MORE ON MOORMAN

THEO MOORMAN INLAY ADAPTED TO CLOTHING

HEATHER LYN WINSLOW

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FIRST EDITION

MORE ON MOORMAN

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DEDICATION

This book is dedicated with a great deal of love, respect and appreciation to my parents.

- To the memory of my father, John A. Morrison, who instilled in me the belief that I could accomplish anything if I was willing to work hard enough.

- To my mother, Evelyn Morrison who taught me all my handwork skills and the patience and perseverance to do any task over until it was right and I could feel proud of what I had done.

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ACKNOWLEDGMENTS

I am very grateful to the following people

- the late Theo Moorman for introducing me to inlay and its limitless possibilities,
- my many students who asked thought provoking questions which forced me to analyze, evaluate and create,
- Denise Kavanagh, SSSF, Director of THE FINE LINE CREATIVE ARTS CENTER for goading me into writing,
- Peter Julian Werner, SSSF, for her layout, grapic work and guidance through the maze of publishing a book,
- Kay Lange, Tara Winslow Morr, Peter Winslow for modelling so patiently,
- my children, Tara and Peter, for believing in me,
- my husband, Dan, for his everlasting patience, goodness and support.

INTRODUCTION

THEO MOORMAN INLAY ADAPTED TO CLOTHING

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For those of you who feel restricted by the structured geometric shapes and the color interactions dictated by traditional woven structure, this technique is for you. With it you will obtain freedom to introduce inlaid shapes and contrasting colors whenever and wherever you desire.

Theo Moorman was an English weaver (1907-1990) who developed a threading and treadling technique which has been commonly called Theo Moorman Inlay. She was fascinated with expressing an idea via tapestry but was searching for a faster and less labor intensive way to accomplish the same effect. Her threading and treadling sequence allow the weaver to inlay a design as an isolated shape or as a total concept which moves from selvedge to selvedge in an "imitation" tapestry.

I became interested in the Moorman technique when I read her wonderful book, *Weaving As An Art Form: A Personal Statement.*[1] By the time I had woven a sampler following the exercises listed in her book, I was hooked. There was a short length of warp left which I used for experimentation. Since I have been sewing garments for years, and that is my primary interest, I suppose it was natural to see those two small experiments as potential embellishments on clothing. It wasn't long before it occurred to me that I could create garments and weave the "design element" or "embellishment" right into the cloth wherever I chose to put it. What a wide open, wonderfully exciting challenge!

Since 1982, I have been thrilled by the flexibility and versatility of this simple weaving technique. This book is an attempt to share with

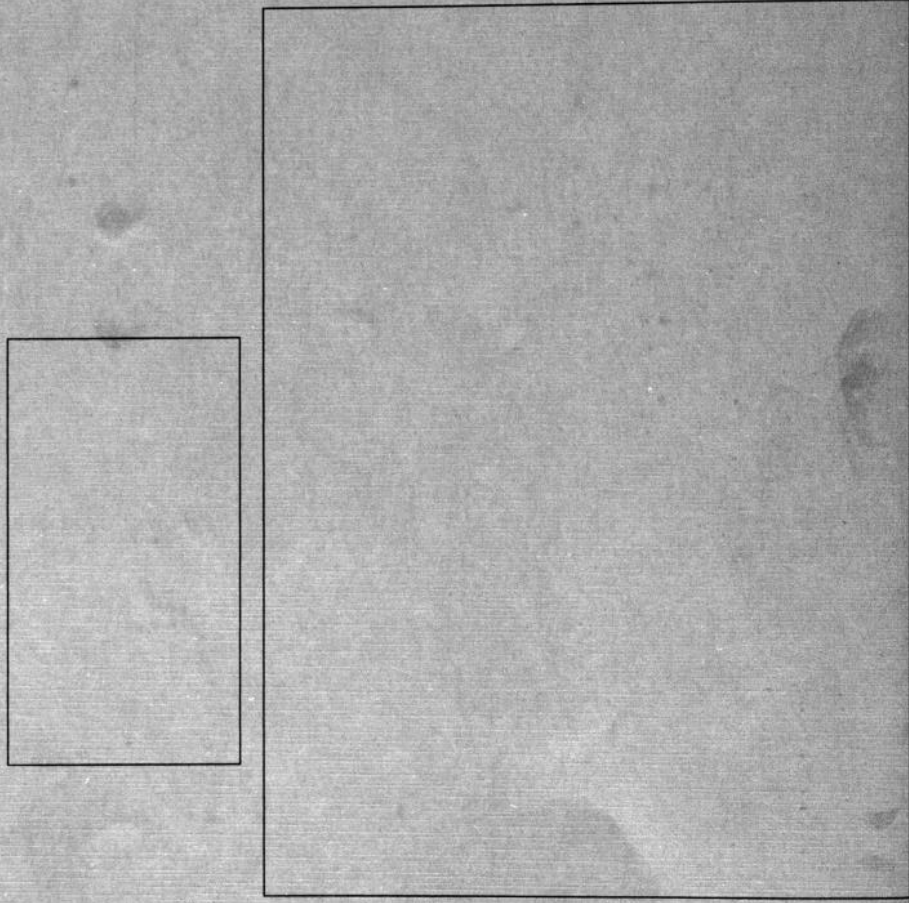
[1] *Weaving As An Art Form: A Personal Statement,* Theo Moorman, Schiffer Publishing Ltd., 1975.

you what I have learned about the process and its special adaptations to the world of clothing design and construction. However, the information to be found here is not limited in its usefullness to wearables. What you learn here can be adapted to any application of Theo Moorman's technique. Your imagination and your willlingness to experiment are your only limitations.

I challenge you to set up your loom and work through the exercises in Chapter 2. Ideas and applications will occur to you as you weave. Be sure to jot them down immediately so you capture them—ideas can be so frustratingly fleeting! Examine your completed sample of the technique and study the thoughts and ideas that you wrote down. It won't be long before a project appears in your mind's eye and begs for fruition. You will have embarked on an exciting road of exploration and creation with innumerable side excursions and/or destinations. **Allow yourself to become immersed and thoroughly enjoy your creative journey!**

CHAPTER 1

MOORMAN INLAY TECHNIQUE



MOORMAN INLAY TECHNIQUE

OVERVIEW

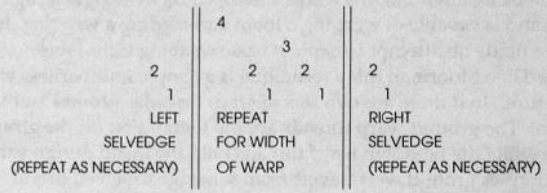
This book assumes that the reader understands weaving at a beginning level and is capable of warping a loom and reading a weaving draft. I have made no attempt to explain basic weaving techniques.

The Theo Moorman Inlay technique is a simple four harness weave structure. In it there are two sets of warp threads: ground and tie-down. The ground warp threads are the foundation for the ground cloth while the tie-down warp threads hold the inlaid design yarns in position. A ground weft travels from selvedge to selvedge and interweaves with both the ground and tie-down warps to create the cloth. The inlay wefts interweave only with the tie-down warps, which hold them in place on the surface of the ground fabric. Since the inlay wefts are not actually woven into the ground cloth, they may be inserted wherever desired.

The ground warp is sett for a balanced plain weave structure and is threaded on shafts 1&2. The tie-down warp is an additional warp of much finer threads which is threaded on shafts 3&4. When this supplementary warp is not being used to hold the inlay wefts, it is weaving into the ground fabric in a mock plain weave structure. The ground weft travels in a path of over 1, under 1, over 2, under 2. Since the tie-down warps are so fine in relation to the ground warps, the structure appears to be plain weave.

THREADING The warp is threaded as follows in *ILLUSTRATION 1 • 1:*

ILLUSTRATION 1 • 1
MOORMAN THREADING



The heavier ground warps are threaded alternately on shafts 1&2. Only the finer tie-down warps are found on shafts 3&4.

TREADLING When this threading is treadled 1&3 followed by 2&4 on a jack loom, and the ground weft is thrown from selvedge to selvedge, the resulting fabric is a mock plain weave of over 1, under 1, over 2, under 2. The ground warps on shafts 1&2, in conjunction with the ground weft, are creating a plain weave structure in relation to each other. However, the tie-down warps on shafts 3&4 also weave into the ground fabric and disrupt the true tabby structure. They account for the weft floats of over 2 (1 tie-down warp and 1 ground warp), under 2 (1 ground warp and 1 tie-down warp). Since the tie-down warps are usually very fine in relation to the ground warps, they tend to disappear visually and the cloth resembles plain weave fabric.

INLAY

The fine tie-down threads on shafts 3&4 are used to secure the inlaid design areas on the surface of the ground cloth. When you wish to inlay a yarn, you must lift the tie-down shaft carrying the same warp thread as was lifted in the previous ground shed. The treadling sequence then becomes:

1&3 - throw ground weft selvedge to selvedge
3 - inlay weft in desired area
2&4 - throw ground weft selvedge to selvedge
4 - inlay weft in desired area

The inlaid weft slides down over the preceding ground weft and is held in place by the tie-down warp. In this sense, the inlaid weft is actually "overlaying" the ground weft. It is for this reason that the ground cloth is not readily distorted as it is in other methods of inlay.

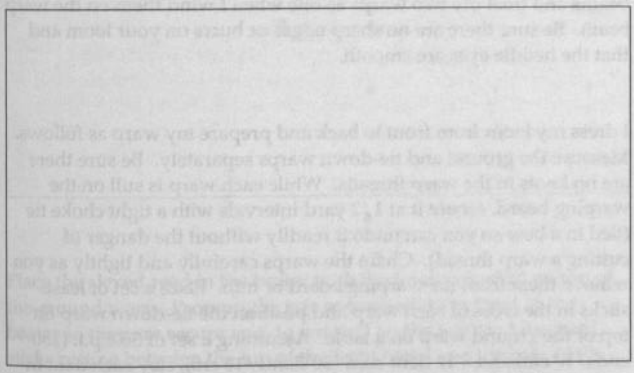


ILLUSTRATION 1 • 2

INLAY WITH LIGHT AND REGULAR BEAT

In this photo at the bottom, the wefts were barely beaten to illustrate how the tie-down warp floats over both the ground and inlay wefts. With a regular beat, the inlay weft slides down over the ground weft.

CHOICE OF LOOM

This weave structure is most readily woven on a rising shed (jack) or countermarche loom. A counterbalance loom may not be appropriate since inlaying requires you to lift only one shaft at a time. Do not despair if that is the type of loom you have. If you have a counterbalance loom which allows a good shed when only one shaft is lifted, (i.e. three shafts are depressed) you will have no problem weaving this structure on it. I have woven several garments on my old counterbalance loom. A table loom may also cause undue problems. Because the distance between the front and back of the loom is limited, there is more strain placed on the warp threads when a shed is opened. This additional tension may be enough to make fine tie-down warps break after repeatedly changing the sheds.

If your loom has two warp beams, wind the ground warp on one and the tie-down warp on the secondary beam. This will allow more control over the tension on each warp. I do not have two warp beams and treat my two warps as one when I wind them on the warp beam. Be sure there are no sharp edges or burrs on your loom and that the heddle eyes are smooth.

PREPARING THE WARP

I dress my loom from front to back and prepare my warp as follows. Measure the ground and tie-down warps separately. Be sure there are no knots in the warp threads. While each warp is still on the warping board, secure it at 1/2 yard intervals with a tight choke tie (tied in a bow so you can undo it readily without the danger of cutting a warp thread). Chain the warps carefully and tightly as you remove them from the warping board or mill. Place a set of lease sticks in the cross of each warp and position the tie-down warp on top of the ground warp on a table. Assuming a set of 36 e.p.i. (150 ends/10 cm) and a 12 dent reed (50 dents/10 cm), sley each dent in

the reed with two consecutive threads from the ground warp cross and one from the tie-down warp cross. See Chapter 2 • 4. The selvedges have only ground warps in them. I do this with the reed taped to the edge of a table or supported by reed holders and the warps spread in front of me behind the reed. The crosses containing their lease sticks are facing me and are at the end of the warp closest to the reed. Leave the lease sticks in the crosses.

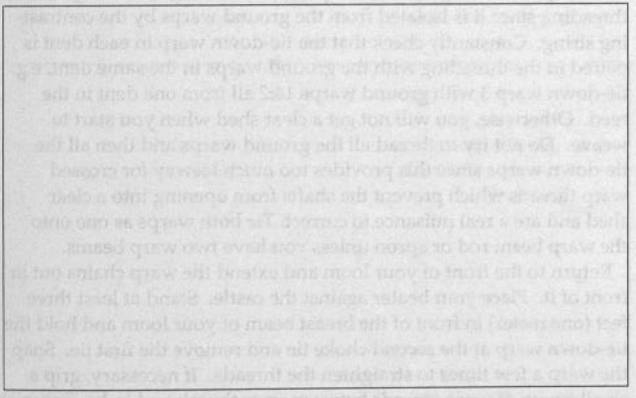


ILLUSTRATION 1 • 3
THREADING REED

The ground warp (white) and its lease sticks rest on the table. The tie-down warp's lease sticks are supported on cans for easy access.

DRESSING THE LOOM

Place the sleyed reed in the beater with the tie-down warp on top of the ground warp. Prop up the sets of lease sticks in front of the beater so they are secure and do not pull on the warps. I use yard sticks resting between the top of the front beam and the base of the

shaft frames. If the castle on your loom allows, you can suspend thread slings to hold the lease sticks between the beater and the front beam.

Thread the heddles being sure that the ground threads are on shafts 1&2 and the tie-down threads are on shafts 3&4. If your tie-down warp is the same color as the ground warp, you can tie a contrasting colored string around the dents of the reed between the two warps. This helps you readily identify the tie-down warp for threading since it is isolated from the ground warps by the contrasting string. Constantly check that the tie-down warp in each dent is paired in the threading with the ground warps in the same dent, e.g. tie-down warp 3 with ground warps 1&2 all from one dent in the reed. Otherwise, you will not get a clear shed when you start to weave. Do not try to thread all the ground warps and then all the tie-down warps since this provides too much leeway for crossed warp threads which prevent the shafts from opening into a clear shed and are a real nuisance to correct. Tie both warps as one onto the warp beam rod or apron unless you have two warp beams.

Return to the front of your loom and extend the warp chains out in front of it. Place your beater against the castle. Stand at least three feet (one meter) in front of the breast beam of your loom and hold the tie-down warp at the second choke tie and remove the first tie. Snap the warp a few times to straighten the threads. If necessary, grip a small group of warp threads between your thumb and index finger and gently slide your hand toward you as though you were expelling the last of the toothpaste out of the tube. Do not comb the warp with a comb or your fingers! This will simply increase the tangles as you move them further along the warp. Move the tie-down lease sticks toward you until they are on top of the breast beam. Place the tie-down warp chain over your shoulder to get it out of the way. Repeat

this procedure with the ground warp. Bring the beater forward to the breast beam. Place the warp chains on the floor in front of the loom and move to the side of the loom with the crank. While supporting the beater with one hand, wind on the warp until the beater has been pulled forward by the warp and rests against the castle again. Continue with these steps, removing the choke ties as you go, until the whole warp is wound on. Be sure to wind sturdy paper or smooth sticks along with the warp onto the warp beam.

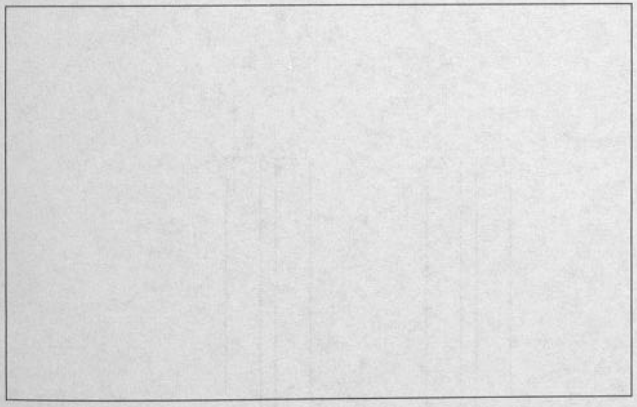


ILLUSTRATION 1 • 4
WINDING WARP

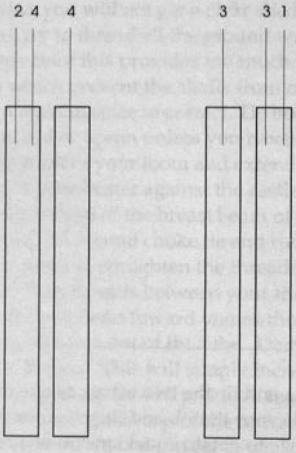
Straighten tie-down warp (dark) and move lease sticks (supported by yard sticks) toward you until they are resting on the breast beam. Repeat with the ground warp whose lease sticks are resting on the sides of the loom.

Remove the lease sticks and tie the two warps as one onto the cloth beam rod or apron. Slide your thumb and finger down each group of threads as described above to obtain equal tension on ground and tie-

down warps before tying onto the rod. Do not tie more than one inch (2.5 cm) of warp threads into one group. I usually tie in groups of 1/2 to 3/4 inches (1-2 cm). Double check your tension and adjust it if necessary.

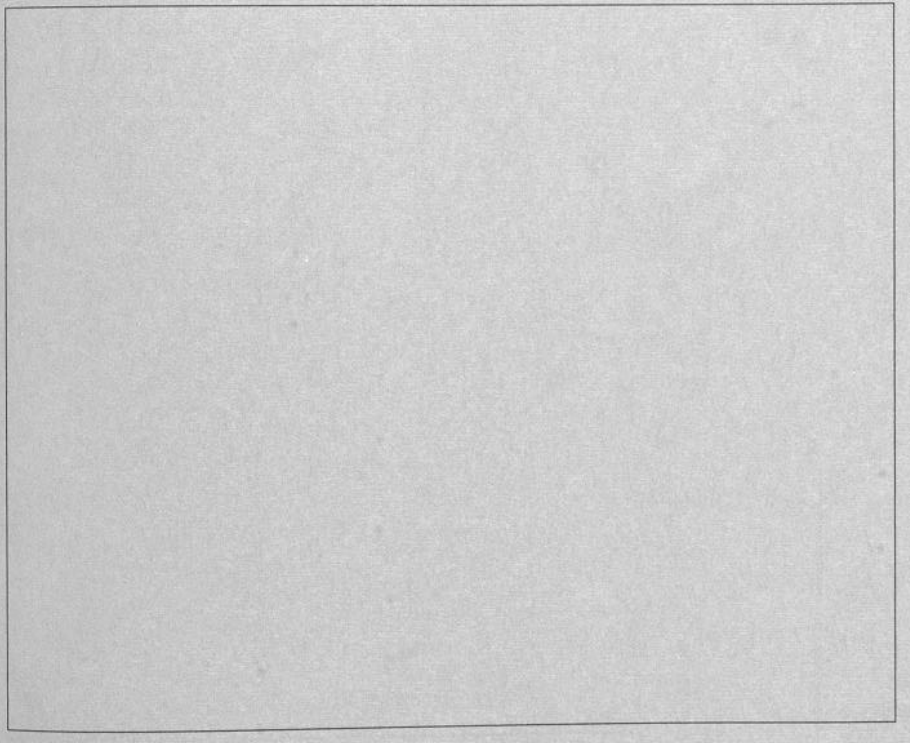
On a jack loom, set up your treadles so that shafts 1&3 are tied to the right hand treadle and 2&4 are secured to the left hand treadle. The treadle to the left of 1&3 is tied to shaft 3 and the treadle to the right of 2&4 is tied to shaft 4. Weave a few shots of filler yarn by alternating 1&3 with 2&4 to space the warp ends and determine if you have any threading errors or tension irregularities.

ILLUSTRATION 1 • 5
TREADLE TIE-UP



CHAPTER 2

WEAVING EXERCISES



WEAVING EXERCISES

INTRODUCTION

This is a very simple four harness weave structure. To weave the ground cloth you will alternate shafts 1&3 against shafts 2&4. It will be to your advantage to get into the habit of stepping on the right treadle (tied to shafts 1&3) and throwing the ground weft from right to left. Next depress the left treadle (tied to shafts 2&4) and throw the ground weft from left to right. It becomes automatic that you step right and throw from the right, step left and throw from the left. You become less fatigued when you alternate legs in treadling and you can set up a more even rhythm. If the phone rings, it is easy to begin weaving again. If your shuttle is on the right, you have just finished the 2&4 shed. If it is on the left, you have already completed the 1&3 shed and are ready to weave the 2&4 pick.

This may seem somewhat insignificant at the moment, but it will become invaluable when you are in the midst of a complicated inlay design with innumerable butterflies of yarn. At that point your mind is full of color, shape, shading, and texture decisions within the inlay design area, and your hands and feet can weave the ground cloth without your conscious effort. I find that if my hands or feet have stopped or balk at a ground shot, I had better stop and look for a possible mistake!

To insert an inlaid image, follow the treadling sequence outlined under Inlay (Chapter 2 • 12). Once you begin to inlay, you must continue with your established rhythm, albeit in a slower mode. In this way you will keep a consistency in your evolving fabric. As the inlay wefts are inserted, remember that you should continue to have the same number of ground picks per inch as you had before the inlay began. Weave for relatively short distances and then advance your warp.

Do not fall into the trap of becoming so enmeshed in the developing inlaid image that you become inconsistent in your weaving of the ground cloth. Believe me, it is easily done.

EXERCISES These exercises have been taken from Theo Moorman's book (p. 25) and elaborated upon from my own experience. They are designed to help you learn the mechanics of the technique, its inherent structure and its innumerable possibilities. Use them as a reference tool as you plan subsequent projects.

Set up your loom with a warp 6 to 8 inches (15 to 20 cm) wide and 2 to 3 yards (meters) long. Use 10/2 pearl cotton (4200 yds./lb. or 8400 m/kg) in a light color at 24 ends per inch (e.p.i.) or (100 ends/10 cm) for the ground warp, and good quality cotton covered polyester sewing thread or 20/2 pearl cotton (8400 yds./lb. or 16800 m/kg) in a dark color at 12 e.p.i. (50 ends/10 cm) for the tie-down warp. You may prefer to have a medium value ground warp and light value tie-down warp. This results in a total of 36 e.p.i. (150 ends/10 cm). Use a 12 dent reed (50 dents/10 cm) and sley 2 ground warp ends and 1 tie-down warp end in each dent, except at the selvedges. Follow the threading and tie-up draft shown in *ILLUSTRATION 2 • 1.*

It is to be understood that ground cloth is woven for the entire length of the fabric. This means that shafts 1&3 are constantly lifted in alternation with shafts 2&4, with or without the addition of supplementary ground weft (EXERCISE 2) or inlay wefts (EXERCISE 5).

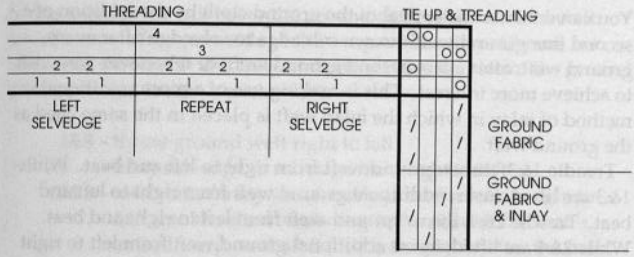


ILLUSTRATION 2 • 1

MOORMAN THREADING AND TREADLING DRAFT

EXERCISE 1
Plain Weave (Ground Fabric)

Wind ground weft thread onto a boat shuttle. Treadle 1&3 alternately with 2&4. Depress 1&3 (tied together on right hand treadle) with right foot and throw shuttle with ground weft from right to left. Depress 2&4 (tied together on left hand treadle) with left foot and throw shuttle from left to right. Ground weft should be no smaller than ground warp but may be a different color or fibre. You will not get a true plain weave structure because the weft is going over 1, under 1, over 2, under 2. Weave a one to two inch (3 to 5 cm) section of plain weave after each exercise to visually separate the samples. If you plan to cut your sampler up and mount each exercise individually, leave an additional 1 inch (3 cm) section unwoven between exercises. Insert a 1 inch (3 cm) wide strip of cardboard at the end of each exercise and use this section to cut the sampler apart. You might wish to hem stitch these areas on the loom.

EXERCISE 2
Plain Weave with Additional Ground Weft

You can enhance the appeal of the ground cloth by the addition of a second fine ground weft thrown selvedge to selvedge after every ground weft, after every second ground weft, or whenever you wish to achieve more interest. This is making use of a more traditional method of inlay in which the inlay weft is placed in the same shed as the ground weft.

Treadle 1&3, throw ground weft from right to left and beat. While 1&3 are lifted, insert additional ground weft from right to left and beat. Treadle 2&4, throw ground weft from left to right and beat. While 2&4 are lifted, insert additional ground weft from left to right and beat.

If you wish to have additional ground weft after every other shot your sequence would be:

*1&3 - ground weft right to left
1&3 - additional ground weft right to left
2&4 - ground weft left to right
1&3 - ground weft right to left
1&3 - additional ground weft left to right
2&4 - ground weft left to right
repeat from *

As you can see, the additional ground weft may not necessarily be moving in the same direction as the ground weft in the same shed.

Very fine additional ground wefts may seem to be too much effort but they can provide subtle and/or smashing results in the overall visual appeal of the resulting ground cloth. Very fine metallics or shiny rayons and silks can be especially effective here.

EXERCISE 3
Selvedge to Selvedge Inlay

In this exercise we will cover the ground cloth with an inlaid weft which extends from one side of the warp to the other. Choose an inlay weft that is soft and lofty and about twice the size of the ground weft, and wind it onto a stick shuttle.

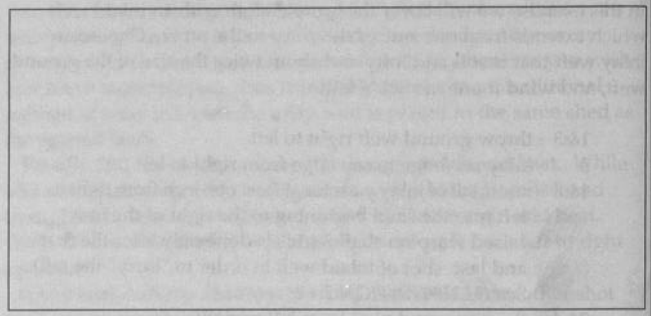
1&3 - throw ground weft right to left
3 - inlay selvedge to selvedge from right to left
1&3 - insert tail of inlay yarn for at least one inch from right to left into the shed beginning to the right of the first raised warp on shaft 3 (this is done only after the first and last shot of inlaid weft in order to "bury" the tail). See *ILLUSTRATION 2 • 2*
2&4 - throw ground weft from left to right
4 - inlay selvedge to selvedge from left to right (place the inlay weft into the shed around the last raised tie-down warp thread—do not interlock it with the ground weft). When you have completed the inlaid area, insert the last inlay weft, return to the preceding ground shed (the one that includes the tie-down shaft under which you just inlaid), and insert the inlay tail for at least one inch into the section of the fabric in which you have been inlaying. See *ILLUSTRATION 2 • 2.*

ILLUSTRATION 2 • 2
"BURY" THE INLAY TAIL

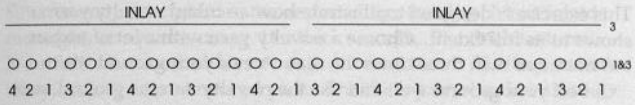
Inlay tail inserted into ground shed 1&3. Ground weft is not shown.

ILLUSTRATION 2 • 3
SELVEDGE TO SELVEDGE INLAY

A soft lofty wool has been inlaid from selvedge to selvedge and completely covers the ground fabric.



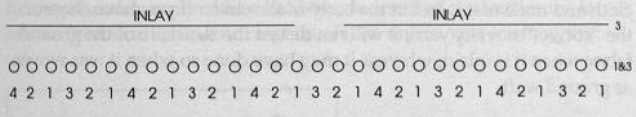
When you run out of inlay yarn, do not overlap the old and new ends in the inlay shed since this is not a secure join with only the tie-down warps to hold the ends in place. Instead, leave 2 inch (5 cm) "tails" on the old and new ends when you add a new inlay yarn in the inlay shed. Go back to the preceding ground shed and insert the "tails" of the inlay yarns. You may choose to weave each tail back under its own inlay and thus create a butt join. See *ILLUSTRATION 2 • 3*. The other alternative is to cross the tails over each other and place them in the ground shed under the opposite inlay. See *ILLUSTRATION 2 • 4*.



INLAY TAILS INSERTED INTO GROUND SHED UNDER ITS OWN INLAY YARN CREATING A BUTT JOIN. **NOTE: GROUND WEFT IS NOT SHOWN.**

ILLUSTRATION 2 • 4
ADDING NEW INLAY YARN

Butt Join



INLAY TAILS INSERTED INTO GROUND SHED UNDER ADJACENT INLAY YARN CREATING A CROSSED JOIN. **NOTE: GROUND WEFT IS NOT SHOWN.**

ILLUSTRATION 2 • 5
ADDING NEW INLAY YARN

Crossed Join

EXERCISE 4
Use of Novelty Yarn

This exercise is designed to illustrate how an inlaid novelty yarn shows to its full extent. Choose a novelty yarn with a lot of texture but not more than three times the diameter of your ground weft.

Cut off your ground weft and use the novelty yarn as ground weft in a plain weave treadling of 1&3 against 2&4 for 1 to 2 inches (3 to 5 cm). Reattach your previous ground weft and weave 1 inch (3 cm). Then weave another 1 to 2 inches (3 to 5 cm) in the same structure as in EXERCISE 3, using the novelty yarn as the selvedge to selvedge inlay. Notice that the novelty yarn sits on top of the ground cloth and none of it is lost in the body of the cloth. If you have chosen the "correct" novelty yarn, it will not distort the structure of the ground fabric when it is inlaid, whereas it may have done so when it was woven as ground weft.

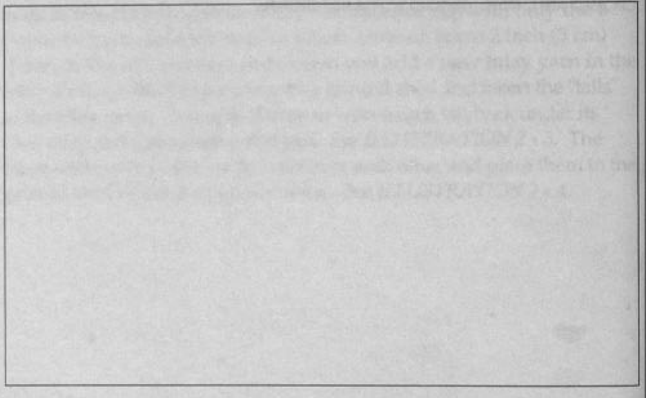
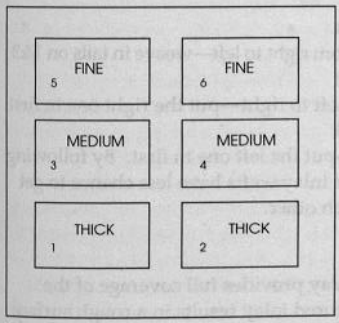


ILLUSTRATION 2 • 6
NOVELTY YARN AS GROUND WEFT AND INLAY

In the lower section of the photo, the novelty yarn is used as ground weft. In the upper section, the same yarn is inlaid.

EXERCISE 5
Isolated Inlaid Shapes

Squares and rectangles are the easiest shape to inlay. Make inlaid rectangles or squares using 1) a thick smooth, 2) a thick textured, 3) a medium smooth shiny, 4) a medium textured, 5) a fine smooth shiny, and 6) a fine textured yarn. The thick yarn should be two to three times the size of the ground weft, the medium should be one to one and a half times the ground weft, and the fine should be about half the size of the ground weft. See *ILLUSTRATION 2 • 7* for positioning of rectangles. You will need one yard (meter) lengths of yarn for this exercise. Wind the inlay yarns on knitting bodkins, fish netting shuttles, embroidery bobbins, or small stick shuttles for larger areas. Boat shuttles are not a good choice unless you are inlaying



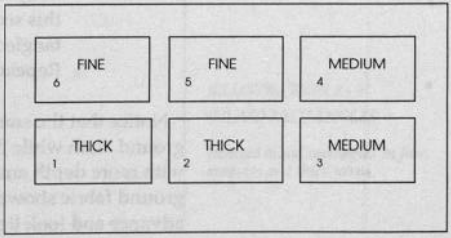


ILLUSTRATION 2 • 7
RECTANGLES

from selvedge to selvedge since they cause too much stress on the tie-down warps as they enter and exit the shed between the tie-downs. I most commonly use butterflies of inlay yarns. To keep them from disintegrating, be sure to wind the last of the yarn tightly around the middle of the butterfly and secure the end under the last wrap around the middle. In the rest of the book I will refer to inlay threads as butterflies. To inlay a butterfly of yarn, lift the appropriate tie-down shaft and enter the butterfly into the shed between two adjacent raised tie-down warps wherever you want the inlaid image to start. Continue in the shed for the desired distance and exit between two raised tie-down warps. Rest the inlay butterfly on the woven fabric, lower the raised tie-down shaft, and beat gently.

1&3 - ground right to left
3 - insert inlay wefts from right to left—weave in tails on 1&3
* 2&4 - ground left to right
4 - insert inlays from left to right—put the right one in first
1&3 - ground right to left
3 - inlay right to left—put the left one in first. By following this sequence, your inlay wefts have less chance to get tangled around each other.
Repeat from *

Notice that the smooth thick inlay provides full coverage of the ground cloth while the thick textured inlay results in a rough surface with more depth and character. With the medium inlays some of the ground fabric shows through. The smooth shiny one seems to advance and look lighter while the textured one covers the ground better and appears darker since it creates shadows. The fine yarns

allow a lot of ground cloth to show and may migrate up and down under their tie-down. The smooth shiny one has a wispy ethereal quality while the textured one appears speckled and elusive. Note that the tail of the fine inlay may show when it is woven into the ground fabric since the inlay yarn is not thick enough to cover it. You may prefer to drop the inlay tail to the back side of the ground fabric and needle weave it into the wrong side of the cloth once it is off the loom. Keep all of these effects in mind when you are designing specific projects and choose the coverage and qualities appropriate for the desired image.

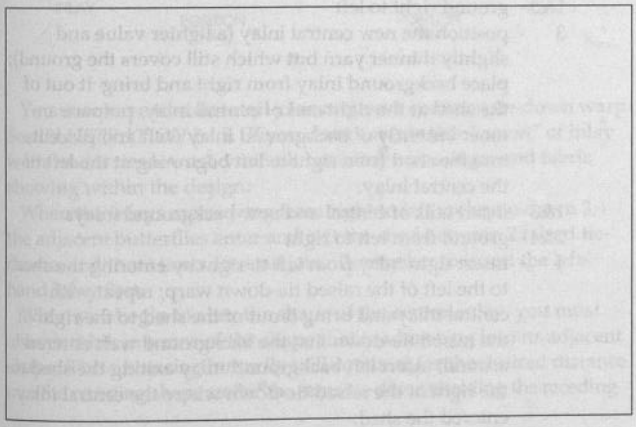


ILLUSTRATION 2 • 8
INLAID RECTANGLES

Isolated inlaid rectangles in fine, medium and thick yarns.

EXERCISE 6
Adjacent Inlaid Areas

The objective of this exercise is to show you how the Moorman technique can be used to obtain a tapestry-like effect. Now we are trying to completely cover the ground fabric and create an image sitting on top of it. The weave structure is the same as in EXERCISE 5. Choose a simple design in which you can play a central motif against a background such as a rounded shape inside a rectangle. The rounded shape might even have another shape inside it.

Use a soft lofty medium value yarn about 2 or 3 times the size of the ground weft and inlay the rectangle for about 1/2 inch (1 cm) or until you are ready to start your central shape. End after an inlay under 4.

1&3 - ground right to left

3 - position the new central inlay (a lighter value and slightly thinner yarn but which still covers the ground); place background inlay from right and bring it out of the shed at the right end of central inlay; prepare another butterfly of background inlay weft and place it into the shed from right to left beginning at the left of the central inlay.

1&3 - insert tails of central and new background inlays

2&4 - ground from left to right

4 - insert right inlay from left to right by entering the shed to the left of the raised tie-down warp; repeat with central inlay and bring it out of the shed to the right of the raised tie-down that the background weft entered around; insert left background inlay exiting the shed to the right of the raised tie-down where the central inlay entered the shed.

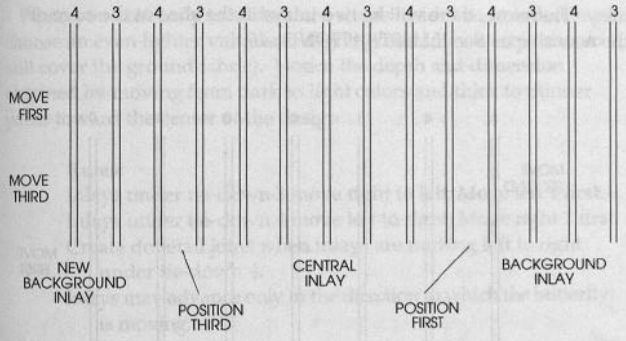


ILLUSTRATION 2 • 9
ADJACENT INLAID AREAS
MOVE THIRD
MOVE FIRST
MOVE SECOND

You now have two dovetail joins around a common tie-down warp. See *ILLUSTRATION 2 • 9*. If you do not create this "union" of inlay wefts under tie-down 4, you will have tiny areas of ground fabric showing within the design.

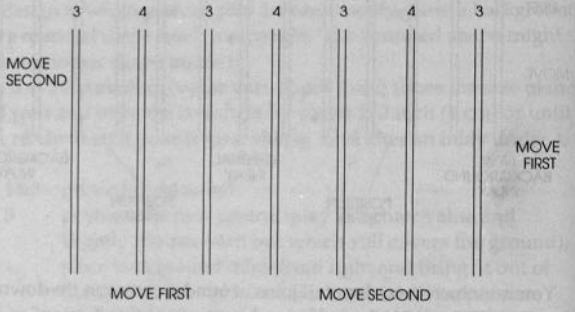
When the inlays are moving from right to left under tie-down 3, the adjacent butterflies enter and exit the shed between 2 raised tie-downs and there is no dovetail join. Remember to insert the left-hand inlay first.

When you begin to alter the shape of the central inlay, you must always think in terms of the shape that is advancing into its adjacent shape. The advancing butterfly will continue for the desired distance into the receding shape under the same tie-downs holding the receding

inlay. Therefore, there will be two inlays in the shed at the edge of the new shape. See *ILLUSTRATION 2 • 10.*

ILLUSTRATION 2 • 10
ADVANCING INLAY SHAPE

Both inlays are under the same tie-down warps on shaft 4.



Remember that the inlaid shape can only advance in the direction in which the butterflies are moving. As a result, a rounded shape can grow on the left side when the inlays are moving from right to left under tie-down 3 and on the right side when the butterflies are moving from left to right under tie-down 4. You are limited on the distance that one inlay can advance into the adjacent one by their relative size and the resulting build-up and possible cloth distortion.

Once you start to change the shape of your inlaid image, the direct application of *ILLUSTRATION 2 • 9* becomes a little questionable. When in doubt, enter the inlay into the shed in the proposed place and then check to see if ground fabric will show. Keep your turns around the tie-down warps firm and crisp without distorting the position of the tie-down thread.

When you are ready to add a third shape inside the rounded one, choose an even lighter value and slightly finer inlay weft (it should still cover the ground fabric). Notice the depth and dimension obtained by moving from dark to light colors and thick to thinner yarns toward the center of the design.

Rules:

Inlays under tie-down 3 move right to left; Move left 1 first.
Inlays under tie-down 4 move left to right; Move right 1 first.
Create dovetail joins when inlays are moving left to right under tie-down 4.
Inlays may advance only in the direction in which the butterfly is moving.

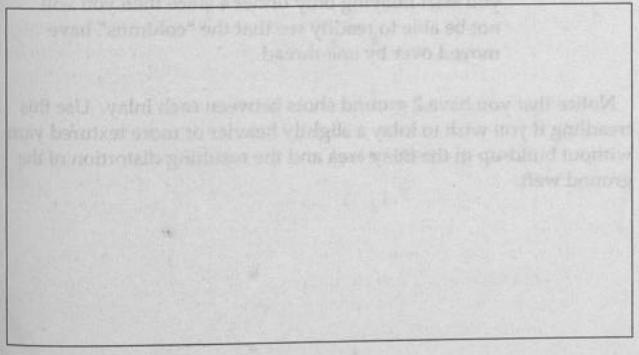


ILLUSTRATION 2 • 11
IMITATION TAPESTRY

Adjacent inlaid yarns to create a tapestry-like effect.

EXERCISE 7
Tie-down Warp Used to Produce Columns

If you use the same tie-down shaft repeatedly and inlay a smooth, thick, soft yarn (e.g. doubled 6 strand embroidery floss) in a contrasting value to that of the tie-down warp, vertical lines created where the tie-down warps cover the inlay yarn become a design element. This effect can be particularly useful in geometric or architectural designs.

*1&3 - ground weft from right to left
3 - inlay weft from right to left
2&4 - ground weft from left to right
1&3 - ground weft from right to left
3 - inlay weft from left to right
2&4 - ground weft from left to right.
Repeat from* for desired distance then switch to inlaying only under 4 after your ground weft on 2&4. Do not weave a section of plain ground cloth before you start inlaying only under 4 since then you will not be able to readily see that the "columns" have moved over by one thread.

Notice that you have 2 ground shots between each inlay. Use this treadling if you wish to inlay a slightly heavier or more textured yarn without build-up in the inlay area and the resulting distortion of the ground weft.

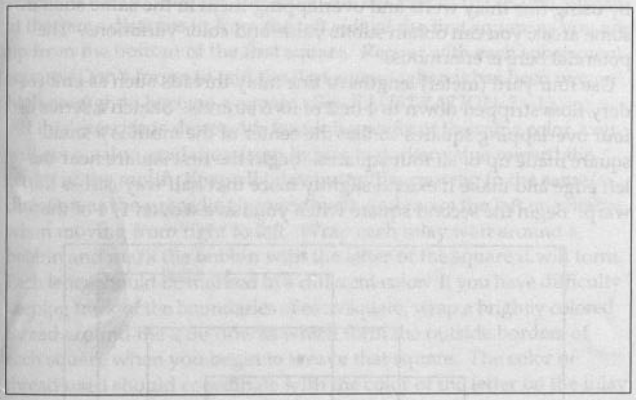


ILLUSTRATION 2 • 12
TIE-DOWN COLUMNS

Tie-down warp threads create vertical columns in the inlaid areas.

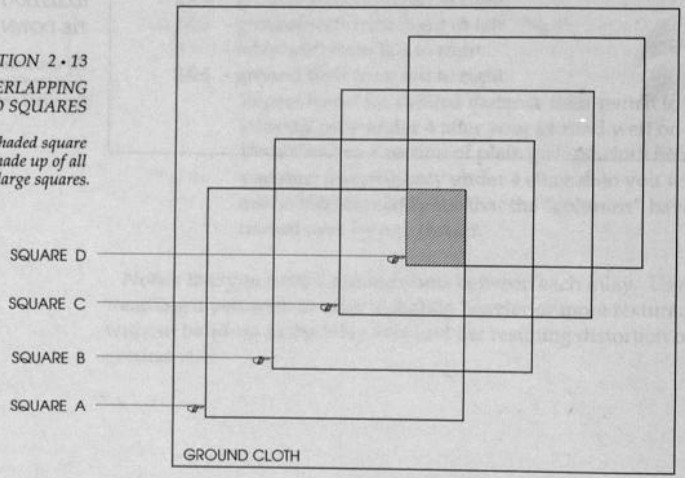
EXERCISE 8
Overlapping Area of Transparent Value or Color

By using fine inlay wefts and overlapping them in the same shed in some areas, you can obtain subtle value and color variations. The potential here is enormous.

Use four yard (meter) lengths of fine inlay threads such as embroidery floss stripped down to 1 or 2 of its 6 strands. Sketch a series of four overlapping squares so that the center of the motif is a small square made up of all four squares. Begin the first square near the left edge and make it extend slightly more that half way across the warp. Begin the second square when you have woven 1/4 of the

ILLUSTRATION 2 • 13
OVERLAPPING INLAID SQUARES

The small shaded square in the center is made up of all four large squares.



height of the first square. Establish the left side of the second square at the same distance in from the left side of the first square as you are up from the bottom of the first square. Repeat with each subsequent square. Don't forget to end the first square when it has been woven high enough to become a square. See *ILLUSTRATION 2 • 13.*

If this exercise is done with four inlay wefts of the same color, you will get a value gradation from lighter to darker value toward the center of the motif. Keep all inlay butterflies moving in the same direction as the preceding ground weft, and move the left one first when moving from right to left. Wrap each inlay weft around a bobbin and mark the bobbin with the letter of the square it will form. Each letter should be marked in a different color. If you have difficulty keeping track of the boundaries of each square, wrap a brightly colored thread around the 2 tie-downs which form the outside borders of each square when you begin to weave that square. The color of thread used should coordinate with the color of the letter on the inlay bobbin for that square. When in doubt about the boundary of a square, follow the tie-down up from where you have wrapped the colored thread around it and that will tell you where to enter or exit the shed with your inlay. See *ILLUSTRATION 2 • 14.*

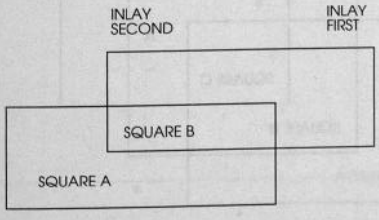


ILLUSTRATION 2 • 14

VALUE GRADATION
Inlaying Same Color Under Tie-down 4

Different colored thread wrapped around tie-down at edge of Squares A and B.

Both inlays A and B are in the same shed but have been shown with space between them to illustrate their position within the shed. Beat gently after each is inserted.

If this exercise is done with four different colors, the objective becomes one of blending the colors where they overlap in the same shed. Since the best color blending occurs when you repeat the same sequence of colors over and over, we must now drop the rule of moving the right one first when inlaying left to right under tie-down 4. Now, regardless of which direction the inlays are moving, you always insert the colors in the same order.

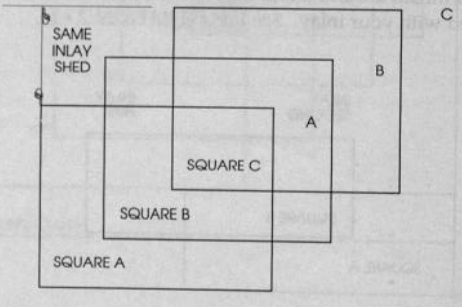
Once you have begun the second square, the weaving sequence becomes:

1&3 - throw ground weft from right to left. Beat.
3 - insert color A within its square from right to left. Beat gently. Insert color B within its square from right to left. Beat. (1 & 3 to insert tail at beginning.)
2&4 - throw ground weft from left to right. Beat.
4 - insert color A within its square from left to right. Beat gently. Insert color B within its square from left to right. Beat. Repeat the sequence until ready to add the third square. See *ILLUSTRATION 2 • 15.*

ILLUSTRATION 2 • 15
COLOR BLENDING

2 & 4 - ground left to right
4 - inlay A, B, then C left to right in the same shed. Beat gently after each color.

Colors A, B, and C are all placed in the same shed but have been shown with space between them to illustrate their position within the shed.



When you reach the fourth square, your weaving sequence will be:

Lift 2&4 and throw ground weft left to right.
Lift 4 and insert inlay wefts A, then B, then C, then D from left to right in the same shed. Beat gently after each inlay weft insertion.

Always insert the colors in the same order and beat gently after each insertion to keep them in order in the shed. Choose colors that are different enough that they will create new colors where they overlap while at the same time having a pleasing relationship with each other.

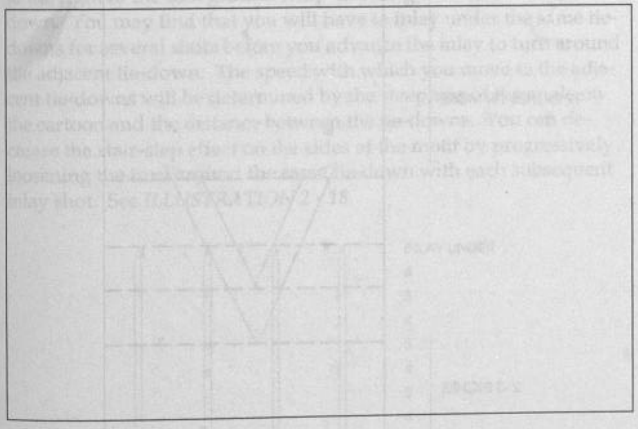


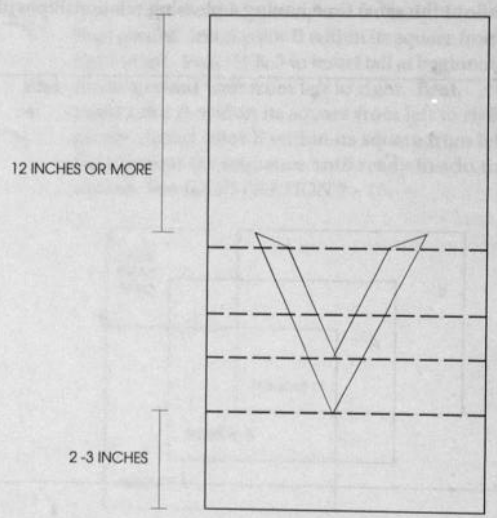
ILLUSTRATION 2 • 16
OVERLAPPING INLAY

This photo illustrates overlapping shapes, each inlaid with a different color of fine embroidery floss or sewing thread.

EXERCISE 9
Using a Cartoon

Draw a "V" or a diamond shape on a long piece of paper. Use a bright color felt tip marker or colored pencil which will be readily seen through your ground warp threads. Be sure to allow 2 to 3 inches (5 to 8 cm) of plain paper below the shape and another 12 inches (30 cm) above the shape. Draw a line across the cartoon perpendicular to the sides at the beginning, middle and near the end of the motif. Attach the cartoon to the woven cloth and beater as directed under *Cartoons,* Chapter 4 • 15. See *ILLUSTRATION 2 • 17.*

ILLUSTRATION 2 • 17
POSITION OF IMAGE ON CARTOON



In this case you will not be able to insert the inlay tail into the preceding ground shed since the motif begins with a point. The inlay tail will only "disappear" when it can be inserted into the ground shed under where it has been inlaid. Drop the 4 to 5 inch (10 to 13 cm) tail of inlay weft to the back side of the woven cloth and needle weave it into the wrong side of the motif after the fabric is off the loom and before it is washed.

For this exercise, create a new color for your inlay weft by combining up to four single strands of embroidery floss or fine threads of different colors. The resulting color will be richer and more interesting than a thicker yarn of a solid color.

If you begin to inlay under tie-down 3, you will drop your tail just to the right of the first ground warp to the right of the raised tie-down. You may find that you will have to inlay under the same tie-downs for several shots before you advance the inlay to turn around the adjacent tie-down. The speed with which you move to the adjacent tie-downs will be determined by the steepness of the angle on the cartoon and the distance between the tie-downs. You can decrease the stair-step effect on the sides of the motif by progressively loosening the turn around the same tie-down with each subsequent inlay shot. See *ILLUSTRATION 2 • 18*.

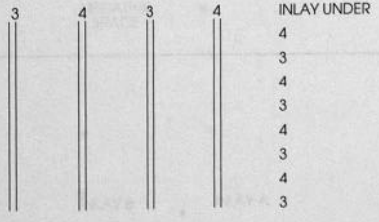


ILLUSTRATION 2 • 18

BEGINNING AN INLAY FROM A SHARP POINT

Each turn of the inlay yarn around the same tie-down warp is made progressively looser to help "even out" the diagonal inlaid line.

I frequently think one shot ahead of where I am actually weaving. For example, if I have inlaid under tie-down 3, I will drop harness 3 and lift 4 to evaluate where I will insert the inlay weft on the next shed. Sometimes I will go back and change where I entered or exited under tie-down 3 so the inlay weft is in a more favorable position to weave under tie-down 4 in the next inlay shed. Watching your cartoon lines on each shot will help you make your decisions.

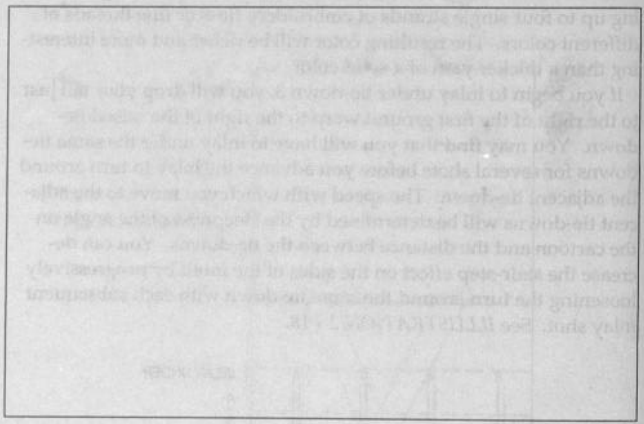


ILLUSTRATION 2 • 19
INLAY BEGINNING WITH A POINT

Inlaid "V" shaped image in four single strands of embroidery floss.

EXERCISE 10
Freeform Design

If your design is more organic and freeform with several colors and/or textures which flow in and out of each other, you will find it easier to use a meet and separate tapestry technique in your inlaid area.

Each inlay butterfly should be moving in the opposite direction to the one beside it. This allows you much more freedom to insert butterfly A for a very short distance in the shed and bring butterfly B a greater distance over to meet it. In the next shed butterflies A and B move away from each other for the desired distance. In the subsequent shed, they move toward each other again and can meet in a completely different location.

If you choose not to have them meet, a bit of the background cloth will show. Theo Moorman used this visible background to great effect to outline elements of her designs. She referred to it as a "corona." My designs seem to lend themselves to larger and more organic areas of ground cloth within the design image. I call them negative spaces. Making use of these negative spaces can add great dimension to your design with no weaving effort on your part! Be aware that the color of this negative space will appear to be different than the rest of the ground cloth since its color is influenced by the surrounding inlaid colors. See *ILLUSTRATION 2 • 20.*

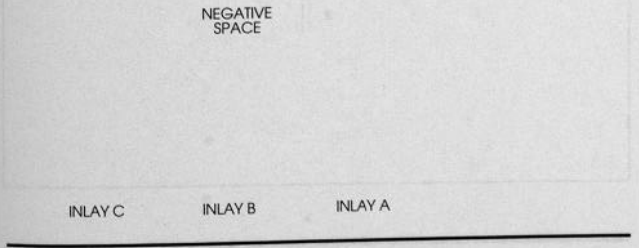


ILLUSTRATION 2 • 20
FREEFORM DESIGN

Only inlay wefts are shown for clarity.

Each time you add a new butterfly of inlay weft within the design area, you must add two butterflies so that all the inlays continue to move in opposition to each other. These can be two butterflies of the same yarn. A single butterfly can be added at the outside edge of an image but it must be moving in the opposite direction to the one beside it.

Make use of this exercise to play with different sizes and textures of inlay yarns. You can achieve solid vibrant color areas and/or textures which contrast with a fine, shadowy, elusive inlaid area. Overlapping the fine yarns in some sections and making use of negative spaces will add further dimension to your design.

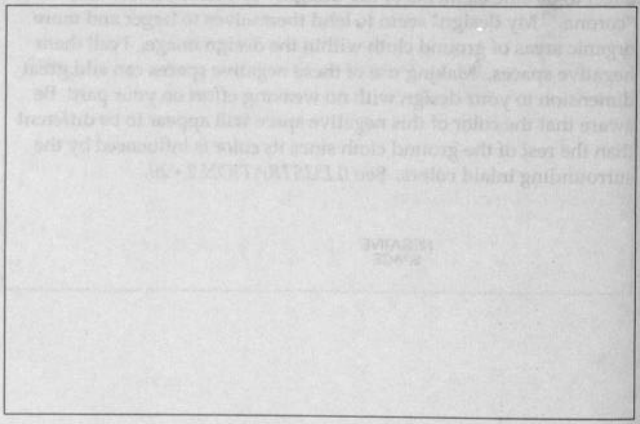


ILLUSTRATION 2 • 21
FREEFORM INLAY

Inlay using meet and separate tapestry technique.

You may wish to move one color beyond its adjacent butterfly and have the two colors change places without cutting them off and beginning them again. Once the two butterflies have met each other, instead of moving them away from each other in the next inlay shed, cross them over each other and insert them in the shed going in opposite directions. They will both go under the same tie-down warp thread right where they cross. You will obtain a smoother color transition if you cross light over dark colors, shiny over dull colors, and textured over smooth yarns. See *ILLUSTRATION* 2 • 22.

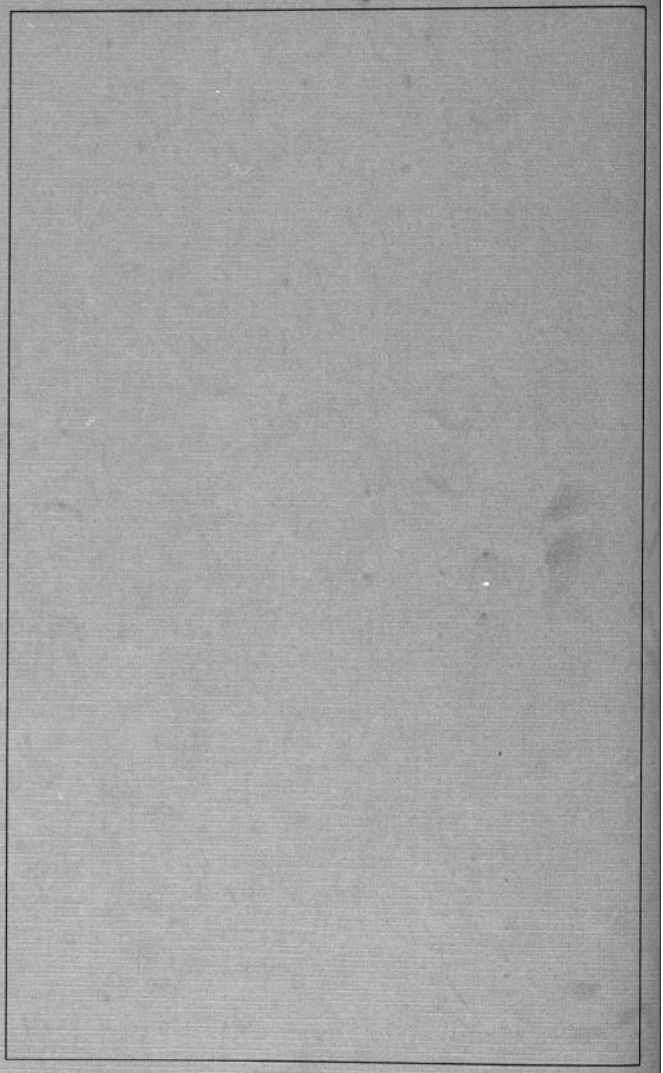
ILLUSTRATION 2 • 22

COLORS CHANGING PLACES

Insert dark color under tie-down and into shed moving left. Then insert light color under same tie-down, over dark color, and into shed moving right.

CHAPTER 3

WARP AND WEFT FIBRE DECISIONS



WARP AND WEFT FIBRE DECISIONS

CHOOSING THE WARP

Ground Warp

Your ground warp and weft fibre will determine the characteristics of the fabric being woven. Therefore, you must make some preliminary decisions. Once you have chosen your garment style, you must refine your options. The fibre you use must be appropriate for the climate, the desired weight of the fabric, the required drape, the amount of tailoring to be incorporated, the intended method of cleaning, and the type and amount of embellishment to be added.

The sett of the ground warp will also affect all of these options. Normally the ground warp sett is determined by that required for a balanced plain weave structure. That is assuming you will use a similar size ground weft and very fine tie-down warp threads. In other words, the tie-down warps are so fine that they need not be considered in determining the ground warp sett.

As the tie-down warp increases in size in relation to the ground warp size, it must definitely be accounted for in the sett determinations. For example, 10/2 pearl cotton (4200 yds./lb. or 8400 m/kg) used with sewing thread tie-downs works well at 24 e.p.i. (100 ends/10 cm). Since the threading requires 1 tie-down warp for every 2 ground warps, your tie-downs would be sett at 12 e.p.i. (50 ends/10 cm) for a total of 36 e.p.i. (24 ground and 12 tie-downs). This could easily be set up in a 12 dent (50 dents/10 cm) reed with 2 ground warps and 1 tie-down warp in every dent (except at the selvedges which have only ground warps). If you choose to use 20/2 (8400 yds/lb. or 16800 m/kg) for your tie-down warp, you might want to sett the 10/2 ground warps at 20 e.p.i. (80 ends/10 cm) and the 20/2 tie-down warps at 10 e.p.i. (40 ends/10 cm) for a total of 30 e.p.i. (120 ends/10 cm). This combination is readily achieved with 3 ends per dent in a 10 dent (40 dents/10cm) reed.

If you have 2 warp beams, it would probably be to your advantage to beam the ground and tie-down warps separately. This would allow you more freedom in differential tension control over the 2 warps. I do not have this option so I beam my 2 warps as one. In order to avoid potential tension problems, I recommend that you choose the same fibre for your tie-down warp as you have used for your ground warp—wool with wool, cotton with cotton, silk with silk.

Tie-Down Warp

There are several characteristics to consider when choosing the thread for your tie-down warp.

1. It must be strong enough to withstand the stress put on it as you manipulate it to inlay under it.

2. It must be elastic enough to allow for variations in size and texture in the yarns you use as inlays. This is particularly important if you are inlaying heavy textured designs only in concentrated areas throughout the warp length. You may have noticed at the end of the last paragraph that I did not mention linen warp. It is because linen is so inelastic that it is not a good choice as a tie-down warp. However, if linen has the fibre properties you need in your garment, choose a design with a limited amount of inlay and use fine smooth inlay yarns for a transparent ethereal effect which will not put a strain on the elasticity of the tie-downs or cause tension problems.

3. It must be smooth enough to slide past the adjacent ground warps and open a clear shed when weaving the ground

cloth. If a tie-down warp is caught mid-shed where it can be hit when you throw the ground weft shuttle, it will probably break.

4. It must be fine enough to visually disappear in the inlaid area and not detract from the design.

5. It must be of the same value as the inlaid yarns in order to visually disappear in the inlaid image. However, if there is a strong contrast in value between the inlay yarns and the ground fabric, you must make a conscious decision of whether you want the tie-down to disappear into the ground cloth or into the inlaid areas. It cannot do both.

   Note that for my dress *Feather Fantasy II,* (See Chapter 4 • 1) I chose black for my tie-down warp which is invisible in the ground fabric but creates an additional pattern where it holds down the inlaid feathers. This is not a consideration if the inlay yarns are soft and textured because the tie-down warp threads will sink into the inlaid yarn and virtually disappear.

CHOOSING THE WEFT

Ground Weft

The ground weft is normally the same size as the ground warp. If it is smaller than the ground warp, the size of the inlay yarns must also be proportionately finer. If you choose a ground weft that is larger than the ground warp, you may also inlay thicker threads, but the resulting fabric becomes weft dominant and increasingly textured.

The ground weft is often the same fibre content as the ground warp. You must make your decision based on the qualities desired in your clothing fabric. A wool or cotton warp with a silk weft can

produce a wonderful fabric which includes characteristics of both the fibres in it.

If you wish to have your ground fabric a solid color, you will achieve a richer and more interesting color if you put one value or shade of the color in the warp and another in the ground weft. For example, cross a true red warp with a blue-red or an orange-red in a different value; or cross a black warp with a navy, deep purple, or dark maroon weft.

You can enhance the beauty and appeal of the ground fabric with supplementary ground weft as in Exercise 2 of Chapter 2. This can be as subtle or bold as you please. You might also consider adding fine textured supplementary ground weft to a smooth shiny ground fabric, or a fine shiny and/or metallic supplementary ground weft to a ground cloth with a matt finish. This need not be done throughout the entire fabric but could be inserted in predetermined strategic areas for maximum effect.

Inlay Wefts

Your choice in inlay yarns is wide open! Basically, anything that can be held in place by the tie-down warp, can be inlaid. However, you do have to practice some restraint! If you are planning to wear and clean this garment, keep that fact in mind when choosing your inlays. The floats in the design area must be able to withstand the stresses of abrasion, stretching, pressure, and exposure to light and moisture.

Wool inlay on a wool ground is the safest combination since the inlay tends to become somewhat felted to the ground cloth. Consequently, your inlay floats can be longer and still remain structurally sound. Smooth, shiny silk, on the other hand, must be held firmly to the surface by closely spaced tie-downs to avoid undesirable "migrations" and/or snags.

One of the main advantages of the Theo Moorman inlay technique is that since the inlaid yarns are sitting on the surface of the ground cloth, as opposed to being embedded within the ground cloth, the ground fabric is not as easily distorted. However, there are limits and you must remember to pay attention to the ground cloth as you inlay a design. Be sure that you continue to get the same number of picks per inch (3 cm) and that your fell line remains straight. It is very easy to become so immersed in the inlay area that you ignore the quality of the ground fabric.

When choosing your threads to inlay you must make some decisions. Do you want the design area to cover the ground fabric and appear to be tapestry-like? In this case your yarns need to be soft and lofty and twice the size of your ground weft. Textured threads need to be the same size or perhaps slightly smaller than the ground weft to avoid build-up. Be very careful with novelty yarns that have very hard or compact textured sections. These create distortion, especially when the textured bumps build up upon themselves in subsequent sheds. Sometimes yarns that are two to three times the size of the ground weft can be used if they are soft and lofty enough to compact when beaten. Experimentation is your best criteria to determine the most suitable choices.

Do not ignore the potential of very fine inlay yarns. As you position a sewing thread or a single thread of a six strand embroidery floss, you may have the distinct impression that this is not worth the effort! Believe me, it is. The transparent, wispy, ethereal quality achieved can add tremendous dimension to your design, especially when contrasted with heavier or more textured areas.

The finer inlay yarns also allow you freedom to shade colors, overlap design elements, and move colors in and out of each other. If you

combine several fine threads together, you can create a beautiful new color which will have more character than one thicker yarn of that same color. Consider threading small beads onto a fine inlay thread and then move the beads into the desired position as you inlay. Be sure that you choose a very strong yarn to string the beads on so it does not break under the weight of the beads and the stress of the inlaying. A word of caution here—a seemingly small number of beads adds a surprising amount of weight to a garment.

Very fine metallics can be used alone or with another fine inlay yarn to add depth and sparkle to your design. Do remember though that even very fine metallics make a statement out of proportion to their size. Do not allow it to overpower the image. Be aware also that metallic yarns frequently do not shrink and this may cause loose floats of metallic when the other inlaid yarns shrink with washing. The excess length can be eased to the ends of the inlay and secured on the back side of the ground fabric.

Thrums are frequently long enough to add just the right touch to an inlaid area. There, now you have another excuse to save your thrums and scraps of those "special" threads you can not bear to throw away!

TIE-DOWN WARP SPECIFICS

Because only 1 tie-down shaft is raised each time you inlay, only half of the total number of tie-down warp threads are being used to secure the inlaid yarn in place on each shot. For example, if there are a total of 12 tie-down warp ends per inch (50 ends/10 cm), half of these or 6 per inch (25/10 cm) are securing the inlay yarn. This results in a float length of 1/6" (4 mm). Fabric for clothing should not have a float length exceeding 1/4" (6 mm). If the inlay and ground yarns are wool, and the fabric will be fulled to the degree that the

inlay becomes somewhat felted to the surface of the ground cloth, then it is safe to have a longer float.

It is easiest and most convenient to sley 2 ground warps and 1 tie-down warp in each dent of the reed. However, as a result, the tie-down thread can jump from one side to the other of its adjacent ground warp in the same dent. For example, in a dent holding warps threaded through 1, 2, and 3, the tie-down in 3 may stay to the left of the ground warp on 2 for perhaps 10 consecutive ground weft shots. Then on the next shot it may suddenly decide to jump to the right of the ground warp on 2 and you have no control over this movement apart from manually putting it "back where it belongs." See *ILLUSTRATION 3 • 1*. When the value of the ground and tie-down warps is the same, this anomaly does not show. The visual problem which resembles a threading error occurs when there is a marked contrast in color or value between the ground and tie-down warps.

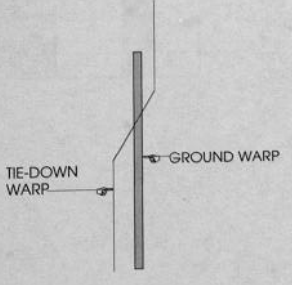


ILLUSTRATION 3 • 1
SIDEWAYS MOVEMENT OF TIE-DOWN WARP

There is no structural need to include tie-down warps across the complete warp if there are sections within the width of the warp which will have no inlay for the entire length of woven fabric. What you must remember is that where the tie-down warps weave into the ground fabric, the ground weft travels over 1, under 1, over 2, under 2 and this creates a slightly different texture than the areas of ground cloth composed of ground warps only. If there will be a large section of plain ground cloth above or below the inlaid area, consider whether the difference in textures of the two types of ground fabric will be pleasing or not.

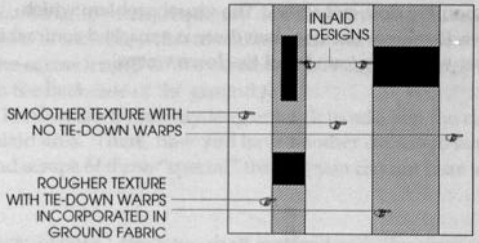
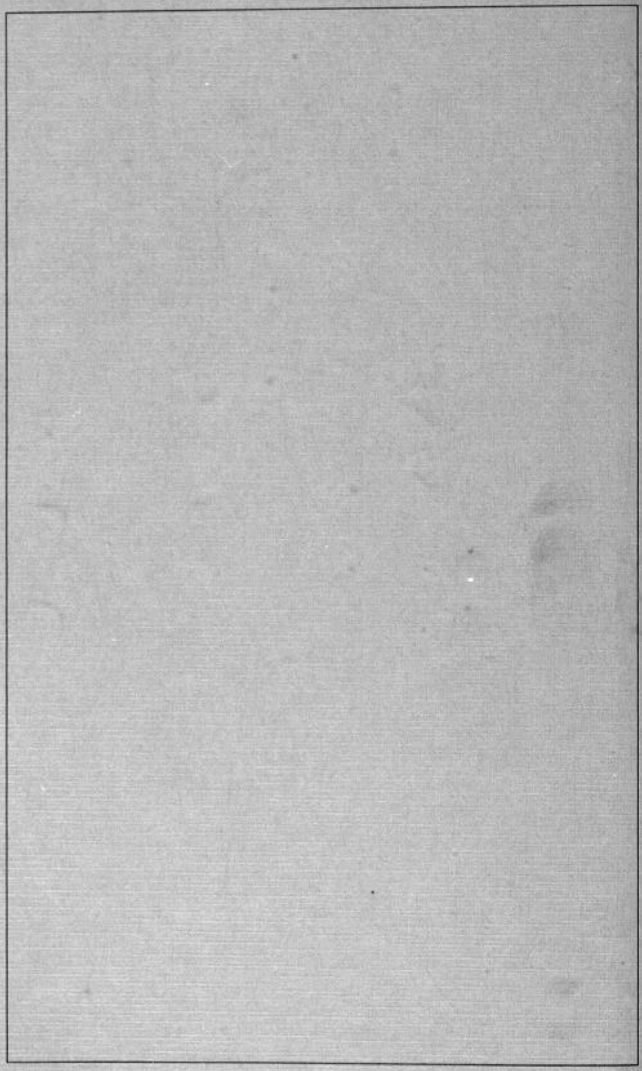


ILLUSTRATION 3 • 2
WOVEN FABRIC SHOWING AREAS WITH AND WITHOUT TIE-DOWN WARPS

CHAPTER 4

DESIGNING GARMENTS



DESIGNING GARMENTS

DESIGN INSPIRATIONS

Many of us must make a conscious effort to retrain ourselves to "see" what is around us. We tend to be so left-brain dominant that we are aware of, but don't actually "see" and assimilate our surroundings. Our senses have deserted us in the sense that we do not appreciate the significance of the input they are continually giving us. Yes, we know there is a maple tree in the front yard. But do we internalize and appreciate the colors, shapes and patterns of its profusion of leaves, the strength and texture of the bark, the light filtering through its noble branches, or the flickering shadows cast on the ground below it? Any one of these could be the spark that begins the creation of a design.

Our brains are constantly receiving signals from our environment which could serve as wonderful designs. What we must do is train ourselves to receive those signals at a conscious level and evaluate them as potential design inspirations. Some will be too complex and will have to be rejected. Others will require simplification by zeroing in on the essential quality or characteristics of a design. As we become more proficient in the Moorman technique, we will begin to recognize design elements that are particularly appropriate for inlay.

A few of the many sources for design inspirations are nature experienced directly or through photographs or magazines, landscapes, sunsets, architecture, enlargements of microscopic structures, stained glass, ceramics, needlework, yarns, exotic fabrics, ethnographic books, ethnic costumes, travel, paintings, and foods.

If a potential design appears overwhelming, try squinting at it until it becomes out-of-focus and blurred. This will help you eliminate irrelevant aspects of the design and get you closer to the simplified key elements of the image. Another approach to the same destination is

to cut a small "window" in a sheet of white paper. Look through your window and isolate the small essential aspects of what you are observing in terms of color, line, and texture.

Always carry a small sketch book with you and record what you see. Include color and texture information on your sketch. Do not be intimidated by the idea of drawing. You are not attempting to create a piece of art; you are simply documenting what touched and inspired you so you will have it recorded for your own future reference. You will be amazed at how much better you "see" an image when you force yourself to draw it.

Another trick is to look at a familiar object in the mirror. Seeing things from a different perspective or a totally different angle can prove very educational and inspirational. Look up at grasses, leaves and flowers from the ground underneath them. Notice how different a building looks when seen from above. Cloud patterns change completely when observed from under water.

Always insist upon simplicity. It is far too easy to fall into the trap of trying to put too much detail into a design or of using too many beautiful and textured yarns. The result is often a jumbled and disjointed design.

THEO MOORMAN INLAY TECHNIQUE ADAPTED TO CLOTHING

The Theo Moorman inlay technique is extremely flexible and versatile. Theo used it mainly as a faster method of accomplishing tapestry-like effects on her wall hangings, space dividers, and ecclesiastical pieces.

However, it holds great potential for cushions, table linens, curtains, bedspreads, upholestry fabric, greeting cards, fashion accessories, and clothing. In fact, it has so many possibilities that all weavers could readily apply it no matter what their area of interest. Each different

application would necessitate careful selection of fibre, sett, and float length to obtain cloth appropriate for the desired use.

In her book, *Weaving As An Art Form*, Theo Moorman does not use her weaving technique on clothing apart from religious vestments. She mentions only that "the possibilities are great and the field is wide open."[1] However, as soon as I had done her series of exercises, I could see its potential for everyday fashions. I decided to try it. That was in 1982 and it has been my main area of interest and experimentation ever since. I could easily continue for another 20 years and never get bored!

Clothing is a communication system. You need to decide what you wish to say about yourself through your clothes. Your garments should fit your personality and life style and should make a unique statement about you. Your clothing should draw attention to you in a positive way. It should emphasize your good points and minimize those you are not so proud of. Simply putting on one of your outfits should make you feel good; and when you feel good, your personality sparkles and that makes you look and feel even better.

Clothing must be three dimensional. Therefore, designing garments is similar to working with sculpture. I think of the body as an armature on which I will display my "sculpture." I have an additional consideration over static sculpture in that my armature moves. Consequently, my garment must flow as the body moves; it must not restrict the wearer's movement; and it must look good from all angles.

Successful fashions must not only look good, but they must be practical. They must be functional whether they are intended for everyday use or for one very special occasion. They must be comfortable, wearable and durable without restricting movement or falling apart.

[1] *Weaving As An Art Form: A Personal Statement*, Theo Moorman, p. 45.

They must be serviceable and be able to withstand the method of cleaning chosen for them.

When adapting the Moorman technique to clothing application, there are a number of considerations to make. Plan the shape of the inlay design to complement the basic shape of the garment. If you are making a jacket with straight lines and squared corners, consider inlaying geometric shapes. However, more organic rounded elements might be more appropriate for a soft jacket with curved lines and set-in sleeves.

Be sure that your design areas move and flow and are not disrupted by seam lines. The viewer's eyes need to be able to move over and around the whole body without interruption. Remember that the back of an outfit makes a very good display board so please design for it as well. Include rhythm and repetition in your designing. Repeat shapes, colors, or textures to encourage the eye to move around on the garment. Consider the placement of the inlay areas so that they are not calling attention to parts of your body you are trying to de-emphasize.

The eye follows unbroken lines and as a result, long vertical lines tend to have a slenderizing effect, especially if they are narrow, off-center, and/or asymmetrical. Be careful not to place an obvious horizontal line at an area you are trying to minimize.

When you inlay design elements onto your ground cloth, you are adding a second layer of threads. Take into consideration the position and weight of those threads. Be sure that the structure of the garment and the stability of the ground fabric are able to support the additional weight and texture. Keep in mind that heavily textured designs create gravitational pull in the same direction as gravity not only structurally but also visually. Do not position your inlaid areas only on the lower section of the garment, or they may appear to be

falling off the outfit. This is especially true for a short person who may seem to be sinking into the ground under the "weight" of the design elements.

When you are planning your design, try to incorporate some enclosed negative spaces. These are areas within the inlaid design where the ground fabric is not covered. These sections appear to be a different color than the main body of ground fabric since their color is affected by the surrounding inlaid colors. These "negative" shapes can add remarkable dimension and depth with absolutely no effort on your part.

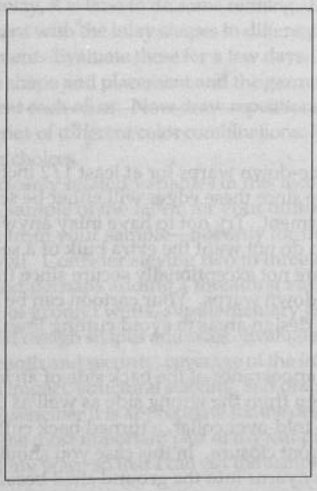


ILLUSTRATION 4 • 1

DETAIL FROM PITCH CREEK THAW CAPE

In this illustration, the small dark area of the ground fabric enclosed by the light inlay is an example of negative space.

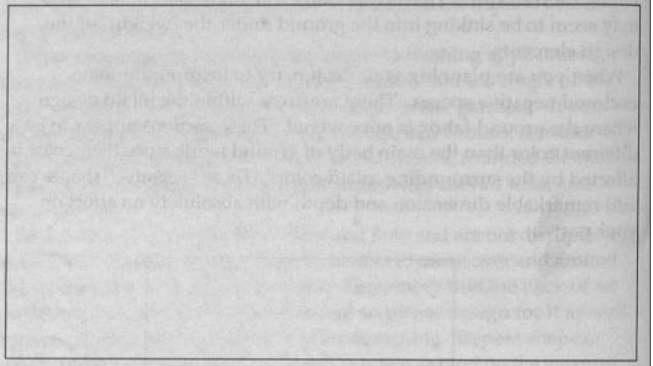


ILLUSTRATION 4 • 2
GROUND FABRIC SERVING AS PART OF THE DESIGN

Ground fabric becomes an important part of the design within the inlay. Notice that the cross in the center of this image appears lighter than the rest of the ground fabric.

I do not sley tie-down warps for at least 1/2 inch (1 cm) on either side of my warp since these edges will either be seam allowances or hems on the garment. Try not to have inlay anywhere that you will be sewing. You do not want the extra bulk of a second layer and the inlaid threads are not exceptionally secure since they are held in place only by the tie-down warps. Your cartoon can be a great help in positioning the design areas to avoid cutting lines, seam allowances, and neck holes.

Consider the appearance of the back side of an inlaid area if the piece will be seen from the wrong side as well as the right side. Examples are a fold-over collar, a turned back cuff, or an unfastened asymmetrical front closure. In this case you should not weave the ends of the inlay yarns into the ground shed because they will show

on the wrong side of the cloth. They must be left hanging from the fabric at the beginning and end of the inlaid area and then be needle woven into the space between the inlay and the ground cloth once the fabric comes off the loom. Another less secure method would be to begin and end the inlay by wrapping the inlay tail around the first (or last) raised tie-down warp and placing it back into the inlay shed under the inlay yarn for about 2 inches (5 cm).

DESIGNING THE GARMENT

Once you have decided on the garment you will weave and the design element(s) you will inlay, it is time to do some refining. Draw a series of sketches of the garment with the inlay shapes in different sizes and locations on the garment. Evaluate these for a few days. Your objective is to have the design shape and placement and the garment style and silhouette complement each other. Now draw repetitions of the chosen garment and do a series of different color combinations. This will help you refine your color choices.

There are a lot of closely related variables in this technique. Now is the time to weave a sample of the fabric for your outfit. Try to learn as much as you can from your sample—not only for this garment but for future ones as well. Consider sleying two to three different setts across the sample and perhaps adding a threading variation. Experiment with a variety of ground wefts, supplementary ground wefts, beats, inlay yarns, and design shapes and sizes. Evaluate the sett of the ground cloth, float length and security, coverage of the inlaid yarns, color relationships, design impact, structural stability, and drapability of the overall fabric. Decide whether it is appropriate for the desired garment. I always try to repeat the most important part of my sample (if not all of it) on the second half of my warp so that I can cut the sample in half and

wash half of it. This gives me an "off-loom"as well as a washed record of the cloth which I find most helpful. The washed sample is used to calculate take-up and shrinkage which in turn must be incorporated into the final warp planning and layout. The unwashed sample sits beside my loom for reference while I weave.

The next step is to make a "muslin" or sample of your proposed garment. Stand in front of a full length mirror and evaluate the fit. Make any adjustments necessary to improve the fit and record the changes you have made so they can be incorporated into the cutting and construction of the woven garment. Cut out your design elements in the appropriate colored paper and pin them in position on your "muslin." Evaluate again in the mirror. Use a hand mirror as well so you can see yourself from all possible angles. Enlarge, reduce, redefine, or reposition the images until you are satisfied. Now ask yourself several questions.

What is the major impression conveyed? Is the focal point in the right place? Is the design all it can be or is too much? Always remember the importance of simplicity. Is the design balanced and does it relate to other areas of the garment and to the overall shape of the outfit? Is the garment comfortable to wear and is it appropriate for the occasion and the season?

Once you are satisfied, you need to draw the design areas onto your "muslin" and then transfer these onto a cartoon. See the section on cartoons later in this chapter—page 4 • 15. As you do this, you must include necessary allowances for the shrinkage that will occur when the cloth is washed before garment construction. See *ILLUSTRATION 4 • 5, Calculating Shrinkage.*

It is also necessary to take into consideration the direction in which you should inlay your design area. Normally, clothing is cut along the lengthwise grain of the fabric. Many of my images however,

have a longitudinal dimension to them and this is enhanced if the inlaid threads follow the same lines. For example feathers woven across their width appear shorter and wider than if they are inlaid along their length as in *Feather Fantasy II*. Because the feathers were being woven along their length, I was also able to blend colors more readily.

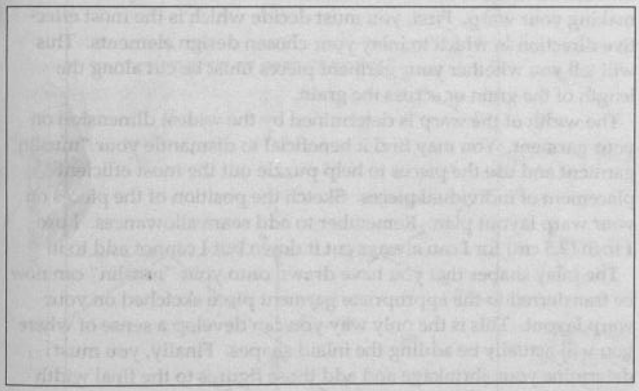


ILLUSTRATION 4 • 3
DETAIL OF FEATHER FANTASY II

The warp is vertical in the photo and the dress was cut across the grain. See Chapter 4 • 1.

Consequently, there may be times when it is more efficient and/or visually effective to weave your fabric "sideways." You must realize that fabric cut on the cross grain will have slightly different characteristics than that cut on the lengthwise grain. With Moorman inlay you do have the advantage of weaving a ground structure which is almost a plain weave interlacement. If you use a ground weft which

is the same as the ground warp (it can be a different color) and you beat for a balanced plain weave between the ground warp and weft, the resulting fabric can safely be cut on the cross grain.

WARP LAYOUT

There are a number of factors which need to be considered before making your warp. First, you must decide which is the most effective direction in which to inlay your chosen design elements. This will tell you whether your garment pieces must be cut along the length of the grain or across the grain.

The width of the warp is determined by the widest dimension on your garment. You may find it beneficial to dismantle your "muslin" garment and use the pieces to help puzzle out the most efficient placement of individual pieces. Sketch the position of the pieces on your warp layout plan. Remember to add seam allowances. I use 1 inch (2.5 cm) for I can always cut it down but I cannot add to it!

The inlay shapes that you have drawn onto your "muslin" can now be transferred to the appropriate garment piece sketched on your warp layout. This is the only way you can develop a sense of where you will actually be adding the inlaid shapes. Finally, you must determine your shrinkage and add those figures to the final width and length of your proposed warp.

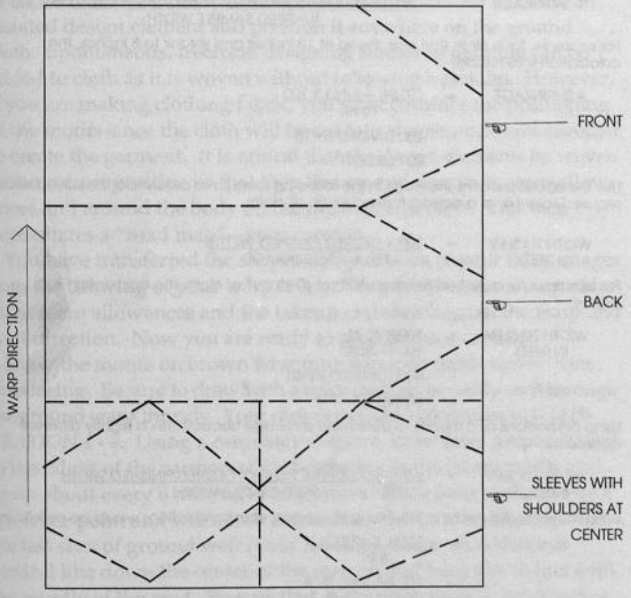


ILLUSTRATION 4 • 4
"WARP LAYOUT FOR FEATHER FANTASY II"
Broken lines indicate cutting lines.

CALCULATING SHRINKAGE

Calculating shrinkage can be a simple chore using either the percentage method or simple proportions method. To use the percentage method, you must first determine the percent that your sample shrank when washed. Use the formula found in *ILLUSTRATION 4 • 5.*

ILLUSTRATION 4 • 5
CALCULATING SHRINKAGE

$$\text{\% SHRINKAGE} = \frac{\text{(WARPED SAMPLE WIDTH—WASHED SAMPLE WIDTH) X 100}}{\text{WARPED SAMPLE WIDTH}}$$

For example, for a cloth that was sleyed at 10 inches and shrank to 8 inches, the calculation is as follows:

$$\text{\% SHRINKAGE} = \frac{\text{(10 IN. —8 IN.) X 100}}{\text{10 IN.}}$$

$$= \text{200 DIVIDED BY 10}$$

$$= \text{20 PERCENT}$$

PERCENTAGE METHOD

Use the above percent shrinkage in the following formula to determine the sleyed width required to achieve a desired finished width of cloth:

$$\text{WIDTH TO SLEY IN REED} = \frac{\text{100 X DESIRED FINISHED WIDTH}}{\text{100 \%—\%SHRINKAGE}}$$

For example, for a desired finished width of 40 inches of cloth, the calculation is as follows:

$$\text{WIDTH TO SLEY IN REED} = \frac{\text{100 X 40 IN.}}{\text{100\%—20\%}}$$

$$= \text{4000 DIVIDED BY 80}$$

$$= \text{50 INCHES.}$$

PROPORTIONS METHOD

Using proportions as a means to determine shrinkage necessitates a slightly different approach:

$$\text{WIDTH TO SLEY IN REED} = \frac{\text{WARPED SAMPLE WIDTH X DESIRED FINISHED WIDTH}}{\text{WASHED SAMPLE WIDTH}}$$

Using the same figures as in the examples above, your calculations would be as follows:

$$= \frac{\text{10 IN. X 40 IN.}}{\text{8 IN.}}$$

$$= \text{400 DIVIDED BY 8}$$

$$= \text{50 INCHES.}$$

Both methods of calculation provide the same result. Use whichever method you are more comfortable with.

To determine the length, substitute the word "length" for "width" in each of the formulae. Do not forget to add loom waste to your final length calculations.

CARTOONS

The Theo Moorman inlay technique allows the weaver to create an isolated design element and position it anywhere on the ground cloth. Spontaneous, freeform designing similar to painting can be added to cloth as it is woven without following a cartoon. However, if you are making clothing fabric, you must consider the positioning of the motifs since the cloth will be cut into shapes and sewn together to create the garment. It is critical that the design elements be woven in the correct position so that they line up and flow over seam allowances and around the body on the finished ensemble. This fact necessitates a "road map"—your cartoon.

You have transferred the shapes and positions of your inlay images onto the drawing of your warp layout. You have taken into consideration seam allowances and the takeup and shrinkage in the warp and weft direction. Now you are ready to prepare your cartoon.

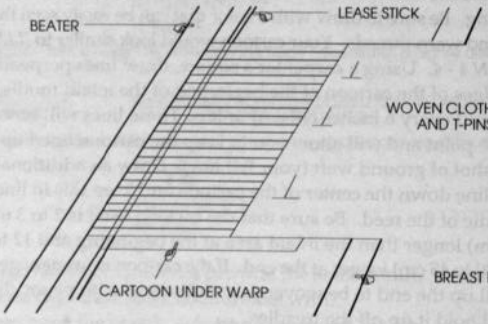
Draw the motifs on brown wrapping paper or stable non-woven interfacing. Be sure to draw with a color that can be easily seen through the ground warp threads. Your cartoon would look similar to *ILLUSTRATION 4 • 4*. Using a carpenter's square, draw lines perpendicular to the edges of the cartoon at the beginning of the inlaid motifs and again about every 6 inches (15 cm) or less. These lines will serve as a reference point and will allow you to keep the cartoon lined up with the last shot of ground weft (your fell line). Draw an additional vertical line down the center of the cartoon and keep this in line with the middle of the reed. Be sure that the cartoon itself is 2 to 3 inches (5 to 8 cm) longer than the inlaid area at the beginning and 12 to 18 inches (30 to 45 cm) longer at the end. If the cartoon is unmanageably long, roll up the end to be woven last and secure with paper clips. This will hold it up off the treadles.

Weave the ground fabric to the beginning of the first inlaid motif. Tape a lease stick to the front surface of the beater below the shuttle

race. Thread the cartoon (right side up) from the bottom between the lease stick and beater. Pull it forward and line up the horizontal line at the beginning of the inlay area with the fell line of the ground cloth and the central vertical line on the cartoon with the center of the reed and your warp width. Pin the cartoon into place under the warp with T-pins positioned about 1 inch (2.5 cm) from the edge of the fell line and about 8 inches (20 cm) apart. This set up will hold the cartoon snugly under the warp threads when the beater is at rest against the castle. In this way it is easy to see where to inlay your design elements. When you move your beater forward to beat, the cartoon should slide down between the lease stick and front side of the shuttle race. If it does not, loosen the tape holding the lease stick to allow more room for the cartoon to slide up and down.

ILLUSTRATION 4 • 6
ATTACHING CARTOON UNDER WARP THREADS

Lease stick is taped to front edge of beater to hold cartoon up under warp threads.



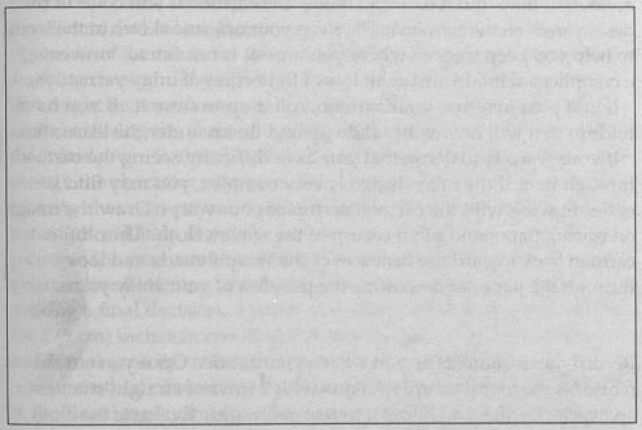


ILLUSTRATION 4 • 7

CARTOON UNDER WOVEN IMAGE

This is another view to help you better visualize the placement of the cartoon under the warp threads. Note how the lease stick is taped to front edge of beater to hold the cartoon up under the warp threads.

Weave and inlay for about 2 inches (5 cm). Move the pins holding the cartoon one at a time to 1 inch (2.5 cm) from the new fell line. Release the tension and advance your warp. Repeat this procedure as you inlay. Unwind the cartoon at the back and roll it up under the woven cloth in the front as necessary and secure with paper clips. The cartoon does not get wound onto the cloth beam with the fabric but hangs just behind the breast beam. Continually check that the cartoon remains "square" under the warp threads by using your horizontal and vertical reference lines.

If your inlaid image has enclosed negative space or overlapping

areas, you may find it easier to follow the cartoon if you color in the design areas on the cartoon itself. Keep your original sketch at the loom to help you keep track of where you are—it is not fun to "unweave" a complicated inlaid area with lots of butterflies of inlay yarns!

If you plan to re-use your cartoon, roll it up to store it. If you have folds in it, it will not readily slide up and down under the lease stick.

If your warp is so dense that you have difficulty seeing the cartoon through it, or if the inlay design is very complex, you may find it easier to work with the cartoon on top of your warp. Draw the image on tracing paper and pin it on top of the woven cloth. Unroll the cartoon back toward the beater over the warp threads and look through the paper to determine the position of your inlay yarns.

FINISHING (WASHING) THE CLOTH

Record measurements as you weave your fabric. Once you cut the fabric off the loom, secure the ends with 2 rows of straight stitches or an overlock stitch and allow it to rest overnight. Evaluate the cloth for weaving errors and correct any that have occurred. Measure and record the width and length so that you will have sleyed and woven measurements, off-loom measurements, and later washed measurements.

Look carefully at the inlaid motifs. If you are not satisfied with the image projected, you do have the option of changing it. One of the advantages of Moorman inlay is that there is a separate ground cloth on which the inlay is floating. As a result, you are free to carefully remove (without cutting ground cloth threads!) sections of inlay. You may also add to your image using yarn threaded on a tapestry needle and woven under the appropriate tie-down warps.

If you have inlay yarn tails hanging down on the wrong side of the fabric, you must needle weave them invisibly on the back side of the

inlay area. Use a tapestry needle and weave them in for at least 1 inch (3 cm) and longer if they are smooth and slippery. Check the right side of the fabric for ground cloth distortion or undesirable color showing through. If your inlay was done with very slippery yarns that might become "unwoven" in the washing process, you might consider fusing the sheerest possible interfacing to the wrong side of the inlaid area. Remember that this will stiffen the design areas and change the character of your cloth, perhaps undesirably. If you use pinking shears to cut out the fusible interfacing, the points along the cut edges will help blend the fused section into the non-interfaced section. The pressure required to fuse the interfacing may cause an unattractive flattening of the inlaid image. Do a sample before making a final decision. I prefer to needle weave slippery inlay tails for 2 (5 cm) inches in one direction and then back on themselves for additional security, rather than using fusible interfacing.

Your method of washing the fabric will depend upon the fibres in it, the float length, and the desired amount of fulling. Dry clean or handwash your cloth for the least amount of fulling and shrinkage. Almost all of my fabrics are washed in my automatic washer. I fill the machine with lukewarm water (about 105 degrees Fahrenheit or 40 degrees Celcius) and dissolve in it a washing agent with a neutral ph (I use Orvus Paste). Immerse the cloth and allow it to soak undisturbed for 30 to 45 minutes. This step is particularly important with wool which requires this soaking time to absorb the water and become thoroughly wetted. Agitate on the gentle cycle for about 2 to 6 minutes. Rinse once or twice in lukewarm water and spin for about one minute. If your fabric is fine wool, do not allow water entering the machine to spray directly onto the cloth since this may cause fulling on contact. Air dry flat or well supported and steam press on

the wrong side before it is completely dry. Use an up and down motion (lift and press, lift and press) and not one in which the iron slides from side to side across the cloth. Be careful when pressing that you do not crush the inlaid area. Once the fabric is dry, measure and record the width and length. Adapt these instructions depending on the requirements of each piece of cloth. Be sure the fabric is completely dry before manipulating it in the cutting and construction process.

CUTTING Most weavers have a phobia about cutting their handwoven fabrics. Even very experienced seamstresses may find themselves doing normally dreaded chores in order to avoid taking scissors to fabric! Let me assure you that a well designed handwoven cloth has the same characteristics as a commercially woven one and will not disintegrate in front of your eyes. Procrastinate no longer!

Handwoven fabric should be cut on a large flat surface in a single layer. Assemble all your pattern pieces and be sure you have a right and left of jacket fronts and sleeves where necessary. Position your pattern pieces on the woven fabric following your warp layout diagram. Evaluate the "scrap" fabric areas—is there a way to rearrange the pattern pieces to obtain larger (and therefore more useable) "scraps?" Secure the pattern pieces with pins or weights. Take a break.

On your return, evaluate your layout and ask yourself the following questions. Do I have all the pattern pieces and are there a left and right where necessary? Are the grain lines straight and in the same direction on all pieces? Are stripes and inlays matched? Have I made all the necessary changes to accommodate any fitting adjustments?

Be sure your cutting shears are sharp. Slide the scissors along the table surface as you cut and disturb the fabric as little as possible.

Move yourself around the table to achieve the correct cutting angle (do not move the fabric). Cut with the grain (usually from wide to narrow) which will force the warp and weft threads together rather than apart.

Take each piece to the sewing machine and secure the cut edges with 2 rows of straight stitches within 1/4 inch (6 mm) of the edge of the fabric. Sew with the grain. Backstitch at the beginning of the first row and leave thread tails at the end. Place the fabric on a flat surface and ease out any gathers which have occurred during the sewing. Complete the second row of stitching in the same manner. Alternatively, you can secure the edges with an overlock stitch on a serger machine. Stay stitch curves and bias cuts just outside the seam line in the seam allowance. Temporarily pin the pattern piece back onto the handwoven fabric and go on to secure the edges of the next piece.

If I have garment sections which are rectangles or squares and are cut across the width of the fabric, I sew the 2 rows of straight stitches across the fabric on either side of the cutting line and then cut the pieces apart. Pin a safety pin to the top right ("public") side of each piece to aid in identification during assembly.

CONSTRUCTION

Some preplanning can help simplify the construction of your garment. Try not to have inlay where you will have to cut and seam the fabric. Because the inlaid design consists of long floats and is held down on the surface of the ground fabric by fine warp threads, it is somewhat unstable when cut into. It is difficult to secure those floats adequately, especially if you are dealing with smooth slippery yarns such as silk or rayon. Plan your warp layout and cartoon so you weave seam allowances of ground fabric only. Be sure that you have inlaid areas arranged so that they match exactly across seamed areas when the garment is assembled.

I allow 1 inch (2.5 cm) seam allowances on my garments—it is my insurance policy! With 1 inch I can assemble the garment using any seaming technique I choose. If the seams require less than 1 inch, I can always cut it off. Since handwoven fabric is often heavier than commercial fabric, the seam will usually lie flatter and be less conspicuous if it is 1 inch rather than 1/2 inch.

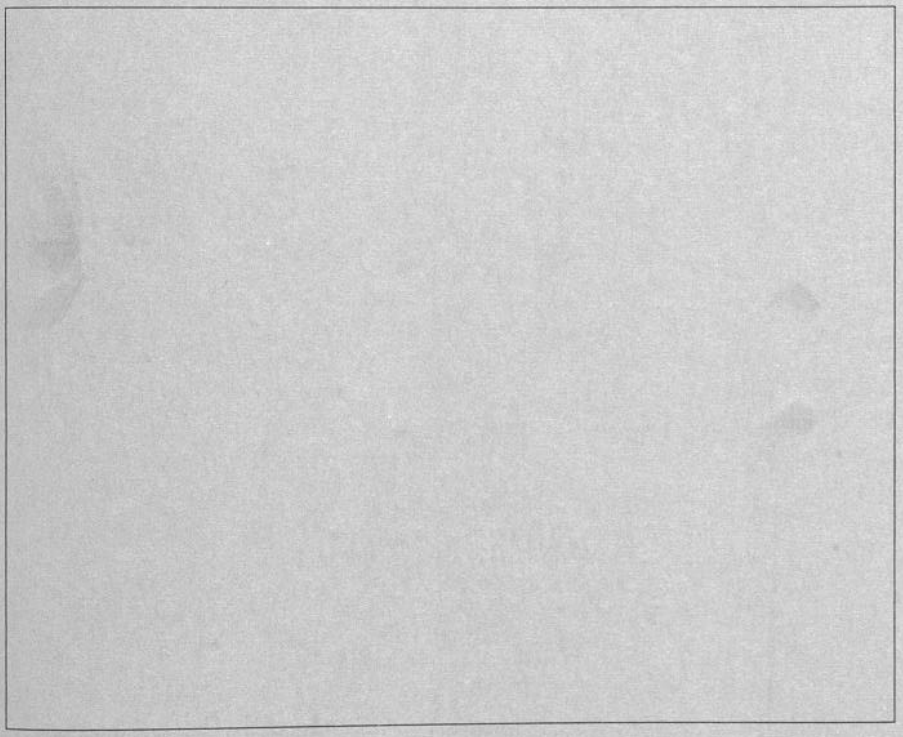
If I am using a seaming technique which requires grading the seam allowance, I accomplish the grading in the joining of the seam. For example, a flat felled seam is sewn with the under side (the one which would normally be trimmed) 3/8 inch (1 cm) shorter than the other seam allowance. The flat felled seam can then be completed without any trimming. I compensate for this "mismatching" of seam allowances by removing the excess from the short side when I do the original 2 rows of straight stitches or serging on the cut edges. If I graded the seam allowance by trimming the fabric, I would also be cutting off my stitching which prevents the fabric from ravelling.

Top stitching can be a very useful tool for the tailor of handwoven clothing. It looks very chic from the outside of the garment while holding facings or other inner construction elements in place. Use it to your advantage.

Garments with inlay are frequently improved by the addition of a full lining. The "wrong" side of the handwoven fabric has spots of the inlaid color showing through and the woven-in tails of the inlay threads are obvious. The lining covers these, allows you to insert shoulder pads between lining and fabric, and provides an elegant finish for the outfit. The lining should be opaque, slippery, structurally sound, lightweight, and have the same washing requirements as the garment to which it is being added. Follow the instructions in your commercial pattern or a respected sewing text for assembly and installation of the lining.

CHAPTER 5

MODIFICATIONS



MODIFICATIONS

THREADING VARIATIONS

In Theo Moorman's inlay technique, the tie-down warps of shafts 3&4 take turns holding the inlaid wefts in place on alternate inlay sheds. Consequently, only half of the total number of tie-down warp threads are securing an inlay at any one time. The distance between the tie-down warp ends determines the length of the floats of the inlaid weft. There may be times when you wish to alter the distance between the tie-downs.

Basic Moorman Threading

In the basic Theo Moorman threading, there are two ground warp ends between every tie-down end. As a result, on an inlay shed, there will be a total of five ends between every functioning tie-down warp thread. When shaft 4 is lifted, you will have warp ends on 1, 2, 3, 1, and 2 between each raised thread on shaft 4. Any yarn that is then inlaid under the tie-downs of shaft 4 will float over five warp ends before it is "tied down" again. At a tie-down warp sett of 12 e.p.i. (50 ends/10 cm), the float length will be 1/6 of an inch (4 mm) long.

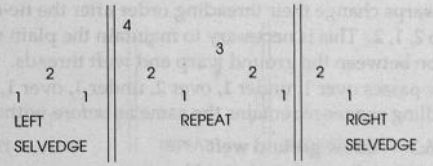


ILLUSTRATION 5 • 1
BASIC MOORMAN THREADING

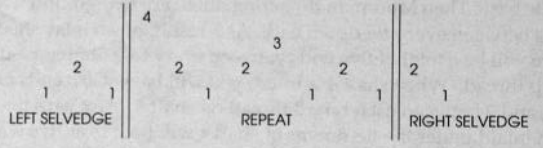
You can shorten the float length by using finer yarns for your ground and tie-down warps and making the sett more dense. With

heavier yarns, you could use a coarser sett and thereby secure a longer float.

Long Float

However, there will be occasions when you would prefer to have more control over the inlay float length. This can be obtained by modifying the threading. If you would like to use finer yarns which would require a closer sett, but still have a longer float to show off your inlaid yarns, you simply add an additional ground warp between every tie-down warp. The threading now becomes:

ILLUSTRATION 5 • 2
LONG FLOAT THREADING



Now, when you lift shaft 4 to inlay, the weft will travel over warp threads on 1, 2, 1, 3, 2, 1, and 2 for a float over 7 ends. Note that the ground warps change their threading order after the tie-down on shaft 3 to 2, 1, 2. This is necessary to maintain the plain weave interaction between the ground warp and weft threads. The ground weft now passes over 1, under 1, over 2, under 1, over 1, under 2. The treadling sequence remains the same as before with:

1&3 - throw ground weft
3 - inlay weft in desired location
2&4 - throw ground weft
4 - inlay weft in desired location

Extra Long Float

If you need an even longer float, add another ground warp between each tie-down warp. There are now four ground warps between each tie-down warp and the inlay yarn floats over a total of nine warp ends. With the same treadling as above, the mock plain weave becomes over 1, under 1, over 1, under 1, over 2, under 1, over 1, under 2.

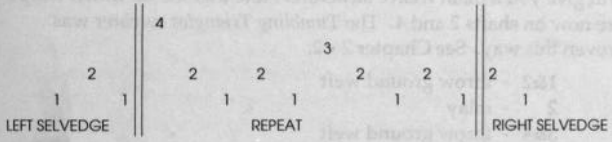


ILLUSTRATION 5 • 3
EXTRA LONG FLOAT THREADING

Short Float

Perhaps now you would like to shorten the float length of your inlaid thread. This may have become necessary because you want to increase the size of your ground warp threads (which would necessitate a wider sett), while at the same time retaining a float length acceptable for clothing. To accomplish this, you can remove one ground warp between the tie-downs and you are left with the following threading:

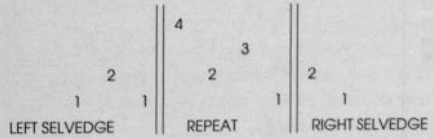


ILLUSTRATION 5 • 4
SHORT FLOAT THREADING

If you use the same treadling as above with this threading, you will get a basket weave structure in which the ground weft travels over 2,

under 2. If your tie-down warp threads are very fine, this structure will be appropriate for clothing. However, if your tie-downs have also increased in size, or are actually the same size as your ground warps, you may have to change your treadling to obtain a structure stable enough for garments. Consider changing your right selvedge to 1,3 and the left to 1,3,1 and weaving the following sequence which will give you a plain weave structure. Note that the tie-down warps are now on shafts 2 and 4. The *Tumbling Triangles* sweater was woven this way. See Chapter 2 • 2.

1&2 - throw ground weft
2 - inlay
3&4 - throw ground weft
4 - inlay

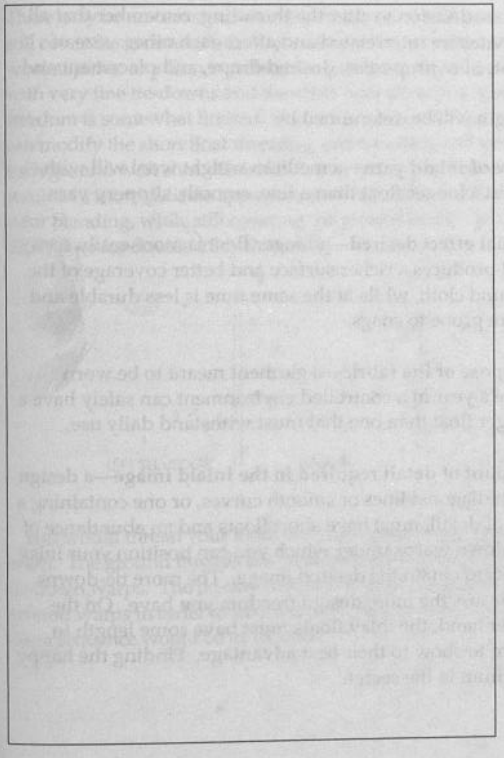


ILLUSTRATION 5 • 5

TUMBLING TRIANGLES
See Chapter 2 • 2

Detail of sweater using short float threading and modified treadling. See pages 5 • 5 and 5 • 6 in this chapter.

In making your decision to alter the threading, remember that all aspects of weaving are interrelated and affect each other: size of yarns, sett, beat, fibre properties, desired drape, and placement and amount of inlay.

The float length will be determined by

1. **type of inlaid yarn**—a medium weight wool will withstand a longer float than a fine, smooth, slippery yarn.

2. **visual effect desired**—a longer float is more easily seen and produces a richer surface and better coverage of the ground cloth, while at the same time is less durable and more prone to snags.

3. **purpose of the fabric**—a garment meant to be worn once a year in a controlled environment can safely have a longer float than one that must withstand daily use.

4. **amount of detail required in the inlaid image**—a design with diagonal lines or smooth curves, or one containing a lot of detail, must have short floats and an abundance of tie-down warps under which you can position your inlay wefts to obtain the desired image. The more tie-downs there are, the more design freedom you have. On the other hand, the inlay floats must have some length to them to show to their best advantage. Finding the happy medium is the secret.

Double Inlay

There may be an occasion when you wish you could use finer inlays and still cover the ground fabric. Let's assume you want to make a heavy woolen jacket or a firm handbag at a ground sett of 10 to 12 e.p.i. Even with very fine tie-downs and the short float threading, your design freedom is somewhat limited. If you have access to a six shaft loom, you can modify the short float threading and treadling and inlay twice for each ground weft shot. This allows you to inlay with finer yarns which result in a more delicate appearance and a greater facility in shading and color blending, while still covering the ground fabric. See *ILLUSTRATION 5 • 6* for double inlay threading.

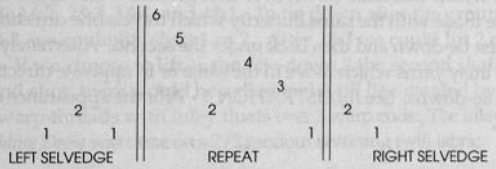


ILLUSTRATION 5 • 6
DOUBLE INLAY THREADING

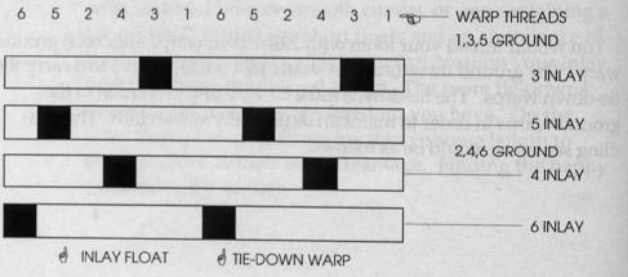
You would thread your loom with 2 tie-down warps after each ground warp. The ground threads are on shafts 1&2 while shafts 3 to 6 carry the tie-down warps. The tie-downs must be very fine in relation to the ground warps in order to maintain structurally stable cloth. The treadling sequence would be as follows:

1,3&5 - throw ground weft
3 - inlay weft in desired location
5 - inlay weft in desired location
2,4&6 - throw ground weft
4 - inlay weft in desired location
6 - inlay weft in desired location

The path of the ground weft is over 1, under 1, over 2, under 2 as it is in the basic Moorman threading and treadling. The inlay floats will travel over 5 warp threads, 2 ground and 3 tie-downs. Each ground weft shot can be (but doesn't have to be) followed by 2 inlay shots which will slide down over that ground weft. The 2 inlay shots can be made with the same butterfly which travels one direction under the first tie-down and then back under the second. Alternately, you can use 2 inlay yarns which move in the same or in opposite directions under the 2 tie-downs. See *ILLUSTRATION 5 • 7* for the appearance of the cloth.

ILLUSTRATION 5 • 7
DOUBLE INLAY

Only the inlay shots are shown.



TREADLING VARIATIONS

Once you understand the concept of Theo Moorman's Inlay Technique, it is easy to see its adaptability to other weave structures. Under threading variations I have discussed modifications to accomplish a choice in the length of the inlay float. The idea of "tie-down" warp threads can also be adapted to an existing warp and threading.

The purpose of the tie-down warps in Theo Moorman's system is to hold the inlaid wefts on the surface of the ground fabric. The weaver can assign certain shafts in a pre-existing warp and threading as "tie-down" shafts. What must be remembered is that the tie-down shaft must be one of the shafts lifted in the preceding ground shed. The next thing to consider is the length of the inlaid float. Let us use 2/2 twill structure on a straight draw threading as an example. The twill treadling is 1&2, 2&3, 3&4, and 4&1. To tie down after the ground shot on 1&2, we could lift shaft 1 or 2. After 2&3 we could lift 2 or 3 and so on. If we choose to lift as the "tie-down," the second shaft of each ground shot, there would be a diagonal twill line created by our tie-down warp threads with inlay floats over 3 warp ends. The inlay on *Carol's Wedding Dress* was done on a 2/2 random reversing twill fabric.

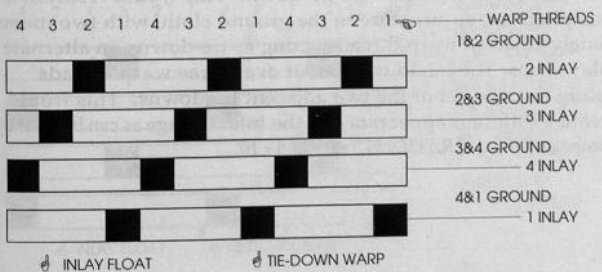


ILLUSTRATION 5 • 8
INLAY ON 2/2 TWILL

Only the Inlay Shots are shown in this illustration.

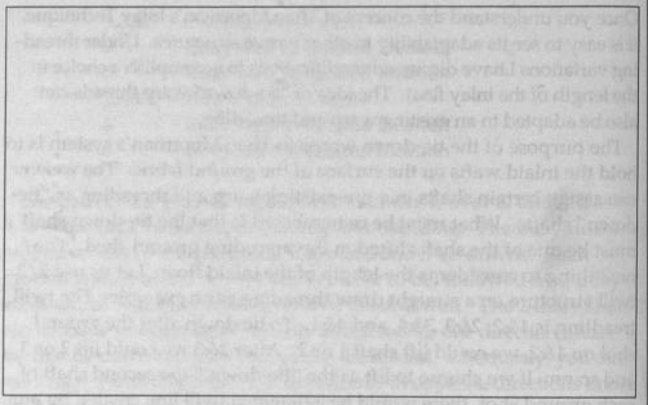


ILLUSTRATION 5 • 9
CAROL'S WEDDING DRESS
See Chapter 3 • 2

Inlay was done on a 2/2 random reversing twill fabric. The beads were sewn on after the fabric was washed.

With the same threading, one could treadle plain weave and use shaft 3 and then 4 as the tie-down. This would result in a true plain weave structure in the ground cloth, with two immediately adjacent warp threads acting as tie-downs on alternate inlay sheds. The inlaid wefts float over three warp threads before the next set of the two adjacent tie-downs. This would create a different appearance in the inlaid image as can be seen by comparing *ILLUSTRATIONS 5 • 8 and 5 • 10.*

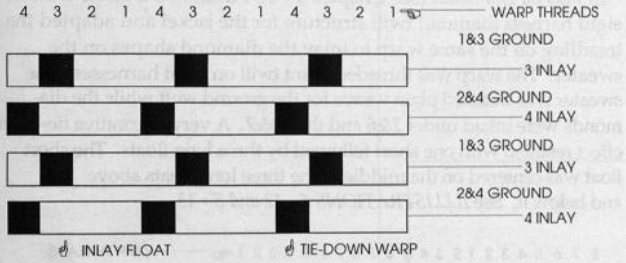


ILLUSTRATION 5 • 10
INLAY ON PLAIN WEAVE

Only the Inlay Shots are shown in this illustration.

In the Theo Moorman set-up, the tie-downs are more evenly spaced and result in a brickwork-like securing of the inlaid weft. In this system the tie-down warps seem to melt visually into the inlaid weft and are less of a design element than in the modifications mentioned above. Compare the position of the tie-downs in *ILLUSTRATIONS 5 • 8, 5 • 10 and 5 •11.*

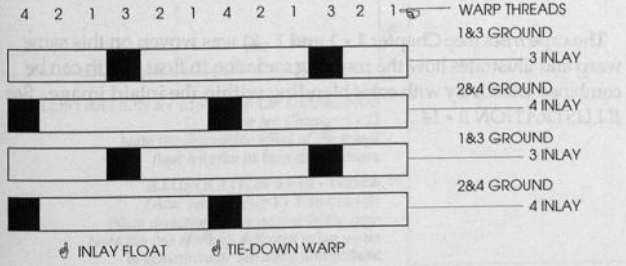


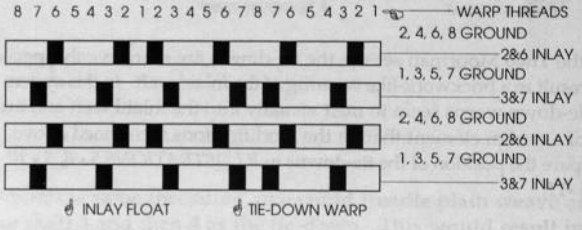
ILLUSTRATION 5 • 11
INLAY ON MOORMAN BASIC THREADING

Only the Inlay Shots are shown in this illustration.

In *Play on Diamonds* (see Chapter 5 • 1), I designed a fabric with an eight harness diamond twill structure for the jacket and adapted the treadling on the same warp to inlay the diamond shapes on the sweater. The warp was threaded point twill on eight harnesses. The sweater was treadled plain weave for the ground weft while the diamonds were inlaid under 2&6 and then 3&7. A very decorative tie-down effect resulted with one short followed by three long floats. The short float was centered on the middle of the three long floats above and below it. See *ILLUSTRATIONS 5 • 12 and 5 • 13.*

ILLUSTRATION 5 • 12
INLAY ON 8H POINT TWILL THREADING

Only the Inlay Shots are shown in this illustration.



The cape *Irises* (see Chapter 1 • 1 and 1 • 2) was woven on this same warp and illustrates how the resulting variation in float length can be combined effectively with color blending within the inlaid image. See *ILLUSTRATION 5 • 14.*

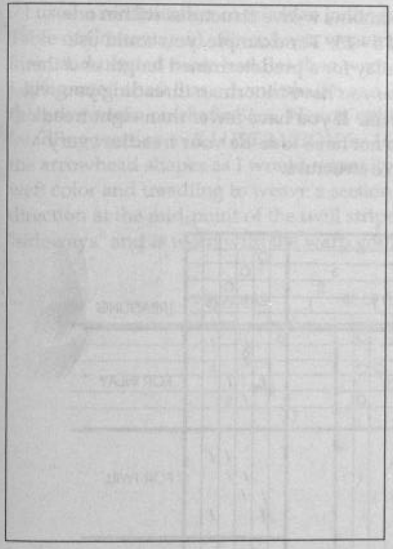


ILLUSTRATION 5 • 13 • PLAY OF DIAMONDS
(Also see Chapter 5 • 1)
Note the decorative effect of the inlaid float lengths in both illustrations

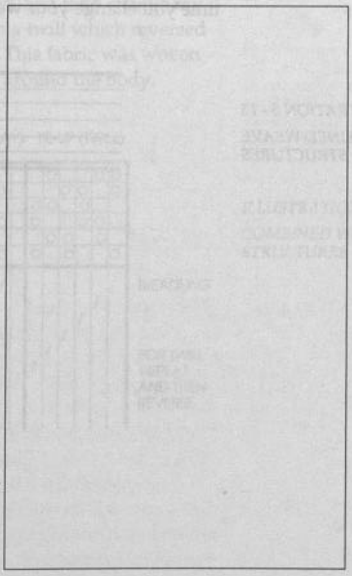


ILLUSTRATION 5 • 14 • IRISES
(Also see Chapter 1 • 1 and (1 • 2)
Warp direction is horizontal in the cape
Note the use of many different inlay yarns to achieve color blending and texture.

You may also choose to combine weave structures within one piece. See *ILLUSTRATION 5 • 15.* For example, you could use Moorman's treadling and inlay for a predetermined length and then treadle for a 2/2 twill. Since you have Moorman threading you will get a modified or broken twill. If you have fewer than eight treadles, do a direct tie up so you do not have to re-tie your treadles every time you change your weave structure.

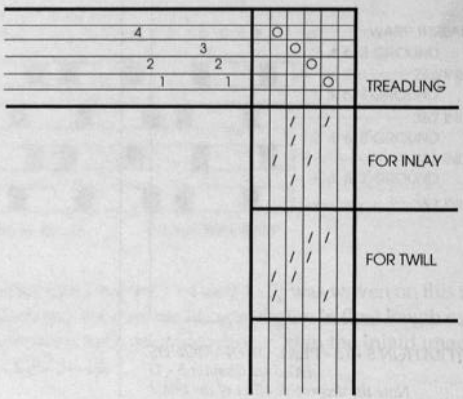


ILLUSTRATION 5 • 15
COMBINED WEAVE STRUCTURES

I used a modification of this idea in the sweater *Arrowhead* (see Table of Contents • x). Since I was weaving on my eight harness loom and needed more heddles than were available on shafts 1&2, I designated shaft 5 as a 1 and shaft 6 as a 2. The tie-down warp threads remain on shafts 3&4. Hence, my threading, tie-up, and treadling were as in *ILLUSTRATION 5 • 16*. This allowed me to inlay the arrowhead shapes as I would normally do, and then change my weft color and treadling to weave a section in a twill which reversed direction at the mid-point of the twill stripe. This fabric was woven "sideways" and is worn with the warp going around the body.

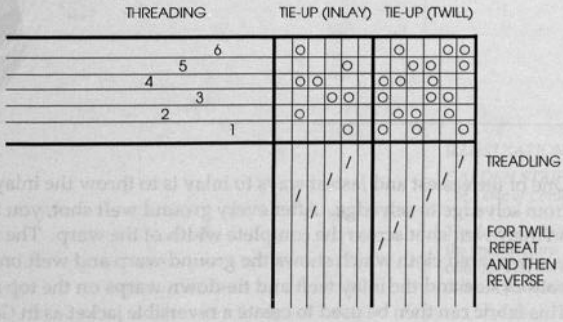


ILLUSTRATION 5 • 16
COMBINED WEAVE STRUCTURES

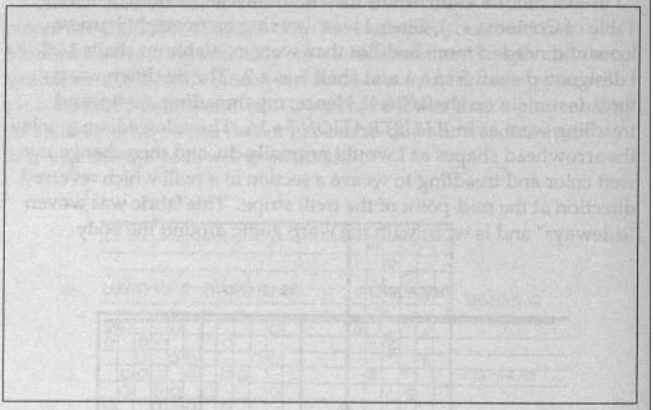


ILLUSTRATION 5 • 17
ARROWHEAD
See Table of Contents • x

The warp is horizontal in the turned fabric. The section on the left was woven in twill while the arrowhead shape was inlaid on a tabby-like ground.

DOUBLE FACED FABRIC

One of the easiest and fastest ways to inlay is to throw the inlay weft from selvedge to selvedge. After every ground weft shot, you throw an inlay weft shot across the complete width of the warp. The result is a two faced cloth which shows the ground warp and weft on the bottom side and the inlay weft and tie-down warps on the top side. This fabric can then be used to create a reversible jacket as in *Garden Stripes*. See Table of Contents • xii.

If your objective is a double sided fabric for garments you will need to design with its weight in mind. You will have two separate wefts which interact with one common warp. The ground warp will be the most visible element on one side of your fabric so it must be interesting.

ILLUSTRATION 5 • 18

GARDEN STRIPES
See Table of Contents • xii

The dominant stripes are the ground warp. The solid color seen on the turned back collar is the inlaid mohair.

I chose to make mine a very bright and dominant stripe arrangement. The mohair inlay weft provides the interest on the reverse side. It needs to be chosen carefully. It should provide good coverage so the ground warp is overpowered. It must be held firmly to the surface of the ground cloth so that it remains in place when the garment is cut and assembled. There should be a color relationship between the two sides of the cloth. It is particularly important that the tie-down warp threads be fine and of a similar value to the inlay weft so they disappear visually.

When designing the garment, consider ways to contrast one side of the fabric against the other. My jacket has turned back collar and cuffs. See *ILLUSTRATION 5 • 18.* Construction with flat felled seams results in finished seams on both sides. When sewing these seams, match the stripes on the one side and use the solid color side to fold over and sew in place. This avoids distortion of the stripes when sewing the second row of stitching. Since facings are inappropriate, cover all borders with knit trim, braids, double bias fabric, or embroidery stitches. I knit a bias trim to encase all edges.

FULLED FABRIC I had been wondering whether the inlaid design areas could be made to look more like they were part of the ground cloth and less like they were floating on its surface. I was fascinated by the idea of creating a cloth similar to embossed felt. I decided to experiment with coarsely woven fabric and inlaid yarns that I knew would full and others that had medium to minimal fulling capacity. The woven fabric was exposed to severe washing conditions to encourage maximum fulling. As I suspected, the inlaid yarns with maximum fulling capacity became embedded in the surface of the ground cloth creating a colorful, textured, soft, and flexible fabric which had the feeling of felt

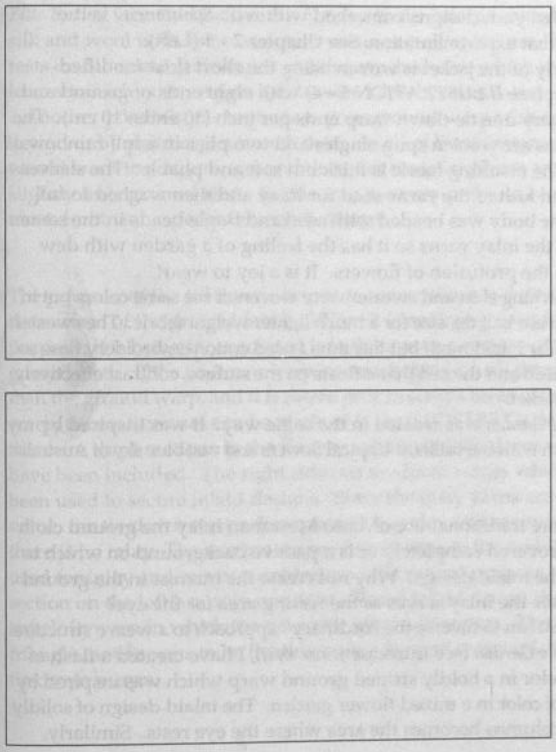


ILLUSTRATION 5 • 19

TROPICAL GARDEN
See Chapter 2 • 1 (on the right)

These photos show a detail of the fabric as it looked before washing (above) and after it was heavily fulled (below).

with muted yarn designs enmeshed within it. *Spontaneity* is the result of that experimentation. See Chapter 2 • 1 (Left).

The body of the jacket is woven using the short float modified threading (see *ILLUSTRATION 5 • 4*) with eight ends of ground and eight of very fine tie-down warp ends per inch (30 ends/10 cm). The inlay yarns are woolen spun singles and two plies in a full rainbow of colors. The resulting fabric is thick but soft and pliable. The sleeves were hand knit of the yarns used for inlay and then washed to full them. The body was beaded with seed and bugle beads in the same colors as the inlay yarns so it has the feeling of a garden with dew drops on the profusion of flowers. It is a joy to wear!

The matching skirt and sweater were woven of the same colors but in yarns that are half the size for a much lighter weight fabric. The sweater has a similar inlaid motif but this time I used cotton embroidery floss so that its sheen and the fact that it floats on the surface, contrast effectively with the jacket.

Tropical Garden was created in the same way. It was inspired by my fascination with the brilliant tropical flowers and vast blue sky of Australia.

GROUND WARP AS A DESIGN TOOL

In the more traditional use of Theo Moorman inlay the ground cloth is either covered completely or is a passive background on which to display the inlaid design. Why not create the interest in the ground warp while the inlay serves as the resting area for the eye?

It is great fun to reverse the "ordinary" approach to a weave structure. In *Denise's Garden* (see Introduction • xvii), I have created a flash of overall color in a boldly striped ground warp which was inspired by the riot of color in a mixed flower garden. The inlaid design of solidly colored columns becomes the area where the eye rests. Similarly,

Blue Spruce (see Addendum A • 2) has a multi-colored mixed warp of silk and wool with shiny and matt yarns as well as texture. The eye rests on the inlaid leaf shapes and the couched vine which joins the leaves to each other. Again beads were added to simulate dew drops.

Another possibility is to prepare your ground warp with an ikat design or by painting on it with dyes. In all of these instances you would want to sett your ground warp for warp emphasis and use a slightly finer ground weft. In this way your warp would become the most dominant aspect of the cloth design.

TIE-DOWN WARP AS A DESIGN TOOL

The purpose of the tie-down warp is to secure the inlaid design on the surface of the ground fabric. When it is not being used for this purpose, it is being incorporated into the weave structure of the ground cloth. If the tie-down warp is a much darker (or lighter) value than the ground warp, and it is sleyed only in certain areas of the ground warp, decorative uses can be made of it. In *ILLUSTRATION 5 • 20*, there are three sections in the warp in which dark tie-down warps have been included. The right side has tie-down warps which have been used to secure inlaid designs. Since the inlay yarns are dark in value, the tie-down warps disappear in the inlay and reappear where there is no inlay. The narrow stripe of tie-downs in the middle is not used for inlay and serves a decorative and textural purpose. The section on the left has only one light colored inlaid design done with soft, lofty yarn in which the tie-down warps disappear. The inlaid triangle motif seems to be floating on the vertical stripe created by the tie-down warps.

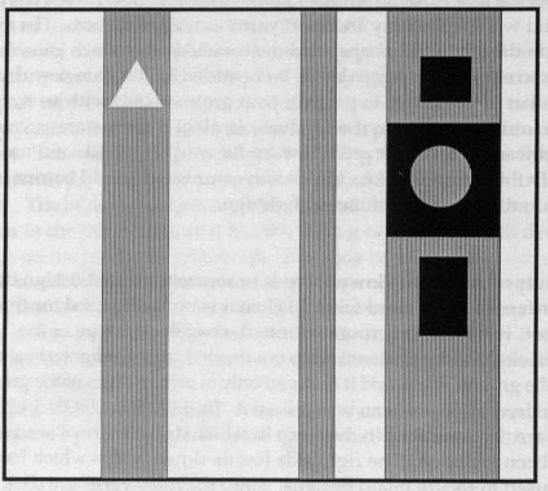


ILLUSTRATION 5 • 20

DECORATIVE USE OF TIE-DOWN WARPS IN THE GROUND FABRIC

A warp can also be planned on which you can "play." In this instance, the tie-down warps should be reasonably close together, strong, and somewhat elastic. The weaver is free to create on these tie-down warps. Here are a few suggestions:

- do soumak wrapping across the warps
- create a pile with ghiordes knots or fleece tied on the warps
- use the warps for hand manipulated lace structures
- establish a fringe within the body of the fabric
- use the warps for bead weaving
- create a design with beads or sequins threaded on string and positioned so they sit on the surface between the tie-downs
- do chain stitch embroidery or crochet across the warps
- make loops of supplementary weft between tie-downs but secure the loops with half hitches around each warp so they do not get pulled out of position
- use the warps to "couch" down a special inlay weft which meanders in a freeform design across the surface of the ground fabric
- spin feathers into a designer yarn and inlay under or knot onto tie-down warps
- crochet a long chain and manipulate it under and around the warps
- wrap the tie-down warps in a decorative design

ILLUSTRATION 5 • 21 should help you visualize a bit more concretely some of these suggestions.

ILLUSTRATION 5 • 21

USING THE TIE-DOWN WARP AS A DESIGN TOOL

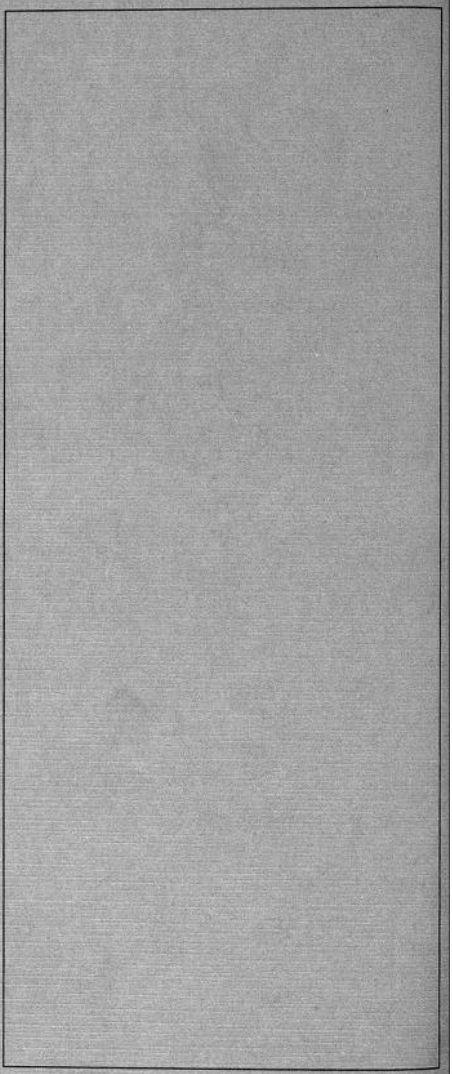
In the photo on the right, reading from the bottom up are examples of soumak wrapping, ghiordes knots, leno lace, beads on a string and then inlaid, couched down novelty yarn (lighter value) and crocheted chain (darker value), an inlaid yarn with feathers spun into it.

In the photo below, I have woven a design incorporating some more of my suggestions. There are two locks of fleece on the bottom right (one inlaid and one knotted); a novelty yarn couched down starting in a loop at center bottom and ending at top right; two areas of wrapped tie-down warps (one of medium value on the middle right and a darker one on top left). The triangle and underlying horizontal lines are "traditional" inlay.

These suggestions, as well as the other variations that I have presented throughout this book, exemplify the versatility and limitless possibilities of the inlay technique. It has been my objective in writing this book to introduce you to Theo Moorman inlay and to stimulate your creative spirit. Hopefully, by now you will have become enthused about and challenged by the technique, and are already on your way to your loom to start experimenting. **Do enjoy your journey of discovery!**

ADDENDUM

GARMENT INFORMATION



ADDENDUM

GARMENT INFORMATION

The garments are listed in the order in which they appear in the book.

Title *Lily* • Table of Contents • viii

Warp Ground - Mixed warp of cotton, rayon, mohair, wool, and silk at 2100 - 5040 yds/lb. in teals, turquoise, purple and wine

Tie-Down - worsted wool at 8400 yds/lb. in light and dark green alternated

Weft Ground - Kolmes 10/2 pearl cotton in dark turquoise at 4200 yds/lb.

Inlay - Silks in hand dyed pinks to wine, salmon/corals to rust, and browns

Ends per inch Mostly 24 (1 cotton at 16, 1 wool and 1 ribbon at 12) ground; 12 tie-down

Reed 12 dent

Threading Regular Moorman - 1 2 3 1 2 4

Treadling 1,3 ground; *3 inlay; 2,4 ground; *4 inlay
*when desired

Title	*Arrowhead* • Table of Contents • x
Warp	Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black Tie-Down - same (all part of the same warp)
Weft	Ground - same in steel (gray) for twill area and peacock for inlay area Inlay - hand dyed 20/2 silks in gold, orange, scarlet, and purple at 5000 yds/lb.
Ends per inch	24 total ground and tie-down
Reed	12 dent
Threading	Regular Moorman (modified) - 1 6 3 5 2 4 (6=2 and 5=1 to obtain more heddles) 3,4 are the tie-downs
Treadling	For inlaid stripes - 1,3,5 ground; 3 inlay; 2,4,6 ground; 4 inlay For twill stripes - 1,5,6; 2,3,6; 3,4,5; 1,2,5; 2,4,6; 1,3,4 - reverse treadling in middle of stripe
Comments:	This sweater was woven sideways so the warp goes around the body.

Title *Garden Stripes* • Table of Contents • xii

Warp Ground - Borgs SN2 wool in light and dark green, red, scarlet, shocking pink, coral, rose, and gold at 1590 yards/lb.

Tie-Down - worsted wool at 8400 yds/lb. in light and dark green alternated

Weft Ground - Borgs Nokam wool in red at 2962 yds/lb.

Inlay - Ironstone NSMB Mohair in wine at 960 yds/lb.

Ends per inch 12 ground and 12 tie-down

Reed 12 dent

Threading Short float Moorman - 1 3 2 4

Treadling 1,3 ground; 3 inlay; 2,4 ground; 4 inlay

Comments This jacket had the inlay woven from selvedge to selvedge to create two sided cloth.

Title	*Denise's Garden* • Introduction xvii
Warp	Ground - Borgs SN2 wool in light and dark green, red, scarlet, shocking pink, coral, rose, and gold at 1590 yds/lb.
	Tie-Down - worsted wool at 8400 yds/lb. in light and dark green alternated
Weft	Ground - Borgs SN2 wool at 1590 yds/lb. in teal No.26
	Inlay - doubled DMC embroidery floss in teals Nos. 964, 959, 992, 943, 991, 924 and odd shots of shocking pinks Nos. 3607, 3608, 917, 3609, 915, 718
Ends per inch	12 ground and 12 tie-downs
Reed	12 dent
Threading	Short float Moorman - 1 3 2 4
Treadling	1,3 ground; *3 inlay; 2,4 ground; *4 inlay *when desired

Title	*Irises* • Chapter 1 • 1 and 1 • 2
Warp	Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black
	Tie-Down - same (all part of the same warp)
Weft	Ground - JaggerSpun Zephyr in indigo
	Inlay - silks, rayon, cotton, wool, embroidery floss, metallic in many colors, sizes and textures
Ends per inch	24 total ground and tie-down
Reed	12 dent
Threading	8H point twill - 1 2 3 4 5 6 7 8 7 6 5 4 3 2
Treadling	1,3,5,7 ground; *3,7 inlay; 2,4,6,8 ground; *2,6 inlay *when desired
Comments	This cape was woven sideways so the warp goes around the body.

Title *Spontaneity* • Chapter 2 • 1 (left)

Warp Ground - Harrisville 2 ply wool at 1000 yds/lb. in 2 ends red, 1 end cinnabar repeated

Tie-Down - worsted wool at 8400 yds/lb. in red and green alternated

Weft Ground - Harrisville 2 ply wool at 1000 yds/lb. in burgundy tweed

Inlay - many wools, mohairs, rayon, silk, and locks of fleece in red, blue, green, purple, orange, gray and black

Ends per inch 8 ground and 8 tie-down

Reed 8 dent

Threading Short float Moorman - 1 3 2 4

Treadling 1,3 ground; *3 inlay; 2,4 ground; *4 inlay
*when desired

Comments This jacket was woven sideways so the warp goes around the body. The fabric was woven very loosely to allow it to be heavily fulled.

Title *Tropical Garden* • Chapter 2 • 1 (right)

Warp Ground - Harrisville 2 ply wool at 1000 yds/lb. in 2 ends cornflower, 1 end denim repeated

Tie-Down - worsted wool at 8400 yds/lb. in medium gray and blue gray alternated

Weft Ground - Harrisville 2 ply wool at 1000 yds/lb. in denim

Inlay - various wools, mohair, rayon, metallic, and ribbon

Ends per inch 8 ground and 8 tie-down

Reed 8 dent

Threading Short float Moorman - 1 3 2 4

Treadling 1,3 ground; *3 inlay; 2,4 ground; *4 inlay
*when desired

Comments This jacket was woven sideways so the warp goes around the body. The fabric was woven very loosely to allow it to be heavily fulled.

Title *Tumbling Triangles* • Chapter 2 • 2

Warp Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black on 1&2, and indigo, deep purple and peacock in sequence on 3&4

Tie-Down - same (all part of the same warp)

Weft Ground - JaggerSpun Zephyr in deep purple

Inlay - silk, Zephyr, and embroidery floss in pinks, purples, reds, teals, greens, rust and yellow

Ends per inch 24 total ground and tie-down

Reed 12 dent

Threading Short float Moorman - 1 3 2 4

Treadling 1,2 ground; *2 inlay; 3,4 ground; *4 inlay
*when desired

Title *Pitch Creek Thaw* • Chapter 3 • 1

Warp Ground - Borgs SN2 wool at 1570 yds/lb. in gray No. 1002 alternated with finer gray wool mill end

Tie-Down - worsted wool at 8400 yds/lb. in blue gray

Weft Ground - Borgs SN2 wool in gray No. 1002

Inlay - various sizes and textures of cottons, rayons, ribbons, and metallics in light gray, creams, off whites, and whites

Ends per inch 10 ground and 5 tie-down

Reed 10 dent

Threading Regular Moorman - 1 2 3 1 2 4

Treadling 1,3 ground; *3 inlay; 2,4 ground; *4 inlay
*when desired

Comments This cape was woven sideways so the warp goes around the body.

Title *Carol's Wedding Dress* • Chapter 3 • 2

Warp Ground - Kolmes 20/2 pearl cotton at 8400 yds/lb. in natural

Tie-Down - same (all part of the same warp)

Weft Ground - Treenway's 20/2 silk at 5000 yds/ in natural

Inlay - Treenway's 20/2 silk hand dyed in very pastel purple, green, rose, and gray blue

Ends per inch 40 total ground and tie-down

Reed 10 dent

Threading 4H straight draw - 1 2 3 4

Treadling 2/2 twill which reversed randomly and had inlay added in some areas - 1,2 ground; *2 inlay; 2,3 ground; *3 inlay; 3,4 ground; *4 inlay; 4,1 ground; *1 inlay
*when desired

Comments The blouse was woven sideways so the warp goes around the body; the skirt was cut on a 45 degree bias.

Title *Feather Fantasy II* • Chapter 4 • 1

Warp Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black

Tie-Down - same (all part of the same warp)

Weft Ground - JaggerSpun Zephyr in black

Inlay - silks, cottons, rayons, wool, embroidery floss in many colors and textures

Ends per inch 24 total ground and tie-down

Reed 12 dent

Threading Regular Moorman (modified) - 1 6 3 5 2 4 (6=2 and 5=1 to obtain more heddles) 3&4 are the tie-downs

Treadling 1,3,5 ground; *3 inlay; 2,4,6 ground; *4 inlay
*when desired

Comments This dress was woven sideways so the warp goes around the body.

Title *Floral Impressions* • Chapter 4 • 2

Warp Ground - mixed warp of cottons, rayons, acrylic, linen, and ribbon in different weights

Tie-Down - Kolmes 20/2 pearl cotton at 8400 yds/lb. in violet

Weft Ground - Kolmes 10/2 pearl cotton at 4200 yds/lb. in jade

Inlay - hand dyed silks

Ends per inch 12-24 ground; 12 tie-down

Reed 12 dent

Threading Regular Moorman (modified) - 1 2 5 3 4 6 (3=1 and 4=2 to obtain more heddles) 5&6 are the tie-downs

Treadling 1,3,5 ground; *5 inlay; 2,4,6 ground; *6 inlay
* when desired

Title *Play On Diamonds* • Chapter 5 • 1

Warp Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black

Tie-Down - same (all part of the same warp)

Weft Ground - JaggerSpun Zephyr in indigo

Inlay - hand dyed silks, rayon, and embroidery floss

Ends per inch 24 total ground and tie-down

Reed 12 dent

Threading 8H point twill - 1 2 3 4 5 6 7 8 7 6 5 4 3 2

Treadling 1,3,5,7 ground; *3,7 inlay; 2,4,6,8 ground; *2,6 inlay *when desired

Comments Matching jacket was woven on the same warp and treadled to obtain diamonds—1,3,4,5; 2,4,5,6; 3,5,6,7; 4,6,7,8; 5,7,8,1; 6,8,1,2; 7,1,2,3; 8,2,3,4; reverse

Title *Pueblo* • Chapter 5 • 2

Warp Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. in black

Tie-Down - same (all part of the same warp)

Weft Ground - JaggerSpun Zephyr in black, cobalt, aegean, and jade

Inlay - 20/2 silk hand dyed in 2 golds, orange, and red at 5000 yds/lb.

Ends per inch 24 total ground and tie-down

Reed 12 dent

Threading Regular Moorman (modified) - 1 6 3 5 2 4 (6=2 & 5=1 to obtain more heddles) 3&4 are the tie-downs

Treadling 1,3,5 ground; *3 inlay; 2,4,6 ground; *4 inlay *when desired

Comments This sweater was woven sideways so the warp goes around the body.

Title *Blue Spruce* • Addendum A • 2

Warp Ground - JaggerSpun Zephyr (50% merino, 50% silk) at 5040 yds/lb. bottle green, peacock, rosewood, royal blue, indigo, admiral blue, deep purple, iris, jade, seafoam, raspberry, and wool in khaki, silk in coral and teal, and ribbon in variegated teal

Tie-Down - same (all part of the same warp)

Weft Ground - JaggerSpun Zephyr in deep purple

Inlay - hand dyed silks in many shades

Ends per inch 24 total ground and tie-down

Reed 12 dent

Threading Short float Moorman - 1 3 2 4

Treadling 1,2 ground; *2 inlay; 3,4 ground; *4 inlay
*when desired

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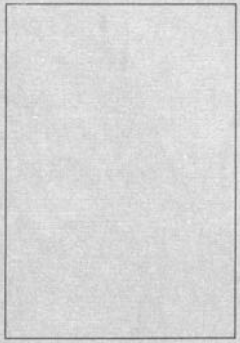

Heather fell in love with clothing at an early age and once she learned to weave, it was a natural evolution to design handwoven fabrics for her one-of-a-kind garments. As soon as she wove her first Theo Moorman sampler in 1982, she could see its unique possibilities as a creative tool in fashion fabric. Growing up near Thunder Bay in Northern Ontario, Canada, Heather experienced an intimate association with the rugged environment. As a result, nature has always been a very important part of her life and provides most of her design inspirations. She often incorporates other fibre techniques such as knitting, crochet, spinning, dyeing, beading, and embroidery to provide that "finishing touch" which makes each garment unique. She looks upon clothing design as creating a three dimensional sculpture which encases and enhances the human body. Her objective is to use subtle simplicity to adorn the body in a very positive way and to enrich the life of the wearer by boosting his or her self image and joy of living. Heather's educational background is in teaching and after nearly 30 years, she still has a passion to share her knowledge with others. She lectures and conducts workshops on all aspects of garment design and construction and on Moorman inlay throughout the United States and Canada. She teaches regularly at regional and national conferences and her articles appear in major fibre publications. She is a faculty member of The Fine Line Creative Arts Center in St. Charles, Illinois. She weaves in a beautiful but typically over-crowded studio which her husband, Dan, added to the house when her "hobby" became her obsession and profession!

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