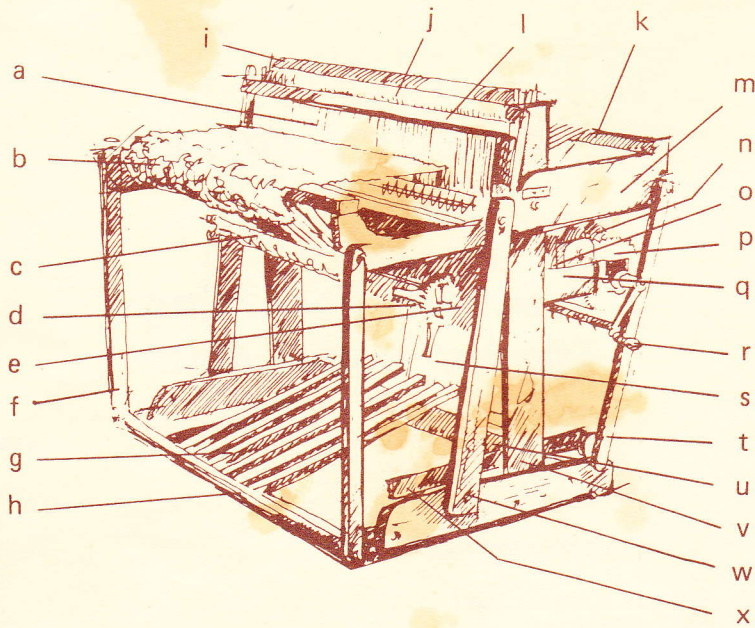


NORWOOD LOOMS

Directions For Using The Norwood Loom

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A Norwood Loom



a- reed
 b- breast beam
 c- cloth beam
 d- cloth beam release
 e- release pawl
 f- front support
 g- treadles
 h- treadle bar
 i- harnesses
 j- heddles
 k- back beam
 l- beater

m- side beam
 n- warp beam
 o- pawl
 p- warp beam ratchet
 q- warp beam support
 r- crank
 s- chain tie-up
 t- back beam support
 u- stretcher
 v- castle
 w- beater sword
 x- warp beam release

NORWOOD LOOMS

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Opening The Norwood Loom

- a) Remove bolt pins from warp beam supports (see diagram q).
- b) If sectional warp beam is not in place, slide the beam into warp beam supports with ratchet wheel on left as you face loom from the back. Raise the ratchet pawl (o) to engage ratchet teeth when beam is in position.
- c) Replace bolt pins and tighten them with wing nuts.
- d) Grasp treadle bar (h) at front of loom and pull forward until treadles rest on the floor.
- e) Pull breast bream (b) upward and fasten side beam (m) to front supports (f) with bolts and wing nuts.
- f) Fasten side beam to back supports (t) with bolts and wing nuts.

When the loom is opened and properly bolted the back beam (k) will be about two inches higher from the floor than the breast beam.

The loom is now ready for warping and operation.

The Sectional Warp Beam

Norwood looms are equipped with a sectional warp beam. The beam is divided into 2' sections by wooden pegs. The circumference of the warp beam on a standard Norwood loom is one yard. One complete turn of the warp beam will wind on one yard of warp. The Fireside 416 Norwood has a 1/2 yard sectional warp beam.

The sectional warp beam is a useful and convenient tool for the weaver no matter what method of warping is used.

A weaver with the aid of a sectional beam, a spool rack, and a Norwood tensioner can put on a long warp with many threads under even tension efficiently and without assistance. A short warp (up to five yards) sett up to 15 epi (ends per inch) can easily be put on a sectional beam loom without the use of other accessories. Most plain-beam methods of warping can also be adapted to the sectional beam.

Beginning weavers would do well to become familiar with their loom by putting on several short warps and weaving them off before committing themselves to a longer project. Placemats, scarves, pillows, handbags, as well as decorative wall hangings, small rugs, and samplers are good short warp projects.

Basic instructions for putting on a sectional warp and a short warp are included with these directions.

The Jack-Type Loom

The Norwood loom is a jack-type loom with rising-shed action. Depressing the treadle raises the harness and threads. Jack-type looms give a weaving versatility not possible with counter-balance looms. One can raise a single harness or three harnesses (on the 4 harness loom) and still get a perfect shed.

On the 4 harness Norwood loom the four treadles on the left as you sit at the loom are for pattern weaving. The two treadles on the right are for plain or 'tabby' weave. Multiple harness looms have more treadles.

The pattern treadles are numbered from left to right 1-2-3-4, and the plain weave treadles are 5-6 or A-B.

Harnesses are also designated by number: 1-2-3-4 from front to back as the weaver sits at the loom.

Pattern drafts are the same for both counter-balance and jack-type looms. In using a counter-balance pattern draft for the jack-type loom an adjustment is necessary in the tie-up since the counter-balance loom has a sinking shed action. Some drafts show the tie-up for both jack-type and counter-balance looms in the same diagram (see below).

4	0	0	x	x	x	0
3	0	x	x	0	0	x
2	x	x	0	0	x	0
1	x	0	0	x	0	x
	1	2	3	4	5	6

Counter-balance tie-up - 'x'
jack-type tie-up - 'o'

Installing Chain Tie-Up

To install the chain tie-up on the Norwood loom, or to change the tie-up for different weaves, tip the loom forward, resting the breast beam firmly on the weaving bench.

Working at the back of the loom, pull the chain up through the proper hole in the treadle with the small wire hook provided. (A hook made from a paper clip will serve).

Hook the chain onto the corresponding hook on the lam. Adjust the length of the chain by hooking into the 2nd, 3rd, or 4th link from the end.

Make certain the hole in the treadle through which the chain is passed corresponds to the lam hook used.

Standard (twill) tie-up for the 4 harness jack-type Norwood loom:

harness #

4	0	0			0	
3	0			0	0	
2			0	0	0	
1		0	0		0	
	1	2	3	4	5	6

treadle #

General Information

Harnesses and Heddles

The harnesses of the Norwood Loom can be lifted out for occasional waxing or for re-arrangement of the heddles. In replacing the harnesses, make certain the heddle bar hooks open toward the back of the loom.

Unused heddles can be left on the loom. Carry about the same number of unused heddles on either side of the warp to maintain good balance.

If you find it necessary to move heddles from one harness to another, unhook the heddle bar from the heddle bar hooks and bend the spring steel heddle bars to release them from one side of the harness. Then slide the heddles off. The heddle bars will retain their shape even with repeated bending.

When adding heddles to the heddle bars, or when replacing harnesses in the loom, check to make certain all heddles on the loom have the same end up.

Reeds

Change the reed in your Norwood loom by loosening the wing nuts on either side of the beater bar and raising the bar. The reed will lift out.

Norwood reeds are two inches wider than the weaving width of the loom to allow for a margin of error and for draw-in when using the full width of the loom.

The dent of the reed is the number of spaces per inch through which the warp yarn is sleyed or threaded. A 10 dent reed has ten spaces per inch. A 15 dent reed has fifteen spaces per inch. Several threads can be sleyed through the same dent in a reed, but each thread must be drawn through a separate heddle.

For thick warp yarns and for projects sett 4 or 6 epi (ends per inch), a 4, 6, or 8 dent reed would be used. Very fine cotton or linen threads for finely woven fabric with many epi would require a 15 or more dent reed.

The wooden sleying hook provided with the Norwood loom will aid in drawing yarns through the dents of the reed.

Cloth Beam

The cloth beam is the round beam at knee level around which woven fabric is

wound. The warp ends are tied or laced to the dowel or wooden bar which is attached by cords to the cloth beam. Narrow warps and warps under great tension such as in rug weaving will eventually warp the dowel. You may wish to replace the dowel at that time with a metal rod. Or an additional dowel can be tied to the original dowel when narrow warps are woven to distribute the pull.

Adjusting Tension

On the right side of the cloth beam near the weaver's right knee is a ratchet and handle for adjusting warp tension. To tighten tension, push the handle with the right hand. To release or loosen tension, push the handle just enough to free the ratchet pawl (e) the small bar which presses against the ratchet teeth, then lift the pawl from the ratchet with the left hand.

Moving Warp Forward

The best weaving on your loom is done in the 3 or 4 inches which are in the center of the warp as it passes from reed to breast beam.

When the weaving is about 5 inches from the reed you will need to move the work forward to free more warp threads. First, release the tension as described above, then step on the warp beam release at the extreme right of the loom. A light touch of the right foot will raise the warp beam pawl enough to clear the ratchet teeth. If the warp beam spins when released, chances are you have not completely released the tension.

With the right hand, wind the finished fabric forward on the cloth beam by turning the handle at the weaver's right knee. When the weaving edge is about 8 inches from the breast beam, replace the ratchet pawl and continue turning the handle until proper tension is reached.

Place strips of corrugated paper or flat sticks on your cloth beam as you wind your weaving forward to protect your work and to help maintain even tension.

After moving work forward, beat once before the next weft shot to do away with streaking. Always, when coming back to your weaving, beat once before throwing the first weft shot.

Occasionally, when work is moved forward, one or two warp threads will be tighter than the rest. Check to make certain the tight threads are not caught around a peg on the warp beam, or that a knot in the warp is not caught in the heddles.

To Close the Norwood Loom When Threaded

- a) Release tension at the cloth beam. Failure to do so will result in broken threads.
- b) Remove wing nuts and bolts from front and back supports.
- c) Push breast beam downward.
- d) Pull treadle bar up and toward back of loom. Treadles will rest on stretcher.
- e) Tie front and back supports and beater to loom frame.

Folded in this manner, your loom will fit through most doors. If necessary, the warp beam can be carefully removed and secured on top of the harnesses.

When opening the loom again, make sure no threads are caught around pegs on the warp beam.

Care of the Norwood Loom

The cherry wood of the Norwood loom has a natural oil finish which darkens as it ages to a lovely brown. With simple care it will continue to bring both pleasure and profit to those who use it for many years.

Rub the wood with a mixture of half raw linseed oil and half turpentine once or twice a year to preserve the beauty of the loom. Boiled linseed oil tends to become sticky; make sure you use raw linseed oil.

The wooden harnesses of the Norwood may swell slightly in extreme humidity. If this should happen and the harnesses stick, sand them with very fine sandpaper or fine steelwool, then wipe with the oil and turpentine mixture.

Tighten nuts occasionally.

Make certain the loom rests level on the floor.

Warping The Norwood Loom

Directions for sectional warping and for putting a short warp on a sectional beam are included in this booklet for the benefit of beginning weavers.

Traditional methods of plain-beam warping can be easily adapted for use with the sectional beam. Still another method of warping a loom is described in a helpful book by Cay Garret - *WARPING ALL BY YOURSELF* - available from The Yarn Depot, 545 Sutter Street, San Francisco, CA 94102. About \$3.00.

Although there are a number of methods of warping floor looms such as the Norwood five basic steps are common to all methods:

1. Planning the warp.
2. Winding the warp onto the warp beam.
3. Threading the heddles (drawing-in).
4. Threading the reed (sleying).
5. Tying the warp onto the cloth beam in preparation for weaving.

These five steps are described in the following pages.

Planning the Warp

WARP YARN. Choose a warp yarn ('yarn' and 'thread' are used

interchangeably in this booklet) which has good tensile strength, is evenly spun (kinky yarns take patience), and is neither too coarse nor too nubby to slide through the heddles easily. Weaving yarns are generally less elastic than knitting yarns and may be preferable for warp.

LENGTH OF WARP. To determine the length of the warp, figure the length of the desired project and add one yard for the loom. There is some 'take-up' or relaxation of yarns whenever a weaving project is taken off the loom. Allowance should be made for this when you plan the warp length or you may find to your consternation that after a day or two your three yard scarf is only 2½ yards long.

WIDTH OF WARP. The width of the warp is, of course, determined by the width of the project. To take full advantage of the sectional beam, plan the width in 2" increments if practical (ie 6 inches wide rather than 5 inches; 10 inches wide rather than 9).

Just as there is some take-up in the length of the weaving, there is also some 'draw-in' in the width of the fabric. The amount of draw-in depends on the type of yarn used and also, somewhat on the weaver. Experience will teach you how much extra width to plan for draw-in. For the present, allow two inches.

SETT. the 'sett' is the number of threads or ends per inch (epi) in a given fabric. Very fine and very firm or closely woven fabric will have many epi while a loosely woven fabric will have fewer epi. (Weft face weaves are an exception.) The thickness of the warp yarn is the most important factor in determining sett. A sett chart which shows how to sett a variety of yarns and threads can be found at the back of this booklet.

When the sett has been determined, multiply the epi by the width of the project in inches to find the total number of ends required for the planned warp.

At this point in the planning you will want to adjust the total number of ends to correspond with your chosen weaving pattern, adding or subtracting a few ends so that the number of ends on your pattern draft will balance with the number of ends in your warp.

If several colors are to be used in the warp, the sequence in which they will appear in the warp, from right to left, should be noted.

The amount of warp yarn needed for the project can now be determined. Multiply the total number of ends required for the width of the warp by the warp length in yards (total no. ends x warp length = yards of warp needed).

Always buy more than enough yarn for each project. It is aggravating and often a major inconvenience to run short, and you can usually find a use for left-over yarns.

A Sectional Short Warp

The following method of warping a short warp (up to 3 yards) is suggested for sample warps only. For longer warps and for warps sett more than 8 epi,

sectional warping or traditional plain-beam warping is recommended.

1. Measure and Group Warp Threads

a) Tie a guide string on a warping board the length of the planned warp. Or use two chairs set the desired distance apart.

b) Wind the exact number of warp threads as ends planned for a two inch section of warp. Wind in sequence planned. Use light, easy tension. It is not necessary to make a cross.

c) Tie the group of threads together at one end in a simple knot, making one warp ribbon. Trim warp evenly at the other end.

d) Lay the warp ribbon over the back beam and harnesses of the loom with knot end near the warp beam.

2. Tie Warp Ribbon to Section Cord and Wind On

a) Tie first warp ribbon to first section cord on the beam with a snitch hitch around the warp knot. (Note - center the warp on the warp beam. For instance, for a 14'' wide warp, use the 7 center sections of the warp beam.)

b) Straighten the threads of the warp as they lay over the back beam and harnesses of the loom with a comb.

c) Hold warp ribbon against the back beam with one hand. Keep them straight and under light tension with the pressure of your hand.

d) Turn the warp beam with the other hand, winding the threads on between two pegs of the beam. Straighten threads with the comb from time to time. Make sure the threads do not build up against the pegs. Winding threads on in 2'' sections under controlled tension makes packing unnecessary.

e) Loop the warp ribbon around a peg to secure.

3. Repeat 1 and 2 until all sections needed for the planned warp are filled.

The loom is now ready for threading.

4. Loosen each section of warp ribbon as needed for threading. Unwrap sufficient length of warp to pass up and over back beam and through the heddles.

MAKE SURE WARP PASSES OVER THE BACK BEAM!

Threading a warp which has not gone over the back beam is a common error in sectional warping. Most weavers do it at least once.

Sectional Warping

Sectional warping is the most efficient method of putting on a long warp with many threads without assistance. The warp threads are wound onto the beam in two inch sections. Packing between layers of warp threads is unnecessary

because the threads go on in perfect order and under even tension.

Equipment: Norwood loom/sectional warp beam
Spool rack and warping spools
Norwood Tensioner

1. Wind the Warp Spools. Wind as many warp spools as there are warp ends in a 2' section of the planned warp.

To determine the amount of yarn to wind on each spool, multiply the warp length by the number of warp beam sections to be used. Add 20 yards of warp to each spool for slippage and miscalculation. Extra yarn can be wound off later, but it is terribly annoying to have to tie additional warp onto a spool in midturn of the warp beam.

The Norwood electric bobbin winder with warp measurer attachment is an invaluable aid in winding spools for sectional warping.

2. Place spools on the spool rack. Begin at the lower left hand corner of the spool rack as you face the rack. Work up, down, then up again. Spools should unwind from the bottom. Place them in order according to the sequence of threads on your warp plan.

Place the spool rack about 6 feet from the back of the loom.

3. Carry Warp Threads Through the Tensioner. Place the Norwood tensioner on the back beam of the loom with the small reed facing the loom.

Beginning with the spool in the lower left corner of the spool rack, carry the warp ends one by one through the tensioner:

a) between the horizontal wooden pegs and upright metal pins. (The pegs and pins at this end of the tensioner cross to form 85 squares and spaces. Each thread from the spool rack should go in a separate space or square.)

b) over the large pegs in the center of the tensioner.

c) through the small reed. Space the warp ends in the reed to cover about 2'.

d) Place thread in tensioner slot to hold.

Make sure each spool unwinds freely from the bottom. Crossed threads will cause tangling, binding, and uneven tension.

When all threads have been run through the tensioner, remove the second and fourth large pegs in the center, place them over the threads to lower them, and re-insert in the proper holes to give desired tension.

4. Wind Warp on Warp Beam. Slant the reed in the tensioner so that the warp ribbon is just wide enough to cover the space between pegs on the warp beam. The small wire rod placed in the proper hole will keep reed in position.

Place tensioner above the first section of the warp beam to be filled.

Remove warp threads from tensioner slot and knot with an overhand knot.

Unfasten cord from section of warp beam below. Fasten knotted warp ribbon to cord with snitch hitch.

Wind warp on beam, making sure warp falls between pegs. Adjust slant of tensioner reed if necessary. Do not allow threads to build up against pegs. Turn knot of warp ribbon so it does not displace warp threads as they are wound on over it.

Count turns of the warp beam so that you know when the proper length of warp is wound onto each section. One complete revolution of the beam winds on one yard of warp.*

Cut warp ribbon and secure ends by slipping them under a few threads of the wound warp.

Tie new overhand knot in warp ribbon and repeat process until all sections needed have been filled.

*A warp counter which can be set to drop when proper number of turns of warp beam have been made is available from Norwood looms. \$2.00.

Directions for use of the Warp Counter

The WARP COUNTER consists of a threaded metal rod with three nuts and a flat bar of steel called a traveller bar. Each thread on the threaded metal rod counts one yard of warp.

To use the warp counter:

1. Set the lock nut as many threads from the end of the metal rod as there are yards in the planned warp (ie. 20 threads for a 20 yard warp, 50 threads for a 50 yard warp). Tighten the inside nut against the outer nut.

2. Facing the loom from the front, screw the threaded rod into the hole at the left end of the warp beam in the metal axle. The rod screws in counter-clockwise and is held in place by the single nut. The winding crank fits on the squared axle on the opposite side of the warp beam.

3. Turn the warp beam so the open part of the beam is at back. Set the traveller bar on the rod against the nut. Check for accurate warp count by turning the warp beam one turn for each yard of planned warp. The traveller bar should drop off when the correct number of turns have been made (20 turns for a 20 yard warp and so forth). If not, re-count the threads on the rod and adjust the position of the lock nut.

It is helpful to place a tin can or metal pan of some sort under the traveller bar so that it drops with a clatter. If the lock nuts are not changed and the traveller bar is always hung at the same place, the same number of turns of the crank will be made each time before the bar drops.

Store the Warp Counter separate from other tools so the threads on the rod will not be damaged.

Threading The Loom

Before threading the loom check the heddles to make sure there are enough on each harness to meet the requirements of your threading draft.

The heddle bars are of spring steel. To move heddles from one harness to another, remove the harness from the loom and lay it flat on a table or on the floor. Bend the heddle bar to take it out of the slot on either side of the harness. Add or remove the desired number of heddles and bend the heddle bar again to place it in the slot.

Unhook the heddle bars from the heddle bar hooks. Estimate the number of heddles you will be using on each harness and group them in the center. Unused heddles can be left on the loom, but leave roughly the same number of heddles on each side of the harness for better balance.

The warp threads will be drawn through the heddles from back to front. Loosen the wing nuts on either side of the bar which holds the reed in place. Lift out the bar and the reed and lay them aside. You can now easily reach over the breast beam to thread the loom.

The Norwood loom can also be broken down for close access to the threading in the following manner:

Release side braces front and back. Raise the back beam. Pull beater forward and down to the floor. Remove the cloth beam. Place a small stool such as the Norwood threading bench inside the loom over the treadles. You will sit sidewise inside the weaving frame and at eye level to the heddles -- an advantage in threading a complicated draft.

When the loom is prepared for threading, fasten the threading draft on the loom where it can be easily seen.

Without releasing the ratchet on the warp beam, unwind enough warp from the first section to be threaded to go over the back beam and through the heddles.

Sit at the loom and space the threads of this 2'' bout of warp with a comb. Threading drafts are read from right to left. For easier threading mark the threads on the draft into groups. Keep your place on the draft with a pin.

Hold the warp threads in the left hand, reach through the harnesses, select a thread and draw it through the eye of the proper heddle from back to front. Thread from right to left as the draft is written. Slide each heddle to the right when threaded.

As each group of threads is drawn in, check for errors, then fasten them together with a slip knot.

Some weavers count out the heddles to be used in threading one group of threads for a quick check for errors.

When one section of the warp is threaded, unwind the next section and repeat. Make certain each section of warp goes up and over the back beam.

Sleying The Reed

If you have broken down the loom for threading, raise the beater bar into position then the front beam, and fasten side supports. Replace the cloth beam.

Or replace the reed and bar and tighten with wing nuts.

Tie or clamp with C clamps the beater in an upright position.

Sit at the loom and draw the threads as they come from the heddles through the dents in the reed. The warp should be centered in the reed. The warp threads will be coming from the warp beam, up over the back beam, through the heddles and through the reed.

Hold a group of threads in one hand. Put them one by one on the sleying hook and draw them through the reed with the other hand. Every 1½" tie the group of threads together.

Do not cross the warp threads between heddles and reed.

Tying-On In Preparation For Weaving

First method: Tie each 1½" group of threads as they come from the reed into a permanent knot. Lace the cord on the dowel stick which is fastened to the cloth beam through the knots -- down through the middle of the group of threads, up under the dowel, down through the next group.

Fasten cord at left side of the loom. Adjust tension as you would a shoe lace until even.

Second method: Divide each 1½" section of warp threads as they come from the reed. Bring them over the dowel, cross them underneath the dowel, bring them up and tie them over the warp in a single knot.

Work from the center to the outside edges of the warp in either direction. Adjust tension as you go by re-tightening the first tied knots. Warp should be at even tension all the way across before you start to weave.

Two extra dowels are packed with each loom. Insert these in the plain weave sheds. About one inch of plain weaving will prepare the warp for pattern weaving. These dowels can be removed before the cloth starts around the cloth beam.

Fasten the heddle bar hooks so that the warp threads run free.

You are now ready to weave.

Trouble?

No shed? Check for crossed threads between heddles and reed. Do all warp threads go over the back beam? Do lam hooks and treadle holes correspond in

the tie-up? Occasionally there is a stubborn warp. Norwood looms' "Weavol" may help.

Skipped thread in the tabby? Check threading for errors. Correct with the addition of a repair heddle or two. Make certain there are no errors in slewing. Is the tie-up correct and chains hooked onto right lam?

Material too stiff? Sley every other dent or use a coarser reed.

Broken thread? Run a thread about 2 yards long through the proper heddle and dent, pin to work in front, weight in back with a spool. You can weave in your original warp thread later. Always weave out warp knots in this manner.

A Few Tips

Make samples. Colors have unexpected effects in weaving. Yarns change when washed and patterns change too. Measure the sample before and after washing to check for shrinkage.

Measure the work with tension released. Allow time for material to relax after weaving.

Sett Chart

	yards per pound	sett per inch		
		Wide	Medium	Close
Cotton				
20/2	8400	26	30	34
10/2	4200	20	24	28
10/3	2800	14	18	22
Carpet warp	1600	12	15	18
Perle #5	2100	12	16	18
Perle #3	1260	10	14	18
3 ply extra	850	9	12	15
Wool				
Willamett 20/2	5200	20	25	30
2 ply worsted	3900	20	24	30
3 ply fingering	2400	12	15	18
Germantown	1500	10	12	15
4 ply worsted	1000	8	10	12
Rya	825	6	8	10
Linen				
40/2	6000	24	30	36
20/2	3000	20	24	28
10/2	1500	12	15	18
10/5	600	8	10	12