

CYREFCO

SUGGESTIONS FOR TIE-UP OF A COUNTERBALANCED LOOM

GENERAL INFORMATION:

-Good care and feeding of the loom and careful work during tieup makes the life of the weaver easier and should assure a good shed and smooth treadle operation.

(If you are using sticky yarn, a poor shed may be related to interference between warp threads rather than to an improper tie-up. To help clear a sticky shed prior to throwing the shuttle, you might try:

--Release and repeat the treadling with considerable force.

--After depressing the treadle, run your hand back and forth across the top of the shed near the reed.)

-Enough time should be taken each time the loom is warped for the tie-up to be done accurately.

-The extra time required to check the loom tie-up occasionally when the shed seems not quite perfect is usually more than made up for in the time saved later in easier weaving.

-Whenever checking the tie-up, be sure to hang the harness sticks on the harness hangers to check roller tie-up cords, roller to harness cords and harness to lam cords. Adjustment relates to the warp center line and heddle eyes.

-Check the treadle to lam tie-up without the harness hangers.

-Polyester tie-up cord is very stable, with very little problem of stretching during use. However, on every new tie-up you may anticipate that some minor adjustment may be necessary after a few hours of weaving. Usually one minor adjustment is all that will be required for a number of yards of warp. Checking tie-up at the beginning of each weaving session is still worthwhile and only takes a very few minutes.

TIE-UP SEQUENCE:

1. Harness hangers: (#27 & #37)

-The functions of the harness hangers are to establish a tie-up frame of reference with the warp threads going through the center of the heddle eyes. They also support the harness/lam/treadle system, when for some reason the warp is slack. (When establishing this warp center line through the heddle eyes, be certain the warp is taut.)

-The harness hanger cord works well hooked over the top roller shafts next to the bearing blocks. If they are placed over the main roller section then there is the

possibilitiy of slipping off to the smaller diameter shaft, which if not noticed, would cause an innacurate tie-up. A loop should be made in the center of the cord by doubling the cord and tying an overhand knot about two inches from the middle. It is this loop which is put over the roller shafts.

-Each half of the cord should go through one of the holes at the end of the harness hanger. Height is adjusted by means of plastic cotter pins at the underside of the holes. Be sure that the harness hangers are adjusted so that they are level. Measure from the side frames or use a level.

2. HARNESES: (#35, #37 & #38)

-Usually, the proper sequence would be to make the tie-up after the loom is warped and tension is established on the warp.

-Note: For safety in preventing heddles from slipping off the harness sticks, it is good preventive medicine to always have a safety string tied from one end of the harness sticks to the other using the holes drilled in the ends of the harness sticks.

Safety strings should also be used on tie-up sticks.

-Top harness sticks should be hung from the harness hangers and harness hangers should be adjusted so that harnesses are level from left to right and from front to back. If your loom is level, using a level to check harnesses and rollers is easier than a tape measure. If your loom isn't level (for instance, an uneven floor) then measuring from the horizontal loom side frame members will do just as well. It just takes a little longer.

-Adjust the harness height so that the warp threads ARE IN THE CENTER OF THE HEDDLE EYES.

3. HARNESS ROLLERS; (Nos. 25-38 & #35 & #38)

-Follow the scheme shown in the four harness tie-up drawing. (#38)

-Rollers should be parallel and level, front to back and left to right.

-First, the middle rollers should be hung from the top roller. Put the loop cords through the wooden end bearing pieces of the middle rollers. Thread the loop cords through the loop next to the end loop so that they are securely fastened to the bearing blocks.

The cords are run up over the top of the top roller, through the holes and are secured by hooking them over adjacent screw heads. (Which should be kept horizontal during tie-up.)

Middle rollers are made level and parallel by adjusting the lengths of the cords over these screw heads.

- Harness sticks are centered and loop cords are tied around the harness sticks by putting them around the sticks and sliding them through the loop next to the end loop. These harness cords should be directly below the holes in the middle rollers. (Try to avoid using the end loops in the loop cord in case the cord was cut off too close to the end loop, in which case it might pull out!)
- These cords go from the harness sticks, up over the top of the rollers, through the holes in the rollers and then are adjusted to length and hooked over the adjacent screw heads. (Again, during the adjustment of cord length on the rollers, the holes in the rollers should be kept horizontal.)

4. LOWER HARNESS STICKS TO LAMS: (#38)

- Mark the center of the lower harness sticks
- Loop the loop cords around the center of the lower harness sticks and drop them through the center holes of the lams directly below the sticks. Lam holes are evenly spaced for tie-up to treadles and the "center hole" is half way between two of the evenly spaced holes. (Note: Before securing the tie-up cords to the lower harness sticks, be certain that the heddles are properly spaced so that the cord is centered in the warp.)
- The harness to lam cords should be adjusted so that the lams are level from the front of the loom to the back of the loom.
- The lams should be angled slightly upward from the pivot end. That is, they rise slightly from the pivot point on the right end.
- Use the plastic cotter pins on the underside of the lams to adjust the lam to harness cords for proper lam height.

5. LAMS TO TREADLES: (#38)

- It has been the custom to tie treadles in the "up" position, and with all treadles in a straight horizontal line for neatness from left to right. Cords by this technique are tight without slack between lams and treadles to suit the tie-up sequence.
- A much better and cleaner lower shed will be obtained if an alternative tie-up method to the above is used. Improving the lower shed may cause the upper half of the shed to have a shadow shed. This is unimportant. The shuttle rides on the lower half of the shed and a false shed on the lower half can cause the shuttle to snag wrong shed threads, giving

skips to the finished cloth. Therefore, the goal is to tie-up carefully to obtain a perfect lower shed!

- For this lam - treadle tie-up technique, you first remove the harnesses from the harness hangers so that they hang free. (Hang the hangers out of the way over the side frame or top cross brace.)
- Lam to treadle tie-up is done one treadle at a time. Lam to treadle tie-up is done with the treadles in the depressed or down position. The down position is established approximately an inch and a quarter from the floor. A boat shuttle makes a good floor to treadle temporary spacer. (That is, you lay the shuttle or a block of wood on the floor between the treadle and the floor.)
- Example:
 - Assume we are tying treadles 1 and 2 for plain weave (tabby). Treadle 1 is to be tied to pull down harnesses 1 & 3. Treadle 2 is to be tied to pull down harnesses 2 & 4.
 - Space treadle #1 from the floor with a boat shuttle.
 - Drop cords from lams 1 & 3 to treadle #1. Plastic cotter pins should be hooked into the upper end of the cord about two inches from the end. The cotter pins should be pushed firmly into the holes in the lams so that when you pull on the cords from below, there is no slippage or give.
 - Pull lams 1 & 3 down so that the harnesses form a perfect lower shed. This is easiest done by pushing the lams up or down in the lam guides, or just by pushing the ends of the lams up or down if you have no lam guides. As you move the lams up and down you can watch the shed open and close, so it will be clear when you have that perfect lower shed. When the shed is perfect, secure the cords in the treadles with plastic cotter pins. Remove the boat shuttle spacer and try the treadle. If, in putting in the cotter pins, any error was made, the lower shed may show a shadow shed. If so, readjust one of the lam cords to correct the problem. (Note: Lam to treadle cords may also be adjusted at the cotter pins at the top of the lams instead of the cotter pins on the underside of the treadles. Use whichever is easier for you.)
 - Continue tie-up of lams to treadles and after all are tied up, test all treadles. Make final corrections as necessary.
 - This sort of tie-up is easier with two persons, although with a little more time it may be done easily by one person.
 - Note: During the procedure, the beater must be low enough

so that the lower half of the shed cannot touch it. If it touches the beater as it would when used as a shuttle race, then, it is not possible to see poor sheds as the race is supporting the warp threads and making the shed even.

-After the tie-up is completed, raise the beater so that when the beater is forward in the "throw the shuttle" position and the shed is open, the lower half of the shed is just starting to be picked up by the beater. This will form a good shuttle race.