

# EVERYTHING YOU'VE EVER WANTED TO KNOW

BY MADELYN VAN DER HOOGT

*You may have overheard and pitied owners of countermarch looms asking each other endlessly, "Do the long cords go in front or in back?" . . . or moaning . . . "All my shafts fell down! . . . I can't get a decent shed! . . . It takes all day to tie up my loom!" Then one day you have a new countermarch loom, and standing among piles of boards and cords you wonder how you will ever make sense of them all.*

To help you on that day (because a countermarch loom is a wonderful tool) we have worked out a streamlined system that gives a good weaving shed with little or no adjustment and allows tie-up changes to be made quickly and easily.<sup>1</sup>

The instructions and diagrams given here are for Glimåkra looms but can be adapted to most other countermarch looms. The significant factors that may differ from loom to loom and affect the directions given here are: the distance from the floor to the bottom shaft bar, the length of the lams, and the heddle size (the distance between the heddle eye and the shaft bar). Measurements here are based on 330 mm (13") Texsol polyester heddles and an approximate distance of 30" from floor to lower shaft bar when the shafts are at rest and the locking pins in place. If your loom differs from the Glimåkra or your heddle size is different, try the instructions first (except you will initially hang your shafts at whatever height places the warp in the center of the heddle eye) and make changes only if they appear to be necessary. The instructions also assume treadles hinged at the back of the loom.<sup>2</sup>

## Getting started

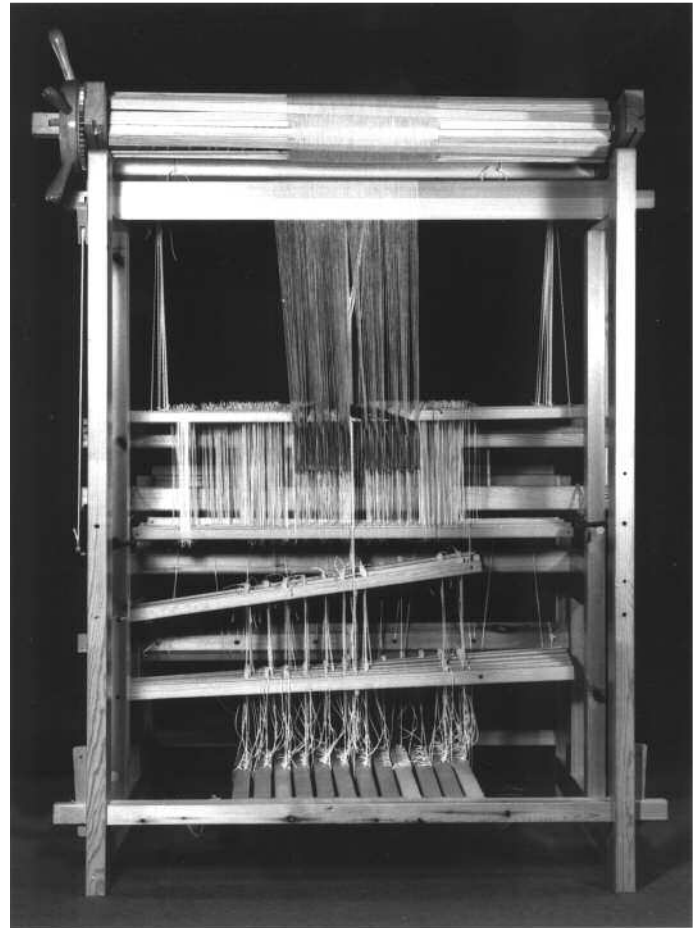
A major part of what makes this tie-up system so easy and fast is the use of Texsol link-loop cord. To follow the instructions completely you will need more cord than is provided in the usual tie-up kit that comes with the loom. You can achieve a functioning tie-up using only that kit, but the investment in an extra roll of cord will repay itself often when you use the time-saving hints given below.

It saves an amazing amount of time and lots of wear and tear on the weaver to install permanent tie-up cords in all of the holes in the treadles (rather than installing them in the lams and clipping them underneath the treadles). These cords connect the treadles to either a lower lam or an upper lam for each shaft, depending on whether the tie-up directs the shaft to go up or down. So that all cords can remain permanently in the treadles for all tie-ups, they must all be long enough to reach the upper lams (this is where you will need that extra roll of cord).

<sup>1</sup>*These instructions are designed for weavers using tie-ups for eight or more shafts, for which adjustments must be made to allow for the greater distance of the last shafts from the fell of the cloth. For 4-shaft tie-ups, lams can be placed in parallel positions as described in the instructions that come with the loom, and tie-up kits and lam-to-treadle cords can all be the same length.*

<sup>2</sup>*Treadles hinged from the front of the loom move the shafts further up or down the farther away they are from the fell of the cloth. They therefore provide a good shed without the adjustments in Steps 2-4 — though they may require more force to depress.*

a. Countermarch loom, back view, warp beam removed



PHOTOS BY HOWARD WILSON

## Materials

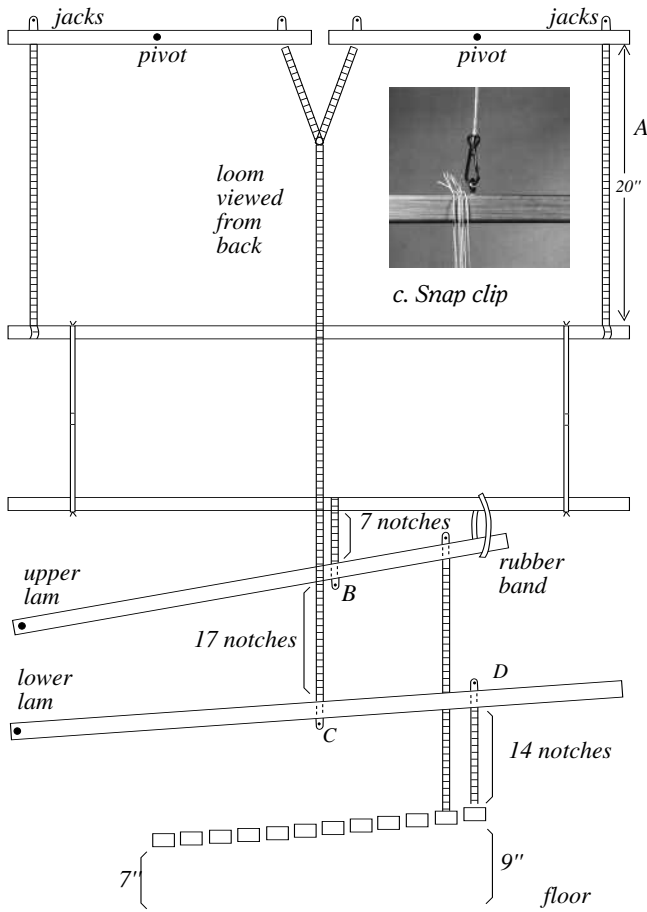
Because of the difference between the tie-up system described here and the one usually recommended, the cords that connect the treadles to both lower and upper lams need to be even longer than the cords supplied in the Texsol tie-up kit to connect treadles to just the upper lams. For best results, cut enough sections of cord 23"-26" long to fill all the holes on all your treadles.<sup>3</sup> Connect them to the treadles as indicated in **3**. The cords not in use will hang from the treadles, and when tied to the lower jacks will extend from them a bit messily (see *Photo b*), but the slick surface of the Texsol cord prevents tangling and interference. Besides the advantage of never having to move a cord once installed, all Texsol clips can be placed in position on top of the lams rather than under the treadles when tying up the loom.

<sup>3</sup>*The cords tied to the lams closer to where they pivot do not need to be as long as the cords at the outer ends. You can use the cords from the tie-up kit at the pivot ends, placing longer ones (26") at the outer ends. See **3** for two methods of inserting the cords in the treadles. The arrow-clip method requires less cord. With it, the cords slide up and down in the treadles when tied and always appear straight, rather than presenting the slightly messy appearance created by the loose, looped cords. Two arrow clips are required for each treadle hole; the upper one is necessary to keep the cord from leaving the treadle when not tied to a lam.*

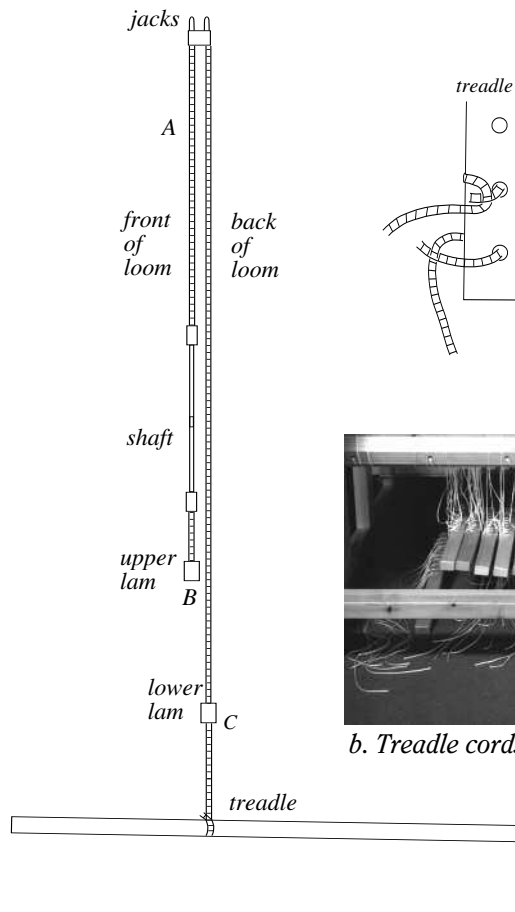
# ABOUT TYING UP A COUNTERMARCH LOOM

WITH DAVID XENAKIS

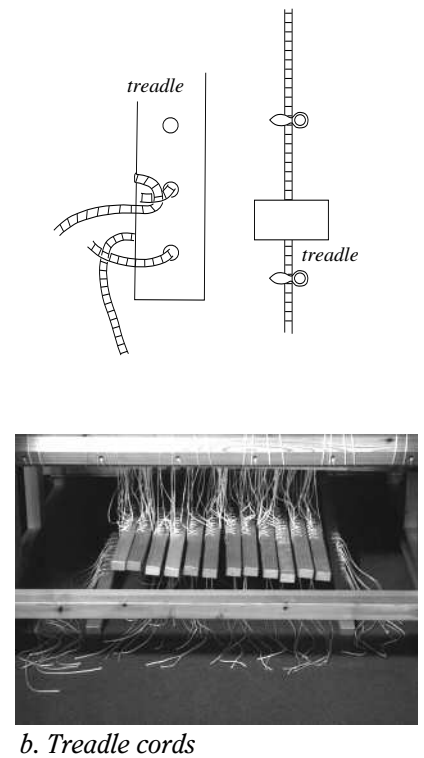
## 1. One shaft viewed from the back



## 2. Side View



## 3. Permanent treadle cords



Steps 1-4 give specific measurements for the positions of shafts, lams, and treadles that cause the back shafts to move up and down a greater distance than the front shafts. This difference is necessary for all of the threads to form a large, clean shed at the fell of the cloth.

### Step 1

Hang the upper shaft bars from the overhead jacks (locking pins in place) so that they are 20-20½" from the jacks (or at whatever height causes a warp thread, stretched from front beam to back beam, to pass through the middle of the heddle eye). There is no need to use the shaft holders supplied with the loom. For greater convenience in removing and adding heddles, you might want to install an eye hook and snap clip to the shaft bar as in *Photo c*. Place heddles and lower shaft bars on each shaft.

### Step 2

Loop the appropriate Texsolv cord in position on the center of the lower shaft bar and attach it to the upper lam with a plastic Texsolv clip (B in **1**) so that 7-9 notches can be counted in the cord between the bottom of the shaft bar and the top of the lam (7 notches for a narrow loom 44"-48" and up to 9 notches for a wide loom 60"-64"). The upper lams should be tied as closely as possible to the bottom shaft bar while still allowing room to place Texsolv clips in position on top of the lam. If your lams are a different length than Glimåkra's standard, you may have to count a different number of

notches, but place the end of the upper lam 1½" to 2½" from the bottom shaft bar (for eight shafts and narrow looms this measurement can be 2½"; for 10 shafts and medium-width looms 2", and for 12 shafts and wide looms 1½"). The higher the upper lam is placed, the greater the distance it can travel during treadling without hitting the lower lam (compare **1** and *Photo d*, p. 50).

### Step 3

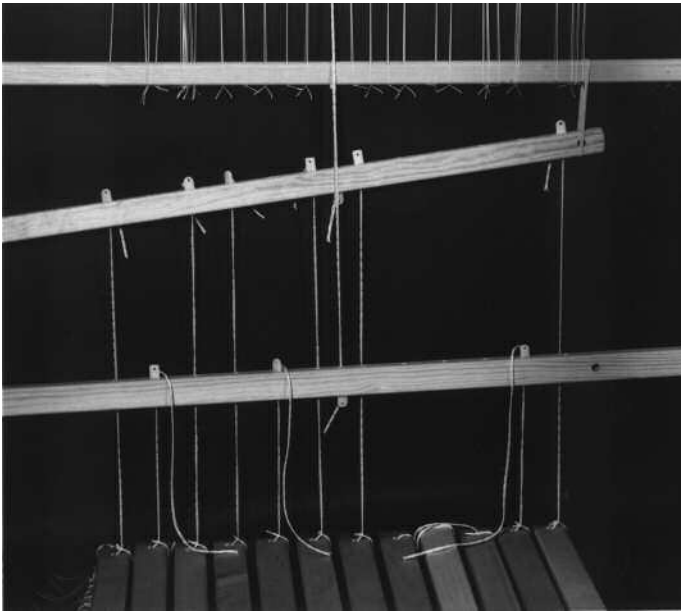
Tie the lower lams so that 15-17 notches can be counted between the bottom of the upper lam and the top of the lower lam (15 notches for wide looms to 17 notches for narrower ones). The cord for this tie comes from the V cord in the center of the overhead jacks, passes down behind the corresponding shaft, behind its upper lam to clip at the center of the lower lam. (See C in **1** and **2** and *Photos d* and *e*, p. 50.) The goal when positioning the lams is to allow as much space as possible for movement between the upper and lower lams and between the lower lams and the treadles.

### Step 4

To tie up the treadles, sit under the warp on the back cross bar, where the treadles are hinged. Begin with the treadle at the left (farthest away from the lam pivot point). Pull the cord looped through the last treadle hole (the cord for the last shaft you are using in your tie-up — and closest to you) through the corresponding hole of the lam indicated in the tie-up (the bottom lam if the shaft is to rise, the

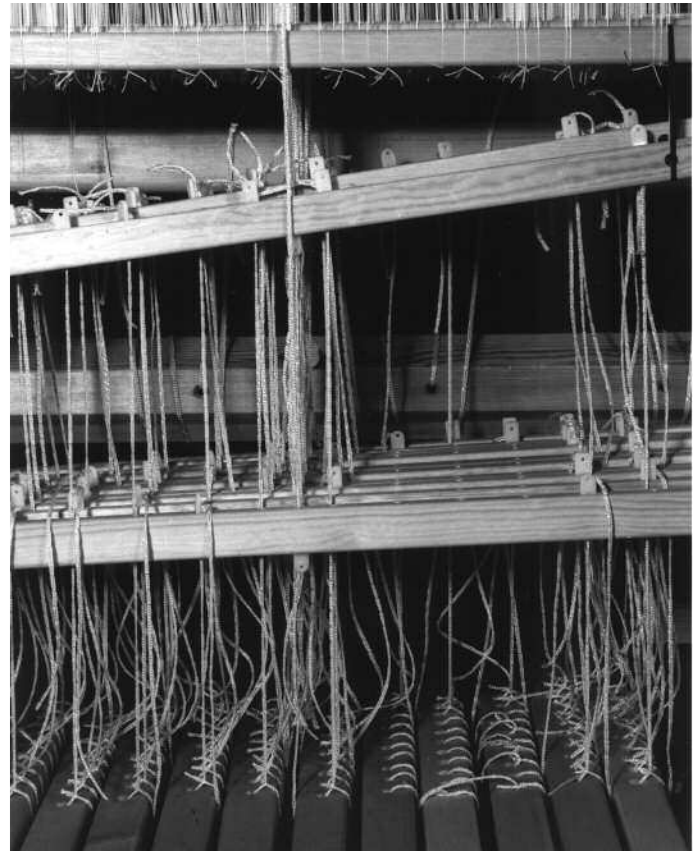
## EVERYTHING YOU'VE EVER WANTED TO KNOW ABOUT TYING UP A COUNTERMARCH LOOM

d. View of last shaft and attached lams/treadles



For this shaft: treadle 1 is tied to the upper lam (the shaft will sink); treadle 2 is tied to the lower lam (the shaft will rise); treadles 3-5 are not tied; treadles 6-7 are tied to the upper lam, 8 to the lower lam, 9-10 to the upper lam, 11 to the lower lam, 12 to the upper lam (as in tie-up 4b, p. 51).

e. View (from the back) of cords from treadles to lams



top lam if it is to sink) so that it raises the treadle to about 8½" to 9" (measuring from the top of the treadle to the floor at the front of the loom); see D in **1**. (The wider the loom, the lower this treadle may need to be to prevent interference with the long lower lam.) This cord determines the height of the treadle and is the only tie-up cord on the treadle that will remain taut when the tie-up is completed.

Complete all ties on this treadle, clipping either to upper or lower lam (as indicated by your tie-up) using the following formula: for the next to the last shaft's cord, pull the cord through the lam hole to taut, then place the Texsolv clip 1 notch away from (above) the notch that would make the cord taut. Do the same (1 notch from taut) for the third cord from the back. For the fourth, clip 2 notches from taut, the next 3, then 3 again, then 4, 5, 5, 6, 7, 7 (if you have 12 shafts to tie). It is a good idea to memorize these numbers since they operate as a constant no matter how many shafts you use.

These numbers are used, for example, when changing from one tie-up to another. If shaft 4 in a new 10-shaft tie-up must go up instead of down, pull the cord out of the upper lam and put it

through the corresponding hole in the lower lam, setting the clip 4 notches from taut (*Photo f*). No other tie is affected. Since you only need to change the ties that are *different* in a new tie-up, the time required for a tie-up change is greatly reduced.

Continue tying the rest of the treadles in the same way. Because of the relationship between the distance from the lam pivot point and the arc through which the lam must move to raise and lower shafts an equal amount, the treadles need not be tied as high toward the lam pivot end. A simple way of achieving gradually lowered treadles toward the pivot point is to tie each treadle the same number of notches when inserting the first clip (about 14 notches from top of treadle to bottom of lower lam) as in *Photos d-e*. The treadles will then follow the slight decline made by the lower lam toward its pivot point. Optimum treadle height depends on the width of the loom, the length of the lams, and the number of treadles in use, but if the above relationships are maintained, adjustment to prevent interference between treadles and lower lams should be minimal.

### Step 5

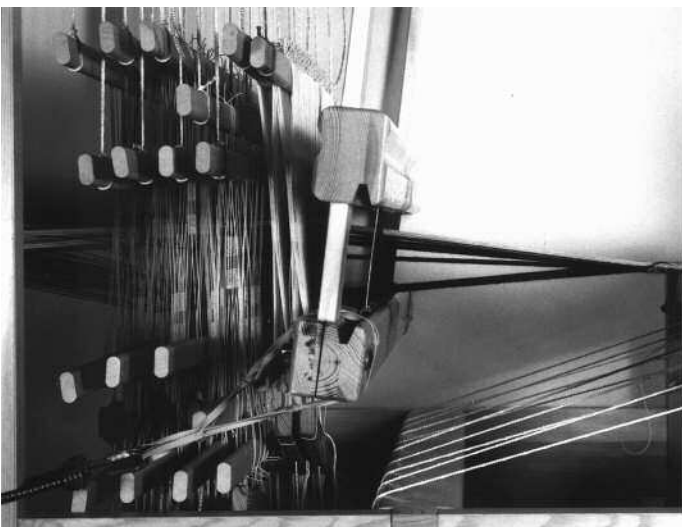
Remove locking pins. Check each shed by depressing each treadle. Some minor adjustments may be necessary. To adjust, for each shed determine which shaft, rising or sinking, is not moving enough (tighten the clip to the corresponding lam one notch) or is moving too much (loosen one notch). In *Photo h*, a cord is tightened two notches to raise shaft 4 as high as the other shafts.

Don't be alarmed if, when you remove the locking pins, the shafts sag a bit. The shafts and their attached upper lams and treadles are very likely to weigh more than the lower lams and treadles balanced against them. It helps this balance to have as many treadles tied up as is convenient, so when a tie-up requires few treadles,

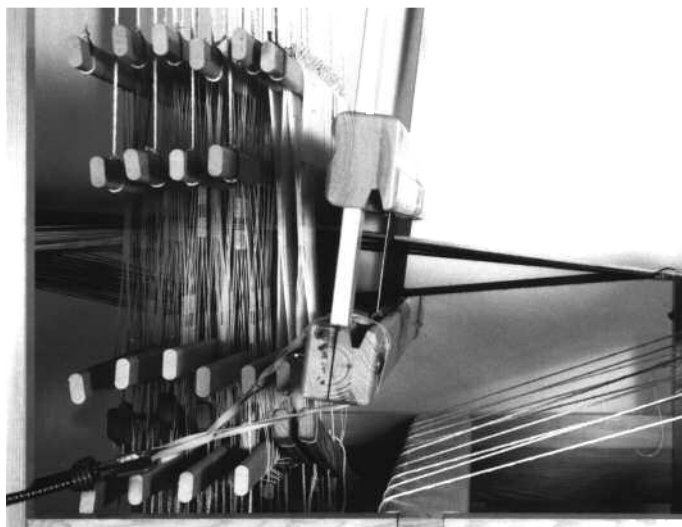


f. When changing to a new tie-up, re-do only the cords for shafts that do something different. Insert the Texsolv clip the appropriate number of notches away from taut for each shaft: four notches for shaft 4 in a 10-shaft tie-up.

*g. Shaft 4 does not rise as high as the other shafts.*



*h. The shed is corrected by tightening the tie to shaft 4.*



I leave others from previous projects tied up. (Note: this sag, however, has nothing to do with what happens after you step on a treadle: at that time, a system of balance no longer exists, and only the measured cords determine where each shaft goes.)

If you are tying up your loom for the first time, some settling and stretching of cords may take place. A final adjustment may need to be made after you have woven for a bit.

Once you have made a complete tie-up for all your shafts, you need never alter the positions of the lam and treadle ties. When fewer shafts are used, the treadles drop to make taut the cord to the last lam; the 1, 1, 2, 3, 3, 4, etc., formula still operates. When adding shafts, raise each treadle from the back so that the notch progression is maintained.

### Additional tips

Sometimes with this method the upper lams move out of the aligned position with their corresponding shaft bars and hit adjacent ones. If this happens, it can be corrected by looping a large rubber band around the end of the lam and the shaft bar (as in *Photos d* and *e*).

Especially helpful when weaving with more than one shuttle is David's idea of inserting a small (1" long) piece of 1/4" dowel into the slots provided for the cloth protector, raising it 1". It then acts as a barrier to prevent the shuttles from falling to the floor (*Photo i*).

Try also David's installation of 'bungie' cords and rubber bands to pull the beater back automatically (*Photo j*). You can then insert the shuttle in the area providing the maximum shed without pushing the beater back. The tension placed on the beater by the bands is not great, and it contributes to an even and consistent beat. When a very light beat is needed, rubber bands may be removed to add resistance.

*j. Rubber bands and bungie cords pull back the beater.*



*i. The cloth protector is raised 1" above the breast beam to act as a barrier for falling shuttles. Add a piece of 1/4" dowel before inserting the cloth protector in the slot.*



### Skeleton tie-ups

Skeleton tie-ups (tie-ups in which two treadles are depressed at the same time) can be used if you remember two principles: two treadles can not ask the same shaft to go up and down at the same time, and, unless you want a split shed, you must move all of the shafts with whatever treadles you do depress. Treadles 3-5 in *Photo d* are only tied to shafts 1 and 2. They are used *with* other treadles tied to shafts 3-10 (as in the sample piqué tie up in **4b**).

As many as 16 treadles can be used on a 44" loom, though the treadles next to the lam pivot point require considerable force. The wider the loom, the greater the number of treadles one can comfortably use.

Be brave and inventive. Just because something has always been done a certain way doesn't necessarily mean that it's the best way!

*This article is reprinted with minor revisions from Prairie Wool Companion, Issue 12, Spring 1986, 'Everything You've Always Wanted to Know about Tying Up a Countermarch Loom Without Really Trying and with Perfect Success the First Time,' pp. 44-49. For basic instructions for countermarch loom assembly and basic tie-up procedures (without the adjustments in Steps 2-4 for eight or more shafts) see Joanne Tallarovic, 'Countermarch: Pure and Simple,' The Weaver's Journal, Issue 31 (Winter '83-'84), pp. 85-87.*

### 4. Sample skeleton tie-ups

a	1	2	3	4	5	6	7	8	9	10
X	O			X	O	X	X	X	O	
X	O			O	O	X	X	X	X	
X	O			X	O	X	O	X	X	
X	O			X	X	O	O	X	X	
X	O			X	X	X	O	X	O	
X	O			O	X	X	X	O	O	
O	X	O								
O	X	O								

b	1	2	3	4	5	6	7	8	9	10	11	12
X	O					X	X	O	X	X	O	X
O	X					O	X	X	O	X	X	O
X	O					X	O	X	X	O	X	O
O	X					O	X					
X	O					X	O	X	X	O	X	O
X	O					X	O	X	X	O	X	O
O	X					O	X					
O	X					O	X	O	X	O	X	X
							X	O				
							O	X				

**4a:** summer and winter tie-up: use treadles 3 and 4 with treadles 5-10.  
**4b:** piqué tie-up: use treadles 3-5 with the rest.