

02 Measuring Equipment

International events

World Bowls' policy for its official events, and any other international events involving players from its Member National Authorities, is that you can only use the following equipment:

The Box Measure <https://youtu.be/sBhCgyGx1B0>

The box string measure is ideal if the jack and bowls are more than 150 millimetres apart. It's a length of string with a pointer at one end and a reel at the other. You use the button to pull the string out and wind it back onto the reel.



When using a box string measure:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- To measure the distance between a **bowl in the ditch and the jack on the green** place the fixed pointer of the measure against the jack with the string extended a short distance towards the bowl to be measured.
- To measure the distance between a **jack in the ditch and a bowl on the green** place the fixed pointer of the measure against the bowl with the string extended a short distance towards the bowl to be measured.
- Hold down the release button and extend the string to the bowl until the tip of the pointer just touches the bowl.
- Release the button on the measure and check that the measure is straight and accurate.
- Without altering the setting of the measure, move the measure so that the fixed pointer is against the jack but the measure is pointing toward the second bowl to be measured.
- Extend the string and check the measure against the second bowl by passing the pointer down from the top to the bottom and from side to side.
- Remove your box measure.

The Calliper Measure <https://youtu.be/OixCjiySM5U>

Callipers are ideal where the distance between the jack and bowls is fairly short – say between 10 and 150 millimetres. Callipers have two legs, fixed together at one end by a spring. You can adjust the distance between the tips of the legs and fix them apart using a screw-nut on a threaded rod. You can use them to measure to a jack or bowl in the ditch but only if there is nothing between the nearest points of the jack and bowl.



When using callipers:

- Make sure you follow the Common Procedures for conducting a measure described earlier.

- Kneel on the green and set the callipers at a distance that seems appropriate to the distance to be measured. Start with the callipers set at a distance that is less than the distance to be measured.
- Steady the hands by resting them on the green
- Move the callipers from top to bottom between the jack and bowl. As the bowl is the heavier object and less in danger of moving, initial contact should be made with the bowl and not the jack. (Note: The measure is made from the nearest points on the bowl and jack so the callipers must be held at an angle.)
- Remove the callipers from between the bowl and jack to make any adjustment to the setting.
- Open the callipers gradually and repeat step until the minimum of contact is made with both bowl and jack.
- Without altering the setting of the callipers, check the other bowls.
- It is important when using Callipers that in your Feeler Gauge there are sufficient blades to cover the minimum measuring distance of your Callipers. This should be checked by all umpires within their kits.
- Remove your Callipers.

The Feeler Gauge <https://youtu.be/4QIUwGOXC10>

Feeler gauges are ideal where the distance between the jack and bowls is very small – say between 0 and 10 millimetres. The gauges are a number of blades fixed at one end within a handle. The blades are different thicknesses and you can use them individually or in combination.



When using feeler gauges:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Select sufficient gauges that seem appropriate to the measure to be made. Start with a selection that has a combined thickness less than the distance to be measured.
- Steady both hands on the green.
- Pass the gauges down first bowl to be measured and the jack using the bowl as a firm object and with the flat surface of the gauges facing the bowl and the jack. Do not slide the gauges down the jack. Do not force the gauges between the bowl and the jack. (Note: The gauges should be on an angle to allow for the nearest points of the jack and bowl being at different heights.)
- If the gauges do not pass between the bowl and the jack, remove them and reduce their thickness and try again.
- If the gauges pass between the bowl and the jack, remove them and increase their thickness and repeat the above steps until there is the minimum of contact with the bowl and jack.

- Without altering the setting of the gauges, **move to the second bowl and try passing the gauges through the gap** between bowl and jack.
- It is important when using Callipers that in your **Feeler Gauge there are sufficient blades to cover up to the minimum measuring distance of your Callipers**. This should be checked by all umpires within their kits.
- **Remove** your Feeler Gauge.

The 30 metre Tape https://youtu.be/jb0VO_ZMwbk

You use the 30-metre tape to **decide whether the jack or a bowl is beyond the minimum distance it must be from the front edge of the mat**. You can use a tape that rewinds manually or automatically.



Measuring the length of a delivered jack

When using a 30-metre tape:

- Make sure you **follow the Common Procedures** for conducting a measure described earlier.
- **Make sure the jack has been centred**.
- **Check that the front edge of the mat is at least 2 metres from the rear ditch**.
- Have the zero end of the 30-metre tape **fixed by a spike to the green at the centre of the front of the mat**.
- Walk forward from the mat to the jack allowing the tape to unwind as you do so **until the 21-metre mark on the tape has been reached. Lock the tape**.
- **Place the 21-metre mark on the tape on the surface of the green, making sure that the tape is straight and tight and check that the jack is more than 21 metres from the front of the mat**. To avoid disturbing the jack if the tape extends beyond it, position the tape as close as possible to one side of the jack. The measure is made to the **edge of the jack nearest to the mat line – that is, the whole of the jack must be past the 21-metre mark to be live**.
- If it is **the first time the jack has been incorrectly delivered** in that end less than 21 metres, return it to the mat end, and ensure the opposition Lead delivers it.
- If it is **the second time the jack has been incorrectly delivered** in that end the jack must be placed with its nearest point to the mat line being 2 metres from the front ditch.
- **Remove** and quickly rewind the tape as you leave the green.

Measuring the length of a delivered bowl or a rebounded jack

When using a 30-metre tape:

- Make sure you **follow the Common Procedures** for conducting a measure described earlier
- Make sure the jack or bowl is **within the boundaries of the rink**.
- Have the zero end of the 30-metre tape **fixed by a spike to the green at the centre of the front of the mat**. Do not centre the jack or bowl.

- Walk forward from the mat to the jack or bowl allowing the tape to unwind as you do so until the **appropriate mark has been reached**. Place the mark on the surface of the green, making sure that the tape is straight and tight and check the length of the jack or bowl. To avoid disturbing the jack or bowl if the tape extends beyond it, it will be necessary to position the tape as close as possible to one side of the jack. The measure is made to the edge of the jack or bowl nearest to the mat line. The whole of the jack or the bowl must be **past the minimum distance from the front of the mat** to be live. **If a bowl is less than the minimum length of 14 metres the bowl is declared dead and removed (Law 17.1.3). If a jack is less than the minimum length of 18 metres the end is declared dead (Law 19.1.4 see also B.4.2 Distances Illustrated).**
- If either (the jack or bowl) is less than the appropriate distance **they must be returned and the end must be declared dead.**
- **Remove** and quickly rewind the tape as you leave the green.

The Boundary Scope <https://youtu.be/5wXJrMB1dHU>

The boundary scope has a sighting mechanism mounted on a stand. It may also have a ditch sighting-plate attached. It is suitable for deciding whether a jack or bowl is within the boundaries of the rink of play. The bowl or jack may either be on the green or in the ditch.

Jack or bowl on the green

Assume **the decision to be made is to decide if a bowl on the boundary line between rinks 3 and 4** is in Rink 3 (the rink of play). The rink boundary is the CENTRE of the boundary marker. Make sure you **follow the Common Procedures** for conducting a measure described earlier



- **Place an object near the bowl on the rink of play**, Rink 3, (say, your hat) so you are always conscious Rink 3 is the rink the bowl must be “in” when viewed through the scope.
- Set up the boundary scope at the end **furthest from the bowl**.
- If the boundary markers are on top of the bank, **place the scope immediately behind centred on the boundary marker between rinks 3 and 4** and pointing to the boundary peg at the other end of the rink.
- *If the boundary markers are on the face of the bank, place the alignment mark on the centre of the base of the scope immediately above the centre of the boundary peg between rinks 3 and 4 and pointing to the boundary marker at the other end of the rink.*
- Kneel so that your **eyes are about 75mm behind the scope**. It is a rifle sight – you will see nothing if your eyes are too close.
- Adjust the level of the scope until the **horizontal cross-hair is parallel to the top of the bank at the far end of the rink**. This ensures that the vertical hair is perpendicular.
- Using both hands, **adjust the scope right or left until the vertical hair comes into line with the centre of the bottom** of the boundary marker.
- Make the decision as to whether the jack or bowl is live or dead and **remove the scope**.

Jack or bowl in the ditch When using a boundary scope:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Set up the scope at the ditch end and align the scope as described above
- Step onto the green in front of the scope and look down through the peep-hole at the front of the scope to line up the cross hair on the base of the scope with the edge of the jack or bowl in the ditch.
- Make the decision as to whether the jack or bowl is live or dead. If shadows make the decision difficult, place a small sight board under the edge of the jack or bowl and remove the scope.

The Fixed Tape <https://youtu.be/5CrdusV7GVk>

You can use the Fixed Tape instead of the string measure. The tape is a calibrated tape attached to an L-shaped frame. You use a screw on the base-plate (or appropriate pins) to fix the tape in place.

When using a long tape:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Place the tape base so that it is just touching the bowl. (The bowl is less subject to disturbance than the jack.)
- Looking from behind the bowl, make sure that the tape is pointing in a straight line from the bowl to the jack and spike the tape to the green.
- Extend the tape until the screw adjuster is just short of the jack and lock the tape at this distance.
- Use the screw adjuster until the minimum of contact is made with the jack.
- Check to see that the tape base is still in contact with the bowl.
- Check other bowl(s) without altering the setting of the measure, by removing the first bowl and reposition it against the second bowl to be measured so that it points directly to the jack.
- Make your decision about the shot and remove the tape.

The Linear Sight

The linear sight is an open rectangular frame with a pointer and an angled mirror at one end and a sighting-frame at the other. A piece of wire runs along the centre of the frame from the base of the mirror to the top of the sighting-frame.

Using a Linear Sight to Check Bowl on Rink:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Check that the boundary markers are in a vertical position.



- At the end of the rink closest to the bowl or jack which has to be checked, stand on the green with feet apart.
- Hold the linear sight with both hands with the vertical sighting wire nearest to you.
- Place the linear sight point to the centre line of the boundary marker.
- With your head above the vertical sighting wire, look into the mirror and adjust the level of the linear sight. At all times, as seen in the mirror, the vertical sighting wire in the mirror and the centre of the far marker must align.
- Without moving your head, the disputed bowl or jack can be judged to be in or out.
- If the disputed bowl or jack on the green is very close to the ditch, then tilt the mirror so as to bring the bowl or jack into view.
- Make the decision, indicate the result to the players and remove the Linear Sight.

Using a Linear Sight to Check Bowl or Jack in Ditch

- Place the linear sight above the disputed bowl or jack, and align to the far boundary peg as above. Look down past the horizontal wire at the bowl or jack in the ditch.
- Make the decision, indicate the result to the players and remove the Linear Sight.

The String Measure <https://youtu.be/JEi3Rw4WPR4>

The string measure is ideal where the jack and bowls are too far apart for a box string measure to reach, or where the jack or at least one of the bowls is in the ditch. It's a length of string wound around a reel at one end and a fixed pointer at the other end. There is a second (moveable) pointer that you can slide along the string that must have a lockable device to ensure that the measure does not slip once in use.



As an alternative, when a string measure is not long enough, a boundary string (shown right), modified by the addition of a fixed and a movable pointer, can be used instead. In countries where a boundary string measure does not form part of the standard equipment, the long tape should be used when a string measure is not long enough.

When using a string measure or a modified boundary string:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Maintain communication with your assistant at all times.
- Have your assistant place the fixed end of the measure against the jack.
- Extend the string to the bowl.
- Check with your assistant that the pointer is just touching the jack and the string is in a straight line from jack to bowl before you set your measurement.
- Without altering the setting of the measure, check the measure from the jack to the second bowl.
- If the measure is to a jack or bowl in the ditch, make sure that the string crosses the ditch in a straight line between the jack and the bowl. Also, make sure that the string does not cut into the green at the point where it crosses the edge of the ditch.

The Boundary String https://youtu.be/jb0VO_ZMwbk

The boundary string is a length of string on a reel. It is suitable for deciding whether a jack or bowl is within the boundaries of the rink of play.



- **Jack or bowl on the green**
When using a boundary string:
- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Ask one assistant to take the loose end of the string to the far end of the rink away from the decision.
- Ask them to place the string on the top of the bank and in line with the centre of the rink boundary peg.
- Ask another assistant to take the other end of the string to the opposite end of the rink and, keeping it taught, place it on the top of the bank and in line with the centre of the boundary peg.
- Make sure that at no time does the string come into contact with the bowl or jack – by holding it above the object.
- Look down over the bowl or jack to see if you can make a decision.
- If not, ask the assistant nearest to you to slowly move the string down the centre line of the boundary peg and stop when the string is just above the bowl or jack.
- Determine if the bowl or jack is live or dead by looking down over it.
- If you still cannot decide by looking down, slide a square up to the bowl or jack from the side of the rink of play until it just touches either the string or the jack or bowl, then make the decision.
- Quickly re-wind the string as you move from the rink.

Jack or bowl in the ditch when using a boundary string:

- Make sure you follow the Common Procedures for conducting a measure described earlier.
- Place a boundary string on the banks as described above.
- If you cannot determine the result by looking down from above the jack or bowl, then use a square.
- Place a square against the jack or bowl making sure that it is level.
- Determine if the jack or bowl is live using the square and the boundary string.