

CHAPTER-III

COACHING

&

TRAINING

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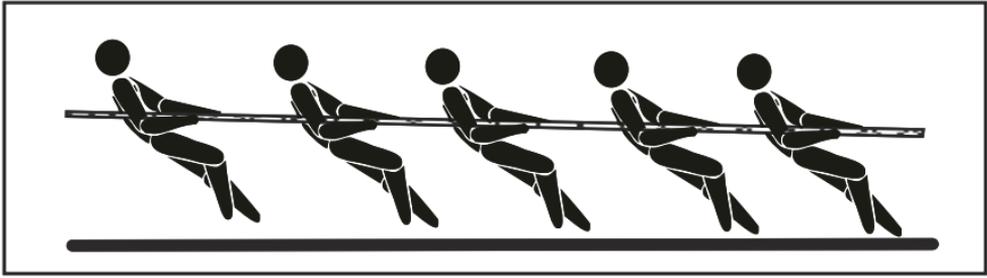
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August 1998

COACHING & TRAINING

1. TRAINING

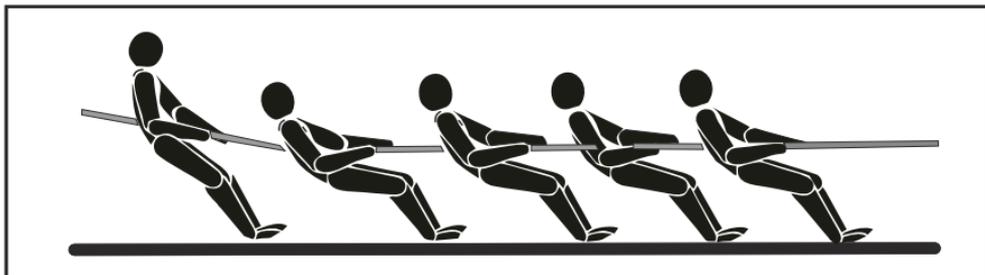
Tug-of-War is a strenuous sport. And unlike some other team sports, where two or three "star" individuals can ensure that a team does well, a Tug-of-War team, consisting of eight pullers must be capable of such teamwork that it is capable of exerting maximum power with the greatest efficiency. Thus, harmonious team-work is of vital importance, and the learning of pulling techniques, paramount.



Ideally a Tug-of-War team should consist of eight men of similar physique, capable of developing broad shoulders, thick thighs, strong arms and legs, and be of a co-operative disposition.



However, size and weight of individual pullers in a team is not, in itself, important. If a team is not comprised of pullers of uniform size, then it is usual to have the smallest men (in height) at the front of the rope, and grading towards the tallest at the back of the rope. This for outdoor competition. The reverse usually applies for indoor competition.



The object of placing the pullers on the rope is to develop as straight a rope as possible, as this will maintain optimum power, whereas a rope which is "bent" will dissipate optimum power.

Harmonious pulling will only be achieved by dedication, hard work, and a high degree of teamwork.

Thus pullers must be prepared to undertake regular training sessions, which will steadily improve their capabilities.

It is likely that individual pullers, after several training sessions, and being placed at differing position on the rope, will find a position at which he/she is most comfortable, and will ultimately, generally pull in that position in a team.

But, the foregoing is given as a general guide. Teams will find their own "permutations" of pulling positions, as they progress.

At the outset of a season, pullers must first be fit. Too many people think that taking up sport is a method of getting fit, but the opposite applies. People must first get fit for sport.

Therefore getting fit, before the start of a Tug-of-War season must be the prime aim of a puller. Pullers should only progress to specific training for Tug-of-War when they have attained fitness.

2. FITNESS TRAINING

Training to become fit can be accomplished by undertaking several types of exercises, all aimed at preparing pullers to become physically fit.

The heart and lungs are vital to strenuous activity, and there are proven

methods employed to assist in developing good circulation and lung capacity (cardio-vascular and pulmonary development), such as, cycling, swimming and road or cross-country running.

The object at the beginning of training would be to set a planned route for cycling, or running, and time oneself on the first effort, and endeavour to progressively lower the time taken, and with swimming to undertake to swim certain number of lengths of the swimming pool, and progressively increase the number of lengths swum.

These three types of exercises will also develop muscular use and stamina.

Developing various parts of the body can be achieved by circuit training and this can be as varied as one likes.

Here again, in such training timing oneself on the first effort, and progressively trying to lower the time on successive efforts will help determine whether fitness is being achieved.

Circuit training may be carried out indoors, in a hall or gymnasium and outdoors on a rugby, soccer or recreational ground.

It should consist of multi-type exercises, such as running walking trotting, sprinting, carrying a weight (bucket of sand or similar) alternatively in the right and left hand, jumping over an impediment, abdominal, arm and leg exercises, and if in a gymnasium, climbing vertical bars, and ropes, the latter with hands only. Circuit training may be accomplished in many ways, and by utilising such space or equipment available. Where little equipment is on hand, then "invention" will be necessary.

Other training can be achieved by simple arm, leg and trunk exercises, some of which are shown on the chart on page no 98 & 99.

It should be emphasised that all training should be carried out by a gradual process of improvement. Trying to reach fitness in a hurry is likely to do more harm than good, Every person will have his or her own level of progress.

A puller, having reached a good standard of fitness should, by regular training

sessions throughout a pulling season, keep up a reasonable level of competitiveness, which will carry them on through the season. In fact as a puller progresses through training and competition, improvement in techniques and stamina should evolve. But, having come to the end of a pulling season, many pullers do not engage in physical activity, until training begins in readiness for the next season.

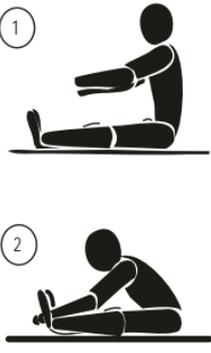
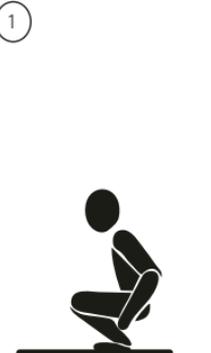
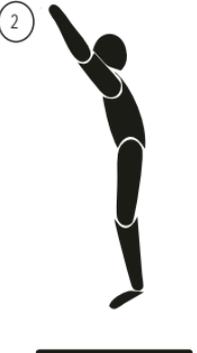
This results in putting on fat and losing condition, which will entail a puller starting again from scratch as the next season approaches.

However, if some form of physical activity can be continued in the close season then a rapid decline in condition can be avoided, and it will assist in progressive fitness. Otherwise fitness gained in one competitive season will be lost, instead of being transferred to the next. So a puller without undertaking too strenuous a programme in the close season should commit himself/herself to an all your round regime.

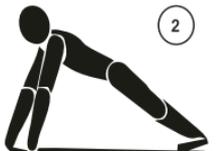
All too often, pullers enter the pulling area without any pre-pulling "warm up" This can cause injury, or prevent a puller giving of their best. There should be "warm up" before starting pulling, by carrying out simple stretching exercises, and raising the body temperature by jogging, or running on the spot.

it is equally important to maintain oneself by keeping warm and dry, and release between rounds of pulling.

PHYSICAL FITNESS TRAINING EXERCISES (1)

			
Forward thrust	Squat jumping		Arms swinging foot to foot
			
High jumping		Upward thrust	
			Short arm Jabs each arm
Pushing through legs		Arm upward thrust	Short arm Jabs each arm

PHYSICAL FITNESS TRAINING EXERCISES (2)

<ul style="list-style-type: none"> ● 25 metres left leg ● return on right leg 	<ul style="list-style-type: none"> ● 25 metres sprint ● right turn, 25 mtr trot ● right turn, 15 mtr trot ● 25 metres sprint ● etc. 		 
Hopping	Trotting	Squat thrust single leg	Squat thrust double leg
 		 	 
Press up	Dorsal lift	Raises lower leg	Feet off ground Open-close legs
	 		 
Lie on back legs over	Trunk curi	Swing arms from toe to toe	Sitting cross-legged Touching floor in front

TUG-OF-WAR TRAINING

3. START OF TRAINING

Having achieved fitness pullers should now pass on to specific Tug-of-War training.

Dress is of minor importance at this stage. It should be informal, serviceable and comfortable, but as a team nears its first competition, pullers should approximate to proper competition clothing, to acclimatise to proper competition dress.

Correct positioning on the rope should be shown as well as the words of command given by the judge at the start of a pull.

The first order will be "Pick up the rope". A puller will pick up the rope nearest to his/her feet. Passing it under the right armpit, with the right arm bent, and the left arm extended, both hands gripping the rope, palms uppermost. Feet being well balanced on the ground.

Normally pullers will have the rope on the right-hand side of the body, and will be about an arm's length away from the puller in front. This distance will vary, according to pullers choice, as they become more experienced. Suffice to say that being too close to the puller in front may impede that puller. Whilst being too distant will dissipate the power on the rope.

Additionally, there may be pullers who prefer the rope to be on the left-hand side of their body.

The next command from the Judge will be "Take the strain". At this, every puller should grip the rope firmly with both hands, and extend (normally) the left leg. establishing a good foothold with the foot, keeping a good balance with the right leg, which should be slightly bent.

All pullers should watch the judge at this stage without exception. The final command to commence pulling will be "Pull". At this the whole team should throw their body backward, at about an angle of 45°, cutting the right foot into the ground, with the left leg straight, the feet being about 12 inches apart, and 6 inches between front and back, almost straddling the rope. The upper part of the body should be positioned over the rope, without lying on it, so as to

exert the full force. The hands should grip the rope fairly close together, the leading arm being straight, and the rear arm as straight as possible as the position of the hands will permit. The head should be thrown well back, in line with the body, thus giving extra weight on the rope.

Position being now known, putting them in practice will be the next step.

4. TECHNIQUE FOR OUT-DOOR TUG-OF-WAR

The technique used in a sport is predetermined by the rules of the sport. The rules of Tug-of-War are rather simple. Top performance in Tug-of-War however is far from simple. This chapter intends to provide the first steps towards the development of performance in Tug-of-War Sport.

5. RULES OF TUG OF WAR

The position on the rope (pulling position) is primarily defined by the rules of the game, Elements of the rules with a direct relation to the position on the rope are :

- * the puller shall not touch the ground with any part of the body other than the feet.
- * the puller shall hold the rope with both bare hands by the ordinary grip. i.e. the palms of both hands facing up.
- * the rope shall pass between the body and the upper part of the arm, except in the case of Anchor.
- * the feet must be extended forward of the knees.

The basic pulling position for the Tug-of-War sport is essentially based on these four elements of the rules of the game.

i) BIOMECHANICS

Apart from the rules of the game there is another important aspect which controls the proper pulling position in the Tug-of-War sport, the biomechanics. The physical laws on forces, torque's and vectors (mechanics) are also applicable on the human body in the sport. However human beings are (luckily) first and foremost living beings.

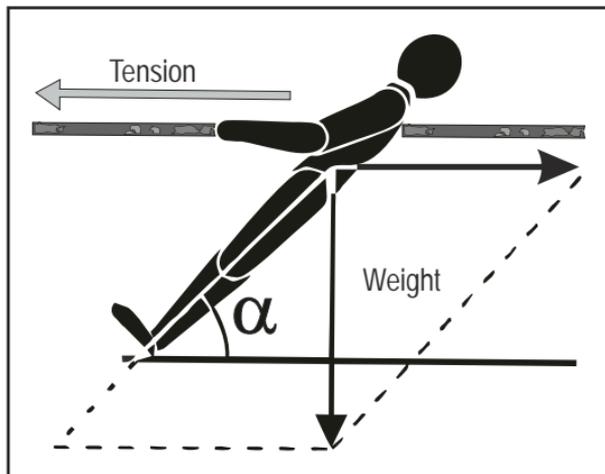
In addition to external forces effecting the body of the puller, notably, the tension in the rope (T) and the gravity (G) (the weight of the body), the puller is able to generate inherent force, the muscular strength.

The three factors, the tension in the rope, weight and muscular strength together form the biomechanics model, which we will use to analyse the technique of the Tug-of-War sport. Through such an analysis, we are able to determine the advantages and disadvantages of the various techniques. Moreover, it will make it possible to determine the best and most effective training for the Tug-of-War sport (such as fitness training, callisthenics and power training).

ii) STATIC MODEL

ANALYSIS

In order to make such analyses just visualise the pullers “stiff as a poker”. A stiff body, a fixed immovable model. The position of such a model is only controlled by the law of physics (mechanics).



The maximum tension (force) which a puller would be able to absorb is the so-called “horizontal resolved factor” of the body weight of the puller (HF). The body weight of the puller does not change during the pull (apart from the fact that one will certainly sweat off some weight through

perspiration during competition). The force HF is then only dependent on the altitude of the body. that is to say depending on the angle between the body and the surface. (Angle alpha - α)

The maximum force is then equal to : $HF = W \times \text{tangent } a$ The value of the angle a in this case will range between 90° and 0° . At 90° the force T (tension in the rope) is zero, which is the case with a puller standing straight up. Likewise at an angle of 0° , which is the case when a puller is lying stretched on the ground, the force T is maximum (theoretically infinite)

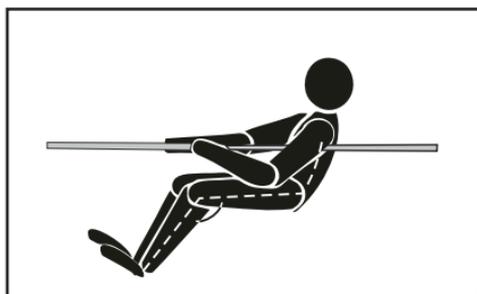
RULE 1

The smaller the angle between body and surface, the greater the result of the body weight on the tension in the rope.

BIOMECHANICS

If indeed a puller was only a stiff body, he would be able to apply a substantial tension in the rope during the defense. However, he would not win a single pull, as he is literally immovable. Fortunately the human body is not a stiff object but it is very lissom (supple), which is certainly a requirement for the sport. As a human being a puller consists of limbs, joints and muscles, forming the locomotor apparatus, (Kinematics)

Standing upright, most parts of the body are above each other; legs, torso and head are stacked on top of each other and the upper and lower arms are hanging from the torso. In such a position the body muscles are almost without strain. In a slanting position of the body (such as indicated in the static model) the muscles have to apply tension in order to keep the limbs straight and fixed in that position. This tension in the muscles does not contribute to the pressure in the rope, . The pressure in the rope in the static model is only dependent on the "horizontal resolved factor" of the body weight. Another disadvantage of the static model is that muscles do not provide the maximum tension at fully stretched position of the limbs.



BIOMECHANIC MODEL

The inherent force / power of the locomotor apparatus is dependent on the angle between the "levers" of the body. For example leg tensors provide optimum force at angles (b) between 110° to 160° and torso

tensors are most effective at angles (β) between 90° to 120° etc.

In the kinematics of the Tug-of-War sport the following three main groups of joints (levers) are important;

- * the knee joint; the angle between lower-and upper leg is beta (β) (optimum at approximately 120°)
- * the hips the angle between upper legs and torso is gamma (γ) (optimum at approximately 100°)
- * the joints of the vertebral column; the (dorsal) vertebrae form individual joints, a slightly bent back provides the ability to apply maximum force through the dorsal tensors.

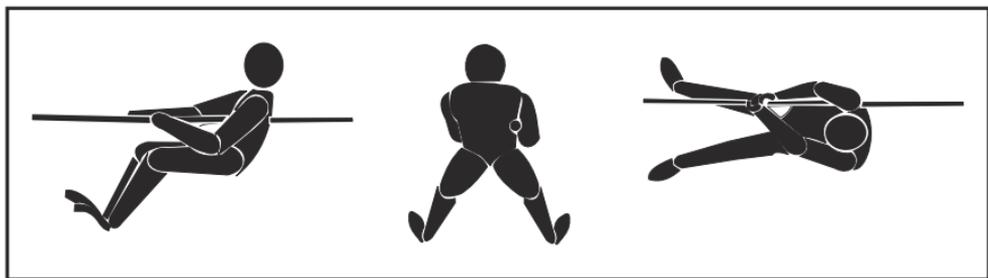
RULE 2

In order to apply optimum muscle tension, Joints ("levers") of the limbs and torso have to have a particular angle.

BASIC POSITION

The biomechanic model for the pulling position is called the basic position.

Using pictures of a puller in the basic position viewed from the side, the rear



and from above, a listing of essential muscle grouping can be made.

In analysing the basic position it is important to look at the position of

- * the hands in relation to the centre of gravity of the body.
- * the feet in relation to the foot tensors and the angle at which the foot is cut into the ground surface.

To learn any Tug-of-War technique, it is essential to master the basic pulling

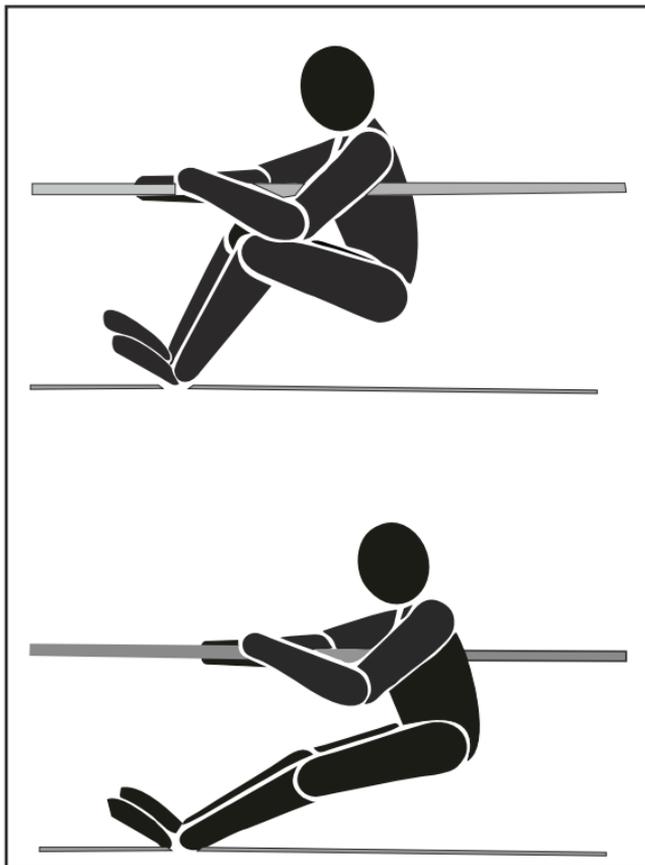
position. All Tug-of-War techniques and skills, both in defence or attack mode are based on the basic pulling position.

RULE 3

Teach novice puller first of all the basic pulling position and explain why this is the optimum body position for the tug of war sport.

FAULTS IN BASIC POSITION

(a)



The leg tensors can only apply a limited part of potential strength. Also the angle between upper legs and torso is too small, limiting the optimum use of the torso tensors.

(b)

In this position the legs are fully stretched, reducing the muscle tension of the legs to zero.

Again it should be emphasised that pullers from the very beginning need to learn the correct basic position. Faults in the basic pulling position

will effect any further technique and style and are very difficult to remedy at a later stage.

START

The next step in the learning process of the pulling techniques is the start. The position to be taken after the command "Take the strain" is the following.

Start position

Important points for a correct starting position are :



- * the foot should be "bashed" into the ground at the required angle.
- * the hands close to the body
- * the back slightly bent
- * the leg to support the body during the start position should be not too far behind the front leg.

Explosive Start

The power explosion at the start of a pull is brought about by the

following factors.

- * the kinetic energy of the weight of the "falling" body.
- * the explosive stretching of the leg and torso muscles.

In particular the explosive stretching of the leg and torso muscle should be timed precisely, otherwise the start results in a puller sitting on the ground with fully stretched legs and no pressure on the rope.

To train and instruct the correct start procedure, the total procedure should be split in three phases;

- * the body position before the start.
- * the active movement during the fall into the rope.
- * the body position after the start.

Following a correct start procedure the puller will be in the basic pulling

position after the start. Depending on the pressure on the rope (opponent) and the preferred tactics the team will turn into a defence or attack technique following the start.

RULE 4

Use the kinetic energy of the "falling" body weight during the start, with explosive stretching of the leg and torso muscles.

Use video material or drawings to explain the start procedure to novice pullers, in particular show the displacement of the centre of gravity of the body during the start procedure.

Leg position in basic pulling position

It's virtually impossible to apply maximum muscle tension of the legs during the full duration of a pull of 2 to 5 minutes. In the basic pulling position therefore one leg is extended at full stretch. such as shown in the static model, while the other leg is angled to apply muscle tension for either the defence or to start an attack. An extra advantage is that the foot of the bent leg is closer to the centre of gravity so the leg can also support the body weight during the pulling position, avoiding that the body will touch the ground. Whenever maximum power and tension is required (heavy pressure on the rope) both legs need to be angled in order to apply maximum tension of the leg muscles.

Starting from the basic pulling position, the puller must be able to turn either into defence or attack techniques. Also these alterations of the body positions (with heavy pressure on the rope) are essential to be mastered in the beginning of the learning process of novice pullers.

ATTACK

There are many and various techniques for attack (body position during attack) in the Tug-of-War sport. The main goal of an attack in Tug-of-War is always the

* Locomotion of the team on the rope

The speed of the locomotion of the team (and the rope) is definite for the style (technique) of the attack. The initiation of an attack can be done in various manners. Novice teams try to start an attack with a mighty heave and although this tactic is sometimes successful, it is certainly not the best practise, particularly not in a contest against very experienced opponents.

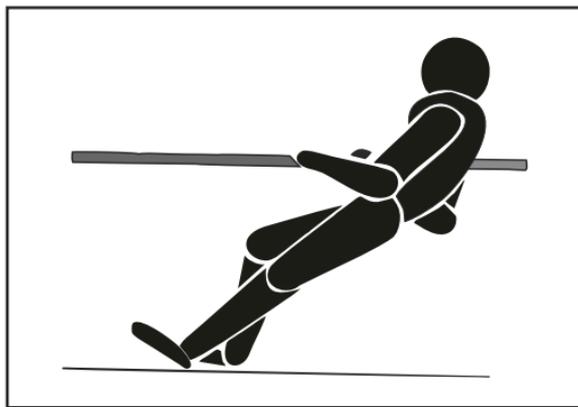
The first standard attacking technique, which should be mastered by a team, is

- * walking a tight rope

Walking means repositioning the feet. This seems very simple, however in Tug-of-War, the feet are the only holds of the puller to the ground. When the foot is moved to the repositioned, the hold to the ground is lost. The technique of walking a tight rope should therefore be aimed at :

- * making the period (time) in which the hold of the foot is lost as short as possible (quick movement of the feet).
- * compensate for the loss of pressure on the rope through the application of kinetic energy (shift of the body weight)

WALKING AT THE ROPE



Using the joints of the hips while walking results in a slight swinging movement of the body. The pressure (force of the leg muscles) onto the surface is alternately moved from the left to the right foot. In doing so the tension in the rope however should be kept

stable or even should be increased.

- * The actual walking at the rope happens in stages.
 - * The full force of the leg (and the body weight) is moved to the left

foot, the right foot is then “unloaded”. Immediately the right foot is quickly moved backwards over a short distance.

- * Subsequently the muscle force and the body weight is moved to the right foot and at the same time the right leg is stretched. While stretching the right leg, the left foot is quickly moved backwards.
- * After the muscle force and body weight is moved again to the left foot, the left leg is stretched and the right foot is quickly moved.

6. IMPORTANT ITEMS FOR ATTACK TECHNIQUE.

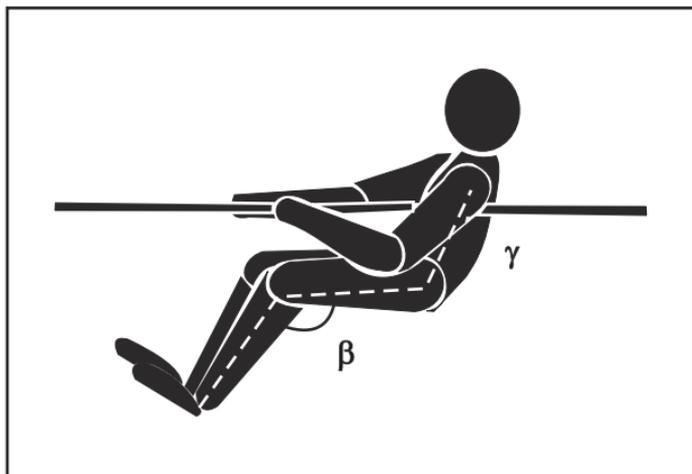
During walking at the rope the angle between the upper legs and the torso should remain the same as before the start of the movement. The tensors of the dorsal muscles should apply optimum power during walking. Novice pullers often make the mistake not to use the dorsal musculature when walking at the rope and just walk without moving the rope, resulting in a fully bent position.

In general it is advantageous when the point of application of the muscle force on the rope is as near as possible to the centre of gravity of the body. In several attack techniques, the upper torso is bent over the rope. Using this technique the body is rotated towards the rope and likewise the feet, which makes it possible to use the full length of the foot as a hold to the ground. When stretching the legs in such a position even the tensors of the feet can be used. The musculature of the feet is certainly strong enough to be of interest in a tug-of-war contest.

As the speed of movement on the rope increases, the body rotates more to the full quarter turn. An advantage is that the puller will not easily sag onto the ground and the legs are in an excellent position to support the body weight. The pressure on the rope is less than under full pressure pulling, however the speed of the movement compensates for the loss of pressure through the kinetic energy of the attacking team. The defending teams will also have trouble finding good holding points for the feet when the speed of the attack is

high. The dorsal tensors of the attacking team are almost unused, the oblique dorsal and abdomen musculature on the other hand are well used in this position.

7. DEFENDING



Defending is the ability to absorb an attack of the opponent. (An awaiting attitude, while none of the teams is attacking is no real defence). The prime importance in the defence technique is to be

able and ready to absorb and counter the heave (attack) of the opponent. It is obvious to use the strongest muscle groups during the defence (the leg musculature). The defence technique in the tug-of-war sport should make use of the strength of stretching muscles (eccentric power) which is far more than the concentric muscle power. The total muscle power of a team in the defence is greater than during an attack.

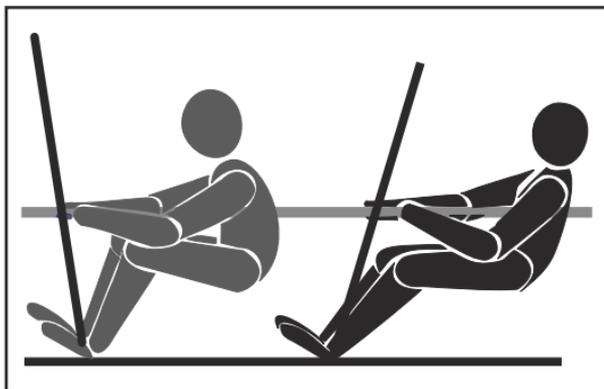
Pressure position

The defence position is mainly static (no movement), the body should be in a position where the angles of the "levers" are optimum for static muscle power. Based on the biomechanical model these angles should be;

$$b=120^{\circ} \text{ and } g=100^{\circ}$$

However in practice these angles also depend on the fitness and the degree of expertise of the puller and the team.

8. PRESSURE PULLING



The defence position makes if possible to

- * absorb the pressure through spring loading the leg muscles.
- * bend or arch the back
- * and change into the recoil position

9. IMPORTANT ITEMS

FOR DEFENCE TECHNIQUE

After absorbing the attack of the opponent through “spring loading” the leg muscles, an immediate effort should be made to restore and counter the attack by stretching the legs and back again. In case the attack is so fierce that the team has to move forward. the teams should avoid being dragged through the ground, as the resistance of the foothold becomes very weak. The best procedure to move forward during the defence technique is to go forward with little steps, keeping good footholds at all times. Every time when a step forward is made the legs are able to be spring loaded again to absorb the energy of the attack of the opponent. The attacking team (the opponent) has to apply dynamic (concentric) power of the legs which is slightly less than the eccentric leg power of the defence technique. In any case it should be avoided that the attacking team (opponent) gains “speed”, as this movement of the team will build kinetic energy which is very difficult to counter and to absorb.

10. TECHNIQUE FOR INDOOR TUG-OF-WAR

BASIC TECHNIQUES

In-door tug-of-war is a discipline in which the weight is very important, weight classes are therefore crucial for a fair competition. The key to winning then lies in teamwork, enabling exertion of the maximum amount of power. Needless to say, the team with the greater power is likely to win a pull. It must be remembered, however, that greater power means more fatigue, which

may make it easier for the opponent team to reverse the pull in the latter half. Therefore, in order to win a pull, a team must learn to exert its maximum power with greater efficiency by applying the necessary technique. Technique employed in tug-of-war should be considered under the following categories :

- (a) techniques for optimal utilisation of weight,
- (b) techniques for optimal utilisation of power,
- (c) techniques of individual pullers, i.e. form and posture
- (d) teamwork and team techniques

11. TECHNIQUES OF INDIVIDUAL PULLERS

Basic Method.

To exert maximum force, each team member must be efficient in applying his total physical strength, that is the strength of grip, arms, back, abdomen and legs combined. This is made possible by storing enough energy in advance and exerting the power all at once, with the legs serving as an axis (i.e. by using the power of muscle extension). The long rhythm method refers to technique of emphasising the force exerted by muscular power. In theory, as regards muscle power per se, and given the first surface of the pulling surface (mat), maximum strength can be obtained by applying the force directly away from the floor. However, in tug-of-war, teams need to pull the rope towards themselves, in which case, other factors such as frictional resistance must also be taken in to consideration. In other words, whilst it is desirable to hold the legs perpendicular to the floor to maximise physical power and thus utilise the weight of the pullers to the optimum, it is better to incline the axis (i.e. legs) all the way down to the limit of frictional resistance. The actual degree of inclination therefore, is found some where between the above two positions, depending on which of the two factors, muscular power or weight, is regarded as more important. Nevertheless, it must be noted that when taking the offensive it is better to maintain a higher position.

BASIC FORM (INDIVIDUAL)

ANGLE OF LEGS.



The extensive strength of the legs is maximised when the knees are held at 100-120 degree angle (fig. 1-A)

The strength of the legs, far greater than that of the arms is crucial in tug-of-war. To obtain their maximum power, the legs should not be bent too far as shown in fig. 1-B, It is important to be able to extend the legs and body once force is applied otherwise no great power can be exerted.



Whilst the legs are stronger than the arms, the potential strength of the upper body (abdominal and back muscles) is greater than that of the legs. To maximise the muscular power of the upper body, lean back 40/60 degree from the original position, as one is



required to do to measure the strength of the back muscles. When a team is at a disadvantage, its members are often forced into a forward leaning position as shown in fig. 1-C.

For a power hold or a later counter offensive, they must pull their bodies back into a position, which allows maximum exertion of muscular power. Furthermore, even when at a disadvantage when being pulled forward, in most cases it is better for the pullers to let their feet slide forward so that they can keep their bodies leaning back, positioned ready for a counter offensive.

Muscular co-ordination.

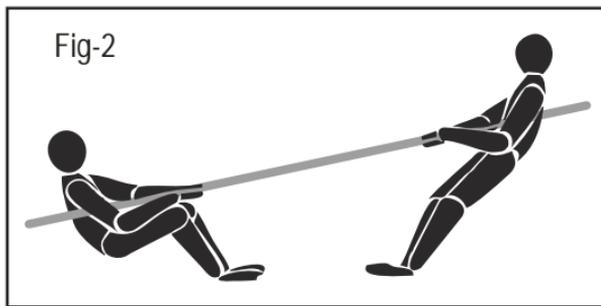
The arms should extend together with legs and upper body. To extend the legs whilst contracting the arms is not a natural body movement. Since it is psychologically difficult to extend the arms while pulling on the rope, it may be advisable to fully extend the arms from the beginning. Furthermore, to ensure co-ordination between leg and back extension, a puller should be sure to let his head lean slightly back, pulling his chin in when getting ready for an action.

Direction of body.

In order to maximise the muscular strength of the entire body, the pullers must face directly towards the opposing team.

Use of weight.

That a greater amount of energy is required by pullers of a greater mass is a natural law of physics. In tug-of-war however, many pullers fail to apply their entire body weight to the direction of the pull. Some pullers appear to believe that their weight is more effectively applied by clinging on the rope in a low posture with their knees bent. The weight in this case is applied perpendicularly against the rope but NOT in the direction of the pull. To apply one's weight effectively in the desired direction, it is more effective to lean backward in a standing position which should also help to avoid foul play such as locking.

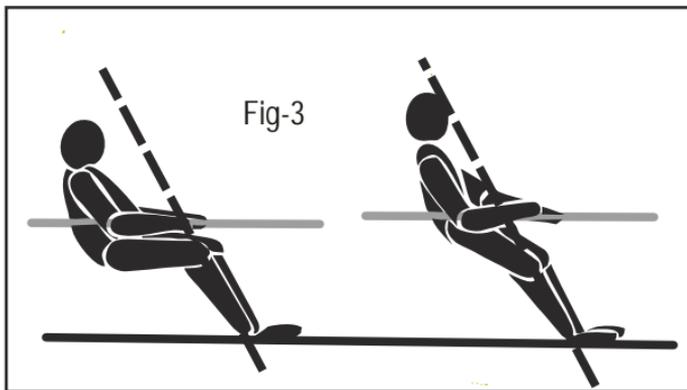


DEMONSTRATION

Have two persons squat alongside a rope and have one of them stand up as shown in fig. 2. The rope should naturally move towards him. Even greater effect can be demonstrated

by having the same person lean backwards in the standing position to apply weight in the direction of pulling.

Static Position



When taking the defensive and maintaining a static position, a puller's muscles bear not only the force of the opposing team but also his own weight. This is also true in a power hold, in which

case as long as the knees are bent, the leg muscles will have to bear a significant load merely to maintain that very stance, accelerating fatigue on the part of the puller.

Therefore, it is especially important in a power hold to have at least one leg extended. Whilst the angles against frictional resistance are equal in both postures (fig.3) the puller feels less fatigue when in an extended position.

Foot angle

On a flat surface, as used in indoor competitions, when the body is leaned back-wards approaching the limit of frictional resistance, the load on one's calves is particularly great if the feet are placed parallel to each other. To reduce the load on the calves, the feet should be set apart as 50/80 degrees to allow bracing of the legs with the entire soles of the feet with the weight centred on the heels.

12. TEAM TECHNIQUES

Spacing between pullers.

Proper spacing of pullers is another important factor in tug-of-war, especially since excessive spacing leads to greater loss of power. On the other hand, if the spacing is too small, the pullers will get in the way of one another.

Therefore, it is important to make sure, before the pull, that the pullers are spaced at an arms length from one another alongside the rope.

Start.

At the start of a pull, it is most important to ensure that the strain on the rope is equal on both sides. If the rope is slackened at this point, great tension will be suddenly applied to the rope at the start of the pull, this can lead to injuries, especially to back and ribs. To successfully maintain the starting position called for by the command "Take the strain". all pullers should have one of their legs fully extended.

Furthermore, all pullers must be fully relaxed in the starting position so that they can exert their power once the pull is actually started. This is especially important, since the results of many pulls are determined immediately after the command "Pull". To take the advantage at the very beginning is the key to winning a pull, For this reason, all pullers must pay full attention to the judge and to be alert for the signal to : "Pull".

Short rhythm.

In the short rhythm method the pullers pull the rope in a relatively short and fast rhythm. Because the intervals are short, little chance is given to the opposing team to pull back, it is also easier to harmonise the movement of pullers in short rather than long rhythms. One disadvantage however, is that using this method one can exert only 60/70% of potential muscle power.

Long rhythm,

This method requires a long preparatory phase between each pull and thus ensures exertion of close to maximum power. However, due to the longer intervals between each pull, there is a greater change for the opposing team to take advantage and pull back. Furthermore, exertion of greater power leads to greater fatigue, and therefore the method is useful only in cases where the team's victory is close at hand. If the pull is prolonged, this method is inappropriate, since it will accelerate puller fatigue, causing the team to give in at the end.

Under any situation, it is particularly effective to harmonise team member's motion by timing to shouts. Harmonised timing is especially difficult in back-stepping and therefore members should time their motion to shouts from the

team coach. Typically, team members extend their right and bend their left legs to a "left" call and extend their left and bend their right legs and pull at the same time to a "Right" call.

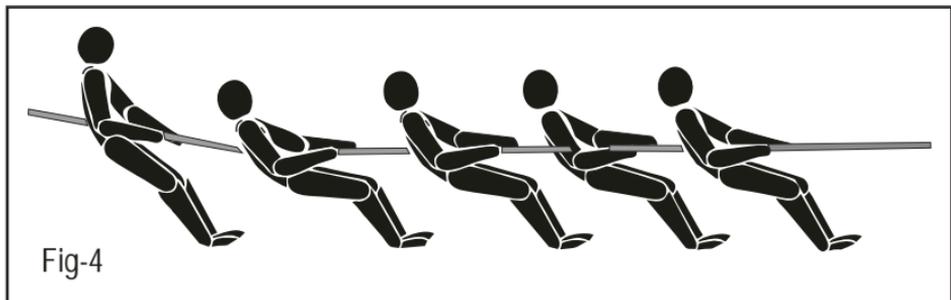
Power hold,

A power hold is a tactic used to minimize energy consumption until a team is certain that it has a chance of winning a pull. To take a power hold does not mean just to stop pulling. Rather, it is important for a team in a power hold to constantly apply force to the rope while, at the same time remaining ready to seize any available opportunity to pull the opposing team. In other words, the team must be alert enough to immediately respond to any changes in the opposing team and take the offensive whenever possible. To provoke the opposing team to change its stance, it is sometimes effective to gradually increase the force applied to the rope. As was described earlier in "Basic technique", it is important in a power hold not to have both legs bent, since such a position imposes great fatigue on the muscles. Instead, pullers should try to extend their legs and have the entire body serve as an axis by leaning back at the heels almost to the limit of frictional resistance. In other words, ideally the heels should be at such an angle that they serve as a type of wedge, which are driven into the mat every time the opposing team tries to heave the rope.

It is also important however, to be always ready to take the offensive during a power hold. Since taking the offensive is difficult from a position with both legs extended, it is a good idea to have one leg extended and the other bent a little so as to be able to respond quickly should any change arise.

POSITION IN A TEAM

(Weight distribution)



The following method has been found to be useful and effective. From the 1st to the 7th puller, the rope should be held in a straight line. Whilst all pullers should lean back (as has been previously described), each one should lean further back than the puller immediately in front of them. As a result, the line of the rope forms a slope inclined towards the back of the rope. The anchorman however, should maintain a higher position to prevent the team falling back. Also the anchorman should pull the rope upwards, forming an angle behind the 7th puller. Such a formation helps the team to apply their weight in the direction of their pulling and therefore result in greater power. The pullers in front, especially the first puller, should consciously try to maintain a position higher than usual (see fig.4)

(Demonstration).

It has been ascertained that when a team takes the above described formation, the opposing team is pulled forward. The lower the stance of the opposing team, the greater effect of the formation.

13. TEAM TECHNIQUES, RECENT TRENDS.

Although back stepping has been very common, this technique alone does not necessarily lead to victory, especially when two teams are equally skilled. As has been mentioned earlier, the long rhythm method is used for generating a maximum amount of power. Therefore, to win the pull, a team should employ back stepping only until there is a perceivable chance of winning, at which point they should immediately switch to the long rhythm method. However, since this method induces greater fatigue on the part of the pullers and because the duration of maximum muscle power is shorter, the timing for switching to the long rhythm method is indeed the key to winning a pull. Unless a team can defeat the opposing team shortly after switching to the long rhythm method, it becomes highly likely that the other team will take the counter-offensive. Furthermore, because of high technical levels of all participating teams, many of them now choose to employ back-stepping or take a power hold to watch the movements of the opposing team before taking the offensive in earnest with the long rhythm method. This in turn, has been inevitable in prolonging the time required for a pull. As a pull is prolonged, either by back-stepping or by power hold, it becomes increasingly difficult for both teams to maintain their stance because of fatigue, thus making the pullers more liable to either lock the rope or fall to the

ground, both of which are subject to cautioning. Therefore, it is especially important to carefully allocate the stamina of the team members throughout a pull. If members of both teams fall because of fatigue for instance, the team that manages to stand up faster is likely to win. Some teams cleverly use a variety of rhythms for back-stepping depending on the type of team against which they are pulling. Also some have demonstrated skillful application of force to the rope without actually pulling it, so as to watch the timing of the opposing team before taking the offensive. Effective combinations of various techniques, by properly changing the rhythms and manner of pulling, is becoming increasingly important in recent tug-of-war competitions.

Moreover, with all teams becoming highly competitive, it is particularly important for each team to develop skills necessary for greater efficiency in their use of energy in relation to the direction in which force should be applied.

While the frictional deficiency of the material used for matting does greatly influence the ease with which one can pull at the rope, pullers must not be distracted by it. Any puller can cope with any kind of matting material by modifying his angle and direction of force. Moreover, even when the frictional coefficient of the matting is relatively high as long as the floor surface is flat, it is better to raise the body up and pull upwards rather than to take a very low stance. Finally, it is also important not to forget to extend the legs when pulling the rope. As described earlier, a position with knees bent not only hampers one's potential power but also causes greater fatigue when prolonged.

14. APPLICATION OF FORCE

Impulse and acceleration.

Impulse and acceleration of force are other factors to be considered in relation to the types of the techniques used in tug-of-war. Whilst the long rhythm method is effective in generating muscular strength that is close to maximum, in a static state (i.e. when the rope does not move in either direction), this method causes great fatigue of the pullers since it is more or less like trying to pull a rope tied to a wall. In other words, the more one pulls at the rope, the more one gets pulled; the applied force is directly converted back. Therefore one solution is to make use of the law of acceleration by gradually moving backwards whilst constantly applying force to the rope. In

general, a greater force is required for moving an object from a static state than from a state already in motion. Because of acceleration caused by continuous movement, greater force can be generated by the same amount of power. Constant and gradual application of force in order to gain acceleration is a widely known conventional technique for moving heavy objects. This natural law of acceleration is applicable in tug-of-war, especially when in a static state such as power hold. Whilst it is not apparent, the pullers are constantly applying force to the rope in harmony, awaiting the chance for an offensive.

Following a slight movement of the rope in their direction, they immediately shift to back stepping.

Teamwork.

Teamwork is particularly important in tug-of-war in order to harmonise the motion of all members of a team. Whilst a certain action is relatively simple at a individual level, to perform the same action in harmony as a team requires a high degree of teamwork, more so than in the majority of other sports. Teamwork in tug-of-war is not only important but also very difficult.

15. PSYCHOLOGICAL FACTORS

In addition to physical power and techniques tug-of-war requires a great amount of mental strength such as perseverance and concentration as demonstrates in the following cases.

During a training session of a highly competitive team, one puller was added to the opposing team, making it nine members instead of eight. While the first team still won when they were not told of the increased number of members in the opposing team, once they were notified of the fact, the same team lost the next pull.

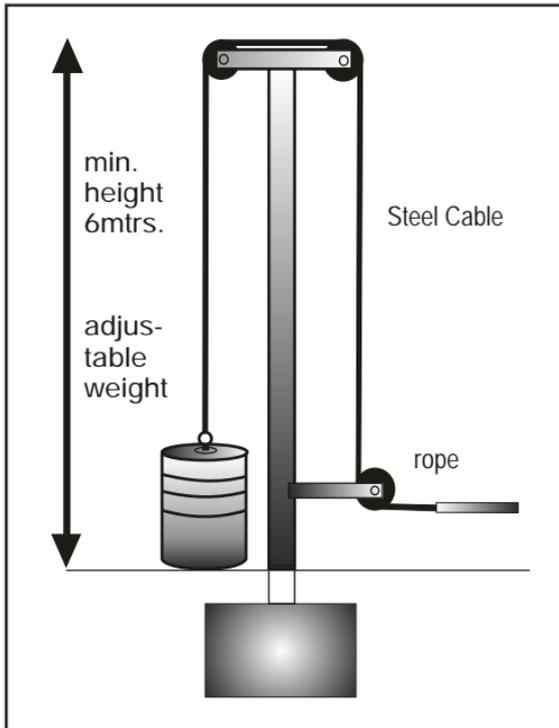
The results of 90% of three set matches in official competitions have been 2-0, demonstrating the difficulty of winning a pull immediately after losing. This may in some cases, be due to a psychological factor.

The foregoing is not meant to be a definitive dissertation on indoor tug-of-war, many teams and coaches have their own methods and techniques of developing training schedules which they think are best suited for them. However, it is hoped that what is contained here will be of use and guidance.

16. INITIAL TRAINING ON THE ROPE

Most teams will train twice a week, may be more often a week or two before an important competition.

As in getting fit, learning to pull on the rope must be accomplished gradually.



Thus a puller should not train on the rope too ambitiously at the start of training.

Getting the right stance and position on the rope, and being tested on the derrick (gantry), with other pullers at modest weight, initially will be best. Learning how to establish a rhythm in pulling in unison with other pullers is vital. Some teams learn this by all chanting together. Such as "one two, one two, one two". Moving first the right leg then left leg, or by chanting "yes" together, as a team puts in a heave. Indeed,

some teams carry this through to competition.

When a coach is satisfied that his pullers are improving with training. He will increase the weight being lifted on the derrick, and teach the pullers how to hold. This will mean pulling a given weight up so far on the derrick, and then instructing the team to hold the weight at that point. Firstly for short periods, then for longer ones. This will equate to keeping an opposing team under pressure.

Eventually as training progresses, pullers will be taught to lower the weight on the derrick, and suddenly be told to stop the downward movement by

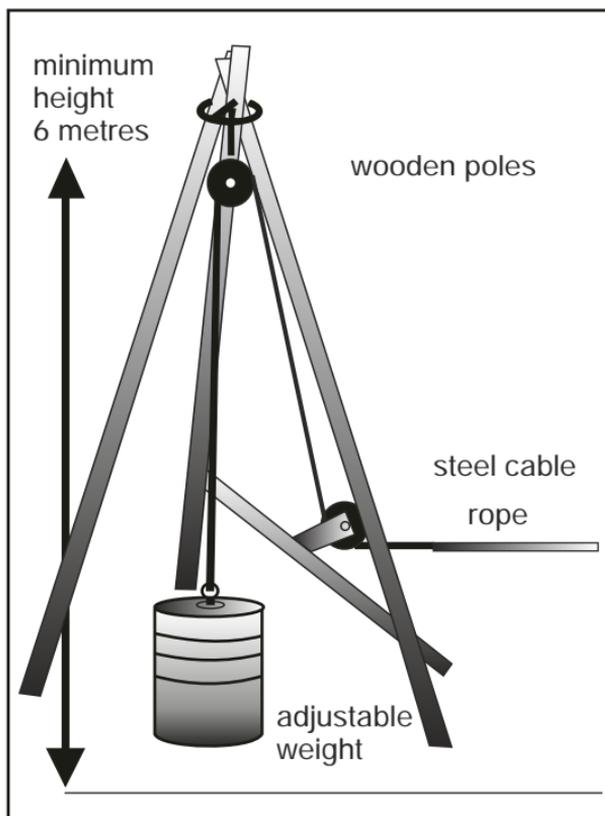
digging in their feet. This equates to a check where an opposing team is taking you forward.

Where more sophisticated equipment is available, it may be possible to test pullers individually, at raising a given weight on the derrick, but no puller should be tested to his limit, individually, as this could cause injury.

Rope training should be interspersed with short runs and simple exercises, so as to vary an evening's programme.

Howsoever much training is carried out on the derrick, "live" pulling gives every puller a chance to feel the rope. Splitting those pullers present at training into two teams, as equal in weight as possible will be of great benefit. Pulling against each other as if in competition. If there is another team, not too distant, arranging an evening's "live" pulling, at the beginning of the season, would be very beneficial.

The following two diagrams show methods of rigging a derrick gantry) for carrying out training work.



for carrying out training work.

In some cases a Tug-of-War club may be fortunate in having a large tree close to its training area which would obviate the necessity of a derrick. A branch may be found strong enough to be able to take a length of steel cable capable of supporting the weight being pulled up by the team training. In all cases a normal Tug-of-war rope is used, and will be secured to the end of the steel cable at ground level.

Strengthening legs may be attained by digging a small trench, and fixing wooden slats into the ground, so that it takes on the appearance of a ladder. The distance between the slats should be not too wide. But just enough to make the required steps under pressure. By placing pullers along the trench, pulling a rope, with other pullers trying to pull them out of the trench, pulling them against the slats in the ground, this will assist in leg strengthening. It will also approximate to the pullers trying to move those in the trench, trying to move an opposing team at has become well 'dug in'.

The use of an "inner tube" from a large van or lorry is favoured by teams in training, if secured to a pole or small tree, the elasticity of the tube gives a "spring" against those pulling against it. Care should be taken to ensure that a tube is in good condition before use.

There are many training methods favoured by countries and clubs worldwide, too numerous to list in this manual, which only seeks to suggest some basic methods. But invention is the mother of innovation, as an old proverb relates!

17. NUTRITION FOR TUG-OF-WAR

Eating wisely, but enjoyable, can assist in faster recovery after training and competition.

The emphasis is on eating the right kind of foods, with a greater intake of the right type of carbohydrates, and less fats. This is the key to getting the most from a diet.

Feeding well will ensure that a puller gives the best performance. Thus, at the outset of a season's training, If body weight must be lost, it should be lost over as long a period as practicable. Periodic weighing, recording the date and body weight, will soon indicate what is happening. If no loss of weight is occurring, then a stricter adherence to diet will be necessary. Thereafter, slight variations in weight may be ignored, but greater fluctuations will need diet adjustment.

Each individual should be able to plan and develop their own diet.

Remember NOTHING is worse than trying to lose weight rapidly (i.e. starving). which is known to take place as an important competition nears, and members of a team are overweight.

That is a recipe for loss of condition and poor performance. Diet does not mean little food. It means a normal quantity of food, with plenty of variety, aimed at getting a puller healthy and capable of sustaining long and arduous pulls, gaining in stamina, and attaining a good level of mental strength and perseverance.

The following advice on nutrition is given, for help and guidance.

Eat more carbohydrates.

Make bread, rice, pasta and potatoes the main items in a meal, together with vegetables and fruits.

Breakfast cereals are a good "anytime" food (e.g. late at night), and adding dried or fresh fruit to a cereal at breakfast is recommended.

Eat plenty of bread. Cut the bread in thicker slices and vary the type of bread eaten (white, brown, wholemeal, etc.)

Use baked beans, chickpeas, sweetcorn canned vegetable and minestrone soups. Use less meat in sauces for pasta, or curry sauces with rice. Baked beans on toast being a quick, cheap and easy snack, which is high in carbohydrate and low in fat.

Try to eat rice more often. Easy cook varieties do not stick together as much as normal rice and brown rice tend to have a more "nutty" taste, which some people prefer Pastas. There is a great variety, and it is worth sampling them to see which is found preferable. There is red pasta, which contains tomato, and a green one, which contains spinach. See which shape pasta is liked best and decide whether to have fresh pasta, or one of the more usual dried ones. When you eat pasta, eat more pasta and less sauce. Or try sauces based on low fat soft cheese, tomato or tuna, which will keep the fat content down and the carbohydrate up. Another stand-by-snack is milk shake, made with skimmed or semi-skimmed milk, blending it with a low fat yoghurt or banana.

Before pulling never leave more than four hours between eating, or drinking a carbohydrate drink, but before competition it is best to avoid high fibre foods, such as wholemeal bread. It is better to have white bread, and low fibre cereals such as cornflakes. Especially if stomach discomfort has been experienced in eating high fibre foods, but all the foods suggested in the manual are suitable to have before pulling.

After competition or a heavy training session, some pullers prefer to eat a few small snacks, and eat a large meal later. Whilst others can eat a meal soon after finishing. Many prefer a liquid intake rather than food. Liquids containing glucose, sucrose or maltodextrins are useful at replacing carbohydrates. together with fluid, and should be taken in concentrations of 6 grams of carbohydrate to 100 millilitres of fluid (approximately 35 g/pint of fluid).

There are also several commercial brands of carbohydrate powders, for this pupose as well as ready-made drinks such as isostar. If making use of these find out which form of carbohydrate suits you the best. the amount of carbohydrate needed within two hours of completing a competition is 0.7 grams per kilogram of body weights. This would work out as 42 grams at 60 kg weight, 50 grams at 70 kg and 56 grams at 80 kg.

The following example indicates how 50 grams of carbohydrate can be obtained.

FRUIT		VEGETABLES	
Apples	4-5 medium	Baked Potato	6 oz size
Bananas	3 medium	Baked beans	450g
Dried apricots	125 g (4 1/2 oz)	Red Kidney beans	330 g
Pears	4-5 medium	Sweetcorn	400 g
Oranges	4-5 medium		
Raisins	8 tablespoons		
BREAKFAST CEREALS		BREAD	
Rice Krispies	14 tablespoons	Raisin bread	3 1/2 small slices
Cornflakes	10 tablespoons	Maltloaf	2 1/2 slices
Grapenutes	9 tablespoons	White bread	5 slices

18. PRACTICAL HINTS AND TIPS

MEAT. Eat fish, turkey or chicken. Use low-fat varieties of sausages, bacon and gammon whenever possible. Use less meat than normal in recipes, replace with beans, vegetable or pulses.

FRENCH FRIES. If you do have French fries try to have thick-cut oven fries with low fat content (i.e. 5% fat).

PASTRY Try to avoid pastry product.

MILK AND CHEESE AND CREAM. Use semi-skimmed or skimmed milk, rather than full-cream milk. Instead of mayonnaise use reduced-fat or fat free dressings, Use reduced-calorie ice cream, low-fat custard, fromage frais or low fat youghurt instead of cream or normal ice cream or custard.

BUTTER AND MARGARINE Try to avoid adding fat to food wherever possible, (e.g.) on bread or potatoes when you have cottage cheese. baked beans or retatouille. Try to have low-fatspread rather than butter or margarine.

COOKING Grill, microwave, steam, bail, bake or stir-fry, rather than roasting or frying. Use non-stick pans and add minimum oil. Remove any fat that appears when cooking meat.

19. DEHYDRATING

You need to have enough fluid stored in your body to allow you to sweat and lose the heat produced during a training session or pull. Sweating is a very effective way of keeping-your body temperature down, especially if you are exercising in a hot environment.

Without enough fluid your performance may well be affected through early fatigue.

20. KEEPING WELL HYDRATED

Weight yourself before and after training or a competition, to see how much fluid you have lost and need to replace. A weight loss of 1 kg means that 1 litre (approx. 2 pints) of fluid needs to be replaced (remember not to weigh your sweaty clothes as well.)

Keep yourself well hydrated before a match or training session your urine should be pale and plentiful.

Try to take some fluid immediately before exercise and continue to take small, frequent amounts throughout, as the competitions or training allows.

Water is a good fluid substitutions in many situations but drinks containing some carbohydrate and sodium can be slightly better (see suggested fluid substitution below).

Alcohol is a diuretic (makes you do more urine), so you should have as little alcohol as possible prior to competition day.

Do not wait until you are thirsty until you start drinking. If you feel thirsty you are already dehydrated.

After exercise remember to re-hydrate. before you visit the bar!

21. SUGGESTED FLUID REPLACERS

Water. Fruit juice (diluted with at least an equal volume of water) Sport drinks (e.g.) isostar, Galorade, Home-made drinks with: 4-8 grams of carbohydrate per 100 ml of water, pinch of salt and a sugar free flavouring.

22. PLANNING YOUR DIET

Plan your eating times around your training and not the other way around.

Have small, frequent meals and snacks rather than traditional three meals a day.

Don't avoid eating late at night, if you have had a late training session. You still need to replace your carbohydrate stores. Something light like cereals and low fat milk is suitable.

Don't get into the habit of eating the same food every day, variety is the key to getting the most from your diet.

23. DIET & REDUCE WEIGHT

General Comment : Courtesy of Dr. E.P. BECKETT, M.B. FRCGP

I have been asked to comment on various practices of Tug of War athletes in the run up to major competitions. I do so as a general medical practitioner having had some discussion with Sports nutritionists and Sports Medicine physicians. My comments will be general comments on the pros and cons of these practices.

The Specific activities addressed are:

1. Diet restriction to reduce weight
2. Use of nutritional supplements
3. Fluid restriction to reduce weight
4. Use of sauna to reduce weight

i) DIET RESTRICTION

Eating less can reduce weight however it stresses the body and starvation leads to the increase of the hormone cortisol which can encourage the body to maintain weight. It also can lead to the loss of muscle mass when the objective should be to lose fat weight.

In general athletes should take a well-balanced diet primarily carbohydrates (up to 60% of energy) fat and protein. It is further recommended that carbohydrates should be mainly from a group regarded as complex carbohydrates e.g. bread, potatoes, pasta, rice and vegetables.

ii) USE OF NUTRITIONAL SUPPLEMENTS

The use of these supplements particularly protein supplements is thought to have the potential to cause kidney damage, osteoporosis and digestive problems especially if used long term. Realistically 500mls of skimmed milk or milk powder daily are an adequate source of protein supplement.

A further problem with supplements is level of regulation of them, with a potential for an athlete to consume a banned substance.

The National Athletic Trainer's Association [based in the US] published a Position statement in 2013 – Evaluation of Dietary Supplements for Performance Nutrition. Several extracts of note:

“Athletes can be vulnerable to the misinformation and risk in terms of safety, legality and efficiency of dietary supplements and should not assume a product is safe simply because it is marketed over the counter.”

“Current regulations do not require supplement manufactures to provide evidence of safety.”

“Consider proper nutrition and changes in habitual diet first.”

“Do not forget to prioritise a healthy diet over dietary supplements to support performance.”

iii) FLUID RESTRICTION

Fluid restriction to lose weight leads to dehydration which has a number of serious side effects. These risks are intensified if athletes undertake several days of intense fluid restriction. Dehydration leads to the loss of essential body components (e.g. sodium and potassium). Consequently dehydration can lead to a rise in blood pressure and heart rate. The loss of sodium and potassium can affect the functioning of the heart and potentially lead to sudden death.

iv) USE OF SAUNA TO REDUCE WEIGHT

Intensive use of sauna can lead to dehydration. As mentioned above this can have ill effects on heart functioning. Ultimately this will have negative effects on performance. A good level of hydration is essential for health and wellbeing.

My research has revealed evidence that the use of sauna for weight loss has potential detrimental effects on health and performance. Consequently use

of sauna should be limited and used in moderation. However no evidence was found supporting the idea of banning such practice.

It should be noted that horse racing facilities have removed sauna facilities from their establishments to try and minimise the risky activity of intense sauna use. Equally the sport of boxing has moved to discourage boxers from partaking in this activity.

24. INJURIES IN TUG-OF-WAR

Both whilst training and pulling in competition, injuries can be sustained by pullers. A coach and/or trainer should be aware of the likely injuries and action to take to minimise aggravation.

Hands suffer burns and cuts, Usually caused by wearing rings, grit on rope, wet rope, sweaty hands, lumpy resin, or a bad rope.

Prevention may be made by cleaning a rope before pulling; dry wet ropes by rubbing with towels, use of line dry resin, and use of sawdust, where applicable. If skin or hands are torn, always trim off with sharp scissors. Dress with a burn cream, and cover with plaster.

Muscular pain, from over-stretching, or cramp can usually be contained by massage to the affected parts, and rest.

Rib injury, burns and bruising, is generally caused by not having the rope tight to the body, and in the correct position, Using padding across the rib cage will alleviate this. Sometimes cartilage displacement can be suffered. And this is usually caused by leaning too far across the rope whilst pulling. This will entail total rest.

Sprains occur at joints, caused by tearing ligaments or tissues. Rarely, a partial dislocation of a joint. Swelling ensues, and the puller will experience sharp pain cold compresses and total rest is essential.

Vomiting. This can be caused by a puller eating and drinking too much, prior to pulling. The puller should rest.

Back and neck pains could be a sign of serious injury. And a puller should rest, at once.

Muscle fatigue (cramp) is generally caused by loss of body fluids, brought on by excessive sweating. Or from lack of liquid intake. Often, this can be overcome by immediate intake of fluid, water being a good fluid.

GENERAL INJURIES

“Warming up” prior to training or competition is an essential to avoiding liability to injury.

In all cases, other than very minor injury, professional advice should be sought at the earliest opportunity.

25. FIRST AID

Attention to injury, as it occurs in training or competition should be essential. But it is stressed that it should be only through “First Aid”. In competition regulations should insist that there should be at least one fully trained first aid person on the ground. In bigger competitions, there should be a first aid point, with an ambulance at hand.

A coach or trainer should have a “kit” at hand, to deal with simple injuries.

The following list is suggested

- * Surgical spirit for cleaning cuts, burns and grazes.
- * assorted adhesive dressings for covering same.
- * assorted sterile dressings for covering cuts etc,
- * lint and cotton wool, for padding dressings.
- * assorted crepe handages for supporting ankle or knee injury,
- * smelling salts for assisting in reviving faints, or for clearing pullers heads, or breathing passages.
- * adhesive tape for fixing dressings.
- * salt tablets for cramp or heat exhaustion
- * glucose tablets for rapid replacement of energy,
- * bottle of fabriguge tablets (aspirin, paracetamol, etc.)

- * tube of antiseptic cream, for small cuts and grazes.
- * blanket for covering puller, to keep warm, when injured.

This will be in addition to the normal kit carried by a trainer, to attend to members of a team, whilst pulling. Ideally, a member of a tug-of-war club should be trained in first aid. Evening or day courses are available in most areas. However, failing this, a first aid manual will be of inestimable value. And in most countries, worldwide, the Red Cross or Red Crescent publishes a manual at a modest cost.

26. ADVICE ON TRAINING A NEW TUG OF WAR TEAM

Courtesy of Peter Tuckvell, TWIF

As the coach of a new team, you are advised to contact one of the Area Representatives for the area in which your team is based. The Area Representative can put you in touch with local people who will be only too pleased to give you sound advice. Names and addresses of the Area Representatives can be found in this handbook.

One of the great merits of Tug of War is that it is essentially a team event with each individual giving nothing but their best in unison and harmony with their colleagues. Tug of War has many brilliant teams but no individual stars. To those who desire to develop mind and muscle together with the true spirit of comradeship within the principles of sportsmanship, Tug of War affords such an opportunity.

In addition to the hard, physical effort and grit demanded by the individual there must be the highest order of self-discipline and cooperation in the interest of the team. This fact must be accepted if a Tug of War team worthy of the name is to be built and maintained.

i) ESSENTIAL EQUIPMENT

Every Tug of War team must possess a regulation size rope and have a suitable training ground. The training ground needs to be equipped with a gantry where the whole team can pull a weight up and down. The weight must have a clear movement of at least 8 metres. You should be able to vary the weight. It is important that gantries are properly constructed and subject to regular safety checks. You also need a suitable fixed point to which you can attach the rope. A static rope is very useful for getting novices to pull in the correct position. If you use a tree be sure to protect the bark.

ii) ASSEMBLING A TEAM

In assembling people to form a team, it should be borne in mind that Tug of War is an exceedingly strenuous sport and training for it can be very physically demanding. The people recruited must therefore be definitely keen, hardworking and cheerful characters and above all, willing volunteers.

Persuasive methods will inevitably be used to recruit potential pullers, but it must not look as if they are being pressed into service. Anyone of churlish disposition given to frequent grouching is much better left out as they will have a very bad effect on the others.

Tug of War is a sport that can accommodate pullers of all shapes and sizes, as long as they have plenty of grit and are prepared to put up with any amount of hard work.

iii) TRAINING

Training should take place twice a week. Training a new Tug of War team is a gradual process and must not be rushed. If you introduce new pullers to a full training regime straight away, you run the risk of causing physical damage - if they stay that long!

During the first period of training (4 to 6 weeks) you should aim to get your new pullers "fit to train", novices should be taught how to hold the rope properly, and introduced to the gantry. A note of caution here - when your team is on the gantry, in the interests of safety, spare pullers should stand by the front of the rope ready to grab it and slow it down in the event of the weight going into "freefall". In the first period, you should also concentrate on general fitness and agility using circuit training, short sprints and medium distance running. You should start with easy exercises, and gradually increase the intensity. It is a good idea at this stage to encourage your pullers to squeeze small rubber balls in both hands (in their own time) to develop the grip.

Throughout the whole of the training it is important to weigh your pullers once a week (in the same kit) and keep a record of their weights. Weight is likely to drop in the first few weeks, and may rise slightly afterwards as fat is replaced by muscle. Tug of War training can become very monotonous, this can be avoided by making it as varied and enjoyable as possible. Active games of a light hearted nature should be freely interspersed with the more serious work, and training should never be carried out as fatigue.

After the first 4 to 6 weeks it should be possible to arrange the likely teams in order in which they are going to pull on the rope, and the rope work should be carried out as a team. You should still make use of the gantry, but from now on

more and more work should be done against live opposition. If necessary divide your available pullers into small teams and run a competition with three or four in each team.

The arrangement of the team on the rope is important, and as the team develops each puller will fit in to a preferred position. You can develop the best type of balanced team if all pullers operate from the same side of the rope; the rope on the right of the team is usually considered the best.

From now on your coach should aim at building the strength and stamina, and perfecting the technique of the team. A team's strength can be improved by working with heavier weights on the gantry. Circuit training and running should still play an important part at this stage of training. The following section on technique aims at giving coaches an idea of the recommended positions to be adopted by the team at various phases of a pull.

TECHNIQUE

iv) PICK UP THE ROPE (rope on the right side)

Pick up the rope (Hint: slip your right toe under the rope, and at the judge's command, lift the rope with your foot and take it with your hands) and stand upright, well balanced on both feet, rope positioned between your body and the upper part of your arm. The rope should be in a straight line and fairly taut from front to rear, but a team should not stiffen themselves in any way. A rigid stance uses up energy that will be required later.

v) TAKING THE STRAIN

This is the normal pulling position on the rope. Gripping the rope firmly as described above, drive the heel of your leading leg (usually the left) into the ground and allow your body to fall back to an angle of about 45 degrees. You are only allowed one "dig" at this stage, you drive the other heel in when the judge gives the command "Pull!". The correct position here is of the utmost importance, so it will be dealt with in detail.

(a) The Feet.

The heels or sides of both feet must be cut well into the ground. It is impossible to push with the feet flat on the ground - a fault common to novices. Your feet should not be directly one behind the other, but should be

one each side of the rope, one foot being about 30 - 45cm to the side of the other. This gives lateral control and prevents swaying about. Your feet should also be separated about 15 - 25cm from front to rear.

(b) The Legs

Your leading leg should be straight. This leg acts as a prop, and the more the opposing team pulls, the more they should pull it into the ground, thus increasing its resistance. The rear leg is slightly bent and it is from this leg that the driving power is mainly produced.

Viewed side on, your feet should always be forward of your knees.

(c) The Body

The rope should pass between your body and the upper part of your arm as close as possible to your centre of gravity, because you can exert your full force only through your centre of gravity. The lower part of your body must be kept well up to the rope, and not allowed to sag, and your back should be kept as straight as possible. If your body is allowed to sag in the middle, not only is tremendous strain being placed on your back muscles, but any drive from the legs will not be carried through the body and will merely accentuate the sag. The upper part of your body should be above the rope, but not lying on it.

(d) The Hands and Arms

The rope should be held with the hands together, left hand in front with both palms facing upwards. Your left arm should be straight, your right arm should be as straight as possible consistent with the position of your hands. If your arms are bent, the arm and shoulder muscles are cramped and much energy is unnecessarily expended. Viewed side on, your hands should always be behind your knees.

(e) The Head

Your head should be kept back in prolongation of the line of your body, and not allowed to slump forward. This gives extra weight on the rope and helps breathing.

vi) THE HEAVE (OR LIFT)

The ability to execute an effective heave, or "lift" as it is called by Tug of War

athletes, is a useful weapon in a team's armoury. Keeping the strain on the rope, slightly lower your body and heave by a powerful stretch of your legs and body upwards (hence the term "lift") and towards the anchor. Immediately take advantage of any ground gained by moving your feet back, taking short steps. There must be no easing up either before or after the lift, as any relaxation will allow your opponents to take the offensive. Your team must be taught to heave in unison. Some pullers heave with a quick snatch, others with a slow, ponderous movement. A happy medium must be found so that your team heaves with a uniform movement.

The lift can be worked up very well on the gantry. It is very important that a team should not relax and give ground after a lift. If, after heaving, the weight on the gantry is seen to drop, it is an indication that the team is not holding what has been gained.

DRIVING OUT

When you have got your opponents on the move, you need to keep them moving until you have beaten them. This is called "driving out". Every puller should be in the normal pulling position as described above. The team moves backwards, taking small steps, no more than 30cm, chipping the heels into the ground at each step. Movement should be from the hips downward, the power coming through the legs. Your team should train to chip back in unison, ie each puller making the same leg movements at the same time, thereby maximizing the power on the rope.

vii) DEFENDING - THE CHECK

To counter a lift from the opposing team, slightly lower the rope and turn so that the line of your shoulders is at right angles to the rope, and brace the rope as hard as you can by adding extra pressure with your legs and body. This is the classic Tug of War defensive position. Unless a team is well coached in its lift, they can be very vulnerable at the end of the movement before they have consolidated their position. If the opposing team applies a counter heave at this stage, they can often gain an advantage. Your team must be carefully coached in checking a heave so that they carry it out quickly and effectively, and not lose ground.

When your team is under attack (ie your opponents are trying to drive you

out), you will have to go into the defensive position to prevent the rope from going forward. Some pullers go into a sitting position (not on the ground where they would be disqualified) when defending, if you do this be sure to keep your back straight.

viii) TACTICS

As a new team, you can learn a lot by watching experienced teams in action. When you watch a Tug of War competition, you will often see the teams go directly into a holding position and remain there until the coach of one side feels the time is right to attack. The attacking team will then increase their pressure (usually without a lift) and try to drive their opponents out. You quite often see novice teams going into a holding position when up against more experienced opposition. When this happens it suits the better team because they only have to wait for their opponents to tire, then they can drive them out without expending much energy. As a new team, you should attack from the start, initially you might not win many pulls, but you will increase your strength and stamina, and as you improve and start to win more pulls you can amend your tactics.

Regarding tactics generally, on hard ground where there is little opportunity for digging in, it is best to attack quickly, and having got your opponents on the move try to drive them out. A team is inclined to slip on hard ground, the best way to prevent this is to pull in a slightly higher position, remembering to keep your feet about 30 - 45cm apart and always work off of your heels. When pulling on a soft surface, a team must be prepared for pulls of long duration. A team, which is well dug in is very difficult to move, and constant heaving against such a team will merely tire out the attackers. The best policy is to dig in also and wait until the other team attacks.

ix) THE COACH

You often see a novice team hampered rather than helped by its coach, so a few notes on the position of the coach will scarcely be out of place here. The ideal team to aim at is one that can pull with few words of command from the coach.

Having said that; the coaches of the very best teams do become quite animated when up against top opposition. A good coach can "read the rope"

and can produce concerted effort by giving the right commands at the right time. A well trained team should be able to tell from the feel of the rope the exact moment at which to make a movement. In some teams, the job of giving commands to the rest of the team is given to one of the pullers, usually someone positioned near the middle of the rope.

The coach should stand on the rope side of the team. He or she should be close enough to the team to be able to encourage them, and at the same time must be able to watch the opposition so as to anticipate their moves, and enable his or her own team to counteract them.

A coach's job is to motivate and encourage the whole team, but sometimes (especially during long pulls when the going gets tough) individual pullers need special attention.

When under extreme stress, different people react in different ways. A good coach knows how to get a positive reaction from the different individuals in his or her team. Some pullers will respond to a kindly word, some to pleading, and others even to being shouted at (be careful not to use bad language as the judge will disqualify the whole team!) whatever it takes to extract that little bit of extra effort to win the pull.

x) INDOOR TUG OF WAR

Novices teams are unlikely to experience indoor Tug of War before outdoor, but a brief description of the indoor version is appropriate here.

Indoor Tug of War is pulled on a mat. Teams wear training shoes instead of boots and pull flat footed. The athletes pull in a straight, almost arched, position with their waists well up to the rope. The rope is kept very tight and teams get into a rhythm as they increase the pressure and try to press the opposition out. Heaves are very rare in indoor Tug of War.

xi) FURTHER INFORMATION

The above section covers the basics of Tug of War, it is not meant to be a coaching manual. Further information can be found in the TWIF Coaching Manual or you could attend one of the coaching courses run by the Tug of War Federation of India.

27. TWFI CRITERIA OF SELECTION OF PLAYERS

A. ELIGIBILITY

1. Individual body weight.

Individual body weight must remain within the limits of weight class of the event.

2. Individual body heights.

The adult player should be between the heights of 4 feet and 9 inches to 6 feet and 4 inches. In the Sub Junior category the minimum height should be 4 feet 6 inches. It is advised that the players should carry an approximate same height to achieve the same level of the rope when stretched.

3. Running Stamina

- i) The player should have sufficient Stamina to run a distance of 3 Km. Without tiring.
- ii) Running Should have the heart of a long distant runner.
- iii) The player should develop individual stamina for back running for long duration.

4. Hand Grip Power

Maximum hand grip power for adult player should exceed carrying 15 kgs for five minutes .

5. Hand gripping stamina

Hand gripping stamina should be sufficient to provide counter pull up to 8 minutes.

6. Heavy shoulder& Arms muscles

Adult player should do workouts to develop Heavy shoulder muscles with powerful arms.

- i) Develop strong & heavy hand fore arms.

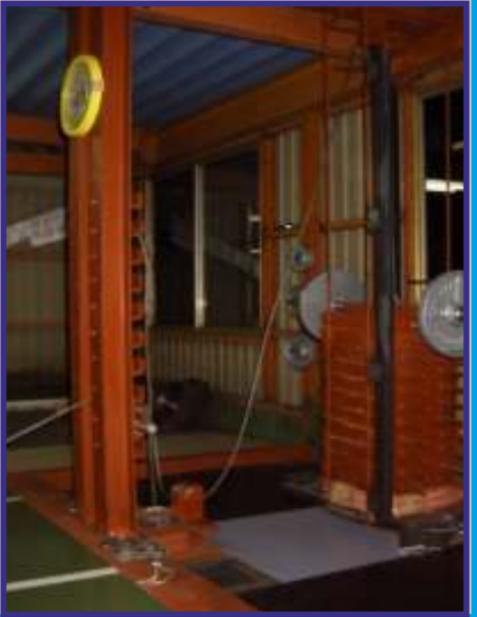
7. Thies and calf muscles
Have well developed thies and calf muscles in the legs.
8. Agile enough to balance immediately the body in motions of falling, sitting & standing
9. Mental ability for quick body coordination with other team members.
10. Stamina of maintaining body balance at 90 degree for maximum duration of time
11. Body capacity for rope climbing category first class.
12. Stamina for running carrying sand bags or heavy weights up to twenty kilos.
13. Individual age / date of birth must be covered under the prescribed age limit of the event.
14. The past experience of participation in the state level tournament /national level tournament or coaching camp of state level will be given preference during the selection process.

B Disqualification of the player :-

- i) Player will be considered medically unfit if he/she has high BP exceeding 10 points from normal, suffers from epilepsy spondilites, cervical illness, and skeletal back pain. In Women category female, pregnancy of any duration, excessive menstrual bleeding & other female medical problems will disqualify the player until medically declared fit by a competent doctor.
- ii) Physical Unfit : any type of handicaps.

Tug- of- War Indoor Game

Training Weight Equipments



Tug-of-War Training Equipments & Grip Blets

Sprint Trainer



Sprint Trainer

Builds hand, leg and hold power,

Small and compact, train at home with not need for large gantry

easy to set up and maintance free.

pin set weight resistance, 100kg, 125kg and 150 kg



Hand Grips



Belts & Supports

Back Support



Nylon Belt



"get the helping hand given by this belt"

Elbow Support



TOW BELT



Heavy Duty buckle, tail to guide the rope

Knee Support



TOW BELT



excellent back support, strong ribs on back

Neo Knee Support



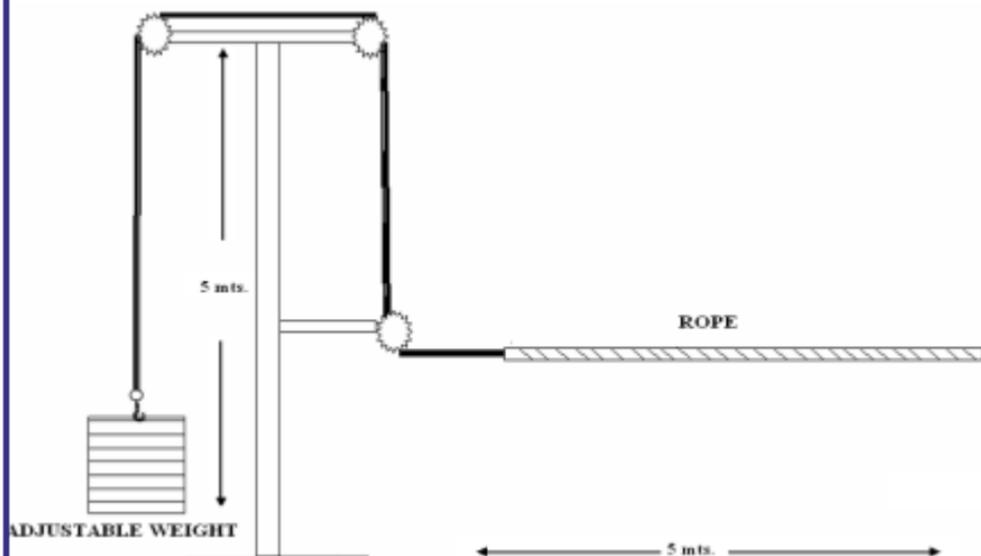
TOW BELT

Strong, Great Back support Keeps the rope in the right place

Best suited belt to tug of war

I have ever seen small(26"-29"), med(30"-32"), large(33"-35") and x large (36"-40")

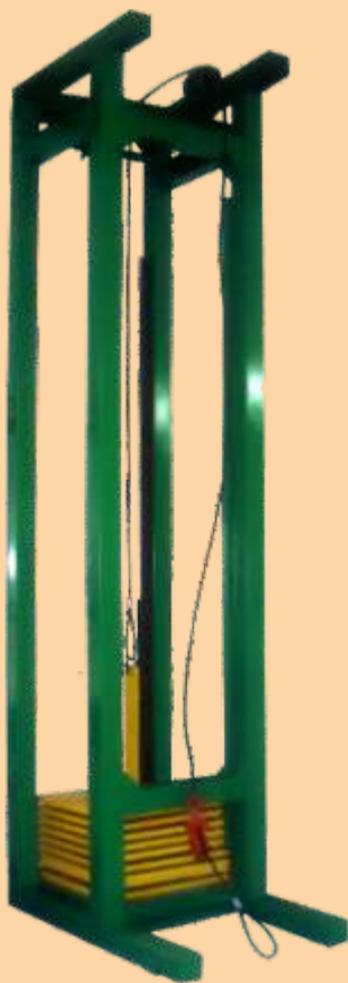
Tug-of-War Outdoor Weight Training Equipment



Tug-of-War Indoor Weight Training Equipment



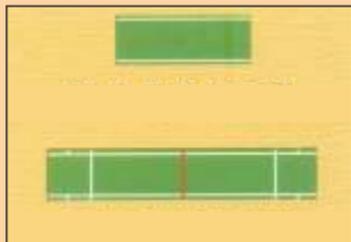
Tug of War Sports Goods & Equipments



Portable Weight
Training Equipment



Rubber Mat (used in Taiwan)



Indoor Floor Marking Tape



Tug of War "Jute" Rope



Rope Roller



Rope Roller Stand



Mat Roller

28. INFORMATION ON THE INDOOR MAT

Used in the Netherlands and accepted by TWIF

1.1 Material

Material	Type	Dimensions	Pics
Ply wood board	18mm board	1,22 x 2,44 meter	15
Rubber	Ring mat	1,50 x 1,00	25
Glue	5 liter cans		4
Acetone	1 liter cans		1
Rings			1500
Parkers			1500
Side strips wood	2cm x 2 cm	2,44 meter	30
Paint	2 liter cans		7
Mounting strips	aluminum U profile		
Tools	Plane bits		

1.2 The rubber mats are for sale at the following company in the Netherlands

UBO MATS AND COMPOUNDS B.V

Haselaarseweg 117

3771 MA Barneveld

Tel: +31 342 422244

Fax: +31 342 421931

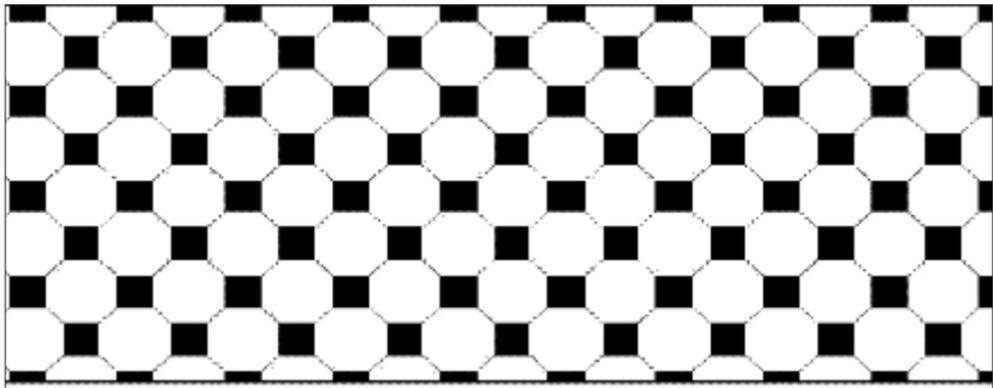
1.3 Do-it-yourself

The mats are produced as a do-it-yourself using rubber mats of 150 cm x 100 cm (floor mats) which are attached to plywood boards. The boards 15 are laid on the floor of the indoor hall and connected by aluminum U profile and the edges.

1.4 Rubber plan

To avoid spilling of rubber material the 25 mat should be cut in accordance with plan as shown below

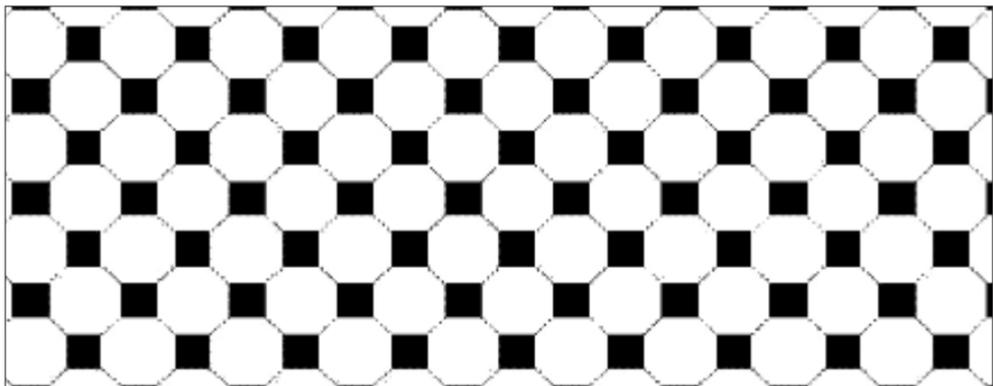
5. Board with



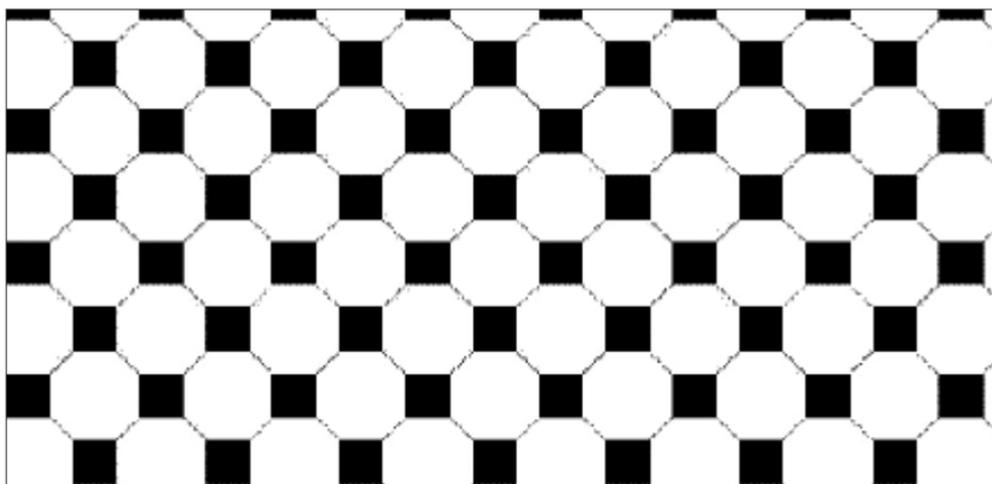
1 Piece 150x100 plus 2 Pieces 50x100

1.5 Removing rubber notches

10. Board with



Mat Section 244x120



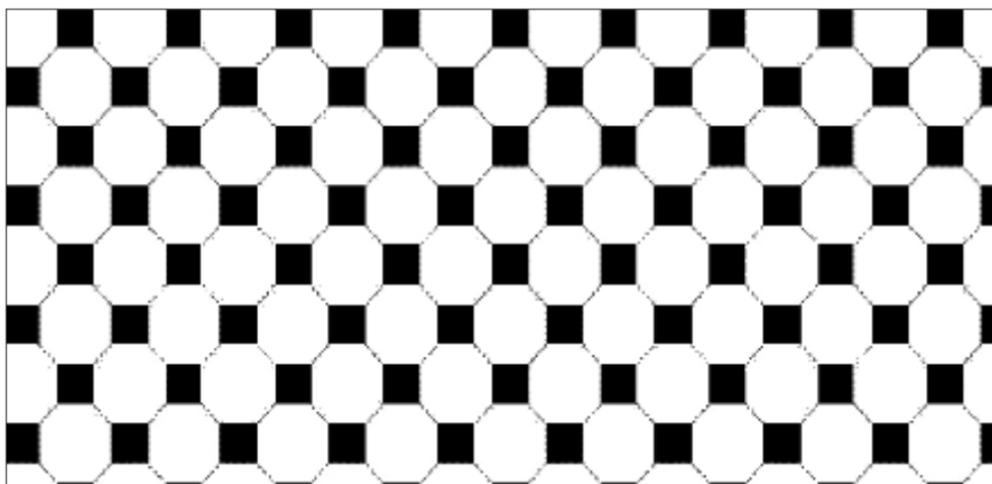
1 Piece 100x100 plus 1 Pieces 100x100

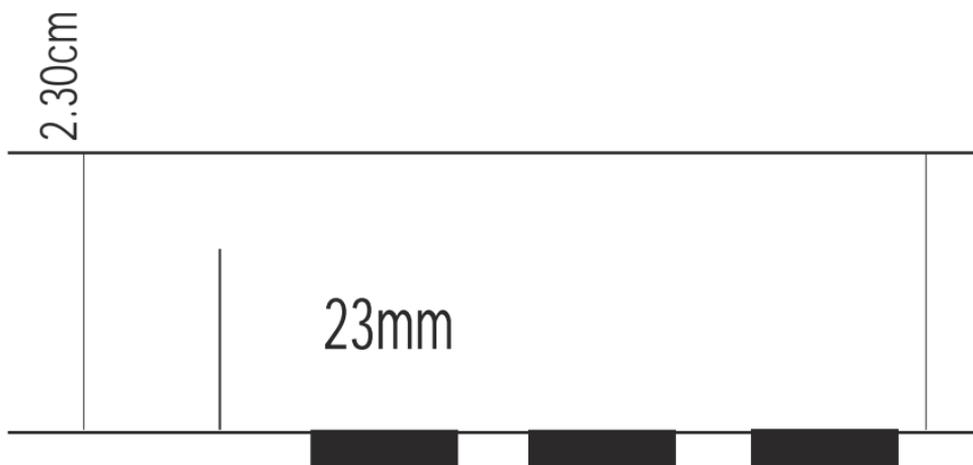
1.6 Removing rubber notches

The rubber mats are delivered with notches on the underside. In order to attach the rubber securely to the plywood by glue and screws, the rubber notches should be removed.

This is a labour-intensive activity. It has mostly to be done by using a rotating plane Ringmat

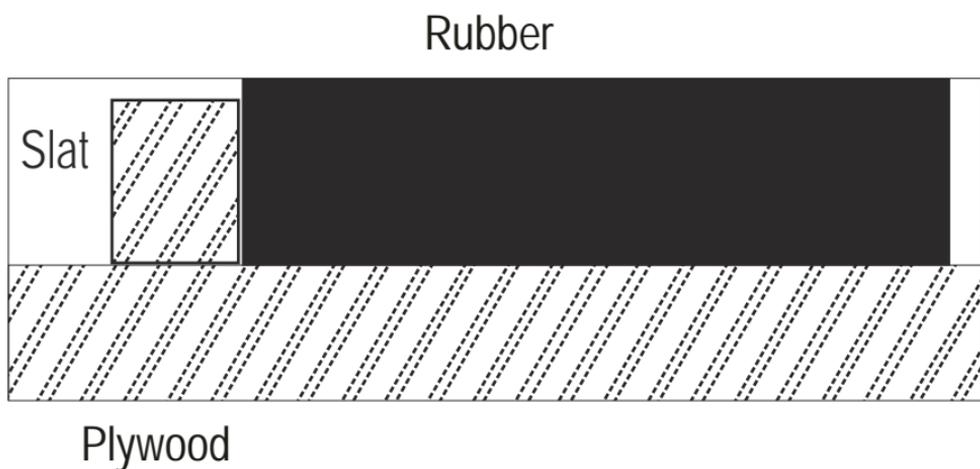
Profile Honeycomb





RUBBER NOTCHES SHOULD BE REMOVED

1.7 Final assembly



TWIF Approved Rubber Mat Specification and Sample



Datasheet Dunlomat

Dunlomat is made of high quality rubber covers, with a Polyester-Nylon fabric which guarantees a long lifetime. Dunlomat is available in a 6 mm and 10 mm thick mat in a wide variety of widths.

Dunlomat "6" is available on a width of 2000 mm

Dunlomat is available on 1000-1200-1500-1600-1700-1800 and 2000 mm wide.

The maximum roll length is 200 m.

The double profiled Dunlomat has a fabric print on the top side, which is easy to clean and will prevent slippage. The bottom side is covered with a rufftop print, which guarantees optimal comfort.

Tolerances: *Width:* +/- 1%

Thickness: +/- 1mm



Dunlomat 10 mm



Rufftop profile



Fabric print



29. SUGGESTED WORK PLAN FOR ASSEMBLY OF DUNLOP MAT FOR INDOOR TUG OF WAR



- Acquire rubber matting approved by TWIF, preferably one metre wide, 36 metres in length and 10 mm thick.
- Cut to lengths of two metres.
- Acquire good quality 18mm thick plywood base and cut to lengths of two metres.
- Cut plywood to width of rubber plus approximately 110 mm extra.
- Use strong adhesive to bond rubber to plywood (Evo – Stik 528 instant contact adhesive or similar.) Apply evenly over both surfaces i.e.the plywood and the underside of the mat.
- Roll out rubber to base ensuring that there are no air pockets between the two surfaces.
- Leave approximately 55mm of plywood protruding on each side of the rubber.
- Stack the mats on top of each other.
- Add heavy weights on top of the upper mat to keep in place until adhesive has fully bonded / dried. Allow up to two days for this to occur.
- Use screws of the appropriate length to further secure rubber to base and provide extra support. These should not protrude above the level of the rubber. They should be inserted at approximately 25mm intervals and approximately 12mm back from both ends of the mat.
- Cut plywood side strips to place along each side of the rubber to cover the 55 mm edges on either side.

- It is an advantage to router or indent one side of each side strip to allow it to slightly overlap the adjoining rubber. This will help provide a more secure mat for competition.
- Use wood glue and screws to affix side strips to plywood base.
- Hopefully you now have an excellent competition mat.

Contributed by; Ballyhegan Tug of War Club, Northern Ireland.

30. How to build outdoor boots for TWIF International Competitions keep your feet in the Ground

There is a saying within the workforce that a bad workman blames his tools. Well this could also be true for those dedicated tug of war pullers who have had a bad day on the rope. Probably the most important piece of equipment a puller requires other than the rope, are his boots. Since the inception of tug of war as a competitive sport in ancient Greece almost 1000 years ago, the sport, as well as the footwear has changed quite a bit, although the goal is exactly the same. In more recent times the boots being used by the pullers competing at the top level in World and European Championships, have generally been adapted ski boots or rollerblade boots. Here is a short guide on how to adapt rollerblade boots for tug of war in a few simple steps:

- I Purchase your rollerblades, not too expensive, but comfortable
- I Unscrew the rollerblade fixings from the sole of the boot
- I Make a template of the sole of the boot
- I Use this template to mark a piece of 8 to 10mm thick black hard nylon, teflon or similar hard product and cut out with a suitable tool
- I Screw this cut-out to the sole of the rollerblade boot. Screws should be fixed from inside the boot downwards into the nylon, and upward through the nylon into the sole, being careful with screw length so not to penetrate the inside of the boot -remember to remove any insoles before fixing.
- I To create a heel, use 10mm nylon or teflon or similar hard material. Make a template of the heel section, about 90mm long from the back of the boot. (Refer to Rule 8.4.1 "Outdoor shoes" in TWIF Rules Manual.)
- I Cut the nylon heel piece to size and screw to the new nylon sole of the boot.

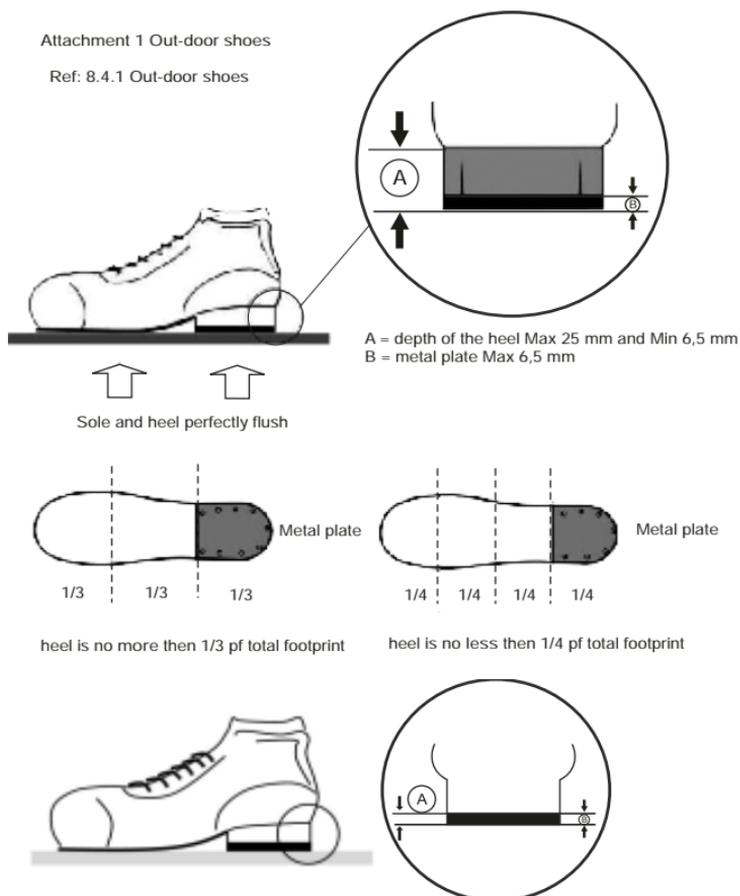
Using the same heel template, mark and cut a piece of steel with a maximum thickness of 6.5 mm.

Screw onto the heel of the boot

You should now have a completed tug of war boot ready for the 21st century.

The one thing any puller has to remember is that no matter how up to date or sophisticated the boots, they are only as good as the puller wearing them, and any puller is only as good as the effort he or she puts in to get to the top level in their sport.

“Compiled by Mr. John Mc Laughlin, Garvagh Tug of War Club, Northern Ireland”



The Side of the heel and sole must be perfectly flush.