APPENDIX 4: CONSTRUCTION OF A PENTAGON

Construction of A Pentagon From One Fixed Diagonal

Establish the diagonal *D* by connecting the top and bottom of a major price move by a straight line. This diagonal will be toward the left and top of the pentagon to be constructed (see Figure A6.1).

Figure A6.1 Construction of a pentagon from one diagonal.

1. Measure the length of the diagonal D. This diagonal connects two points of the pentagon.
2. With the point of a compass at one end of the diagonal and the tip on the other, draw a long arc to the right; placing the point on the other end of the diagonal, draw another arc to the right. These arcs should not cross to avoid confusion.
3. The length of a side of a regular pentagon is calculated from the diagonal by the formula

$$S = 0.618 \times D$$

   Using a ruler, set the compass to the length of a side and place the point at one end of the diagonal. Draw an arc on both sides, crossing the arc on the right; do the same for the other end of the diagonal. The two new arcs will cross on the left. The three new crossings are the missing points of the pentagon.
4. The center of the pentagon can be found by bisecting any two sides. The point at which the two bisecting lines cross is the center. Use this point to circumscribe a circle around the pentagon.

Construction of A Pentagon From One Side

Establish the side *S* by connecting the top and bottom of a major price move with a straight line. As in the previous example, this side will be toward the top and left of the pentagon, which will extend down and to the right (see Figure A6.2).

Figure A6.2 Construction of a pentagon from one side.

1. Calculate the length of the diagonal *D* by applying the formula *D* = S/.618. This will require a ruler to determine the length of S.
2. Using a ruler again, set your compass to the length of the diagonal calculated in the first step. Draw wide arcs of radius *D* from the endpoints of *S* crossing to the lower right of S. The place of crossing will be the third point of the pentagon P_4, opposite side *S*.
3. Set the compass back to length *S* and place the point at P_4. Cross the inner arcs drawn in step 2 with a small arc drawn on either side of *P*. The place of crossing will be the two remaining points of the pentagon.
4. The perpendicular bisectors of any two sides will cross at the center of the pentagon and allow you to circumscribe a circle around the pentagon.

The perpendicular bisector of any side is constructed by setting the compass to any length greater than half of the line being bisected, then placing the point at one end of the line. Draw an arc on both sides of the line in the area above the center of the line. Do the same by placing the point of the compass at the other end and crossing the arcs already drawn. A line through the two crosses will be the perpendicular bisector of the original line.