Sṛṣṭikrama Construction of Śrīyantra*

Method of construction of Śrīyantra by Saunharkrama to the maximum correctness has been explained in the Historical Notes, *IJHS* 41.3 (2006) 327-333.

The method of construction of Śrīyantra by Sṛṣṭikrama has been explained very briefly in Sanskrit in the *Tripura Tāpinī Upniṣad*. English translation of the Sanskrit paragraph is also printed at pages 332-333 in the same issue. On the basis of description in Sanskrit it is very difficult to put into practice. Anyhow efforts are made to translate the paragraph to make it possible to draw the figure by Sṛṣṭikrama accordingly.

The diagram (Fig. 1) may please be seen. It is necessary to have measurements of nine segments of lines indicated by nine alphabets 'a' to 'i'
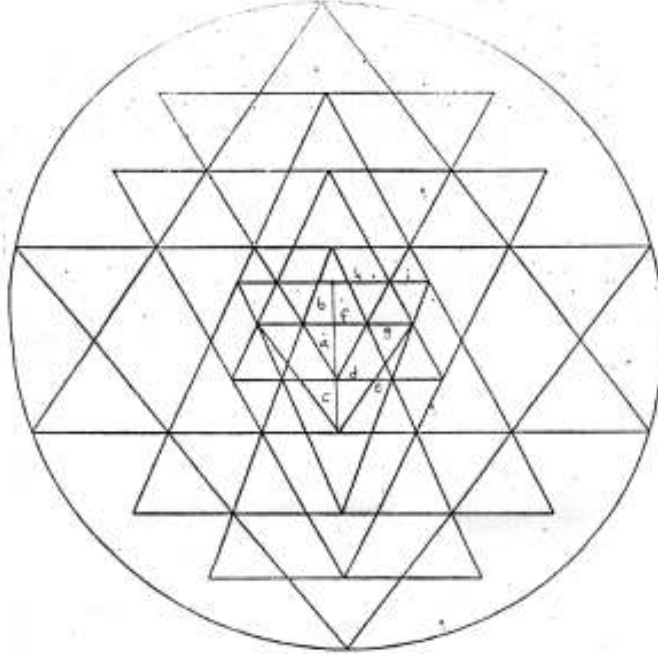

Fig. 1. Nine segments of Śrīyantra

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Table 1: Ready Reckoner for Śṛiṣṭikrama – Śrīyantra

Proportion		Small Bottom = 1/3rd Bottom, Center at midpoint of base	Small Top = 1/3rd Top, Center at midpoint of base	Small Top = 1/3rd Top, Center at midpoint of altitude	Small Top = 1/3 Top Center at the Trisecting point of altitude	Small Top = 1/3rd Top, Center at the apex point
$\dfrac{a}{a+b}$	1	0.5700483009966	0.583202460222	0.589087536582	0.598461461486	0.596853664698
$\dfrac{f+g}{f}$	2	2.4054114340112	2.325423100612	2.325385834520	2.254055805003	2.318831415345
$\dfrac{a+c}{a}$	3	1.959159702694	1.919780465168	1.938629683923	1.8625023859284	1.9840712337259
$\dfrac{d+e}{d}$	4	1.4520088415275	1.5339136330722	1.5424532044402	1.659473786630	1.5304563169126
$\dfrac{h+i}{h}$	5	1.694932787628	1.743196403385	1.741611219545	1.787918421759	1.744637113958

in the figure. After getting the measurements of nine segments, five proportions as stated in the first column of the Ready Reckoner (Table 1) are worked out. Five Śrīyantras of different specifications are drawn first by Saunharkrama and then measurements of nine segments of lines from each figure are taken. Five proportions are worked out for each figure. The method of drawing the figures is common for all five figures. One has to take corresponding proportions from different columns for five different figures. For five figures the proportions are given in five columns.

Readers are requested to try the method on computer CAD. However it is wonderful as to how our forefather could think of such a figure in the absence of computer and such advance instruments.

Successive step-by-step Sṛṣṭikrama construction of Śrīyantra may be seen (Fig. 2).

Construction of Śrīyantra by Sṛṣṭikrama (Fig. 2)

Step 1: Draw a horizontal straight line of suitable length (say about 2 cm).

Step 2: Taking the end points of the said line as centers and radius equal to the length of the line draw arcs of circles below the line interesecting each other.

Step 3: Join the end points of the horizontal lines and the intersecting point of the arcs so that an equilateral/equiangular triangle is completed. This is called a first 'Śakti' triangle.

Step 4: Draw the vertical altitude of the triangle (i.e. the line from the vertex point to the mid point of the base).

Step 5: Taking the vertx point as base, reduce/shrink the legnth of the altitude by scale 0.5700483009966 (*)

Note: (*) For drawing different figures corresponding scales shown in the Ready Reckoner is used. With the help of Computer only the length of line already drawn can be reduced by the given scale. (It is not removed or trimmed out).

Step 6: From the upper and point of the reduced altitude draw a horizontal straight line both ways which will be stopped or terminated by the side lines of the First/Śakti triangle.

Step 7: Taking the mid point of the said horizontal line (i.e. the top end point of the reduced altitude) as base, extend the said line both ways by scale 2.4054114340112(*)

Step 8: Taking the top end point of the reduced altitude as base, extend the altitude downwards by scale 1.959159702694(*)

Step 9: By joining the end points of the extended horizontal line and the extended vertical (altitude) line complete the second traingle. The equilateral triangle inside this second traingle is known as *Ādyā* (*Śakti*) triangle (*Trikona*)

Step 10: Through the vertex point of the first triangle (and also of the *Ādyā Trikona*) draw a horizontal, straight line both ways which will be stopped (terminated) by the side lines of the second triangle.

Step 11: Taking mid point of the said line as base extend the said line both wasy by scale 1.4520088415275 (*)

Step 12: Join the end points of the said extended line to the upward intersecting points of the sides of the first triangle and the base line of the second triangle.

Setp13: Extend the said lines upwards to meet each other in one point beyond the first horizontal line (Fig. 13). Thus the third (first *Śiva'*) triangle is completed in this figure there is a chain of eight small traingles. Therefore it is called as 'Aṣṭar' or 'Aṣṭar Cakra'

Step 14: Join the side verticides of the second triangle and the side vertex of the first traingle by oblique lines.

Step 15: Extend the oblique lines upward to meet each other in a point.

Step 16: Extend the oblique lines downwards and also extend the horizontal line drawn through the vertex of the first traingle both ways so that the oblique lines and the horizontal lines will meet each other and the triangle will be completed (Fig. 16).

Step 17: Taking the mid point of the first line as base extend the first line both ways by scale 1.694932787628 (*). Join the end point of the extended first line and the verticies of the 4th and 6th smallest triangles out of 'Aṣṭar' (Fig. 17)

Setp 18: Extend those oblique lines down wards to meet each other in a point (Fig. 18).

Step 19: Extend the sidelines of the first Śakti triangle upwards and also extend the sidelines of the first 'Śiva' triangle downwards.

Step 20: Draw horizontal lines through the top and bottom apex points of the 'Aṣtar' to meet the lines extended as stateed in step 19 and to complete the said traingles (Fig. 20). Thus a chain of 10 small triangles is completed which is called as 'Antar Daṣar'
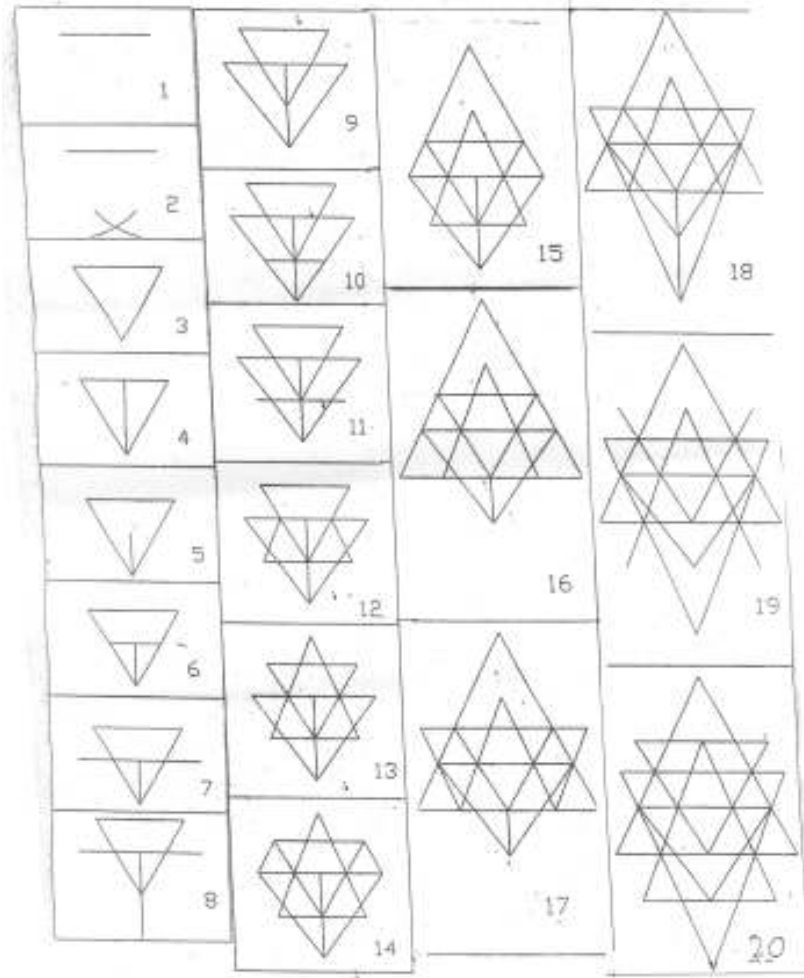

Fig. 2. 29 steps of Sṛṣtikrama construction

Step 21: Join the pairs of vertices in each quardrant (at the North East, East-South, South-West and North-West directions) by oblique lines (Fig. 21)

Step 22: Extend the oblique lines in the upper quadrant upwards and in the lower quadrant downwards to meet earch other in respective points at the north and south directions (Fig. 22).

Step 23: Now extend the said oblique lines in the upper quardrant down wards and in the lower quadrant upwards to meet the horizontal lines passing through the bottom and top apex points of the 'Aṣṭar' respectively and to complete the respective traingles.

Step 24: Once again extend further the sides of the first 'Śakti' triangle upwards and the sides of the first 'Śiva' triangle down wards to meet the horizontal lines passing through the apex points of 'Antar Daṣar' and to complete a chain of 10 small outer triangles which is called as 'Bāhir Daṣar' (Fig. 24).
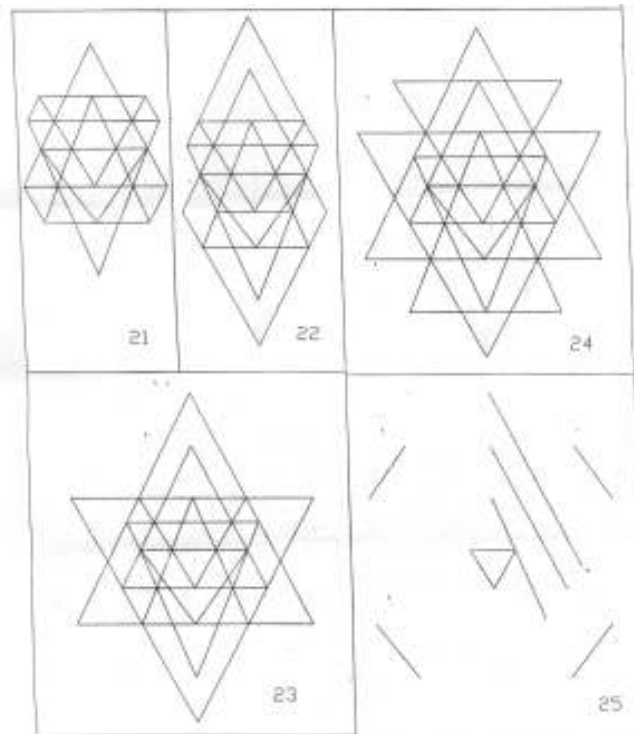

Fig. 2 (Continued)

Step 25 & 26: Draw four oblique lines in four quadrants each of which are the fourth lines from the inner most triangle as shown in Fig. 25. These lines will join two vertices in each quadrant (Fig. 26).

Step 27: Extend the oblique lines in the upper quadrant upward and in the lower quadrant downward to meet each other at the north and south directions.
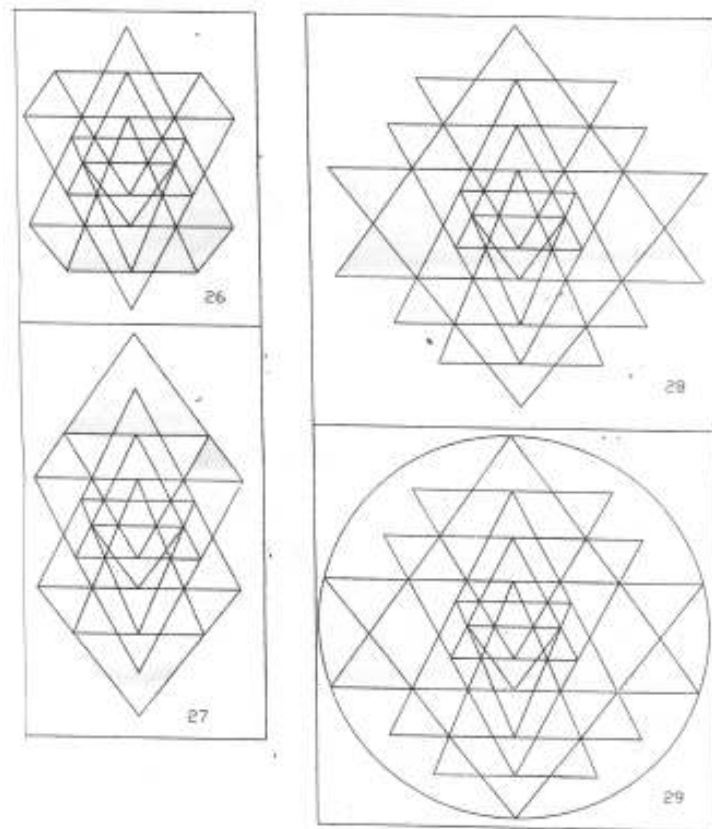

Fig. 2 (Continued)

Step 28: Again follow similar procedure of extending the lines as explained in step Nos. 23 and 24. A chain of 14 small triangles will be completed, which is called 'Catur Daṣar'

Step 29: Draw a circle passing through the six outer points. Thus the figure of nine bigger traingles inside the circle is completed.