1.84	0.13
17	0	-2	6.23	6.58	4.81
18	0	-2	4.29	2.90	4.59
19	0	-2	2.25*	3.41	0.11
20	0	-2	2.50*	2.15	0.17
21	0	-2	5.92	5.59	5.21
1	1	-2	47.23	45.28	0.65
2	1	-2	71.13	68.38	0.29
3	1	-2	35.62	32.56	1.13
4	1	-2	47.34	45.63	0.65
5	1	-2	16.63	17.07	4.55
6	1	-2	8.68	8.25	10.61
7	1	-2	18.61	16.23	3.68
8	1	-2	20.27	19.98	3.18
9	1	-2	12.34	12.31	6.55
10	1	-2	10.51	12.30	7.29
11	1	-2	12.94	14.24	6.07
12	1	-2	15.20	15.15	4.37
13	1	-2	12.60	12.04	5.26
14	1	-2	7.35	8.97	5.67
15	1	-2	5.81	7.15	4.65
16	1	-2	3.60*	4.58	0.24
17	1	-2	5.68	5.40	4.35
18	1	-2	8.00	7.43	5.44
19	1	-2	0.00*	0.58	0.00
20	1	-2	2.97*	2.49	0.19
21	1	-2	3.78	2.90	3.69
1	2	-2	7.81	8.61	10.32
2	2	-2	23.87	22.40	2.35
3	2	-2	40.59	37.82	0.88
4	2	-2	33.88	32.02	1.24
5	2	-2	35.80	32.23	1.11
6	2	-2	30.54	27.45	1.49
7	2	-2	27.03	25.16	1.87
8	2	-2	7.42	7.32	9.06
9	2	-2	11.35	11.94	6.33
10	2	-2	7.99	8.14	7.65
11	2	-2	9.11	9.23	7.25
12	2	-2	8.92	9.83	6.10

H	K	L	FO	FC	WEIGHT
13	2	-2	6.60	6.39	6.67
14	2	-2	5.95	7.43	3.90
15	2	-2	6.67	7.24	5.60
16	2	-2	6.35	6.81	4.30
17	2	-2	4.30	3.76	3.59
18	2	-2	4.93	5.92	2.56
19	2	-2	2.75*	0.73	0.16
20	2	-2	7.15	7.74	4.49
21	2	-2	4.49	4.18	3.56
1	3	-2	10.36	9.21	6.85
2	3	-2	33.90	35.62	1.21
3	3	-2	30.98	30.68	1.45
4	3	-2	44.10	39.62	0.74
5	3	-2	29.71	27.77	1.57
6	3	-2	30.59	27.34	1.46
7	3	-2	12.05	11.07	6.38
8	3	-2	4.82	3.72	4.71
9	3	-2	20.60	18.38	2.87
10	3	-2	27.90	25.37	1.70
11	3	-2	12.85	13.12	5.09
12	3	-2	7.10	7.25	6.11
13	3	-2	18.08	19.52	3.18
14	3	-2	3.43*	3.28	0.22
15	3	-2	12.07	12.10	4.38
16	3	-2	3.80	1.95	2.97
17	3	-2	4.88	4.24	4.22
18	3	-2	1.91*	2.64	0.07
19	3	-2	4.04	4.35	2.53
20	3	-2	3.23*	3.96	0.23
1	4	-2	7.59	9.47	6.17
2	4	-2	16.51	16.74	3.96
3	4	-2	14.29	14.90	4.57
4	4	-2	22.72	21.04	2.39
5	4	-2	9.54	9.13	6.02
6	4	-2	15.03	14.15	4.35
7	4	-2	6.91	5.22	5.55
8	4	-2	17.03	14.33	3.76
9	4	-2	17.31	15.65	3.32
10	4	-2	5.32	4.97	4.13
11	4	-2	9.30	9.91	5.46
12	4	-2	16.22	16.28	3.58
13	4	-2	7.21	6.56	5.49
14	4	-2	16.98	16.99	3.28
15	4	-2	8.30	8.34	4.90
16	4	-2	9.28	8.88	5.69
17	4	-2	5.55	4.93	4.32
18	4	-2	2.49*	1.73	0.15
19	4	-2	0.66*	1.69	0.01
1	5	-2	4.14	5.65	2.30
2	5	-2	8.72	9.11	4.29
3	5	-2	6.94	7.07	3.31
4	5	-2	4.41	3.08	3.12
5	5	-2	9.67	10.38	4.51
6	5	-2	18.77	18.78	2.92
7	5	-2	13.08	14.24	4.48
8	5	-2	5.77	6.61	3.54
9	5	-2	7.12	6.94	3.72
10	5	-2	6.55	7.17	4.00
11	5	-2	0.00*	2.34	0.00
12	5	-2	6.51	6.39	4.81
13	5	-2	6.29	6.35	3.98
14	5	-2	6.52	6.91	4.17
15	5	-2	0.52*	2.22	0.00
16	5	-2	5.58	4.01	4.00
17	5	-2	3.66	3.36	3.01
1	6	-2	7.08	9.66	2.91
2	6	-2	4.77	4.05	2.29
3	6	-2	9.44	11.75	3.12
4	6	-2	7.02	8.43	2.52
5	6	-2	3.97*	2.93	0.20
6	6	-2	13.03	15.19	3.65
7	6	-2	7.59	8.92	3.21
8	6	-2	5.76	5.15	2.52
9	6	-2	2.95*	2.28	0.14
10	6	-2	8.30	9.22	4.39
11	6	-2	5.82	6.09	2.55
12	6	-2	5.59	5.03	3.65
13	6	-2	5.40	4.63	3.76
14	6	-2	2.64*	3.09	0.15
15	6	-2	6.98	6.57	5.84
1	7	-2	4.72	4.93	2.13
2	7	-2	3.57*	6.16	0.13
3	7	-2	3.51*	3.73	0.12
4	7	-2	9.82	12.03	3.72
5	7	-2	10.02	10.73	4.36
6	7	-2	4.47	2.06	2.28
7	7	-2	0.00*	1.37	0.00
8	7	-2	4.09*	4.23	0.18
9	7	-2	7.77	8.10	5.25
10	7	-2	6.38	4.01	3.85
11	7	-2	0.00*	0.94	0.00
1	8	-2	4.70*	6.40	0.15
2	8	-2	4.29*	2.91	0.13
3	8	-2	4.21*	4.87	0.12
4	8	-2	4.02*	4.60	0.14
5	8	-2	3.06*	1.26	0.10
1	0	-1	6.54	5.79	14.91
2	0	-1	51.15	53.70	0.53
3	0	-1	52.04	52.85	0.53
4	0	-1	70.88	74.78	0.29
5	0	-1	48.03	51.20	0.63
6	0	-1	24.78	25.73	2.27
7	0	-1	12.96	12.77	6.64
8	0	-1	40.81	41.53	0.86
9	0	-1	16.57	17.86	4.33
10	0	-1	44.84	44.73	0.71
11	0	-1	4.35	3.32	5.47
12	0	-1	8.35	9.05	8.58
13	0	-1	8.79	7.94	7.00
14	0	-1	30.19	30.30	1.45
15	0	-1	0.93*	0.76	0.02
16	0	-1	8.81	8.48	4.49
17	0	-1	0.00*	1.10	0.00
18	0	-1	3.11*	0.86	0.18
19	0	-1	4.52	4.91	2.38
20	0	-1	2.82*	1.67	0.15

H	K	L	FO	FC	WEIGHT
21	0	-1	7.95	6.66	5.08
1	1	-1	25.85	21.88	2.02
2	1	-1	47.86	44.52	0.63
3	1	-1	26.19	24.95	1.99
4	1	-1	61.29	57.17	0.39
5	1	-1	27.93	29.19	1.80
6	1	-1	20.16	17.87	3.28
7	1	-1	14.06	12.82	5.71
8	1	-1	14.99	15.19	5.27
9	1	-1	30.87	32.23	1.45
10	1	-1	3.65	6.16	5.06
11	1	-1	9.73	9.27	7.29
12	1	-1	4.55	3.42	6.15
13	1	-1	9.47	9.69	6.69
14	1	-1	12.94	13.01	5.19
15	1	-1	9.50	9.00	7.02
16	1	-1	5.98	6.20	3.21
17	1	-1	7.29	6.41	5.92
18	1	-1	4.06	3.23	2.44
19	1	-1	3.99*	3.84	0.22
20	1	-1	4.05	2.81	2.56
21	1	-1	5.45	4.16	4.33
1	2	-1	58.05	51.43	0.44
2	2	-1	24.90	20.22	2.18
3	2	-1	9.96	8.29	8.61
4	2	-1	53.44	49.76	0.51
5	2	-1	8.70	8.15	10.73
6	2	-1	21.36	23.03	2.91
7	2	-1	3.32	3.67	5.54
8	2	-1	16.62	15.40	4.26
9	2	-1	23.10	22.43	2.46
10	2	-1	8.38	7.80	8.13
11	2	-1	14.15	12.69	5.03
12	2	-1	5.78	6.96	6.60
13	2	-1	8.19	8.53	5.65
14	2	-1	5.16	4.70	4.87
15	2	-1	7.46	6.93	5.13
16	2	-1	5.08	4.43	3.15
17	2	-1	6.70	5.70	4.64
18	2	-1	9.85	9.20	5.34
19	2	-1	2.27*	2.88	0.07
20	2	-1	4.87	2.68	4.32
21	2	-1	5.09	3.79	3.70
1	3	-1	16.87	15.11	4.02
2	3	-1	5.14	4.96	6.70
3	3	-1	40.05	37.20	0.89
4	3	-1	17.51	16.25	3.89
5	3	-1	37.71	35.58	1.00
6	3	-1	3.54	1.83	4.91
7	3	-1	12.47	10.64	6.04
8	3	-1	3.69	3.00	4.13
9	3	-1	6.04	6.40	6.13
10	3	-1	5.21	3.73	5.65
11	3	-1	13.37	13.76	4.85
12	3	-1	15.06	13.85	4.27
13	3	-1	2.71*	1.79	0.17
14	3	-1	9.36	8.50	5.44
15	3	-1	1.19*	2.41	0.02
16	3	-1	5.30	5.12	2.68
17	3	-1	10.11	8.79	4.44
18	3	-1	0.58*	1.21	0.01
19	3	-1	4.19	3.02	2.82
20	3	-1	0.00*	1.96	0.00
1	4	-1	8.17	10.21	5.36
2	4	-1	30.30	28.83	1.46
3	4	-1	26.50	22.54	1.85
4	4	-1	9.12	7.39	6.76
5	4	-1	4.40	5.15	4.70
6	4	-1	9.87	9.18	6.28
7	4	-1	10.04	9.40	5.58
8	4	-1	15.17	12.75	4.13
9	4	-1	13.04	12.33	4.64
10	4	-1	7.57	6.98	5.07
11	4	-1	8.39	8.62	4.81
12	4	-1	4.68	2.77	2.73
13	4	-1	19.28	18.02	2.86
14	4	-1	2.75*	1.63	0.10
15	4	-1	6.42	6.99	3.33
16	4	-1	7.53	6.88	4.36
17	4	-1	7.38	7.46	3.93
18	4	-1	6.66	6.50	3.87
19	4	-1	3.76	2.32	2.85
1	5	-1	8.37	8.58	4.04
2	5	-1	13.72	13.52	4.20
3	5	-1	9.85	10.19	4.11
4	5	-1	6.74	7.96	4.07
5	5	-1	9.06	8.74	5.70
6	5	-1	5.81	4.17	4.12
7	5	-1	10.30	8.80	5.17
8	5	-1	3.31*	1.85	0.15
9	5	-1	6.42	5.30	2.97
10	5	-1	16.74	15.48	3.49
11	5	-1	10.29	10.56	3.99
12	5	-1	3.36*	4.12	0.15
13	5	-1	8.69	9.09	4.26
14	5	-1	0.00*	2.91	0.00
15	5	-1	7.57	6.37	4.01
16	5	-1	6.48	4.97	3.71
17	5	-1	4.32	2.89	2.84
1	6	-1	16.17	16.97	3.13
2	6	-1	4.17*	3.85	0.14
3	6	-1	12.68	12.61	3.01
4	6	-1	12.17	10.87	3.57
5	6	-1	22.25	21.72	2.12
6	6	-1	8.24	9.75	3.14
7	6	-1	12.86	9.52	3.69
8	6	-1	20.88	19.69	2.32
9	6	-1	8.90	8.45	3.93
10	6	-1	8.07	6.68	3.66
11	6	-1	8.59	9.26	5.04
12	6	-1	6.05	5.78	3.64
13	6	-1	4.42	3.29	2.16
14	6	-1	4.68	3.12	2.99
15	6	-1	3.02*	2.76	0.18
1	7	-1	13.08	13.04	3.55
2	7	-1	11.36	10.98	3.59

H	K	L	FO	FC	WEIGHT
3	7	-1	6.77	6.82	2.55
4	7	-1	10.90	10.29	3.14
5	7	-1	4.25*	4.66	0.13
6	7	-1	8.12	6.92	3.36
7	7	-1	8.68	7.49	3.27
8	7	-1	4.23*	5.27	0.19
9	7	-1	2.58*	3.45	0.08
10	7	-1	3.03*	0.94	0.14
11	7	-1	6.96	6.68	4.35
12	7	-1	3.94*	2.48	0.22
1	8	-1	5.49	6.44	1.34
2	8	-1	3.20*	4.17	0.06
3	8	-1	3.08*	4.11	0.07
4	8	-1	5.35	3.03	2.06
5	8	-1	2.17*	0.73	0.05
6	8	-1	3.43*	3.91	0.10
1	0	0	6.25	7.33	11.05
2	0	0	43.42	48.58	0.70
3	0	0	10.64	13.28	4.37
4	0	0	68.74	83.66	0.31
5	0	0	43.14	50.85	0.72
6	0	0	7.45	7.47	3.39
7	0	0	0.00*	5.33	0.00
8	0	0	25.65	31.42	2.09
9	0	0	4.41	3.50	5.02
10	0	0	4.37	0.63	4.34
11	0	0	20.69	23.51	2.86
12	0	0	9.49	9.50	5.88
13	0	0	1.47*	0.81	0.07
14	0	0	3.26*	4.14	0.22
15	0	0	3.76	3.23	2.93
16	0	0	1.89*	1.91	0.06
17	0	0	2.73*	3.45	0.17
18	0	0	8.60	8.09	4.76
19	0	0	2.10*	0.38	0.12
20	0	0	0.00*	0.33	0.00
21	0	0	2.59*	2.06	0.16
22	0	0	5.09	3.58	3.92
1	1	0	51.36	46.08	0.52
2	1	0	57.55	51.14	0.43
3	1	0	86.93	82.54	0.20
4	1	0	51.45	52.24	0.55
5	1	0	31.69	31.18	1.42
6	1	0	41.89	43.69	0.83
7	1	0	22.16	24.58	2.70
8	1	0	6.27	6.99	10.76
9	1	0	17.15	18.06	4.08
10	1	0	4.90	5.19	8.12
11	1	0	5.58	6.42	6.11
12	1	0	5.33	4.63	6.48
13	1	0	6.30	6.05	7.72
14	1	0	9.38	9.65	5.59
15	1	0	6.23	6.68	4.39
16	1	0	11.41	11.32	4.86
17	1	0	11.55	11.43	4.28
18	1	0	4.85	5.41	2.32
19	1	0	3.50*	1.37	0.21
20	1	0	2.87*	1.08	0.20
21	1	0	3.65*	3.05	0.27
0	2	0	43.34	35.95	0.76
1	2	0	74.86	63.10	0.26
2	2	0	48.41	39.39	0.62
3	2	0	63.76	55.52	0.36
4	2	0	12.90	11.85	6.56
5	2	0	24.28	25.85	2.28
6	2	0	34.63	32.33	1.19
7	2	0	25.02	25.52	2.17
8	2	0	13.71	15.01	5.58
9	2	0	14.15	14.99	5.45
10	2	0	7.95	7.89	7.72
11	2	0	8.02	7.14	6.31
12	2	0	15.73	17.09	3.91
13	2	0	7.01	8.00	5.78
14	2	0	5.98	7.28	4.40
15	2	0	4.77	4.96	3.32
16	2	0	4.05*	4.76	0.22
17	2	0	6.58	7.32	4.02
18	2	0	4.48	3.60	3.49
19	2	0	5.29	4.56	3.08
20	2	0	6.57	6.08	4.28
21	2	0	3.23*	1.38	0.24
1	3	0	10.42	8.29	7.00
2	3	0	16.03	15.54	4.65
3	3	0	33.03	28.18	1.27
4	3	0	31.13	30.83	1.43
5	3	0	29.23	29.35	1.60
6	3	0	14.77	14.06	4.73
7	3	0	33.61	34.51	1.25
8	3	0	25.59	26.02	1.98
9	3	0	9.59	10.34	6.85
10	3	0	5.70	4.97	4.63
11	3	0	14.32	13.62	4.57
12	3	0	8.36	7.58	5.92
13	3	0	11.13	11.96	4.69
14	3	0	9.45	9.37	5.52
15	3	0	8.17	8.10	4.47
16	3	0	7.46	6.73	4.44
17	3	0	11.50	11.64	4.13
18	3	0	9.71	9.37	5.46
19	3	0	3.16*	1.98	0.16
20	3	0	2.65*	1.74	0.14
0	4	0	73.95	62.63	0.27
1	4	0	41.43	33.29	0.82
2	4	0	22.62	19.53	2.46
3	4	0	13.95	11.57	4.89
4	4	0	6.58	6.50	4.99
5	4	0	12.52	11.50	5.38
6	4	0	13.22	13.70	5.10
7	4	0	11.13	11.18	5.46
8	4	0	10.12	10.04	5.25
9	4	0	14.75	15.65	4.08
10	4	0	10.63	10.78	5.37
11	4	0	11.84	10.91	5.16
12	4	0	8.48	8.36	5.49
13	4	0	10.20	10.63	4.81
14	4	0	7.57	6.05	4.58

H	K	L	FO	FC	WEIGHT
15	4	0	2.30*	4.47	0.06
16	4	0	7.88	8.89	4.01
17	4	0	3.41*	3.91	0.18
18	4	0	5.01	4.58	3.74
19	4	0	7.06	6.35	4.58
1	5	0	17.01	16.00	3.14
2	5	0	10.52	8.89	4.50
3	5	0	18.66	15.74	3.09
4	5	0	5.05	4.62	3.28
5	5	0	11.16	10.20	4.94
6	5	0	5.83	5.29	3.12
7	5	0	10.30	10.24	5.23
8	5	0	16.14	16.12	3.34
9	5	0	14.28	15.29	3.51
10	5	0	20.70	19.93	2.53
11	5	0	16.88	15.89	3.17
12	5	0	5.43	4.65	3.23
13	5	0	5.09	4.66	2.89
14	5	0	8.32	7.58	5.25
15	5	0	5.69	4.83	3.42
16	5	0	6.53	5.65	3.73
17	5	0	0.99*	1.05	0.02
0	6	0	12.82	11.41	2.89
1	6	0	5.63	4.52	2.03
2	6	0	15.16	13.89	3.17
3	6	0	6.15	5.06	2.38
4	6	0	3.35*	5.05	0.11
5	6	0	11.39	11.59	3.74
6	6	0	15.97	15.39	3.02
7	6	0	2.87*	1.52	0.10
8	6	0	17.57	16.81	3.13
9	6	0	12.67	13.41	4.01
10	6	0	10.77	9.45	4.48
11	6	0	2.31*	2.12	0.09
12	6	0	5.01	3.52	2.88
13	6	0	7.45	7.43	4.12
14	6	0	4.33	3.62	2.65
15	6	0	2.57*	3.42	0.10
1	7	0	3.64*	3.55	0.10
2	7	0	6.90	7.05	2.64
3	7	0	6.66	5.88	2.52
4	7	0	12.43	12.61	3.41
5	7	0	14.99	14.59	3.22
6	7	0	1.26*	2.35	0.02
7	7	0	13.54	12.84	3.56
8	7	0	11.26	10.96	4.25
9	7	0	9.20	8.78	4.62
10	7	0	2.32*	0.86	0.07
11	7	0	5.25	5.24	2.78
12	7	0	7.45	6.12	4.03
0	8	0	5.12	5.16	1.52
1	8	0	5.73	4.35	1.79
2	8	0	4.56*	2.50	0.14
3	8	0	0.91*	1.03	0.01
4	8	0	4.49*	2.67	0.17
5	8	0	0.00*	1.23	0.00
6	8	0	3.33*	4.01	0.10
0	0	1	37.60	38.81	0.97
1	0	1	68.40	72.85	0.30
2	0	1	58.62	65.18	0.39
3	0	1	4.82	4.76	12.49
4	0	1	41.54	43.88	0.84
5	0	1	13.39	14.61	6.25
6	0	1	26.52	32.74	1.97
7	0	1	36.32	37.14	1.09
8	0	1	33.67	37.68	1.26
9	0	1	7.02	6.39	8.87
10	0	1	18.99	19.79	3.48
11	0	1	3.73	4.54	4.79
12	0	1	6.00	6.81	8.01
13	0	1	7.24	7.11	6.67
14	0	1	11.84	11.92	5.28
15	0	1	2.65*	1.06	0.20
16	0	1	8.04	9.34	5.28
17	0	1	2.27*	1.25	0.09
18	0	1	12.67	12.51	4.95
19	0	1	2.83*	2.85	0.12
20	0	1	2.57*	1.04	0.13
21	0	1	3.43*	2.10	0.31
0	1	1	14.34	15.09	5.67
1	1	1	23.80	25.35	2.33
2	1	1	66.66	69.99	0.33
3	1	1	135.38	133.31	0.08
4	1	1	119.68	122.82	0.10
5	1	1	26.87	29.24	1.96
6	1	1	34.08	36.57	1.22
7	1	1	32.38	35.53	1.35
8	1	1	23.77	28.05	2.37
9	1	1	20.22	23.19	3.09
10	1	1	16.63	17.90	4.14
11	1	1	15.81	15.02	4.57
12	1	1	7.75	6.97	7.53
13	1	1	5.06	5.43	4.84
14	1	1	5.01	7.10	3.12
15	1	1	5.34	6.51	4.19
16	1	1	6.23	7.40	4.33
17	1	1	8.33	8.42	5.51
18	1	1	4.96	5.31	2.81
19	1	1	0.00*	1.68	0.00
20	1	1	2.05*	1.19	0.11
21	1	1	4.31	3.92	2.76
0	2	1	34.70	36.44	1.18
1	2	1	63.29	67.30	0.37
2	2	1	25.14	24.41	2.18
3	2	1	14.62	15.04	5.51
4	2	1	30.35	31.45	1.53
5	2	1	23.34	24.42	2.45
6	2	1	19.46	20.65	3.39
7	2	1	11.28	11.70	7.56
8	2	1	16.56	16.77	4.18
9	2	1	6.96	8.23	9.78
10	2	1	26.98	27.65	1.81
11	2	1	13.20	13.77	5.34
12	2	1	7.08	7.99	5.42
13	2	1	4.84	3.80	4.51
14	2	1	6.90	5.06	7.26

H	K	L	FO	FC	WEIGHT
15	2	1	4.49	3.27	3.07
16	2	1	4.75	3.91	3.48
17	2	1	9.39	9.36	4.96
18	2	1	5.39	4.44	3.69
19	2	1	2.41*	2.07	0.12
20	2	1	11.35	11.55	4.79
21	2	1	3.44	1.30	3.13
0	3	1	19.67	20.76	3.29
1	3	1	42.52	48.31	0.79
2	3	1	25.81	25.86	2.02
3	3	1	47.57	39.65	0.64
4	3	1	27.32	24.76	1.81
5	3	1	23.49	24.71	2.35
6	3	1	26.32	24.31	1.93
7	3	1	3.59	3.57	4.07
8	3	1	21.45	21.98	2.76
9	3	1	16.45	15.43	3.93
10	3	1	8.01	7.01	7.10
11	3	1	7.86	9.77	4.62
12	3	1	4.02	4.52	2.82
13	3	1	11.84	11.33	4.60
14	3	1	9.98	9.70	5.47
15	3	1	4.91	5.25	3.04
16	3	1	2.07*	0.68	0.09
17	3	1	3.93	4.54	2.35
18	3	1	4.95	5.54	2.47
19	3	1	4.94	4.94	3.67
20	3	1	4.98	3.62	5.13
0	4	1	6.93	8.66	6.07
1	4	1	26.37	24.83	1.90
2	4	1	17.02	15.48	3.95
3	4	1	8.16	7.27	6.63
4	4	1	12.96	10.68	5.64
5	4	1	15.63	15.65	4.16
6	4	1	22.07	19.69	2.61
7	4	1	7.73	7.09	6.60
8	4	1	5.63	5.25	4.39
9	4	1	6.01	6.72	4.61
10	4	1	6.04	5.07	5.40
11	4	1	8.61	8.20	5.37
12	4	1	10.67	11.09	4.71
13	4	1	14.39	15.79	3.97
14	4	1	12.32	12.21	4.19
15	4	1	10.71	10.62	4.52
16	4	1	3.81*	3.87	0.21
17	4	1	5.18	4.58	3.67
18	4	1	5.83	5.15	3.94
19	4	1	1.94*	1.32	0.10
0	5	1	6.43	7.97	4.65
1	5	1	6.78	7.62	5.23
2	5	1	6.59	5.65	5.04
3	5	1	20.25	17.39	2.77
4	5	1	10.70	9.33	5.07
5	5	1	9.68	9.01	5.24
6	5	1	4.41	4.42	2.51
7	5	1	10.54	10.13	5.18
8	5	1	9.98	9.17	5.36
9	5	1	6.70	6.92	4.30
10	5	1	12.99	13.35	3.85
11	5	1	10.88	10.40	4.36
12	5	1	15.53	14.94	3.63
13	5	1	4.47	3.97	2.87
14	5	1	0.00*	1.37	0.00
15	5	1	3.43*	3.07	0.22
16	5	1	6.61	5.49	5.06
17	5	1	2.79*	2.87	0.16
0	6	1	4.15*	3.69	0.19
1	6	1	7.18	6.74	3.48
2	6	1	3.63*	4.06	0.17
3	6	1	5.66	6.09	3.17
4	6	1	12.80	12.72	4.40
5	6	1	5.18	4.00	3.03
6	6	1	10.59	10.56	3.66
7	6	1	5.19	4.33	2.49
8	6	1	4.86	2.92	2.89
9	6	1	5.07	4.55	2.57
10	6	1	2.38*	0.83	0.08
11	6	1	1.45*	2.04	0.03
12	6	1	7.03	6.68	3.85
13	6	1	0.00*	0.52	0.00
14	6	1	6.37	5.89	3.94
15	6	1	3.70	2.20	2.91
0	7	1	3.21*	2.58	0.12
1	7	1	8.61	8.65	3.60
2	7	1	14.39	14.13	3.65
3	7	1	6.61	5.48	3.13
4	7	1	4.47*	5.82	0.18
5	7	1	13.69	14.18	3.56
6	7	1	6.79	6.70	2.92
7	7	1	6.43	5.66	3.49
8	7	1	7.09	6.96	3.51
9	7	1	11.52	10.93	4.72
10	7	1	7.89	6.86	4.60
11	7	1	2.57*	3.44	0.10
12	7	1	8.16	6.56	5.35
0	8	1	2.93*	3.41	0.10
1	8	1	3.19*	3.40	0.11
2	8	1	2.48*	0.74	0.08
3	8	1	4.19*	3.07	0.20
4	8	1	0.00*	2.26	0.00
5	8	1	2.54*	2.44	0.08
6	8	1	3.16*	2.05	0.14
0	0	2	29.65	27.02	1.54
1	0	2	16.27	17.13	4.76
2	0	2	16.93	16.79	4.27
3	0	2	40.97	39.24	0.86
4	0	2	107.01	111.55	0.13
5	0	2	57.59	59.51	0.45
6	0	2	18.83	18.73	3.62
7	0	2	27.23	25.53	1.89
8	0	2	13.89	13.98	5.40
9	0	2	2.36*	1.07	0.43
10	0	2	6.21	6.14	8.51
11	0	2	16.29	17.22	4.07
12	0	2	0.00*	2.78	0.00
13	0	2	3.27	1.25	4.25

H	K	L	FO	FC	WEIGHT
14	0	2	4.87	6.15	3.24
15	0	2	4.96	3.70	3.79
16	0	2	0.00*	3.67	0.00
17	0	2	3.76*	5.14	0.26
18	0	2	0.00*	0.37	0.00
19	0	2	3.59*	3.08	0.23
20	0	2	3.77	0.74	3.87
21	0	2	2.42*	2.16	0.14
0	1	2	57.79	57.50	0.44
1	1	2	69.68	69.16	0.30
2	1	2	30.10	28.96	1.56
3	1	2	80.59	84.06	0.23
4	1	2	62.55	63.80	0.38
5	1	2	52.58	53.25	0.53
6	1	2	21.15	23.50	2.90
7	1	2	15.61	16.90	4.78
8	1	2	9.25	9.82	8.23
9	1	2	16.74	17.13	4.16
10	1	2	12.16	13.01	6.33
11	1	2	7.49	8.37	7.35
12	1	2	2.16*	3.01	0.16
13	1	2	6.52	6.90	6.28
14	1	2	4.80	5.60	3.55
15	1	2	6.43	7.30	4.84
16	1	2	4.15	3.56	2.96
17	1	2	5.14	5.09	3.64
18	1	2	1.85*	1.12	0.07
19	1	2	5.19	5.18	3.60
20	1	2	8.07	7.82	5.65
21	1	2	3.83	3.35	2.91
0	2	2	22.08	24.44	2.77
1	2	2	31.72	34.01	1.42
2	2	2	13.76	14.48	5.63
3	2	2	22.09	21.54	2.75
4	2	2	29.33	30.37	1.63
5	2	2	9.76	11.24	8.94
6	2	2	17.46	17.06	3.91
7	2	2	44.94	43.93	0.72
8	2	2	34.69	35.35	1.16
9	2	2	6.91	6.56	7.07
10	2	2	19.42	20.40	3.13
11	2	2	7.41	8.07	7.04
12	2	2	8.00	7.88	5.36
13	2	2	5.82	4.89	5.90
14	2	2	4.48	3.22	2.88
15	2	2	5.50	4.64	4.44
16	2	2	4.88	4.44	3.50
17	2	2	9.21	9.93	6.14
18	2	2	4.66	3.17	3.75
19	2	2	2.44*	2.63	0.10
20	2	2	3.90	3.59	3.42
21	2	2	5.96	5.25	5.61
0	3	2	14.14	15.76	5.26
1	3	2	11.86	12.89	6.43
2	3	2	26.95	24.85	1.84
3	3	2	25.95	25.25	1.98
4	3	2	26.16	26.13	1.97
5	3	2	8.13	8.65	8.08
6	3	2	21.75	22.56	2.71
7	3	2	10.77	11.28	6.64
8	3	2	16.26	16.76	4.13
9	3	2	6.44	7.18	6.28
10	3	2	7.34	6.25	7.21
11	3	2	6.81	6.59	5.03
12	3	2	8.66	8.88	6.20
13	3	2	1.86*	1.33	0.08
14	3	2	3.29*	2.45	0.20
15	3	2	5.12	3.68	5.60
16	3	2	5.48	5.21	5.73
17	3	2	6.34	5.52	4.46
18	3	2	7.54	6.78	5.27
19	3	2	0.78*	1.98	0.01
20	3	2	4.62	4.29	3.43
0	4	2	14.40	14.28	4.86
1	4	2	10.60	11.08	6.73
2	4	2	7.69	8.31	6.67
3	4	2	10.43	9.64	6.26
4	4	2	19.31	18.41	3.03
5	4	2	5.72	4.95	6.14
6	4	2	7.01	7.05	5.92
7	4	2	12.09	12.62	5.62
8	4	2	2.13*	0.83	0.13
9	4	2	4.22	3.94	3.64
10	4	2	5.50	4.22	4.65
11	4	2	1.78*	4.78	0.05
12	4	2	11.04	11.59	4.57
13	4	2	6.63	5.04	5.78
14	4	2	7.33	7.11	5.08
15	4	2	7.84	7.91	4.55
16	4	2	0.00*	0.37	0.00
17	4	2	2.70*	3.73	0.11
18	4	2	4.67	4.76	3.94
0	5	2	6.32	5.91	4.65
1	5	2	12.92	13.05	4.55
2	5	2	8.85	9.21	4.77
3	5	2	23.63	25.74	2.17
4	5	2	9.54	10.20	4.87
5	5	2	19.05	19.04	2.99
6	5	2	5.06	3.59	3.71
7	5	2	3.82	4.86	2.67
8	5	2	6.35	5.63	4.75
9	5	2	2.44*	2.53	0.10
10	5	2	0.14*	1.76	0.00
11	5	2	5.66	5.94	3.52
12	5	2	2.29*	1.67	0.07
13	5	2	7.37	7.66	3.87
14	5	2	3.11*	2.88	0.15
15	5	2	1.37*	0.82	0.03
16	5	2	3.91	2.25	3.43
17	5	2	3.11*	2.40	0.20
0	6	2	8.52	9.47	4.48
1	6	2	4.52	4.92	2.60
2	6	2	9.77	10.88	4.63
3	6	2	9.04	9.60	4.11
4	6	2	11.29	11.60	4.21
5	6	2	4.32	2.28	2.57

H	K	L	FO	FC	WEIGHT
6	6	2	9.75	9.91	4.32
7	6	2	11.13	11.16	4.27
8	6	2	5.74	5.97	3.01
9	6	2	6.56	6.27	3.48
10	6	2	5.06	4.00	2.90
11	6	2	7.08	5.77	4.29
12	6	2	4.83	5.49	2.86
13	6	2	4.07*	4.29	0.23
14	6	2	4.89	4.33	4.03
0	7	2	6.91	7.57	2.94
1	7	2	2.36*	1.75	0.07
2	7	2	3.07*	3.55	0.09
3	7	2	5.41	6.70	2.15
4	7	2	6.23	5.57	3.75
5	7	2	4.56	3.53	2.51
6	7	2	6.03	7.00	3.21
7	7	2	0.00*	2.82	0.00
8	7	2	4.42	5.24	2.20
9	7	2	5.69	4.71	3.78
10	7	2	5.33	6.96	2.51
11	7	2	3.24*	2.77	0.16
0	8	2	5.16	6.26	2.72
1	8	2	6.08	6.73	2.73
2	8	2	7.41	7.03	4.14
3	8	2	6.15	5.49	3.53
4	8	2	3.34*	3.40	0.14
5	8	2	6.48	5.92	3.49
0	0	3	55.94	53.33	0.47
1	0	3	23.51	23.14	2.49
2	0	3	26.76	25.06	1.94
3	0	3	36.72	34.90	1.06
4	0	3	10.18	12.20	8.07
5	0	3	21.84	23.05	2.76
6	0	3	31.01	33.53	1.38
7	0	3	5.02	4.88	8.71
8	0	3	4.89	4.23	8.57
9	0	3	9.26	9.62	7.88
10	0	3	20.50	20.90	2.90
11	0	3	12.26	13.03	5.85
12	0	3	23.54	25.25	2.25
13	0	3	3.08*	4.12	0.19
14	0	3	15.42	16.15	3.99
15	0	3	1.78*	2.31	0.06
16	0	3	4.17	4.28	2.78
17	0	3	4.10	3.46	3.11
18	0	3	6.63	5.87	3.91
19	0	3	2.53*	3.55	0.10
20	0	3	2.20*	1.19	0.11
21	0	3	2.95*	2.25	0.18
0	1	3	29.97	30.36	1.59
1	1	3	27.80	27.42	1.81
2	1	3	32.22	33.38	1.39
3	1	3	16.84	17.98	4.33
4	1	3	40.47	41.08	0.88
5	1	3	35.53	33.08	1.14
6	1	3	5.42	5.20	7.53
7	1	3	30.38	33.09	1.51
8	1	3	27.50	28.59	1.77
9	1	3	33.89	36.05	1.21
10	1	3	32.02	32.05	1.32
11	1	3	14.66	15.27	4.39
12	1	3	13.20	13.50	5.27
13	1	3	5.44	5.70	4.80
14	1	3	7.69	7.95	5.51
15	1	3	13.25	15.51	3.65
16	1	3	7.95	8.93	4.23
17	1	3	6.12	6.18	4.23
18	1	3	4.82	5.32	3.15
19	1	3	2.56*	2.74	0.13
20	1	3	4.72	3.22	4.34
21	1	3	3.02*	3.85	0.17
0	2	3	37.77	38.08	1.00
1	2	3	4.06	4.98	7.71
2	2	3	13.83	14.81	5.81
3	2	3	26.06	24.06	1.98
4	2	3	27.59	28.61	1.80
5	2	3	8.50	6.43	8.12
6	2	3	62.80	60.50	0.37
7	2	3	19.48	21.07	3.30
8	2	3	24.90	26.82	2.13
9	2	3	12.37	13.65	5.61
10	2	3	0.96*	2.82	0.03
11	2	3	13.27	14.80	5.06
12	2	3	12.56	13.27	5.23
13	2	3	6.27	7.07	3.89
14	2	3	5.49	6.18	2.94
15	2	3	5.20	5.37	3.61
16	2	3	2.92*	2.33	0.13
17	2	3	2.71*	0.81	0.14
18	2	3	4.19	4.61	2.18
19	2	3	4.26	4.29	2.43
20	2	3	0.00*	1.47	0.00
0	3	3	20.90	20.02	2.88
1	3	3	22.30	23.15	2.60
2	3	3	11.22	12.50	6.73
3	3	3	31.49	30.06	1.41
4	3	3	20.86	22.35	2.93
5	3	3	10.91	10.27	6.99
6	3	3	15.71	13.78	4.39
7	3	3	2.48*	0.96	0.22
8	3	3	2.75*	2.96	0.26
9	3	3	12.33	13.07	5.72
10	3	3	11.88	11.39	5.90
11	3	3	10.84	10.53	5.90
12	3	3	3.88	3.36	2.59
13	3	3	2.39*	2.32	0.11
14	3	3	8.37	8.17	4.42
15	3	3	4.26*	4.71	0.21
16	3	3	2.95*	3.21	0.13
17	3	3	0.00*	2.65	0.00
18	3	3	6.30	6.91	3.53
19	3	3	2.72*	3.47	0.12
0	4	3	24.46	27.38	2.08
1	4	3	20.20	21.35	2.92
2	4	3	10.04	10.33	6.94
3	4	3	11.10	9.42	6.13

H	K	L	FO	FC	WEIGHT
4	4	3	6.98	8.06	5.98
5	4	3	13.48	13.41	5.02
6	4	3	9.46	9.28	7.08
7	4	3	6.88	6.87	7.32
8	4	3	11.45	11.77	5.57
9	4	3	11.62	11.45	5.24
10	4	3	4.03	3.88	2.67
11	4	3	3.30*	2.18	0.19
12	4	3	6.62	8.19	3.71
13	4	3	5.52	5.44	5.05
14	4	3	4.81	6.39	2.25
15	4	3	7.79	8.06	3.93
16	4	3	3.90*	3.30	0.22
17	4	3	0.00*	1.05	0.00
18	4	3	2.51*	3.09	0.13
0	5	3	16.63	18.11	3.44
1	5	3	6.87	6.33	4.91
2	5	3	15.27	16.03	3.93
3	5	3	6.32	7.09	3.84
4	5	3	14.61	14.65	4.43
5	5	3	11.30	10.27	4.35
6	5	3	2.54*	2.23	0.12
7	5	3	9.11	10.53	4.54
8	5	3	3.56*	3.06	0.18
9	5	3	7.54	7.89	3.73
10	5	3	8.80	8.85	5.41
11	5	3	11.72	12.92	4.39
12	5	3	6.80	6.05	3.95
13	5	3	8.12	8.12	5.16
14	5	3	4.11	3.60	2.56
15	5	3	2.62*	3.33	0.12
16	5	3	3.33*	1.80	0.21
0	6	3	18.79	20.35	2.78
1	6	3	9.69	10.23	3.99
2	6	3	6.98	7.57	3.17
3	6	3	12.40	13.51	3.96
4	6	3	8.64	8.98	4.40
5	6	3	9.13	8.73	4.45
6	6	3	10.75	10.02	4.49
7	6	3	8.45	8.66	4.17
8	6	3	13.99	14.00	4.04
9	6	3	6.94	7.70	4.04
10	6	3	4.35	3.47	1.94
11	6	3	4.04*	3.18	0.23
12	6	3	4.87	5.85	1.97
13	6	3	2.65*	2.88	0.11
14	6	3	3.57*	2.53	0.25
0	7	3	8.70	8.07	4.21
1	7	3	5.78	7.09	2.90
2	7	3	5.29	5.06	2.98
3	7	3	6.57	8.14	3.02
4	7	3	9.16	9.38	3.35
5	7	3	8.27	8.74	3.79
6	7	3	4.62	3.38	2.57
7	7	3	3.97*	2.61	0.20
8	7	3	5.29	5.08	3.36
9	7	3	4.17*	4.19	0.21
10	7	3	3.70*	4.99	0.22
0	8	3	7.71	9.02	3.64
1	8	3	1.50*	3.33	0.04
2	8	3	9.33	10.04	4.85
3	8	3	5.14	3.42	2.95
0	0	4	8.11	10.70	4.82
1	0	4	26.84	27.05	1.93
2	0	4	4.05	2.86	7.88
3	0	4	31.14	30.26	1.45
4	0	4	14.73	18.16	4.61
5	0	4	20.20	19.78	3.18
6	0	4	25.30	26.58	2.09
7	0	4	12.91	12.15	5.67
8	0	4	5.96	4.78	5.50
9	0	4	19.84	19.96	3.04
10	0	4	8.17	7.77	7.24
11	0	4	1.39*	0.42	0.07
12	0	4	8.88	10.06	5.08
13	0	4	9.42	9.30	4.93
14	0	4	17.72	18.08	3.20
15	0	4	6.75	8.25	3.74
16	0	4	3.38*	3.23	0.17
17	0	4	0.58*	0.83	0.01
18	0	4	4.58	4.16	3.59
19	0	4	2.33*	1.92	0.11
20	0	4	2.33*	1.93	0.13
0	1	4	18.52	17.95	3.71
1	1	4	33.13	30.44	1.28
2	1	4	12.07	10.64	6.61
3	1	4	34.67	32.33	1.18
4	1	4	11.59	11.37	7.01
5	1	4	31.38	32.56	1.43
6	1	4	23.71	23.29	2.31
7	1	4	36.53	37.68	1.07
8	1	4	9.29	9.97	7.22
9	1	4	39.33	42.42	0.90
10	1	4	2.29*	4.65	0.15
11	1	4	21.06	23.14	2.69
12	1	4	0.00*	2.34	0.00
13	1	4	14.02	15.54	4.45
14	1	4	9.07	9.12	5.84
15	1	4	5.88	6.40	3.17
16	1	4	4.11	3.35	3.06
17	1	4	4.88	4.69	3.15
18	1	4	3.36*	1.42	0.25
19	1	4	4.60	3.52	2.75
20	1	4	1.71*	1.28	0.08
0	2	4	20.57	21.16	3.08
1	2	4	16.76	18.32	4.17
2	2	4	16.34	17.52	4.23
3	2	4	22.36	21.12	2.63
4	2	4	14.04	13.75	5.15
5	2	4	13.24	12.44	5.76
6	2	4	23.51	23.74	2.33
7	2	4	26.03	27.64	1.97
8	2	4	18.43	17.35	3.35
9	2	4	8.86	8.47	8.05
10	2	4	10.59	10.01	6.46
11	2	4	6.81	7.64	4.61

H	K	L	FO	FC	WEIGHT
12	2	4	8.79	8.87	5.22
13	2	4	12.10	13.97	4.19
14	2	4	5.22	4.72	3.78
15	2	4	5.05	4.90	3.38
16	2	4	5.94	7.11	2.98
17	2	4	3.35*	3.28	0.16
18	2	4	8.18	7.47	5.46
19	2	4	3.83	2.61	3.31
0	3	4	20.54	22.22	2.91
1	3	4	16.31	16.34	4.18
2	3	4	5.59	6.53	7.20
3	3	4	6.00	7.32	6.61
4	3	4	16.49	17.31	4.15
5	3	4	12.30	11.26	5.74
6	3	4	13.61	13.42	5.07
7	3	4	15.38	15.90	4.32
8	3	4	21.86	20.99	2.52
9	3	4	13.54	11.73	5.16
10	3	4	3.69*	1.22	0.29
11	3	4	11.58	12.22	4.38
12	3	4	5.67	4.19	5.25
13	3	4	7.54	7.38	3.66
14	3	4	3.36*	3.28	0.20
15	3	4	6.29	6.01	4.23
16	3	4	3.20*	1.28	0.18
17	3	4	3.22*	3.71	0.16
18	3	4	5.66	5.97	4.50
0	4	4	17.18	16.29	3.79
1	4	4	36.10	35.71	1.06
2	4	4	11.24	11.24	5.57
3	4	4	8.39	9.12	6.11
4	4	4	3.23*	1.82	0.23
5	4	4	17.46	17.38	3.57
6	4	4	16.35	16.91	3.78
7	4	4	9.23	8.84	5.11
8	4	4	7.06	7.48	4.68
9	4	4	2.32*	3.40	0.08
10	4	4	6.93	7.08	4.01
11	4	4	5.63	7.06	3.01
12	4	4	3.38*	2.68	0.17
13	4	4	9.13	8.70	5.28
14	4	4	8.56	9.59	4.18
15	4	4	7.05	7.02	4.86
16	4	4	5.29	4.25	3.88
17	4	4	2.18*	1.85	0.10
0	5	4	10.11	10.21	4.31
1	5	4	5.61	6.22	3.00
2	5	4	15.00	15.52	3.73
3	5	4	12.99	14.13	3.85
4	5	4	9.70	10.71	4.67
5	5	4	9.86	10.65	4.23
6	5	4	13.24	13.56	4.18
7	5	4	6.00	5.71	3.36
8	5	4	3.03*	3.01	0.15
9	5	4	4.93	6.01	2.40
10	5	4	3.50*	1.74	0.21
11	5	4	7.57	7.19	4.92
12	5	4	4.44	5.22	2.32
13	5	4	4.49	3.36	2.44
14	5	4	4.27	4.25	2.09
15	5	4	3.09*	3.99	0.15
0	6	4	11.28	11.29	3.91
1	6	4	5.84	5.22	3.49
2	6	4	4.17*	4.31	0.18
3	6	4	4.30	4.28	2.68
4	6	4	11.50	12.79	4.11
5	6	4	4.24	4.83	2.16
6	6	4	18.70	20.34	2.87
7	6	4	1.66*	2.52	0.04
8	6	4	7.03	8.06	3.60
9	6	4	2.61*	4.20	0.11
10	6	4	1.81*	2.32	0.06
11	6	4	4.10*	5.83	0.22
12	6	4	4.66	3.89	3.05
13	6	4	4.52	4.85	3.27
0	7	4	5.48	6.37	2.48
1	7	4	9.44	10.05	4.11
2	7	4	4.96	3.38	3.40
3	7	4	11.94	12.73	4.22
4	7	4	0.00*	1.51	0.00
5	7	4	5.40	5.18	3.37
6	7	4	5.84	6.15	3.32
7	7	4	4.26	3.97	2.61
8	7	4	6.84	6.73	3.87
9	7	4	3.56*	2.91	0.19
0	0	5	29.21	28.87	1.62
1	0	5	20.63	20.45	3.00
2	0	5	6.36	4.66	9.58
3	0	5	8.62	7.99	9.01
4	0	5	7.58	6.26	9.56
5	0	5	2.99*	2.21	0.38
6	0	5	0.00*	1.36	0.01
7	0	5	7.22	8.47	6.54
8	0	5	9.97	11.60	6.87
9	0	5	11.99	12.49	5.53
10	0	5	5.97	6.25	4.83
11	0	5	12.38	12.42	4.84
12	0	5	10.17	10.92	5.61
13	0	5	6.70	6.96	3.98
14	0	5	7.11	6.86	5.05
15	0	5	20.15	19.51	2.65
16	0	5	14.26	13.35	4.00
17	0	5	0.00*	2.80	0.00
18	0	5	5.43	5.43	4.01
19	0	5	4.52	2.58	3.59
0	1	5	6.30	5.53	9.38
1	1	5	35.35	31.52	1.13
2	1	5	22.60	19.46	2.54
3	1	5	22.03	20.38	2.65
4	1	5	15.42	16.05	4.61
5	1	5	26.87	27.60	1.85
6	1	5	10.70	10.79	6.91
7	1	5	3.09*	1.70	0.40
8	1	5	15.89	15.41	4.11
9	1	5	9.23	9.93	6.49
10	1	5	8.67	9.22	6.53

H	K	L	FO	FC	WEIGHT
11	1	5	14.97	15.28	4.47
12	1	5	4.37	4.45	2.94
13	1	5	4.02	3.46	2.77
14	1	5	11.15	12.66	4.56
15	1	5	4.86	4.45	3.19
16	1	5	4.23	3.54	2.58
17	1	5	7.30	8.01	3.46
18	1	5	4.26	4.81	2.95
19	1	5	3.39*	3.78	0.22
0	2	5	20.86	21.30	2.85
1	2	5	3.27	4.10	3.97
2	2	5	5.97	5.86	6.95
3	2	5	4.27	3.45	6.75
4	2	5	17.07	16.54	4.05
5	2	5	16.93	16.61	4.12
6	2	5	8.79	8.57	7.30
7	2	5	6.40	7.06	6.27
8	2	5	16.33	17.40	3.82
9	2	5	4.54	4.56	4.80
10	2	5	8.17	7.55	5.31
11	2	5	14.43	14.81	4.12
12	2	5	13.41	14.62	4.18
13	2	5	9.87	10.26	5.54
14	2	5	11.76	12.70	4.43
15	2	5	9.97	10.16	4.41
16	2	5	6.29	5.80	5.19
17	2	5	6.71	5.88	4.92
18	2	5	4.57	4.54	2.98
0	3	5	12.44	11.81	6.02
1	3	5	9.64	9.13	7.15
2	3	5	5.08	3.84	7.33
3	3	5	12.64	10.61	5.55
4	3	5	3.71	2.53	3.35
5	3	5	8.26	8.38	7.15
6	3	5	8.02	8.27	6.79
7	3	5	6.58	6.93	5.23
8	3	5	8.83	7.91	6.02
9	3	5	8.26	8.42	5.60
10	3	5	13.36	13.39	4.74
11	3	5	8.40	8.65	5.03
12	3	5	5.03	5.60	4.24
13	3	5	4.23	4.11	2.64
14	3	5	4.24	5.77	2.18
15	3	5	1.32*	2.59	0.03
16	3	5	2.28*	2.35	0.09
17	3	5	8.92	8.54	6.84
0	4	5	10.94	11.67	6.12
1	4	5	4.70	3.43	4.24
2	4	5	10.00	9.04	6.20
3	4	5	10.85	10.49	5.20
4	4	5	9.05	9.19	5.54
5	4	5	6.78	7.30	5.24
6	4	5	3.14*	1.37	0.20
7	4	5	3.52*	4.71	0.23
8	4	5	8.45	8.69	5.15
9	4	5	12.14	11.94	5.20
10	4	5	6.61	6.74	3.58
11	4	5	4.24	2.85	3.25
12	4	5	4.86	4.95	2.68
13	4	5	4.67	4.35	2.20
14	4	5	4.91	4.11	3.39
15	4	5	3.71	1.78	3.01
16	4	5	5.25	5.72	3.29
0	5	5	16.42	16.66	3.45
1	5	5	16.19	17.33	3.36
2	5	5	11.06	11.28	5.16
3	5	5	10.35	9.46	4.79
4	5	5	23.78	23.44	2.16
5	5	5	5.35	5.56	2.87
6	5	5	18.96	19.50	2.87
7	5	5	6.79	5.92	4.10
8	5	5	15.88	16.51	3.52
9	5	5	3.97	3.03	2.35
10	5	5	8.18	7.85	4.61
11	5	5	4.72	4.60	2.64
12	5	5	4.20	3.40	3.42
13	5	5	3.36*	3.05	0.24
14	5	5	3.93	3.35	3.08
0	6	5	2.96*	3.23	0.12
1	6	5	7.14	8.32	3.78
2	6	5	3.78*	2.52	0.25
3	6	5	8.73	8.64	4.79
4	6	5	4.77	5.08	2.29
5	6	5	7.67	6.01	5.93
6	6	5	7.52	7.97	3.99
7	6	5	6.73	6.76	4.82
8	6	5	3.51*	1.29	0.23
9	6	5	5.14	4.29	3.86
10	6	5	4.86	3.89	3.24
11	6	5	3.51*	2.57	0.29
0	7	5	7.54	6.56	4.38
1	7	5	4.59	3.59	3.41
2	7	5	5.90	5.60	4.01
3	7	5	5.54	5.87	3.79
4	7	5	3.62*	3.40	0.23
5	7	5	3.83*	3.90	0.23
6	7	5	3.22*	2.50	0.18
7	7	5	3.70*	3.10	0.28
0	0	6	5.37	4.64	7.03
1	0	6	25.24	22.49	2.11
2	0	6	13.83	14.33	5.06
3	0	6	3.19*	2.16	0.29
4	0	6	3.47	3.33	4.85
5	0	6	33.76	31.93	1.21
6	0	6	5.02	4.43	6.50
7	0	6	10.11	9.90	6.67
8	0	6	2.81*	1.76	0.26
9	0	6	0.00*	0.05	0.00
10	0	6	3.92	3.99	3.87
11	0	6	2.31*	0.07	0.13
12	0	6	8.04	7.60	4.96
13	0	6	7.04	7.03	6.93
14	0	6	1.48*	1.93	0.04
15	0	6	1.15*	0.53	0.03
16	0	6	5.33	3.69	4.62
17	0	6	5.01	3.52	4.64

H	K	L	FO	FC	WEIGHT
18	0	6	6.21	5.37	5.49
0	1	6	10.27	10.67	6.87
1	1	6	10.93	11.75	6.31
2	1	6	14.51	14.51	5.01
3	1	6	8.41	8.32	8.10
4	1	6	20.15	19.42	2.93
5	1	6	8.62	6.71	6.46
6	1	6	3.36*	4.13	0.35
7	1	6	7.20	6.04	7.36
8	1	6	7.88	7.23	6.23
9	1	6	6.41	6.35	5.89
10	1	6	4.54	5.27	2.40
11	1	6	12.14	13.29	5.02
12	1	6	14.78	14.94	3.83
13	1	6	4.85	4.84	3.33
14	1	6	4.46	3.11	3.52
15	1	6	6.06	6.29	4.27
16	1	6	3.14*	3.14	0.19
17	1	6	4.56	4.40	4.26
18	1	6	0.00*	2.42	0.00
0	2	6	11.48	11.46	6.30
1	2	6	19.85	19.33	3.08
2	2	6	7.55	6.69	6.33
3	2	6	14.77	14.96	4.66
4	2	6	9.32	8.48	7.05
5	2	6	6.56	6.14	6.38
6	2	6	1.98*	1.79	0.12
7	2	6	11.77	11.88	5.35
8	2	6	4.99	5.47	3.42
9	2	6	22.01	23.08	2.38
10	2	6	6.80	7.09	4.66
11	2	6	7.67	7.66	5.46
12	2	6	15.33	15.11	3.85
13	2	6	5.05	3.53	4.19
14	2	6	6.03	5.18	6.25
15	2	6	2.58*	1.62	0.13
16	2	6	4.45	2.53	3.96
17	2	6	4.39	3.72	2.99
0	3	6	1.66*	1.82	0.09
1	3	6	21.03	21.81	2.62
2	3	6	0.00*	1.17	0.00
3	3	6	6.48	7.50	5.74
4	3	6	11.58	10.91	5.40
5	3	6	5.43	4.73	6.18
6	3	6	9.43	10.28	6.39
7	3	6	1.78*	2.94	0.07
8	3	6	9.45	10.07	5.98
9	3	6	6.92	6.44	5.21
10	3	6	10.27	11.31	5.09
11	3	6	1.63*	2.13	0.05
12	3	6	4.57	5.11	3.00
13	3	6	3.40*	3.58	0.21
14	3	6	0.00*	2.08	0.00
15	3	6	9.60	8.58	6.59
16	3	6	8.03	7.50	6.26
0	4	6	18.08	18.72	3.03
1	4	6	6.87	6.44	6.64
2	4	6	8.53	8.50	5.01
3	4	6	13.96	14.51	4.62
4	4	6	11.84	11.51	5.50
5	4	6	13.53	13.09	4.91
6	4	6	11.76	12.21	4.66
7	4	6	3.19*	3.67	0.17
8	4	6	5.76	6.05	3.56
9	4	6	15.35	15.65	3.83
10	4	6	7.10	7.05	4.91
11	4	6	6.80	5.87	5.62
12	4	6	6.60	4.93	5.68
13	4	6	3.77*	2.83	0.23
14	4	6	2.76*	3.22	0.15
15	4	6	3.01*	1.17	0.30
0	5	6	11.38	10.71	4.96
1	5	6	4.70	3.69	3.25
2	5	6	14.20	15.22	3.91
3	5	6	10.11	10.90	4.60
4	5	6	6.59	7.35	4.69
5	5	6	10.32	11.11	4.56
6	5	6	3.93	3.66	2.40
7	5	6	6.93	6.56	4.84
8	5	6	0.60*	3.97	0.01
9	5	6	4.59	4.44	3.86
10	5	6	4.03	6.08	2.26
11	5	6	3.25*	2.06	0.30
12	5	6	4.42	4.90	3.02
0	6	6	1.94*	3.78	0.05
1	6	6	6.71	7.78	4.18
2	6	6	5.22	4.33	3.72
3	6	6	8.05	8.16	4.32
4	6	6	3.70*	3.02	0.26
5	6	6	4.38	3.73	3.06
6	6	6	4.60	3.10	4.12
7	6	6	3.10*	4.09	0.17
8	6	6	3.23*	3.20	0.20
9	6	6	5.74	4.39	5.19
0	7	6	7.03	6.36	5.45
1	7	6	6.81	6.66	4.75
2	7	6	3.15*	0.77	0.26
0	0	7	2.86*	5.97	0.26
1	0	7	25.21	23.78	2.03
2	0	7	6.51	8.45	6.27
3	0	7	3.11*	1.33	0.40
4	0	7	3.85	2.59	3.81
5	0	7	6.36	6.58	7.27
6	0	7	4.76	4.66	4.48
7	0	7	7.69	7.69	6.23
8	0	7	6.41	6.71	6.25
9	0	7	14.00	14.41	4.30
10	0	7	4.10	3.16	3.43
11	0	7	5.36	4.73	4.62
12	0	7	11.96	11.63	4.79
13	0	7	11.51	10.89	5.26
14	0	7	7.10	6.77	5.92
15	0	7	4.92	4.57	5.67
16	0	7	1.63*	1.99	0.07
0	1	7	4.99	4.42	4.85
1	1	7	13.84	14.75	4.93

H	K	L	FO	FC	WEIGHT
2	1	7	1.32*	1.53	0.06
3	1	7	17.91	16.90	3.42
4	1	7	6.22	5.76	5.49
5	1	7	3.80	5.19	2.86
6	1	7	7.05	7.50	6.19
7	1	7	0.00*	1.55	0.00
8	1	7	14.78	14.45	4.37
9	1	7	3.81*	3.94	0.24
10	1	7	7.57	7.98	5.37
11	1	7	3.07*	2.11	0.18
12	1	7	2.49*	0.88	0.15
13	1	7	8.46	8.66	4.83
14	1	7	2.13*	0.15	0.12
15	1	7	6.31	6.03	4.97
16	1	7	2.81*	2.54	0.16
0	2	7	11.37	10.78	5.82
1	2	7	9.45	9.44	6.77
2	2	7	6.18	5.22	5.24
3	2	7	7.79	6.66	5.33
4	2	7	21.06	20.68	2.73
5	2	7	7.83	8.61	5.01
6	2	7	10.71	10.59	5.08
7	2	7	12.23	11.59	4.74
8	2	7	1.51*	0.77	0.05
9	2	7	6.70	5.58	5.78
10	2	7	8.56	8.57	5.48
11	2	7	6.31	7.42	4.50
12	2	7	5.49	6.61	3.31
13	2	7	10.72	10.15	5.11
14	2	7	2.70*	2.70	0.13
15	2	7	4.22	4.25	3.31
16	2	7	5.54	5.10	4.58
0	3	7	12.23	11.05	4.64
1	3	7	13.27	12.53	4.66
2	3	7	16.57	16.22	3.76
3	3	7	6.87	5.87	6.53
4	3	7	12.82	12.26	5.24
5	3	7	14.38	15.27	4.44
6	3	7	10.59	10.42	5.70
7	3	7	5.82	5.68	4.40
8	3	7	12.08	12.19	5.22
9	3	7	4.13	3.94	3.32
10	3	7	7.20	6.57	5.92
11	3	7	9.68	9.76	4.64
12	3	7	8.75	9.34	6.49
13	3	7	9.72	9.21	5.98
14	3	7	5.78	6.04	4.34
15	3	7	5.97	6.08	5.02
0	4	7	11.91	11.17	5.34
1	4	7	19.52	20.25	2.91
2	4	7	7.87	7.58	5.52
3	4	7	5.06	4.95	5.64
4	4	7	6.86	5.44	4.37
5	4	7	9.39	9.60	5.06
6	4	7	9.14	8.31	5.57
7	4	7	9.37	9.21	6.24
8	4	7	8.68	8.85	5.55
9	4	7	4.34	2.81	3.61
10	4	7	2.65*	3.63	0.12
11	4	7	8.05	7.08	5.86
12	4	7	3.88	3.26	3.76
13	4	7	3.36*	2.93	0.29
0	5	7	7.06	7.61	5.02
1	5	7	8.14	8.04	4.80
2	5	7	8.46	8.83	5.52
3	5	7	5.29	6.49	3.23
4	5	7	3.27*	3.50	0.17
5	5	7	2.38*	1.51	0.12
6	5	7	1.63*	2.09	0.06
7	5	7	4.20	3.16	2.97
8	5	7	7.02	6.17	5.53
9	5	7	6.86	6.38	5.71
10	5	7	2.61*	1.38	0.23
0	6	7	9.34	9.14	6.14
1	6	7	3.92	3.33	2.88
2	6	7	3.10*	2.10	0.22
3	6	7	3.87	3.50	2.43
4	6	7	11.12	12.08	5.18
5	6	7	3.15*	2.56	0.31
6	6	7	5.50	5.21	5.23
0	0	8	8.35	8.44	6.26
1	0	8	13.11	13.51	4.45
2	0	8	2.25*	0.26	0.17
3	0	8	5.43	4.94	5.47
4	0	8	8.28	8.02	6.76
5	0	8	9.44	8.83	5.92
6	0	8	2.16*	0.41	0.13
7	0	8	4.09	2.97	2.76
8	0	8	3.69	2.63	2.83
9	0	8	3.79*	2.70	0.26
10	0	8	2.42*	1.66	0.15
11	0	8	4.08	4.40	2.62
12	0	8	3.06*	1.53	0.24
13	0	8	2.63*	0.27	0.19
14	0	8	3.13*	1.50	0.29
15	0	8	2.79*	0.79	0.27
0	1	8	8.10	7.42	5.45
1	1	8	8.27	8.08	5.47
2	1	8	7.47	7.53	5.20
3	1	8	9.93	10.07	5.98
4	1	8	8.81	8.99	4.85
5	1	8	13.26	12.92	4.71
6	1	8	9.29	9.09	5.19
7	1	8	10.39	10.60	5.58
8	1	8	5.32	5.87	3.82
9	1	8	7.38	7.16	5.12
10	1	8	4.04	3.35	3.16
11	1	8	3.95	2.33	4.03
12	1	8	4.36	4.56	2.55
13	1	8	1.78*	2.99	0.06
14	1	8	4.88	3.45	5.08
0	2	8	1.64*	2.51	0.05
1	2	8	8.57	8.37	5.86
2	2	8	12.85	12.23	4.82
3	2	8	7.36	6.51	4.79
4	2	8	4.96	4.11	4.45

H	K	L	FO	FC	WEIGHT
5	2	8	7.81	8.17	5.45
6	2	8	10.33	10.48	4.31
7	2	8	6.75	6.33	5.67
8	2	8	8.31	8.59	5.43
9	2	8	2.61*	3.83	0.13
10	2	8	3.39*	2.65	0.27
11	2	8	5.68	5.47	4.20
12	2	8	4.50	3.55	3.31
13	2	8	3.31*	1.88	0.31
14	2	8	1.56*	1.29	0.07
0	3	8	5.36	4.56	4.66
1	3	8	8.02	7.58	4.28
2	3	8	5.24	4.44	3.17
3	3	8	16.16	16.39	3.67
4	3	8	15.41	15.00	3.83
5	3	8	9.12	9.09	4.46
6	3	8	6.28	6.55	4.44
7	3	8	9.78	9.70	6.12
8	3	8	7.14	7.63	4.37
9	3	8	2.66*	1.42	0.18
10	3	8	3.97	2.77	3.29
11	3	8	3.77	3.55	3.24
12	3	8	8.18	7.18	5.07
0	4	8	6.12	5.09	4.36
1	4	8	5.87	6.11	3.56
2	4	8	10.02	9.09	5.49
3	4	8	5.25	5.08	3.68
4	4	8	7.45	6.81	5.15
5	4	8	3.18*	4.00	0.14
6	4	8	3.20*	2.53	0.20
7	4	8	5.07	4.64	4.55
8	4	8	4.68	4.59	4.29
9	4	8	1.41*	0.85	0.05
10	4	8	2.88*	0.90	0.21
0	5	8	1.13*	1.99	0.02
1	5	8	3.43*	2.53	0.20
2	5	8	6.76	5.54	5.24
3	5	8	3.16*	1.52	0.27
4	5	8	2.86*	2.49	0.15
5	5	8	4.33	3.50	4.14
6	5	8	7.30	7.52	5.33
7	5	8	2.92*	3.29	0.22
0	0	9	3.27*	0.25	0.26
1	0	9	11.00	10.68	4.96
2	0	9	0.00*	0.86	0.00
3	0	9	1.98*	1.10	0.08
4	0	9	0.00*	2.31	0.00
5	0	9	6.32	6.67	5.30
6	0	9	3.74	3.12	2.75
7	0	9	3.03*	3.38	0.17
8	0	9	5.86	5.21	5.06
9	0	9	3.59*	1.72	0.30
10	0	9	5.94	5.65	5.51
11	0	9	0.00*	0.57	0.00
12	0	9	2.97*	0.71	0.28
0	1	9	4.66	3.61	3.83
1	1	9	12.45	10.33	4.72
2	1	9	9.46	8.89	6.16
3	1	9	3.02*	1.17	0.17
4	1	9	4.60	3.32	3.71
5	1	9	5.72	5.17	4.03
6	1	9	5.29	5.18	3.70
7	1	9	7.46	7.28	5.14
8	1	9	0.00*	1.99	0.00
9	1	9	10.43	10.20	5.17
10	1	9	4.48	2.73	5.19
11	1	9	3.83	4.20	2.84
12	1	9	3.66	3.97	2.92
0	2	9	5.00	4.77	3.42
1	2	9	4.40	4.89	2.39
2	2	9	4.87	4.08	5.11
3	2	9	5.23	6.08	4.38
4	2	9	5.45	5.22	5.74
5	2	9	4.30	3.16	3.43
6	2	9	4.23	2.62	3.38
7	2	9	8.06	9.19	4.86
8	2	9	5.75	6.31	3.73
9	2	9	4.46	3.55	3.32
10	2	9	3.15*	1.32	0.28
11	2	9	6.15	6.52	4.23
0	3	9	3.93	2.93	3.02
1	3	9	8.87	7.43	6.25
2	3	9	8.87	8.06	4.97
3	3	9	2.36*	1.71	0.11
4	3	9	6.67	5.70	5.74
5	3	9	3.01*	1.19	0.23
6	3	9	3.38*	2.56	0.23
7	3	9	3.90	2.23	4.34
8	3	9	1.50*	2.13	0.05
9	3	9	2.69*	2.60	0.19
0	4	9	6.87	6.47	3.65
1	4	9	6.04	5.84	4.09
2	4	9	8.13	7.48	4.67
3	4	9	4.69	3.76	4.44
4	4	9	2.02*	2.98	0.10
5	4	9	3.95	3.93	2.52
6	4	9	5.25	5.43	3.98
7	4	9	3.43	1.56	3.35
0	0	10	6.51	4.46	5.63
1	0	10	5.89	4.57	5.14
2	0	10	12.80	11.97	4.45
3	0	10	0.00*	0.31	0.00
4	0	10	1.86*	0.63	0.08
5	0	10	2.66*	2.39	0.19
6	0	10	4.02	2.44	2.85
7	0	10	2.03*	0.45	0.10
8	0	10	4.49	5.46	2.70
9	0	10	1.22*	0.18	0.04
0	1	10	6.22	5.80	4.61
1	1	10	9.35	8.39	5.12
2	1	10	12.67	11.65	5.13
3	1	10	9.89	8.98	5.74
4	1	10	0.00*	0.78	0.00
5	1	10	6.83	6.24	5.29
6	1	10	4.14	5.29	2.55
7	1	10	4.24	1.93	5.26

H	K	L	FO	FC	WEIGHT	H	K	L	FO	FC	WEIGHT
8	1	10	2.50*	4.17	0.12	7	2	10	4.17	3.64	3.55
0	2	10	4.85	3.83	4.39	0	3	10	7.76	6.31	7.00
1	2	10	4.41	4.58	3.19	1	3	10	3.56	3.53	3.20
2	2	10	5.89	6.28	3.96	2	3	10	5.38	4.87	5.62
3	2	10	6.48	5.68	4.44	3	3	10	2.01*	1.19	0.11
4	2	10	5.86	5.53	3.56	4	3	10	6.08	5.45	6.58
5	2	10	13.86	12.79	4.73	0	0	11	1.80*	1.72	0.10
6	2	10	6.54	5.74	5.65	1	0	11	10.38	9.45	5.50

* DENCTES AN UNOBSERVED REFLECTION