EFFECT OF STARTING DISTANCE ON VERTICAL GROUND REACTION

FORCES IN THE DOG

by

DAVID BURNETT DULANEY

(Under Direction the of Hugh Dookwah)

ABSTRACT

Kinetic gait analysis is used extensively in both human and veterinary medicine, both to detect pathological gait abnormalities and to quantify the efficacy of surgical and pharmacological protocols. This study evaluates the effect of three different staring distances from the kinetic data collection device (2m, 4m, and 6m) on the peak vertical and associated impulse ground reaction forces generated by the test subjects at a trot. Five dogs weighing between 20 and 30kg were trotted over two force plates at between 1.6 and 2.1 m/s until 5 right first contacts and 5 left first contacts were collected. Data collection was repeated approximately a week apart for a total of 5 collections. Vertical impulse values were found to be significantly different ($p<0.05$) between 2m and 6m, but neither were different from 4m. Peak vertical force was not found to be significantly effected by distance.

INDEX WORDS: Gait analysis, force plate, starting distance, steady state gait, peak vertical force, vertical impulse

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DEDICATION

These manuscripts are, like everything else in my life, dedicated to my loving wife Twanya.

To Richard Fox, Michael Runyan, Ford Lux and all of the faculty and students of Lander University. Such a small school, such a large heart, such an impressive mind.

To the dog people of the class of 2003 for making me feel at home. To the dog people of the class of 2004 for helping me realize how little I know. To the dog people of the class of 2006 for understanding when I didn't know it all. To the dog people to come, remember "when in doubt, cut it out" will not keep it from being on the exam.

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CHAPTER I

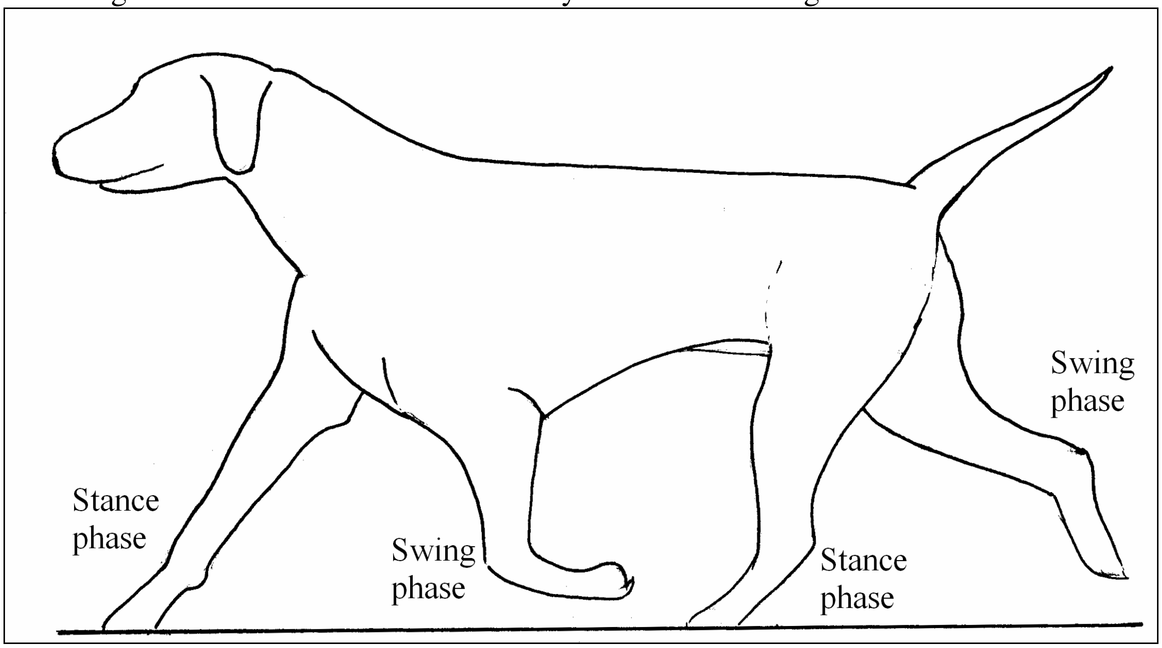
INTRODUCTION AND LITERATURE REVIEW

ANATOMY OF GAIT PATTERNS

Gait is broadly described as the cyclical manner in which terrestrial locomotion occurs.[7, 21] The complete cycle of a limb's motion from contact of one foot to the next successive contact of that same foot is called a stride.[1] The volitional locomotion of a body has been described as consisting of three distinct phases; quiet standing, gait initiation, and steady-state gait.[4] During the standing phase, the body is motionless and therefore generally is not considered in the analysis of a gait pattern, rather it is simply considered a silent phase of the gait. This is not to say that there is no biomechanical activity occurring during the standing phase. The standing body is not only constantly experiencing slight postural modifications, but as Mylène and Alexander recently noted studies have shown that postural control during the standing phase is modified when a cognitive task is executed.[29] It is important not to confuse the initial standing phase, of which there is only one in a gait cycle, and the stance phase of a stride, of which there are many. Whereas in the standing phase there is little of biomechanical interest as it relates to the study of gait, the stance phase is an active and dynamic portion of the gait cycle in which the limb in stance is supporting the body.

The gait initiation phase of locomotion has become a source of great interest to researchers as an instance of relatively dynamic change in the body. Nissan and Whittle noted that while this portion of the gait cycle has received little attention in the past, investigation into gait initiation might provide a tool for the identification of locomotor dysfunctions that are not exhibited during steady-state gait.[30] Additionally, investigation of the gait initiation event provides an expansive view of what many consider a transitory

Figure 1: Swing verses stance limb. During locomotion, the limb that is in contact with the ground is said to be in the stance phase, while the limb not in contact with the ground is in the swing phase. These terms are not definitive identification of a particular limb as the swing and stance limbs will switch every half stride of the gait.



state between quiet standing and steady-state gait. Previous researchers point out that this simple event incorporates "balance, coordination, central nervous system programming and precise neuromotor control from the neuromuscular system, and the momentum and mechanical energy generation from the musculoskeletal system".[28] While the subtle intricacies of the gait initiation event may be complex, the motion of the event has generally been described by equating it to that of a simple inverted pendulum.[4, 8, 25] Brenière and Do described the period of this pendulum as being a function of "body mass, moment of inertia, and the distance between the center of gravity and the ground.[4] Further, it has been determined that period is not affected by initial velocity or initial displacement.[4, 8] If the initial velocity and initial displacement, both of which have the potential for volitional bias in the human test subject, have no effect on the duration of the gait initiation event, then one can presume that the veterinary test subject, which is usually urged into motion by a handler, would also be free from both external and internal gait initiation influence. This finding is of importance to the investigator of veterinary gait initiation events, as it allows for a stronger inference to be gleaned from the existing human studies.

The importance of identifying the gait initiation event is due to the complex combination of biomechanical forces needed to transition a body from a quiescent resting phase to an active locomotory phase. As the intent on the one phase is not the same as the other, it would not be expect that the forces generated in the steady state phase of a gait would be equivalent to the forces generated in the gait initiation event. Investigations into when a gait moves past the gait initiation event into steady-state gait are also well documented and well debated.[27, 28, 30, 41] However, the exact point at which gait initiation becomes steady-state gait has been open to debate because researchers have used many different biomechanical parameters to define steady-state gait.[28] The current literature tends to look at when steady-state begins not so much based on when there is a transition between the gait initiation event into steady-state gait, but rather defines steady-state gait as the phase after the gait initiation event is completed.[21, 28, 33] Many researchers, especially those utilizing kinematics for gait analysis, identify steady-state gait by the display of a particular pattern of gait.[3] Typically researchers who utilize gait-based definitions for steady state gait cite conservation of energy as the criteria for the need to move through space with minimal energy expenditure. It is expected, therefore, that for a particular species moving at a particular velocity there will be a predictable gait pattern moving from gait initiation to the final steady-state gait. For instance, previous researchers have defined the gait initiation event of a trot as a very first short step performed by one pair of diagonal limbs, with the animal immediately falling into the typical pattern of trotting.[3] But this research also noted that occasionally, a dog started walking and then, after a couple of strides, the walk-trot transition appeared. Despite this variability, Blaszczyk *et al* states that during the actual event of steady-state locomotion on an experimental platform "the kinematic parameters of the limbs are quite constant".[3] When using this definition of steady state gait, researchers are able to examine the entire locomotory event, but they are unable to look at an individual step within a larger gait pattern.

A more precise definition of steady-state gait can be found via the use of kinetics and the analysis of Ground Reaction Forces (GRF). The generally accepted functional definition of steady-state gait indicates that it can be identified in a particular gait when the acceleration is equal to the deceleration in the y axis, or when breaking forces and propulsive forces are equal. If for example the breaking forces are greater than the propulsive forces for a particular foot-fall event, then the subject is at that point decelerating their gait and is therefore not in steady-state. This definition of steady-state gait is also based on conservation of energy; if the forces in the y axis are equal, then there is not net loss or gain of kinetic energy. Unfortunately, owing to the technology currently available, kinetics can only evaluate a single step in that gait.

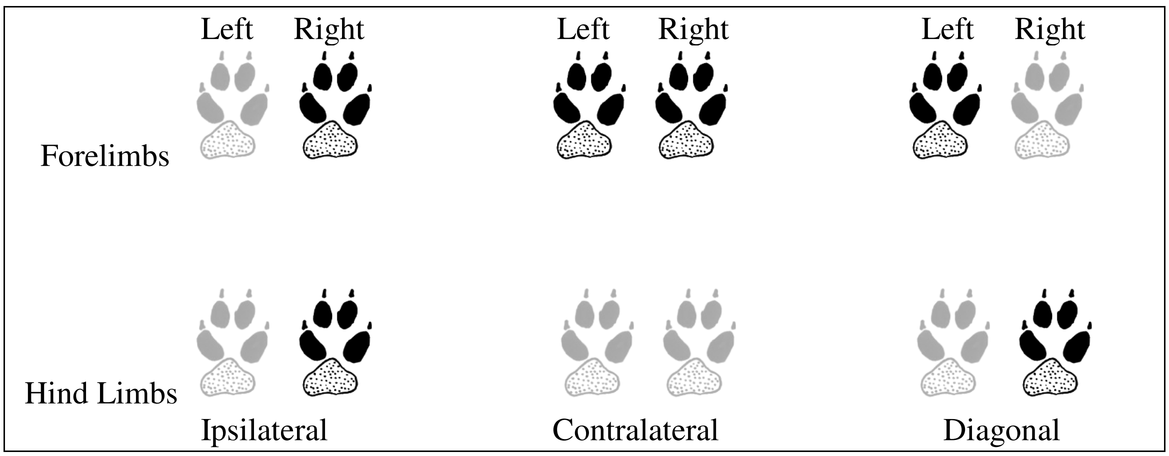
While a complete description of a steady-state gait must include both of the above definitions, researchers must choose one and use it as their functional definition for their protocol. This functional definition corresponds to the description of two general strategies for locomotion; those which minimize energy consumption, and those which maximize velocity.[3] If in a steady-state gait the breaking forces are equal to the propulsive forces, then it can be said that there is minimal energy consumption for that action. Thus a steady-state gait would correspond to the first general strategy for locomotion. Although this definition will only work in a gait by gait analysis, and does not say explicitly when steady-state begins, it does provide a quantitative tool for identifying a steady-state gait when it occurs. To date, there has been no published work utilizing force plate data to explicitly identify when steady-state gait begins, to the Author's knowledge.

CATEGORIZATION OF GAITS

Gaits are easily divided into several logical categories, with the primary distinction being whether the gait is a walk or a run. In the biped model, that distinction is easily made by looking at the mathematical value termed the duty factor.[1] The duty factor is that portion of the stride for which a foot is in contact with the ground. A walk is categorized for bipedal organisms as having a duty factor greater than 0.5, indicating that both feet have to be in contact with the ground at the same time at some point in the stride.[1] A run therefore must have a duty factor less than 0.5, meaning that at no point of the stride will both feet be in contact with the ground at the same time.[1]

Researchers dealing with quadrupeds have the need to further categorize the gait of their test subjects. As the duty factor is now shared by four feet, the delineation between gaits occurs based on interactions of forelimb and hind limb in coordinate limb pairs; either ipsilateral, contralateral or diagonal (see figure 2).[1, 20] The second quadrupedal gait delineation is whether the gait is symmetrical or asymmetrical.[1, 7, 20, 21] A symmetrical gait is characterized by the coordination of ipsilateral contacts being repeated by the contralateral limb pair a half stride later. Examples of symmetrical gaits are the walk, trot, and pace. Asymmetrical gaits, by definition, would not show this repetitive pattern, resulting in gaits such as a canter or a gallop.[20] This is not to say that the idea of symmetrical and asymmetrical gaits do not apply to bipeds.

Figure 2: Examples of footfall categories. These are transient terms and can only be applied to describe the foot contacts of an individual stride.



In humans, both walking and running are symmetrical gaits, as one limb will repeat the action of its paired limb one half stride later. In contrast, the bipedal hop is an asymmetrical gait. Using the previously defined parameters for a symmetrical gait, a hop would entail both feet moving as one, with no stride phase shift, resulting in an asymmetrical gait.

Perhaps the best categorization of gait for individual species would be those based on velocity. It has been noted that particular species have a preferred gait pattern for particular velocities.[1] In our species of interest, the dog, Blaszczyk *et al* found a walk-trot transition velocity between 0.8 and 1.2 m/s, with a trotting gait appearing in every dog examined at speeds ranging between 1.2 and 3.1 m/s.[3] It should be noted that even with a generalization about a particular species, some researchers have suggested that there may be slight differences within that species. This suggestion should be of special interest to researchers utilizing the dog as their model quadruped, as it displays considerable morphometric variability, not only in size, but in localization of the center of mass and preferred stance. Previous data from Budsberg *et al* found that mesomorphic dogs generated greater forces in the y axis by the forelimbs due to the cranial shifting of the center of mass of these dogs to a point closer to the forelimbs.[9] Additionally Rumph *et al* suggests that breed or group specific stance predilection, such as the more plantigrade habit of a pointer-type dog when compared to that of the more digitigrade habits of greyhounds, might artificially influence the results of a ground reaction force survey.[37] Both of these considerations are important when choosing the types of dogs that one would use in their research, as a widely varying morphological population could either mask or overemphasize differences in ground reaction forces, especially those of impulse, within the test group.

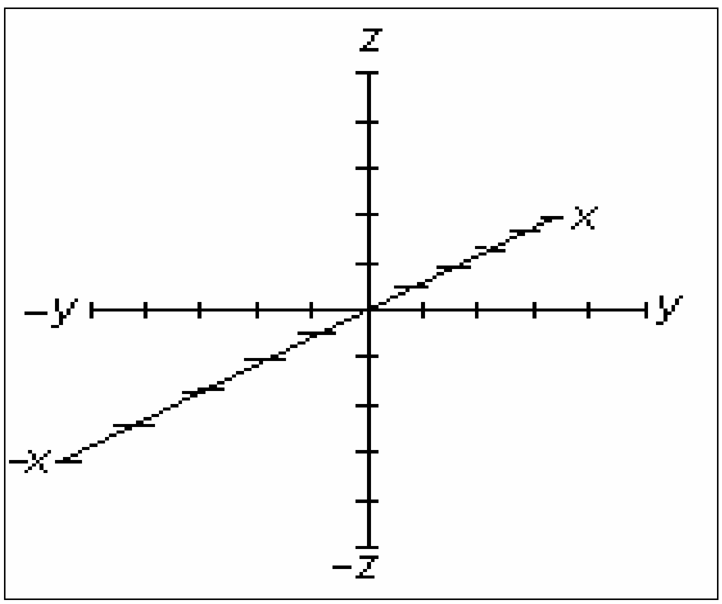
THE TOOLS OF GAIT ANALYSIS

The study of the biomechanics of motion has developed over the last hundred years for both normal and abnormal gaits. However, technological advances in the past few decades have resulted in a dramatic increase in both the number of research endeavors and their quantitive value.[1, 10, 41] Today, gait analysis is an increasingly popular investigatory tool among a variety of research disciplines. This progress is due in large part to the advances in technology used by researchers to study the complex forces at work in the simple act of locomotion[16]. These advances in gait analysis have led to the ability to provide quantitative evaluation of the success of a surgical procedure, the efficacy of an experimental drug, and even the ability to diagnose a pathologic gait before it can be identified visually.[16] Further, these advances have moved the experimental techniques of gait analysis beyond the obligatory development of a baseline database for normal gait. Increasingly, researchers are evaluating the validity of some of the experimental variables of data collection protocols.[7, 9, 17, 38, 42, 45] The research presented here is meant to add to the developing body of data collected to analyze the statistical significance of the variables of a data collection protocol, rather than of an experimental variable itself.

The tools used to analyze gait can be divided into two approaches, kinematic analysis and kinetic analysis.[2] In a kinematic approach to gait analysis, an image recording device tracks the test subjects' limbs and body as they move through space. Depending on the complexity of aspect of gait that the researcher is interested in analyzing, this image recording device can vary in complexity from a video cassette recorder to an optoelecrical system requiring infrared light emitting diodes for markers and infrared sensors to record the path of the subject through the test field. The kinematics approach provides its best analytical function while the limb is in its swing phase, which is the phase when the majority of limb action is occurring.[2] It has been suggested that the kinematic approach is best used to study segmental velocities and acceleration, as well as to identify any asymmetry present in the movement of the test subject.[2] But, as powerful of a tool as kinematic analysis can be during the swing phase of a gait, it has been found to be less sensitive to the forces exerted on the ground during the stance, or load bearing phase of gait.[2] As most gait pathologies manifest themselves during load bearing, the alternative approach of kinetic analysis has become a favored tool for both human and veterinary gait analysis.[1,2, 4-29, 38-45]

Kinetic analysis utilizes a force plate to collect ground reaction forces associated with a footfall event. Ground reaction forces are generated in response to the forces exerted on the ground by the test subject during a gait and are in accordance with Newton's third law of motion. Newton's third law states that for every action there is an equal and opposite reaction. It is this opposite reaction to the force exerted on the ground by the footfall event that is termed the ground reaction force.

Figure 3: Example of the tri-axial Cartesian coordinate system. When considering ground reaction forces in accordance to Newton's third law of motion for every force applied to the ground by a body along one of these axes, an equal force will be exerted in the opposite direction.



These forces are generated along the axes of a right-handed orthogonal represented by the x, y, and z axes of the three dimensional Cartesian coordinate system.[1, 13, 16, 20, 21, 32] In an individual footfall event, the medial/lateral forces experienced at the force plate are represented in the x axis, with medial forces recorded as negative values and lateral forces recorded as positive values. Cranial/caudal forces are represented in the y axis, with cranial forces (deceleration) recorded as negative value and caudal forces (acceleration) recorded as positive values. Lastly, the z axis represents forces generated in the vertical axis.[13] The forces generated in the three coordinate axes are described as having two quantitative qualities, namely a peak force and an impulse.[18] The measurement of peak force in any axis identifies the maximal force applied by a limb that is in a stance phase while on the force plate. The impulse is a correlation measurement that identifies total force (peak force) over time of contact with the force plate.[10, 16]

Two types of devices are used to measure ground reaction forces, either a strain gauge force plate or a piezoelectric force plate. A strain gauge force plate produces an electrical signal when a force applied to the plate alters the resistance of strands of wire within the gauge, producing an electrical current in accordance with Ohm's law. Ohm's law states that a current is equal to the electromotive force divided by resistance. When a strain gauge has a force applied to it the resistance of the wire is reduced and the current will increase. Typically, strain gauges are best used for force application of longer durations, as with a weight scale. A piezoelectric force plate, on the other hand, utilizes a quartz transducer that produces an electrical charge that is strictly proportional to the force applied to the plate. Piezoelectric sensors have the widest measuring range of all force sensor technologies but are best used for short term applications of force. Whichever type of force plate is used, the basic function is the same; deformation of the plate is created by the force exerted on the plate by the test subject, and that mechanical force is translated into an electrical force that is measured and recorded.[2, 45]

The forces generated during locomotion are a combination of the passive forces exerted by gravity on the body and the active forces generated by the body itself. In quadrupeds the forelimbs, which are closer to the center of gravity for most body types, are the support limbs. The hind limbs, with their relatively larger muscle mass, are the power limbs. As such there is an expected inequality with respect to the workload between these pairs of limbs. It has been documented that a clinically normal dog should register symmetrical forces between the two constituents of each limb pair, either forelimbs or hind limbs.[7] It is therefore the absence of symmetries within these limb pairs in ground reaction forces that identify a pathological gait via force plate analysis.[7, 14]

We have hypothesized that starting distance will have a significant effect on the peak vertical force and associated impulse of our test subjects. We propose that through the investigation of our chosen data collection variable, i.e. where the gait is initiated relative to the collection plate, we can remove one more questionable parameter from future biomechanical investigation. As this is a preliminary inquiry into the possible effect of this particular variable of data collection, we will utilize orthopedically normal dogs.

CHAPTER II

MATERIALS AND METHODS

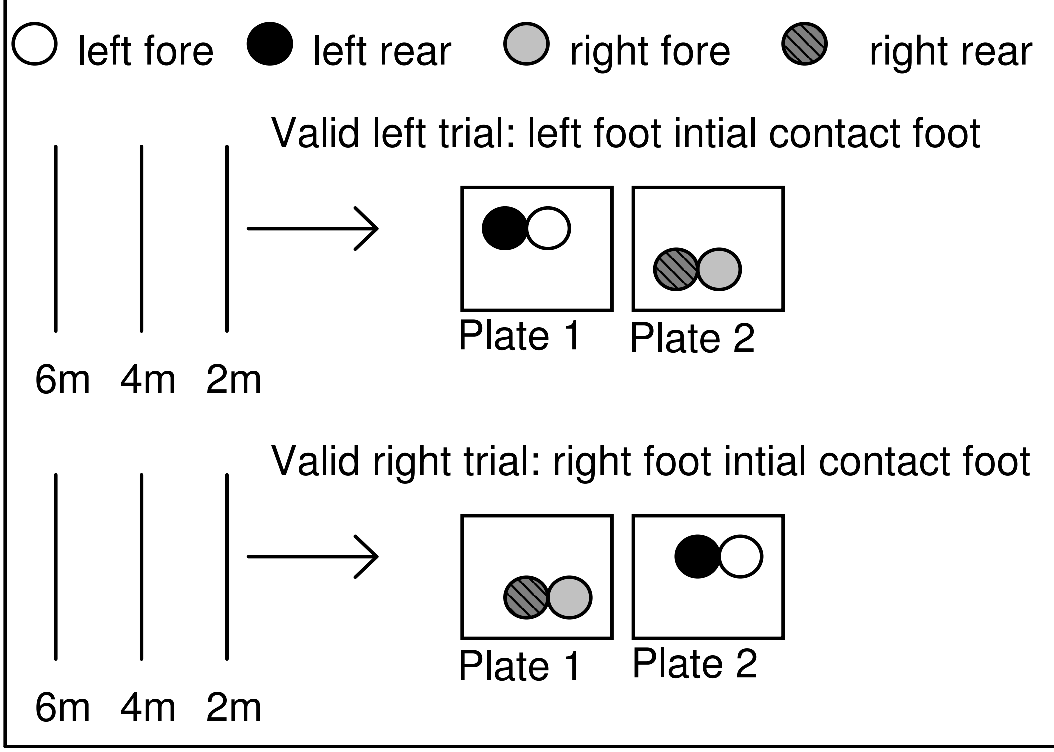
DOGS

The test group consisted of five adult dogs, each between 20 and 30 kilograms and of consistent body size and shape, with no history of musculoskeletal abnormalities. The participants received a physical exam and were considered to be clinically normal. Radiography of the pelvis was performed under sedation to exclude any preexisting musculoskeletal abnormalities. The sole exception to these conditions being that one of the test subjects had received OFA[a] certification within six months of the data collection and therefore did not have radiographs taken by the investigator. All of the test subjects were the personal pets of employees of the Teaching Hospital of the College of Veterinary Medicine, University of Georgia and were leash trained.

EQUIPMENT AND DATA COLLECTION PROTOCOL

Two identical strain gauge biomechanical force plates[b] mounted flush with the surface, at roughly the midpoint, of a 12-m platform were used. Both force plates interfaced with a dedicated computer where data were collected, processed, and stored using dedicated software[c] as previously described.[6, 8] The data collection rate was 1,000 Hz. The test subjects were trotted over the force plate starting from each of three distances from the first plate; 2-, 4-, and 6-meters, until ten valid foot falls were captured for the first-foot contact events; 5 right and 5 left. No overt handler influence was exerted on the test subject as to which fore limb paw would contact the first plate. A valid foot fall event was defined as a trial where a forepaw strikes the first force plate and after a short period of time the ipsilateral hind paw strikes the same force plate, with the contralateral paws following the same parameters for contact with the second force plate (figure 4). Additionally, footfalls had to occur completely within the dimensions of the force plate, with only the prescribed number of contact per plate being considered valid. The latter condition of validity was judge by the combined observations of both the handler and system operator, with final trial validity judged by the force curve pattern and foot contact location recorded by the force plate software. A VHS recording was made of all trials and used to confirm first foot contact when either handler or system operator could not determine said event.

Figure 4: Diagram for valid footfalls



The subjects were trotted across the across the force plates at their preferred velocity, but only trials between 1.7 and 2.1 m/s were recorded as valid. To allow for natural inter dog variability in preferred velocity, there was an allowance of +/- 0.1m/s beyond the set velocity parameters. For a particular dog in a particular trial set, a value of 1.6 or 2.2m/s was scored as valid so long as all other velocities from that data set were within 0.4m/s of the extreme value. Values of acceleration/deceleration greater than +/- $0.5m/s^2$ resulted in a trial being rejected.

Ground reaction forces for the three axes, x, y, and z were collected. For the purposes of this project, only forces in the z axis were analyzed. Those forces analyzed were maximal force exerted in the z axis, the peak vertical force (PVF), and the durational impulse associated with that peak force, the vertical impulse. The peak vertical force was measured in units of Newtons (N) and was normalized by the body weight in kilograms of the test subject (N/kg). The vertical impulse values were measured in Newtons exerted per second of plate contact, and was also normalized to test subject body weight (N-sec/kg).

A total of five data sets were collected on each test subject. Consecutive collection sessions were held a maximum of one week apart with no less than two days elapsing between any one subject's consecutive collection periods. The weight of each subject was recorded on each collection day, prior to the day's collection period . As none of the subjects varied in weight more than 1.0kg over the entire experiment, the first recorded weight of each subject was stored by the force plate software and that original weight served as the base weight through out the experiment.

Statistical Evaluation

Data analysis of the test group initially considered a 6-factor complete block ANOVA with both fixed (distance, plate, fore- vs. hind limb, and right vs. left side) and random factors (dog and trial) for each response variable, peak vertical force and vertical impulse, in the z axis. The significance level was set at $p < 0.05$. When a statistic was found to be significant, means of interest were evaluated with post hoc tests. Post hoc test used in this analysis was the Fischer's Least Significant Difference (LSD).

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a OFA, Orthopedic Foundation for Animals Columbia, Missouri

b Model OR6-6-1000, Advanced Mechanical Technology Inc, Newton Mass.

c Vetforce, Sharon Software Inc, Dewitt, Mich.

CHAPTER III

RESULTS

Statistical analysis identified significant differences in total body vertical impulse as a result of distance, with a $p = 0.0479$ and $\alpha = 0.05179$ (figure 5). Further analysis revealed a statistically significant effect of distance on the vertical impulses of the forelimb ($p=0.012$, figure 5). Both of the above differences were only found to be significant between the two extreme distances, 2 and 6 meters; neither extreme distance produced vertical impulses significantly different from those produced from the 4 meter starting distance. Analysis of the hind limb vertical impulses from the three starting distances found no significant effect (appendix C). Total body peak vertical forces were not found to be significantly affected by the fixed variable of distance (figure 6).

Additional statistically significant differences were found in both peak vertical forces and associated impulses due to the random variable of dog. The fixed variable of fore- and hind limb pair within individual dogs was also found to have a statistically significant effect on both peak vertical forces ($p<0.001$), and associated impulses, ($p<0.001$). The fixed factor of plate had no statistically significant value on either PVF or vertical impulse. The fixed factor of right vs. left side was found to have no effect on either peak vertical forces or vertical impulses. Clinically, right side contacts had a mean of 97.58 N/kg, while left side contacts had a mean of 97.20 N/kg. This data produces a non-significant p value. Vertical impulses generated from right and left side contacts were not found to be significant; right side contacts produced a mean of 12.42 N-sec/kg, while left side contacts produced a mean of 12.48 N-sec/kg. The considered random factor of trial was found to have no significant effect on either peak vertical force or associated impulses, contributing less than 0.05% of the total variability in peak vertical forces and 5% of total variability in vertical impulses due to random factors. As a result, trial was combined with repetition as a factor of dog variability (appendix B). No combination of effects was found to have a significant effect on either peak vertical force or associated impulse without having a constitutive response factor having a significant effect on its own.

Figure 5: Mean (± SE) vertical impulses generated at a trot from three starting distances; 2, 4, and 6 meters. * Significant effect ($p < 0.05$) seen in the total body and forelimb impulses between the 2 and 6 meter starting distances.

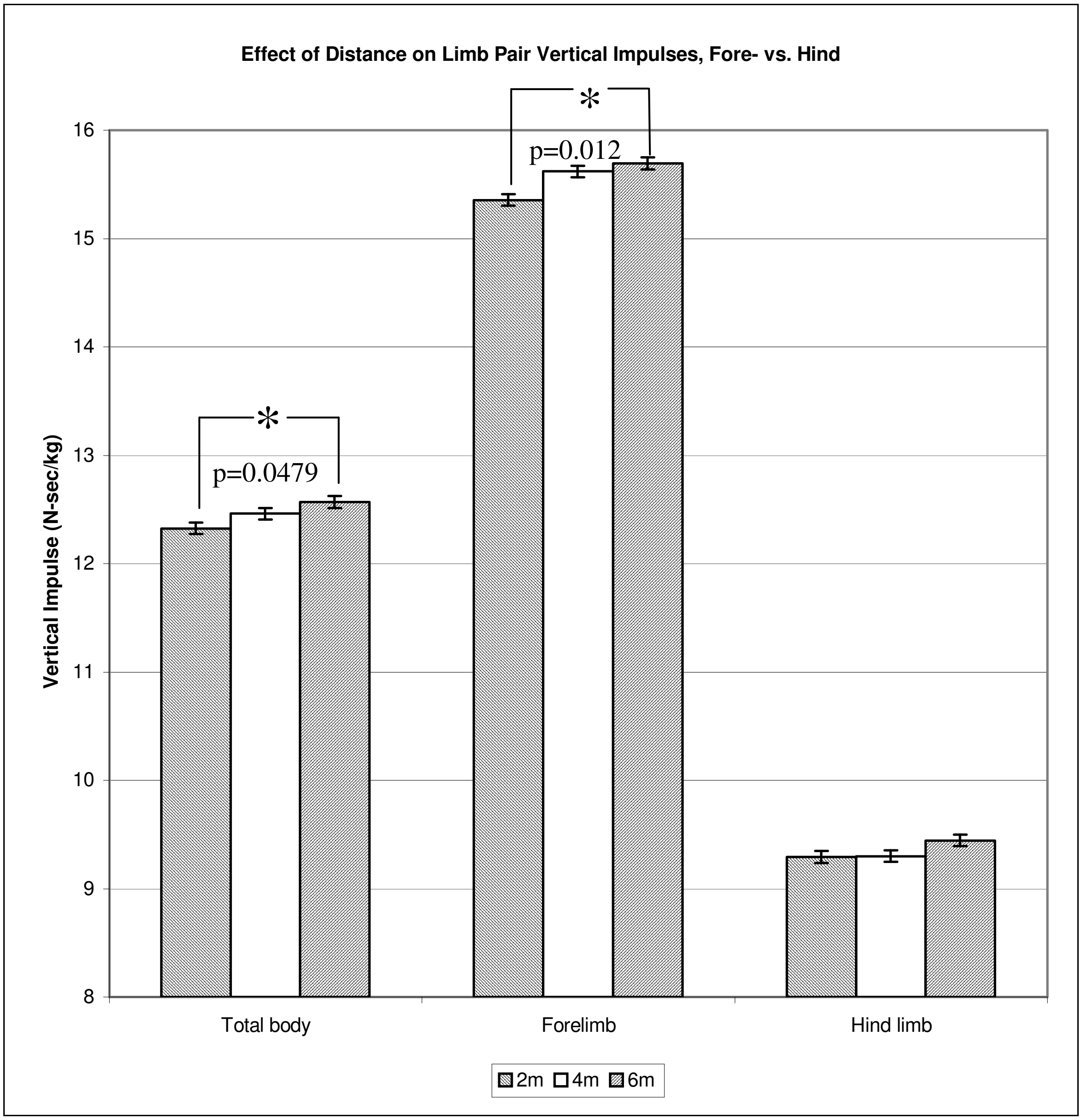
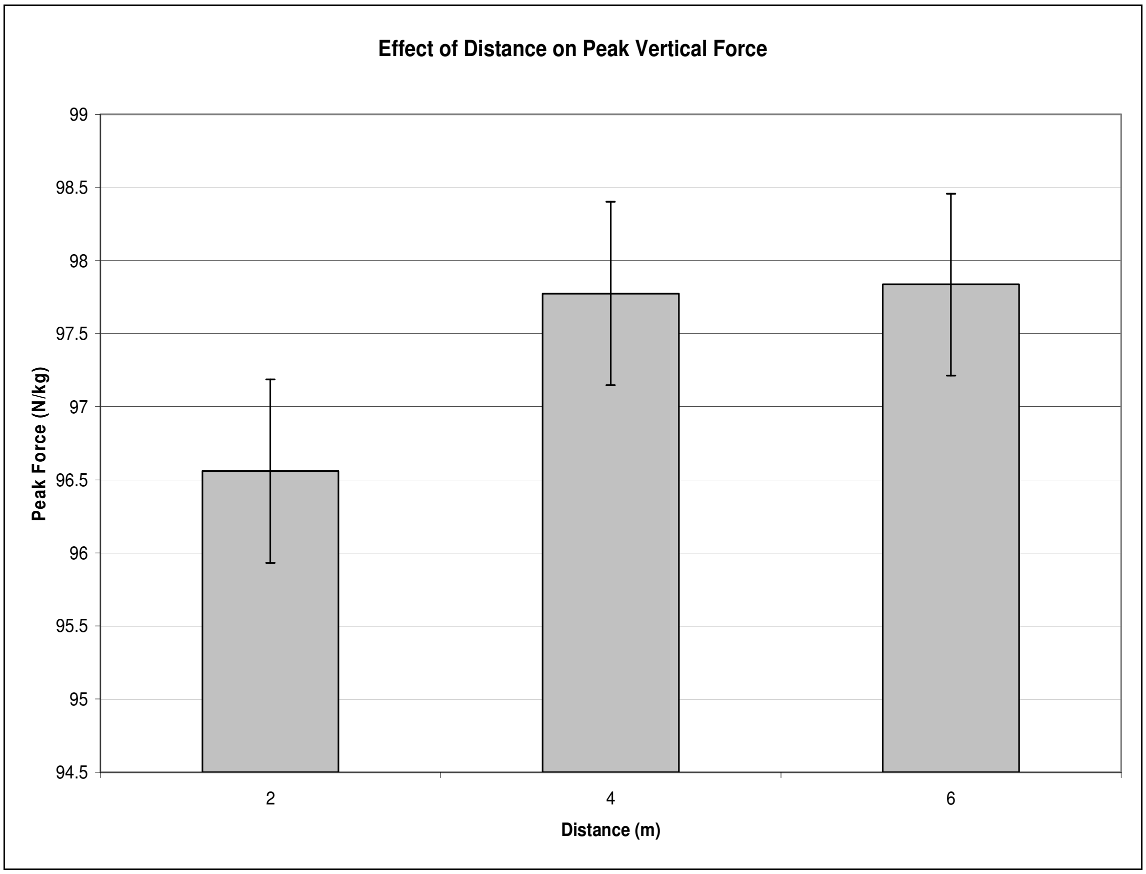


Figure 6: Mean (± SE) peak vertical forces generated at a trot from three starting distances; 2, 4, and 6 meters. Starting distance had no statistically significant effect (p<0.05) on peak vertical forces in our study.



CHAPTER IV

DISCUSSION

In recent years researchers investigating possible areas of statistically significant variability have worked to identify which of these forces, peak and/or impulse, and in which axes, x, y, and/or z, are required to produce valid conclusions based on the data collected.[2, 5, 9, 11, 14, 18, 20, 23, 29-32, 35, 36, 41-44] Specifically, researchers have identified peak and impulse forces in the z axis as displaying the most symmetry between contralateral limb pairs in the absence of pathological gait abnormalities.[9, 31, 37] It follows then that asymmetry in contralateral ground reaction force indicates a pathological gait. Moreover, the degree of return of contralateral ground reaction force symmetries can be used to quantify the success of surgical or drug intervention on a gait affecting orthopedic defect or the usefulness of post-intervention physical therapy.[40]

The use of morphometric parameters to normalize force plate data to physical measurements of the dog, such as height at shoulder or length of femur, has been shown to correlate well to ground reaction forces, but the parameter of body weight has been found to be the most accurate and reproducible morphometric normalizer.[7, 24] It has been suggested that future research should use this morphometric parameter as the standard measurement for normalizing ground reaction force data.[7] As such, we have selected body weight as the morphometric parameter for normalizing our test subject. Concern involving variability due to handlers has been addressed by previous researchers and it has been determined that multiple handlers can be used without appreciable influence on the data produced.[20]

The need to collect the most statically significant data in the fewest number of trials has been identified by Renberg *et al* as especially important when analyzing the gait of a clinically lame dog, as unnecessary trials may lead to fatigue of compensatory muscle groups and exacerbate the lameness, resulting in ground reaction forces that may not be a true and accurate indication of the “normal” dysfunctional state.[34] The number of attempts needed to collect the desired number of valid trials in our research does not have this concern, as we were using dogs with no history of gait effecting dysfunction. Nevertheless, this variable needs to be considered, as it is a source of variability in ground reaction forces for dogs with a history of lameness.[22]

Lastly, the effect of velocity on ground reaction forces has been addressed in previous studies. It has been found that there was little variation in ground reaction forces in the x and y axes at three distinct speeds of trot; slow (1.5-1.8 m/s), medium (2.1-2.4 m/s), and fast (2.7-3.0 m/s), in dogs with similar morphometrics.[24, 35, 36] This study also showed that of dogs with similar morphometrics, ground reaction forces in the z-axis can be affected by variations in velocity at a trot. The effect on peak vertical forces and vertical impulses have been shown to be inversely influenced by trot velocity within an individual dog; increased trot speed increased peak vertical forces while at the same time decreased the vertical impulses in both fore- and hind limbs. It is therefore more important for the velocity range of an individual test subject to remain within a narrow range throughout an experiment than it is for that test subject to display velocities similar to the rest of the test participants.

Our starting distances were selected by starting with the average size of veterinary kinetic gait analysis platforms. From that average distance we selecting one starting point closer to and one point further from the force plate. As most researchers use an approximately 3 to 4 meter platform, we selected 2, 4, and 6 meters as our starting distance. The use of 3 to 4 meters by most veterinary gait analysis labs seems to be based on the space available to the researchers and the assumption of the completion of the gait initiation event. As stated previously, the gait initiation event and steady state gaits are expected to display different biomechanical qualities on force plate analysis, owing to their different purposes in locomotion. Therefore, by selecting a starting distance of approximately 3 to 4 meters, it is believed that the chance of the test subject will contact the force plate while still in a gait initiation event will be unlikely.

Our analysis, when considering the total body vertical impulse and more specifically the forelimb vertical impulse, revealed increasing values with significance found between 2 and 6 meters only (figure 5). These findings are of importance because vertical impulse force has been shown to display more sensitivity than peak vertical force to pharmaceutical and/or surgical treatments for pathologic gaits, while maintaining a correspondingly small variance in normal dogs at a trot.[7, 21] This data strongly suggest that if a researcher is evaluating forelimb vertical impulses, they need to document and apply consistence reproduction of the starting distance. Distance was not found to have a significant effect on hind limb vertical impulses (figure 5). This may be due to an inability to accurately identify a significant effect at the relatively low magnitude of change seen in the vertical impulse values generated by the hind limbs. As both the total body and the forelimb and hind limb individually displayed a trend to increased vertical impulses over distance, we speculate that there may actually be an effect of distance on the vertical impulses generated by the hind limb.

Peak vertical force alone, for which we found distance to not have a significant effect on, may not identify subtle gait pattern changes accurately (figure 6). This may in part be due to the inability of peak vertical force to describe changes in the force curve, which is an indicator of a gait abnormality.[23] Interestingly, peak vertical forces also showed a trend to increased values over distance. This effect, like what was found in the mean vertical impulses of the hind limb over distance, did not rise to the lever of a significant effect, but the trend was observed. It is possible that an effect of distance is exerted on peak vertical forces, but is masked by the relatively high values coupled with a low magnitude of change in of the peak vertical forces and our sample set (type II error). This masking effect, if true, may also be due to the inability to accurately describe small but significant change, as mentioned above.

The observed trend to an increase in both peak vertical force and vertical impulse may also be explained by reexamining our definition of steady state gait. As stated before, kinetic analysis is only able to evaluate gait at the force plate. Therefore researchers must use the measurement of velocity at the force plate, along with ground reaction forces in the y axis, to describe a steady state gait. Previous research has identified ranges of velocity at a trot that do not display significant variability in ground reaction forces.[20] It is possible that velocities of the test subject prior to the initial plate contact need to be evaluated to further define steady state gait for kinetic analysis. We can speculate that instead of, or even in addition to, an inability to accurately identify significant events with a small magnitude of chance that the acceptable range of velocities at a trot may need to be reexamined.

Of the six experimental factors considered in this protocol, only dog and fore- vs. hind limb pair were found to have a statistically significant effect on both peak vertical forces and associated impulses. However, neither of these two factors would be expected to produce data to the contrary. The random factor "dog" contributes only a small portion of the total variance of the total attributed to random factors. Even though we used dogs of similar size and shape, they were not identical and therefore some degree of variability is expected. The variation due to fore- vs. hind limb pair is due to the different functions that the pairs perform in quadrupedal locomotion. The forelimb is the support limb; as a result of being closer to the bodies' center of mass its function is to support the body in space. The hind limb, or power limb, supplies the propulsion to move the body through space. As a result, the two limb pairs should, and do, display consistently different force diagrams on kinetic analysis.

The effect of right vs. left sides was removed from our final ANOVA calculation due to our use of orthopedically normal dog. As symmetry of ground reaction forces between contralateral limb pairs is an indication of an orthopedically sound test subject, there was no reason to expect, nor was there found a statistically significant effect from this fixed variable. The random factor of trial was combined with the factor of dog when it was found to only contribute a small amount of the total variance due to random factors for both of our response variables (appendix B).

CONCLUSION

The relative distance for the initiation of a trot from the force plates can affect the values of total body and forelimb vertical impulses in the normal dog. Future researchers utilizing kinetic analysis should make note of the relative distance from the force plate that they initiate the gait of their test subject in their protocols, especially when considering the vertical impulses generated by the forelimb. A reexamination of how kinetic analysis determines the presence of a steady state gait may also need to be undertaken by future researchers. By doing so, not only will their research be more valid, but also any other researcher interested in either reproducing their experiment or wanting to evaluate the data produced therein could do so without concern over the effect of distance on impulse forces.

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APPENDIX A: RAW DATA

D = Dog

T = Trial

m = Distance in meters

m/s = Velocity in meters per second

S = Side of first plate contact, right (R) or left (L)

P1 = Plate 1

P2 = Plate 2

PVF = Peak vertical force in newtons per kilogram

IMP = Vertical impulse in newtons per second of plate contact per kilogram

					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
1	1	2	1.80	L	542.1	84.1	L	384.8	49.3	R	523.8	85.5	R	382.4	52.3
1	1	2	1.85	R	547.3	79.2	R	367.3	50.5	L	523.0	80.5	L	364.5	58.8
1	1	2	1.90	L	569.9	85.4	L	377.2	49.8	R	551.7	87.6	R	343.4	54.6
1	1	2	1.78	L	533.6	78.8	L	338.0	43.0	R	538.3	82.4	R	320.8	47.5
1	1	2	1.97	R	551.0	81.8	R	381.9	53.5	L	532.9	78.1	L	366.7	53.5
1	1	2	1.88	R	577.1	88.0	R	400.6	55.1	L	558.6	85.8	L	389.3	53.5
1	1	2	1.95	R	606.9	86.8	R	418.5	51.3	L	578.7	83.9	L	405.8	50.2
1	1	2	1.91	L	547.2	81.8	L	381.1	50.3	R	583.8	86.3	R	385.0	51.5
1	1	2	1.81	R	606.4	86.1	R	366.0	47.0	L	600.9	86.0	L	397.1	55.1
1	1	2	1.89	L	550.0	89.4	L	398.1	53.3	R	535.8	87.0	R	386.5	50.4
1	1	4	1.89	R	541.2	79.7	R	355.8	46.2	L	572.7	88.3	L	382.3	52.4
1	1	4	1.81	L	498.5	81.3	L	372.5	51.4	R	518.6	87.3	R	365.1	53.6
1	1	4	2.00	L	541.6	82.6	L	393.6	52.0	R	532.1	85.7	R	370.3	51.4
1	1	4	1.99	L	570.8	83.7	L	371.5	50.5	R	576.8	84.2	R	373.1	51.7
1	1	4	1.90	R	552.4	85.2	R	388.9	50.7	L	577.7	88.8	L	395.4	53.0
1	1	4	1.90	R	594.1	86.0	R	383.0	49.3	L	546.0	86.7	L	386.4	52.5
1	1	4	2.05	R	556.8	80.9	R	393.7	50.3	L	583.1	86.8	L	400.1	51.7
1	1	4	1.85	R	580.1	89.0	R	388.2	54.2	L	588.4	91.5	L	366.9	53.5
1	1	4	1.78	L	537.8	88.8	L	368.5	52.0	R	534.9	90.0	R	373.4	55.4
1	1	4	1.77	L	569.0	89.2	L	370.0	50.9	R	551.4	87.8	R	371.1	52.1
1	1	6	2.02	L	574.1	82.7	L	379.2	48.4	R	560.3	85.8	R	376.0	51.1
1	1	6	1.88	L	588.9	85.5	L	386.4	49.8	R	585.2	88.8	R	374.9	50.2
1	1	6	1.83	L	530.7	79.5	L	384.7	52.1	R	558.8	86.6	R	362.9	50.6
1	1	6	1.95	R	524.4	83.5	R	343.4	49.6	L	524.2	84.7	L	362.5	52.7
1	1	6	1.96	L	526.0	85.1	L	364.7	56.8	R	519.2	85.2	R	359.7	58.9
1	1	6	1.76	R	545.9	86.0	R	368.1	49.8	L	548.8	89.0	L	366.3	52.7

1	1	6	1.86	L	551.1	83.1	L	383.6	51.2	R	572.7	88.0	R	367.4	51.2
1	1	6	1.73	R	545.2	86.8	R	389.8	53.2	L	558.3	89.7	L	381.2	53.4
1	1	6	1.85	R	541.4	86.6	R	367.4	50.7	L	543.2	88.0	L	372.8	51.4
1	1	6	1.93	R	562.9	84.6	R	387.9	51.7	L	561.8	84.4	L	381.1	51.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
1	2	2	1.87	L	557.9	81.9	L	264.7	37.6	R	545.9	92.4	R	374.1	61.2
1	2	2	1.99	L	548.3	75.1	L	370.5	53.8	R	531.2	81.9	R	371.8	51.7
1	2	2	1.92	R	599.1	88.9	R	381.7	56.1	L	555.2	86.6	L	361.3	55.6
1	2	2	1.94	R	552.8	89.7	R	363.5	55.4	L	514.1	85.9	L	346.5	56.5
1	2	2	2.02	R	632.0	83.0	R	356.3	43.1	L	603.3	79.8	L	386.6	54.0
1	2	2	2.01	R	620.9	81.9	R	359.0	47.6	L	611.1	83.9	L	375.4	51.9
1	2	2	1.96	L	614.7	85.5	L	412.9	56.0	R	616.0	90.8	R	377.8	52.2
1	2	2	1.93	L	579.9	82.1	L	394.9	50.9	R	588.4	90.8	R	378.5	52.2
1	2	2	2.04	L	617.3	92.3	L	406.3	57.6	R	620.5	90.3	R	399.6	62.3
1	2	2	2.03	R	597.7	90.4	R	380.1	51.8	L	586.7	82.8	L	176.5	23.8
1	2	4	1.99	R	579.7	80.6	R	326.1	45.3	L	542.6	87.6	L	356.0	56.7
1	2	4	2.03	L	573.3	86.6	L	373.4	53.2	R	566.8	93.0	R	355.9	51.5
1	2	4	1.84	L	586.0	90.9	L	412.1	54.7	R	578.6	88.1	R	405.4	54.4
1	2	4	2.08	L	656.7	79.2	L	359.0	49.2	R	582.7	91.2	R	361.2	58.0
1	2	4	2.01	L	559.0	79.8	L	387.0	51.5	R	545.6	84.7	R	335.7	45.6
1	2	4	1.81	L	527.1	84.0	L	360.7	54.9	R	514.9	91.7	R	326.6	56.6
1	2	4	1.89	R	560.1	82.3	R	363.3	48.0	L	571.1	88.8	L	390.7	55.5
1	2	4	2.02	R	591.8	88.6	R	392.9	52.9	L	565.4	89.0	L	388.5	52.5
1	2	4	1.97	R	593.8	90.2	R	352.1	49.9	L	567.2	86.5	L	300.8	41.8
1	2	4	2.00	R	595.8	84.6	R	390.7	53.9	L	599.3	89.8	L	372.0	51.3
1	2	6	2.10	L	555.6	78.2	L	397.6	54.7	R	526.6	88.3	R	423.3	55.0
1	2	6	1.96	R	574.9	83.2	R	384.6	49.0	L	560.4	81.1	L	388.0	51.5
1	2	6	1.83	L	545.7	86.4	L	383.0	54.2	R	524.5	85.3	R	368.5	51.5
1	2	6	1.98	L	582.8	78.2	L	390.4	53.5	R	603.8	86.9	R	358.1	50.6
1	2	6	2.08	L	566.3	82.9	L	358.8	48.6	R	556.0	81.6	R	336.1	47.2
1	2	6	1.83	R	530.0	87.0	R	376.8	54.7	L	499.3	85.4	L	382.8	54.2
1	2	6	1.76	L	549.8	85.8	L	384.9	52.8	R	567.0	87.3	R	366.4	51.9
1	2	6	2.10	R	543.7	85.6	R	364.7	49.5	L	528.7	83.9	L	382.9	54.4
1	2	6	1.84	R	586.2	85.0	R	375.6	53.2	L	559.8	85.6	L	353.0	51.1
1	2	6	2.02	R	576.9	87.3	R	397.1	51.7	L	587.7	86.2	L	397.5	54.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
1	3	2	1.85	L	521.5	80.1	L	367.8	55.6	R	556.5	89.8	R	355.6	53.6
1	3	2	1.72	R	490.9	92.4	R	390.7	56.8	L	522.4	80.8	L	382.0	53.0
1	3	2	1.74	L	487.2	81.0	L	331.1	51.8	R	496.2	88.5	R	377.2	56.6
1	3	2	2.01	L	537.2	86.3	L	375.0	53.7	R	577.6	87.7	R	370.3	52.0
1	3	2	1.95	L	574.4	86.5	L	329.6	43.6	R	565.6	82.3	R	137.9	19.0
1	3	2	1.79	L	556.4	81.9	L	402.6	52.1	R	510.9	75.3	R	393.7	52.2
1	3	2	1.76	R	557.4	89.5	R	400.1	55.3	L	564.3	87.4	L	402.6	53.4
1	3	2	1.75	R	598.4	88.9	R	358.8	50.5	L	591.4	85.3	L	382.8	52.6
1	3	2	1.86	R	586.2	90.7	R	401.1	56.2	L	559.6	85.7	L	371.4	48.8
1	3	2	1.96	R	539.0	81.4	R	378.0	50.5	L	555.4	83.5	L	383.3	51.9
1	3	4	1.95	R	536.6	82.0	R	381.9	51.2	L	532.0	83.6	L	374.8	50.2
1	3	4	2.03	R	574.3	88.9	R	359.3	51.5	L	547.9	80.6	L	385.1	55.6
1	3	4	2.02	L	604.7	87.7	L	396.9	51.9	R	574.1	80.8	R	396.0	52.3
1	3	4	2.02	L	544.3	82.2	L	390.7	52.6	R	565.0	85.9	R	382.4	52.9
1	3	4	1.89	L	574.3	86.5	L	411.6	54.5	R	581.1	86.6	R	371.7	50.3
1	3	4	1.96	L	569.3	86.2	L	410.4	53.9	R	596.9	86.8	R	388.5	51.5
1	3	4	1.95	L	580.7	86.4	L	405.3	55.1	R	584.9	87.4	R	379.7	51.6
1	3	4	2.02	R	560.1	83.0	R	387.0	50.3	L	544.2	83.6	L	382.6	53.3
1	3	4	1.95	R	550.1	85.9	R	396.2	53.6	L	566.6	85.7	L	386.5	52.9

1	3	4	1.98	R	551.0	84.9	R	393.1	53.0	L	551.9	84.3	L	388.3	53.6
1	3	6	1.96	R	544.8	79.7	R	379.0	52.1	L	578.4	84.7	L	390.0	52.9
1	3	6	1.98	R	564.3	83.2	R	362.8	51.1	L	564.4	86.7	L	369.7	52.6
1	3	6	2.06	R	564.0	82.0	R	363.7	49.5	L	587.0	87.9	L	387.2	54.6
1	3	6	1.83	R	572.9	86.3	R	393.9	52.1	L	551.0	83.5	L	383.4	53.0
1	3	6	1.88	L	605.5	85.1	L	403.4	53.9	R	579.6	85.6	R	351.8	50.5
1	3	6	1.96	R	612.1	86.8	R	403.6	55.0	L	589.6	87.6	L	382.9	51.7
1	3	6	2.06	L	534.1	77.7	L	376.5	54.1	R	541.7	79.8	R	371.5	51.9
1	3	6	1.98	L	489.8	81.3	L	350.1	55.3	R	510.7	85.4	R	355.4	53.7
1	3	6	2.11	L	542.6	84.5	L	375.0	54.8	R	562.2	89.8	R	367.0	53.9
1	3	6	1.88	L	583.1	86.1	L	382.4	53.1	R	558.2	87.2	R	366.5	53.2
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
1	4	2	1.75	L	587.3	85.4	L	416.6	53.1	R	582.3	85.2	R	383.3	51.1
1	4	2	1.82	R	616.6	87.9	R	422.9	53.1	L	561.7	81.0	L	418.6	53.4
1	4	2	1.86	R	578.8	81.7	R	374.6	45.6	L	584.8	87.3	L	416.4	53.5
1	4	2	1.75	L	568.3	81.3	L	412.3	51.9	R	588.1	86.5	R	389.7	50.7
1	4	2	1.72	R	579.4	89.2	R	396.6	54.0	L	599.7	91.3	L	397.0	57.4
1	4	2	1.82	R	580.7	81.7	R	386.4	48.0	L	575.0	83.4	L	414.1	53.0
1	4	2	1.72	L	587.2	91.0	L	411.7	56.1	R	605.6	95.4	R	378.4	52.9
1	4	2	1.65	L	602.7	89.8	L	422.2	56.5	R	615.1	90.5	R	381.1	51.9
1	4	2	1.76	R	687.3	96.2	R	365.0	48.0	L	570.6	87.9	L	403.0	56.1
1	4	2	1.76	L	602.6	88.8	L	437.1	56.2	R	602.1	86.8	R	398.9	49.2
1	4	4	2.10	R	655.3	85.2	R	405.3	47.6	L	626.6	88.5	L	424.9	55.3
1	4	4	1.96	L	583.4	83.6	L	412.4	49.8	R	607.6	87.8	R	387.2	49.9
1	4	4	2.01	L	610.8	84.3	L	428.7	52.5	R	626.6	88.4	R	401.5	50.6
1	4	4	1.98	L	581.2	87.2	L	413.8	52.9	R	578.1	87.4	R	379.0	49.7
1	4	4	1.92	R	637.5	86.6	R	417.0	49.1	L	608.4	86.9	L	398.6	49.8
1	4	4	1.88	L	628.2	89.0	L	433.3	55.0	R	623.4	90.0	R	378.0	48.7
1	4	4	1.96	L	592.5	83.8	L	412.6	49.9	R	569.7	85.8	R	372.3	49.2
1	4	4	1.91	R	612.7	87.0	R	398.0	48.7	L	597.1	89.6	L	422.4	54.5
1	4	4	1.93	R	616.4	87.9	R	418.8	52.4	L	616.7	90.3	L	403.1	50.8
1	4	4	1.82	R	607.5	88.7	R	396.8	50.9	L	582.0	90.3	L	401.9	53.8
1	4	6	1.83	R	554.8	88.4	R	373.9	51.9	L	573.0	95.0	L	396.9	59.3
1	4	6	1.73	R	542.1	88.6	R	379.5	55.4	L	550.0	91.9	L	374.3	55.4
1	4	6	1.90	R	636.8	89.1	R	439.4	54.0	L	614.9	90.7	L	427.1	52.7
1	4	6	1.85	R	606.8	89.2	R	407.8	52.0	L	594.2	92.0	L	408.6	54.3
1	4	6	1.69	R	571.2	88.5	R	378.2	52.5	L	566.6	93.3	L	361.2	57.6
1	4	6	1.78	L	567.3	90.3	L	385.0	54.2	R	546.3	92.3	R	350.1	56.5
1	4	6	1.86	L	600.9	88.6	L	402.5	53.7	R	590.1	88.3	R	379.7	52.6
1	4	6	1.86	L	607.9	87.9	L	400.8	52.6	R	589.0	90.4	R	362.0	50.4
1	4	6	1.82	L	581.3	88.5	L	400.4	55.8	R	568.6	90.9	R	360.8	51.1
1	4	6	1.79	L	548.8	88.7	L	387.5	53.9	R	557.8	88.8	R	360.1	51.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
1	5	2	1.83	R	596.8	78.5	R	416.0	50.2	L	616.3	85.2	L	418.8	49.3
1	5	2	1.60	R	624.9	91.5	R	391.3	49.9	L	604.4	90.9	L	423.4	56.3
1	5	2	2.00	L	587.0	82.4	L	420.0	52.5	R	631.8	89.3	R	388.0	48.9
1	5	2	1.70	R	591.0	89.2	R	387.5	50.7	L	559.5	89.3	L	395.1	54.3
1	5	2	1.72	L	600.7	90.3	L	449.6	55.6	R	640.9	95.2	R	412.0	52.4
1	5	2	1.69	R	604.2	89.3	R	385.1	48.8	L	590.0	91.0	L	395.2	53.3
1	5	2	1.80	L	607.3	88.7	L	431.4	52.8	R	637.7	92.6	R	382.5	48.4
1	5	2	1.65	L	590.1	91.9	L	412.2	57.4	R	614.2	99.1	R	391.5	56.3
1	5	2	1.79	L	586.7	90.1	L	417.3	51.6	R	625.3	93.0	R	390.5	51.7
1	5	2	1.65	R	526.3	71.7	R	250.8	33.1	L	582.8	94.7	L	380.2	57.0
1	5	4	1.88	L	589.0	84.4	L	404.0	55.5	R	598.7	89.3	R	382.9	53.8
1	5	4	1.88	R	615.0	93.6	R	383.4	51.9	L	560.9	93.6	L	389.3	53.3

1	5	4	1.74	L	597.7	91.6	L	413.3	55.3	R	586.4	91.5	R	369.6	51.3
1	5	4	1.96	L	598.6	85.9	L	418.8	53.8	R	648.5	94.2	R	371.6	50.3
1	5	4	1.82	L	603.1	90.7	L	409.0	53.7	R	630.8	93.3	R	371.7	48.9
1	5	4	1.87	L	580.5	89.0	L	393.7	54.2	R	610.7	96.2	R	385.7	54.7
1	5	4	1.73	R	607.2	91.1	R	396.3	51.0	L	591.1	92.1	L	409.9	54.5
1	5	4	1.79	R	594.4	89.6	R	386.8	51.1	L	553.5	90.6	L	363.7	53.2
1	5	4	1.70	R	576.7	90.1	R	355.4	48.5	L	561.0	93.5	L	386.9	56.8
1	5	4	1.84	R	609.8	91.6	R	387.0	49.8	L	608.9	90.5	L	403.0	55.0
1	5	6	2.05	L	569.3	86.0	L	403.3	54.8	R	590.8	90.8	R	376.6	53.0
1	5	6	1.86	R	609.4	87.9	R	378.0	49.1	L	586.2	88.6	L	405.5	55.2
1	5	6	1.81	R	621.5	91.6	R	415.6	52.3	L	605.2	89.6	L	411.1	52.3
1	5	6	1.70	R	523.0	90.2	R	368.3	51.3	L	552.1	92.2	L	376.0	53.0
1	5	6	1.75	L	562.1	87.4	L	390.5	52.5	R	554.9	90.8	R	346.9	49.7
1	5	6	1.70	L	565.0	92.6	L	388.8	55.5	R	560.2	94.4	R	349.3	52.0
1	5	6	1.98	R	610.0	89.1	R	400.0	52.9	L	606.4	91.4	L	400.3	54.3
1	5	6	1.82	R	566.1	93.9	R	380.3	56.7	L	581.9	93.6	L	388.9	58.7
1	5	6	1.68	L	565.5	90.2	L	380.4	53.5	R	584.7	94.5	R	362.5	52.2
1	5	6	1.74	L	590.0	90.9	L	392.3	56.8	R	590.0	94.2	R	346.7	49.0
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
2	1	2	2.07	L	463.2	55.5	L	403.4	42.8	R	491.4	58.8	R	379.5	41.6
2	1	2	1.92	R	481.7	59.3	R	357.8	40.4	L	491.8	61.8	L	423.3	48.8
2	1	2	1.99	R	486.3	53.4	R	377.8	38.7	L	515.7	63.1	L	425.1	45.5
2	1	2	1.95	R	509.8	60.4	R	379.6	40.8	L	518.4	64.2	L	439.3	46.5
2	1	2	1.95	L	487.9	63.3	L	423.9	45.0	R	544.8	63.7	R	358.6	40.7
2	1	2	1.93	L	471.4	59.5	L	372.8	49.2	R	512.9	58.4	R	325.5	40.7
2	1	2	1.90	L	473.0	61.2	L	382.1	45.5	R	531.5	65.9	R	375.5	41.3
2	1	2	1.94	L	501.5	64.7	L	423.8	46.3	R	536.4	66.2	R	360.5	40.2
2	1	2	1.72	R	509.2	63.5	R	366.9	39.6	L	508.6	62.9	L	393.2	45.3
2	1	2	1.85	R	524.4	61.9	R	392.6	40.8	L	516.9	62.2	L	379.4	44.3
2	1	4	1.99	L	519.9	60.7	L	412.1	42.3	R	520.7	58.6	R	393.7	42.1
2	1	4	1.83	R	500.0	59.2	R	401.3	40.9	L	497.7	60.1	L	449.5	45.1
2	1	4	1.84	R	471.8	62.6	R	345.0	42.4	L	494.2	66.2	L	371.2	44.6
2	1	4	2.13	L	490.5	67.7	L	423.2	48.7	R	495.4	62.9	R	363.6	39.6
2	1	4	1.92	R	511.4	61.4	R	363.6	39.1	L	525.2	66.1	L	392.9	44.2
2	1	4	1.89	R	540.8	65.5	R	384.2	39.5	L	526.1	63.6	L	218.3	26.2
2	1	4	1.84	L	489.5	61.7	L	399.2	43.1	R	525.0	65.0	R	345.5	38.2
2	1	4	1.93	R	519.1	63.6	R	388.2	37.6	L	518.0	63.3	L	441.9	45.5
2	1	4	1.91	L	529.4	66.8	L	378.5	44.3	R	523.9	67.1	R	375.5	41.4
2	1	4	2.00	L	519.3	66.4	L	381.1	45.7	R	530.5	66.1	R	353.9	40.0
2	1	6	1.76	L	507.9	66.5	L	385.3	43.0	R	535.8	67.3	R	369.7	48.8
2	1	6	1.84	L	12.0	-0.1	L	385.3	0.1	R	3.1	0.0	R	369.7	0.0
2	1	6	1.92	R	530.2	66.6	R	364.9	38.7	L	509.5	67.9	L	359.0	43.7
2	1	6	2.09	L	522.5	65.3	L	412.9	42.5	R	532.9	66.9	R	379.7	38.0
2	1	6	1.97	L	524.7	64.6	L	386.9	43.2	R	535.7	67.5	R	349.0	39.0
2	1	6	2.00	L	505.8	63.1	L	409.3	44.0	R	526.5	65.2	R	360.5	39.7
2	1	6	2.10	R	528.6	62.7	R	375.6	39.1	L	529.6	63.0	L	405.0	44.3
2	1	6	1.91	R	496.1	67.0	R	367.2	42.6	L	480.8	62.9	L	367.7	46.8
2	1	6	1.87	R	526.3	68.0	R	362.3	41.3	L	494.8	64.4	L	377.8	44.7
2	1	6	1.95	R	529.0	65.3	R	387.8	40.0	L	506.2	65.0	L	408.8	45.5
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
2	2	2	1.99	R	523.9	58.7	R	385.4	40.1	L	508.0	55.0	L	391.3	43.5
2	2	2	2.09	R	536.5	63.2	R	352.7	41.2	L	475.5	59.7	L	380.4	45.4
2	2	2	1.82	R	499.8	68.1	R	335.9	44.1	L	468.9	63.1	L	333.6	45.2
2	2	2	1.93	L	458.8	57.9	L	360.8	42.0	R	452.3	57.8	R	343.4	44.0
2	2	2	1.99	L	597.8	62.7	L	434.1	46.0	R	611.2	66.3	R	380.8	43.8

2	2	2	1.94	L	528.6	58.3	L	452.9	44.9	R	594.5	65.2	R	401.6	42.0
2	2	2	2.12	L	522.9	64.1	L	391.3	42.1	R	560.4	66.7	R	376.7	43.4
2	2	2	2.07	R	519.4	69.1	R	354.5	41.2	L	486.7	64.1	L	331.7	43.3
2	2	2	1.75	L	497.4	65.5	L	359.4	43.6	R	524.1	68.7	R	316.0	39.8
2	2	2	1.93	R	579.6	68.4	R	374.5	43.8	L	560.9	65.7	L	389.4	46.4
2	2	4	1.86	L	534.1	66.9	L	408.7	47.2	R	542.3	69.4	R	351.7	42.0
2	2	4	1.95	R	560.7	64.9	R	380.6	41.6	L	532.6	62.1	L	395.1	43.6
2	2	4	1.87	L	522.8	65.7	L	353.0	45.5	R	506.0	67.7	R	334.7	45.1
2	2	4	2.01	L	536.7	65.9	L	402.8	44.7	R	544.4	66.8	R	353.8	40.7
2	2	4	2.11	L	532.1	63.7	L	405.5	40.3	R	542.6	63.8	R	406.7	41.8
2	2	4	2.10	R	519.1	59.8	R	378.5	38.9	L	517.3	61.4	L	422.4	47.7
2	2	4	1.92	L	514.9	63.3	L	412.4	43.2	R	525.6	63.4	R	372.6	40.6
2	2	4	1.84	R	536.3	66.3	R	367.1	40.2	L	498.5	65.4	L	390.5	46.1
2	2	4	1.87	R	521.5	64.1	R	353.1	39.8	L	523.6	64.7	L	385.0	45.7
2	2	4	1.86	R	539.8	66.3	R	371.6	40.8	L	514.5	66.7	L	393.5	44.7
2	2	6	1.92	L	518.7	67.3	L	386.5	44.2	R	532.5	66.6	R	359.4	42.1
2	2	6	2.03	L	430.5	52.1	L	385.3	48.9	R	470.4	53.3	R	326.2	42.9
2	2	6	2.02	R	484.2	58.9	R	348.7	40.9	L	496.7	62.2	L	428.8	47.3
2	2	6	1.95	L	479.3	60.2	L	415.2	44.9	R	528.6	65.1	R	372.2	38.7
2	2	6	1.86	L	523.6	65.9	L	394.2	45.6	R	531.0	66.0	R	334.6	40.6
2	2	6	2.04	L	522.1	63.5	L	397.6	43.8	R	527.7	63.3	R	361.0	42.3
2	2	6	1.95	R	528.2	64.7	R	355.1	40.6	L	509.9	65.7	L	368.5	44.6
2	2	6	1.91	R	604.9	80.9	R	316.2	46.2	L	551.6	75.1	L	315.0	51.5
2	2	6	1.90	R	541.2	65.1	R	357.2	39.3	L	397.8	54.9	L	277.3	32.2
2	2	6	2.06	R	540.3	66.3	R	352.0	40.0	L	512.9	63.5	L	395.0	45.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
2	3	2	2.02	R	489.4	62.2	R	363.9	40.0	L	486.2	66.1	L	381.7	46.6
2	3	2	1.72	R	489.5	71.4	R	337.2	41.5	L	452.7	70.3	L	370.1	49.4
2	3	2	1.66	R	514.7	70.4	R	338.8	41.3	L	496.7	68.0	L	371.7	46.7
2	3	2	1.85	L	525.0	68.2	L	374.5	43.9	R	531.3	70.7	R	333.3	43.4
2	3	2	1.71	L	495.1	66.4	L	342.2	43.7	R	481.7	64.2	R	367.0	48.4
2	3	2	2.12	L	531.9	64.3	L	426.9	45.1	R	569.0	67.4	R	367.6	39.4
2	3	2	2.05	R	579.9	71.4	R	361.6	40.8	L	523.8	61.9	L	387.5	45.7
2	3	2	2.13	L	498.8	60.9	L	425.6	43.2	R	539.3	63.8	R	366.6	39.3
2	3	2	2.08	L	506.2	56.1	L	402.4	44.9	R	524.2	58.8	R	338.0	38.7
2	3	2	1.88	R	577.2	67.5	R	333.9	37.4	L	560.1	73.1	L	368.0	50.2
2	3	4	1.91	L	522.4	66.1	L	398.4	44.8	R	529.2	63.6	R	361.0	39.0
2	3	4	2.11	R	542.6	64.3	R	369.5	40.4	L	524.5	65.0	L	394.1	45.2
2	3	4	1.90	R	560.3	72.6	R	329.9	43.6	L	550.4	71.0	L	363.2	48.1
2	3	4	1.99	L	573.2	72.1	L	372.2	46.2	R	603.6	72.7	R	326.7	42.1
2	3	4	2.15	L	547.7	64.5	L	403.0	44.6	R	579.5	70.2	R	350.4	40.4
2	3	4	1.96	L	560.0	66.8	L	390.6	44.8	R	560.8	69.1	R	347.8	38.6
2	3	4	1.95	L	529.9	63.9	L	381.9	44.2	R	540.3	68.7	R	338.0	40.7
2	3	4	1.94	R	547.1	69.9	R	336.9	41.5	L	486.9	67.5	L	360.9	48.0
2	3	4	2.18	R	552.8	66.3	R	394.6	42.7	L	522.0	64.7	L	274.5	34.8
2	3	4	2.07	R	559.9	65.4	R	365.0	38.5	L	523.0	65.2	L	405.0	43.4
2	3	6	2.05	R	519.4	62.1	R	372.3	37.4	L	508.0	65.2	L	386.1	44.2
2	3	6	2.02	R	545.3	66.3	R	370.5	40.4	L	507.2	62.2	L	395.3	43.8
2	3	6	2.03	R	542.5	67.7	R	391.1	40.3	L	512.3	66.2	L	395.8	44.4
2	3	6	2.13	L	518.7	57.1	L	427.1	41.8	R	541.9	58.7	R	358.5	38.5
2	3	6	2.03	R	540.6	67.2	R	372.0	39.7	L	520.0	66.4	L	394.5	44.0
2	3	6	1.99	R	545.3	66.4	R	387.3	39.1	L	532.0	65.6	L	407.5	43.6
2	3	6	1.75	L	476.7	62.2	L	412.1	45.9	R	506.5	62.3	R	351.9	37.7
2	3	6	1.85	L	516.6	62.7	L	395.0	42.4	R	570.6	72.3	R	372.6	40.9
2	3	6	1.99	L	614.9	74.0	L	375.7	52.3	R	575.1	73.9	R	335.1	42.5
2	3	6	1.73	L	532.2	72.1	L	363.0	41.9	R	492.7	70.0	R	386.8	46.3
					P1			P1			P2			P2	

					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
2	4	2	1.95	L	514.1	61.8	L	398.7	43.5	R	545.0	65.1	R	360.2	40.9
2	4	2	2.03	L	499.0	63.6	L	396.1	44.7	R	532.8	65.7	R	333.2	37.3
2	4	2	1.91	L	492.7	62.1	L	371.9	44.7	R	515.0	67.4	R	349.2	41.0
2	4	2	2.08	L	521.7	62.5	L	388.9	44.1	R	557.6	68.2	R	358.6	38.7
2	4	2	2.02	R	541.2	70.2	R	342.0	42.1	L	519.8	67.8	L	348.7	44.6
2	4	2	1.88	L	521.9	66.0	L	343.8	43.3	R	522.6	71.8	R	301.5	40.1
2	4	2	1.88	R	564.6	72.2	R	358.0	43.4	L	533.5	72.5	L	330.8	43.1
2	4	2	2.10	R	532.5	68.8	R	337.6	40.8	L	539.9	68.9	L	330.8	42.3
2	4	2	1.62	R	576.2	83.4	R	301.6	42.6	L	521.0	75.8	L	290.1	42.7
2	4	2	1.87	R	516.3	63.2	R	327.3	37.3	L	510.8	69.4	L	306.9	44.3
2	4	4	1.75	R	559.5	74.5	R	332.4	38.8	L	539.2	76.0	L	290.9	45.5
2	4	4	1.94	R	620.6	74.5	R	355.1	40.5	L	592.7	72.1	L	337.3	41.0
2	4	4	2.11	L	597.5	67.2	L	305.0	34.0	R	584.0	73.8	R	347.4	39.6
2	4	4	1.92	R	585.3	74.3	R	360.0	41.4	L	559.9	72.1	L	324.7	39.3
2	4	4	1.76	L	559.1	69.6	L	337.7	44.4	R	528.6	72.7	R	337.1	41.6
2	4	4	1.80	L	523.2	69.9	L	378.2	48.3	R	561.9	75.2	R	300.8	38.0
2	4	4	1.64	R	567.7	76.2	R	336.5	42.5	L	524.2	73.6	L	319.0	44.7
2	4	4	2.02	R	539.8	61.4	R	363.5	40.5	L	499.6	61.0	L	391.8	44.5
2	4	4	1.68	L	486.6	67.7	L	356.9	44.7	R	535.9	74.3	R	323.3	45.6
2	4	4	1.70	L	499.0	64.2	L	367.1	44.7	R	546.0	74.0	R	347.3	42.3
2	4	6	1.80	R	545.9	69.2	R	361.9	40.2	L	485.6	69.3	L	408.6	46.2
2	4	6	1.84	R	577.6	70.7	R	347.3	41.1	L	546.8	72.6	L	348.8	43.7
2	4	6	1.79	L	570.5	76.1	L	362.1	46.6	R	586.4	77.5	R	316.4	40.9
2	4	6	2.03	L	526.1	64.5	L	388.6	43.0	R	526.9	65.3	R	349.9	38.1
2	4	6	1.99	R	546.8	71.4	R	350.4	39.2	L	510.7	67.3	L	372.9	44.5
2	4	6	1.99	L	529.8	67.9	L	396.8	43.1	R	553.8	70.8	R	352.7	41.7
2	4	6	1.87	L	479.2	65.7	L	381.4	43.8	R	533.3	73.2	R	371.2	43.8
2	4	6	1.69	L	535.3	74.4	L	378.8	45.0	R	565.7	78.1	R	328.8	39.8
2	4	6	1.78	R	602.1	81.5	R	318.9	44.1	L	597.1	82.4	L	308.1	48.1
2	4	6	1.74	R	547.7	75.2	R	340.1	40.6	L	534.7	73.9	L	366.1	44.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
2	5	2	1.69	R	565.8	69.3	R	407.3	44.9	L	554.6	63.4	L	428.3	47.3
2	5	2	2.01	L	470.4	63.2	L	420.2	48.8	R	504.5	64.4	R	379.2	41.9
2	5	2	1.71	L	526.4	69.9	L	405.4	48.3	R	575.3	73.6	R	385.3	44.6
2	5	2	1.75	R	530.7	68.7	R	380.4	40.4	L	536.1	68.0	L	403.6	46.6
2	5	2	1.68	L	520.1	72.2	L	392.6	47.6	R	536.7	72.4	R	357.1	41.8
2	5	2	1.79	L	535.9	67.9	L	398.4	45.0	R	563.6	72.1	R	346.9	40.1
2	5	2	1.82	R	547.7	70.8	R	365.1	40.6	L	515.9	66.8	L	380.8	44.4
2	5	2	2.00	R	542.9	71.3	R	387.1	41.7	L	510.8	68.7	L	400.5	44.3
2	5	2	1.78	R	552.6	71.1	R	395.6	42.2	L	530.5	69.3	L	383.1	44.6
2	5	2	1.70	L	501.2	67.9	L	368.0	42.9	R	556.4	72.7	R	352.4	43.5
2	5	4	1.96	R	640.7	71.0	R	421.7	47.3	L	577.4	66.4	L	403.6	45.1
2	5	4	1.80	L	520.0	72.9	L	390.7	44.7	R	538.4	73.7	R	352.8	42.3
2	5	4	1.76	R	570.3	73.1	R	369.5	43.0	L	537.7	69.4	L	390.6	48.6
2	5	4	2.02	L	531.7	74.2	L	435.5	50.0	R	581.0	73.1	R	379.9	47.5
2	5	4	1.82	R	587.4	67.7	R	366.9	42.5	L	581.3	71.4	L	417.9	47.7
2	5	4	1.74	L	583.3	74.5	L	393.0	46.9	R	578.1	72.5	R	342.8	43.2
2	5	4	2.15	L	535.4	65.8	L	431.8	48.0	R	505.7	63.1	R	345.9	37.4
2	5	4	1.79	L	507.7	68.2	L	377.1	46.0	R	550.4	75.0	R	367.7	43.6
2	5	4	1.65	R	550.5	69.3	R	381.5	40.7	L	522.8	67.5	L	436.8	46.6
2	5	4	1.83	R	624.2	76.7	R	396.7	47.1	L	573.3	71.0	L	244.6	33.6
2	5	6	2.15	R	532.3	61.1	R	375.7	40.1	L	536.0	65.3	L	417.7	45.3
2	5	6	1.93	R	563.3	70.7	R	353.6	44.0	L	570.8	72.4	L	382.5	48.2
2	5	6	1.80	R	520.2	71.9	R	371.0	43.2	L	496.0	69.5	L	370.5	46.2
2	5	6	1.82	R	498.7	67.1	R	400.0	44.4	L	522.8	74.8	L	425.3	47.1

2	5	6	1.95	R	619.8	74.0	R	340.3	43.7	L	593.2	74.2	L	357.4	53.7
2	5	6	1.79	L	489.2	70.3	L	382.5	46.8	R	528.6	73.2	R	332.1	42.0
2	5	6	1.92	L	576.5	71.1	L	389.2	45.5	R	562.7	71.4	R	296.6	38.2
2	5	6	2.11	L	543.6	67.0	L	427.4	43.9	R	551.3	67.9	R	364.3	39.6
2	5	6	1.98	L	503.1	70.7	L	400.3	44.4	R	535.4	75.3	R	368.8	43.4
2	5	6	1.80	L	553.8	65.6	L	420.8	46.1	R	571.3	70.6	R	364.4	42.4
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
3	1	2	1.87	L	541.9	81.2	L	453.3	51.5	R	556.7	61.6	R	379.4	43.5
3	1	2	1.99	L	560.2	70.4	L	395.0	40.4	R	569.9	66.8	R	360.3	42.3
3	1	2	1.91	R	558.3	73.5	R	364.9	42.7	L	505.4	64.3	L	363.2	45.1
3	1	2	1.96	R	562.6	68.7	R	416.2	45.3	L	528.9	62.3	L	362.3	40.5
3	1	2	2.03	L	581.7	75.6	L	394.3	46.6	R	545.6	67.5	R	388.9	49.2
3	1	2	1.97	L	543.7	71.1	L	383.8	44.7	R	567.7	69.9	R	358.7	40.3
3	1	2	1.91	R	564.3	74.8	R	385.2	45.6	L	560.4	71.5	L	388.1	45.1
3	1	2	1.99	L	544.3	77.1	L	394.4	45.0	R	557.4	69.4	R	342.9	37.8
3	1	2	1.89	R	551.8	76.0	R	380.3	43.6	L	559.3	73.8	L	355.8	45.1
3	1	2	1.99	R	597.4	74.9	R	358.4	42.8	L	565.9	71.6	L	349.0	43.4
3	1	4	1.97	R	541.5	65.1	R	371.4	47.3	L	548.7	70.5	L	370.3	44.2
3	1	4	1.92	R	602.9	73.0	R	386.5	44.5	L	552.6	67.3	L	351.9	39.8
3	1	4	2.06	R	637.0	72.6	R	354.2	41.0	L	596.0	74.3	L	372.4	45.7
3	1	4	1.98	L	596.3	75.0	L	384.8	44.7	R	596.0	70.6	R	356.0	41.6
3	1	4	1.92	R	604.3	70.4	R	386.8	41.7	L	621.2	76.3	L	358.5	41.3
3	1	4	2.12	R	650.4	74.5	R	375.1	45.2	L	583.1	69.4	L	361.3	44.1
3	1	4	2.01	L	608.6	74.9	L	361.9	42.6	R	577.7	72.1	R	357.4	47.3
3	1	4	2.06	L	596.8	72.4	L	372.9	42.3	R	615.5	70.4	R	359.0	40.9
3	1	4	2.03	L	618.5	75.1	L	391.0	45.3	R	617.3	68.2	R	349.6	41.4
3	1	4	2.01	L	617.3	73.6	L	380.1	43.1	R	596.6	69.4	R	344.9	37.5
3	1	6	2.02	R	595.5	73.0	R	357.2	45.1	L	577.9	74.3	L	370.1	45.0
3	1	6	2.06	R	608.6	69.3	R	368.4	42.7	L	595.9	75.2	L	369.0	42.9
3	1	6	2.07	L	549.7	68.7	L	392.4	45.0	R	597.4	76.0	R	350.0	39.1
3	1	6	2.03	L	576.6	66.9	L	392.1	46.5	R	651.4	77.7	R	355.6	40.8
3	1	6	2.05	R	609.5	71.6	R	357.5	44.1	L	593.4	74.5	L	363.9	44.0
3	1	6	1.98	R	633.0	73.6	R	353.0	40.9	L	601.2	76.1	L	362.2	44.6
3	1	6	2.01	L	605.5	73.6	L	369.4	43.6	R	652.7	79.2	R	365.9	46.0
3	1	6	2.13	R	610.4	69.1	R	377.5	43.4	L	607.2	72.8	L	367.8	42.2
3	1	6	2.10	L	585.6	70.4	L	379.2	43.1	R	612.9	73.8	R	360.9	41.9
3	1	6	2.07	L	600.2	72.6	L	366.4	41.1	R	594.6	75.7	R	361.4	42.7
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
3	2	2	2.08	R	612.2	64.4	R	371.2	40.8	L	268.7	34.2	L	377.7	40.2
3	2	2	1.99	L	589.8	73.9	L	333.3	41.5	R	511.7	68.6	R	320.3	43.5
3	2	2	1.96	R	604.1	66.0	R	360.0	40.4	L	642.5	81.9	L	388.9	47.1
3	2	2	1.99	R	626.2	68.2	R	363.9	41.8	L	589.8	69.9	L	378.0	44.8
3	2	2	1.90	R	599.2	71.1	R	370.2	45.2	L	589.0	73.5	L	362.8	45.9
3	2	2	1.98	L	566.6	68.0	L	375.0	43.9	R	624.4	72.8	R	357.0	41.5
3	2	2	2.08	R	602.7	67.8	R	386.2	43.4	L	603.7	72.5	L	355.5	39.9
3	2	2	1.89	L	558.0	71.9	L	362.4	45.5	R	593.6	76.8	R	356.5	43.8
3	2	2	1.94	L	606.1	70.2	L	387.4	40.8	R	612.4	69.2	R	368.9	42.0
3	2	2	2.12	L	550.6	63.1	L	381.4	46.2	R	611.6	66.1	R	347.6	43.7
3	2	4	2.01	R	637.0	68.6	R	371.5	48.9	L	265.0	28.6	L	350.4	50.1
3	2	4	1.79	R	582.6	69.0	R	341.4	44.9	L	573.0	76.0	L	379.8	51.9
3	2	4	1.95	L	609.7	71.5	L	370.2	45.4	R	614.9	72.5	R	348.7	44.3
3	2	4	2.02	L	609.6	67.8	L	364.0	43.8	R	645.6	74.9	R	352.4	43.2
3	2	4	2.04	R	648.2	71.4	R	363.8	41.7	L	616.4	71.2	L	366.3	45.2
3	2	4	2.16	R	618.1	68.1	R	366.5	41.7	L	586.1	69.1	L	374.9	44.9
3	2	4	1.96	L	584.9	70.6	L	384.9	46.3	R	608.5	71.7	R	358.4	45.2

3	2	4	1.79	L	598.5	75.1	L	367.4	43.2	R	585.2	77.7	R	321.9	41.2
3	2	4	1.88	L	588.9	70.2	L	358.3	44.2	R	615.3	76.6	R	355.3	46.2
3	2	4	1.80	R	623.8	74.1	R	349.9	42.1	L	541.5	70.1	L	314.7	41.1
3	2	6	2.05	L	669.0	74.6	L	365.2	43.4	R	602.8	71.0	R	388.7	46.7
3	2	6	2.08	L	613.7	77.3	L	381.0	46.9	R	604.0	71.5	R	355.8	42.9
3	2	6	1.82	R	617.3	73.2	R	355.8	46.1	L	549.8	72.2	L	376.6	49.2
3	2	6	1.99	R	608.8	69.9	R	351.8	43.6	L	533.9	64.4	L	359.1	46.7
3	2	6	1.97	L	642.2	75.0	L	387.2	48.3	R	661.2	77.3	R	345.0	41.2
3	2	6	2.10	R	647.0	71.3	R	380.3	43.3	L	600.6	69.3	L	389.8	46.2
3	2	6	1.85	R	587.9	74.3	R	345.3	43.2	L	588.3	80.6	L	358.9	47.1
3	2	6	1.77	L	616.3	79.7	L	355.6	45.1	R	565.2	76.3	R	347.3	45.8
3	2	6	1.85	L	552.1	70.4	L	347.0	44.6	R	585.2	77.2	R	350.9	45.6
3	2	6	2.17	R	617.1	67.6	R	405.8	47.0	L	618.0	62.2	L	351.0	48.4
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
3	3	2	1.94	R	516.4	64.6	R	401.2	47.0	L	568.4	69.7	L	376.8	45.5
3	3	2	----	L	----	----	L	----	----	R	----	----	R	-----	----
3	3	2	2.06	R	563.6	62.7	R	379.3	48.4	L	561.4	65.0	L	389.6	48.4
3	3	2	2.07	L	560.8	67.1	L	404.4	49.3	R	565.9	63.5	R	368.7	40.7
3	3	2	2.05	R	616.9	73.5	R	390.2	44.1	L	568.1	70.1	L	409.8	46.7
3	3	2	2.10	R	564.9	68.5	R	342.2	40.5	L	511.4	56.1	L	337.4	38.7
3	3	2	2.02	L	545.8	66.8	L	400.0	45.5	R	575.7	63.9	R	371.9	44.7
3	3	2	2.02	R	570.8	66.9	R	388.3	47.4	L	554.8	66.1	L	381.4	45.3
3	3	2	2.06	L	535.6	61.9	L	408.1	47.7	R	573.4	62.2	R	373.3	42.7
3	3	2	1.81	L	587.0	73.0	L	372.0	43.7	R	622.1	76.3	R	348.2	39.3
3	3	4	2.02	R	580.5	67.3	R	376.9	43.3	L	549.0	66.9	L	362.4	44.3
3	3	4	2.02	L	587.1	69.8	L	387.5	46.0	R	618.1	71.1	R	376.9	43.7
3	3	4	1.91	R	551.0	69.0	R	354.2	34.9	L	577.4	70.8	L	390.5	39.0
3	3	4	1.98	R	607.0	74.9	R	311.5	31.2	L	602.9	74.6	L	387.7	42.3
3	3	4	2.12	R	112.8	12.4	R	378.7	44.3	L	570.0	66.1	L	375.2	43.6
3	3	4	2.12	L	577.7	69.2	L	392.4	45.5	R	614.2	70.0	R	365.4	40.6
3	3	4	2.01	R	604.6	66.1	R	391.0	43.2	L	527.4	61.6	L	384.5	45.5
3	3	4	2.06	L	559.1	65.4	L	386.2	45.7	R	603.8	68.2	R	372.6	44.8
3	3	4	2.05	L	593.4	69.2	L	376.8	44.6	R	594.8	66.8	R	364.1	42.5
3	3	4	2.06	L	584.9	71.1	L	360.9	41.9	R	607.6	70.6	R	371.4	44.2
3	3	6	2.05	L	595.9	67.1	L	404.0	50.9	R	628.4	68.5	R	370.3	44.3
3	3	6	2.08	R	624.3	69.3	R	395.1	44.2	L	592.0	66.9	L	395.5	45.1
3	3	6	2.13	R	612.0	66.9	R	385.0	46.4	L	585.3	68.2	L	372.5	42.6
3	3	6	2.11	R	595.9	64.7	R	352.9	43.5	L	620.7	68.3	L	377.6	45.0
3	3	6	2.06	L	580.5	68.7	L	367.9	44.1	R	570.9	64.8	R	375.8	44.4
3	3	6	2.11	R	597.4	67.9	R	382.0	44.0	L	552.4	65.2	L	403.7	46.5
3	3	6	2.10	R	609.1	67.8	R	379.2	44.7	L	578.2	69.1	L	377.3	44.9
3	3	6	2.00	L	580.3	68.1	L	372.3	44.4	R	618.4	70.5	R	369.8	44.3
3	3	6	2.13	L	570.1	65.7	L	381.3	45.8	R	611.4	68.0	R	356.2	41.6
3	3	6	2.14	L	591.5	69.7	L	396.0	45.9	R	613.3	68.1	R	371.1	41.5
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
3	4	2	2.13	R	680.5	75.9	R	429.3	52.1	L	637.3	69.9	L	418.9	50.8
3	4	2	2.17	L	537.9	58.7	L	407.1	43.2	R	612.8	66.3	R	390.7	42.4
3	4	2	2.12	R	634.5	72.2	R	379.6	44.6	L	621.2	71.6	L	389.3	45.5
3	4	2	2.14	L	615.2	68.4	L	401.9	42.6	R	599.6	67.2	R	390.9	43.4
3	4	2	2.07	L	628.8	74.6	L	386.5	44.8	R	615.7	72.1	R	365.3	42.7
3	4	2	2.12	R	613.2	70.3	R	378.2	41.9	L	608.6	72.4	L	395.9	44.8
3	4	2	2.06	L	597.9	71.1	L	415.9	45.0	R	642.8	77.7	R	382.6	41.1
3	4	2	2.18	L	597.0	68.4	L	398.5	45.7	R	617.7	73.0	R	354.2	39.6
3	4	2	2.13	R	617.0	70.3	R	396.0	43.5	L	609.9	70.0	L	386.5	42.6
3	4	2	1.79	R	613.6	76.2	R	379.3	40.5	L	591.9	76.8	L	398.1	45.6

3	4	4	1.97	R	606.2	75.5	R	351.1	41.4	L	560.9	75.6	L	396.0	52.4
3	4	4	1.87	L	633.1	80.1	L	370.9	46.7	R	621.0	79.3	R	369.7	51.9
3	4	4	2.13	L	616.1	69.2	L	423.5	49.4	R	644.5	71.5	R	369.7	44.3
3	4	4	2.06	L	637.9	73.6	L	408.3	50.4	R	672.8	74.0	R	294.8	40.0
3	4	4	2.16	L	636.8	77.5	L	407.8	49.4	R	564.9	64.4	R	364.1	44.6
3	4	4	2.02	R	589.5	70.4	R	362.5	41.8	L	584.1	74.9	L	385.8	46.6
3	4	4	1.98	R	620.9	76.6	R	390.2	46.4	L	587.1	74.5	L	383.7	47.7
3	4	4	1.96	R	623.9	74.7	R	381.1	47.8	L	550.3	72.0	L	382.8	48.8
3	4	4	2.03	R	605.7	69.1	R	373.0	47.8	L	556.8	70.7	L	377.4	47.5
3	4	4	1.99	L	614.1	75.3	L	387.8	45.7	R	609.2	72.7	R	375.5	47.5
3	4	6	1.88	R	624.7	69.9	R	379.6	46.9	L	564.7	71.2	L	388.4	50.5
3	4	6	1.84	R	599.5	78.7	R	357.5	43.7	L	579.5	79.3	L	370.0	48.5
3	4	6	2.16	R	594.8	68.8	R	387.0	43.7	L	586.9	70.1	L	403.3	46.2
3	4	6	2.06	R	677.6	99.8	R	351.5	37.2	L	550.7	73.3	L	355.8	42.1
3	4	6	2.05	R	644.0	75.6	R	380.8	44.3	L	613.3	76.2	L	401.5	49.0
3	4	6	2.06	L	611.9	73.8	L	387.6	47.2	R	620.3	75.6	R	377.2	48.5
3	4	6	2.09	L	659.7	78.4	L	399.0	46.7	R	655.1	99.4	R	380.8	46.0
3	4	6	2.07	L	623.7	74.2	L	382.2	46.0	R	637.7	76.8	R	364.3	45.7
3	4	6	1.97	L	622.5	80.6	L	394.9	49.1	R	633.5	78.3	R	364.7	43.7
3	4	6	1.82	L	595.5	86.0	L	379.1	49.8	R	580.1	82.4	R	341.7	45.1
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
3	5	2	2.03	L	687.8	87.3	L	409.1	45.7	R	594.8	64.7	R	403.9	50.7
3	5	2	2.00	R	620.5	75.0	R	393.3	47.4	L	649.9	78.5	L	390.7	57.5
3	5	2	1.91	R	614.5	45.6	R	374.9	44.3	L	576.2	76.9	L	391.8	47.3
3	5	2	2.02	L	570.6	73.1	L	386.8	46.3	R	602.1	79.3	R	384.8	45.8
3	5	2	2.17	L	609.7	70.9	L	387.0	41.5	R	614.5	73.1	R	379.2	41.6
3	5	2	1.97	L	619.0	74.6	L	379.5	42.4	R	587.7	76.4	R	374.9	44.8
3	5	2	2.00	R	610.2	69.8	R	401.6	46.9	L	652.1	72.1	L	377.2	48.1
3	5	2	1.94	R	586.0	71.1	R	374.1	44.5	L	617.6	79.9	L	362.1	45.3
3	5	2	1.80	L	490.6	70.1	L	376.5	42.1	R	571.6	74.1	R	422.1	47.0
3	5	2	1.77	R	619.5	79.2	R	376.1	43.8	L	573.6	77.2	L	355.9	44.5
3	5	4	1.77	L	617.6	82.9	L	356.7	44.9	R	526.3	83.3	R	363.3	53.7
3	5	4	1.95	R	606.4	78.4	R	365.7	44.0	L	587.5	83.5	L	344.6	44.6
3	5	4	1.94	L	647.7	81.0	L	359.6	42.1	R	595.0	79.5	R	361.7	46.3
3	5	4	2.01	L	636.1	78.6	L	372.2	45.0	R	638.5	76.6	R	368.9	46.2
3	5	4	1.95	L	609.0	80.3	L	365.2	45.9	R	592.2	77.1	R	394.6	48.9
3	5	4	2.00	R	595.6	77.8	R	358.9	44.8	L	588.0	83.8	L	374.5	47.8
3	5	4	1.92	L	604.9	79.0	L	371.5	45.7	R	606.3	76.9	R	358.0	43.8
3	5	4	2.19	R	614.8	70.2	R	369.8	39.3	L	616.1	77.5	L	389.4	44.7
3	5	4	1.96	R	602.3	77.5	R	357.1	40.4	L	558.5	74.7	L	372.3	46.4
3	5	4	1.85	R	595.5	77.1	R	349.9	40.6	L	587.3	78.5	L	381.0	45.8
3	5	6	2.17	L	561.3	67.7	L	396.3	46.6	R	563.3	66.4	R	355.0	43.3
3	5	6	2.03	R	568.7	70.9	R	346.7	40.3	L	575.8	78.9	L	342.1	43.4
3	5	6	2.20	L	599.6	83.8	L	363.2	48.6	R	553.9	75.7	R	314.4	42.2
3	5	6	1.90	L	600.4	79.0	L	361.7	47.9	R	541.3	70.8	R	334.7	44.2
3	5	6	2.16	L	616.3	74.7	L	391.7	42.9	R	605.2	71.7	R	373.4	42.6
3	5	6	2.13	R	620.9	72.9	R	384.6	43.2	L	606.7	74.9	L	391.4	45.2
3	5	6	2.15	L	671.6	73.8	L	386.0	43.3	R	659.9	84.4	R	343.1	41.8
3	5	6	1.99	R	738.9	86.5	R	359.2	46.1	L	685.4	77.7	L	395.8	53.2
3	5	6	2.18	R	637.9	76.8	R	386.9	43.1	L	615.8	75.5	L	364.8	41.6
3	5	6	1.98	R	594.0	78.4	R	369.4	44.1	L	582.9	81.5	L	339.3	43.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
4	1	2	1.98	R	547.7	60.1	R	354.2	39.7	L	638.4	69.4	L	324.8	34.8
4	1	2	1.96	R	510.0	65.1	R	360.8	42.8	L	611.2	77.0	L	359.7	41.8
4	1	2	1.83	R	535.1	68.1	R	351.5	39.1	L	586.6	72.0	L	329.9	37.1

4	1	2	1.73	R	529.0	67.4	R	327.4	41.1	L	610.0	76.5	L	324.5	39.6
4	1	2	1.76	L	563.6	72.2	L	319.7	37.9	R	569.6	73.8	R	330.0	40.9
4	1	2	1.86	R	551.3	69.4	R	335.6	42.1	L	602.6	73.0	L	336.3	39.4
4	1	2	1.85	L	535.8	64.0	L	320.4	33.1	R	536.7	66.7	R	358.4	39.8
4	1	2	1.83	L	582.4	71.9	L	339.2	38.5	R	552.3	67.9	R	342.5	36.1
4	1	2	1.86	L	562.8	68.4	L	300.4	33.6	R	540.8	66.2	R	339.7	39.5
4	1	2	1.96	L	534.4	63.9	L	322.7	38.6	R	564.2	66.5	R	360.8	40.3
4	1	4	1.99	L	571.1	68.9	L	325.5	38.0	R	560.0	67.1	R	390.5	40.0
4	1	4	1.96	L	589.0	69.10	L	312.5	33.9	R	544.1	65.5	R	336.8	38.6
4	1	4	2.05	L	591.2	68.7	L	316.0	35.0	R	560.7	66.2	R	356.4	39.6
4	1	4	1.97	L	578.7	69.3	L	324.4	37.1	R	572.8	67.7	R	302.8	33.1
4	1	4	1.97	R	564.8	65.8	R	358.2	38.2	L	599.0	69.7	L	336.1	37.1
4	1	4	1.99	L	576.5	68.8	L	321.6	35.1	R	566.8	68.6	R	355.6	40.1
4	1	4	1.91	R	547.4	66.4	R	344.2	38.6	L	586.9	67.9	L	311.3	35.7
4	1	4	1.90	R	565.2	68.0	R	326.1	38.6	L	594.3	72.4	L	314.5	38.7
4	1	4	2.09	R	545.9	66.6	R	340.2	39.5	L	615.2	74.5	L	324.4	38.8
4	1	4	2.00	R	574.1	63.4	R	346.9	38.0	L	657.2	72.2	L	327.9	35.4
4	1	6	2.05	L	605.2	70.6	L	339.9	37.8	R	579.4	65.8	R	355.4	37.8
4	1	6	1.95	L	572.4	73.1	L	324.1	37.5	R	550.0	69.1	R	329.9	37.5
4	1	6	1.93	L	577.6	70.1	L	308.7	35.6	R	561.1	68.5	R	478.0	49.7
4	1	6	2.03	L	605.4	72.2	L	334.6	37.9	R	568.5	67.4	R	328.9	36.8
4	1	6	2.19	L	564.9	70.7	L	320.4	38.0	R	568.7	68.9	R	338.5	38.4
4	1	6	2.05	R	579.4	69.4	R	346.1	40.7	L	629.9	74.1	L	323.2	38.2
4	1	6	2.17	R	590.3	64.7	R	353.2	36.1	L	633.7	67.5	L	331.3	34.8
4	1	6	2.01	R	571.8	63.6	R	352.5	39.2	L	659.0	71.1	L	324.7	35.7
4	1	6	2.04	R	589.1	67.7	R	346.1	38.1	L	631.6	71.7	L	322.8	37.9
4	1	6	2.17	R	546.2	62.2	R	354.6	38.6	L	654.4	72.6	L	341.0	37.0
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
4	2	2	2.07	R	556.7	66.0	R	339.7	37.3	L	623.5	72.7	L	335.9	39.3
4	2	2	1.95	R	545.5	66.5	R	361.1	38.8	L	602.1	69.7	L	335.3	35.3
4	2	2	1.96	L	582.0	68.6	L	333.2	40.3	R	571.8	67.0	R	309.3	35.9
4	2	2	1.93	R	531.1	62.3	R	330.2	37.9	L	627.3	75.8	L	356.6	42.6
4	2	2	2.10	R	544.4	71.6	R	318.4	37.3	L	561.9	70.9	L	321.3	42.0
4	2	2	1.74	L	581.2	71.6	L	319.2	38.7	R	553.2	70.7	R	327.4	41.5
4	2	2	1.94	R	551.6	71.6	R	319.8	40.4	L	603.7	75.2	L	325.8	42.2
4	2	2	2.06	L	590.3	67.1	L	325.4	39.3	R	621.8	69.8	R	360.2	42.5
4	2	2	1.93	L	612.3	65.6	L	335.2	42.2	R	560.0	60.7	R	346.2	49.4
4	2	2	1.81	L	558.0	66.1	L	344.3	39.0	R	557.3	66.7	R	331.5	40.2
4	2	4	1.88	L	9.9	0.1	L	344.3	0.1	R	4.6	-0.2	R	331.5	0.2
4	2	4	1.74	R	612.1	71.3	R	330.7	39.8	L	653.6	77.3	L	339.6	45.5
4	2	4	1.84	R	11.0	0.2	R	330.7	0.1	L	3.8	-0.6	L	339.6	0.0
4	2	4	1.88	R	634.3	72.6	R	333.6	37.7	L	686.7	79.5	L	328.3	43.6
4	2	4	1.79	L	637.9	73.8	L	320.7	40.1	R	617.3	74.7	R	332.5	41.9
4	2	4	1.85	R	11.5	0.0	R	320.7	0.1	L	3.0	-0.4	L	332.5	0.0
4	2	4	1.80	L	598.6	73.1	L	291.4	34.3	R	571.4	73.1	R	332.6	41.3
4	2	4	1.93	L	639.6	73.3	L	337.8	40.8	R	645.9	72.1	R	343.9	53.1
4	2	4	2.00	R	594.6	70.7	R	337.2	38.1	L	610.5	72.6	L	327.9	39.2
4	2	4	2.00	L	592.9	68.5	L	298.4	31.5	R	563.3	67.8	R	338.9	40.2
4	2	6	2.01	R	587.0	72.7	R	341.4	37.7	L	598.0	73.9	L	331.0	38.3
4	2	6	2.02	R	595.0	72.3	R	340.7	38.0	L	624.3	72.0	L	326.1	40.1
4	2	6	1.88	L	600.5	72.7	L	303.5	35.0	R	549.7	70.4	R	337.0	40.1
4	2	6	2.08	L	575.3	71.8	L	294.3	35.2	R	559.4	73.0	R	330.4	40.7
4	2	6	2.12	R	568.5	67.8	R	338.6	39.8	L	610.6	71.8	L	314.8	38.7
4	2	6	1.89	L	589.4	72.6	L	309.8	36.8	R	578.6	71.9	R	318.3	39.0
4	2	6	1.95	R	566.5	69.8	R	320.6	40.0	L	628.9	77.1	L	298.3	38.1
4	2	6	1.97	L	629.0	73.3	L	318.4	35.9	R	580.8	69.7	R	321.6	38.2
4	2	6	1.89	R	541.6	65.8	R	319.4	36.7	L	598.3	74.6	L	272.1	35.2

4	2	6	1.96	L	613.5	69.5	L	316.3	35.9	R	594.6	69.2	R	338.5	41.0
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
4	3	2	1.80	R	549.4	67.0	R	305.5	35.4	L	563.3	72.2	L	292.6	38.1
4	3	2	1.95	L	566.8	68.9	L	302.8	38.5	R	590.7	71.2	R	284.8	33.3
4	3	2	2.01	R	510.9	63.7	R	327.3	38.5	L	571.3	73.2	L	301.6	39.6
4	3	2	1.79	R	548.9	68.7	R	323.7	40.6	L	573.6	69.9	L	281.8	34.9
4	3	2	1.79	R	539.0	69.0	R	295.9	35.5	L	550.8	71.1	L	279.7	37.0
4	3	2	1.84	L	601.6	70.5	L	329.9	36.3	R	573.3	66.6	R	359.1	39.4
4	3	2	2.09	L	605.8	68.8	L	298.6	36.4	R	631.4	69.0	R	339.7	36.9
4	3	2	1.63	R	503.1	68.6	R	323.4	39.9	L	587.2	76.6	L	291.9	37.0
4	3	2	1.83	L	570.0	70.7	L	301.7	37.6	R	582.3	72.3	R	317.8	37.9
4	3	2	1.93	L	567.6	69.4	L	300.3	35.9	R	585.1	73.7	R	308.1	37.1
4	3	4	1.73	L	564.7	77.1	L	306.6	38.5	R	558.2	74.7	R	312.5	41.3
4	3	4	1.76	R	13.1	0.0	R	306.6	0.0	L	2.2	0.1	L	312.5	0.1
4	3	4	2.10	L	602.1	67.9	L	322.4	34.3	R	580.4	66.6	R	340.9	36.0
4	3	4	2.06	L	590.5	67.1	L	309.4	32.0	R	559.8	62.3	R	332.4	37.3
4	3	4	2.15	R	594.9	68.0	R	362.9	37.3	L	633.3	70.8	L	332.8	36.5
4	3	4	2.01	R	541.1	68.0	R	334.9	38.5	L	583.0	70.8	L	316.6	34.7
4	3	4	2.03	L	602.5	68.8	L	320.5	34.6	R	603.0	70.0	R	336.3	36.8
4	3	4	2.12	L	588.9	65.6	L	320.1	33.6	R	568.7	64.3	R	341.8	36.9
4	3	4	2.17	R	589.1	63.2	R	216.3	23.2	L	614.9	68.4	L	274.8	36.8
4	3	4	1.98	R	575.0	67.3	R	337.4	37.9	L	626.8	73.1	L	325.5	36.9
4	3	6	2.10	L	607.9	70.5	L	308.5	34.5	R	577.9	70.2	R	303.9	35.5
4	3	6	1.93	L	757.0	81.1	L	340.4	53.7	R	728.2	72.7	R	313.7	40.7
4	3	6	1.96	R	519.2	60.7	R	334.2	37.8	L	605.4	71.2	L	300.6	35.2
4	3	6	1.88	L	577.3	72.8	L	295.6	35.7	R	556.3	72.8	R	308.3	39.2
4	3	6	2.02	R	538.5	62.4	R	326.4	35.7	L	618.3	71.0	L	320.1	36.3
4	3	6	2.15	L	618.8	72.4	L	316.6	35.2	R	605.0	68.2	R	317.3	35.9
4	3	6	1.83	L	602.3	74.0	L	292.2	35.3	R	561.8	71.6	R	319.4	38.6
4	3	6	1.87	R	537.7	70.8	R	321.2	39.0	L	579.4	76.3	L	310.8	40.0
4	3	6	1.85	R	554.1	76.4	R	299.3	36.8	L	544.3	74.6	L	279.4	37.2
4	3	6	1.94	R	532.3	64.0	R	323.5	38.2	L	585.1	68.4	L	440.8	46.3
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
4	4	2	1.95	L	641.6	71.2	L	343.2	46.9	R	587.1	63.8	R	338.0	42.0
4	4	2	1.65	L	553.4	68.8	L	323.6	38.1	R	570.7	69.4	R	307.7	35.3
4	4	2	1.79	R	566.1	73.5	R	330.3	39.5	L	542.1	70.8	L	313.9	38.7
4	4	2	1.63	R	529.1	69.2	R	327.6	39.3	L	544.7	71.2	L	320.1	39.5
4	4	2	1.46	R	558.2	76.5	R	316.6	41.6	L	566.7	78.4	L	320.7	42.4
4	4	2	1.85	L	562.6	67.7	L	312.4	37.4	R	568.8	67.5	R	330.7	38.8
4	4	2	1.98	R	613.3	70.7	R	296.6	35.6	L	596.5	68.5	L	307.8	35.1
4	4	2	2.02	R	602.4	69.6	R	328.8	36.3	L	605.2	71.2	L	320.3	36.6
4	4	2	1.83	L	546.3	70.8	L	312.7	38.6	R	555.8	69.2	R	320.2	38.7
4	4	2	2.09	L	590.7	67.0	L	303.0	35.2	R	482.0	56.6	R	321.3	36.8
4	4	4	1.94	R	609.7	67.5	R	343.3	41.5	L	716.8	79.6	L	331.5	46.0
4	4	4	1.92	R	603.3	67.3	R	351.9	38.4	L	661.3	73.1	L	305.0	35.1
4	4	4	1.98	R	586.8	64.8	R	348.6	37.5	L	613.7	71.0	L	309.6	36.5
4	4	4	1.94	R	589.4	69.3	R	325.3	36.3	L	605.5	72.8	L	311.4	37.3
4	4	4	1.92	R	579.9	70.0	R	352.3	39.5	L	325.4	75.1	L	321.5	38.0
4	4	4	2.05	L	607.0	70.1	L	313.5	35.0	R	599.4	70.6	R	339.9	40.7
4	4	4	1.85	L	597.3	74.2	L	297.5	36.7	R	566.2	71.3	R	332.4	41.1
4	4	4	2.01	L	620.5	70.1	L	326.3	35.3	R	586.7	69.4	R	338.3	38.9
4	4	4	1.86	L	632.7	71.0	L	297.3	32.9	R	577.4	67.0	R	332.2	39.1
4	4	4	2.12	L	613.6	68.8	L	322.8	35.5	R	634.8	73.5	R	345.0	38.8
4	4	6	2.02	L	606.9	70.7	L	310.6	33.9	R	598.2	70.6	R	350.6	39.3
4	4	6	1.90	L	629.6	73.0	L	315.5	35.3	R	588.3	69.0	R	328.2	38.1

4	4	6	1.86	L	638.7	76.4	L	306.5	37.1	R	616.9	74.7	R	320.2	38.7
4	4	6	1.95	R	553.0	67.5	R	331.8	40.8	L	640.9	79.0	L	280.5	36.1
4	4	6	1.82	R	580.5	74.2	R	348.1	40.4	L	614.6	76.9	L	312.2	37.2
4	4	6	1.92	R	551.2	66.2	R	355.8	39.9	L	623.4	71.4	L	329.6	38.8
4	4	6	2.00	R	574.2	70.3	R	350.8	40.2	L	606.3	73.2	L	314.6	36.6
4	4	6	1.99	R	568.0	70.4	R	346.4	39.4	L	616.3	74.9	L	323.5	36.5
4	4	6	2.03	L	611.8	73.5	L	321.9	37.1	R	586.7	73.6	R	456.3	49.4
4	4	6	1.93	L	598.1	73.7	L	299.0	33.7	R	578.5	72.5	R	338.8	39.2
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
4	5	2	1.73	L	644.3	76.2	L	295.7	33.9	R	580.1	72.7	R	311.2	38.2
4	5	2	2.16	R	577.9	69.1	R	359.1	39.6	L	598.1	71.5	L	513.1	50.3
4	5	2	1.60	L	609.5	78.8	L	331.0	39.3	R	584.6	76.5	R	327.1	39.7
4	5	2	1.92	L	597.5	71.6	L	316.3	35.2	R	585.4	71.1	R	334.8	37.9
4	5	2	2.07	L	598.7	72.8	L	326.0	37.1	R	595.0	76.6	R	324.8	38.7
4	5	2	1.71	R	557.8	74.4	R	349.9	40.0	L	574.2	73.6	L	315.3	37.3
4	5	2	1.69	R	542.3	74.5	R	334.3	42.2	L	563.0	73.9	L	303.0	37.6
4	5	2	1.69	L	572.1	73.8	L	329.0	40.1	R	592.0	75.3	R	299.2	37.8
4	5	2	1.65	R	556.2	71.7	R	339.9	40.3	L	607.3	76.1	L	318.2	37.5
4	5	2	2.05	R	572.0	59.4	R	348.3	36.4	L	654.0	64.6	L	317.1	36.7
4	5	4	1.91	R	589.7	69.5	R	343.3	38.5	L	623.1	72.7	L	323.6	35.3
4	5	4	1.89	R	594.2	73.0	R	330.2	36.8	L	596.8	76.0	L	322.3	38.9
4	5	4	2.06	R	588.6	71.7	R	333.8	36.5	L	578.0	69.7	L	310.7	34.9
4	5	4	2.03	R	571.9	71.1	R	367.7	42.1	L	606.3	72.6	L	324.2	35.8
4	5	4	1.82	L	606.1	75.2	L	273.6	33.5	R	590.2	74.1	R	321.8	38.0
4	5	4	1.79	L	612.2	71.2	L	320.1	34.7	R	595.3	72.0	R	307.8	36.1
4	5	4	1.68	R	581.0	77.7	R	304.7	39.2	L	581.1	79.8	L	276.7	38.1
4	5	4	2.06	L	633.6	69.1	L	314.2	33.6	R	622.0	70.2	R	353.8	38.8
4	5	4	1.85	L	628.9	76.5	L	297.5	33.9	R	575.8	73.2	R	323.9	39.2
4	5	4	----	L	----	----	L	----	----	R	----	----	R	----	----
4	5	6	2.01	R	635.1	73.3	R	296.6	31.8	L	579.1	68.8	L	336.4	38.8
4	5	6	1.98	R	551.6	66.8	R	347.3	40.5	L	628.9	74.5	L	313.8	34.8
4	5	6	1.98	L	572.9	68.0	L	348.8	37.8	R	598.4	70.2	R	307.1	33.7
4	5	6	2.04	L	633.9	76.2	L	308.8	33.2	R	559.9	67.2	R	338.0	37.7
4	5	6	1.88	L	585.0	68.7	L	312.2	34.5	R	581.0	72.5	R	360.4	40.2
4	5	6	2.07	L	597.5	70.0	L	312.8	31.8	R	558.6	68.3	R	353.1	39.4
4	5	6	2.19	R	575.1	67.5	R	347.8	36.9	L	606.5	69.5	L	316.9	33.9
4	5	6	2.21	R	556.9	68.5	R	345.9	37.0	L	534.8	65.3	L	350.5	39.3
4	5	6	2.11	L	570.5	70.0	L	335.9	36.3	R	592.5	73.1	R	335.9	36.4
4	5	6	2.09	R	593.1	72.5	R	353.5	39.4	L	615.5	73.1	L	314.6	35.1
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
5	1	2	1.94	L	533.6	75.9	L	347.5	46.5	R	569.6	84.8	R	331.0	42.6
5	1	2	1.71	R	588.0	81.6	R	344.9	42.0	L	552.0	75.7	L	359.3	47.6
5	1	2	1.79	L	523.4	68.3	L	321.4	44.2	R	594.6	85.4	R	326.1	43.0
5	1	2	1.85	R	543.2	80.2	R	341.4	43.6	L	526.9	76.9	L	390.7	49.6
5	1	2	1.81	L	550.7	75.1	L	334.9	41.3	R	602.0	86.2	R	366.0	46.2
5	1	2	1.89	R	555.6	80.3	R	373.3	45.5	L	555.7	79.4	L	424.5	51.1
5	1	2	1.96	L	509.9	71.8	L	397.0	49.5	R	535.9	75.7	R	349.0	42.8
5	1	2	1.85	R	536.5	77.4	R	384.9	47.6	L	529.6	75.3	L	386.5	49.2
5	1	2	1.68	L	525.4	76.4	L	373.8	46.8	R	529.3	79.7	R	359.3	45.2
5	1	2	1.83	R	583.8	82.9	R	363.3	42.5	L	527.8	71.3	L	377.4	46.8
5	1	4	1.82	L	519.5	75.1	L	384.7	49.1	R	526.6	78.5	R	359.0	43.2
5	1	4	1.84	R	560.2	78.3	R	346.0	43.0	L	554.0	79.2	L	356.0	46.9
5	1	4	1.89	L	519.1	69.3	L	343.0	42.2	R	568.0	81.2	R	370.0	49.6
5	1	4	1.93	R	582.9	79.9	R	369.0	42.4	L	552.0	70.7	L	371.5	44.2
5	1	4	2.01	R	563.3	75.3	R	384.5	46.6	L	546.6	69.3	L	369.6	42.7

5	1	4	1.85	R	545.4	81.1	R	348.8	42.6	L	540.8	76.7	L	375.1	48.0
5	1	4	1.81	L	541.3	77.4	L	349.0	45.0	R	556.4	84.8	R	345.9	47.5
5	1	4	1.84	R	610.5	81.0	R	359.7	46.2	L	590.3	79.2	L	332.5	45.4
5	1	4	1.74	L	508.2	74.8	L	353.7	46.2	R	566.4	86.8	R	356.0	48.1
5	1	4	1.73	L	535.2	75.9	L	382.5	49.1	R	537.5	75.9	R	337.0	42.1
5	1	6	1.88	R	568.0	80.5	R	364.1	43.5	L	519.5	72.8	L	375.5	46.5
5	1	6	1.88	R	851.2	63.9	R	0.0	0.0	L	567.5	78.1	L	276.2	8.5
5	1	6	1.82	R	553.5	79.6	R	344.3	43.0	L	537.5	74.6	L	372.5	46.4
5	1	6	1.97	R	553.1	75.8	R	384.6	47.1	L	554.9	73.2	L	367.7	43.7
5	1	6	2.02	L	537.3	71.6	L	377.8	46.6	R	576.5	79.7	R	358.2	44.1
5	1	6	1.90	R	575.0	80.3	R	398.7	47.9	L	535.1	70.7	L	353.3	42.1
5	1	6	1.77	L	543.1	78.1	L	384.1	50.2	R	565.0	84.7	R	363.8	51.0
5	1	6	1.81	L	554.0	79.3	L	378.2	48.5	R	547.1	83.5	R	466.4	56.6
5	1	6	1.90	L	639.7	93.2	L	383.9	61.6	R	552.5	79.8	R	358.4	54.7
5	1	6	2.00	L	552.3	74.0	L	354.9	44.6	R	580.5	82.5	R	330.3	42.6
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
5	2	2	1.82	R	539.8	73.7	R	378.8	43.0	L	531.3	68.2	L	362.5	43.4
5	2	2	1.99	L	485.1	66.6	L	369.5	45.0	R	567.7	78.6	R	379.2	44.1
5	2	2	1.74	R	544.4	75.6	R	361.9	43.0	L	502.4	65.4	L	387.3	46.0
5	2	2	1.70	R	523.7	75.5	R	358.8	42.4	L	504.3	67.8	L	386.0	46.6
5	2	2	1.76	L	536.4	72.4	L	397.6	47.2	R	496.3	67.4	R	389.4	43.5
5	2	2	1.72	L	507.0	70.5	L	402.2	48.8	R	561.7	76.9	R	382.6	46.0
5	2	2	1.82	R	544.1	73.4	R	355.0	40.0	L	516.0	67.3	L	386.0	48.2
5	2	2	1.91	L	528.6	68.9	L	374.8	44.3	R	515.4	69.2	R	357.8	41.4
5	2	2	2.01	L	504.0	67.3	L	419.8	50.0	R	547.9	72.1	R	362.9	39.1
5	2	2	1.90	R	539.5	74.1	R	341.4	38.2	L	507.7	66.6	L	404.4	48.4
5	2	4	1.98	R	534.8	72.5	R	339.0	38.7	L	491.2	66.9	L	402.3	47.7
5	2	4	1.99	L	493.5	66.2	L	407.8	47.3	R	561.5	75.6	R	369.9	42.9
5	2	4	2.05	R	682.7	88.5	R	319.3	34.5	L	569.0	71.8	L	392.8	46.1
5	2	4	2.01	R	539.7	71.8	R	364.6	39.5	L	474.7	64.8	L	427.2	50.3
5	2	4	1.96	R	522.6	68.9	R	363.1	40.7	L	510.7	67.4	L	398.6	46.5
5	2	4	2.04	L	569.2	71.8	L	395.9	44.0	R	540.5	70.9	R	359.3	40.9
5	2	4	2.04	R	535.2	69.3	R	380.5	41.5	L	575.9	75.2	L	409.7	46.1
5	2	4	1.90	L	537.6	69.5	L	399.8	46.6	R	568.0	73.8	R	377.8	43.4
5	2	4	2.14	L	551.4	70.1	L	402.7	48.8	R	532.2	69.1	R	357.4	39.8
5	2	4	1.94	L	540.8	71.2	L	370.7	42.3	R	562.2	77.6	R	386.2	46.4
5	2	6	2.03	R	572.3	77.6	R	354.4	40.4	L	525.2	66.8	L	378.1	44.2
5	2	6	1.94	R	550.4	74.1	R	355.1	39.5	L	529.0	69.9	L	389.9	46.4
5	2	6	1.97	R	526.6	67.4	R	365.1	40.7	L	588.1	77.7	L	386.7	46.3
5	2	6	1.94	L	516.9	69.3	L	415.4	50.7	R	536.7	73.6	R	360.6	42.0
5	2	6	1.88	R	532.7	72.8	R	356.8	41.2	L	531.8	72.6	L	386.8	46.3
5	2	6	1.98	R	561.1	77.7	R	380.4	44.0	L	635.9	84.5	L	367.2	43.7
5	2	6	2.04	L	493.7	65.9	L	405.1	51.3	R	472.9	64.3	R	355.9	44.2
5	2	6	1.95	L	517.6	69.6	L	378.8	46.4	R	553.7	77.1	R	370.3	44.0
5	2	6	2.08	L	503.5	66.0	L	398.2	47.4	R	522.8	68.4	R	365.3	41.6
5	2	6	1.97	L	467.7	58.5	L	387.8	49.9	R	424.5	54.2	R	370.9	45.8
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
5	3	2	2.04	R	579.1	77.9	R	402.3	48.3	L	640.9	82.8	L	419.9	48.3
5	3	2	1.87	L	565.7	71.7	L	387.9	41.3	R	588.4	78.9	R	387.7	45.4
5	3	2	1.75	L	566.7	71.6	L	402.8	45.7	R	607.3	82.5	R	410.4	46.4
5	3	2	1.72	L	553.7	75.0	L	386.0	41.5	R	539.6	77.0	R	405.2	48.1
5	3	2	1.86	R	555.2	80.3	R	401.9	49.4	L	556.2	75.0	L	392.7	45.4
5	3	2	2.04	L	594.9	76.2	L	431.5	47.6	R	602.6	80.9	R	362.4	41.2
5	3	2	1.99	R	544.6	78.0	R	374.9	78.0	L	555.9	76.6	L	384.0	46.6
5	3	2	1.65	L	579.4	78.5	L	404.7	48.7	R	577.2	80.2	R	379.2	46.8

5	3	2	1.68	R	574.1	85.1	R	398.2	47.6	L	587.5	82.7	L	404.6	48.6
5	3	2	1.79	R	567.3	80.0	R	384.4	46.5	L	568.6	78.9	L	401.8	48.0
5	3	4	1.89	R	546.1	78.1	R	373.9	45.7	L	536.5	75.2	L	394.8	47.7
5	3	4	1.92	L	568.9	79.4	L	398.4	47.3	R	568.3	82.4	R	366.0	46.1
5	3	4	2.09	L	568.5	73.5	L	425.3	48.0	R	614.5	81.4	R	403.4	45.1
5	3	4	1.82	R	559.3	79.8	R	374.0	44.2	L	591.9	82.1	L	404.0	48.2
5	3	4	1.94	L	574.6	75.4	L	412.7	47.8	R	599.2	83.9	R	383.9	45.8
5	3	4	1.93	R	572.9	78.9	R	568.3	79.7	L	568.3	79.7	L	413.1	51.9
5	3	4	1.93	L	558.7	75.4	L	393.0	47.4	R	572.7	79.8	R	378.4	44.4
5	3	4	1.94	R	574.4	82.3	R	385.0	47.4	L	570.8	77.9	L	387.3	46.9
5	3	4	1.75	L	582.4	79.2	L	414.3	48.6	R	870.9	120.9	R	383.1	47.0
5	3	4	1.60	R	565.4	82.4	R	392.8	47.4	L	595.0	83.8	L	402.9	48.7
5	3	6	1.81	L	549.6	79.1	L	384.2	49.3	R	559.7	84.0	R	361.2	46.1
5	3	6	1.73	R	592.6	86.4	R	359.6	48.8	L	561.8	78.2	L	355.2	48.2
5	3	6	1.79	R	563.6	84.8	R	356.3	45.0	L	540.3	79.4	L	380.1	48.2
5	3	6	1.78	R	735.8	103.9	R	368.7	48.5	L	540.8	75.6	L	372.1	50.3
5	3	6	1.76	R	561.9	77.9	R	353.5	45.1	L	550.2	76.4	L	374.6	52.3
5	3	6	1.69	L	527.4	77.3	L	387.4	50.4	R	575.4	87.8	R	361.3	50.2
5	3	6	1.71	L	536.6	81.1	L	398.5	53.0	R	577.2	88.1	R	346.9	49.3
5	3	6	1.62	R	566.6	85.5	R	365.1	49.1	L	514.6	78.5	L	388.8	52.0
5	3	6	1.65	L	536.0	77.8	L	375.6	51.6	R	574.2	87.7	R	352.4	50.7
5	3	6	1.64	L	551.2	81.9	L	456.9	57.4	R	536.2	81.7	R	357.2	47.5
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
5	4	2	1.67	L	530.9	78.5	L	398.8	47.5	R	522.5	75.2	R	398.9	47.4
5	4	2	1.70	L	525.1	76.5	L	388.4	45.3	R	564.6	82.8	R	386.4	47.6
5	4	2	1.73	R	553.1	77.6	R	377.4	45.2	L	571.8	78.4	L	397.3	48.4
5	4	2	1.86	R	576.9	81.2	R	415.2	48.3	L	616.4	82.5	L	424.8	48.1
5	4	2	1.91	R	546.0	77.4	R	392.9	46.1	L	569.4	76.0	L	404.2	46.7
5	4	2	1.61	L	575.1	80.8	L	399.8	47.1	R	569.8	81.7	R	385.0	46.3
5	4	2	1.73	R	580.5	82.3	R	395.7	46.7	L	618.2	80.6	L	412.5	51.3
5	4	2	1.81	L	546.0	81.5	L	386.4	46.4	R	575.9	86.5	R	386.1	47.7
5	4	2	1.60	R	547.5	83.6	R	358.8	48.3	L	593.6	85.4	L	389.2	48.6
5	4	2	1.88	L	563.2	78.7	L	389.0	47.5	R	583.3	81.7	R	380.2	45.9
5	4	4	1.87	R	574.2	80.9	R	353.8	42.4	L	542.5	77.3	L	404.6	50.4
5	4	4	1.81	L	564.1	79.1	L	412.3	49.7	R	584.7	84.9	R	342.3	42.1
5	4	4	1.69	R	579.6	84.5	R	343.2	42.7	L	585.6	83.4	L	379.4	49.4
5	4	4	2.00	R	607.6	85.9	R	363.7	41.4	L	595.4	82.4	L	432.0	53.8
5	4	4	1.82	R	583.4	82.4	R	363.4	43.9	L	561.3	78.5	L	390.7	48.9
5	4	4	1.91	L	562.7	78.5	L	394.6	46.7	R	575.5	84.4	R	377.9	46.4
5	4	4	1.93	L	573.8	80.8	L	396.4	50.0	R	578.0	84.6	R	353.6	43.8
5	4	4	1.95	L	567.1	78.0	L	383.0	46.0	R	605.0	87.1	R	379.6	50.5
5	4	4	1.74	L	571.0	78.3	L	389.8	46.8	R	574.6	85.4	R	378.5	48.5
5	4	4	1.93	R	563.6	81.1	R	370.7	46.2	L	579.5	82.3	L	410.9	51.0
5	4	6	1.68	R	555.7	85.1	R	356.6	50.2	L	582.9	86.4	L	379.4	54.5
5	4	6	1.93	L	539.0	75.4	L	398.4	48.2	R	566.3	82.7	R	362.7	44.0
5	4	6	2.03	L	579.4	82.8	L	378.9	50.7	R	583.9	86.5	R	367.3	46.6
5	4	6	1.67	R	569.5	86.7	R	351.3	45.8	L	584.1	84.1	L	388.8	52.4
5	4	6	1.92	R	590.1	88.0	R	369.7	49.5	L	587.0	83.6	L	363.8	51.3
5	4	6	1.81	R	569.2	83.2	R	354.4	44.1	L	562.3	81.7	L	396.2	51.8
5	4	6	1.87	R	568.1	85.3	R	369.8	46.7	L	557.8	80.2	L	400.7	52.0
5	4	6	1.90	L	594.9	81.5	L	399.3	49.6	R	586.0	81.7	R	361.1	44.9
5	4	6	1.93	L	561.3	78.7	L	382.5	49.2	R	576.1	87.1	R	372.9	47.6
5	4	6	1.90	L	540.9	79.4	L	375.4	50.2	R	560.7	83.6	R	346.9	46.2
					P1			P1			P2			P2	
					Fore			Hind			Fore			Hind	
D	T	m	m/s	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp	S	PVF	Imp
5	5	2	2.08	R	562.2	73.2	R	355.2	40.0	L	536.9	75.8	L	375.4	46.8

5	5	2	1.69	R	555.2	82.4	R	355.4	43.7	L	529.5	74.3	L	376.8	47.8
5	5	2	1.89	L	573.0	77.9	L	363.1	44.8	R	584.8	82.8	R	370.7	46.7
5	5	2	1.93	R	548.4	81.4	R	390.7	49.5	L	516.8	75.1	L	405.9	51.1
5	5	2	2.06	R	548.7	75.2	R	391.9	45.4	L	582.0	76.9	L	384.5	43.4
5	5	2	1.82	R	566.6	79.7	R	395.2	46.9	L	594.7	79.8	L	410.5	46.2
5	5	2	1.85	L	563.8	76.4	L	402.1	46.1	R	572.9	80.2	R	373.5	44.5
5	5	2	1.71	L	555.2	77.6	L	385.9	43.8	R	590.8	83.0	R	378.0	45.4
5	5	2	1.64	L	561.9	80.3	L	371.6	46.0	R	546.0	80.2	R	369.0	47.3
5	5	2	1.80	L	517.3	77.4	L	388.5	49.7	R	531.6	78.8	R	319.2	41.6
5	5	4	1.74	L	536.9	78.1	L	389.1	48.0	R	562.0	84.0	R	339.0	43.1
5	5	4	1.64	R	563.8	84.9	R	355.1	45.6	L	567.1	86.0	L	384.0	51.9
5	5	4	1.69	R	554.2	82.3	R	347.2	42.7	L	538.4	82.4	L	388.5	50.0
5	5	4	1.91	L	589.7	77.2	L	406.9	45.6	R	580.6	79.8	R	365.2	43.2
5	5	4	1.81	R	566.5	82.8	R	355.6	43.4	L	550.2	78.2	L	395.4	49.6
5	5	4	1.76	L	552.0	78.6	L	394.8	47.9	R	566.9	85.6	R	367.0	46.0
5	5	4	1.80	L	558.3	83.1	L	394.9	50.8	R	544.9	82.6	R	359.4	45.7
5	5	4	1.76	L	530.5	75.1	L	401.6	49.4	R	575.5	85.5	R	471.7	54.9
5	5	4	1.88	R	579.8	82.6	R	359.8	42.5	L	546.2	81.0	L	394.5	50.1
5	5	4	1.90	R	577.1	81.8	R	368.2	42.9	L	549.0	76.5	L	401.1	49.0
5	5	6	1.74	R	566.7	82.5	R	357.0	43.9	L	550.5	81.1	L	383.0	47.9
5	5	6	1.69	R	558.7	79.5	R	353.5	43.2	L	553.9	79.5	L	401.8	48.1
5	5	6	1.66	R	592.6	87.7	R	380.6	48.3	L	586.6	85.0	L	371.2	47.8
5	5	6	2.01	L	579.6	78.1	L	388.3	46.0	R	580.3	81.2	R	362.4	44.6
5	5	6	1.71	L	504.3	75.4	L	400.4	51.9	R	564.7	86.9	R	370.2	45.7
5	5	6	1.70	R	579.7	88.1	R	369.4	46.8	L	560.1	83.5	L	384.8	49.8
5	5	6	1.82	R	565.8	82.2	R	373.6	46.7	L	570.4	80.6	L	379.9	47.4
5	5	6	1.76	L	577.5	76.8	L	381.1	44.1	R	589.9	88.8	R	358.1	46.2
5	5	6	1.75	L	507.5	76.7	L	408.6	52.8	R	764.5	108.3	R	370.0	45.2
5	5	6	1.78	L	525.9	75.3	L	380.8	46.2	R	560.2	88.0	R	370.8	48.1

APPENDIX B: ANOVA DATA

Response variables:
Y_1 Peak
Y_2 Impulse

Six factors influenced those response variables:

Distance	Fixed	d-1 = 2
Plate	Fixed	p-1 = 1
Fore/Hind limb	Fixed	l-1 =1
Rt/Lt side	Fixed	s-1 = 1
Dog	Random	d-1 = 4
Trial	Random	t – 1 =4

Data can be analyzed and we can quantify the variation due to the random factors. This is done from the ANOVA table by setting the MS = expected MS and solving for the variance = σ^2 = sd^2 = standard deviation squared = s^2.

	Peak mean = 97.4		Impulse mean=12.45	
	variance	% of total	variance	% of total
Random Factor				
repetitions	211.4	90	0.76	51
dog	19.4	8	0.56	37
trials	0.73	<½	0.08	5
dog*trial	3.84	~1½	0.10	7

Analysis of Variance Table for **PEAK**

Source Term	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (Alpha=0.05)
A (Distance)	2	1040.656	520.3279	1.36	0.311244	0.050531
B (Plate)	1	765.7869	765.7869	0.92	0.391684	0.050132
AB	2	724.1064	362.0532	1.93	0.207621	0.050754
C (Fore/Hind)	1	1292742	1292742	134.87	0.000314*	0.069509
AC	2	1126.226	563.113	3.16	0.097265	0.051240
BC	1	981.6098	981.6098	39.53	0.003268*	0.055695
ABC	2	391.4301	195.7151	1.21	0.347991	0.050473
D (Dog)	4	48590.37	12147.59	56.32	0.000000*	
AD	8	3071.342	383.9178	1.78	0.076191	
BD	4	3327.834	831.9584	3.86	0.003949*	
ABD	8	1504.063	188.0079	0.87	0.539582	
CD	4	38339.96	9584.989	44.44	0.000000*	
ACD	8	1424.426	178.0533	0.83	0.579905	
BCD	4	99.31848	24.82962	0.12	0.977219	
ABCD	8	1296.164	162.0205	0.75	0.646124	
S	2904	626309.8	215.6714			
Total (Adj)	2963	2016230				
Total 2964						

<u>PEAK</u> Term	Count	Mean	Standard Error	Effect
All	2964	97.38745		97.39725
A: Distance				
2	996	96.56019	0.6208539	-0.8373088
4	976	97.77525	0.6271829	0.3840214
6	992	97.83649	0.6221044	0.4532874
B: Plate				
1	1482	97.90158	0.7492499	0.5084706
2	1482	96.87332	0.7492499	-0.5084706
C: Fore/Hind				
1	1482	118.229	2.543149	20.89141
2	1482	76.54592	2.543149	-20.89141
D: Dog				
1	600	91.39066	0	-6.006586
2	596	103.9578	0	6.560443
3	592	98.18626	0	0.7686555
4	580	97.56121	0	0.187485
5	596	95.89161	0	-1.509998

AB: Distance,Plate

2,1	498	96.50603	0.6144313	-0.5602314
2,2	498	96.61436	0.6144313	0.5602314
4,1	488	98.21779	0.6206948	-8.225295E-02
4,2	488	97.33273	0.6206948	8.225295E-02
6,1	496	98.99165	0.6156688	0.6424843
6,2	496	96.68133	0.6156688	-0.6424843

AC: Distance,Fore/Hind

2,1	498	116.8807	0.5979438	-0.5690329
2,2	498	76.23966	0.5979438	0.5690329
4,1	488	119.3743	0.6040392	0.8567925
4,2	488	76.17625	0.6040392	-0.8567925
6,1	496	118.4559	0.5991481	-0.2877596
6,2	496	77.21712	0.5991481	0.2877596

BC: Plate,Fore/Hind

1,1	741	118.1632	0.1830526	-0.5756802
1,2	741	77.63996	0.1830526	0.5756802
2,1	741	118.2948	0.1830526	0.5756802
2,2	741	75.45187	0.1830526	-0.5756802

AD: Distance,Dog

2,1	200	91.18015	0	0.6267921
2,2	200	103.0866	0	-3.373613E-02
2,3	196	96.49831	0	-0.8302824
2,4	200	96.17535	0	-0.5720783
2,5	200	95.85925	0	0.8093047
4,1	200	92.41485	0	0.6401619
4,2	200	104.8397	0	0.4979837
4,3	196	96.8203	0	-1.729623
4,4	180	98.26711	0	0.2983527
4,5	200	96.5644	0	0.2931245
6,1	200	90.577 0	0	-1.266954
6,2	196	103.9467	0	-0.4642476
6,3	200	101.1791	0	2.559905
6,4	200	98.31175	0	0.2737256
6,5	196	95.23811	0	-1.102429

Term	Count	Mean	Standard Error	Effect
BD: Plate,Dog				
1,1	300	91.95457	0	5.542943E-02
1,2	298	104.8205	0	0.3543257
1,3	296	100.4493	0	1.737352
1,4	290	96.69845	0	-1.361315
1,5	298	95.60983	0	-0.785792
2,1	300	90.82677	0	-5.542943E-02
2,2	298	103.095	0	-0.3543257
2,3	296	95.92328	0	-1.737352
2,4	290	98.42397	0	1.361315
2,5	298	96.17339	0	0.785792
CD: Fore/Hind,Dog				
1,1	300	109.9964	0	-2.285676
1,2	298	122.3271	0	-2.52297
1,3	296	119.3153	0	0.2468218
1,4	290	125.3172	0	6.899639
1,5	298	114.4417	0	-2.337816
2,1	300	72.78493	0	2.285676
2,2	298	85.58839	0	2.52297
2,3	296	77.05727	0	-0.2468218
2,4	290	69.80518	0	-6.899639
2,5	298	77.34155	0	2.337816
ABC: Distance,Plate,Fore/Hind				
2,1,1	249	116.2826	0.8066502	3.363612E-02
2,1,2	249	76.72944	0.8066502	-3.363612E-02
2,2,1	249	117.4788	0.8066502	-3.363612E-02
2,2,2	249	75.74988	0.8066502	3.363612E-02
4,1,1	244	119.6675	0.8148732	0.4274582
4,1,2	244	76.76804	0.8148732	-0.4274582
4,2,1	244	119.081	0.8148732	-0.4274582
4,2,2	244	75.58447	0.8148732	0.4274582
6,1,1	248	118.5713	0.8082749	-0.4610943
6,1,2	248	79.41202	0.8082749	0.4610943
6,2,1	248	118.3404	0.8082749	0.4610943
6,2,2	248	75.02222	0.8082749	-0.4610943

ABD: Distance,Plate,Dog				
2,1,1	100	91.7425	0	0.5586814
2,1,2	100	103.5179	0	0.1286851
2,1,3	98	97.04561	0	-1.138295
2,1,4	100	94.9818	0	0.2195258
2,1,5	100	95.2531	0	0.2314028
2,2,1	100	90.6178	0	-0.5586814
2,2,2	100	102.6554	0	-0.1286851
2,2,3	98	95.95102	0	1.138295
2,2,4	100	97.3689	0	-0.2195258
2,2,5	100	96.4654	0	-0.2314028
4,1,1	100	93.0351	0	0.1386029
4,1,2	100	106.1249	0	0.5046567
4,1,3	98	98.22388	0	-0.7599981
4,1,4	90	97.70177	0	0.3697641
4,1,5	100	95.9518	0	-0.2530256
4,2,1	100	91.7946	0	-0.1386029
Term	Count	Mean	Standard Error	Effect
ABD: Distance,Plate,Dog				
4,2,2	100	103.5545	0	-0.5046567
4,2,3	98	95.41673	0	0.7599981
4,2,4	90	98.83244	0	-0.3697641
4,2,5	100	97.177 0	0	0.2530256
6,1,1	100	91.0861	0	-0.6972843
6,1,2	98	104.8187	0	-0.6333418
6,1,3	100	105.9657	0	1.898293
6,1,4	100	97.5121	0	-0.5892899
6,1,5	98	95.6249	0	2.162281E-02
6,2,1	100	90.0679	0	0.6972843
6,2,2	98	103.0748	0	0.6333418
6,2,3	100	96.3925	0	-1.898293
6,2,4	100	99.1114	0	0.5892899
6,2,5	98	94.85133	0	-2.162281E-02

ACD: Distance,Fore/Hind,Dog				
2,1,1	100	110.5817	0	1.36485
2,1,2	100	120.3512	0	-0.5348562
2,1,3	98	117.2798	0	0.2122819
2,1,4	100	122.6638	0	-0.7335653
2,1,5	100	113.5351	0	-0.3087099
2,2,1	100	71.7786	0	-1.36485
2,2,2	100	85.8221	0	0.5348562
2,2,3	98	75.71684	0	-0.2122819
2,2,4	100	69.6869	0	0.7335653
2,2,5	100	78.1834	0	0.3087099
4,1,1	100	110.9704	0	-0.9069759
4,1,2	100	124.4521	0	0.3871683
4,1,3	98	119.6809	0	0.8655891
4,1,4	90	127.0736	0	0.1586038
4,1,5	100	115.4704	0	-0.5043854
4,2,1	100	73.8593	0	0.9069759
4,2,2	100	85.2273	0	-0.3871683
4,2,3	98	73.95969	0	-0.8655891
4,2,4	90	69.46067	0	-0.1586038
4,2,5	100	77.6584	0	0.5043854
6,1,1	100	108.4371	0	-0.4578737
6,1,2	98	122.1751	0	0.1476879
6,1,3	100	120.9517	0	-1.077871
6,1,4	100	126.39 0	0	0.5749615
6,1,5	98	114.317	0	0.8130953
6,2,1	100	72.7169	0	0.4578737
6,2,2	98	85.71837	0	-0.1476879
6,2,3	100	81.4065	0	1.077871
6,2,4	100	70.2335	0	-0.5749615
6,2,5	98	76.15919	0	-0.8130953
BCD: Plate,Fore/Hind,Dog				
1,1,1	150	110.1995	0	0.2148469
1,1,2	149	122.4117	0	-0.2010691
1,1,3	148	120.7551	0	-0.2322096
1,1,4	145	123.9393	0	6.864316E-02
1,1,5	149	113.7363	0	0.1497887
1,2,1	150	73.70966	0	-0.2148469

Term	Count	Mean	Standard Error	Effect
BCD: Plate,Fore/Hind,Dog				
1,2,2	149	87.22926	0	0.2010691
1,2,3	148	80.14345	0	0.2322096
1,2,4	145	69.45759	0	-6.864316E-02
1,2,5	149	77.48335	0	-0.1497887
2,1,1	150	109.7933	0	-0.2148469
2,1,2	149	122.2426	0	0.2010691
2,1,3	148	117.8755	0	0.2322096
2,1,4	145	126.6952	0	-6.864316E-02
2,1,5	149	115.147	0	-0.1497887
2,2,1	150	71.8602	0	0.2148469
2,2,2	149	83.94752	0	-0.2010691
2,2,3	148	73.97108	0	-0.2322096
2,2,4	145	70.15276	0	6.864316E-02
2,2,5	149	77.19973	0	0.1497887
ABCD: Distance,Plate,Fore/Hind,Dog				
2,1,1,1	50	110.8104	0	-6.452782E-03
2,1,1,2	50	119.7504	0	-0.2889368
2,1,1,3	49	117.7586	0	0.7057333
2,1,1,4	50	120.5894	0	-0.4074491
2,1,1,5	50	112.5338	0	-2.894618E-03
2,1,2,1	50	72.6746	0	6.452782E-03
2,1,2,2	50	87.2854	0	0.2889368
2,1,2,3	49	76.33266	0	-0.7057333
2,1,2,4	50	69.3742	0	0.4074491
2,1,2,5	50	77.9724	0	2.894618E-03
2,2,1,1	50	110.353	0	6.452782E-03
2,2,1,2	50	120.952	0	0.2889368
2,2,1,3	49	116.801	0	-0.7057333
2,2,1,4	50	124.7382	0	0.4074491
2,2,1,5	50	114.5364	0	2.894618E-03
2,2,2,1	50	70.8826	0	-6.452782E-03
2,2,2,2	50	84.3588	0	-0.2889368
2,2,2,3	49	75.10102	0	0.7057333
2,2,2,4	50	69.9996	0	-0.4074491
2,2,2,5	50	78.3944	0	-2.894618E-03
4,1,1,1	50	111.2452	0	-0.4120748
4,1,1,2	50	125.009	0	-0.3790089
4,1,1,3	49	121.802	0	1.097983
4,1,1,4	45	126.2371	0	-0.1915323
4,1,1,5	50	114.744	0	-0.1153667

4,1,2,1	50	74.825 0	0	0.4120748
4,1,2,2	50	87.2408	0	0.3790089
4,1,2,3	49	74.64571	0	-1.097983
4,1,2,4	45	69.16644	0	0.1915323
4,1,2,5	50	77.1596	0	0.1153667
4,2,1,1	50	110.6956	0	0.4120748
4,2,1,2	50	123.8952	0	0.3790089
4,2,1,3	49	117.5598	0	-1.097983
4,2,1,4	45	127.91 0	0	0.1915323
4,2,1,5	50	116.1968	0	0.1153667
4,2,2,1	50	72.8936	0	-0.4120748
4,2,2,2	50	83.2138	0	-0.3790089

Term	Count	Mean	Standard Error	Effect
ABCD: Distance,Plate,Fore/Hind,Dog				
4,2,2,3	49	73.27367	0	1.097983
4,2,2,4	45	69.75489	0	-0.1915323
4,2,2,5	50	78.1572	0	-0.1153667
6,1,1,1	50	108.5428	0	0.4185276
6,1,1,2	49	122.4771	0	0.6679457
6,1,1,3	50	122.6656	0	-1.803716
6,1,1,4	50	125.2212	0	0.5989813
6,1,1,5	49	113.9351	0	0.1182613
6,1,2,1	50	73.6294	0	-0.4185276
6,1,2,2	49	87.1602	0	-0.6679457
6,1,2,3	50	89.2658	0	1.803716
6,1,2,4	50	69.803 0	0	-0.5989813
6,1,2,5	49	77.3147	0	-0.1182613
6,2,1,1	50	108.3314	0	-0.4185276
6,2,1,2	49	121.8731	0	-0.6679457
6,2,1,3	50	119.2378	0	1.803716
6,2,1,4	50	127.5588	0	-0.5989813
6,2,1,5	49	114.699	0	-0.1182613
6,2,2,1	50	71.8044	0	0.4185276
6,2,2,2	49	84.27653	0	0.6679457
6,2,2,3	50	73.5472	0	-1.803716
6,2,2,4	50	70.664 0	0	0.5989813
6,2,2,5	49	75.00367	0	0.1182613

Analysis of Variance Table for **IMPULSE**

Source Term	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (Alpha=0.05)
A (Distance)	2	31.29337	15.64668	4.55	0.047921*	0.051785
B (Plate)	1	10.81103	10.81103	3.77	0.124257	0.050542
AB	2	1.481887	0.7409437	0.75	0.503426	0.050293
C (Fore/Hind)	1	28571.85	28571.85	476.45	0.000026*	0.119656
AC	2	9.591447	4.795723	3.36	0.087302	0.051317
BC	1	5.431513	5.431513	2.39	0.197100	0.050343
ABC	2	2.190454	1.095227	1.25	0.337887	0.050488
D (Dog)	4	1398.188	349.5471	354.00	0.000000*	
AD	8	27.51513	3.439391	3.48	0.000522*	
BD	4	11.48014	2.870035	2.91	0.020525*	
ABD	8	7.91696	0.98962	1.00	0.432009	
CD	4	239.8729	59.96824	60.73	0.000000*	
ACD	8	11.42264	1.427831	1.45	0.172090	
BCD	4	9.094915	2.273729	2.30	0.056307	
ABCD	8	7.029311	0.8786638	0.89	0.524017	
S	2904	2867.492	0.9874284			
Total (Adj)	2963	33198.43				
Total	2964					

<u>IMPULSE</u> Term	Count	Mean	Standard Error	Effect
All	2964	12.45056		12.44319
A: Distance				
2	996	12.32376	5.876397E-02	-0.1226031
4	976	12.45984	0.059363	-6.330431E-03
6	992	12.56873	5.888233E-02	0.1289336
B: Plate				
1	1482	12.39052	4.400677E-02	-6.041509E-02
2	1482	12.51059	4.400677E-02	6.041509E-02
C: Fore/Hind				
1	1482	15.55515	0.2011576	3.105854
2	1482	9.345965	0.2011576	-3.105854
D: Dog				
1	600	13.33042	0	0.8872231
2	596	12.69451	0	0.2518558
3	592	11.71676	0	-0.7274099
4	580	11.57212	0	-0.875088
5	596	12.90456	0	0.463419

AB: Distance,Plate

2,1	498	12.26213	0.0445779	-6.818519E-04
2,2	498	12.3854	0.0445779	6.818519E-04
4,1	488	12.37418	4.503232E-02	-2.704732E-02
4,2	488	12.54549	4.503232E-02	2.704732E-02
6,1	496	12.5355	4.466768E-02	2.772917E-02
6,2	496	12.60196	4.466768E-02	-2.772917E-02

AC: Distance,Fore/Hind

2,1	498	15.35456	5.354559E-02	-7.667948E-02
2,2	498	9.292972	5.354559E-02	7.667948E-02
4,1	488	15.61969	5.409143E-02	5.949488E-02
4,2	488	9.299979	5.409143E-02	-5.949488E-02
6,1	496	15.69304	5.365343E-02	0.0171846
6,2	496	9.444415	5.365343E-02	-0.0171846

BC: Plate,Fore/Hind

1,1	741	15.45173	5.539368E-02	-4.282252E-02
1,2	741	9.329311	5.539368E-02	4.282252E-02
2,1	741	15.65857	5.539368E-02	4.282252E-02
2,2	741	9.362618	5.539368E-02	-4.282252E-02

AD: Distance,Dog

2,1	200	13.2251	0	1.728649E-02
2,2	200	12.5782	0	5.753832E-03
2,3	196	11.5301	0	-6.307848E-02
2,4	200	11.65495	0	0.2094476
2,5	200	12.6146	0	-0.1694094
4,1	200	13.3498	0	2.571376E-02
4,2	200	12.73205	0	4.333111E-02
4,3	196	11.75745	0	4.799574E-02
4,4	180	11.45167	0	-0.1101085
4,5	200	12.89335	0	-6.932154E-03
6,1	200	13.41635	0	-4.300025E-02
6,2	196	12.7749	0	-4.908494E-02
6,3	200	11.8598	0	1.508274E-02
6,4	200	11.5977	0	-9.933913E-02
6,5	196	13.21189	0	0.1763416

Term	Count	Mean	Standard Error	Effect
BD: Plate,Dog				
1,1	300	13.21293	0	-5.706825E-02
1,2	298	12.64003	0	5.818148E-03
1,3	296	11.7378	0	8.160692E-02
1,4	290	11.43124	0	-8.214232E-02
1,5	298	12.89493	0	0.0517855
2,1	300	13.4479	0	5.706825E-02
2,2	298	12.74899	0	-5.818148E-03
2,3	296	11.69571	0	-8.160692E-02
2,4	290	11.713 0	0	8.214232E-02
2,5	298	12.9142	0	-0.0517855
CD: Fore/Hind,Dog				
1,1	300	16.66483	0	0.2285627
1,2	298	15.46711	0	-0.3328026
1,3	296	14.49378	0	-0.3294873
1,4	290	15.03372	0	0.3570516
1,5	298	16.08772	0	7.667562E-02
2,1	300	9.996 0	0	-0.2285627
2,2	298	9.921913	0	0.3328026
2,3	296	8.93973	0	0.3294873
2,4	290	8.110518	0	-0.3570516
2,5	298	9.72141	0	-7.667562E-02
ABC: Distance,Plate,Fore/Hind				
2,1,1	249	15.27414	5.940346E-02	2.430559E-02
2,1,2	249	9.25012	5.940346E-02	-2.430559E-02
2,2,1	249	15.43498	5.940346E-02	-2.430559E-02
2,2,2	249	9.335823	5.940346E-02	2.430559E-02
4,1,1	244	15.50311	6.000901E-02	1.365862E-02
4,1,2	244	9.245246	6.000901E-02	-1.365862E-02
4,2,1	244	15.73627	6.000901E-02	-1.365862E-02
4,2,2	244	9.354713	6.000901E-02	1.365862E-02
6,1,1	248	15.57948	0.0595231	-3.796421E-02
6,1,2	248	9.491532	0.0595231	3.796421E-02
6,2,1	248	15.80661	0.0595231	3.796421E-02
6,2,2	248	9.397299	0.0595231	-3.796421E-02

ABD: Distance,Plate,Dog				
2,1,1	100	13.1308	0	2.386519E-02
2,1,2	100	12.4846	0	-3.832121E-02
2,1,3	98	11.60337	0	5.275532E-02
2,1,4	100	11.5376	0	2.588926E-02
2,1,5	100	12.5411	0	-6.418855E-02
2,2,1	100	13.3194	0	-2.386519E-02
2,2,2	100	12.6718	0	3.832121E-02
2,2,3	98	11.45684	0	-5.275532E-02
2,2,4	100	11.7723	0	-2.588926E-02
2,2,5	100	12.6881	0	6.418855E-02
4,1,1	100	13.2043	0	-9.6935E-04
4,1,2	100	12.7339	0	8.349425E-02
4,1,3	98	11.74796	0	-3.634316E-03
4,1,4	90	11.26044	0	-0.0216175
4,1,5	100	12.8004	0	-5.727309E-02
4,2,1	100	13.4953	0	9.6935E-04
Term	Count	Mean	Standard Error	Effect
ABD: Distance,Plate,Dog				
4,2,2	100	12.7302	0	-8.349425E-02
4,2,3	98	11.76694	0	3.634316E-03
4,2,4	90	11.64289	0	0.0216175
4,2,5	100	12.9863	0	5.727309E-02
6,1,1	100	13.3037	0	-2.289584E-02
6,1,2	98	12.70286	0	-4.517305E-02
6,1,3	100	11.8596	0	-0.049121
6,1,4	100	11.4786	0	-4.271761E-03
6,1,5	98	13.35245	0	0.1214616
6,2,1	100	13.529 0	0	2.289584E-02
6,2,2	98	12.84694	0	4.517305E-02
6,2,3	100	11.86 0	0	0.049121
6,2,4	100	11.7168	0	4.271761E-03
6,2,5	98	13.07133	0	-0.1214616
ACD: Distance,Fore/Hind,Dog				
2,1,1	100	16.555 0	0	7.216281E-02
2,1,2	100	15.1879	0	-8.667188E-02
2,1,3	98	14.15622	0	-7.356474E-02
2,1,4	100	15.0237	0	-1.747608E-02
2,1,5	100	15.826 0	0	0.1055499
2,2,1	100	9.8952 0	0	-7.216281E-02
2,2,2	100	9.9685 0	0	8.667188E-02
2,2,3	98	8.903979	0	7.356474E-02

2,2,4	100	8.2862 0	0	1.747608E-02
2,2,5	100	9.4032 0	0	-0.1055499
4,1,1	100	16.731 0	0	-1.271154E-02
4,1,2	100	15.6013	0	3.670377E-02
4,1,3	98	14.58633	0	-6.983991E-03
4,1,4	90	14.95233	0	-2.173376E-02
4,1,5	100	16.1401	0	4.725533E-03
4,2,1	100	9.9686 0	0	1.271154E-02
4,2,2	100	9.8628 0	0	-3.670377E-02
4,2,3	98	8.928572	0	6.983991E-03
4,2,4	90	7.951 0	0	2.173376E-02
4,2,5	100	9.6466 0	0	-4.725533E-03
6,1,1	100	16.7085	0	-5.945127E-02
6,1,2	98	15.6151	0	4.996812E-02
6,1,3	100	14.7339	0	8.054873E-02
6,1,4	100	15.117 0	0	3.920984E-02
6,1,5	98	16.30133	0	-0.1102754
6,2,1	100	10.1242	0	5.945127E-02
6,2,2	98	9.934694	0	-4.996812E-02
6,2,3	100	8.9857 0	0	-8.054873E-02
6,2,4	100	8.0784 0	0	-3.920984E-02
6,2,5	98	10.12245	0	0.1102754
BCD: Plate,Fore/Hind,Dog				
1,1,1	150	16.48027	0	-2.426081E-02
1,1,2	149	15.37141	0	1.754157E-03
1,1,3	148	14.55662	0	8.496742E-02
1,1,4	145	14.86979	0	0.0216429
1,1,5	149	15.95201	0	-8.410367E-02
1,2,1	150	9.9456 0	0	2.426081E-02

Term	Count	Mean	Standard Error	Effect
BCD: Plate,Fore/Hind,Dog				
1,2,2	149	9.908658	0	-1.754157E-03
1,2,3	148	8.918986	0	-8.496742E-02
1,2,4	145	7.99269	0	-0.0216429
1,2,5	149	9.837852	0	8.410367E-02
2,1,1	150	16.8494	0	2.426081E-02
2,1,2	149	15.56282	0	-1.754157E-03
2,1,3	148	14.43095	0	-8.496742E-02
2,1,4	145	15.19765	0	-0.0216429
2,1,5	149	16.22342	0	8.410367E-02
2,2,1	150	10.0464	0	-2.426081E-02
2,2,2	149	9.935167	0	1.754157E-03

2,2,3	148	8.960473	0	8.496742E-02
2,2,4	145	8.228345	0	0.0216429
2,2,5	149	9.604966	0	-8.410367E-02
ABCD: Distance,Plate,Fore/Hind,Dog				
2,1,1,1	50	16.4332	0	1.527775E-02
2,1,1,2	50	15.0568	0	-2.073722E-02
2,1,1,3	49	14.27775	0	-1.818518E-02
2,1,1,4	50	14.8316	0	-7.787596E-02
2,1,1,5	50	15.7514	0	0.1015206
2,1,2,1	50	9.8284 0	0	-1.527775E-02
2,1,2,2	50	9.9124 0	0	2.073722E-02
2,1,2,3	49	8.92898	0	1.818518E-02
2,1,2,4	50	8.2436 0	0	7.787596E-02
2,1,2,5	50	9.3308 0	0	-0.1015206
2,2,1,1	50	16.6768	0	-1.527775E-02
2,2,1,2	50	15.319 0	0	2.073722E-02
2,2,1,3	49	14.03469	0	1.818518E-02
2,2,1,4	50	15.2158	0	7.787596E-02
2,2,1,5	50	15.9006	0	-0.1015206
2,2,2,1	50	9.962 0	0	1.527775E-02
2,2,2,2	50	10.0246	0	-2.073722E-02
2,2,2,3	49	8.87898	0	-1.818518E-02
2,2,2,4	50	8.3288 0	0	-7.787596E-02
2,2,2,5	50	9.4756 0	0	0.1015206
4,1,1,1	50	16.5118	0	-2.027529E-02
4,1,1,2	50	15.5352	0	-4.054026E-02
4,1,1,3	49	14.66531	0	3.266586E-02
4,1,1,4	45	14.79422	0	4.063212E-02
4,1,1,5	50	15.9214	0	-1.248243E-02
4,1,2,1	50	9.8968 0	0	2.027529E-02
4,1,2,2	50	9.9326 0	0	4.054026E-02
4,1,2,3	49	8.830612	0	-3.266586E-02
4,1,2,4	45	7.726666	0	-4.063212E-02
4,1,2,5	50	9.6794 0	0	1.248243E-02
4,2,1,1	50	16.9502	0	2.027529E-02
4,2,1,2	50	15.6674	0	4.054026E-02
4,2,1,3	49	14.50735	0	-3.266586E-02
4,2,1,4	45	15.11044	0	-4.063212E-02
4,2,1,5	50	16.3588	0	1.248243E-02
4,2,2,1	50	10.0404	0	-2.027529E-02
4,2,2,2	50	9.793 0	0	-4.054026E-02

Term	Count	Mean	Standard Error	Effect
ABCD: Distance,Plate,Fore/Hind,Dog				
4,2,2,3	49	9.02653	0	3.266586E-02
4,2,2,4	45	8.175333	0	4.063212E-02
4,2,2,5	50	9.6138 0	0	-1.248243E-02
6,1,1,1	50	16.4958	0	4.997544E-03
6,1,1,2	49	15.52531	0	6.127748E-02
6,1,1,3	50	14.7234	0	-1.448069E-02
6,1,1,4	50	14.976 0	0	3.724384E-02
6,1,1,5	49	16.18796	0	-8.903817E-02
6,1,2,1	50	10.1116	0	-4.997544E-03
6,1,2,2	49	9.880408	0	-6.127748E-02
6,1,2,3	50	8.9958 0	0	1.448069E-02
6,1,2,4	50	7.9812 0	0	-3.724384E-02
6,1,2,5	49	10.51694	0	8.903817E-02
6,2,1,1	50	16.9212	0	-4.997544E-03
6,2,1,2	49	15.7049	0	-6.127748E-02
6,2,1,3	50	14.7444	0	1.448069E-02
6,2,1,4	50	15.258 0	0	-3.724384E-02
6,2,1,5	49	16.41469	0	8.903817E-02
6,2,2,1	50	10.1368	0	4.997544E-03
6,2,2,2	49	9.988979	0	6.127748E-02
6,2,2,3	50	8.9756 0	0	-1.448069E-02
6,2,2,4	50	8.1756 0	0	3.724384E-02
6,2,2,5	49	9.72796	0	-8.903817E-02

APPENDIX C: PAIRED T-TEST DATA

Impulse	2m total	4m total	6m total
Dog 1	13.2251	13.3498	13.41635
Dog 2	12.5782	12.73205	12.7749
Dog 3	11.5301	11.75745	11.8598
Dog 4	11.65495	11.45167	11.5977
Dog 5	12.6146	12.89335	13.21189
Impulse	2m fore	4m fore	6m fore
Dog 1	16.555	16.731	16.7085
Dog 2	15.1879	15.6013	15.6151
Dog 3	14.15622	14.58633	14.7339
Dog 4	15.0237	14.95233	15.117
Dog 5	15.826	16.1401	16.30133
Impulse	2m hind	4m hind	6m hind
Dog 1	9.8952	9.9686	10.1242
Dog 2	9.9685	9.8628	9.934694
Dog 3	8.903979	8.928572	8.9857
Dog 4	8.2862	7.951	8.0784
Dog 5	9.4032	9.6466	10.12245

t-Test: Paired two sample for means
2m vs. 4m forelimb impulse

	Variable 1	Variable 2
Mean	15.34976	15.60221
Variance	0.809115	0.754462
Observations	5	5
Pearson Correlation	0.973098	
Hypothesized mean	0	
df	4	
t Stat	-2.72243	
P(T<=t) one-tail	0.026427	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.052854	
t Critical two-tail	2.776451	

t-Test: Paired two sample for means
2m vs. 6m hind limb impulse

	Variable 1	Variable 2
Mean	9.291416	9.449089
Variance	0.499015	0.80963
Observations	5	5
Pearson Correlation	0.931786	
Hypothesized mean	0	
df	4	
t Stat	-1.00076	
P(T<=t) one-tail	0.186787	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.373574	
t Critical two-tail	2.776451	

t-Test: Paired two sample for means 2m vs 6m forelimb impulse		
	Variable 1	Variable 2
Mean	15.34976	15.69517
Variance	0.809115	0.66475
Observations	5	5
Pearson Correlation	0.974509	
Hypothesized mean	0	
df	4	
t Stat	-3.66221	
P(T<=t) one-tail	0.010769	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.012383*	
t Critical two-tail	2.776451	

t-Test: Paired two sample for means 2m vs 4m hind limb impulse		
	Variable 1	Variable 2
Mean	9.291416	9.271514
Variance	0.499015	0.709401
Observations	5	5
Pearson Correlation	0.976267	
Hypothesized mean	0	
df	4	
t Stat	0.205933	
P(T<=t) one-tail	0.42345	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.8469	
t Critical two-tail	2.776421	

t-Test: Paired two sample for means 4m vs 6m forelimb impulse		
	Variable 1	Variable 2
Mean	15.60221	15.69517
Variance	0.754462	0.66475
Observations	5	5
Pearson Correlation	0.996288	
Hypothesized mean	0	
df	4	
t Stat	-2.31008	
P(T<=t) one-tail	0.041013	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.082025	
t Critical two-tail	2.776451	

t-Test: Paired two sample for means 4m vs 6m hind limb impulse		
	Variable 1	Variable 2
Mean	9.271514	9.449089
Variance	0.709401	0.80963
Observations	5	5
Pearson Correlation	0.98278	
Hypothesized mean	0	
df	4	
t Stat	-2.31531	
P(T<=t) one-tail	0.040778	
t Critical one-tail	2.131846	
P(T<=t) two-tail	0.081555	
t Critical two-tail	2.776451	