Rounded balls with seams

form-Z can, of course, generate faceted soccer balls. But what about smoothly rounded balls whose seams are also shown? To create such balls, you model two pieces: a hexagonal and a pentagonal piece. You then attach copies of these pieces to the respective faces of the faceted soccer ball. You certainly do not try to construct the smoothly rounded ball all at once.

1 With Grid Snap on, generate a soccer ball by first clicking on the origin and then at a point on the X axis. Positioning the soccer ball this way will make matters easier for you. Also remember where you clicked for the second point, since you will need it again later.

2 You next need to position one of the hexagonal faces so that it is parallel to the XY plane. Working in the front view, note that the face marked a projects as a single line. Rotate the ball about its center so that the line of face a becomes exactly horizontal (parallel to X). Grid Snap should be on when you click on the center. It should be off when you rotate.

3 Switch to the top view. With topological level at Face and the Derivative Surface Object tool active, select the top face of the soccer ball (a).

4 Copy-scale it to produce a second hexagon inside the first.

5 With topological level at Object, use the Derivative Extrusion tool and extrude the two hexagons. Use a small height for the larger hexagon and a significantly greater height for the smaller hexagon, roughly as shown.

6 Union the two extruded hexagons.

7 You may next slightly scale the top face of the unioned object to give its sides a slight inclination (draft angle).

You have generated the basic hexagonal piece, whose top face will next be replaced with a rounded surface. Note that this hexagonal piece can also be generated using other methods; for example, as a boundary sweep using a properly drawn profile and the top face of the ball as a path.

You will now generate a revolved sphere which you will use to round the top end of the hexagonal piece.

8 In the Spherical Solid Options dialog select Revolved Sphere and set Length resolution to 64 and Depth resolution to 24. You can use values other than 64 for length, but a depth resolution of 24 (or any number divisible by 6) is highly recommended, so that the depth lines match the hexagonal shape exactly. Working in a front view with Grid Snap on, generate a sphere slightly larger than the soccer ball. This sphere should be sufficiently large to intersect the top part of the hexagonal piece, as shown.

9 Intersect (Boolean Intersection) the sphere and the hexagonal piece.

10 You may "lighten" the resulting piece by deleting the top point. You can also round it some more, as shown.

11 Repeat the same process for one of the pentagons. When done, you will have the two basic pieces you need to complete the smoothly rounded soccer ball.

Using face attachments, attach copies of the hexagonal and pentagonal pieces to the hexagonal and pentagonal faces of the soccer ball, respectively.