Subdivision Patterns and what this implies about *S* and *P* for Centered-Point Flowers

The simplest extension of jump patterns is to simply ***Jump*** one vertex ($J = 1$) then ***In*** to the center, ***C***, and back ***Out*** to the same vertex. Each move like this carries with it ***S*** subdivisions so the image shown is unlike other files in that the center is explicitly included in each jump set. Each vertex of the ***n***-gon gets used twice. Given the $n = 3$ vertex frame discussed in the *Jumps Primer*, this creates the following subdivision endpoints (noted beneath the vertex and center jumps):

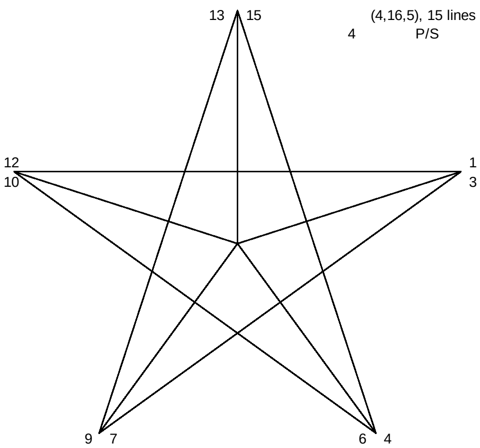
0 to 1 to ***C*** to 1 to 2 to ***C*** to 2 to 3 to ***C*** to 3

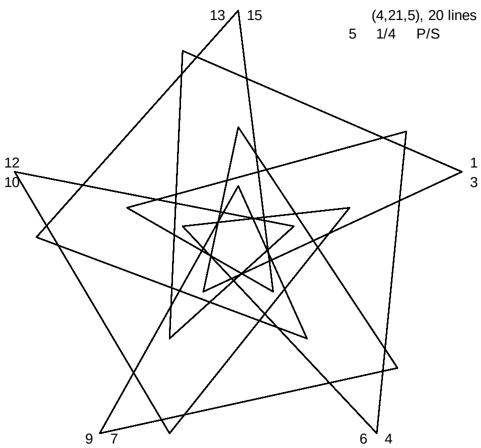
S 2***S*** 3***S*** 4***S*** 5***S*** 6***S*** 7***S*** 8***S*** 9***S***

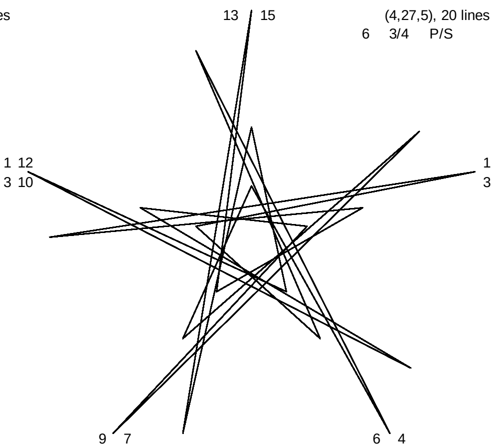
Because of the "***Jump***, ***In***, ***Out***" pattern, each new vertex involves three moves. Notice in particular that the following is true about the multiple, ***m***, in front of ***S*** in each case:

- ***Jump*** If this is the first time vertex ***v*** is used, then $m = 3v - 2$ ($m = 1$ if $v = 1$, $m = 4$ if $v = 2$, and $m = 7$ if $v = 3$).
- ***In*** The move **into the center** is always of the form: $m = 3v - 1$ ($m = 2$ if $v = 1$, $m = 5$ if $v = 2$, and $m = 8$ if $v = 3$).
- ***Out*** The move back **out from the center** to ***v*** is of the form: $m = 3v$ ($m = 3$ if $v = 1$, $m = 6$ if $v = 2$, and $m = 9$ if $v = 3$).

This same pattern works for values ***n*** beyond $n = 3$, for each vertex ***v*** of the ***n***-gon, $1 \le v \le n$, as we see for $n = 5$ below.







These five "pentagrams with attitude" based on $n = 5$ and $S = 4$ are each annotated with multiple values ***m*** noted above (together with ***P***/***S*** which tells us where the first line lands relative to these multiples of ***S*** vertices). Each is more pentagram like than pentagon like because $4 \le P/S < 7.5 = 3n/2$ (half-way around). You should be able to see where the first line ends in each image. Remember that $m = 5$ and 8 are at the center so the top middle 5 ¼ is 1/4th of the way out from the center 5 to $m = 6$ at vertex 2 (and the top left first 4 lines in terms of ***m*** are 4-8-12-1 since 16-15 = 1). The top 3 have fewer lines because SCF > 1. The bottom right is a *porcupine* ($P = 31$ is the same image and $P = 30$ is a single line).