



Golf Croquet Refereeing Manual 2020

Effective June 2020

Notes

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Section A – General

A1 – PREFACE

The Golf Croquet Refereeing Manual, 2020, is endorsed by the Australian Croquet Association (ACA) and is recommended for use as a guide for ACA Golf Croquet Referees. Much of the material in the Manual is also of benefit to Players.

The first ACA Golf Croquet Referees Manual was compiled by the then ACA National Director Referees, Owen Edwards (Ivanhoe Park CC and Kew CC, both in Victoria) in 2003 and was revised by him in 2008. It was revised in 2015 by Gordon Matthews to comply with the 2013 edition of the WCF GC Rules and again in 2019/20 by Jim Clement and John van der Touw to comply with the 5th edition of the WCF GC Rules which became effective in Australia on 1 January 2019.

In the latest revision, the main changes were in:

Sections B2 – There were changes in line with the new definition of when a ball has left the court.

Sections B7 – the detection of double tap and crush faults has been extensively rewritten to incorporate information collected from further slow-motion videos of numerous strokes played with the striker's ball in close proximity to another ball or a hoop.

Sections B8 – this section provides the technical details and evidence that support the methods proposed in Section 7 on how to judge double taps and crushes.

Sections B11 – revised in line with changes to the offside rule.

Other sections were changed, as appropriate because of the considerable changes to the Rules with the release of the WCF GC Rules 5th edition.

I am indebted to John van der Touw (Victorian State Coordinator Referees-GC) for writing Sections B7 and B8 (Judging Double Taps and Crushes), for provision of much of the photographs, for significant contributions to other parts of the Manual, for arguing with me to get it right and, finally, for proof reading.

Jim Clement
National Coordinator of Refereeing – Golf Croquet

A2 – GLOSSARY OF ABBREVIATIONS

The following abbreviations are used throughout this Manual.

AC	Association Croquet
ACA	Australian Croquet Association Inc.
AR	Active Referee
CA	Critical Angle
GC	Golf Croquet
GCR	Golf Croquet Referee
CP	Contact Point
IAR	Inactive Referee
LOC	Line of Centres
LOS	Line of Stroke
NCR	National Coordinator of Refereeing
OB	Other Ball
OR	WCF Official Rulings
RiC	Referee in Charge
RoA	Referee on Appeal
RoC	Referee on Call
RoR	Referee on Request
Rules	<i>The Rules of Golf Croquet, 5th Edition</i>
SB	Striker's Ball
SCR	State Coordinator of Refereeing
SuR	Supervising Referee
TA	Tangential Angle
TM	Tournament Manager
TP	Tangential Point
TR	Tournament Referee
TRegs	Australian Tournament Regulations (September 2018)
VM	Venue Manager
WCF	World Croquet Federation

A3 – OPERATIONAL PROCEDURES

This Manual is mainly for the guidance of Golf Croquet referees in carrying out their duties as officials at Golf Croquet events whether they be ACA, State, Regional or Club controlled. It also has sections offering guidance for conducting or participating in training sessions.

Officials conducting workshops and accreditation courses are encouraged to make this document available to participants.

Suggested changes to the *Golf Croquet Refereeing Manual* can be made by referees presenting written submissions to their State Coordinator of Refereeing-GC, who will forward them to the National Coordinator of Refereeing-GC, who will circulate the submissions together with any comments to all other SCRs. If a majority of SCRs agree, the changes will be submitted for approval, adoption and distribution by the ACA Board.

Any time the Manual is altered a new page or pages will be issued showing the sections and page number(s), the date the alteration became effective, the number(s) of the superseded page(s) and a brief reason for the reissue. If necessary, a whole Section may be reissued; the layout of the manual allows this to be done without affecting other sections.

Below is an example of how a notification might appear.

Date	1 April, 2015
Supersedes	Section B11, Page 4
Issued By	NCRGC
Reason	New policy to conform with Official Rulings

At other times, persons who are authorised to submit pages for issue or reissue in this Manual via the NCRGC are:

NCRGC	For changes in refereeing procedure and techniques
ACA Chair	For policy issues
Chair, Tournament Committee	For interpretations of TRegs
Australian Representative on the WCF Golf Croquet Rules Committee	For rule changes, explanation of the Rules and Official Rulings

Section B – Technical and Practical Techniques and Considerations

B1 – HOOP SETTINGS, GAUGES AND REFEREE EQUIPMENT

1.1 Hoop Settings:

GC Rule 3.2.1 lists the specifications for hoops including height of the crown above the ground and diameter of upright. It also specifies the hoop settings (i.e. allowed distances between the inner surfaces of the uprights), but says that in tournament and match play, the organising body may specify a narrower internal width. In the Australian Tournament Regulation (2018), TReg 15.6 specifies for level play in GC the distance between the hoop uprights is set at $3^{11/16}$ inches with zero upward tolerance and downward allowance of $1/32$ inch. For handicap events the regulations specify a distance between the hoops to be $3^{3/4}$ inches with zero upward tolerance and downward allowance of $1/32$ inch.

For all tournaments, details of the hoop setting specifications should be published in the Conditions of Play for the event.

For social club play, setting the distance between the hoop uprights at $3^{3/4}$ inch $\pm 1/32$ inch (i.e. between $3^{23/32}$ inch and $3^{25/32}$ inch) is acceptable.

For WCF events, hoops are commonly set with the space between the uprights being equal to the diameter of the largest ball in use on each court plus $1/32$ inch. The ball with the largest diameter can be determined by using a ball gauge depicted on page 10.

ACA, for its events, requires that the distance between the hoop uprights is correct but does not stipulate how this is to be achieved. Although the ACA logo or the letters ACA appear on some gauges there is no “official” ACA Hoop Setting Gauge nor does ACA recommend any particular gauge be used. The settings for ACA events are the responsibility of the Tournament Committee and for non-ACA events the Tournament Management’s responsibility. Prior to commencement of play it is essential that the TR and Authorised Referees know the specified settings.

As well the TR is responsible for ensuring that the hoops are correctly positioned on all courts. The TR is to attend to or delegate this duty prior to the commencement of play each day.

1.2 Commonly Used Gauges:

1.2.1 Wedge Gauge



The Wedge Gauge is an acrylic gauge weighing approximately 50 grams, which is much lighter than a brass gauge, and can be used when setting hoops to all of the specifications set down in the TRegs for both level play and handicap play at all levels of GC competition.

For WCF events, hoop widths will be generally set at the diameter of the largest ball on the court $+1/32$ inch.

Using the normal diameter of a ball, which is $3^{5/8}$ inches, each marking on the gauge represents a hoop width of ball diameter of $3^{5/8}$ inches diameter plus the dimension of the mark. For example, the $+1/32$ inches setting results in a hoop width of $3^{5/8}$ inches $+1/32$ inches, the $+5/32$ inches setting results in a hoop width of $3^{5/8}$ inches $+5/32$ inches and so on for the other three marks in between. When setting hoops using a Wedge Gauge, the top 3 markings indicate the following hoop widths,

$$+1/32 \text{ inch} = 3^{11/16} \text{ inches} - 1/32 \text{ inch}$$

$$+1/16 \text{ inch} = 3^{11/16} \text{ inches}$$

$$+3/32 \text{ inch} = 3^{11/16} \text{ inches} + 1/32 \text{ inch}$$

which is the range of settings for level play.

and the bottom 3 markings indicate the following hoop widths,

$$\begin{aligned} +\frac{3}{32} \text{ inch} &= 3\frac{3}{4} \text{ inches} - \frac{1}{32} \text{ inch} \\ +\frac{1}{8} \text{ inch} &= 3\frac{3}{4} \text{ inches} \\ +\frac{5}{32} \text{ inch} &= 3\frac{3}{4} \text{ inches} + \frac{1}{32} \text{ inch} \end{aligned}$$

which is the range of settings for handicap play.

Being acrylic, a Wedge gauge is prone to wear if grit or sand particles come in contact between the surface edges of the gauge and the hoop uprights, in time possibly rendering the gauge less accurate. It is suggested the hoop uprights and the Wedge gauge edges be wiped with a soft cloth or tissue each time the gauge is used.

1.2.2 Brass Gauge ACA '09



The **ACA '09** gauge is a brass gauge with three measurements, $3\frac{11}{16}$ inches, $3\frac{23}{32}$ inches and $3\frac{21}{32}$ inches, which allows for checking that the distance between hoop uprights is within the allowable range for level play events.

The width between the 2 arrows is $3\frac{11}{16}$ inches; the width of the notch below is $3\frac{11}{16}$ inches + $\frac{1}{32}$ inch and the notch above $3\frac{11}{16}$ inches - $\frac{1}{32}$ inch`

The **ACA 09** gauge can only measure three widths ($3\frac{21}{32}$ inches, $3\frac{11}{16}$ inches and $3\frac{23}{32}$ inches). It is suitable for major level play tournaments where the width between the hoop uprights may be required to be set at between $3\frac{11}{16}$ inches and $3\frac{21}{32}$ inches (Refer TRegs). However, it is unsuitable for measuring hoop widths in ACA handicap events as it can only measure the lower allowed width of $3\frac{3}{4}$ inches - $\frac{1}{32}$ inch but cannot measure $3\frac{3}{4}$ inches or $3\frac{3}{4}$ inches + $\frac{1}{32}$ inch which are the nominal and the upper allowed widths for handicap events.

Although these gauges are quite accurate and sturdy, they weigh about 110 grams which does not make them ideal for a referee to carry in a pocket or waist bag.

1.2.3 Tru-gauge™



The Tru-gauge™ is a rigid plastic gauge with an arc shaped edge graduated in $\frac{1}{32}$ inch steps from $3\frac{11}{16}$ inches to $3\frac{13}{16}$ inches.

On the Tru-gauge™:

The 11 mark = $3\frac{11}{16}$ inches

The mark between 11 and 12 = $3\frac{11}{16}$ inches + $\frac{1}{32}$ inch

There is no mark indicating a $3\frac{11}{16}$ inches - $\frac{1}{32}$ inch,

making the gauge unsuitable for some level play events.

The 12 mark = $3\frac{3}{4}$ inches

The mark between 12 and 13 = $3\frac{3}{4}$ inches + $\frac{1}{32}$ inch

The mark between 12 and 11 = $3\frac{3}{4}$ inches - $\frac{1}{32}$ inch

This gauge is suitable for handicap events.

The 13 mark = $3\frac{13}{16}$ inches

The Tru-gauge™ is not suitable for level GC tournaments™ as they are not calibrated downward to $3\frac{21}{32}$ inches (that is $3\frac{11}{16}$ inches - $\frac{1}{32}$ inch) but are suitable for handicap tournaments as they are calibrated from $3\frac{11}{16}$ inches to $3\frac{3}{4}$ inches.

Being acrylic the Tru-gauge™ is prone to wear if grit or sand particles come in contact between the surface edges of the gauge and the hoop uprights, in time possibly rendering the gauge less accurate. It is suggested the hoop uprights and the Tru- Gauge™ edges be wiped with a soft cloth or tissue each time a Tru-Gauge™ is used.

Some of these gauges are inaccurate and if being used should be calibrated against an ACA '09 Brass gauge or the newer Wedge Gauge.

The Tru-gauge™ is no longer in production and will gradually be used less frequently.

1.3 Older Hoop Gauges:

1.3.1 ACA Brass "Go-No-Go"

The ACA Brass "Go-No-Go" gauge is superseded and rarely used.

1.3.2 Aluminium Gauges

Aluminium Gauges – being made of soft metal which is prone to bending and wearing of the edges these are not considered to be satisfactory.

1.4 Other Gauges

1.4.1 Feeler Gauges



Hoops width settings may sometimes be measured at half ball height above the court surface using the ball with the largest diameter plus $\frac{1}{64}$ inch, $\frac{1}{32}$ inch or $\frac{1}{16}$ inch. Therefore, the hoop setters, and official responsible for checking the hoops, needs to have access to a set of feeler gauges for all three measurements. This technique is more time consuming than other methods but it is commonly used in WCF

controlled GC Tournaments.

The set of feeler gauges as pictured are made from plastic strips of $\frac{1}{16}$ inch and $\frac{1}{32}$ inch thickness, but not a strip of $\frac{1}{64}$ inch thickness.

1.4.2. Ball Gauges



The set of 3 rigid plastic ball gauges have diameters of $3\frac{19}{32}$ inches, $3\frac{5}{8}$ inches and $3\frac{21}{32}$ inches. That is $3\frac{5}{8}$ inches plus and minus $\frac{1}{32}$ inch, which is the allowed range of ball diameters for major events. The gauges can also detect if a ball is truly spherical or out of shape.

The gauge for each particular diameter must allow the ball to fit snugly into the gauge and yet still pass through the gauge. When the ball is in the gauge, the gauge is used to roll the ball around, on a firm, flat surface over several of the ball's diameters. If

in the process the ball occasionally becomes jammed in the gauge this is evidence of the ball being misshapen.

When performing the test it is usual to commence with the $3\frac{5}{8}$ inches gauge and change over to one of the other two gauges if the diameter of the ball is greater or smaller than $3\frac{5}{8}$ inches.

1.5 Summary

Due to its capability of measuring a larger range of hoop settings, its light weight and the unlikelihood of causing an injury should the referee fall while carrying one, the Wedge Gauge should be the gauge to use.

1.6 Setting Clamps

1.6.1 Atkins Hoop Setting Clamp & Bolt



The Atkins Setting Bolt & Clamp are invaluable when setting Quadway (and other) hoops for WCF requirements, i.e. all hoops on a court set to the largest ball plus 1/32".

1.6.2 Other Hoop Setting Clamps



The clamp pictured was designed and manufactured by Ian Bassett and is designed to hold the hoop at $3\frac{11}{16}$ whilst setting it into the ground. These clamps are found at several clubs within Victoria.

1.7 Referee Equipment

1.7.1 Recommended for a Referee to carry on their person:

- At least 6 ball markers
- The latest edition of the ACA *The Rules of Golf Croquet*
- A copy of the latest Official Rulings on the WCF GC Rules
- A Wedge Gauge (See Note 1 below)
- Distinctive garment, ideally a high visibility vest – Day Yellow – for ease of identification. (For WCF events this will be provided)

1.7.2 Other useful items the Referee might carry:

- A piece of thin, white PVC plastic approximately 100 mm x 12 mm to help determine if balls are touching (See Note 2 below)
- A container for markers. A small plastic tablet container is excellent for this purpose;
- A coin for tossing to determine which side plays first
- Notebook and pen/pencil to take notes for future reference, but not to be used while actively refereeing during a game as the referee's attention to the play can be distracted
- A device to help with the marking of balls (See Section B1.3.3)
- A device to help measure angles (e.g. goniometer).

1.7.3 What the venue ought to provide for a Referee:

- A shady and sheltered area, especially for a RoR
- Electronic timer (if the referee is responsible for time keeping).

Referees are usually not required to be the timekeeper and should only undertake this task if it is absolutely necessary and only when acting as RiC.

SuRs and RoRs (RoCs) should not act as timekeepers as they are required to be constantly moving between games and/or courts which makes timekeeping very difficult and unsatisfactory.

Note 1. It is best not to carry a metal hoop gauge during games as it could cause an injury if the referee should unfortunately fall over.

Note 2. Carefully placing the narrow strip of PVC along the ground between the two balls and then looking down on the balls from above is a very simple way to accurately determine whether or not two balls are touching; especially when there are shadows over the court or when the court is wet or damp and the balls are covered with a thin film of water.

Another method is to place a white object, such as a hat, on the ground to one side of the balls and to check for touching by viewing from the other side at half ball height from the ground. This requires a fair degree of agility which is not enjoyed by many referees.

B2 – DETERMINING IF A BALL IS ON OR OFF THE COURT

The Rules specify that a ball becomes an outside agency when it leaves the court, which occurs as soon as any part of it would touch a straight edge raised vertically from the boundary.

When describing a Standard court GC Rule 2.2.2: *“The boundaries are to be clearly marked. The inner edge of the marking defines the actual boundary”*.

Determining if a ball has actually left the court is usually self-evident but in certain circumstances a ball may be very close to resting on the boundary or may only have barely left the court in a critical position. In this case it becomes imperative for the referee to decide if the ball has actually left the court or not.

Example: A critical situation could occur when the players are contesting Hoop 13 and a player has deliberately struck a ball to go off the court behind Hoop 13 but it only just reaches the boundary and needs to be judged ‘in’ or ‘out’.

If it is judged to have left the court, when it is replaced on the boundary it cannot legally be hit away by the opponent because it is now an outside agency. Such is not the case if it has not left the court in which case it can be legally hit away.

It is usually possible to judge whether a ball is in or out by eye, but with very close decisions it is helpful to set up a vertical plane and look along it. This can be done by setting up two square-faced mallets along the boundary edge, as illustrated in Figure 2.1, and looking along the sides of the mallets at half-ball height. Alternatively, make a test box which is open on one side, as illustrated in Figure 2.2. The test should be performed by looking along the sides touching the boundary, not by looking from the top. Care should be taken not to touch the ball when performing the test. The holes in the box shown in Figure 2.2 are for carrying the box, not for sighting the ball.



Figure 2.1 Testing for out-of-bounds using mallets

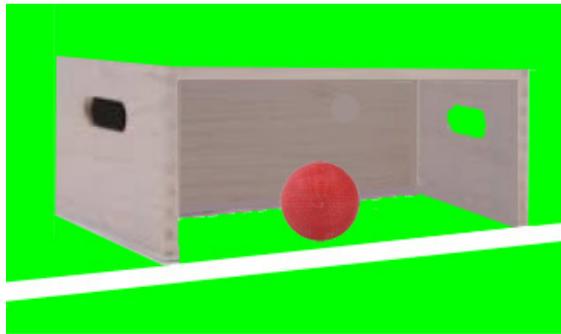


Figure 2.2 Testing for out-of-bounds using a purpose-built box

2.1 Boundary markings

There are numerous types of boundaries markings such as chalk lines, paint lines, dye lines, string or cord lines and metal or plastic strips.

2.1.1 Paint lines boundaries

With liquid chalk, paint or dye lines the edges of the boundary are sometimes not sharp and there can also be a problem with overlapping from successive line marking. The **inside** of the apparently newest line is to be used.

If the lines are ambiguous, under some circumstances, the referee ought to walk the players (or team captain) around the lines and obtain agreement as to what constitutes the boundary line for the match.

Paint lines are the safest as they cannot cause people to trip.

2.1.2 String lines boundaries

In order to keep string lines straight they need to be tethered to the court every 2 to 3 meters. If not taut and firmly tethered to the court surface, string lines can present a potential safety hazard.

2.1.3 Metal strip boundaries

These need to be tensioned very tightly to keep them flat on the ground. If any part of the metal projects above the ground it can pose a safety risk with the possibility of players and officials tripping on the raised strip. Also, if the strips are not totally flat on the ground they can cause interference and damage to the mallet head.

If tightly tensioned and flat on the court surface, unless overgrown with grass, the edge of a flat metal strip presents a sharp and definite boundary line.

2.1.4 Plastic strip boundaries

These are usually a T-section of PVC plastic with a 40 mm flange set firmly and permanently into the court surface.

When first set, the plastic strips give a well-defined boundary line. However, over time, due to repeated top dressing and other court maintenance, the strips tend to sink a little below the level of the court surface, resulting in the actual boundary line becoming much less well defined. If a ball is resting on a sunken plastic strip it has obviously left the court.

2.2 Summary

Chalk or paint lines are preferred over other forms of boundary markers as they present no physical hazard, need no maintenance (other than periodic repainting) and cannot interfere with a player's stance or stroke

B3 – BALL MARKING

Ball marking is typically done for one of two reasons:

1. In case a fault is committed, so that you know where the balls need to be placed if the non-offender chooses the option (allowed under GC Rule 11.4.2) of having the balls “*replaced in the positions they occupied before the stroke was played*”.
2. So that a ball can be replaced where it was if it was temporarily removed, for example, to avoid interference to another game, or to be cleaned.

In the former situation, any ball that requires marking will usually be in a critical position, commonly near a hoop and with another ball, or balls, close by.

Ideally ball marking should be performed with the minimum of delay and such that the balls can be replaced accurately. The markers should not be a distraction to the striker, if possible, and should not become displaced by the stroke.

3.1 Methods for marking balls

3.1.1 Single line method

For each ball to be marked, this method uses a single golf ball marker and a fixed object. The marker is placed right next to the ball and such that the center of the ball is on the line between the marker and the fixed object. When putting the marker near the ball, place it such that a particular point of the marker (e.g. the center or the edge nearest the ball) is directly below the edge of the ball when viewed from above. This is illustrated in Figures 3.1 and 3.2.

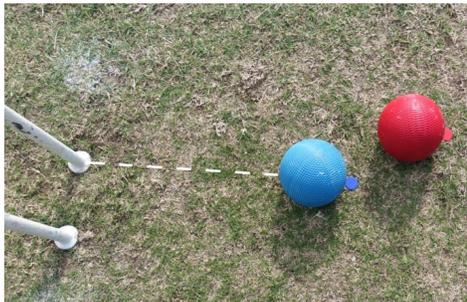


Figure 3.1 Single line method



Figure 3.2 Single line method (close-up)

The ball shadow method. A variation of the single line method is to place the marker on the furthest part of the shadow of the ball. See Figures 3.3 and 3.4. There is no need for a separate fixed object with this method. To replace the ball, put it such that the furthest part of the shadow of the ball is again where the marker is. The shadow will move a negligible amount between marking the ball replacing it, except close to sunset or sunrise. The method should only be used when there are no clouds so that you can be sure that the shadow will be visible when the ball needs to be replaced.



Figure 3.3 The ball shadow method

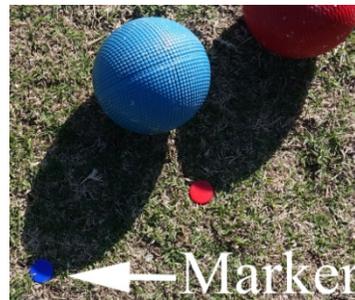


Figure 3.4 The ball shadow method (close-up)

3.1.2 Cross-bearing method

With the cross-bearing method, two or more lines are used for each ball being marked. The lines are chosen so that the ball is where the lines intersect. Two lines are enough if they are marked accurately. Markers are usually placed about half a meter or more from each ball to reduce the chances that the markers will distract the striker, interfere with the stroke, or become dislodged as the stroke is played.

The cross-bearing method works as follows.

Two points on each line are marked either

- using two golf ball markers (one for each of the two points on the line), or
- using one golf ball marker and a fixed object such as a hoop upright.

Using a marker and a fixed object is quicker than using two markers. There is no shortage of fixed objects on or around the courts. Hoop uprights are a popular choice.

Figure 3.5 illustrates the cross-bearing method where each line uses a marker and a hoop upright. In this case the two uprights of the same hoop are used for the two lines. The lines drawn in the diagram show the pair of intersecting lines used for the blue ball.



Figure 3.5
Cross-bearing method using both uprights of the same hoop

The method is more accurate the greater the angle between the lines. A larger angle (up to ninety degrees) can be achieved by choosing uprights from different hoops, as shown in Figure 3.6

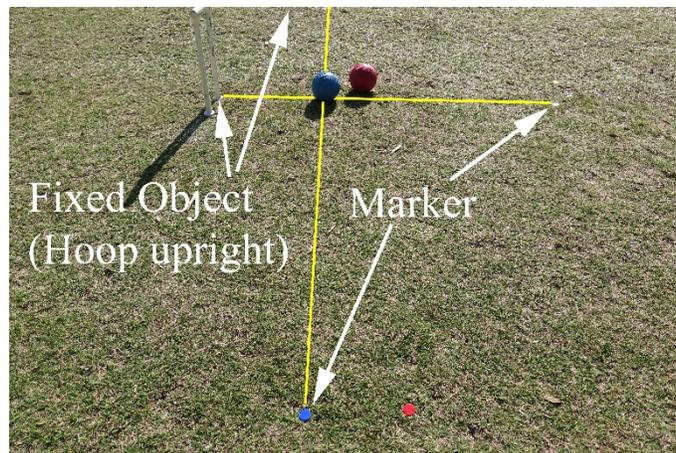


Figure 3.6 Cross-bearing method using uprights from different hoop

The cross-bearing method is sometimes called cross-triangulation although, strictly speaking cross-triangulation refers to the use of three lines. The third line is a check line. If the three lines have been marked accurately, they will all intersect at a single point but, in practice, they will intersect at different points which form a triangle. The triangle gives an indication of the accuracy. The smaller the triangle, the greater the accuracy. A third line is rarely used for ball marking because of the extra time it takes.

3.1.3 The marking device method

This method uses a thin rod or pole and, for each ball to be marked, two golf ball markers. The rod can be any length but is typically about 45 to 60 cm. The rod is placed on the ground so that one end is directly below the edge of the ball when viewed from above.

One of the golf ball markers is placed at the other end of the rod, and the second marker is placed anywhere along the rod, but not too near either end. See Figure 3.7. Once the markers are in place, the rod is removed. The procedure is repeated using the same rod for any other balls that are to be marked. To replace a ball, put the rod back on the ground using the two markers placed earlier as a guide, and put the ball back so that the end of the rod nearest the ball is once again directly below the edge of the ball when viewed from above.

One end of the rod should be slightly asymmetric (see Figure 3.8). That is so that, when the rod is used to replace the ball, it can be put on the ground in the same orientation as it was before. Before removing the rod when marking the ball, the orientation should be noted. Using the same orientation will avoid an error in replacement that could occur if the rod is not exactly straight. Preferably the rod should be telescopic, so it can be stored easily in a pocket or referee's bag when not in use.

The rod shown in the diagrams was collapsible fly-swat bought from a "Two Dollar Shop", with the "swat" part cut off.



Figure 3.7 The rod method



Figure 3.8 The marking rod collapsed

Some people place the rod so that one end is just touching the ball rather than directly below the edge of the ball. Doing that runs the slight risk of moving the ball accidentally before the marking process has been completed.

3.2 Advantages and disadvantages of the ball marking methods

It was stated above that the ideal ball marking method would satisfy the following four criteria:

- Little delay to the game
- Accurate replacement of the balls
- Little distraction to the striker
- Unlikely to become displaced by the stroke

The single line method is the quickest and most accurate, but some strikers find that having the markers so close to the ball is distracting. Also, by being so close to the balls, there is a danger that one or more of the markers could become displaced by the stroke. By asking the striker in which direction he intends to play the stroke, the referee should be able to position the markers to reduce the chances of displacement. So, in most cases the single line method is the preferred method providing the striker does not object to where the markers are placed.

The marking device method is almost as quick and accurate as the single line method, and the markers are less likely to become displaced or be a distraction to the striker compared with the single line method. So, the marking rod method might be the preferred method for balls in a situation where the striker finds that the markers are distracting.

The cross-bearing method is the slowest and least accurate. It has the advantage that the markers are least likely to become displaced or (once they are in place) be distracting to the striker. On the other hand, the striker might find the length of time it takes to get the markers in place to be somewhat distracting.

The use of the marking device has been prohibited at some tournaments because of concerns by the tournament manager about the possibility that the ball will be moved during the marking process. Observations suggest that, even if the marking device touches the ball, it is very unlikely that the ball will be moved by much. Even if it is moved accidentally, the amount by which the ball is moved is likely to be considerably less than the average replacement error of the cross-bearing method. The risk of moving the ball with the marking rod method can be reduced by using the variation where the device does not touch the ball.

3.3 Marking a ball to avoid interference from another game.

GC Rule 17.2.1 says *“If two games are played simultaneously on the same court, all players ... are to try to avoid interference with the other game. For that purpose, with the permission of the players of the other game, one or more balls of the other game may be temporarily removed after their positions have been marked”*.

The need to obtain permission from the players before moving a ball from their game applies not only to the players of the other double banked game but also to officials such as referees.

The players may not want the ball to be moved if it is in a critical position. In that case, the players who asked for the ball from the other game to be moved to avoid interference would have to wait until the ball in the critical position had been played so that it is unlikely to cause interference or it is no longer in a critical position so it can be marked and moved.

Normally, if a ball is marked to avoid interference from another game, the single line method is used. If the ball is in a moderately critical position but not so critical that the players don't want it to be moved, a modified single line method can be used with a second marker placed next to the ball diametrically opposite the first one. i.e. with a marker next to the ball on either side, with both balls on the line from a fixed object (such as a hoop upright).

Sometimes such a moderately critical ball is marked so that it can be replaced if hit by a ball from the other game, but it is deliberately not moved before the stroke by the other game is played. In that case, for the purposes of GC Rule 9.2.3, the ball that was marked but not moved would still have to be treated as a ball that *“was stationary from when the stroke was played until the collision occurred”*.

B4 – TESTING IF A HOOP IS MADE (OR IS ABLE TO BE MADE IN A SUBSEQUENT TURN)

4.1 Visual Test

When deciding if a ball has run a hoop, a visual test is usually all that is necessary and should be conducted as promptly as possible.

The visual test is to determine if all of the ball has passed the *critical plane* in the situation where the ball has entered the hoop.

- The critical plane is the plane of the "*playing side*" if the ball last entered the hoop from the playing side, e.g. in an attempt to run the hoop.
- The critical plane is the plane of the "*non-playing*" side if the ball last entered the hoop from the non-playing side, e.g. in an attempt to be able to run the hoop a hoop in a subsequent turn.

The planes of the playing and non-playing sides are defined in Rule 7.

When making the visual test the hoop is **not** to be touched. For example, it should not be used as a prop to assist in getting down to and up from the inspecting position. Touching a hoop in this way can cause the hoop to be moved, which could significantly alter the relative positions of the ball and hoop.

In the following two figures the red ball has been struck from the left-hand side of the hoop in an attempt to run the hoop.

The visual test is to be conducted from side on to the hoop, as shown in Figure 4.1, or from both sides if it is not clearly obvious the ball has broken the plane of the hoop when viewed from one side only. See Section 4.1.1 for details on how to perform the visual test.

Figure 4.1 shows that red ball has not cleared the plane of the "playing side" of the hoop and therefore, the hoop has not been run.



Figure 4.1 Ball and hoop viewed from the side.



Figure 4.2 Ball and hoop viewed from above

Because the crown of the hoop is usually wider than the uprights the visual test is **not** to be conducted from above by looking down on the top of the hoop. In Figures 4.1 and 4.2 the position of the ball has not been changed, but in Figure 4.2, it appears that the red ball has run the hoop (because the trailing edge of the ball cannot be seen when viewed from directly above). A decision made by looking from above is likely to be wrong.

4.1.1 Performing the visual test

Look along the edge of both uprights such that your line of sight is along the *critical plane*. See Figure 4.3.

The visual test should be performed using only one eye because it is extremely difficult to look along the critical plane with both eyes simultaneously.

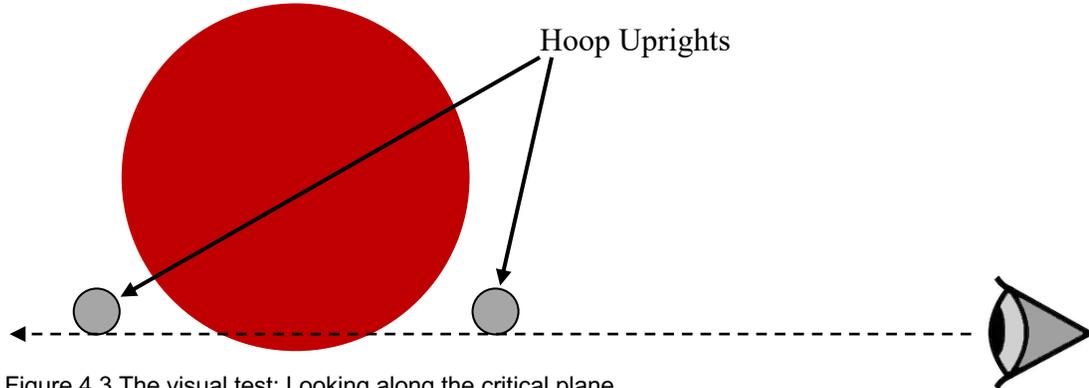


Figure 4.3 The visual test: Looking along the critical plane.

Ideally, the test should be done with the eye at half ball height and quite close to the hoop. However, this is physically very difficult, if not impossible, for some referees. The test should be conducted from as low a position as the referee can comfortably get down to and up from. When doing the test, a reliable result can be obtained with a crouched stand about a meter from the near upright such that the line of view is about 30° from horizontal.

When giving your ruling you will usually say that the ball is “*through*” or “*not through*”. To say that a ball is “*through*” means that it has cleared the critical plane.

Making the decision

It is very difficult to keep the head completely steady while performing the visual test. To rule that the ball is *not through*, you must be able to see the relevant edge of the ball for at least about one second as you line up the uprights. Likewise, to rule that the ball is *through*, the relevant edge must be out of sight for at least one second.

If the relevant edge moves in and out of view as you perform the test, you cannot be sure where the edge was when the uprights were correctly lined up as your head moved, and you should align the near upright with the edge of the ball, as shown in Figure 4.4. This alternative method of performing the test can give a more definitive result.

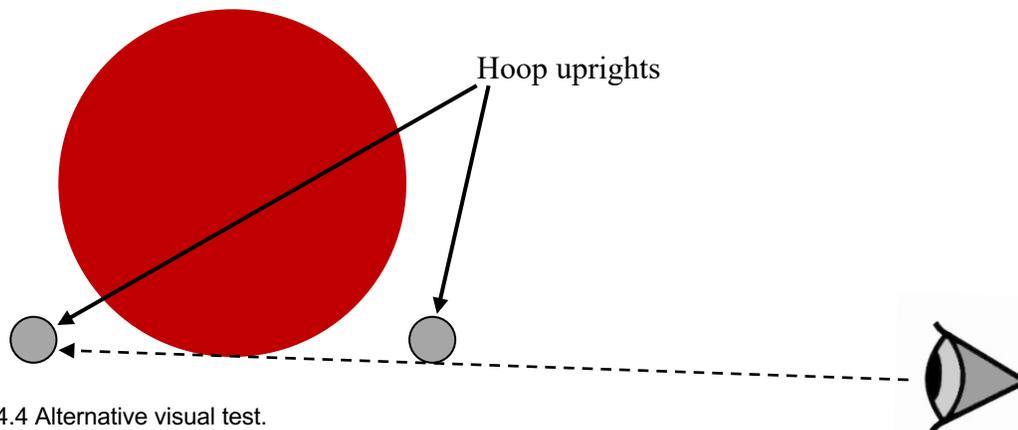


Figure 4.4 Alternative visual test.

Looking along the edge of the near upright and the edge of the ball.

The alternative test is performed by first looking along the edge up the near upright so that you can see part of the ball beyond. You then move your line of sight slowly until the ball just disappears from view. If you can still see part of the far upright, then the ball should be ruled as “through”. This procedure is illustrated in Figures 4.5 and 4.6.



Figure 4.5 Preparing for the alternative visual test.



Figure 4.6 Final stage of the alternative visual test

If you could not reach a decision after the standard visual test, and you could still not rule the ball as “through” after the alternative test, you should perform the string test.

4.2 The string test

The visual test should be performed before doing the string test because the visual test is quicker. Usually a decision can be made just using the visual test, in which case there is no need to do the string test. However, the string test should be used for a very close decision because it is more accurate, if performed correctly, than the visual test.

Some referees are reluctant to perform the string test because they fear that performing it could cause the hoop to move, thereby destroying the evidence of whether the ball was “through” or not. However, if the string test is performed carefully and properly, the hoop is unlikely to move even if it is loose.

Another reason for performing the visual test before the string test is that, in the unlikely event that the evidence is destroyed doing the string test, the referee still has some evidence to go by. The fact that a referee decided to perform the string test should mean that the visual test was not conclusive. Nevertheless, the referee must make a decision based on what he thinks is more likely to be correct.

4.2.1 Performing the string test

Use a piece of thin strong string about 30 cm long. It must be long enough so that you can grip the ends by wrapping them around a couple of fingers on each hand, as shown in the diagram on the right. Putting a loop (bowline knot) on each end helps. Hold the string taut and place it against the hoop below half-ball height so that the string is touching both uprights on the side that represents the critical plane. The hands should not touch the hoop. Keeping the string taut, move it upwards so that it remains in touch with the uprights. Most of the force used is to keep the string taut. Very little of the force applied should be in the direction of the upright. It should be possible to do this without moving the hoop.



Move the string up slowly until you see it touch the ball. If it touches the ball, then you know that the ball is cutting the relevant plane, so you should rule the ball as “not through”. When the string touches the ball, you should be able to see the ball bend the string very slightly. If the string has not touched the ball by the time it has been moved gently further than half-ball height, then you know that the ball was not cutting the relevant plane, so you should rule the ball as “through”.

Although the referee should be careful not to move the ball while testing, any movement of the ball does not invalidate the test. If the ball moves but the hoop doesn't, then the ball was clearly “not through”. Furthermore, a small movement of the ball is unlikely to have a critical effect on subsequent play. Much more important is to be careful not to move the hoop. Moving the hoop before the test was complete would invalidate the test.

4.3 Don't use a mallet to test if a hoop has been run.

The use of the side of a mallet, the edge of a hoop gauge or any other rigid, supposedly straight edge is to be avoided because:

- 4.3.1 There is no guarantee that the instrument used has a truly straight edge or perfectly flat and even surface
- 4.3.2 A loose hoop could easily be moved, resulting in a false result

The Rules do not specify what manner of test a referee is to perform to determine if a hoop has been run or entered. Likewise, there is nothing in the Rules stating that a player can demand that a string test be performed. The decision of how to test is at the referee's discretion, and in the absence of a referee by mutual agreement between the players. Note however, that it is an offense under Rule 16, Behaviour, for a player to attempt a physical test to determine whether has ball has run a hoop, etc., without permission for the opponent or the referee (if present).

B5 – HOOP SETTING, RESETTING AND CHECKING

5.1 Setting

The setting of hoops is the responsibility of the TM who, in consultation with the groundsman, will use an agreed technique with or without hole-packing material (grass clippings, fine sandy soil, tree bark, sphagnum moss, etc.) using appropriate clamps and gauges. See also Section B1 regarding gauges.

For ACA controlled events the distance between the hoop uprights at half ball height above the court surface is specified in the TRegs and this information should be repeated in the Conditions of Play.

In WCF GC events the hoops are set according to WCF Sports Regulations.

5.2 Checking

Golf croquet referees need to know how to set and reset hoops as well as how to check for correct settings if asked to do so during a game.

The WCF Refereeing Regulations say that the TR must ensure that the courts and equipment are checked for conformity with the laws/rules, regulations and advertised conditions, whereas the ACA Tournament Regulations say that the TM has that responsibility. Common practice in Australian is for the TR to take responsibility for checking and setting hoops or to delegate this duty to referees assigned to the various courts.

Checking a hoop always involves checking the width between the hoop uprights and firmness of the hoops in the ground. A more thorough check also means checking that the crown is horizontal and the correct height above the ground and that the uprights are vertical and in the correct location and orientation within the court.

Hoop settings must be checked at the start of each day and may be checked between games. They should also be checked if requested by a player.

5.3 Width re-adjustment

If the referees are required to perform this task it is suggested that extensive time-consuming techniques not be used. A large screwdriver (e.g. 300 mm long) or similar instrument, a rubber hammer and a hoop gauge are all that are usually necessary to perform the re-adjustment. See Figures 5.1, 5.2 and 5.3.

5.4 To increase the hoop width (Figure 5.1)

Shaving some soil from the outside of one, or both holes and moving it to the inside of the hole(s) will cause the uprights to spread a little when the hoop is reset, thereby widening the space between the uprights. The grey crescents in Figure 5.1 represent the soil placed on the inside of the holes. The same result can be achieved by packing a small amount of material, such as sphagnum moss against the inner sides of the holes.

5.5 To decrease the hoop width (Figure 5.2)

Shaving some soil from the inside of one or both holes and transferring it to the outside of the holes, as shown by the grey crescents in Figure 5.2., will cause the uprights to be pressed together a little and narrow the gap between them when the hoop is reset.

The same result can be achieved by packing a small amount of material, such as sphagnum moss, against the outer sides of the holes.

5.6 To firm up or tighten (Figure 5.3)

To make the hoop firmer in the ground, loosen a small amount of soil on the leading and trailing sides of the holes, that is, on both the “playing” and “non-playing” sides of the hoop, or place a small amount of sphagnum moss in the same positions, re-insert the hoop and hit into place with the rubber mallet. The hoop will usually then be firmly in the ground. If this simple procedure fails, the hoop will need to be totally re-set.

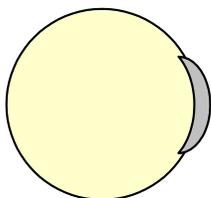


Figure 5.1 Position of material to increase width of hoop. The soil (or moss) is shown in relation to the hoop “carrots”

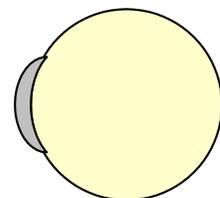
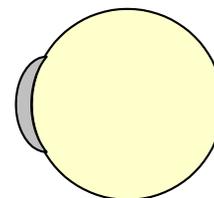


Figure 5.2 Position of material to decrease width of hoop. The soil (or moss) is shown in relation to the hoop “carrots”

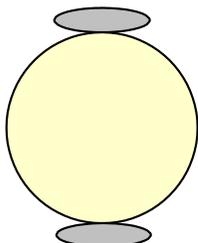
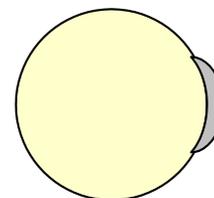
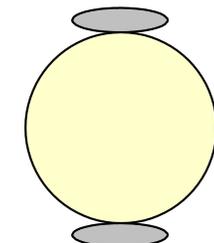


Figure 5.3 Position of material to tighten hoop without changing width. The soil (or moss) is shown in relation to the hoop “carrots”



These techniques also avoid the build-up of extra compressed material mass in the holes which over time causes the raising of the court around the holes, resulting small “hills” that can affect the path taken by a softly hit or slowly moving ball.

For cast iron hoops

Never hit hoops in the centre of the crown as over time repeated blows to the centre of the crown can cause them to bow and the uprights to splay.

Always hit directly over each upright with alternating blows. Recommended reading:

Hoop Setting Guide Compiled by Elizabeth & Bruce Fleming.

For Quadway hoops

The hoops **should** be hit in the centre of the crown because hitting directly over the uprights can damage the adjusting screws above the uprights.

B6 – DEMONSTRATING FAULTS USING THE CARBON PAPER TEST Double Taps, Crushes, Pulls and Pushes

This section is about **learning or teaching** how to judge double taps. Section B7 describes a very accurate method for judging double taps using the finishing positions of the balls after a clearance stroke where the ball cleared was initially close to the striker's ball.

The best way to tell if a double tap has occurred is to video the stroke with a high-speed camera and replay the video at a normal frame rate so that the stroke can be viewed in slow-motion. Cameras that can video at 200 frames per second (fps), and even 1000 fps are reasonably affordable nowadays. The normal frame rate is about 25 fps, so a stroke filmed at 200 fps will slow the action by a factor of eight. This is enough to detect a double tap if it occurs for most close angled hoop shots, and also for open court clearances if the initial separation of the balls was about 20 mm or more. For smaller initial separations, a higher frame rate is needed. With a 1000 fps camera, the action is slowed down by a factor of forty, which is enough to detect a double tap in almost all situations when one has occurred.

We know that the method described in Section B7 works well because it was tested on strokes where the actual outcome (double tap or not) was known because of high frame rate video recordings.

6.1 The Carbon Paper Impact Test

If you don't have a high speed camera, the carbon paper test can be a simple and reasonably effective test – some further details are available on the Oxford Croquet web site in the technical section at <http://www.oxfordcroquet.com/tech/impact>. The test is performed by:

- 6.1.1...Taping a piece of carbon paper to the face of a mallet, carbon outward as depicted in Figure 6.4.
- 6.1.2 Perform the test by striking a ball or balls with whatever type of shot is chosen.
- 6.1.3 Remove and check the white paper. A single crisp mark is evidence of a clean stroke, and two separate marks is evidence of a double tap. Two marks superimposed could be due to a "ball crush" and smudged marks could result from a "push" or a "pull" stroke.

When conducting training sessions, it is suggested allowing the participants to try the Carbon Paper Impact Test for themselves. It is a fun way for them to learn that double taps have sometimes occurred when they did not think they had. Always prepare at least 6 mallets with carbon paper strips attached, prior to a session starting.



Figure 6.1 Examples of the impressions caused by double taps GC Rule 11.2.4



Figure 6.2 Examples of the impression caused by a "push" or a "pull". GC Rule 11.2.5



Figure 6.3 Examples of the impression caused by a clean stroke

6.2 Adapting a mallet to perform a Carbon Paper Impact Test.

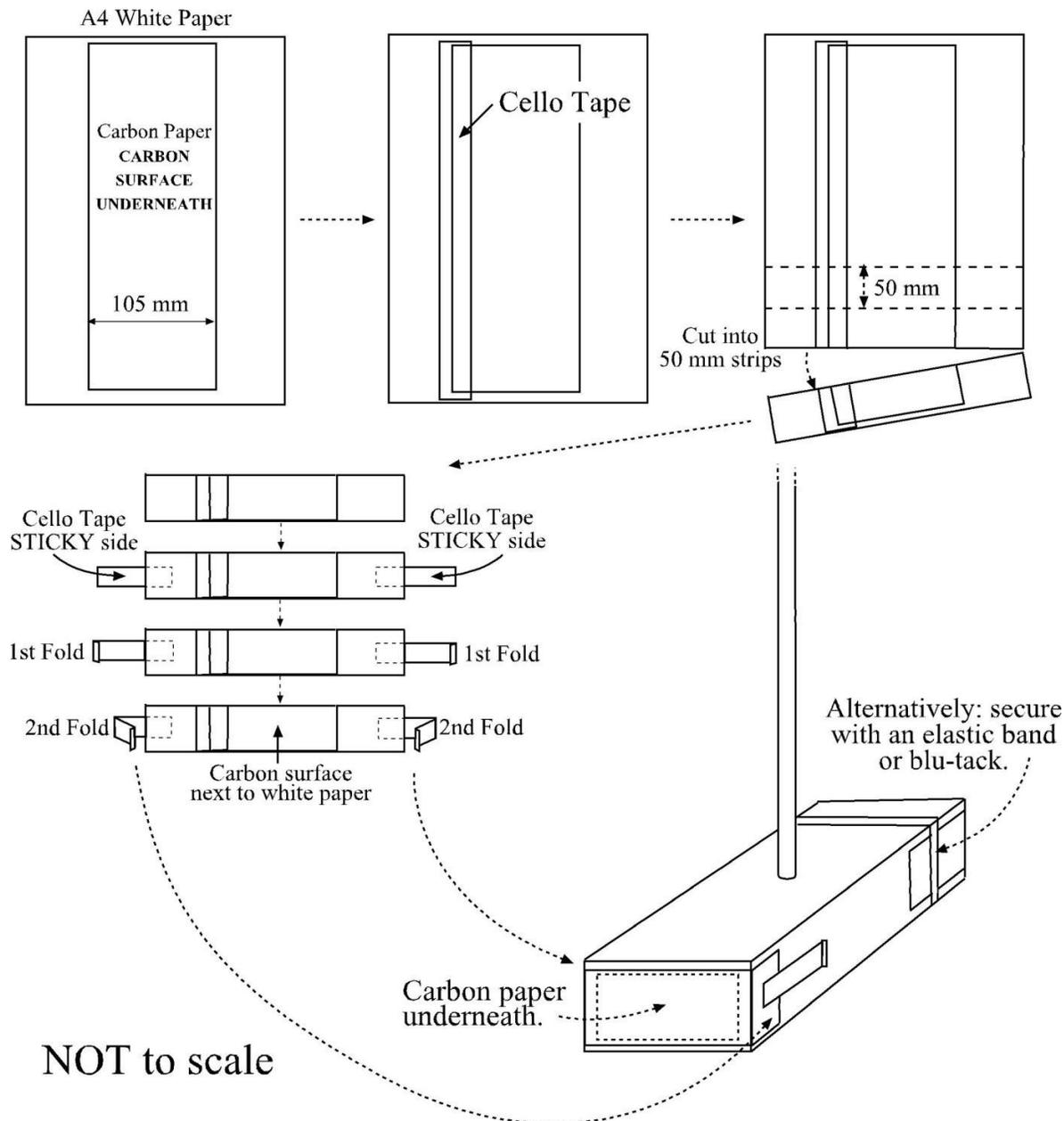


Figure 6.4 How to prepare a mallet for a Carbon Paper Impact Test

6.2.1 Preparing the mallet for a Carbon Paper Impact Test.

- 6.2.1.1 A sheet of A4 carbon paper cut in half vertically 100 mm x 300 mm (4 inches x 12 inches)
- 6.2.1.2 Centre the carbon paper on a sheet of A4 white paper – carbon side towards the paper.
- 6.2.1.3 Stick the tape to one side of the carbon paper, the full length, to the white paper.
- 6.2.1.4 Cut across to make combined strips approximately 50 mm (2 inches) wide.

- 6.2.1.5 Use the tape to make a pre-folded attachment at each end, to facilitate quick attachment to the mallet face – see sketch.

B7 – FAULTS WHEN A BALL IS NEAR A HOOP, PEG OR ANOTHER BALL

The following abbreviations are used throughout of this Section:

SB	Striker's Ball	For a stroke, the striker's ball is the ball that should be played in that stroke. In this section it is assumed that no wrong balls are played, so the striker's ball is the ball struck by the mallet.
	Striker	The striker is the owner of the striker's ball. Since, in this section, it is assumed that no wrong balls are played, the striker is the person playing the stroke.
	Clear	To "clear" a ball is to knock it away in a stroke by causing the striker's ball to collide with it.
OB	Other Ball	The ball which is contacted by the striker's ball. It is sometimes called the target ball.
LOC	Line of Centres	This refers to the line through the centres of striker's ball and the other ball before the stroke is played.
LOS	Line of Swing	The line of swing is the (projection on to the horizontal) of the line along which the mallet is swung in a stroke.
AOS	Angle of Swing	The angle between the LOS and LOC in a stroke.

When two balls are in very close proximity, say from 1 mm to 25 mm apart, and a stroke is played along the line of centres of the balls there is a highly increased chance of the striker committing a fault by double tapping the striker's ball, or by crushing the striker's ball against the other ball. By playing the stroke at an angle to the line of centres the chance of a fault decreases as the angle becomes wider. A double tap or crush is also likely in an angled hoop shot when the ball is played from very close to the hoop.

- A "double tap" is a fault under GC Rule 11.3.3.
 - where a player strikes a ball with the mallet more than once in the same stroke or allows a ball to retouch the mallet.
- A "crush" is a colloquial term for the fault that occurs under GC Rules 11.3.5 or 11.3.6.
 - where a player causes a ball, while still in contact with the mallet, to touch a hoop, the peg or, unless the balls were in contact before the stroke, another ball; or
 - where a player strikes a ball when it lies in contact with a hoop upright or the peg other than away therefrom.

Double tap and crush faults will be looked at in this Section. Judging whether a double tap has occurred is one the most important duties a GC referee is called upon to do. Technical details supporting the recommended methods for making decisions about double taps and crushes are given in the next section (Section B8).

7.1 Double Tap Faults – Prevention and Detection

Double taps and crushes tend to occur in two situations

- (1) **Clearances.** When playing a ball such that it will hit another ball which is very close.
- (2) **Angled hoop shots.** When attempting to run a hoop at an angle from a close distance.

In both situations, if a fault occurs, it will be because the striker's ball slowed down or changed direction as a result of the collision with the other object. The method of judging faults differs in these two situations, so we will look at them separately.

Double taps and crushes can also occur when a stroke is played with a ball close to the centre peg, but such faults are very rare. The method of judging those is essentially the same as for judging close angled hoop shots.

A player's task is one of prevention: in order to avoid committing a double tap, a player needs to know which factors increase the likelihood of committing one. A referee should also know which factors increase that likelihood so that he knows when to step in (as an active referee) to watch a shot closely, but he should not allow that knowledge to cloud his judgement.

A referee's task is one of detection: to decide whether a double tap *has* occurred, not to decide whether the stroke was played in a way that was likely to result in a double tap. Suppose a player uses a small angle of swing in a forceful stroke with a large follow through when trying to clear a ball close to the striker's ball. The referee will know that all of those factors make a double tap more likely but, no matter how likely, if there is good evidence available which suggests that it was not a double tap, then the referee should call it clean (unless it was a fault for a different reason).

So, factors which increase the chances a striker will commit a double tap in a clearance are:

- a small initial separation between the balls,
- a small angle of swing,
- a powerful stroke, or
- a large follow through

But a referee using these factors to judge table taps is more likely to make the wrong decision than one using the method described in Section B7.2. See Section B8 for evidence supporting this.

7.2 Double Tap Faults with Clearance Shots

Adjudicating on double taps is possibly the most frequent duty a GC referee is called upon to do. In the past "double taps" have been the bane of GC referees lives as there has been very little material available to train referees in how to determine if a double tap has occurred, especially when the balls are very close together.

The best evidence for judging a clearance for a double tap consists of the following factors.

1. Angle of separation: the final resting angle between the balls, and
2. Distance ratio: the relative distances they travelled.

The angle of separation is the angle between the finishing positions of the balls measured from where they collided. If the balls deviate noticeably as they slow down just before coming to rest, and that deviation was caused by uneven ground, estimate the angle using the positions where the balls would have finished without that deviation.

Unless the initial separation of the balls is at least about 100 mm (4 inches), it is virtually impossible to actually see or hear the double tap. A double tap in a clearance involves three collisions: mallet-ball, ball-ball and mallet-ball. For many situations where a referee is called on to make a decision, the time between collisions will about one hundredth of a second. Human auditory and visual acuity is simply not good enough to be able to tell whether there are two collisions (i.e. no double tap) or three collisions (i.e. double tap). Except for the situations described in Section B7.2.2, the referee should use the evidence provided by where the balls finished. This is much more reliable than what he sees before and as the stroke is played.

7.2.1 Judging double taps using angle of separation and distance ratio

Using the angle of separation and distance ratio to judge double taps will be referred to as the **ASDR** method. Here is a simple and reliable version of it.

Rule the stroke as a double tap if either of the following is true

- the angle of separation is less than 45 degrees **and** the other ball travelled less than eight times as far as the striker's ball.
- the angle of separation is less than 60 degrees **and** the other ball travelled less than five times as far as the striker's ball.

This method is summarized in following table.

Angle	OB:SB ratio
0° - 45°	8: 1 or more
45° - 60°	5: 1 or more
60° or more	Any

Use the left-hand column to decide which row of the table is appropriate for the stroke (based on the estimated **angle of separation**).

Then call the stroke not a double tap if the **OB/SB distance ratio** is in the range given in the right-hand column.

(Interpret 45° - 60° to mean: 45° or more and less than 60°.)

This should be thought of as a guide rather than a hard and fast rule. Sometimes, as we shall see below, the angle and ratio evidence can be contaminated.

The ASDR method is versatile because it works for powerful strokes as well as soft strokes. Although a double tap is more likely with a powerful stroke or a stroke with a large follow through, there is no need to take those factors into account when using the method.

A double tap is also more likely with a small initial ball separation but there is no need to take that factor into account when using the ASDR method, at least for separations down to as small as 2 mm. For initial ball separations less than 2 mm, a fault can occur even if the final angle of separation is greater than 60 degrees. In that case the fault will be due to a ball crush rather than a double tap. See Section B7.3.

When the two balls are touching, a double tap can only be called if the referee actually sees a separation between mallet and ball followed by a second contact of mallet and ball (Rule 11.3.3 refers).

7.2.2 When to ignore the angle and ratio evidence because of contamination

The rule given above is very reliable way of judging whether a double tap fault has occurred in a clearance shot but, even so, there are times when that evidence should be disregarded. The rule works because a double tap will change the path of the striker's ball to make it go further than it would otherwise, or to narrow the angle of separation, or both. Sometimes, these things can happen for other reasons. For example, the angle of separation and distance ratio evidence can be unreliable in the following situations.

- (a) If the striker's ball is airborne as it hits the other ball.
- (b) If the initial separation was large enough for the striker's ball to pick up a considerable roll.
- (c) If one of the balls hits another object.

The first situation can arise if the stroke is played as a jump shot (intentionally or not), or because of a bump or depression in the court surface. In the first two cases, the initial separation of the balls is likely to be large enough to actually see a double tap if it occurs.

In the third case it may be more problematic. If either ball hits another object such as a hoop, person or another ball (whether it be a ball of the game or an outside agency), it may be possible to make a good enough estimate of where the ball or balls would have finished. If so, then the referee may still be able to apply the ASDR method using those estimated finishing positions. Sometimes it will be impossible to make a reasonable estimate of where the balls would have finished, in which case the referee will still have to make a decision as best he can.

7.3 Ball crush fault

A ball crush occurs when, as a stroke is played, the striker's ball is simultaneously in contact with the mallet and another ball. This inevitable if the striker's ball and the other ball were lying in contact before the stroke was played, however a ball crush is **not** a fault in that situation. According to Rule 11.2.6, a ball crush is not a fault if "the balls were in contact before the stroke" (i.e. for "touching balls"). But it is a fault for balls that were not touching. This means that if a referee is watching a stroke, the referee must decide before the stroke is played whether the balls are touching. See Section B7.3.1

For balls that are not touching, the ASDR method described above for judging double taps should be used for initial ball separations of 2 mm or more. If that method indicates a fault, you may not know whether it was a ball crush or a double tap, but you can be confident that it was a fault.

For initial separations less than 2 mm, the upper critical angle of 60 degrees should be replaced with 80 degrees. In other words, for such a small initial ball separation, the angle of separation needs to be at least 80 degree before the stroke should be called clean regardless of the distance ratio. For an angle of separation between 45 and 80 degrees, a ratio of 5:1 or more is needed.

7.3.1 Are the balls touching?

One of the common questions you will be asked as a referee is "Are they touching". The player will want to know if the striker's ball is touching the ball they want to clear. The answer to that is critical, because a ball crush is not a fault if the balls were touching before the stroke. So, you will need to be careful to make the correct decision when answering that question. Your referee's kit should include something white, such as a strip of laminated paper, which you can put on the ground between the balls to provide visual contrast to make it easier to see whether or not there is a gap between the balls.

7.3.2 What if the player asks why it was a fault?

If a player asks the referee why he ruled a stroke as a fault, the Refereeing Regulations require the referee to explain the reasons for his ruling. If the referee was sufficiently confident that it was a double tap or ball crush, but he wasn't sure which of those it was, he could state that it was "a double tap or ball crush". If the players asked which of those it was, it would be acceptable for the referee to say that he didn't know which, but that he was confident that it was one of them. If pressed further, the referee could state the evidence on which he based his decision. That would be considered to be sufficient explanation.

7.4 Angled hoop shots

A double tap can occur even if only one ball is involved. The striker's ball can bounce off the hoop and be hit again by the mallet. Judging whether a double tap has occurred in an angled hoop shot attempt is usually more difficult if the ball goes through the hoop than if it jams in the hoop or bounces back off the hoop, so we will look at those two situations separately. Also, if the ball was touching one of the uprights before the stroke was played then, if a fault occurs it is likely to be a crush rather than a double tap, and we will look at that separately too.

The phrase "close angled hoop shot" is used to describe an attempt by a player to run a hoop with a ball close to the hoop but at an angle. The fact that the ball is at an angle to the hoop makes it more difficult to run than if the ball was straight in front. The fact that the ball was played from close to the hoop makes it likely that, if the ball does not run the hoop cleanly, the mallet will catch up with it, or the ball will bounce back onto the mallet.

7.4.1 Double taps for an angled hoop shot where the ball runs the hoop

Close angled hoop shots where the ball goes through the hoop are probably the most difficult shots to judge correctly. The problem with close angled hoop shots is that there is no reliable after the event evidence. A double tap that occurs when a ball runs the hoop in a close angled hoop shot can be very hard to see, so the referee usually

must rely on circumstantial evidence to some extent, but that evidence will be what the referee observes as the shot is played.

7.4.1.1 Judging the double tap when the ball runs the hoop

The referee must decide the answers to these two questions as he watches the shot:

- (1) Did the ball pass through the hoop cleanly enough?
- (2) Was the follow through of the mallet big enough for it to have hit a ball in the jaws of the hoop (even if the ball was there only briefly)?

The referee may not see the subsequent contact between the mallet and ball, but he will be able to see that the ball hesitated in the hoop and that it emerged in a suspicious way, e.g. if the ball emerges from the hoop somewhat later than expected given when it was struck. Late emergence is not conclusive evidence of a double tap. Sometimes a ball will hesitate in the hoop briefly and then continue through as a result of the spin rather than because of a double tap. With experience, a referee can learn to tell the difference.

For judging close clearances, it is recommended that sound be disregarded altogether, but sound can be helpful when judging close angled hoop shots because the sound of a mallet hitting the hoop is different from the sound of a ball hitting the hoop. However, use sound with caution.

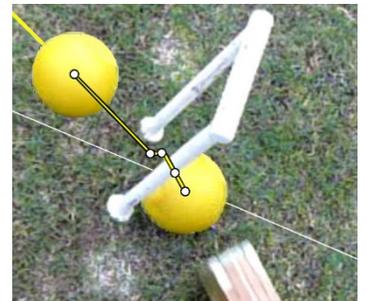
7.4.1.2 How does a double tap occur when the ball runs the hoop?

After a mallet has struck a ball, the ball will travel much faster than the mallet head and the mallet will not catch up with the ball unless the ball slows down for some reason. If a ball hits a hoop upright just once and then passes through the hoop, that won't slow the ball down enough. If the ball rattles in the hoop, e.g. hits the hoop three or more times, then the ball is likely to remain near the hoop for long enough for the mallet to catch up – providing the mallet head travelled far enough to reach the hoop. The hesitation in the hoop is usually noticeable. Double contact (far upright then near) sometimes slows the ball enough for the mallet to catch up. Such shots are the hardest to judge.

7.4.1.3 Do not use the angle at which the ball emerges from the hoop

It has been suggested that where the striker's ball has finished in relation to the far upright can be used as a guide. The reasoning is that a ball which runs a hoop at an angle will bounce off the far upright and finish through the hoop in the middle or else closer to the near upright than the far upright. In other words, a ball that finished on the same side as the far upright must have been knocked in that direction by a double tap. Nice as it would be to have a rule such as that, it just doesn't work.

Slow motion evidence shows that the ball can finish on the same side as the far upright for many reasons. Sometimes the ball doesn't hit an upright at all or just makes a glancing blow against that upright. Sometimes it hits both uprights, as in the diagram on the right, where it was the near upright and not the mallet which pushed the ball in its final direction. Examples of this type are not all that rare.



7.4.2 Double taps for an angled hoop shot where the ball fails to run the hoop

If a player attempts a close angled hoop shot and the ball finishes in the jaws of the hoop or bounces back off the hoop, the referee should only rule that a double tap has occurred if he actually sees the mallet make contact with the ball again. For such shots the action tends to occur more slowly than with close clearances and hoop shots where the ball runs the hoop, so actually seeing the double tap is less difficult – not easy, but less difficult. With practice, a referee will be able to make a correct decision most of the time.

7.4.3 Learning how to make good decisions for close angled hoop shots

Slow motion replays are generally not allowed for making decisions about double tap during a game. Maybe they will be one day but, in the meantime, they make a good teaching aid.

Inexperienced referees tend to imagine double taps when they are not there. Even if a referee is told that he is calling double taps that are not there, it's hard for him not to believe the evidence of his own eyes. The trouble is that the mind can play tricks and make you think you see what you expect to see. The best way to learn how to judge what double taps look like is to watch strokes live while filming them and record your decision. Then view the strokes played in slow motion. It's more interesting with a friend to help you, but a tripod will do.

Many cameras can film at 200 frames per second, which is fast enough. Higher frame rates are needed for close clearances but not for most close angled hoop shots.

7.5 Hoop and peg crushes

Firstly, we will look at Rule 11.2.6 which deals with a fault that can occur when a player strikes a ball when it lies in contact with a hoop upright or the peg. Then we will look at Rule 11.2.5 which deals with a fault that can occur when a player strikes a ball not initially in contact with but close to a hoop upright or the peg or another ball. The aspect of Rule 11.2.5 which deals with a ball crush has already been covered in Section B7.3, so we'll only look at hoop and peg crushes here.

7.5.1 Crush fault when the ball played is initially in contact with the hoop or peg

Rule 11.2.6 says that a fault is committed by a player who, during the striking period, "strikes a ball when it lies in contact with a hoop upright or the peg other than away therefrom". A peg crush is less common than a hoop crush and is dealt with essentially in the same way so, for the sake of simplicity, the description here is for a hoop crush.

7.5.1.1 Playing "away therefrom"

Some players find the term "away therefrom" a bit confusing", so here is an explanation. Figure 7.1 shows the striker's ball in contact with the left hoop upright. The mallet head is shown touching the ball and aligned with the big arrow labelled "Critical direction".

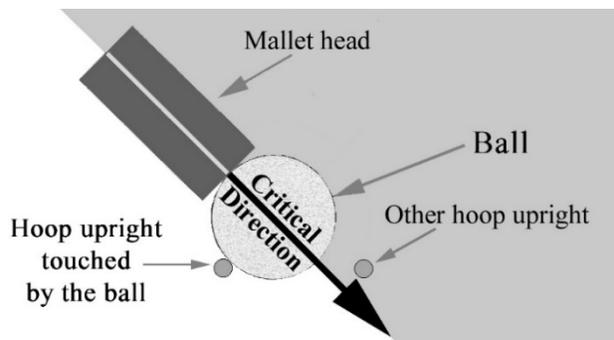


Figure 7.1. Playing "away therefrom" and the "Critical direction".

The shaded area in the diagram represents the *fault zone*. The unshaded area in the diagram represents the *safe zone*. A stroke played such that the mallet made contact

with the hoop in the shaded area would be a hoop crush fault. A stroke played such that the mallet made contact with the hoop in the unshaded area would not be a hoop crush.

The *critical direction* represents the boundary between the fault zone and the safe zone. So, when about to watch a stroke where the ball to be played is already in contact with a hoop, the referee needs to determine the critical direction.

The critical direction is parallel to the line which is a *tangent* to both the ball and the upright. The *tangent* is the line that passes between the ball and the upright which is at right angles to the line through the centres of those two objects.

Figures 7.2 and 7.3 illustrate strokes played away from the upright which would, therefore, not be hoop crushes. Care would still be needed to avoid a different type of fault, especially in the case of Figure 7.2, where a double tap could occur if the stroke was played too forcefully. Figure 7.4 illustrates a hoop crush fault because the striker's ball is simultaneously in contact with the mallet and the hoop, and the stroke is being played *into* the upright.

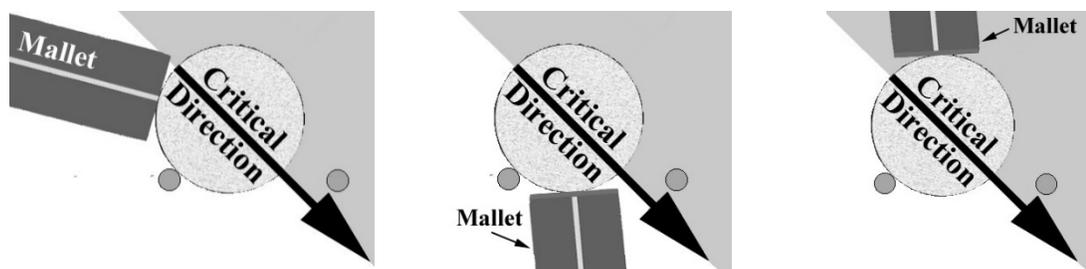


Figure 7.2 Not a hoop crush

Figure 7.3 Not a hoop crush

Figure 7.4 Hoop crush fault

7.5.1.2 How to judge whether a hoop crush has occurred under Rule 11.3.6

If the striker's ball is already in contact with a hoop before the stroke is played, use the following method to decide if a hoop crush fault has occurred.

- Before the shot is played, determine the critical direction.
- As the shot is played, decide if played in a direction away from the hoop.

Although you should observe the alignment of the mallet before the stroke is played, you also need to observe the actual line of swing as the stroke is played. Also, look to see if the ball deviates from the line of swing immediately after the stroke is played, because that would be a strong indication that the stroke was played into the upright, i.e. not away therefrom.

7.5.1.3 Is the ball touching the hoop?

In Section B7.3.1 it was said that a referee might be asked if the balls are touching before a clearance shot is played. Giving the correct answer to that question is critical. However, it's not so critical to know if a ball is touching a hoop. Here's why:

Suppose you thought the ball was not touching the hoop but was about 0.2 mm from the nearest upright. If you called it a crush fault because the ball was hit towards that upright, you will probably have made the correct decision because, even with a glancing blow, the ball probably travelled less than a millimetre before hitting the upright, so a crush would have occurred. Even if you were wrong in deciding that the ball was not touching, you would have made the correct decision about it being a fault.

If the ball and upright are very close but clearly not touching, however, a referee should be wary about calling a stroke a crush. Section B7.5.2.2 explains that a ball crush is not inevitable even if a ball is played from about a millimetre or two of an upright and in a direction that causes the ball to hit the upright. In that situation a referee would be wise not to call such a stroke a fault unless he thought a double tap had occurred.

7.5.2 Crush fault when the ball played is not initially in contact with the hoop or peg

A hoop or peg crush can occur even if the ball was not in contact with a hoop upright or the peg before the stroke was played and the crush would be a fault under Rule 11.2.5. Nevertheless, it is recommended that a referee does not call a stroke a fault if he thinks a hoop crush has occurred unless

- (1) The ball and upright were initially so close together that it was difficult to tell whether or not they were touching (e.g. less than one mm apart), **or**
- (2) The referee thinks another fault has occurred as well.

The reason for this is simple. If a stroke is played with a ball that was far enough from an upright to be able to tell that it was not touching the upright before the stroke, then a hoop crush is very unlikely to occur **without** a *double tap occurring as well*. In other words, if a referee thinks a hoop crush has occurred *by itself* in such a situation (i.e. balls clearly not touching initially and no double tap occurred), then the referee is almost certainly wrong.

Figures 7.5 and 7.6 show situations where even experienced referees sometimes wrongly rule the stroke to be a hoop crush.

7.5.2.1 A ball played directly towards a nearby upright

In this situation the ball is 4 mm from an upright and the stroke is aimed directly at that upright. It may seem that, with the ball so close to the upright, a crush is very likely, but the results given in Table 8.1 in Section B8 show that, even with a very powerful stroke, the mallet will not still be in contact with the ball when the ball hits the upright.

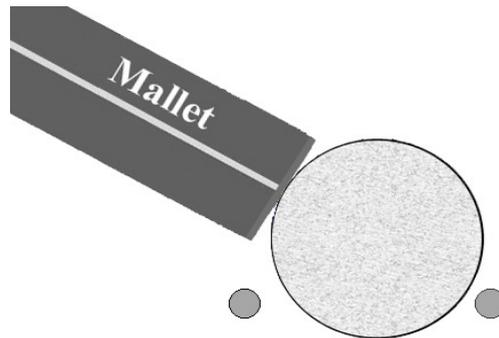


Figure 7.5 Ball aimed directly or almost directly at a nearby upright

The stroke is very likely to be a double tap and, if it is, the double tap will probably be quite easy to see. However, if you don't see a double tap but call it a fault anyway, it's very likely that you will have made a wrong decision

If the ball had started closer to the hoop, e.g. 2 mm, then a crush would be possible, but even if a crush did occur, a double tap would almost inevitably also occur in the same stroke. A double tap in such a situation would be very easy to see. The point is that it is so unlikely that a crush would occur in such a situation without a double tap occurring as well, that a referee would be unwise to call it a crush if they did not see the double tap

7.5.2.2 A ball that hits a nearby upright in a glancing blow

In this situation the ball is much closer to the upright than in the previous example. It is only 1.5 mm from it. In situations like this the player's intention is usually for the ball not to hit the near upright at all, but the player's intention is irrelevant. What is relevant is that, if the ball hits the near upright, it will be a glancing blow. That means that the ball will travel much more than 1.5 mm before it hits the upright. In this situation the ball will have travelled about five millimetres before hitting the upright. Once again, the results given in Table 8.1 in Section B8 show that by time the ball hits the upright it will have separated from the mallet and there will be no hoop crush, even with a forceful stroke. A double tap might result if the ball bounced back off the far upright, but that would be quite easy to see. A player might be able to avoid a double tap with a very soft stroke. A referee who correctly judged that there was no double tap but called the it a fault anyway because he thought a hoop crush had occurred would have made a mistake.

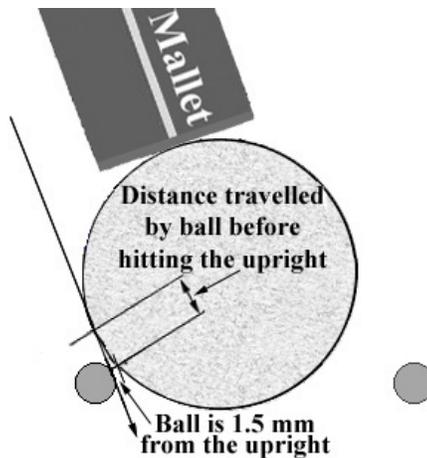


Figure 7.6 Ball hitting a nearby upright in a glancing blow

7.6 Summary

7.6.1 Double taps and crushes tend to occur in two situations: clearances and close angled hoop shots. The method of judging faults differs between these two situations

7.6.2 The best way to judge whether a double tap has occurred in a clearance stroke is to use the **Angle of Separation** and **Distance Ratio** method (ASDR). This means using the following two factors:

1. Angle of separation: the final resting angle between the balls, and
2. Distance ratio: the relative distances they travelled.

A simple and reliable version of the ASDR is to rule the stroke as a double tap if

- the other ball travelled less than five times as far as the striker's ball, **and** the angle of separation was at least 45 degrees but less than 60 degrees.

or

- the other ball travelled less than eight times as far as the striker's ball, **and** the angle of separation was less than 45 degrees.

7.6.3 Unless the initial ball separation was at least about 100 mm (4 inches), things happen so quickly in a double tap that sight and sound should not be relied upon for deciding if a fault occurred. Human auditory and visual acuity is simply not good enough.

Some referees use the initial separation of the balls and angle of swing to make double tap decisions for clearances. There is clear evidence that this is much less reliable than the ASDR method. A referee's job is to decide whether a fault **has** occurred, **not** to decide whether the stroke was played in a way that a fault was **likely to occur**.

7.6.4 Sometimes the evidence of the ASDR method should be ignored. In particular if

- the striker's ball is airborne as it hits the other ball, or.
- the initial separation was large enough for the striker's ball to pick up a considerable amount of roll, or.
- one or both of the balls hits another object and it is not possible to estimate where the balls would have finished if they had not hit the object, or
- if the balls were in contact prior to the stroke.

In such situations, there may be an alternative explanation (other than a double tap) for why the striker's ball travelled so far (relative to the other ball) and why the angle between their paths was so narrow.

7.6.5 The ASDR method works well for clearances with initial ball separations up to about 100 mm and down to as small as about 2 mm. The ASDR method is simple because, within this range, the method works without the need to take into account any of the following: the initial separation, the angle of swing, nor how much force or follow through was used in the stroke.

For larger initial ball separations, the striker's ball might pick up enough roll before hitting the other ball to affect the angle of separation and the distance ratio. In such situations, however, it should be possible for the referee to make a decision based on what he sees and hears as the stroke is played. The problems of human and visual acuity mentioned above don't apply here where there is more time between collisions.

For smaller initial ball separations (less than 2 mm), the possibility of a ball crush may be a problem. Ball crushes can sometimes occur even for angles of separation greater than 60 degrees. For such situations, an angle of separation less than 80 degrees is usually a good indicator that a ball crush occurred.

7.6.6 For close angled hoop shots where the ball runs the hoop, it can be very difficult to see the actual double tap if one occurs, so you usually need to rely on circumstantial evidence – typically the ball emerging from the hoop somewhat later than expected given when it was struck. When the ball runs the hoop, a double tap will have both these features:

1. The ball will hesitate in the hoop due to bouncing between the uprights, and
2. The mallet will have enough follow-through to take it into the jaws of the hoop.

A stroke with only one of those features was probably not a double tap (or crush). A stroke with both features may have been a double tap, but not necessarily, even if the ball emerged from the hoop late.

Just like a player, a referee can improve with practice. Using video in practice is recommended because, if you don't check whether you are usually making correct decisions, you will continue to make the same mistakes.

7.6.7 The angle at which the ball emerges from the hoop is not a useful guide to whether a double tap occurred.

- 7.6.8** For close angled hoop shots where the ball fails to run the hoop, there is no useful circumstantial evidence available during or after the stroke. The referee simply must rely on actually seeing the double tap. Fortunately, things usually happen slowly enough in these situations for that to be possible. The mind can play tricks and make you think you saw what you expected to see, so watch carefully.
- 7.6.9** If a ball is played when it was initially in contact with a hoop upright or the peg, use the following method for deciding whether a crush occurred.
1. Before the shot is played, determine the critical direction so that you know what “*playing away*” from the upright (or peg) means for the stroke to be played.
 2. As the shot is played, decide if it was played in away from the upright (or peg).

Definitions of “*critical direction*”, and “*away from*” are given in Section B7.5.1.1.

If a ball might be touching the upright before the stroke is played, but you are not sure, then treat it as if it is touching the hoop (or peg) for the purposes of making a decision about whether a crush occurred. If it is that close, it doesn’t really matter.

- 7.6.10** If a stroke is played with a ball that was far enough from an upright to be able to tell that it was not touching the upright before the stroke, a referee should not call a fault even if he thinks that a ball crush has occurred unless he **also** thinks it was a fault for another reason. In such a situation, a ball crush is very unlikely to occur without a double tap occurring in the same stroke.

B8 – DOUBLE TAPS AND CRUSHES – TECHNICAL DETAILS

Those who are only interested in how to judge double taps and crushes can skip this section. This section contains technical details including evidence supporting the recommendations in Section B7 for how to judge double taps and crushes.

8.1 Judging double taps for close clearances

8.1.1 Evidence that the ASDR method works very well

When a double tap occurs, there may be only one or two hundredth of a second between the two taps, so it is no wonder that the event cannot be seen with the naked eye. However, the double tap can be seen with the aid of a slow-motion camera. Over 275 clearance shots were videoed in slow-motion. The final resting angle between the balls was measured from where they collided (called the angle of separation) and the distances the balls travelled were measured for each shot. A wide variety of clearance shots were played:

- Initial ball separations ranged from 1 mm to 100 mm.
- For most shots the angle of swing ranged from 0 to just over 30 degrees, but very small initial separations and larger angles of swing were also used: up to 75 degrees.
- Shots ranged in power from soft to very hard and some were played with minimal follow through and some with full follow through.
- Shots were played by a variety of players. Mostly players used their own mallet, and these ranged from light to heavy.

About 55% of the shots were faults. The shots videoed were not played in game situations. The high fault rate occurred because players were often instructed to play the shot in a way that they wouldn't have in a game, e.g. with a small angle of swing even though the initial ball separation was small, or with considerable force or follow through. In games, players would have been much more cautious in order to avoid double taps.

Figure 8.1 shows where the striker's ball finished relative to the other ball for each shot. The crosses represent shots where the slow-motion video showed that a double tap had occurred. The dots represent clean shots. There is good separation between the double taps and clean shots, demonstrating that the final angle of separation and distance ratio together make a very good indicator of whether a double tap occurred.

The angle of separation is defined in Section B7.2. Basically, it is the angle between the finishing positions of the balls measured from where they collided.

The points on the vertical axis (near the left of the diagram) all represent shots where the striker's ball travelled in the same direction as the other ball. For such shots, double taps occurred except where the striker's ball travelled only a very small fraction as far as the other ball. The other points in the diagram represent shots where the two balls went in different directions. It was very rarely a double tap for shots with an angle of separation greater than 60 degrees. For smaller angles of separation double taps occurred except where the striker's ball did not travel far relative to the other ball.

The very clear pattern in the above diagram exists even though the shots included a wide range of initial separations, angles of swing, and amounts of power and follow through. It suggests that a good decision rule can be constructed for judging double taps for clearance shots using just the final angle of separation and distance ratio.

Note that data where the initial separation between the balls was less than 2 mm are not included in the Figure 8.1. For a discussion of strokes with such small initial ball separations, see Section B8.1.3.

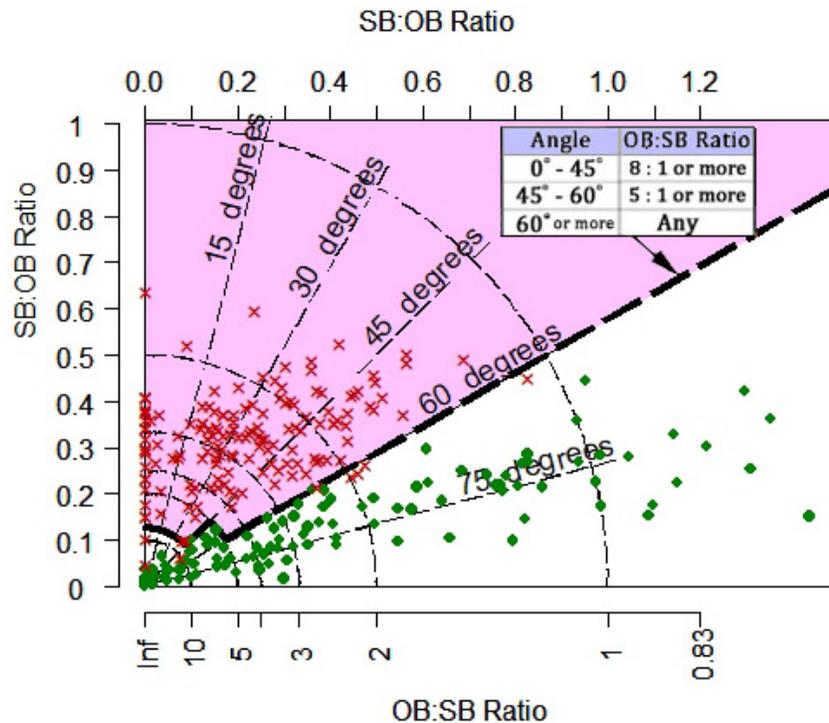


Figure 8.1 Finishing position of the striker's ball in a clearance shot
 (x = Double tap; ● = Not double tap)

The thick dashed line represents the decision rule given in Section B7.2.1:

Rule the stroke as a fault if

- the other ball travelled less than five times as far as the striker's ball, **and** the angle of separation was at least 45 degrees but less than 60 degrees.
- or**
- the other ball travelled less than eight times as far as the striker's ball, **and** the angle of separation was less than 45 degrees.

Otherwise rule the stroke as clean unless it was a fault for a different reason.

8.1.2 Knowing the angle of separation and distance ratio is usually enough

The angle of separation and distances travelled by the balls were recorded for every stroke videoed. At first, other factors were also recorded but it soon became apparent that these factors were generally not needed when judging faults. These factors were:

- the initial separation between balls*,
- the angle of swing, and
- the amount of follow through (classified as *Modest* or *Full*).

After about the first 90 strokes, the amount of follow through was only recorded occasionally, and the initial separation and angle of swing were only recorded for about 80% of the strokes.

* Some allowance is needed for initial ball separations less than 2 mm.
 See Section B8.1.3.

8.1.3 Small initial ball separation

The ASDR method recommended in Sections B7.2 and B7.3 for judging double taps or ball crushes says not to call a double tap or ball crush fault on any stroke where the angle of separation was 60 degrees or more regardless of the initial ball separation, except when the initial ball separation is less than 2 mm. Figure 8.2 shows that for strokes with initial ball separations as small as one millimeter, quite a few faults occurred where the angle of separation was well over 60 degrees. That is why the recommendation in Section B7.3 is that for initial separations less than 2 mm, the upper critical angle of 60 degrees be replaced with 80 degrees).

Figure 8.2 also suggests that there might be a slight improvement in the accuracy of decisions using the ASDR method if the recommendation:

For initial ball separations of at least 2 mm, rule a stroke as not a double tap (or ball crush) if angle of separation was 60 degrees or more.

was replaced with

For initial ball separations of at between 2 mm and 38 mm, rule a stroke as not a double tap (or ball crush) if angle of separation was 64 degrees or more.

For initial ball separations of over 38 mm, rule a stroke as not a double tap (or ball crush) if angle of separation was 60 degrees or more.

This modification was not recommended in in Sections B7 because it was thought that the possible small improvement in accuracy was not worth the added complication. For a method of making decisions to be useful, it needs not only to be accurate, but also to be reasonably easy to apply.

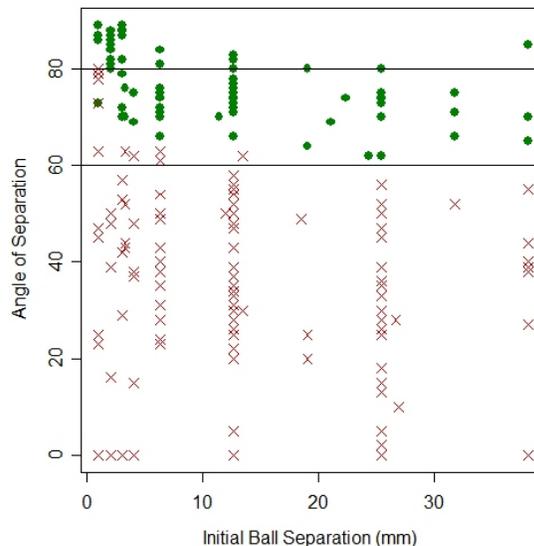


Figure 8.2 Angle of separation plotted against initial ball separation for strokes with OB:SB distance ratio less than 5:1
 (x = Double tap or crush; ● = Not double tap or crush)

8.1.4 Comparison of ASDR with other methods

8.1.4.1 Comparison with observer opinions

For about half of the shots recorded in slow-motion shown in Figure 8.1 there was no one else present except the striker (who also had the role of camera operator). For the other half there were observers who were asked what their ruling would

be on the stroke. Those observers gave the wrong ruling about 15% of the time. This is considerably more than the 4% error rate for the ASDR method for the same strokes.

8.1.4.2 Comparison with a different objective method.

The ASDR method not only performed better than the subjective opinions of observers, it also performed better than objective methods based on observations before or as the stroke was played. The best of those methods had a 12% error rate (on the same strokes where the ASDR method had a 4% error rate) and was very complicated.

8.2 How does a crush occur?

The faults described in Rules 11.2.6 and 11.2.7 are colloquially known as crushes, but the word “crush” does not appear in those rules. Rule 11.2.6 says, “causes a ball, while still in contact with the mallet, to touch a hoop, the peg or ... another ball”. If the mallet separates from the striker’s ball and re-touches it, then Rule 11.2.6 doesn’t apply. That would be a fault but not a crush. It would be a fault under Rule 11.2.4 – which is colloquially known as a double tap. For it to be a crush, the ball must **still** be in contact with the mallet. In other words, to be a fault under Rule 11.2.6, the mallet must have remained in contact with the striker’s ball for the entire time between initial contact with that ball and when the striker’s ball hit a hoop, peg or another ball. How long does a mallet remain in contact with a ball during a stroke and how far does the striker’s ball travel during that time?

Professor Stan Hall addressed that question, and in 1994 demonstrated that a ball remains in contact with a mallet end-face for a very short distance and period of time, irrespective of the way the stroke is played. Table 8.1 below is a condensed chart of Professor Hall’s findings derived from the Oxford Croquet web site, produced by Owen Edwards in 2007 and further modified by Gordon Matthews in 2014.

The distance the OB travelled in metres	Average contact time between balls in thousands of a second	Initial velocity of mallet metres/second	Distance SB travels, in mms while still in contact with mallet
24 (hard shot)	0.89	7.3	3.7
12	0.94	5.2	3.0
2.7	1.03	2.2	1.6
0.6 (soft shot)	1.32	1.15	1.19

Table 8.1. Contact times and distances for a single ball stroke.
 (Results shown here are for Dawson Mark II balls).

The first thing to note is that, regardless of the way the stroke is played, the ball remains in contact with the mallet for only about a thousandth of a second. That means that if you think you can see a crush, you are fooling yourself. A referee can only infer that a crush has occurred in a game from circumstantial evidence.

For a hoop crush the thinking might be:

The ball hit the hoop.

The ball was very close to the hoop before the stroke was played.

Therefore, the mallet must still have been in contact with the ball when the ball hit the hoop.

To apply this sort of logic soundly, we must know

1. how far a ball travels in contact with a ball during a stroke, and
2. how far the ball had to travel before it hit the hoop.

Table 8.1 provides the answer to the first question: less than 2 mm for a soft to medium soft shot and less than 4mm for a powerful shot. We look at the second question in Section B8.3.

8.3 How far does a ball travel before hitting another object?

How far a ball must travel before it hits another object depends on how far away the object is and the direction the ball is hit. It will also depend on the shape of the object. The objects we are interested in from the point of view of crush faults all have circular horizontal cross-sections. Let's look firstly at the situation where the striker's ball is hit towards another ball.

8.3.1 How far does a ball travel before hitting another ball?

Suppose that the striker's ball is separated from another ball by a distance s , and that a stroke is played with an angles of swing A , as shown in Figure 8.3.

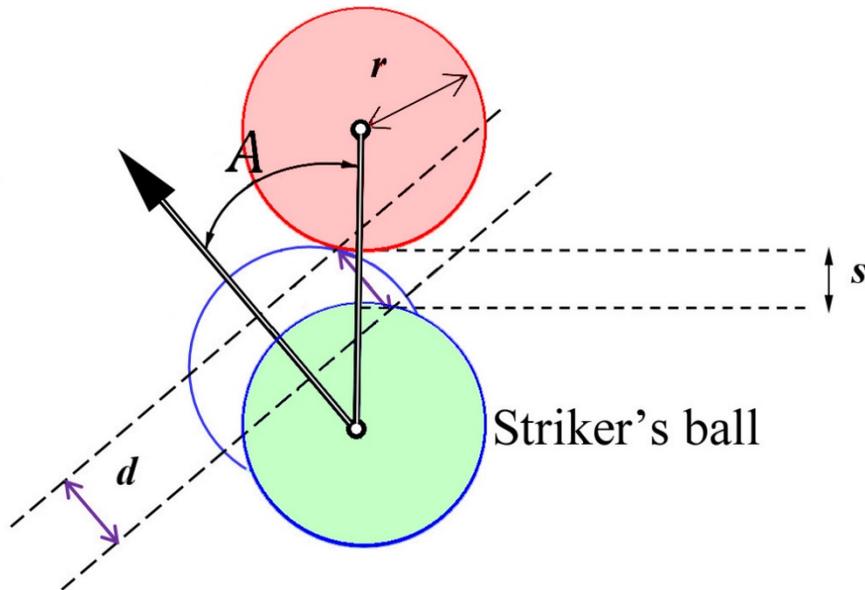


Figure 8.3 Ball struck with an angle of swing A at a ball with initial separation s .

The distance, d , that the striker's ball will travel before hitting the other ball is given by the equation

$$d = (2r + s) \cos A - \sqrt{\{(2r + s) \cos A\}^2 - s(4r + s)}, \text{ where}$$

r is the ball radius. The standard radius of a croquet ball is $1^{13}/16$ inches, or 46.0375 mm

If d_0 denotes the distance that the mallet remains in contact with a ball during a stroke, then a ball crush will occur if d is less than or equal to d_0 . So, the maximum angle of swing for which a ball crush will occur can be obtained by solving the equation $d = d_0$.

$$A_{\max} = \cos^{-1} \left(\sqrt{\frac{s(4r + s) + d_0^2}{2(2r + s)d_0}} \right)$$

Figure 8.4 shows how far the striker's ball will travel, depending on the angle of swing, before hitting the other ball in a clearance stroke. The solid curved lines represent (from bottom to top) initial ball separations ranging from 1 mm to 5 mm.

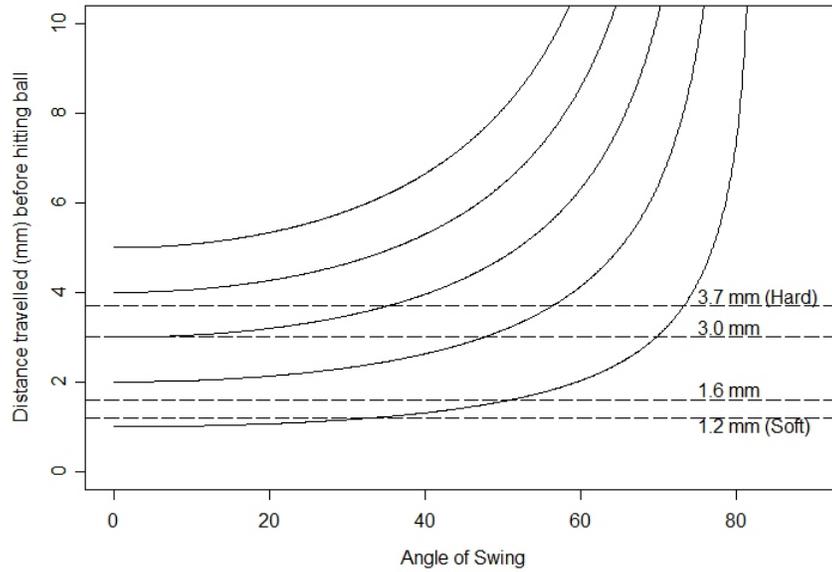


Figure 8.4 Ball struck with an angle of swing A at a ball with initial separation s .

Figure 8.4 shows that the distance the ball must travel before hitting the other ball increases only slowly with increasing angle of swing for small angles of swing, but for large angles of swing, the distance the striker's ball must travel increases dramatically with increasing angle of swing.

Figure 8.5 shows the critical angle of swing for a given initial ball separation and mallet head speed. If the angle of swing was greater than that, a ball crush would not occur. If it was less than that, a ball crush would occur.

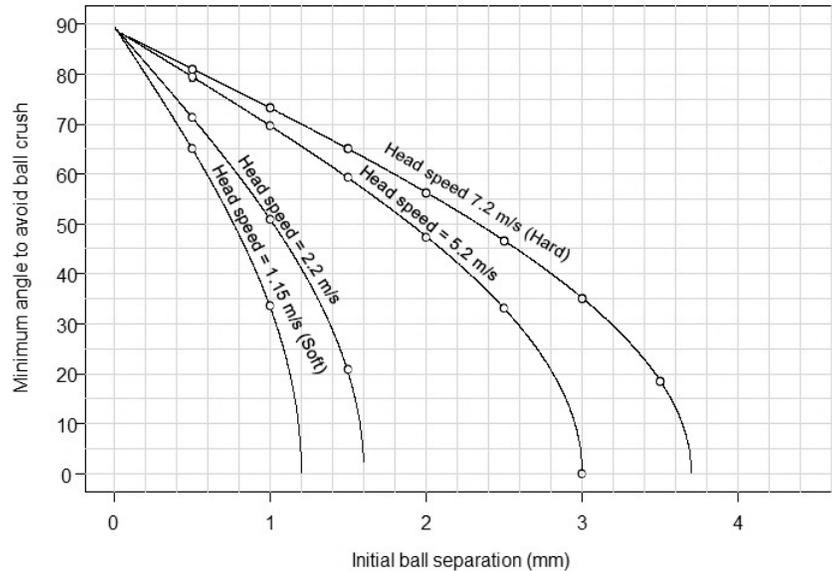


Figure 8.5 Critical angle of swing for a given initial ball separation

The small open circles in Figure 8.5 show the critical angles of swing for a ball crush for initial ball separations from 0.5 mm to 4.0 mm in steps of 0.5mm. These values are also shown in Table 8.2. This information could be used by a referee for making decisions about ball crushes, but the method recommended in Section B7.3 is much simpler and probably at least as reliable.

Angle of Swing (degrees)		Mallet head speed			
		Soft 1.2 m/s	2.2 m/s	5.2 m/s	Hard 7.3 m/s
In contact for:		1.2 mm	1.6 mm	3.0 mm	3.7 mm
Initial Ball Separation	0.5 mm	65	71	79	81
	1.0 mm	33	51	70	73
	1.5 mm	-	20	59	65
	2.0 mm	-	-	48	56
	2.5 mm	-	-	33	47
	3.0 mm	-	-	0	35
	3.5 mm	-	-	-	19
	4.0 mm	-	-	-	-

Table 8.2 Critical angles of swing for a ball crush

8.3.2 How far does a ball travel before hitting a hoop upright?

The equation for d in this case is very similar to the one above except that, instead of having a single radius r , there is a different radius for the ball and upright. Let

r_1 denote the radius of a ball ($r_1 = 1^{13}/16$ inches, or 46.0375 mm), and
 r_2 denote the radius of an upright ($r_2 = 5/16$ inches, or 7.9375 mm, typically).

Then,

$$d = (r_1 + r_2 + s) \cos A - \sqrt{\{(r_1 + r_2 + s) \cos A\}^2 - s(2(r_1 + r_2) + s)}$$

If the ball is aimed directly at the upright, then $A = 0$, and this equation boils down to the obvious answer of $d = s$.

Figure 8.6 shows how far the striker's ball will travel, depending on the angle of swing, before hitting a hoop upright. The solid curved lines represent (from bottom to top) initial ball separations ranging from 1 mm to 5 mm. Figure 8.6 is very similar to Figure 8.4. Thus, the fact that a hoop upright has a much smaller diameter than a ball doesn't make much difference to the distance travelled as a function of angle of swing. that's especially true for small angles of swing. In Figure 8.6 (hitting an upright), the dramatic upward curve occurs for large angles of swing occurs slightly earlier than in Figure 8.4 (hitting another ball).

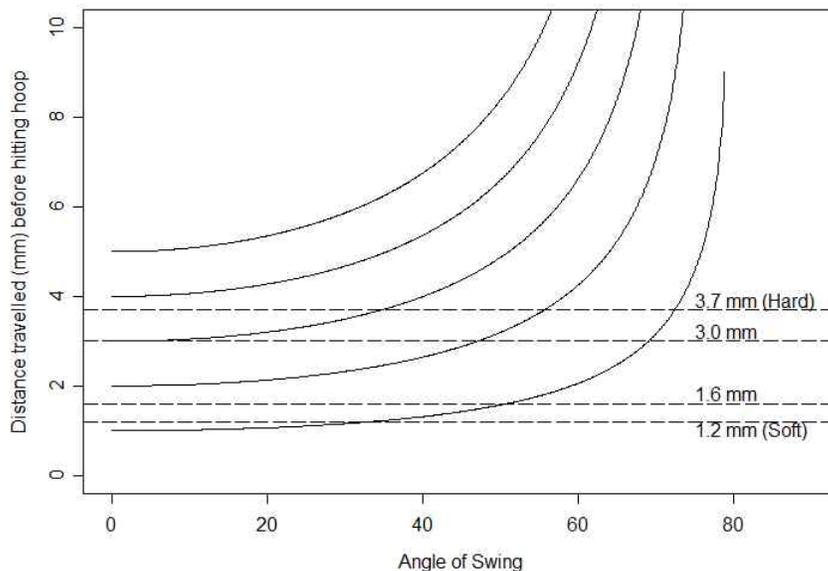


Figure 8.6 Ball struck with an angle of swing A at a ball with initial separation s .

For the example given in Section B7.5.2.2, $s = 1.5$ mm, and $A = 70^\circ$, so $d = 5.0$ mm

8.4 Suggested additional reading and viewing

- 8.4.1 “When a mallet strikes a Ball” by Prof Stan Hall, ACA Gazette 1994 (Vol.44 No1 Page 12) which is a quick summary of the full article at <http://www.oxfordcroquet.com/tech/hall/index.asp>
- 8.4.2 Video material produced by Bob Kroeger
Bob Kroeger has uploaded numerous interesting croquet videos to YouTube.
- 8.4.3 Video material produced by John van der Touw
Video of 32 strokes shown in slow motion. Shots 13 – 29 are strokes played very near a hoop where some are clean and some are double taps but **none** are crushes.
<https://www.youtube.com/watch?v=TslWklmvU00>

B9 – MAINTAINING CONTACT - PUSHES AND PULLS

A "Push" or a "Pull" is a fault under GC Rule 11.2.5, i.e. where a player *maintains contact between the mallet and a ball*.

Figure 9.1 demonstrates how a "push" or a "pull" is committed around a hoop when **special care is required** by the striker because of the close proximity of a hoop or another ball, or when a ball that has run a hoop finishes in a position close to the hoop such that the striker cannot play a "normal" stroke, especially if the aim is to get the striker's ball to a favourable position on the next hoop.

When a "push" occurs the striker's stance is usually behind the SB on the "playing side" of the hoop and with a "pull" the striker's stance is usually in front of the SB on the "non-playing side" of the hoop, with the striker playing the ball backwards through the striker's legs. The mechanics of both faults are the same.

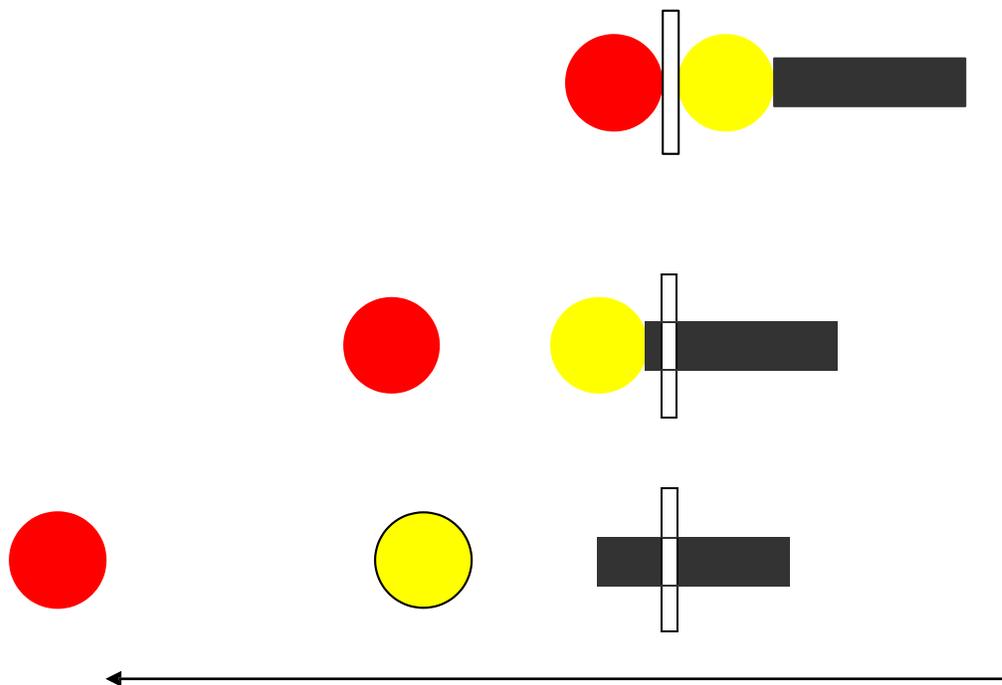


Figure 9.1 A "Push" Stroke Played Through the Hoop

In Figure 9.1 the Red and Yellow balls are initially stationary and about 12 mm apart. Red is almost clear of the hoop, Yellow is attempting to run the hoop.

Yellow is struck by the mallet and proceeds partly through the hoop where it hits Red which in turn moves forward. Yellow now loses most of its forward momentum and as the forward momentum of the mallet continues on, with the follow through, it maintains contact with the Yellow for a short time and distance resulting in a "push" or a "pull".

Yellow slowly staggers through the hoop and eventually loses contact with the mallet and then travels further that it would have, had a "push" or "pull" not occurred.

B10 – HAMPERED STROKE - BEVEL EDGE

The term “bevel edge” fault and “hampered stroke” are commonly used terms, neither of which appears in the rules. The terms describe the fault in the GC Rule 11.2.3 which reads: “*strikes a ball with any part of the mallet other than an end face of the head either deliberately or accidentally in a stroke which **requires special care** because of the proximity of a hoop or the peg or another ball;*”

GC Rule 11.2.3 does not apply to a stroke played in the open court unless special care is required because the proximity of another ball. Where special care was required, it does not matter whether the resulting stroke was deliberate or accidental.

If the ball departs the mallet at an angle to the line of the striker’s swing the referee can be certain that the ball has not been struck with the end face of the mallet but rather the “bevel edge”.

When watching for a possible “bevel edge” fault the referee should first ask the striker how they intend to play the stroke (e.g. a hard or soft stroke, through the hoop or across the face of the hoop) and then take up a suitable and safe position to watch the stroke.

Figures 10.1 & 10.3 demonstrate top or bottom “bevel edge” faults when the striker decided to play the stroke through the hoop.

Figure 10.2 demonstrates a side “bevel edge” fault.

Figure 10.4 shows another top “bevel edge” fault where the striker is attempting to play a hampered hammer stroke.

In all four instances the referee should mark the ball (using a ball marking technique described in Section B3) and stand in the most appropriate position. Sometimes it’s difficult to find a position which gives a good view of the stroke that doesn’t disturb the striker. Try to be as considerate as possible to the striker but remember that you cannot make a good decision if you don’t have a good view of the stroke. In Figures 10.1, 10.3 & 10.4 watch from the side, about 12 inches to 18 inches from ground level and as close as is reasonably safe. In Figure 10.2 watch from directly behind the striker, again in a close but safe position. In all scenarios the referee should take as much care as possible not to distract the striker.

In Figures 10.1, 10.3 & 10.4 the chance of a “push” or a “pull” fault is also increased.

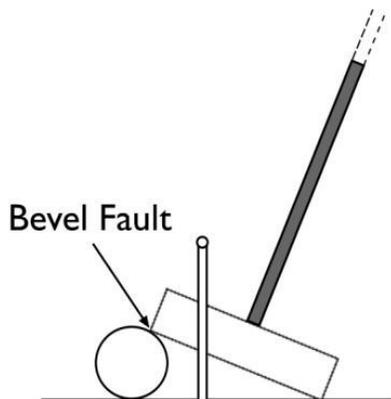


Figure 10.1

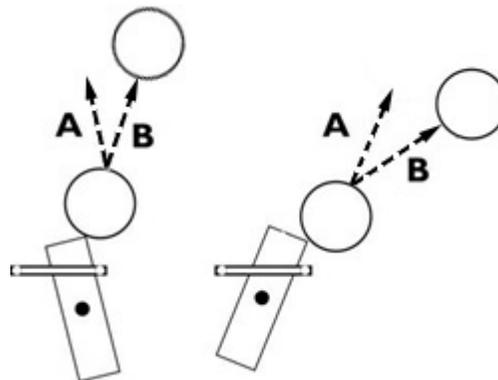


Figure 10.2

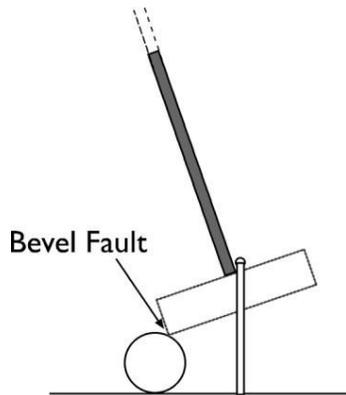


Figure 10.3

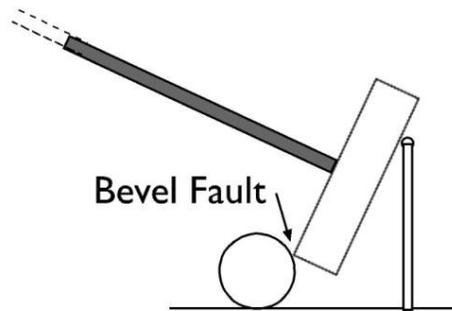


Figure 10.4

If the striker decides to play the stroke as in Figure 10.2 the referee, by standing directly behind the striker, can readily detect a “bevel edge” fault. If the ball departs along line “B” and not line “A” (the LOS) the referee can be sure the “bevel edge” has contacted the ball. The validity of the stroke in this situation cannot be accurately judged if the stroke is watched from a side-on position. The referee only needs to rely on the direction (A compared to B) of the SB departure as the indicator of a “bevel edge” fault.

In Figures 10.1, 10.3 & 10.4 the referee should consider calling a second referee as a combination of one or more faults may occur. The prime referee should ask the second referee to watch for a specific fault and the prime referee will watch for the others. The second referee is to offer confidential advice to the prime referee before any decision is announced by the **prime referee**.

Referees need never be intimidated or fear scorn by calling a second referee to assist, as this is becoming a practice at international events where calling a fault in these high-level games can be of much significance.

B11 – OFFSIDE BALLS

GC Rule 8 formerly known as “The Halfway Rule” is commonly misunderstood by players and referees.

GC Rule 8.2.1 *Subject to Rule 8.3, a ball is an offside ball if all of it is clearly beyond the halfway line for the hoop in order at the end of a turn in which a point was scored.*

A ball is clearly beyond a halfway line if all of it is beyond the line. The halfway lines are imaginary lines of zero thickness. They are not usually drawn on the court, but their positions can be indicated by pegs known as “halfway marks” just outside the court. See GC Rule 4.2.5. Also see Rule 8.1 which defines the positions of the halfway lines, and sections B11.4.3 and B11.4.5 which say what happens if halfway markers or the centre peg are misplaced.

GC Rule 8.3 *A ball beyond the halfway line (a “specified ball”) is not an offside ball if it reached its final position as a result of:*

The rule then describes four situations when a ball would not be offside even if it was beyond the halfway line. These situations are explained below.

11.1 Exemptions from being offside (Rule 8.3)

11.1.1 “*the stroke just played*” (Rule 8.3.1)

In each of the following examples the Blue ball is **not** offside because it reached its final position “at the end of a turn in which a point was scored” as a result of the stroke just played.

Example 1.1 The Blue ball ran Hoop 1 and it came to rest beyond the halfway line between Hoops 1 & 2.

Example 1.2 The black ball ran Hoop 1 and after going beyond the halfway line between Hoops 1 & 2, it made contact with and moved the stationary blue ball.

Example 1.3 The Black ball was in the jaws of Hoop 7 and resting against an upright. The owner of the Blue ball tried to knock the Black ball but missed and hit a hoop upright without contacting the Black ball. The impact on the upright knocked the Black ball through the hoop. The Blue ball came to rest beyond the halfway line between Hoops 7 & 8.

Note that in this example it was not necessary for the Blue ball to have made contact with the Black ball (or any other ball) for it to qualify as having reached its final position as a result of the stroke just played.

11.1.2 “*a stroke played ... by the opposing side*” (Rule 8.3.2)

Note that a fault is a stroke, and so is a wrong ball play. In each of the following examples the Blue ball is not offside because it reached its final position “at the end of a turn in which a point was scored” as a result of a stroke played by the opposing side.

Example 2.1 The owner of Red played his ball and hit the Black ball away from Hoop 9 which in turn knocked the Blue ball past the halfway line between Hoop 9 & 10. The Black ball was played back towards Hoop 9 which was run by the Yellow ball in the next turn. The Blue ball has reached its position as a result of a stroke played by the owner of the Red ball.

Example 2.2 The owner of Red committed a fault in playing his ball which hit the Black. In the stroke, the Black ball knocked the Blue ball past the halfway line between Hoops 9 & 10. The non-offenders chose to leave balls where they were, and Black attempted to clear the Yellow ball but failed and the Yellow ball scored Hoop 9 in the next turn. The Blue ball has reached its position as a result of a stroke played by the owner of the Red ball even though a fault was committed in that stroke.

Example 2.3 The owner of Yellow played the Blue ball which finished past the halfway line between Hoop 9 & 10. The wrong ball play was not noticed until after the owner of Red played his ball in the next stroke. The non-offending side chose to leave the balls where they were and to play the Black ball. The hoop was scored by Black in that stroke. The Blue ball has reached its position as a result of a stroke played by the owner of the Yellow ball even though that stroke had been played as a wrong ball.

11.1.3 “contact with an opponent's ball ...” (Rule 8.3.3)

In the first four examples below, the Blue ball is not offside because it reached its final position “at the end of a turn in which a point was scored” as a result of a contact with an opponent's ball. In the fifth and sixth examples the blue ball is offside.

Example 3.1 The Blue ball came to rest beyond the halfway line between Hoops 3 & 4 after having made contact with the Yellow ball. The Red ball was then played and ran Hoop 3.

Example 3.2 The Black ball was played onto the Red ball which in turn contacted the Blue ball and knocked it past the halfway line between Hoops 2 & 3, the Yellow ball then ran Hoop 2.

Example 3.3 The Blue ball came to rest beyond the halfway line between Hoops 3 & 4 after having first made contact with the Yellow ball and then with the Black ball. The Red ball was then played and ran Hoop 3. The Blue ball is not offside even though the last ball the Blue ball touched before coming to rest was not an opponent's ball. Rule 8.3.3 says that the offside exemption applies for “contact with an opponent ball at any time in the last turn in which the specified ball moved”.

Example 3.4 The owner of Blue committed a fault in playing his ball. The Blue ball came to rest beyond the halfway line between Hoops 3 & 4 after having made contact with the Yellow ball. The non-offending side chose to leave the balls where they stopped. The Red ball was then played and ran Hoop 3. Blue ball is not offside even though the last turn in which the Blue ball moved was one in which its owner committed a fault.

Example 3.5 The Yellow ball was played and knocked the Blue ball beyond the halfway line between Hoops 3 & 4. The owner of Blue declared his stroke as played under Rule 6.3.3(c), and the red ball was then played and ran the hoop. The Blue ball is offside even though it was not moved in any turns after the turn in which it touched the Yellow ball. That's because Official Ruling 8.3 (October 2018) says, that “The exemptions under Rule 8.3 do not apply to a ball whose owner has declared a stroke to have been played with it since it reached its final position”.

Example 3.6 The Blue ball was in contact with the Yellow ball when it was played in a stroke where it came to rest beyond the halfway line between Hoops 1 and 2. The Yellow ball did not move or shake in that stroke. The Red ball was then played and ran Hoop 1. The Blue ball is offside because Rule 8.3.3 says that it is not offside “provided that, if the only contact with an opponent ball was one from which the specified ball started in contact, the opponent ball was caused to move or shake when the specified ball moved”.

11.1.4 “being directed to a penalty area” (Rule 8.3.4)

In the first example the Blue ball is not offside because it reached its final position “at the end of a turn in which a point was scored” as a result of being directed to a penalty area. In the second example the blue ball is offside.

Example 4.1 The Red ball was directly in front of Hoop 1. The owner of the Blue ball missed a clearing shot on the Red ball and came to rest beyond the halfway line between Hoops 1 and 2. The Red ball then ran Hoop 1. The Blue ball was offside was directed to Penalty Area E. The owner of the Black ball then played a very long shot from near Hoop1 and ran Hoop 2. The owner of the Red ball then said that the Blue ball is offside because it is past the halfway line between Hoops 2 & 3 and wants to direct the Blue ball to Penalty Area D. The Blue ball is not offside because it is in its position as a result of being directed to a penalty area and is to be next played from Penalty Area E.

This is true whether or not the Blue ball had been physically moved to the Penalty Area E before Hoop 2 was run. A ball directed to be played from a penalty area becomes an outside agency and cannot become an offside ball again until it is next played.

Example 4.2 The Red ball was directly in front of Hoop 1. The owner of the Blue ball missed a clearing shot on the Red ball and came to rest beyond the halfway line between Hoops 1 and 2 near the eastern boundary. The Red ball then ran Hoop 1. Although the Blue ball was offside, the opponent decided to leave the Blue ball where it came to rest. The owner of the Black ball then played a very long shot from near Hoop1 and ran Hoop 2. The owner of the Red ball then said that the Blue ball is offside because it is past the halfway line between Hoops 2 & 3 and wants to direct the Blue ball to Penalty Area D. The Blue ball is offside because it was not directed to a penalty area (nor is it exempt for any other reason) and can be directed to be next played from Penalty Area D.

11.2 Direction to a penalty area (Rule 8.4)

GC Rule 8.4 also needs to be well understood by golf croquet referees.

At the end of a turn in which a point was scored a side has the right to direct an opponent’s ball to played next from a penalty area. They retain that right until the first of the following occurs

- their side has played a stroke, or
- they have given a direction or stated that no direction will be given.

A side that has given a direction or stated that no direction will be given is not permitted to change that decision. Before the owner of an offside ball plays their next stroke, they are entitled to ask their opponent if they wish to give a direction. That opponent is to reply promptly (see Rule 16.2.8).

If the side owning an offside ball plays one of their **offside** balls before the opponent has given a direction under Rule 8.4.2, and before the opponent has played their next stroke, the opponent may stop play and direct the stroke be replayed **from a penalty area**. They also have the option of letting the stroke stand. This is also true if the side owning an offside ball plays one of their **offside** balls after failing to act on such a direction.

Rule 8.4.5 which allows the option of a replay, as described in the paragraph above, does not apply to a ball played which was **not offside**, even if the other ball belonging to the side playing it is offside. The opponents still have the option of directing that other ball to a penalty area (provided the opponents have not also played a stroke since the hoop was run).

A side required to replay a stroke under Rule 8.4.5 is no longer entitled to give a direction under Rule 8.4.2 until after the next point is scored.

Example. 11.2.1

When the Blue ball scores Hoop 3 the Red ball is onside but the Yellow and Black balls are offside. The Red ball is then played by its owner before any direction has been given on either the Yellow or the Black ball.

The side owning the Blue and Black balls may now stop play and direct the Yellow ball to a penalty area, if they wish. The red ball cannot be made to be replayed under the Offside Rule, so that stroke stands unless it must be replayed under a different rule. For example, if it was a fault or interference occurred, it might have to be replayed.

If the Yellow is directed to a penalty after Red's stroke, it only becomes an outside agency under the Offside Rule after it has been directed. That means that, if the Yellow ball was moved by Red's stroke, it is treated as a ball in play for that stroke (unless it was an outside agency for another reason).

The side owning the Red and Yellow balls has lost the right to give a direction on the offside Black ball (because a stroke was played by the side owning the Red ball).

If the Black ball had been played following the playing of the Red ball and before a direction was given to the owner of the yellow ball, then the side owning the Blue and Black balls cannot give a direction to the Yellow ball.

Example. 11.2.2

When the Blue ball scores Hoop 3 the Yellow ball is onside but the Red and Black balls are offside. The Red ball is then played by its owner before any direction has been given on either the Yellow or the Black ball.

The side owning the Blue and Black balls has the option of allowing the stroke with the (offside) Red ball to stand, or they could stop play and direct the Red ball to be played from a penalty area. If they choose the latter, any other balls moved by Red's stroke must be replaced where they were before that stroke.

The side owning the Red and Yellow balls has lost the right to give a direction on the offside Black ball (because a stroke was played by the side owning the Red ball).

If the Black ball had been played following the playing of the Red ball, then the playing of the Red ball is condoned and the side owning the Blue and Black balls cannot give a direction to the Red ball.

Once a direction is given to place an offside ball on a penalty area such placement may be delayed for the sake of convenience. However, the ball remains an outside agency, and if hit by another ball GC Rule 9.2.3 applies. Therefore, it ought to be moved if there is any chance that it could be so hit. If the offside ball is hit by another ball before it is directed, then it does not become an outside agency under Rule 8.4.4 until it is directed. See example 11.2.1 above.

11.3 The halfway lines

A full description of the positions of the halfway lines is given in GC Rule 8.1 its accompanying Table and Diagram.

Figure 11.1

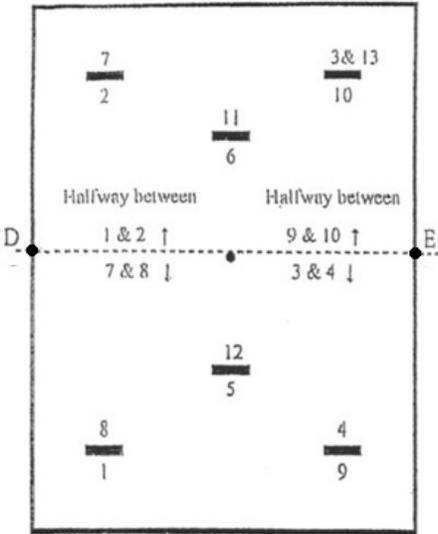


Figure 11.2

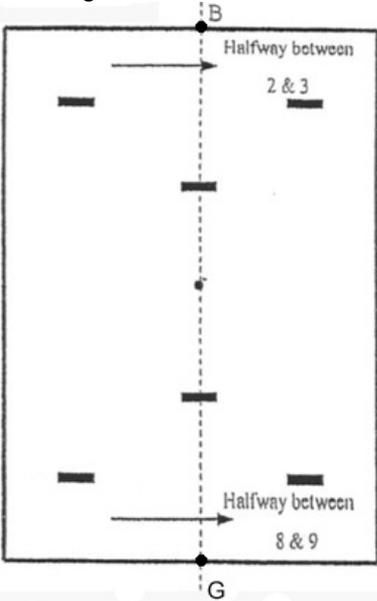


Figure 11.3

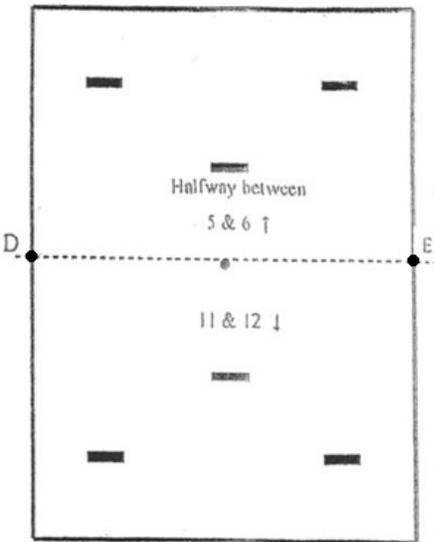


Figure 11.4

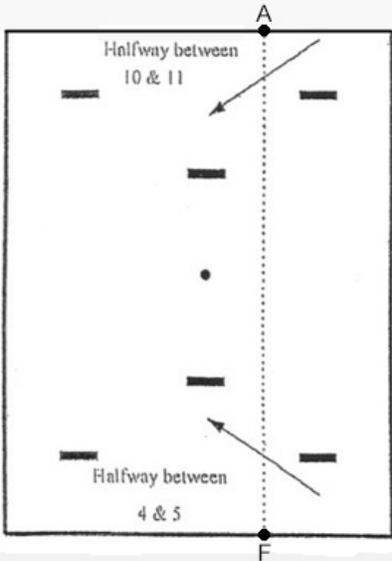


Figure 11.5

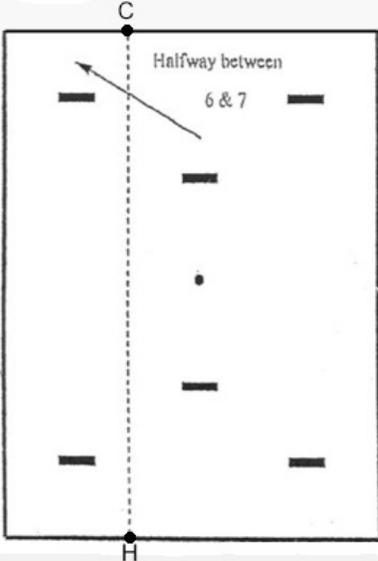
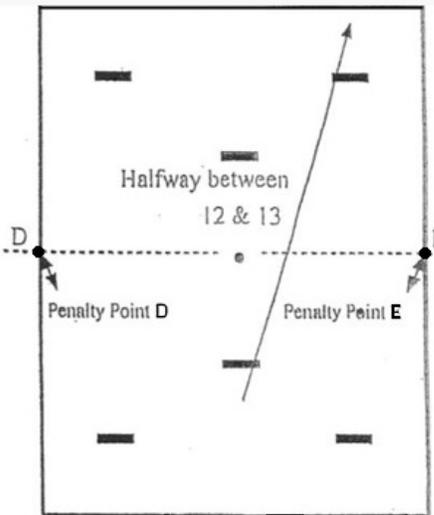


Figure 11.6



Figures 11.1 – 11.6 Depicting positions of the halfway lines for a 13 point game.

Additionally, in a 19-point game:

- The “DE” line is the halfway line between Hoops 13 & 14, 15 & 16, 17 & 18 and 18 & 19.
- The “BG” line is the halfway line between Hoops 14 & 15.
- The “AF” line is the halfway line between Hoops 16 & 17.

And in a 7-point game:

- The “DE” line is the halfway line between Hoops 6 & 1(the final hoop in a 7 point game).

11.4 Practical Points for GC Referees regarding the Offside Balls Rule.

- 11.4.1 The referee is not allowed to declare whether or not a ball is offside unless asked by one of the players for a decision. However, if a player wrongly declares a ball to be onside or offside, the referee should intervene and inform the players of the correct status of the ball.
- 11.4.2 When asked to give a decision about whether a ball is offside, the referee should ascertain how the ball reached its position at the end of the turn in which the last hoop was run, and who has played a stroke since that turn. This is particularly important if play is to Hoop 13 and balls have not been played since the running of Hoop 11.
- 11.4.3 Referees need to remember that the positions of the lines AF, BG, CH and DE as described in GC Rule 8.1 are the **definitive** halfway Lines. Halfway marker pegs can be used. Marker pegs are to be coloured white and tall enough to be easily visible from one boundary to the other. The halfway marker pegs *should be* in their **correct** positions at all times during a match. The halfway marker pegs are to be used as **guides only** and if they are inadvertently placed in an incorrect position this incorrect positioning **does not define** the positions of the ends of the halfway lines.
- 11.4.4 There are two penalty areas. They are located on the eastern and western boundaries where the D-E line crosses those boundaries;
- 11.4.5 GC Rule 8.1 says that D-E line is “the line through the [centre] peg perpendicular to the East and West boundaries”. Although the centre peg *should be* in its correct position at all times during a match, GC Rule 8.1 still applies even if the centre peg is misplaced.

Example. Blue decided that he could not prevent Red from making Hoop 1 and so played his ball to just south of the center peg (i.e. just short of what he thought was the halfway line).

- (1) After Red ran the hoop it was noticed that the centre peg was misplaced. If the hoop was put in its correct position, the Blue ball would clearly be north of the peg. Is Blue offside?
- (2) What if the misplacement of the centre peg was noticed after Blue had played but before Red ran the hoop?

GC Rule 2.5 says that “*If it is discovered that a game is being played with a hoop or the peg missing or seriously misplaced ...*” In the first case it would be reasonable to make the decision about whether the blue is offside first before moving the peg to its correct position. In the second case that’s more problematic because it would mean delaying the repositioning of the peg until after another stroke had been played. Although Rule 2.5 does not say when the centre peg should be correctly placed, it is reasonable to assume that it should happen before the next stroke after the discovery of its misplacement. In that case, the blue ball would be offside in the second example after red ran the hoop.

B12 – REPLACEMENT OF A BALL AFTER INTERFERENCE

The most common reason for replacing a ball after interference is when a stationary ball is contacted by a ball from a double banked game on the same court.

GC Rules 9.2.2 and 9.2.3 describe how this situation is rectified

Rule 9.2.2 says what to do with the ball that was stationary: It is to be replaced in its original position before the next stroke is played.

For the ball that was moving at the time of the collision it is a bit more complicated. Rule 9.2.3 says

- (a) If a moving ball hits an outside agency, including a ball or player from another game, which was stationary from when the stroke was played until the collision occurred, the stroke is not replayed.
- (b) The opposing side chooses whether to leave the ball where it stopped or to place it where they (or a referee, if present) judge that it would have stopped if there had been no interference.

If the opposing side chooses to leave the ball where it stopped, that is straight forward. If they choose to leave it where they judge that it would have stopped, that is often also reasonably straight forward because a rough guess will do. Usually, when interference of that nature occurs, precisely where the ball is put will have little effect on the game. In the few situations where a more accurate estimate is needed, the player or referee making the decision can use the following method.

12.1 $Z = Y + 2.5X$

Rudi Miller (Kew CC, Victoria) has devised a method for how to calculate where the moving ball is to be placed. Practical experiments have shown the method to be reasonably accurate.

The moving ball is placed according to the formula $Z = Y + 2.5X$ and is shown in Figure 12.1.

X = the distance the stationary ball was moved.

Y = the distance the moving ball travelled after contacting the stationary ball.

Z = the distance from the original position of the stationary ball to where the moving ball is to be placed.

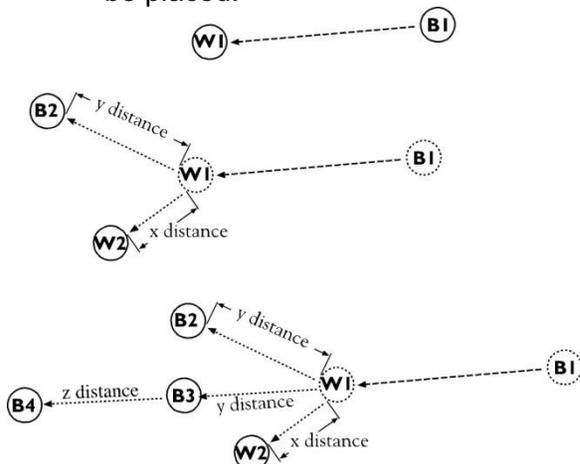


Figure 12.1 Pictorial Description $Z = Y + 2.5X$

For the example shown In Figure 12.1 the moving ball (B1) travelled 3 paces to (B2) after contacting the stationary ball (W1), this is the Y distance and the stationary ball (W1) was moved 2 paces to (W2), the X distance.

$$\begin{aligned} \text{So, } Z &= Y + 2.5X \\ &= 3 + 2.5 \times 2 \text{ paces} \\ &= 3 + 5 \text{ paces} \\ &= 8 \text{ paces} \end{aligned}$$

Therefore, the moving ball is to be placed along its original line of travel, 8 paces from the original position of the stationary ball.

12.2 SHHh

Jim Clement (Sarsfield CC, Victoria) has thought of a good way to describe the same method which makes it easier to remember and apply the formula.

The distance "Y" in Rudi Miller's formula is replaced by "S" (the ball **S**truck).

The distance "X" is replaced by "H" and "h" (the ball **H**it by the ball struck).

Thus "H" represents the distance the stationary ball moved after being hit, and little "h" represents half that distance.

The mnemonic "**SHHh**" tells us that the ball that was moving at the time of the collision should be put a distance **S + H + H + h** beyond where the stationary ball was.

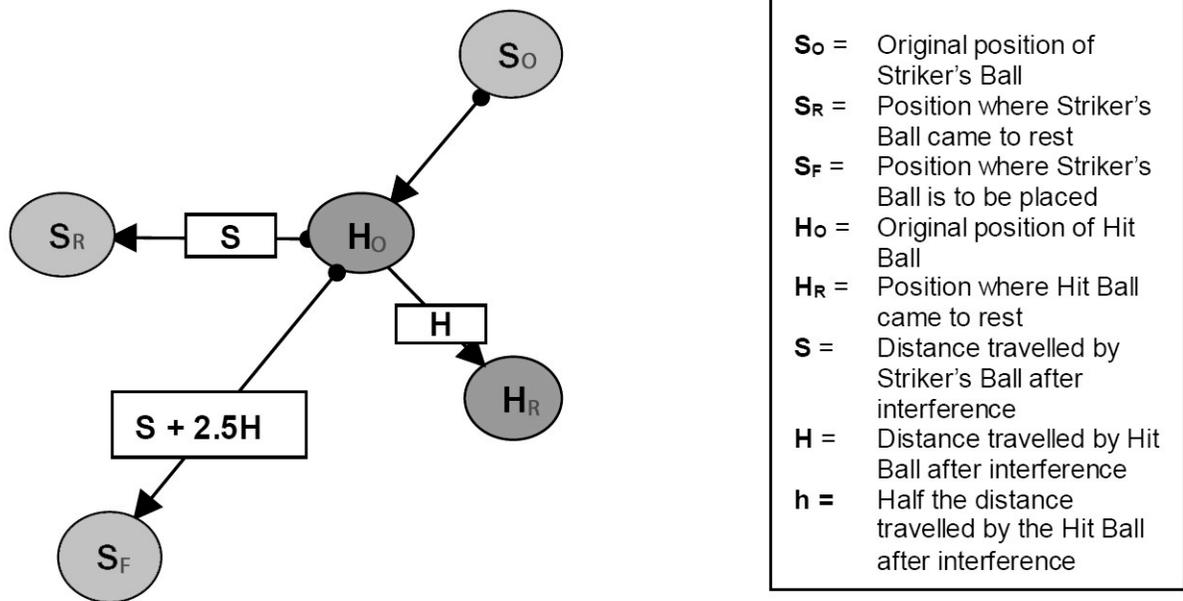


Figure 12.2 Pictorial Representation of the Shy method

If this method is to be applied, the players should **not** put the ball that was hit back straight away. That seems to be an instinctive reaction but, if that ball is put back before the distance it moved was estimated, it makes it rather difficult to apply the formula.

The correct procedure is as follows:

- (1) Lay a mallet down so the centre of the head is where the stationary ball was when it was hit, and the shaft shows the direction the moving ball was going before the collision.
- (2) Estimate the distance moved by the balls after the collision. Pacing out the distances is good enough. There is no need for a tape measure.
- (3) Use the formula to estimate how far the striker's ball would have gone after the collision.
- (4) Use that estimate to place the striker's ball and put the other ball back where it was.

B13 – HANDICAPS AND EXTRA STROKES

In handicap events the players need to clearly understand the number of extra turns available in each game of the match and who receives or gives those extra strokes.

A player's GC handicap changes **immediately** a trigger point is reached, which can happen at the end of a game during a match. It is important that players attend to their score cards immediately after every game because playing with an incorrect handicap can lead to disqualification.

The allocation of extra strokes should be attended to by the TM, or an appointed person.

The rules allow for GC handicap changes to occur in both doubles and singles games. See GC Rule 19.

GC Rule 7.5.4 explains what is to be done if extra strokes have been taken when both sides have competed for one or more hoops out of order.

It says that any extra strokes used after the last hoop scored correctly are restored.

13.1 Singles Handicap Matches

In singles handicap matches the number of extra strokes the lower handicapped player gives to the higher handicapped player is the difference between their handicaps and adjusted for 7, 13 or 19 point games according to the Table 1 in Appendix 2 of the GC Rules Book.

Example Player "A" handicap is 7 and player "B" handicap is 3
 The difference in handicaps = 4
 Player "A" receives 4 extra strokes in a 13 point game
 6 extra strokes in a 19 point game
 2 extra strokes in a 7 point game

13.2 Doubles Handicap Matches

In doubles handicap games the extra strokes are given to **individual players and not to the side** and can only be used by the player receiving the extra strokes.

The lower handicap on each side is subtracted from the higher handicap on the other side and the difference is halved. If this results in a fraction, this is usually rounded down in seven-point games and up in thirteen and nineteen-point games. The number of extra strokes received games is shown in Appendix 2, Table 2.

Exception (GC Rule 19.3.6). If both players of a side will receive one or more extra strokes based on a half handicap difference that is not a whole number before rounding upwards, 0.5 is to be deducted from the half handicap difference of one player of the side. They are to announce before the game starts which of them will be affected by the deduction.

In other words, in this situation one of the numbers is rounded down and the other is rounded up. This is so that the total for the side after rounding is never more than half an extra stroke different from what it was before rounding.

GC Rule 19.3.2 says that the two players in one side have the same handicap they are to decide and announce before the game starts which of them will receive extra strokes based on the lowest handicap. Some competitions have special regulations which override Rule 19.3.2. For those competitions, the players don't decide. Instead the competition regulations specify how it is decided (e.g. based on player index as well as handicap).

Example	Side A.	Player 1	Handicap 4
		Player 2	Handicap 5
	Side B	Player 3	Handicap 2
		Player 4	Handicap 10

Half the difference in handicaps between Players 1 & 4 = 3 and therefore
Player 4 receives 3 extra strokes in a 13 point game
5 extra strokes in a 19 point game
2 extra strokes in a 7 point game

Half the difference in handicaps between Players 3 & 2 = 1.5 and therefore
Player 2 receives 2 extra strokes in a 13 point game.
2 extra strokes in a 19 point game
1 extra stroke in a 7 point game

Note. Rule 19.3.6 does not apply because it only applies when players of the **same** side receive extra strokes **and** their half handicap differences are **both fractional**.

Depending upon their handicaps in doubles games it is possible for:

- One player on either side to receive extra strokes.
- Both players on one side to receive extra strokes.
- Only one player in the game to receive extra strokes.
- No player on either side to receive extra strokes

Handicap changes can come about as the result of both singles and doubles games.

Sometimes the referee needs to be involved (before the game starts) because the players are confused or ill-informed regarding who receives extra strokes. The following technique often helps the referee to sort out the allocation of the extra strokes:

13.2.1 Have the low handicapped player from each side stand facing the high handicapped player from each side.

13.2.2 Calculate the extra strokes to be given between each pairing by verbally going through the calculation in the manner described in the example above. This way there should be no misunderstanding.

13.3 Extra stroke clips

Some suitable visible means of displaying the number of extra strokes a player has in a handicap event should be used to indicate to the players, the referee and spectators the state of the game.

Coloured clothes pegs or clips are commonly used to indicate the extra strokes. These may be attached to the centre peg extension or at some suitable courtside position. The technique of removing the extra stroke clips from the peg extension is a simple way of keeping spectators informed of the state of the game.

Another way is to have the players carry clips or tokens which are handed to the opponent as each extra stroke is taken.

Sometimes coloured wooden pegs or small coloured flags are placed in the ground by the boundary, off the court. As each extra stroke is taken a peg or flag is removed.

If coloured clips attached to the peg extension are used to indicate the number of extra strokes available, care must be taken that they are of distinctive colours so as not to become confused with the clips that are commonly used to show which side has won each hoop.

Whatever system is used for checking on the number of extra strokes available the referee should ensure the players fully understand the system in use, before the match begins

B14 – COURT DAMAGE

Damage to the court caused by a player playing or intending to play a stroke could be a fault under GC Rule 11.2.10 if it occurred during the striking period and was caused the mallet. Damage caused by a ball being pushed into the court surface by the mallet during a stroke is not in itself a fault. To be a fault, at least part of the damage must have been caused by direct contact by the mallet with the court surface

GC Rule 11.2.10 a fault is committed by a player who, during the striking period: *“causes damage to the court surface with the mallet that, before the court surface is repaired, is capable of significantly affecting a subsequent stroke played over the damaged area.”*

Damage to the lawn outside the court boundary is not a fault.

Court damage faults under GC Rule 11.2.10 can occur in any stroke but are more common occur in jump shots and hammer shots.

The GC Rules do not specify what constitutes sufficient damage to the court surface for it to be ruled as a fault other than to say that *“before the court surface is repaired, [the damage] is capable of significantly affecting a subsequent stroke played over the damaged area”*.

If there is visible damage to the court surface which was caused during the striking period with a mallet by a player playing or intending to play a stroke, then the following test can be performed to assess whether the damage was severe enough to constitute a fault. The test is not compulsory, and it is a guideline only.

14.1 A test for court damage

Use a ball to perform the test. The ball can be a spare ball (i.e. one that as not being used in any game) or it can be a ball of the game. If it is a ball of the game. choose a ball that is not in a critical position and mark the position of the ball before removing it.

Roll the test ball gently over the damage about two or three times, from a different direction each time, so that it travels approximately 300 – 450 mm either side of the damage. If the changes direction **significantly** during any one of the rolls and that change in direction is thought to be due to the damage, then it should be ruled as a fault.

It is up to the person performing the test to decide what “significantly” means. At the time of writing (June 2020), the WCF and ACA have not clarified how the term *“is capable of significantly affecting a subsequent stroke played over the damaged area”* should be interpreted.

If the previous striker is observed to be repairing the court by pressing a foot or the mallet onto the court in the vicinity of a dubious stroke, in what appears to be an effort to disguise or repair damage, this could suggest a fault has been committed and it might be in order for the referee to fault the stroke. However the referee should be sure that the damage was caused by the mallet and the player was not repairing some previous damage caused by another player, was not stepping on an insect, or flattening a worm cast or such other object, particularly if the referee observed the behaviour from a distance and not nearby.

A player can be given a warning or penalty for unacceptable behavior”

GC Rule 16.2.12 attempts to repair damage to the court surface that may indicate a fault under Rule 11.2.10 before it is ruled on by the opposing side (or a referee, if present).

If there is sufficient doubt as described above, the referee could give the player a friendly rather than official warning not to repair damage that might be considered to constitute a fault.

B15 – WHEN A GAME ENDS AND TIME LIMITED GAMES

GC Rule 1.4.1 says that “A game is a contest for the best of 7, 13 or 19 points and ends as soon as one side has scored a majority of the points to be played. Alternative endings which may be used include playing to a two-point advantage or using a time-limit...”

Most golf croquet games do not have time limits, but the Rules provide for time limits. The ACA Tournament Regulations (2018) include the following:

Regulation 16.1 Imposing a time limit

The TM may impose a time limit on all games in an event, provided that such a time limit is advertised in advance or announced at the tournament before the start of the event; or on each game in any round of an event before that round commences.

Regulation 16.2 Unlimited games

If no time limit had been imposed, the TM may impose a time limit ... in GC of a further 15 minutes on any game that has been in progress for at least one hour.

That means that, even if no time limit was announced beforehand, the tournament manager may impose a time limit on a game after it has started if it is felt that the game is progressing too slowly. Normally, the TM would impose such a time limit in consultation with the TR or the referee of the game in question.

15.1 When a game ends

An unlimited game ends as soon as one side has scored a majority of the points to be played. A time limited game also ends then unless it has ended earlier. We look at time limited games below.

GC Rule 7 covers “Scoring a Point” and describes how a ball to *complete the running of a hoop*.

Rule 7.1.3 says that “... A ball completes the running and scores the point ... when the whole of the ball clears the plane of the playing side, provided that it stops at the end of the turn clear of that plane ...”.

That does not mean that a game is necessarily over as soon a ball completes the running even if the point would give a player the majority of the points. The game is only over then if the point is not disallowed as a consequence of another GC Rule. The point may be disallowed, for example, as a result of a fault, wrong ball play or interference.

Even if points should have been disallowed, a game is over if the players leave the court or start another game, having agreed which side has won. GC Rule 1.4.1 says that, in those circumstances, “... the game has ended with the agreed result.”

Note that, for the game to have ended under GC Rule 1.4.1, the players only need to have left the court (or started another game) having agreed **who won**. They don't have to have agreed on **the score**. If a score needs to be recorded, then they will either have to agree subsequently on the score, or a score will have to be assigned to the game by someone else (e.g. the referee or tournament manager). The assigned score need not give either player a majority of the points played. For example, a score of 6-4 might be assigned in a best-of-13 game if it was established that hoop 10 was the last one played, and it was agreed that the loser had scored at least four points.

15.2 Time limited games

If time limits are set, they are usually at least 60 minutes, but it is not against the regulations to set a shorter (or longer) time limit.

How a game ends when the time limit is reached in a game depends on the specific regulations applying to the event. Obviously, these must be clearly stated.

For most time limited games, the side with the most points when the time limit is reached is declared the winner of the game. And, if the scores are level the game continues until either side has won the next hoop being contested at the time.

Some events will allow draws and the game is over as soon as it is the end of the turn being played when the time limit was reached. That is usually referred to as “stop on the bell”.

Some events have more complicated stopping regulations.

15.2.1 Matches consisting of more than one game

If time limits are set on matches consisting on more than one game, there might be an overall time limit for the match. In that case, it is not unusual for different time limits also to be set for each game of the match, with unused time in a game being added to the time available for the next game of the match.

Often there are no scheduled breaks between games of a match, and the timer for the next game should be set and started as soon as possible after the preceding game of the match is completed. In practice, a short break is usually allowed even between such so called “seamless” matches. When there is a difference like this between common practice and the regulations things can be awkward, especially if players abuse the latitude they are given – but that’s the tournament manager’s problem, not the referee’s.

15.2.2 Time keeping

Electronic timers with alarms are now almost universally used. Sometimes the players will act as timekeepers for their own games. In order to avoid conflicts, the appointment of an independent timekeeper is desirable but commonly not possible. A referee is not necessarily responsible for keeping time for a game he is refereeing. He may agree to do so, but that can be difficult if he is in charge of more than one game.

Often the players will start the game themselves by activating the timer as the first ball is struck into the court.

It is good practice for someone to write down the time the game started. Even if a referee is not responsible for timekeeping of the game, he might agree to write down the starting time. Writing down the time is a safeguard against the possibility the someone might stop the timer and forget to restart it.

15.2.3 Stopping the timer during a game

Conditions under which players may stop their timer during a game should be written into the Conditions of Play and fully explained to the players before the commencement of play. Unfortunately, this rarely happens, and referees should insist that the TM clearly explains to the players under what conditions their timer may be stopped and when it is to be restarted.

Generally, the timer should not be stopped while a problem is being sorted out, either when a referee is present or in self-refereed games. Sorting out a problem is usually part of the game, but there may be unusual circumstances.

Stopping of a timer is usually allowed while the players are waiting for a referee on request to arrive. However, it should be restarted as soon as the referee is present on the court and attending to the problem.

15.2.4 Stopping the timer in a time limited, double banked game

Play being held up by a double banked game is always a bit annoying for players, but more so in a timed game, especially for a player if he is behind on the score.

GC Rule 17.3 says, “In tournament and match play, if a time-limit is applied to two games played simultaneously on the same court, the organising body may direct that the timer of one game is to be stopped if play is held up by the other game”.

Even if the referee is not the timekeeper, the referee needs to be aware of what the organising body has decided with regard to the stopping of timers in double banked games.

Be aware that the following problems with timers can arise in time limited, double banked games.

- The wrong timer is stopped;
- The wrong timer is restarted;
- A timer is not restarted;
- The players of the first game to finish inadvertently remove the timer belonging to the other game.

15.2.5 Positioning the timer

Timers should be situated where the players have ready access to them and where the alarm can clearly be heard. As most electronic timers have LCD screens, care needs to be given to where they are placed during matches. They will malfunction if the screen is left exposed to direct sunlight. It is also a good practice to keep the timers in double banked games well away from each other to prevent the wrong timer for either game being incorrectly stopped.

Before the start of a tournament it is the responsibility of the TM to ensure that the timers are functioning correctly and that there is a supply of charged batteries.

15.2.6 Ending a game when a timer has been stopped but not restarted during a game

Occasionally in double banked games, once a game restarts after the timer has been stopped the players, or timekeepers, forget to restart the timer. See the comment in Section 15.2.2.

This can lead to much confusion and angst when the players think the game is close to ending and ask the referee to check the time remaining only to discover it has not been restarted. The best solution is to let the players decide on a mutually acceptable amount of time to continue playing. If they cannot agree and if the referee cannot “broker” upon an agreed time the referee might then instruct that play will continue for a short period, say 2 or 3 minutes. If this is not acceptable to the players, the matter should be referred to the TM.

15.2.7 The procedure as time draws to a close

Towards the end of a game the referee (whether acting as a timekeeper or not) should not look at the timer in an obvious manner and certainly not pick it up as this could be an indication to the players that the time limit is approaching. This action could be considered to be giving advice. The referee (even when acting as timekeeper) is not to state the time remaining unless asked.

It is preferable for a referee to keep in earshot of the timer towards the end of the game, especially if there happens to be any significant ambient noise and the players are far away from the timer.

A referee should be aware of the possibility that a player who has a narrow lead towards the end of a game might waste time by, for example, taking longer to play their strokes than they did earlier in the game or by repeatedly asking how much more time is left or walking over to the check the timer. If necessary, such behavior should be dealt with under Rule 16 (Behaviour). If a referee did decide that issuing a warning for time wasting was warranted, it would be reasonable for the referee to stop the timer while issuing the warning.

15.2.8 Contested hoops out of order

If a penalty area continuation is applied in a game because one or more hoops have been run out of order, time is not restored in time-limited games. See Rule 7.5.

B16 – ON COURT DECISION MAKING

Once a referee has made a decision it should be announced audibly and clearly. The referee should never simply nod or shake their head and walk away.

GC Rule 15 and the WCF Refereeing Regulations describe the powers, duties and responsibilities of referees and how referees are to act. These Regulations need to be read by all GC referees to maintain a good understanding of their duties and responsibilities.

16.1 Balance of Probabilities

No decision should be made other than on the balance of probabilities, which in itself can be relatively subjective, and a referee needs to carefully look at and think about the evidence before making a decision on anything other than a clearly open and shut situation.

GC Rule 11.3.1 says, “*A fault is to be declared if the player (or a referee or other observer requested to watch the stroke) believes that it is more likely than not that the relevant event occurred*”.

That means that a referee can call a fault even if he is not certain that the fault occurred. If a referee calls a clean stroke as a fault, it is obviously bad for the striker. But if a referee calls a fault as a clean stroke, it is equally bad for the striker’s opponent. The fairest thing a referee can do is call a stroke a fault if he thinks it is more likely than not that a fault occurred.

The referee needs to be in an appropriate position on the court that allows a reasonable view of the circumstances surrounding the possible fault.

In the interests of keeping games flowing and the avoidance of placing unnecessary stresses on the players decisions on matter of fact issues should be made without undue delay but at the same time hasty decision making is to be avoided.

16.2 Evidence that can be used when deciding if a fault has occurred

In general, the commission of a fault may be deduced from observations made as and after the stroke was played, “*including sound and the movement of balls*”. See Rule 11.3.4. In particular, the methods for judging double taps suggested in Section B7 comply with the rules.

For two rules, however, there are restrictions placed ***in certain circumstances*** on what observations can be used for making the decision. For Rules 11.2.4 (double tap) and 11.2.5 (push), only the observations described below can be used if ***the ball struck was in contact with another ball before the stroke***.

16.2.1 Double tap or push when balls were in contact before the stroke

GC Rule 11.3.3 When the mallet strikes a ball that is in contact with another ball before the stroke is played, the following faults may only be declared if the observer, assisted by nothing more than spectacles, contact lenses or a hearing aid,

- (a) under Rule 11.2.4, sees a separation between mallet and ball followed by a second contact between mallet and ball; or
- (b) under Rule 11.2.5, sees or hears a contact between mallet and ball that is materially longer than that which necessarily occurs in a stroke of the same type.
- (c) GC Rule 11.3.3(a) effectively says that the method based on the angle of separation and distance ratio recommended in Section B7 for judging double taps should not be used if the balls were in contact before the stroke.

The phrase “a stroke of the same type” in Rule 11.3.3(b) is somewhat enigmatic, but that’s not a problem for the referee because, for a stroke to be a fault under Rule 11.3.3, it will sound and look very different from a clean shot. If it’s a fault there will be a dull and somewhat prolonged sound rather than the crisp sound of a clean shot. A normal stroke is unlikely to be a fault, but a stroke played unusually slowly but with considerable follow through when the balls are touching could result in a fault. If it is, it will look very much like a push.

B17 – BASIC COURTESY AND ETIQUETTE FOR GOLF CROQUET REFEREES AND PLAYERS

During games and matches, referees and players are expected to display appropriate courtesy to each other.

The following guidelines and suggestions strive to express how referees and players should conduct themselves and interact during games of GC. Suggestions are also included that may help referees manage players and control situations when differences of opinion between the players are becoming heated and when a player behaves in an unreasonable or thoughtless manner.

GC Rule 16 (Behaviour) deals with specific issues related to player behaviour and gives a number of examples of inappropriate behaviours. Referees and players need to remember that inappropriate behaviour is **not limited to** those listed in GC Rule 16.2 and therefore a referee may issue a warning for other behaviours deemed unacceptable.

Fortunately, unacceptable behaviour is uncommon, and referees rarely need to apply GC Rule 16.

The following aims at producing guidelines about the way referees and players should conduct themselves, and how referees should manage players who are unwittingly or deliberately discourteous and breach GC Rule 16.

It is important for referees to remember that games and matches of GC are for the benefit and enjoyment of the players and therefore they should stay in the background as much as possible and refrain from taking a draconian approach when applying GC Rule 16.

Usually by acting with polite firmness a referee can show players what is expected of them and quietly “defuse” any unpleasantness.

Courtesy is mostly a matter of common sense and thoughtfulness which the other players and the referee should be showing to the striker. Apart from ensuring that the striker is not distracted there are other aspects of behaviour which referees and players should keep in mind at all times. These matters are discussed below.

All players and the referee are to ensure that matches continue according to the rules and regulations and be played in the spirit of the game.

17.1 Avoid distracting a striker

Once a striker has commenced preparing to play a stroke and until the stroke is completed the referee and other players should remain stationary and silent.

17.1.1 Where to stand and not to stand

The referee, as much as possible, and the other players are not to stand directly in the striker’s line of direct vision nor in the range of peripheral vision. It is preferable for all to stand behind the striker as depicted in the Figure 17.1. Sometimes a referee or a player will find themselves unavoidably in front of the striker in which case they should try to be no closer than about 10 metres and even then should stand to one side or the other of the striker’s direct line of vision and above all remain stationary. Players should not allow their mallets to swing about.

Occasions arise when a referee needs to be close to a striker to watch a stroke which requires special care in its execution because of the proximity of another ball or balls, a hoop or the peg. The referee may be asked by the striker or by an opponent to watch the stroke, in some cases a referee will make the decision himself that the attempted stroke needs to be carefully watched.

In these situations where the referee positions himself will be dictated by the nature of the stroke to be attempted. Here it is wise for the referee to follow Owen Edward's time-tested dictum of "Stand where you can see. Not where you cannot see".

However, referees need to consider personal safety and ensure they are standing where they are not likely to be struck by the striker's mallet on the backswing, the forward swing or when the striker is withdrawing the mallet at the completion of the stroke.

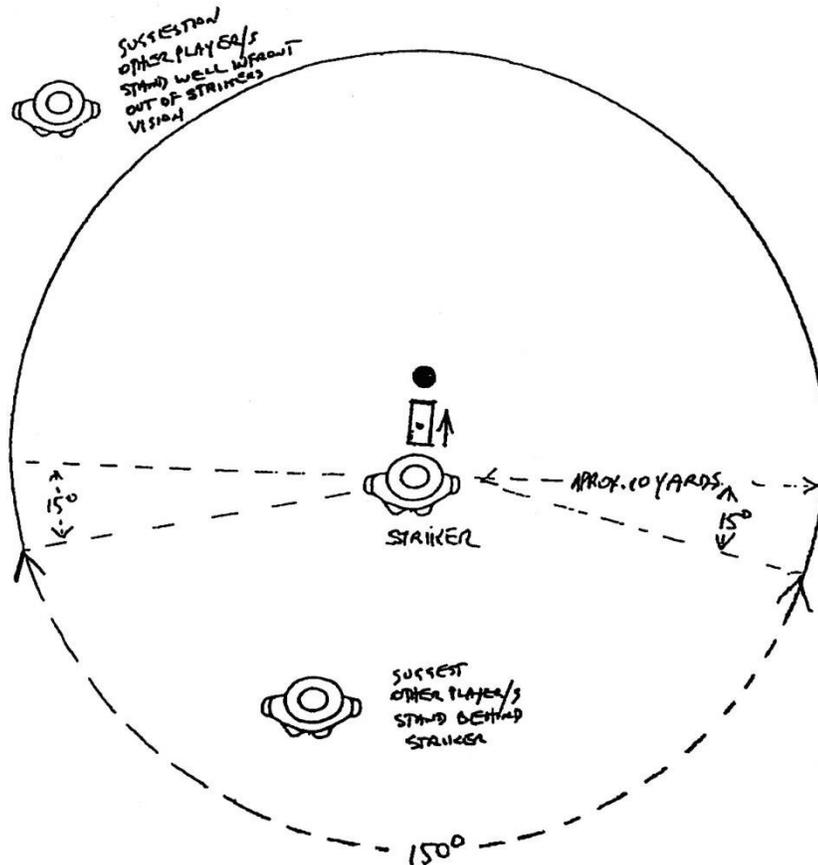


Figure 17.1 Ideal Positions of Where to Stand

If a striker asks the referee to stand elsewhere and the referee decides that an adequate view of the stroke is not possible from any other position in order to give a fair and accurate decision on the stroke, the referee should inform the striker accordingly. However, when a referee is standing very close to a striker, and possibly in the striker's field of vision, the referee should take extra care to remain perfectly stationary throughout the duration of the stroke.

If asked to move or when otherwise walking from place to place on the court, it is discourteous to walk across the striker's intended line of play. This is especially so on courts where the surface is soft, usually as the result of rain, as footprint impressions can interfere with the direction a ball will travel.

17.1.2 Silence

Once a striker is preparing to play a stroke and until the stroke has been completed the referee and all other players in the match are to remain silent, unless:

- 17.1.2.1 Asked a question by the striker;
- 17.1.2.2 Responding to a request made by the striker;
- 17.1.2.3 Advising the striker that a wrong ball is about to be played, in accordance with GC Rule 10.1;
- 17.1.2.4 The opponent wishes to forestall play in order that a referee can be summoned to watch the stroke;
- 17.1.2.5 The striker's partner wishes to offer advice.

17.2 Time Wasting

Rule 16.2.8 says that unacceptable behavior includes where a player “*wastes time or fails to play their strokes with reasonable dispatch*”. This is rather subjective, and it is up to the referee to decide what constitutes time wasting or failure to play with reasonable dispatch. A “*one-minute rule*” (see below) was introduced in the 2013 edition of the Golf Croquet Rules to try to provide an objective way of deciding whether a player was guilty of time wasting. The one-minute rule was very unpopular with players because it was thought to be too draconian, and it was dropped from the general list of examples of unacceptable behavior (Rule 16.2), but it can still be applied in certain situations as described in Rule 16.3.

Referees are often reluctant to give a warning under Rule 16.2.8 for slow play. That is understandable since the penalty for a subsequent offence can be severe. Also, especially in doubles, it is often the case that both sides are guilty of slow play. Rather than wait until a lot of time has already been wasted due to slow play, a referee could give an unofficial warning early in a game where there have already been several instances of “failure to play with reasonable dispatch”. A polite word from the referee may be all that is needed to keep a game moving at an acceptable pace. And if it isn't, then it won't come as such a shock to players if they are given an official warning later.

17.2.1 The one-minute rule

Rule 16.3.1 says “In tournament or match play, a match may be made subject to a requirement that each player is to play a stroke or declare that a stroke has been played within one minute of the end of the last turn, except when the game is held up while a ball is retrieved, or a referee is called or another example of justifiable delay exists”.

If the requirement under Rule 16.3.1 is to apply throughout a match, that would normally be a decision made by the organising body of the event, and the players are to be informed before the match starts that such a requirement applies. However, in exceptional circumstances, a referee in charge of a match may impose a requirement under Rule 16.3.1 after the match has started.

Rule 16.3.2 says “If a match is subject to a requirement under Rule 16.3.1, the existence of the requirement does not permit players to wait for one minute before playing”.

In other words, whether or not the one-minute rule is in force, a referee can apply the penalties under the “Behaviour” rule if he believes that a player is guilty of time wasting or failure to play with reasonable dispatch even if the player has not taken more than one minute to play any single stroke. The referee should only do so if the player has been guilty of the offence (of time wasting or failure to play with reasonable dispatch) on several occasions.

Time wasting can be avoided by:

- Players walking promptly to their balls once a turn has ended;
- Refraining from regularly taking unnecessarily long to make a decision about what stroke to play – especially in doubles where length discussions should be avoided.

17.3 Advice

GC Rule 14 clearly states what advice players can give each other as well as what advice they are not entitled to give.

17.3.1 Information to or from the opposing side (Rule 14.1)

This rule clearly states what advice players can give each other as well as what advice they are not entitled to give. It also outlines the consequences of giving incorrect information: if a side plays a stroke acting on incorrect information given by the opposing side, the affected side is entitled to a replay in certain circumstances. In deciding whether a replay is allowed, the referee should not take into account whether or not the incorrect information was given with the intention of misleading their opponent.

17.3.2 Written information (Rule 14.2)

During a game, players are not permitted to refer to information in the form of printed, handwritten, electronic or other prepared material except for the purpose of clarifying the Rules that apply to a circumstance that has arisen or may be about to arise.

17.3.3 Referee giving information to players (Rule 14.2)

Refereeing Regulation 2 says that referee may give information to a player subject to the certain conditions. In summary, a referee should:

- 17.3.3.1 if asked by a player, give information about the state of the game;
- 17.3.3.2 state the rule on any matter if asked by a player, or volunteer such information at his discretion
- 17.3.3.3 do his best to explain the reasons for a given ruling if asked by a player, or to explain the reasons at his discretion;
- 17.3.3.4 forestall play and apply the appropriate rule if he believes that a wrong ball
 - is about to be played (Rule 10.1.2) or
 - may have been played in the last stroke (Rule 10.1.3)

When providing information, it is recommended that all players of the same game be provided with that information.

17.4 Double banked games

In double banked games patience and tolerance are often required by the players of both games. All referees and players need to pay particular courtesy to one another. If the same hoop is about to be contested by the players in more than one game, the game involving the player who first plays a ball into the vicinity of that hoop should normally be given priority. There may be occasions when the referee will need to take control and 'mark-down' a slow double banked game that is preventing a faster game progressing. "Marking down" by the referee is also needed when double banked games are playing for hoops that are in the same line such as when one game has contested Hoop 3 and wishes to go for Hoop 4 while the other game has contested Hoop 9 and wishes to go for Hoop 10.

During double banked games players should carry markers and observe the practice specified in GC Rule 17.2.1 "*...with the permission of the players of the other game, one or more balls of the other game may be temporarily removed after their positions have been marked*"

GC Rule 9/2.2(b) allows a player to lift without penalty, a ball from his game that is in danger from being contacted by a ball from another game.”

17.5 Keeping score

Both sides are responsible for keeping the score. After each point is scored, the side for whom the point has been scored (or a referee, if present) should announce the score or, if in use, attach a scoring clip to the hoop or ensure that a scoreboard is updated. If the score is announced, this is customarily done by first calling the colour of the ball that scored the hoop followed by the score, starting with the score of the side that won the hoop point. For example, “Red hoop. Red and Yellow lead 4 – 1” or “Blue hoop. Blue and Black trail 1 – 4”.

17.6 Calling a Referee (In the absence of a Supervising Referee)

When calling for a referee, for any reason, the time-honoured manner for a player to signal this is to raise the mallet above the head. If the striker or the opponent stops play and calls a referee, the striker must wait until the referee has arrived. If they fail to wait, tell them that they must wait and that they have breached GC Rule 16.2.9. Also Rule 13 may apply.

Under Rule 13, if a player plays a stroke after the opposing side has justifiably forestalled play in a manner capable of conveying the request to a person with normal hearing and before the issue has been settled, the stroke is cancelled and any balls moved as a result of the stroke are replaced in the positions they occupied before the stroke was played. The issue is to be settled and the player entitled to play is then to play.

If the striker calls a referee to watch a shot such as a close-run hoop and the opponent calls (with the best of intentions) *“Play on, don’t bother calling the referee - I trust you.”* a difficult situation can arise. The striker is to ignore the non-striker as play has been stopped by the striker’s signal for a referee. The striker is to wait until the referee has arrived and performed the duty for which they have been called.

17.7 Shaking Hands

While it is common practice in Australia to shake hands with the players of the other side before and after a match, don’t be alarmed if an overseas visitor fails to do this before a game as it is not necessarily the practice in some overseas countries. Shaking hands between games of a best-of-3 or 5 games match should not be done as a handshake signifies the end of a match not the end of a game.

Shaking the hand of a referee at the end of a match is appropriate and a gesture appreciated by most referees.

17.8 Self Refereeing by Players

The presence of a referee does not relieve a player from the responsibility of announcing any fault that they commit.

GC Rule 15.1.1 *“All the players in a match are joint referees of the game and responsible for the fair and correct application of these Rules”*

GC Rule 15.1.2 *“...the presence of ... a referee does not remove the player’s responsibilities under Rule 15.1.1”*

Refereeing Regulation 8 says that *“The presence of a referee does not relieve a player in a game of the duty to draw attention to an irregularity that he thinks the referee may have overlooked”*.

- GC Rule 15.1.3 *“Where a stroke is to be played that may result in the commission of a fault or a ball leaving the court in a critical position, the player should first request the opposing side (or a referee, if present) to watch the stroke. If the player does not make the request, the opposing side may forestall play and require the stroke to be watched”.*
- GC Rule 15.3 *“If a situation does not appear to be adequately covered by these Rules, or their interpretation appears to be uncertain in relation to a situation, the issue shall be decided by the players (or a referee, if present) in a manner which best meets the justice of the case”.*

17.9 Summary: The spirit, the intent, the expectation

The rules are written to facilitate play and prevent time wasting.

The game of Golf Croquet is intended to be a game that involves prompt interactive play incorporating a participating referee.

It is intended, where possible, that the game is to be played with a RiC who is an active, but not obtrusive, participant, calling the score and keeping spectators informed by signaling when appropriate.

Good behaviour is important. The rules require the non-striker to be discrete and to be silent, stationary and unnoticeable to the striker and, as far as possible, this also applies to the referee.

The expectation is that play will be continuous with minimal time lapse between strokes. Time wasting discussions between strokes is to be discouraged and penalised when appropriate under GC Rule 16.

If games are always played according to the rules and in the spirit of the game, it follows that common courtesy will be displayed by all involved and breaches of GC Rule 16 will not occur.

B18 – HEALTH AND SAFETY

The welfare of the players is paramount at all times. Referees need to be aware of Health and Safety matters that can be of concern to themselves and the players during GC matches.

18.1 Extreme Weather Conditions

Due to the wide variation in the seasonal weather conditions across Australia, the extreme weather policy of each State is applicable.

Any alteration to the event program, including postponement or abandonment of play, because of extreme weather is the responsibility of the TM, often in consultation with the TR.

Most concerns about weather extremes revolve around hot and dry, hot and humid or stormy conditions.

Many of our players and referees are more susceptible to the potential problems related to hot weather conditions, including dehydration and heat exhaustion. Therefore, when playing in hot weather players and referees should be reminded of the need to wear cool, loose clothing, a broad brimmed hat, application of protective sunscreens and maintain a steady intake of cool fluids.

Referees ought to be alert to the possibility of the onset of heat exhaustion among players, particularly the elderly, and if concerned take the player(s) aside and suggest they take a break, seek a cool and shady place to rest and start drinking cool fluids. If the referee considers the situation to be more serious, or has the potential to become so, play should be stopped, and the TM notified. Many players are reluctant or too embarrassed to accept early advice, but this should not deter the referee from acting responsibly.

In cold weather adequate warm clothing is called for, together with adequate protective wet weather clothing and wind protection.

The TM should stop all play if there is lightning present or impending.

If play is abandoned due to extreme weather, referees may be required to “mark-down” any games they are controlling.

18.2 General on Court Safety

On court safety generally applies to avoiding accidents that can be caused by hoops, balls, boundary markers, ball barriers and other courtside objects.

18.2.1 Equipment

18.2.1.1 Balls as hazards:

- 18.2.1.1.1. Players and referees should refrain walking backwards before first looking to see what is behind them. Tripping over a ball can result in a serious injury;
- 18.2.1.1.2 Balls travelling at high speed can cause serious damage if they make contact with a foot, leg or any other part of the anatomy. Therefore, referees and players need to be especially aware of all balls from both games of double-banked matches;
- 18.2.1.1.4 Balls that are deflected from a hoop upright or another ball;
- 18.2.1.1.5 Balls from a game on an adjacent court, especially when ball barriers are not placed between the boundaries of the adjacent courts.

- 18.2.1.2 Hoops as hazards:
Hoops are usually set very firmly into the court and can trip up the unobservant referee or player. This is most likely to happen when walking backwards onto a hoop.

Always look before you walk backwards on the court.
- 18.2.1.3 Mallets as hazards:
- 18.2.1.3.1 A referee can sustain a quite painful and even serious injury by being struck by a mallet. This is most likely to happen if the referee stands too closely, directly behind the striker, when watching for a possible fault, such as a “bevel edge” fault.
- 18.2.1.2.2 If the position taken up is too close to the striker there is the danger of the referee being hit by the mallet on its backswing, particularly when the striker is a hard hitter and using a long backswing.

Remember to stand in an appropriate but safe position.
- 18.2.1.4 Boundary markers as hazards:
Loose string and cord boundaries can easily cause a person to trip, poorly tensioned metal strip boundary present the same risk.
- 18.2.1.5 Courtside hazards:
Halfway marker pegs, ball barriers, corner flags, ball boxes, chairs, tables, buckets containing hoop setting gear etc. can all cause a person to trip or fall.
- 18.2.1.6 Hoop gauges as hazards:
Heavy metallic hoop gauges are best not carried on court by referees. They can cause serious injury if the referee is unfortunate enough to fall or trip.

Section C – Administration

C1 – COORDINATORS/DIRECTORS OF REFEREEING

1.1 National Coordinators of Refereeing

ACA appoints annually a National Coordinator of Refereeing Golf Croquet (NCRGC) and a National Coordinator of Refereeing Association Croquet (NCRAC). Their duties and responsibilities are listed in the relevant position's Terms of Reference.

1.2 National Golf Croquet Referees' Committee

The National Golf Croquet Referees' Committee consists of the NCRGC and six State Directors or Coordinators of Golf Croquet. The duties and responsibilities of this committee are listed in the relevant Terms of Reference

1.3 State Coordinators/Directors of Golf Croquet Refereeing (SCRGC/SDRGC)

Each State Association is responsible for appointing a State Director or Coordinator of Golf Croquet Refereeing.

It is expected that each SDRGC, or Coordinator will from time to time liaise with the NCRGC on all or any matter concerning GC refereeing in Australia.

Such matters include, but are not restricted to, GC Rules, recruitment of GCRs, GCR Training and the National GCR Training Program, improvement in GC refereeing standards, items arising from the National GCR Committee meetings, suggestions for inclusion/deletion of issues relating to this Manual.

1.4 State Golf Croquet Referees Committees

The appointment of State GCR Committees is a matter for each State Association.

C2 – REFEREES APPOINTMENT AND DUTIES AT TOURNAMENTS

It is important that Golf Croquet Referees understand their responsibilities when officiating at ACA controlled tournaments and other tournaments played under ACA or WCF regulations.

The definitions of the various types of referees, their responsibilities, duties and powers are explained in the WCF Refereeing Regulations.

2.1 ACA Tournament Regulations

The following sections contain useful information –

2.1.1 TReg 4 Officials, Clauses 1, 2 and 3

2.1.2 TReg 8 The Tournament Referee, Deputy Tournament Referee and Referees

2.1.3 TRegs Appendix B Guidelines for States Hosting the Australian Croquet Championships.

C3 – ROLE OF THE TOURNAMENT REFEREE

While a great deal has been written about the rules and refereeing in general, little has been written about the specific role of the Tournament Referee

The role of a TR is different to that of an authorised, appointed referee.

The first difference is that at a major event the TR needs to spend a lot of time watching the work of the appointed referees. Also, there is the opportunity for extended discussions about rules and about refereeing techniques with other referees, officials and players, all of which can be most valuable.

As the approach to refereeing is a little different in New Zealand, and a great deal different in the United Kingdom, we need to come to grips with what constitutes "World's Best Practice" which ought to be by adopting the best practices from each country and on this matter there is still a lot of work to be done.

At all levels, communication is the most important element.

The TR should address the players before the start of an event.

An example of a TR's opening address appears in Section C4.

Addressing the players has proven to be of significant benefit in advising players what is expected of them relative to referees, other players and themselves. Such a communication politely presents information and invites questions which, when answered, prevent misunderstandings occurring and leads to a more pleasant and smoothly run tournament.

The TR's address has caused some players to express surprise about some of their rights, privileges and obligations as there is still a surprisingly high number of players, even at the top level, whose knowledge of the rules is such that they sometimes forego a right or a privilege by not knowing differently.

A common misunderstanding is how players may apply the Rules when acting as their own referees, in accordance with GC Rule 15.1, when no Supervising Referee is available. (Refer Section B17.9).

A lesser known function of a TR is to "protect" (as it were) other referees from the machinations of petulant players. Although rare, clashes of personalities do sometimes unfortunately occur when the TR needs to be called, for example when a player (or players) disagrees aggressively or offensively with the referee's ruling or about an application of a rule.

Another situation is when the TR might need to step in to protect a timid or inexperienced player when one of the worst examples of poor behaviour occurs with a player, who is qualified referee, saying to an opponent or the RiC: *"You are wrong! I am a referee and I know"*. The TR should gently remind the player who has transgressed in this way, that he is not bringing any glory on himself, the game or on referees in general by this type of behaviour. The player ought also to be reminded that in the current match he is a player and **not an authorised referee** and should act accordingly.

The TR cannot overrule a referee's decision on a matter of fact as players are not allowed to appeal against a referee's decision on a matter of fact. However, the TR can overrule a referee's ruling if a rule has been applied incorrectly [WCF Refereeing Regulations R6(a)].

The TR may confidentially suggest to a referee that an alternative method be used to show that justice is seen to be done. In this situation the TR's function is to fully support and protect the referee from the intimidation of overbearing players.

Another responsibility of the TR is to appoint a Deputy TR [ACA Refereeing Regulation 5(b)] and Authorised Referees for the tournament [WCF Refereeing Regulation 5(c)].

The TR is to allocate Authorised Referees to games and matches [WCF Refereeing Regulation 5(d)].

When the last game of a match is finished the referee is no longer appointed and no longer has any authority over the players.

If unacceptable behaviour continues, the application of GC Rule 16 is appropriate.

The TR can also report the behaviour to the TM who may decide to take further appropriate action.

Here is an example of a Tournament Referee's listing of referees authorised to officiate during the tournament.

3.1 Authorised Referee List

Authorised Referee List	
Event Name	
Date	
Location	
The following are authorised referees for this event and when active maybe appointed as Referees in Charge or as Supervising Referees.	
When inactive they are also authorised to act as Referee on Request.	
Spectators who are accredited Golf Croquet Referees but not named on this list have no authority to intervene during the Tournament.	
Insert names of authorised Referees	
_____ Name of TR	_____ Signature of TR

C4 – TOURNAMENT REFEREE’S OPENING ADDRESS – AN EXAMPLE

This is based on an example by Owen Edwards which was included in Version 1 of the manual.

1. This Tournament is being played under The Rules of Golf Croquet and Regulations, the ACA TRegs and the Conditions of Play as published.
Please note that spectators are **NOT** appointed as Authorised Referees.
2. The Rules say that Rule 15.1.3 “Where a stroke is to be played that may result in the commission of a fault or a ball leaving the court in a critical position, the player should first request the opposing side (or a referee, if present) to watch the stroke. If the player does not make the request, the opposing side may forestall play and require the stroke to be watched”. If a player asks an opponent to watch a stroke, the player must accept the opponent’s decision on any matter of fact regarding that stroke. If the opponent does not want to accept that responsibility, he may call for a referee to watch the stroke.
3. If your court is double banked, it is required under GC Rule 17.2 that you ask permission of the players of the other game **before lifting** the ball. It may be in a critical position even if it is in an open part of the court.
4. An accepted method of calling a referee is to raise your mallet above your head. Calling out for a referee can be disturbing to other games, and you should only do that if raising the mallet has not attracted a referee’s attention.
5. *(If the games are time-limited)* In the absence of a specifically appointed timekeeper the referee may be able to discharge this duty, but only if sufficient referee numbers are available. Otherwise please listen for your timer to ring. *(Add any other information you wish regarding attending to the timer during the match).*
6. The referees are those wearing high visibility vests. There is a list of Authorised Referees on the notice board.
7. Referees in this tournament are [Supervising Referees]/[Referees on Request]. [State which, and what that means, if necessary].
8. Any questions?
9. I wish you all a good, successful and enjoyable Tournament.

Note. Most Tournament Referee addresses do not mention all of these points, but it gives you an idea of some of the points you might want to make as a Tournament Referee.

Section D – Training

D1 – REFRESHER COURSES – PRESENTATION AND PARTICIPATION

The attendance at, or the conducting of a GCR Refresher Course during each 2 year period is a requirement for ACA registered GCRs who wish to reaccredit in accordance with the ACA *Accreditation and Reaccreditation Programs for Referee and Umpires*.

It is important for all GCRs to keep themselves up to date regarding rules changes, any official rulings on the rules and refereeing techniques.

Successful Refresher Courses do not just happen. Success depends upon the preparation and effort put in place by both the presenter and the participants.

1.1 To be successful a Refresher Course ought

- 1.1.1 Be conducted in a suitably pleasant environment with adequate club house and on court facilities and equipment.
- 1.1.2 Not be held at any venue on days when there is a club activity, any organised play or maintenance in progress as all of these can cause distraction and interference.
- 1.1.3 Be well planned, informative and enjoyable and conducted in a relaxed manner. The planning and content will be largely governed by the time available; for example, the content of a full day course will naturally be different to a half day course.

1.2 The Presenter

- 1.2.1 Should prepare and distribute a notice advising of the proposed agenda which could include items such as:
 - 1.2.1.1 Rules and Rulings Review;
 - 1.2.1.2 Practical Refereeing Techniques;
 - 1.2.1.3 Practical Training Techniques;
 - 1.2.1.4 Question and Answer Time.
- 1.2.2 Needs to ensure there will be adequate facilities available at the venue e.g.:
 - 1.2.2.1 Whiteboard and pens;
 - 1.2.2.2 Power outlets, if required for visual presentations;
 - 1.2.2.3 Tables and chairs;
 - 1.2.2.4 On court equipment.
- 1.2.3 Ought to arrive at the venue sufficiently early to set up the training material, both on and off the court.
- 1.2.4 Needs a well-planned but flexible timetable to include:
 - 1.2.4.1 Introduction and outline of the course;
 - 1.2.4.2 Rules session(s), including Q & A time;
 - 1.2.4.3 Break times, including lunch break and comfort break. Each session should not be longer than 60 minutes, followed by a 10 minute break to help prevent the participants from becoming getting tired and less receptive;
 - 1.2.4.4 On court refereeing and training techniques, including demonstrations and involvement of participants;
 - 1.2.4.5 Specific Q & A session;
 - 1.2.4.6 End of day review, with feedback questionnaire. Hopefully completed by all present during the course.
- 1.2.5 Should have own teaching and demonstration aids.

- 1.2.6 Should avoid “over loading” the course’s agenda:
- 1.2.6.1 Keep to topical issues;
 - 1.2.6.2 Avoid unnecessary involved detail;
 - 1.2.6.3 Cater to the participants’ requests;
 - 1.2.6.4 Introduce any recent innovations, rulings and techniques.
- 1.2.7 Rules sessions:
- 1.2.7.1 Do not conduct a didactic lecture;
 - 1.2.7.2 Do not simply work through the wording of the rules. Remember the course is for GCRs, who should have a reasonable understanding on the wording;
 - 1.2.7.3 In many instances it is better to concentrate on real life situations dealing with the application of the rules rather than the actual wording of the rules themselves;
 - 1.2.7.4 Ensure the participants are aware of and understand any Official Rulings on the Rules.
- 1.2.8 On court session
- 1.2.8.1 Helpers and “stooges” to act out faults and situations are very helpful;
 - 1.2.8.2 Using material from Part 2 of the ACA GCR Assessment can be helpful;
 - 1.2.8.3 Participants appreciate viewing strokes replayed in slow-motion that have been filmed with a high-speed video camera. They find that to be an interesting and informative way to learn how to judge double taps – by seeing what really is or isn’t a double tap and comparing the outcome with the recommended method for judging double taps during a game. If a high-speed camera is not available, Carbon Paper Impact Tests can be done instead (See Section B6.1).
 - 1.2.8.4 Demonstrate all the other types of Fault (listed in GC Rule 11.2).
 - 1.2.8.5 Demonstrate and discuss examples of offside balls;
 - 1.2.8.6 Practical demonstrations are an excellent means of teaching and there are many situations that can be set up to demonstrate the application of the rules, such as:
 - A ball is to be stationary before it is struck by a mallet;
 - A ball that’s an outside agency and contacted by a ball from its own game;
 - A ball that is contacted by a moving ball from a double banked game;
 - Offside ball examples;
 - A ball that has been played from off the court.
- 1.2.9 Have available a brief questionnaire for the candidates to complete. This is an invaluable source of feedback information to help improve the presenter’s performance at future presentations. Send copies to both the SCR and NCRGC.

1.3 The Participants

Participants should arrive at the course prepared and have -

- 1.3.1 Specific questions and requests ready to be asked;
- 1.3.2 A list of past experiences involving players and referees they would like addressed.

Unless the participants become involved, the course as a whole is not likely to be very fruitful nor enjoyable for those in attendance. They should be encouraged to join in discussions.

Likewise, they should be encouraged to actively participate in the on-court practical session. Very little is likely to be gained by sitting quietly and listening to the presenter drone on and on.

It helps the sessions progress more successfully if the participants are advised not be shy or frightened about interrupting the presenter at any time and ask for further information on a particular issue or for the presenter to repeat a particular point or to explain a situation in

another way. Asking what might seem like an annoying question can often be very helpful to the group as well to the individual.

When conducting training sessions, it can be helpful to begin by telling the group:

- 1.3.3 If there is a question they wish to be answered, but feel too timid or embarrassed to ask, be assured there will be someone else in the group hoping that very question will be asked. So just open up and ask it;
- 1.3.4 There are no “foolish” questions, only lost opportunities. It is only a fool who labels a question as being “foolish”;
- 1.3.5 Join in during discussion sessions on rules etc.;
- 1.3.6 Actively participate in on court demonstrations. Do not be shy;
- 1.3.7 Complete the end of course questionnaire. It is only with feedback that presenters learn of the strengths and weaknesses of their performances. With feedback, improvement can be made.

Sometimes when the group is not asking many questions, not being very interactive and generally appearing to be too frightened or shy to contribute to the session it helps to make some sort of outrageous statement or propose a ridiculous example of a rule application. The usual response is for all to look a bit stunned, followed by a barrage of questions or contradictions of what has just been said. From there the session continues in a livelier way with far better input from the participants.

D2 – PREPARING QUESTIONS AND ANSWERS BY CORRESPONDENCE

It frequently happens when asked to solve a problem either by mail, email or phone and having worked some way through the question it arises that there is not enough information provided to formulate an appropriate reply.

2.1 Preparing the question

When seeking an opinion about how a situation that has or might occur in golf croquet should be resolved, all relevant aspects of the situation should be described. The following is a list of things to consider including in the description. Many things in the list will not be relevant to some situations, and the list is not exhaustive: there may be things not listed here that should be mentioned in the description. Nevertheless, this is a useful checklist to ensure adequate information is supplied by the person making the enquiry.

- 2.1.1 Before phoning – make notes to be able to refer to during the conversation.
- 2.1.2 Before writing prepare a preliminary outline of the problem and then use that outline to present a clear description of the problem.
- 2.1.3 Specify what type of a game the issue relates to e.g.
 - 2.1.3.1 Is it level or handicap?
 - 2.1.3.2 What level of competition it is?
 - 2.1.3.3 What is the level of ability of the players concerned?
 - 2.1.3.4 Is the game time limited or not.
 - 2.1.3.5 What type of event – Australian Championships or club event etc.?
- 2.1.4 Was there a referee involved and if so in what capacity was the referee operating; TR, SuR, RiC or RoR etc.?
- 2.1.5 Was a timekeeper involved?
- 2.1.6 Was the timer stopped and if so, who did it, for how long and was it restarted?
- 2.1.7 What happened next?
- 2.1.8 Explain the sequence of events, specify who said what (write notes). Also specify any change of mode that the referee assumed or was asked to assume.
- 2.1.9 When a ruling was made by the referee was the relevant rule or regulation used disclosed and explained by the referee?
- 2.1.10 Where was the TR available at that time?
- 2.1.11 Was the TR called? If so at what point.
- 2.1.12 If the TR was not called what happened next?
- 2.1.13 Was the TM or VM involved and if so why and what transpired?
- 2.1.14 What then finally happened?
- 2.1.15 Did the person who is reporting this incident write notes and how soon after the event were these notes written?

2.2 Preparing the answer

The following is offered to help those who are requested to supply an answer or to give an opinion on particular situations.

- 2.2.1 With the availability of hindsight and plenty of time to sit, read and think over questions presented by mail, email, or phone it is possible to prepare for the enquirer a more detailed and accurate opinion.
- 2.2.2 If not enough information has been offered the respondent should request further information as described above.
- 2.2.3 Any question asked should be answered to the best of your ability and no question should be looked upon as trivial or too simple to warrant a full explanation. What might seem patently clear to one person can be quite confusing to another, especially to an inexperienced player or referee.
- 2.2.4 Always quote the Rule, Commentary, Official Ruling or Regulation that pertains to the questions and your answers.

- 2.2.5 It can sometimes help make your reply more easily understood if you can quote examples of real life situations that you know about, that are similar to those on which your opinion is sought.

D3 – GOLF CROQUET REFEREE TRAINING

A National GCR Training Program is being developed by the GC Technical Panel but until this is completed each State should continue with their own training programs and courses.

No matter what form a State's training course takes the requirements for candidates to qualify as an ACA accredited GCR remain the same.

3.1 Requirements needed to attain ACA GCR status

Successful completion of the following four steps

- Step 1 - ASC "*Community Officiating General Principles Course*".
- Step 2 - Golf Croquet Referees Open Book Home Exam.
- Step 3 - An assessment of the Practical Techniques of GC Refereeing.
- Step 4 - An assessment of the Knowledge and Understanding of the Rules of Golf Croquet.

Steps 1 and 2 must be completed before steps 3 and 4 may be attempted.

Step 3 is often referred to as the *theory* exam and, in addition to questions on the Rules of Golf Croquet, may contain questions on the latest Official Rulings on the WCF Rules of Golf Croquet, the Australian Tournament Regulations and the WCF Refereeing Regulations.

3.2 Golf Croquet Referee Accreditation

Candidates attempting to achieve ACA GCR Accreditation will need access to the following material -

- 3.2.1 *The Rules of Golf Croquet 5th edition*
- 3.2.2 *Official Rulings on the WCF GC Rules*
- 3.2.3 *ACA Tournament Regulations*
- 3.2.4 *WCF Refereeing Regulations*
- 3.2.5 *ACA Golf Croquet Refereeing Manual*

The references mentioned above are available for download from the ACA. www.croquet-australia.com.au, or WCF www.worldcroquet.org websites and *Rules of Golf Croquet* can be purchased from each State association.

3.3 Attendance Training Course

Attendance at a well-structured GC referee training course is necessary for the candidate to acquire:

- 3.3.1 A good understanding of the GC Rules and Official Rulings on the WCF GC Rules.
- 3.3.2 Competency in the 12 Practical Techniques of GC refereeing listed in Part 2 of the GCR Assessment, especially:
 - 3.3.2.1 Ball marking
 - 3.3.2.2 Detection of faults
 - 3.3.2.3 Where to stand when watching a stroke where special care is needed to be taken by the striker to avoid committing a fault
 - 3.3.2.4 Hoop checking and resetting
 - 3.3.2.5 Deciding if a hoop has been run
 - 3.3.2.6 Deciding if a ball is still on the court or has left the court
 - 3.3.2.7 General set up of the court
 - 3.3.2.8 Replacing balls displaced by a ball from a double banked game

- 3.3.2.9 Assessing the degree of court damage made by a mallet and whether it is enough to be a fault
- 3.3.2.10 How to instruct a player seeking relief from court damage or from fixed immovable outside agencies and uneven stance.
- 3.3.3 Awareness of health and safety issues
- 3.3.4 An understanding of:
 - 3.3.4.1 Duties & powers of the TR (Section C3 of this manual and WCF Refereeing Regulations, R5);
 - 3.3.4.2. Player Behaviour (GC Rules, R16)
 - 3.3.4.3 Appeals against referee decisions (WCF Refereeing Regs, R6)
- 3.3.5 An understanding of the ACA Tournament Regulations, in particular the Standard and Specific GC Conditions of Play and the section devoted to GC referees.
- 3.3.6 An understanding of the Refereeing Regulations

Section E – Ethics and Etiquette

E1 – ETHICS FOR GOLF CROQUET REFEREES

- 1.1 Respect the rights, dignity, worth, health and safety of players, officials and spectators. Refrain from any discriminatory practices on the basis of age, gender, ethnic origin, religion or ability.
- 1.2 Be professional in your appearance and manner. Accept responsibility for all actions taken. Display high standards in language, manners, punctuality, preparation and presentation.
- 1.3 Show control, respect, dignity and professionalism to players, coaches, managers, administrators, the media, parents and spectators and encourage other referees to demonstrate the same respect toward anyone involved in the games of croquet.
- 1.4 At all times be courteous, respectful and open to discussion and interaction.
- 1.5 Make a commitment to provide quality service to refereeing within your state and the ACA, by seeking continual improvement of your refereeing knowledge and skill through study, performance appraisal and regular updating of competencies.
- 1.6 Maintain and improve your refereeing accreditation by reaccrediting as laid down in the ACA *Accreditation and Reaccreditation Programs for Referees and Umpires*. Continue to improve your level of competence. This is best done by officiating at ACA and State Association controlled events.
- 1.7 Always operate within the rules, regulations, spirit and intent of the game of Golf Croquet. Abide by and respect the regulations governing Golf Croquet, sport generally and the organisations and individuals administering those regulations.
- 1.8 Refrain from any form of personal abuse or criticism, verbal, physical or psychological towards players.
- 1.9 Refrain from any form of sexual harassment, explicit, implicit, verbal and non-verbal.
- 1.10 Place the safety and welfare of the participants above all else. Ensure that equipment and facilities meet rule and regulation requirements and safety standards. Remember that the laws of the land override the rules and regulations of Golf Croquet.
- 1.11 At all times be impartial.
- 1.12 Value the individual in sport.
- 1.13 Avoid any situation which may lead to a conflict of interest.
- 1.14 Show concern and caution towards unwell and injured athletes.
- 1.15 Encourage inclusiveness and access to all areas of refereeing.
- 1.16 Be a positive role model for croquet and refereeing.
- 1.17 Abide by the ACA's Anti-Doping Policy

E2 – ON COURT ETIQUETTE FOR GOLF CROQUET REFEREES

As well as the suggestions offered in Section B17 on how GCRs ought to manage players and conduct themselves on court during matches, the GCR's function is to see that a fair and equal contest is conducted within the framework of the rules and regulations.

- 2.1 Be impartial and appear to be impartial. If you realise that you made a wrong decision do not make an “even up” decision later on. It is better after the game to take the players aside, admit your mistake and apologise as necessary.
- 2.2 At all times be courteous and respectful to players and in return expect to be treated with respect.
- 2.3 Remember you are a qualified referee and need to observe the principles of refereeing at all times, including when you are a player. Be a positive role model in behaviour and appearance.
- 2.4 Never give tactical advice to a player during a game. If offering advice after the game, if possible, do so in the presence of the opponent.
- 2.5 If a player appeals against a referee's decision on a matter of fact, quietly and diplomatically inform the player that matter of fact decisions cannot be appealed. If the player is being difficult on this point summon the TR who should reinforce your stance.
- 2.6 If a player appeals a referee's application of a rule this should be accepted graciously and the appeal referred to the TR.
- 2.7 When going onto the court to watch a shot, avoid walking across the striker's line of aim, as your footprints could affect subsequent shots, especially on a rain affected court or a court with a soft surface.
- 2.8 Avoid casting your shadow across the striker's ball and the intended line of the shot to be played.
- 2.9 Do not voluntarily hold lengthy conversations with spectators but be available to answer any reasonable questions about rules and regulations both on and off the court.
- 2.10 Be open to discussion and interaction at appropriate times
- 2.11 Do not conduct loud conversations or move in a way that might distract the striker.
- 2.12 When summoned, do not run onto the court but move promptly and with dignity.
- 2.13 Avoid using marking techniques that are likely to distract the striker.
- 2.14 Use plastic markers only. Do not use coins as they can damage mower blades if left on the court.
- 2.15 Always stand where you can watch the action clearly, with consistency and safety.
- 2.16 Make players aware of any safety concerns you have about the court. Place the safety and welfare of the participants above all else.
- 2.17 When adjudicating a stroke, never speak or move while the stroke is being played.
- 2.18 At all times give clear, audible verbal decisions.
- 2.19 Accept fair criticism with good nature.
- 2.20 Remember it is the players' game and for their enjoyment. So be as unobtrusive as possible and do not try to become part of the play nor take over their game.

End of *Golf Croquet Refereeing Manual*, 2020