



The Phantom Commander has been designed to lay out the Brunswick Phantom series of bowling balls according to each individual bowler's track and axis. The Commander consists of two pieces that are used along with an existing quarter scale in order to quickly and easily mark the center of the grip for drilling purposes.

ASSEMBLY:

The Commander cap consists of a ring and a plate that must be assembled. The straight edges above the curved side of the plate slide into the two grooves in the inside of the ring, so that the tips on the straight edges rest in the shallow notches on the underside of the ring. The deep notches in the ring should face the same direction as the notch in the curved side of the plate. Once the plate is snapped into the ring, a drop of super glue on each tip will secure the head cap assembly. The side rule attachment requires no assembly.

The Commander head cap has been designed so that the two deep notches in the ring fit snugly onto the rails of most quarter scales. If the notches are too narrow for your quarter scale, simply file them open so that they fit snugly but allow the head cap assembly to be moved along the rail.

RENUMBERING THE QUARTER SCALE FACE:

Before the Commander is ready for use, the quarter scale face needs to be remarked so that 0 inches is at the outer edge and 6-3/4 inches is in the center of the face. A template (Figure 1) is provided to place behind the quarter scale face to help in renumbering the quarter scale. If the end of the quarter scale looks like Figure 2 it is important to number the side labeled "A". If the end of the quarter scale looks like Figure 3 either side can be numbered.

To use the Commander it is necessary to find the bowler's axis point from an old ball and measure where the axis is with respect to the center of the grip.

FINDING THE AXIS ON AN EXISTING BOWLING BALL:

1. Trace the track with a grease marking pencil to form a circle on the ball.
2. Place the ball in a ball cup with the track circle in the bottom half of the ball. (For a full roller make sure the positive half of the ball is facing up.)
3. Adjust the track circle so that it is parallel to the table.
4. Mark the very top of the ball. This will be the bowler's axis.

If desired, a piece of white tape can be placed on the axis point. When the ball is thrown, the tape should spiral in a small circle. If it does not, adjust the tape until it spirals in a small circle for at least the first 15 feet down the lane.

RECORDING THE AXIS MEASUREMENTS:

1. Draw the bridge line between the finger holes and over the center of the thumb hole.
2. Find the point on the bridge line halfway between the edge of the thumb hole and the front edges of the finger holes.
3. Draw a line at a right angle to the bridge line through the point found in step 2. (Where the bridge line and this line meet is the center of the grip.)
4. Measure how far the axis is out from the center of the grip along the center line. Record this measurement.
5. Measure how far up or down from the center line the axis is. Record this measurement.

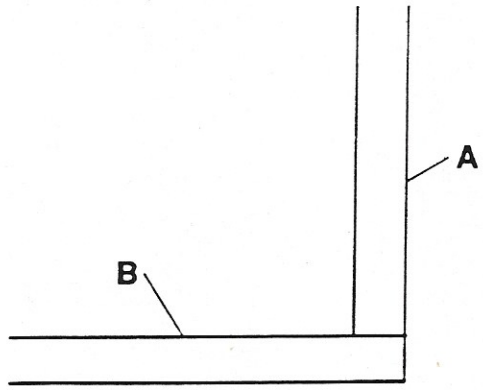
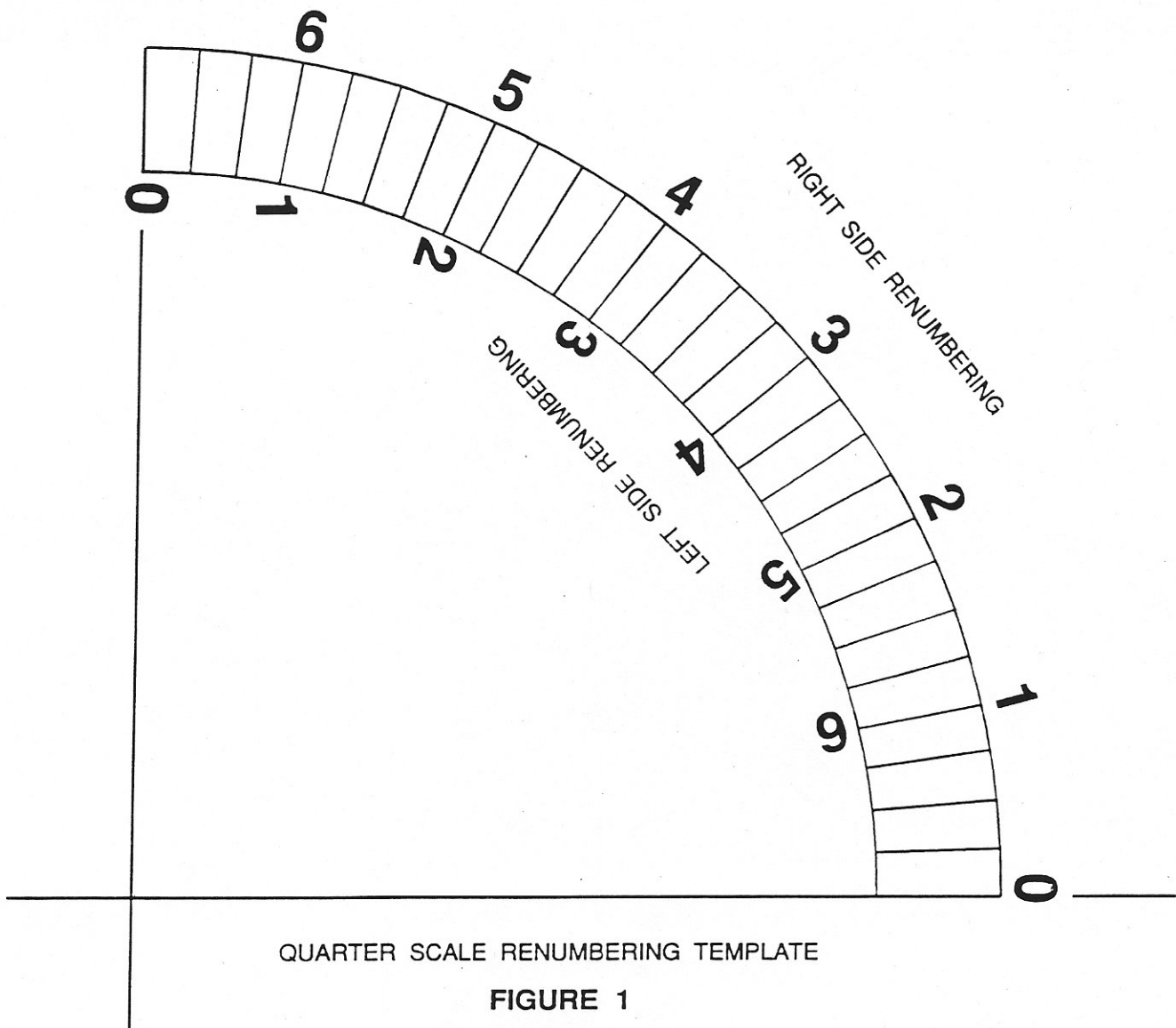
SETTING THE COMMANDER:

1. Place the quarter scale on the table so that the renumbered face is up and facing away from you.
2. Set the head cap on the renumbered face of the quarter scale so that the two deep notches of the ring and the notch of the flat plate all straddle the rail of the quarter scale. For a right-hander the flat plate should be to the right of the quarter scale cross bar. For a left-hander the plate should be to the left of the cross bar.
3. Move the head cap so that the flat plate is the same distance back from the end of the quarter scale as the bowler's axis is out from the center of the grip.
4. Clip the ruler attachment onto the right side of the base rail of the quarter scale for a right-hander, so the tip of the ruler is flush with the renumbered face of the quarter scale. (Left-hander, left side.)
5. Slide the ruler attachment up or down to match the distance the bowler's axis is above or below the center line. Each notch on the ruler is 1/8" inch. If the bowler's axis is above the center line, the tip of the ruler attachment will extend past the renumbered face of the quarter scale.

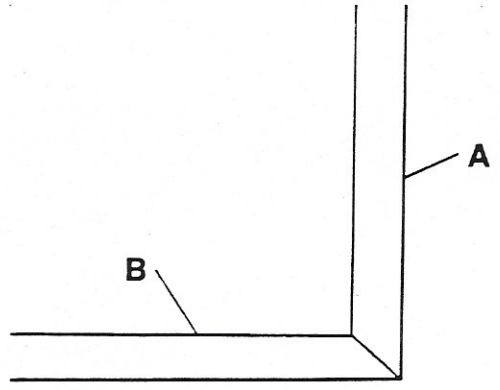
USING THE COMMANDER TO LAY OUT THE NEW BALL:

With the Commander set and locked in, place it on the ball so that the tip of the ruler attachment is on the point that is to be the axis after drilling. The center of the grip will then automatically be at the corner where the flat plate and the renumbered face of the quarter scale meet. Mark this corner with a grease pencil to mark the center of the grip and the ball is ready to drill. Once the axis point is chosen, the Commander can be rotated around that point in order to adjust the position of the label or the relative pin positions before marking the grip center.

For details on specific layouts for the Phantom series of bowling balls and how to use the Commander, please refer to the drilling manual or videotape on "How to Arm a Phantom".



QUARTER SCALE END VIEW
FIGURE 2



QUARTER SCALE END VIEW
FIGURE 3