

HYPERBOLIC TATTING ~ Tatting on Steroids!

What Got Me Started With Hyperbolic Tatting

I saw a couple of websites about people crocheting the Great Barrier Reef in fantastic, swirling representations of corals and the critters that live there. They were fascinating and beautiful. The reef was based on mathematical models of hyperbolic planes and pseudo spheres that curl wildly. I HAD to be able to do this in Tatting!

Hyperbolic refers to an object that always grows at the same rate. The rate of increase can be anything: doubling, 3:2 (each row increases by 1 DS for each 2 DS in the previous row. 12:11, 37:22. Anything. But it is always the same. Now artistically, we can take liberties, but we'll do the simple stuff first.

Below are the websites that triggered my hunger to do this stuff.



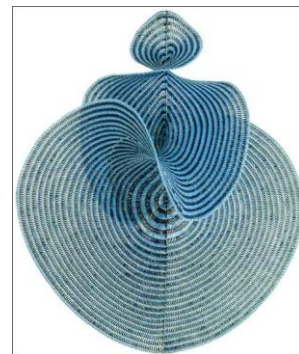
[Cabinet magazine](#)

[Cornell University](#)



[The Smithsonian](#)

[The Institute For Figuring](#)



[Lorenz Manifold](#)



How to Tat a Ruffled Ball

Abbreviations

CTM – continuous thread method (do not cut the ball thread)

CLR – close ring

DNR – do not reverse work

SLT – shoe lace trick

LKJ – lock join

Start with a shuttle wound CTM

Start Ring: **1 – 1 – 1 – 1** CLR Close very firmly, DNR, SLT closed firmly

Firmly tensioning your work allows the ruffles the stiffness they need to stand up. There are only 3 picots in the start ring, but the SLT functions as a lock join into a picot and the start of the first chain segment in the second row. The SLT starts a spiral. There will be no separate rows, the work just keeps going until you call it quits.

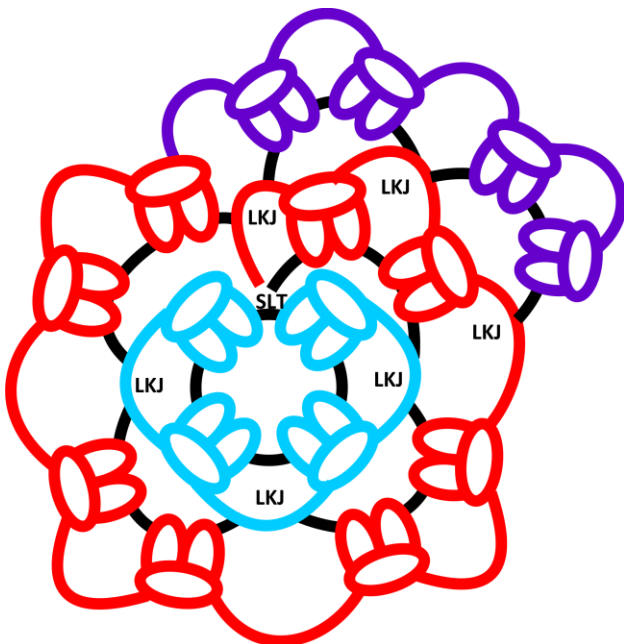
The picots precede the DS on all the chain segments of every row after the start ring.

The process is to make 2 segments of a picot followed by a DS, doubling the number of DS in the previous row. The picots should be just a bump to make a tight connection. A Lock Join in the next picot of the previous row finishes the segment.

Chain Segments: – **1 – 1** LKJ to the next picot on the previous row

Repeat around the spiral, LKJ in the first picot of the first segment.

Work as many rounds as you like. The more you do, the greater the ruffling will be.

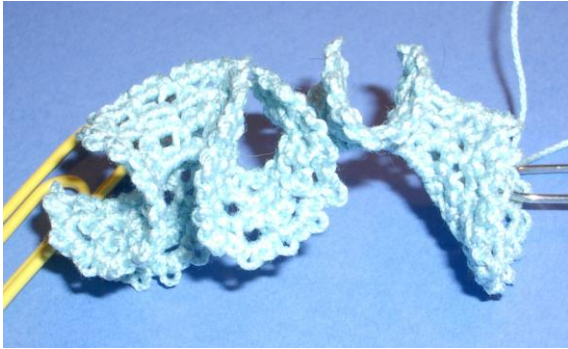


The first round is blue, the second round is red and the third round is purple. The core thread is shown in black.

You can see that for 1 DS in the first round there are 2 DS in the second row and 4 DS in the third row.

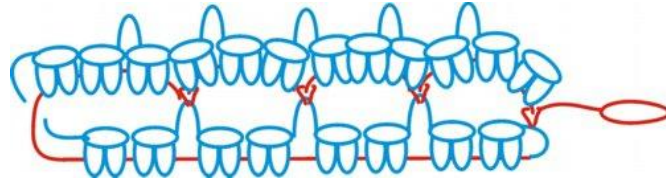
The picots should be small joining picots, just a bump, but still visible because you have to find them while you are working.

The – **1 – 1** pattern will produce quite dense ruffles.



How To Tat a Ruffled Chain

This form of hyperbolic Tattting starts from a chain with picots marking off the base number of DS. In this example the base segment separates every 2 DS with a small picot (just a bump) where the next round will be lock joined.

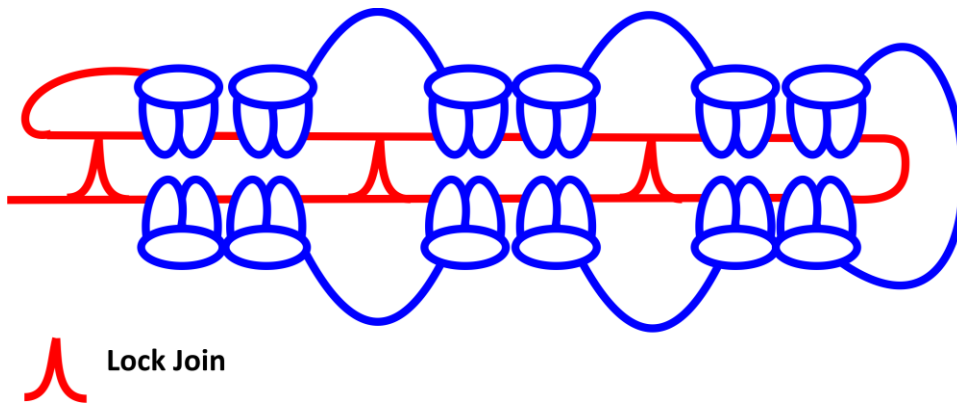


When the increase is not a simple doubling you are, in effect, borrowing DS from the next base segment. In the $-1-1$ pattern it looks like you just repeat the segment, but since there was only 1 DS to borrow, there are no left over DS to account for.

This pattern has base segment of 2, but we are only borrowing 1 from the next segment to have an increase of 1 for every 2 DS. That leaves 1 DS left over in the following segment. This is accounted for by noting that while the lock join closes each segment, some lock joins have a picot over them and some don't. This is because the picots are only made after the complete DS count of a segment.

Since normal block Tattting on a chain does not usually increase at all in the middle of the row, the hyperbolic ruffled chain, which increases by the same multiplier across every row, becomes un-flat almost immediately.

It is possible to work Ruffled Chains on both sides of the foundation chain. The first row BELOW the chain lock joins to the core thread of the foundation chain. In this case it is wise to leave the chain a little looser in tension than normal. Working a double sided Ruffled Chain also converts the work automatically to frontside tattting only by changing the shape of the work into a continuous spiral oval. Alternatively, the original chain can be worked as pearl tattting with a picot between groups of 2 stitches on both sides of the pearl tattting.

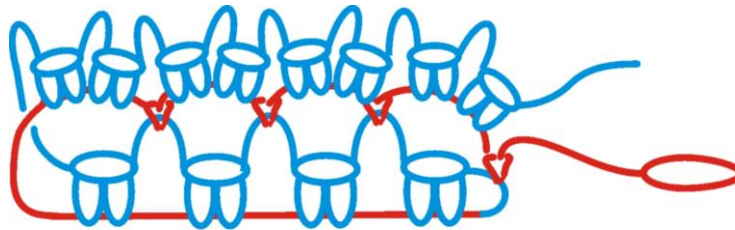


How to Figure Out Where to Put the Picots

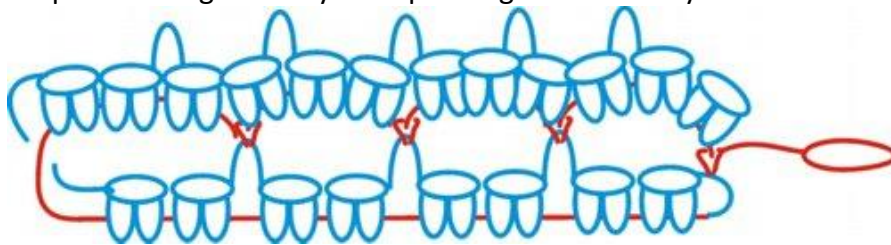
All Ruffled Tatting starts with a foundation row, but the only simple pattern is doubling the number of stitches in every row. The doubling pattern is 1 DS increase for every 1 DS in the previous row (2 DS in the current row for every 1 DS in the previous row). So growing from 2 DS to 128 DS only takes 6 rows (4, 8, 16, 32, 64, 128). That's a lot of picots!

The doubling pattern has the same repeating segment for the whole row:

– 1 – 1 , LKJ to the next picot in the previous row



But as soon as the increase pattern is different, say, increase 1 DS for every 2 DS in the foundation row, the placement of the picots changes in a cycle depending on how many DS are between the increase DS.



The following table shows the pattern of DS and picots to make an increase row for each specified segment pattern.

Segment Pattern	1 DS + 1DS	2DS + 1DS	3DS + 1DS	4DS + 1DS	5DS + 1DS	6DS + 1DS	7DS + 1DS	8DS + 1DS	9DS + 1DS	10 DS + 1DS
1 st	– 1 – 1	– 2 – 1	– 3 – 1	– 4 – 1	– 5 – 1	– 6 – 1	– 7 – 1	– 8 – 1	– 9 – 1	– 10 – 1
2 nd	repeat	1 – 2	2 – 2	3 – 2	4 – 2	5 – 2	6 – 2	7 – 2	8 – 2	9 – 2
3 rd		repeat	1 – 3	2 – 3	3 – 3	4 – 3	5 – 3	6 – 3	7 – 3	8 – 3
4 th			repeat	1 – 4	2 – 4	3 – 4	4 – 4	5 – 4	6 – 4	7 – 4
5 th				repeat	1 – 5	2 – 5	3 – 5	4 – 5	5 – 5	6 – 5
6 th					repeat	1 – 6	2 – 6	3 – 6	4 – 6	5 – 6
7 th						repeat	1 – 7	4 – 7	3 – 7	4 – 7
8 th							repeat	1 – 8	2 – 8	3 – 8
9 th								repeat	1 – 9	2 – 9
10 th									repeat	1 – 10
										repeat

NOTE: Only chain segments that start with a dash (–) have a leading picot. Lock joins do not automatically have a picot over them. The picots mark the base count of the groups of DS. If the lock join between segments falls in the middle of a base group of DS, there is no picot above it.

Here's some weird ones, but I had to try them! Note that picots are only between complete counts of the base segment.

Segment Pattern	1DS + 2DS	3DS + 2DS	5DS + 4DS	7DS + 5DS
1 st	- 1 - 1 - 1	- 3 - 2	- 5 - 4	- 7 - 5
2 nd	repeat	1 - 3 - 1	1 - 5 - 3	2 - 7 - 3
3 rd		2 - 3	2 - 5 - 2	4 - 7 - 1
4 th		repeat	3 - 5 - 1	6 - 6
5 th			4 - 5	1 - 7 - 4
6 th			repeat	3 - 7 - 2
7 th				5 - 7
8 th				repeat

Tips for the Work Process

Keep Your Shuttle on a Short Leash

You only work a few DS at a time for each segment and then make a lock join. Keep your shuttle thread as short as possible.

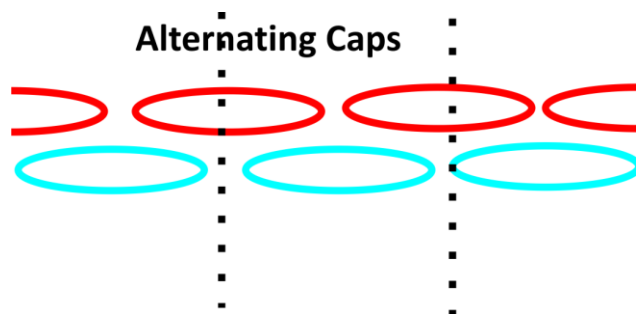
Keep Twist Out of the Thread

After forming the picot and DS pattern for the segment you are working, snug up the DS and then drop your shuttle in front of the work to allow additional twist on the thread to unwind. This is purely for your own sanity! The next step is to form the Lock Join, which snarl horribly if there is any extra twist present.

Finding the Next Picot for a Join

In the very first increase row, finding the next picot to make a lock join is usually pretty easy because it is quite isolated and to the right of where you are working. Very quickly, however, the next picot will be directly under where you are working or even to the left of it! After dropping the shuttle in front of the work (see above), lift the current segment you are working on to help you see where to join on the previous row.

If your picots are very small (a very good idea), it may be difficult to tell where the picot to be joined to is located. After all my experience with hyperbolic tatting, I finally figured out that what I was looking for was the next cap on the backside of the work in the segment pattern I was working in.



Start Picots from the Beginning of the Row

Whatever the end count for the previous row in a Ruffled Chain, start the base count from the beginning at the start of a new row. This method provides a picot to join to at the end of every row since the beginning segment of every pattern starts with leading picot.

About Lock Joins

I prefer to make my Lock Joins by pulling the shuttle thread DOWN through the picot in the same way as a DOWN picot join. In my opinion, this produces a smoother surface and I consider a DOWN Lock Join to be worked as frontside.

I have also discovered that pulling the Lock Join to the left as you make it allows the work to have the same tension across all the DS since the lock join can force an opening in the fabric of the work if it is sitting on the center or right side of the picot being joined to.

The Hook

1. Get the right size hook for the thread you are using. The thread should lie comfortably in the hook. Test this, and don't rely on the size on the hook. I have size 10 hooks that are smaller than size 12. Hook sizes are not uniform and I don't think they measure the finished product (modern hooks are chrome plated and the plating can change the diameter and real size of the space inside the hook significantly).
2. When pushing a hook through the joining picot, push the hook through on the back of the hook. Bring the hook part down over the thread. Pull the hook and thread back toward the spot where the thread will go through. When the hook is over the picot, don't pull the thread through, lever it. The hook is not for grabbing (and shredding), the hook is to prevent your thread from falling off.
3. The flat spot on the hook usually is different on both sides. My favorite hooks are smooth on one side and have lettering on the other. One side is the hook side. Learn which one it is and you can operate your hook by feel and speed up your work.

Working Frontside/Backside

Ruffled balls start with a ring and continue in a spiral series of chain segments. This means that you can just tat normally and the work will be frontside tatted. A two-sided Ruffled Chain also works all frontside in a spiral.

Single Ruffled Chains have a frontside and a backside, so the backside DS can be worked in reverse order DS and the backside Lock Joins are UP joins if you wish. Whether frontside or backside, the picots go in the same places; you **DON'T** have to reverse the order of the DS counts or anything like that. This is because the segments between picots are a fixed size, so it doesn't matter whether you are working frontside or backside.

Moving From One Row to Another in Ruffled Chains

I found that I prefer the look of the side edges of the Ruffled Chains if I make an unflipped DS with the shuttle thread over the ball thread. This seems to function like the turning chains in crochet by lifting the level of the working threads to the next higher row and provides a nicer side edge.

A Spiral Dangle



This little dangle could be used as a pendant on a necklace, bracelet or earrings. It is worked in size 20 Flora. A variegated thread highlights the spiral structure nicely and multicolor variegated would also work well.

Start with a chain, continuous thread method, leaving a small space before the first DS:

17 groups of 2 DS separated by picots

At the end of the row, turn the work around.

I prefer to move from one chain row to another by making an unflipped DS with the core thread on the shuttle. I think this makes the chain stay put since the core thread gets locked. Also, the unflipped DS lifts the threads to the level of the next row and makes a nice edge.

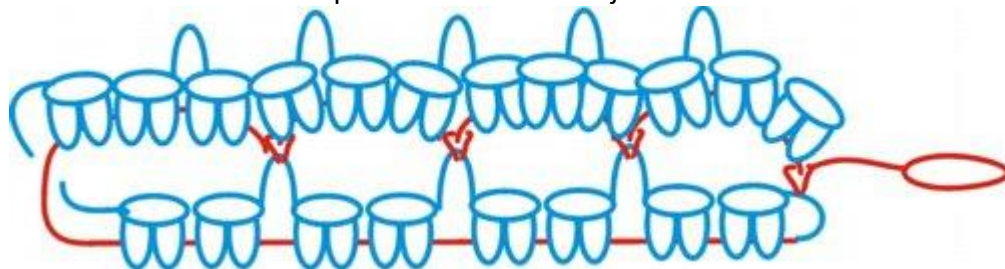
The first row of increases are reverse order tatted (if you want to do frontside – backside tatted). In my opinion, backside lock joins are UP joins

The increase pattern requires 2 different segments, because for every 2 DS in the previous row, there are 3 DS in the current row. (and 2 into 3 won't go!).

First Segment: – 2 – 1 Lock Join no picot

Second Segment: 1 – 2 Lock Join with a picot

There is no picot over a lock join that does not fall at the border between two complete base number counts of DS. Since we are working with an increase of 1 DS for every 2 DS, some lock joins fall in the middle of a base count and there is no picot over those lock joins.



Work to the end of the row and lock join to the space left at the beginning of the work.

Turn the work around, work and unflipped DS with the shuttle thread, the second row of increase segments is frontside tatted.

Start each new row with the first segment, since it starts with a picot where the following row can join.

– 2 – 1 segment

At the end of the row, turn the work around, direct tat 2 second half DS stitches and work the third row of increase segments in backside tatting (if you so desire).

Now you will have some kind of ruffling or waving or even spiraling going on. To reproduce this pattern, twist the ruffles around in the same direction until they lie in a spiral as shown.

Work unflipped half DS over the working thread in spiral tatting until you reach the start of the foundation chain. Lock Join to it. Continue the spiral tatting until you reach the outer tip of the tip of the spiral and lock join to the piece at the tip.

Place beads on the ends of the threads, knot and trim.