

TIED WEAVES ON THE DRAWLOOM

Exploring Complex Tied Weaves
Beyond Damask and Supplemental Weft
Patterning

Presented at
Complex weavers Seminars
Knoxville, TN
2022



by

Sara von Tresckow

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Samite Roundel in 4 colors woven on 50 Pattern Shaft Drawloom

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Enhanced Version of Presentation

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THE WOOLGATHERERS LTD.



The Woolgatherers Ltd., LLC

Fond du Lac, WI

2022

Published by:

The Woolgatherers Ltd., LLC

Fond du Lac, Wisconsin

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ISBN 978-0-9904464-0-8



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Photographs produced by Sara von Tresckow unless otherwise indicated.

First published as electronic PDF 2022.

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FOREWARD

This monograph is the result of a two-year study/experimentation adapting a standard countermarche loom equipped with a pattern-shaft draw system to weave various tied weaves. It was prepared to accompany a presentation at Complex Weavers Seminars in 2022.

An Oxaback Lilla loom with 50 pattern shaft Myrehed attachment formed the basis for testing four classic tied weaves. All four required modification from the usual drawloom setup

TAQUETE

SAMITUM

LAMPAS

BEIDERWAND

Included is a short discussion of the tied weaves related to summer/winter that work without loom modification.

Before trying these weaves, it is important to read thoroughly the way the threads are utilized – that two distinct warps are in use – interleaved – and that in the case of the Lampas related weaves, there are actually two sets of treadles in use – one for each structure.

This was a fascinating study. I am ready to test these structures further using a variety of materials – and I have a new, full-sized Lampas bedspread as a result. Also, I was able to recreate a 4-color polychrome samite, this time using a drawloom rather than a Jacquard as I did in 2007 at EMU on the TC-1.

Enjoy.

TIED WEAVES ON THE DRAWLOOM

DEFINITIONS

To begin, “tied weaves” are loosely defined as weaves where pattern wefts are “tied” by regularly occurring warp threads to prevent long floats. There is not just one tied weave, but many. They vary greatly in appearance and definition. The three classic tied weaves, historically, are taquete, samitum and lampas (which includes Beiderwand).

Handweavers also often use summer and winter in several variant forms, tied overshot, paired tie float weave, blocks with 2, 3 or even 4 ties. These structures are covered in a short section for tied weaves not needing loom modification.

Reference Materials

For producing the drafts in the handout, I have used Doramay Keasby’s “Pattern Techniques for Handweavers” and John Becker’s “Pattern and Loom”, “Warp and Weft” from Eriksson, Gustavsson and Lovallius as well as Vaev, gamla och gloemda tekniker” Eriksson, Getzmann, Gustavsson, Lovallius. There may be alternate methods of tieup and treading possible – feel free to experiment in your projects.

The field or background of the pattern.

The drafts pictured in this handout have been created by “Weavepoint 8.0” and “Weavepoint Complex Drafting Module” 7.0. Weavepoint CD is the ONLY software available to display two or three “harnesses” along with the pattern threading so that the fabric is shown with all interlacements. This functionality provides a basis to design a pattern for the Drawloom and adapt it to multiple weaves – and to compare those results before warping the loom. For those who do not have this software, “Pattern Techniques for Handweavers” and “Pattern and Loom” both contain methods for visually representing a fabric prior to measuring a warp.

Draft conventions

Black square = rising shaft

White square =sinking shaft

Square with black dot = “neutral” shaft that is supported by the weights or elastics on the drawloom and is neither up nor down. Weavepoint CD is once again the only current weaving software that has a way to enter this symbol. For other programs or graph paper, the weaver needs to add a symbol by hand on the printed draft.

Loom requirements

This publication assumes a double harness loom, countermarche or counterbalance, or at least a cm or cb loom with the ability to work with half heddle sticks to form the pattern. All pattern suggestions can be executed by single cord, pattern shaft or half heddle systems.

For understanding of drawloom setup and techniques, see my book - “When a Single Harness Simply Isn’t Enough” or another basic text.

Terms

Binding Warp – Lampas warp controlling the pattern fabric layer

Binding Weft – Weft controlling the pattern layer in a lampas fabric

Decoupure - the smallest gradation of a design: the smallest number of warp ends, or the smallest number of picks or passes that forms one step in the outline of a design. The weft Decoupure is counted by picks if the weft is a single thread, and by passes if more than one weft is used or if the weft is divided into two or more series. It is possible for two decoupures composed of different numbers of ends, picks, or passes to be used in regular alternation. Swedish term - stygn

Ground Weave – Any weave that serves as a foundation for pattern texture or pile.

Lash – A selection of pattern producing drawcords, bound with a cord that, when pulled, produces a pattern shed. A complete pattern can include hundreds of lashes.

Leash – Term used to distinguish the heddles of a drawloom. The leash is suspended from the drawcord and is a heddle with an eye called a mail (the mail contains 6 small openings for single threads). Generally, the term leash is understood to include the lingo. In modern usage, the leashes are often a group of 5 or 6 heddles attached to a lingo with one thread sleyed in each heddle.

Long Eye Heddle – the special heddle needed for double harness pattern weaving. The eye is 2 – 2.5” (5-6cm) long to aid in forming a good shed. Heddles come pre-made or can be hand-tied.

Main Warp – The lampas warp controlling the ground fabric

Main Weft – The lampas weft controlling the ground fabric

Pattern Heddle – long heddle with normal eye used to carry the pattern threads in double harness weaving. These special heddles form the leashes and control the pattern formation through the use of draw cords or pattern shafts.

Pass –(Passe) one complete cycle of picks that suffices by varied interlacements with the warp to produce the weave unit in the full width of a textile.

Ratio – when more than one warp s used, there is a ratio between the two. For alternating warp ends, A B A B, the ratio is 1:1. It is also possible to put two or more primary warps between the tie-down warps. Then the ratio becomes 2:1 (2 primary between the ties), 3:1(3 primary between ties as in most of my lampas samples), 4:1 (4 primary between ties as in Beiderwand).

HISTORY

When textile research states that a particular complex fabric must have “been woven on a drawloom” we immediately think of the current drawlooms made for handweavers to use in their homes. Over the centuries, there have been many ways to produce patterned textiles using a supplementary pattern harness in a variety of ways. Since John Becker wrote “Pattern and Loom” in 1986, his supposition of how the Han dynasty jin fabrics were produced using sticks inserted into the warp has been shown to have been done on a mechanized version of the half heddle loom. At the recent Chinese loom conference in 2018, there was a working model on display – quite different from the drawlooms in use currently. As we consider doing the weaves shown in this handout, I encourage weavers to be innovative in modifying their looms with experimental techniques and not shy away from deviating somewhat from “standard practice.”

The “drawlooms” that are used today by a single weaver are, oddly, a major simplification of the looms of past centuries. One of the early Drawloom, a so-called “button loom” is documented in France around 1470. It had some similarity with today’s pattern shaft drawloom. Other mechanisms were also documented, often using drawcords and pattern saving lashes. By the late 1500’s, drawlooms were weaving figured damask in Haarlem (Netherlands) and Kourtrai (Belgium). They were used for complex fashion fabrics of the day, including elegant velvets and silk lampas fabrics. From 1650, the German city of Grossschoenau in Oberlausitz joined the damask centers of Europe. Until the mid-1700’s, pretty much all luxury fabrics used in Europe came from this limited collection of weaving centers. Looms were specialized for a particular fabric type. The strength of any city or province for production statistics was measured by the “number of looms in operation”.

The early drawlooms required several persons to design the patterns, set up the looms and weave and finish the fabrics. These were professional “workshops” that represented something like the Lisio Foundation or Scalandre Fabrics in today’s world. Looms were specially designed and set up for specific fabrics that a Master weaver had designed and made repeatedly to sell.

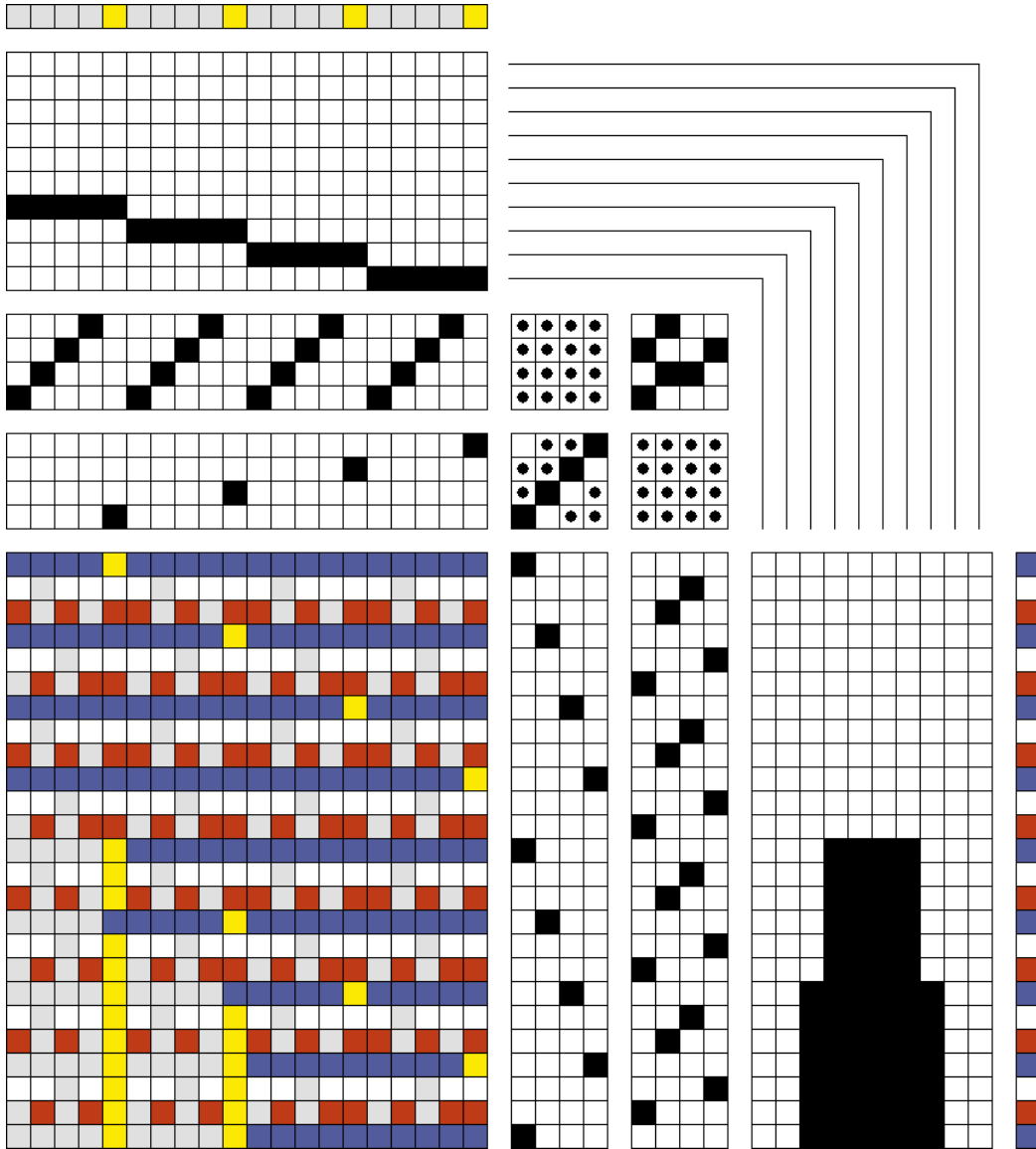
The patterns were drawn by artists and rendered onto graphed “point paper” – a blueprint sized graph paper used to prepare the loom for the pattern design. The loom (ground harness) was then prepared to weave the basic structure while the pattern harness was prepared for efficient execution of the design. Setting up the pattern harness with sequential lashes could take months.

Weaving proceeded with more than one person at the loom. One person prepared the pattern row by raising the leashes required and another wove the correct number of picks until a pattern row change was needed.

In addition to damask, opphamta, taquete, samitum, lampas, and velvet were also produced on double harness looms. The time and skill needed to produce complex and sumptuous fabrics made them extremely valuable – according to a transcript from German television, covering the German Damask Museum in Grossschoenau, “A small table runner with hunting motives could at that time have the value of a large Oberlausitzer Vierseithof (farmstead). Therefore, the Oberlausitzer treasured the secret of their looms and especially the pattern drawings. The designs alone were worth as much as an entire loom back then.”

An extremely valuable resource is “Royal Silks” by Ulla Cyrus-Zetterstrom and Gudrun Ekstrand. The book performs textile analysis on clothing from the collection of Royal Family Garments – from about 1590 to 1800. Interesting is that all the ornate lampas and brocaded fabrics come from either France (Lyon) or Italy (Florence) until about 1750 when the provenance switches to Swedish weavers.

To better understand how to use today’s drawlooms to make some of these complex fabrics as well as simpler tied weaves, an understanding of features found on these early drawlooms is in order.



This is a representation of the draft on p. 35 of Ulla Cyrus' "Royal Silks" showing the lining of the bodice of Charles X Gustav used at his coronation.

Lampas

Ground weave: tabby, both ground and auxiliary warp, as well as weft yellow silk with no discernable twist – shown here as grey(main) and yellow(auxiliary) warp and red weft

A second tabby of flat gold thread is marked by the white row

Pattern weft is also gold thread, shown in blue, pattern structure 3/1 twill

Ratio 4:1 Decoupure 4 main threads Thread count 72 mains plus 18 auxiliary makes 90 per cm, or 18 decoupure per cm.

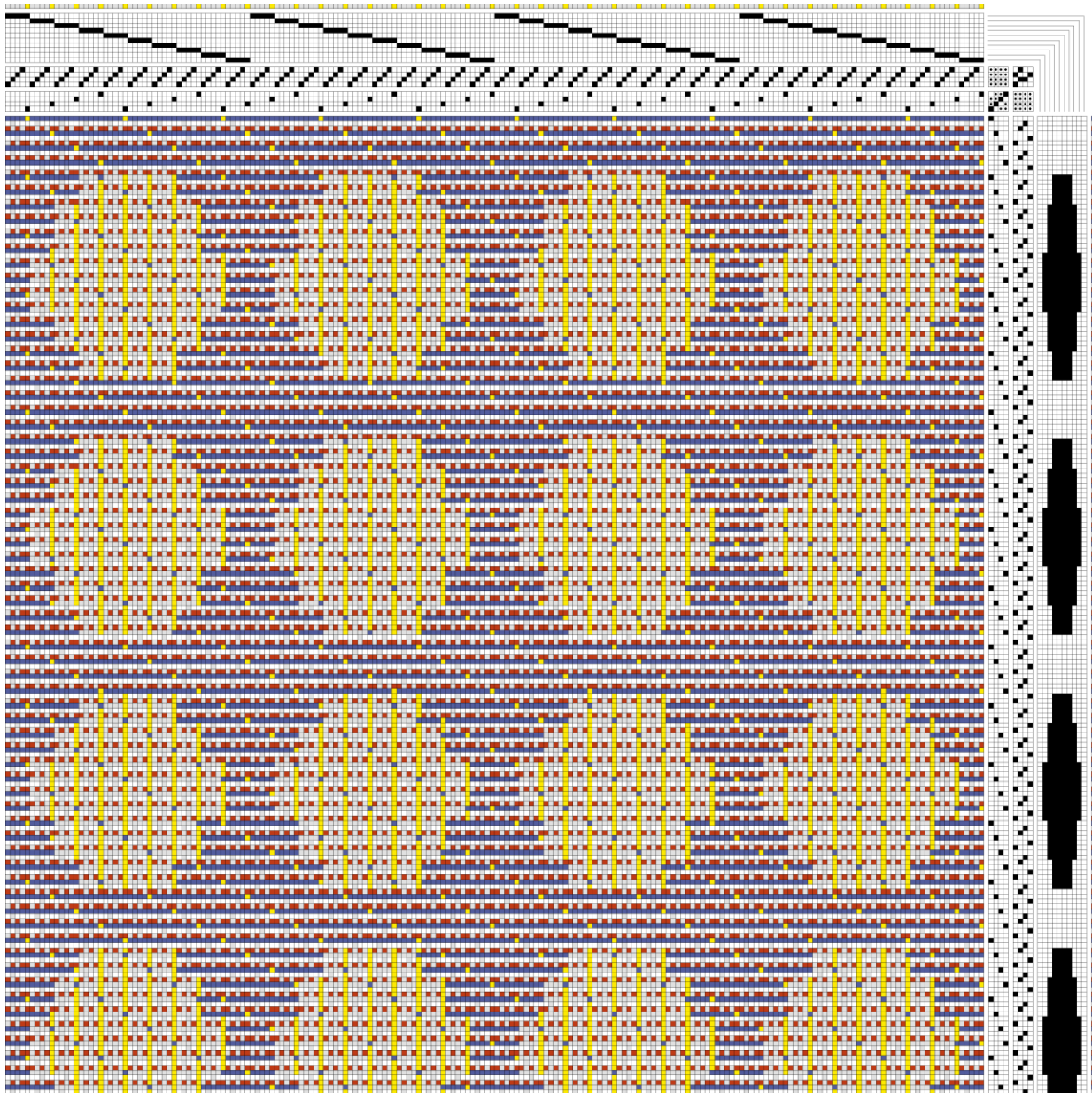
Weft A. Red quadruple yellow silk without any discernible twist

B. White gold flat strip

C. Blue gold thread of flat strip spun around gold silk

Pass: A1, B1, C1. Thread count: 18picks per cm = 54 wefts

“The silk is woven with the face up. The loom would have had a draw system with approx. 162 drawcords. In each pattern heddle are entered 4 main threads and 1 auxiliary binding thread. The main warp is then entered on 4 ground shafts and the auxiliary binding threads on 4 shafts for raising and 4 shafts for lowering. For the main wefts 2 treadles are used and for the wefts of gold flat strip a further 2 treadles. The draws take place only in connection with the pattern wefts of gold thread, approx. 122 per pattern repeat. The shafts with the auxiliary binding threads are attached to 4 treadles so that for each pattern weft one of the four auxiliary binding threads from the raised sections is lowered and one of four from the lowered sections is raised, in accordance with the twill structure.”



Now, this is not a fabric that any of us is going to duplicate in the near future but serves as an example of fabrics woven centuries ago with skills requiring a lengthy education and understanding of complex weaves. This example has the binding ends included in the pattern heddle – it changes the fabric to thread them separately. Later it will be seen that for other lampas fabrics, the binding warp is not threaded in the pattern heddles.

Historical Drawloom operation

Size and Depth

The old looms are quite massive and very deep. There was no attempt to make them compact as they needed to produce complex cloth without errors. Sometimes if there was a supplemental warp, as in velvet, there was a creel mounted inside the loom frame holding the silk pile ends on tiny wooden spools.

COMBER BOARD – this is a device that connects several drawcords to a single pattern cord or simple. The pattern cords are selected and put into “lashes” or stored and numbered groups of simples that drawn in sequence produce a complex pattern. If there is only a single repeat, each leash has its own simple. With a single mirrored design, there will two cords connected over the comber board to a single simple. For multiple repeats, there will be a leash for each repeat connected to the comber board. Using a drawloom with simples and a comber board required the use of at least two persons.

There was a so-called “button” loom where something similar to pattern shafts were connected to buttons or levers to control the sequence of pattern rows. The single cord console that is popular today was not in use. Single cord looms were operated differently. There was a fixed number of cords in a repeat. A “comber board” was set up whereby each of the cords was linked to 2 or more additional cords, in the same sequence. A single secondary cord controlled a single leash. When one of the original cords was pulled, multiple leashes lifted. The most elaborately patterned lampas fabrics in “Royal Silks” have fewer than 200 cords, most around 150-160. Because of the complex nature of the patterns, pre-selected lashes were used for complex patterning and AT LEAST two persons were required to operate the loom.

The single cord console that is popular today was not in use. It was too inefficient to expect the weaver to work more than 100 individual cords AND do the weaving. The overhead warp model of single cord drawloom developed AFTER the Jacquard loom to allow storage of many lashes for repeated patterns.

Draw bar and pattern lashes

The pattern would be stored with “pattern saving lashes” that were looped into the simple cords usually running vertically down one side of the loom. The drawboy would pull a loop, insert a heavy wooden bar and move about 3 feet back to a support to hold the bar. This was all calculated so that the individual leashes on the loom would rise consistently to provide a good shed for the weaver. After the prescribed number of picks, the drawboy would return the wooden bar to the loom, remove the lash and pick up the next one in the same manner.

Multiple structures on separate sets of treadles and ground shafts merged into complex fabric. There were groups of ground shafts – some with normal heddle eyes and some with long eyes. By treading alternately, the sets of shafts could be woven into an integrated fabric like lampas or Beiderwand.

TIED WEAVES AND TODAY'S LOOMS

Today, for handweavers, there are basically three types of looms available.

DOBBY loom is the designation for any loom with 4 or more shafts controlled either by a doobby mechanism or treadles.

DRAWLOOM OR DOUBLE HARNESS loom is any loom that has a ground harness with long eye (or clasped) heddles and an additional pattern harness (single leashes, pattern shaft or half heddle sticks)

JACQUARD looms control each thread singly, either electronically or through a comber board that determines thread sequence and pattern repeats

Each type of loom has features that enhance certain types of tied weaves. Below are several criteria to apply to a desired project – to see which type of loom will weave that fabric without excessive loom modification or excessive effort from the weaver.

Dobby (including multishift looms with treadles and table looms)

Tied weaves make good use of available shafts but **require a dedicated threading**.

Block designs are put to effective use on the doobby.

Treadling complex sequences of structure combinations such as 5-end main weave and 3-end pattern weave using a 3:1 ratio as shown in Alice Schlein's monograph fit best on doobby looms to aid in remembering the treadling sequence.

Combining two structures fits more easily into a liftplan than to a treadling sequence on the handloom. This makes table looms attractive.

Low ratio tied weaves – 1:1 or 2:1 - are better on the doobby loom because of the effort setting up the Drawloom with only one of two threads in a leash.

Drawloom

Not requiring a dedicated threading makes changing patterning quite easy.

Possibilities for lovely textured fabrics, including approaching figured velvet are possible.

Patterning is much richer than the structured block designs from the doobby

Higher ratios are favored – 3:1 or 4:1

Figured taquete, figured samitum or polychrome designs are difficult because each color in a sequence requires pulling a unique pattern row. This would certainly be a case for building pattern saving lashes and having an A and a B row (front and reverse sides) for each pattern row.

Jacquard Loom

The Jacquard Loom is the most versatile loom for complex fabrics. There is no dedicated pattern threading and no dedicated tieup

Using the Jacquard loom for tied weaves offers the possibility of **changing the ratio midstream** by picking up different sized groups of warp threads

Polychrome versions of tied weavers are best done on the Jacquard loom

TIED WEAVE STRUCTURES

Here is a list of weaves mentioned in this handout from fairly straightforward to more complex

Summer and Winter – variations of alternating, x-, birdseye	Samitum
Paired-tie float weave	Proto Lampas (see John Becker)
Uneven tied overshot	Pseudo Lampas (see John Becker)
Taquete	Lampas (including Beiderwand) tied and untied

There is not a single “method” to weaving with tied structures on the Drawloom. The tied weaves listed here allow the tie down warps to ride along in the pattern heddle(s), others do not.

Tieup and treadling schemes are also not always the same. Since some of these weaves require loom modification, it is worth time and effort to do some preliminary drafting to work out what will be suitable for perhaps several warps using those modifications, tying on new projects with different colors and threads, even different sett, but all with the same basic setup.

WEAVE STRUCTURES NOT REQUIRING LOOM MODIFICATION

The weaves in this section do NOT require modification of the drawloom.

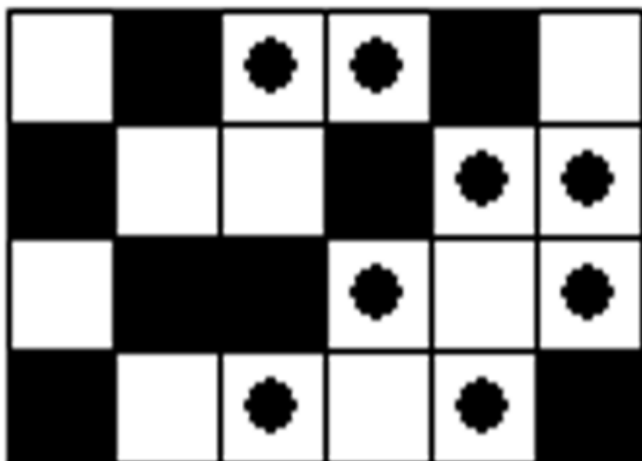
Since this section is not the primary topic, I have included sample drafts and refer the reader to Doramay Keasby’s “Pattern Techniques for Handweavers” (see bibliography) for details. For those who do not have the time and inclination to do the full setup for Lampas (incl. Beiderwand), these drafts offer several interesting fabric variations without difficult setups and designing.

Summer and Winter variations,

Here the warp is entered into the pattern leashes in groups of 4 threads. The ground harness is threaded as indicated for the structure desired. Four treadles are needed. Note that all these weaves are a single layer and structure, not the compound multi-layered weaves contained in the next section.

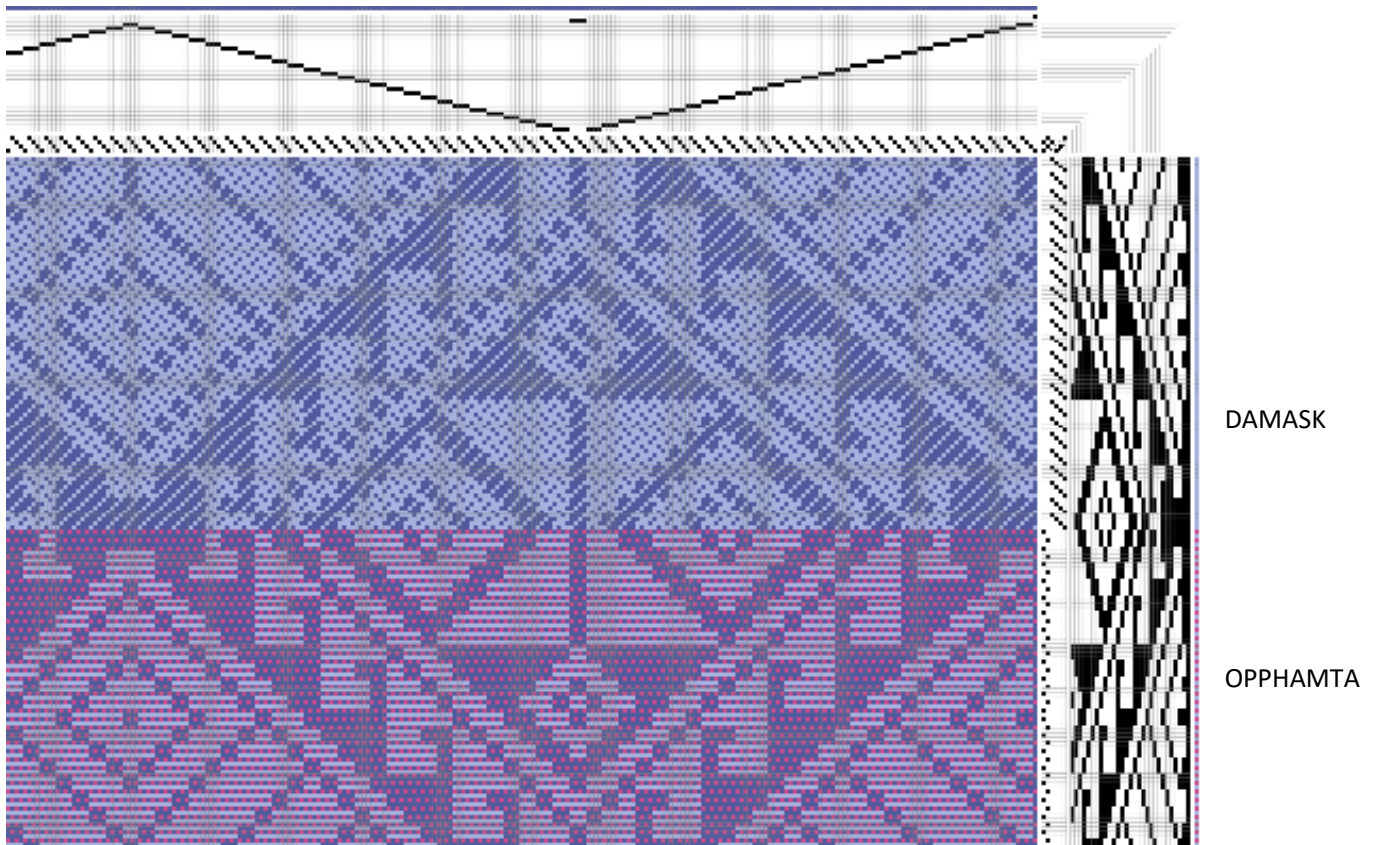
Pattern shaft threading should match planned liftplans. Single cord looms should have enough drawcords to execute planned patterns.

This might be a good place to begin experimenting. In my book, “When a Single Harness Simply Isn’t Enough” I have

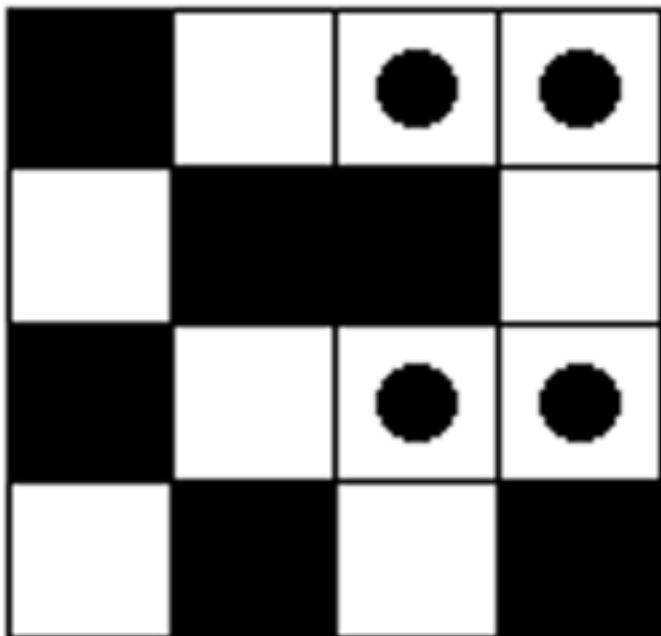


instructions for a setup using 4 threads to a leash and four ground shafts in straight draw to produce both opphamta (supplementary weft) and 4-end damask in the form of a 3/1 twill – straight or broken. This same setup continues into tied weaves for the structures listed here. Four or six treadles will be needed.

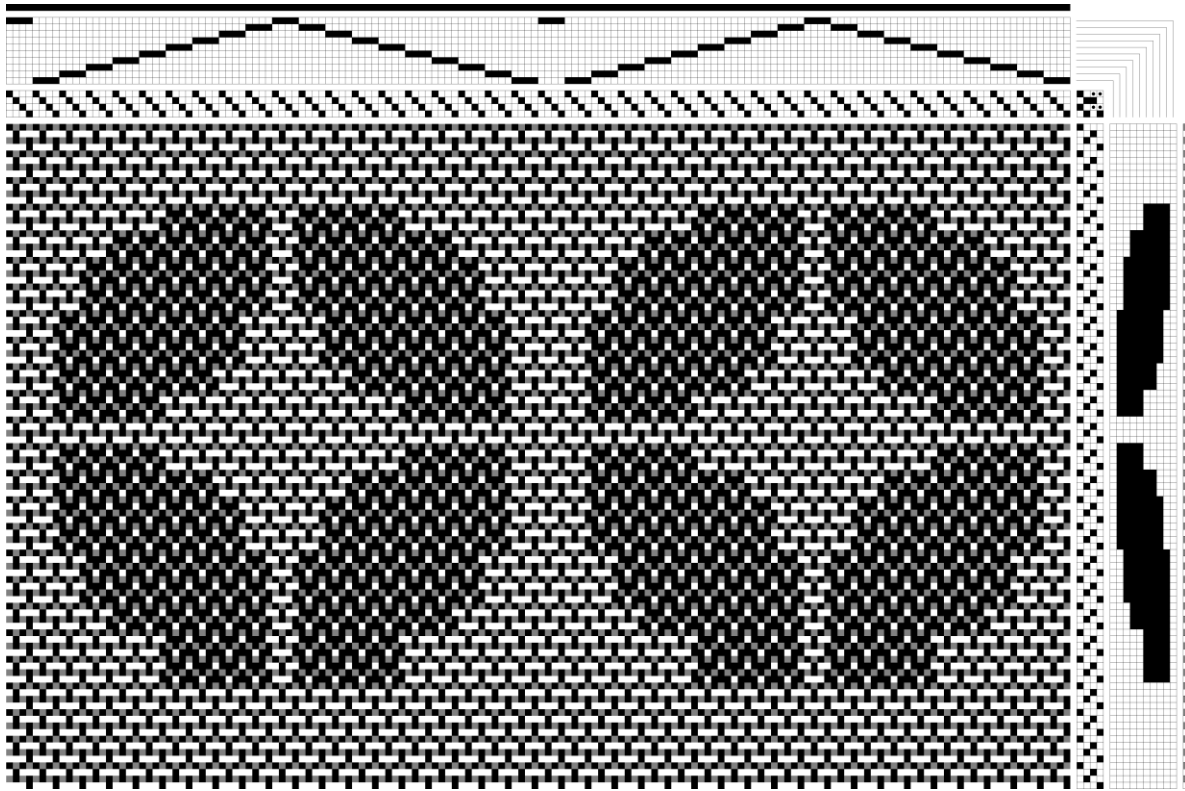
Tieup for doing damask (4-end twills) AND opphamta on the same Drawloom warp. Units consist of 4 threads for both structures. Damask is woven with a single weft color and the opphamta is a two-shuttle weave with contrasting wefts.



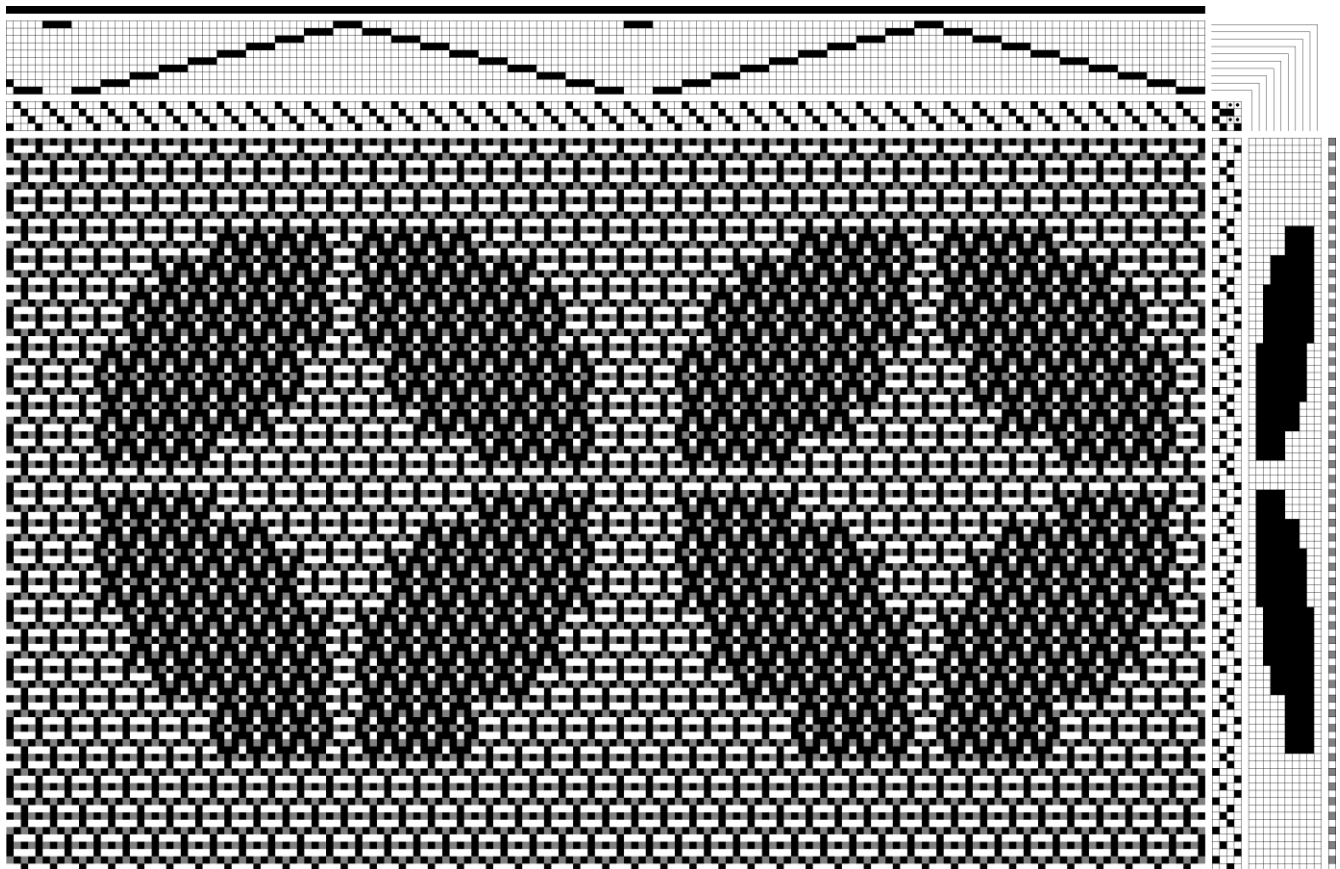
Damask AND opphamta using the same loom setup. Detailed instructions are found on pp. 91-92 of “When a Single Harness Simply Isn’t Enough”.



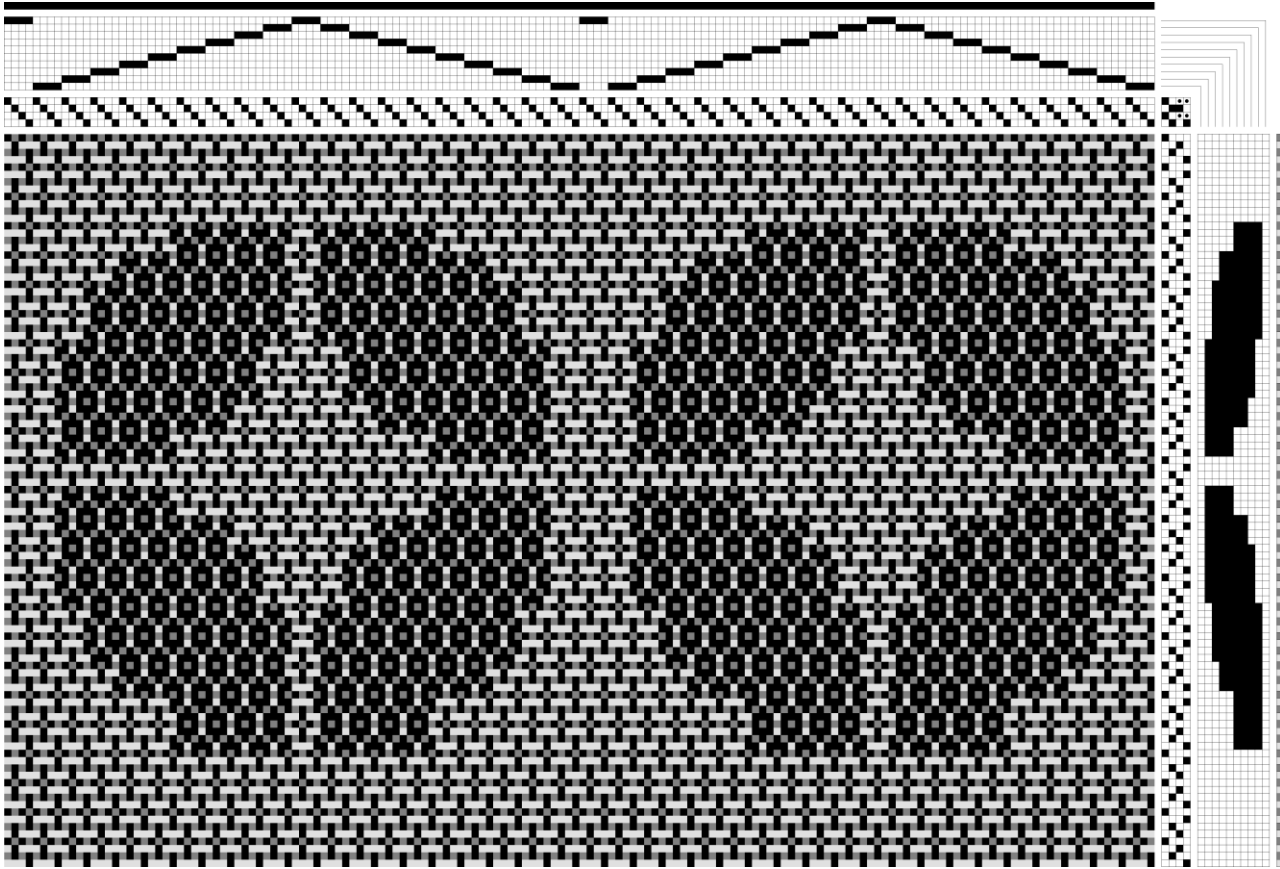
Tieup for the summer/winter variations that follow. Only the treadling sequence changes, giving the weaver a versatile warp – patterning is free for the number of pattern shafts of single cords available, and the structure is not dependent on the threading.



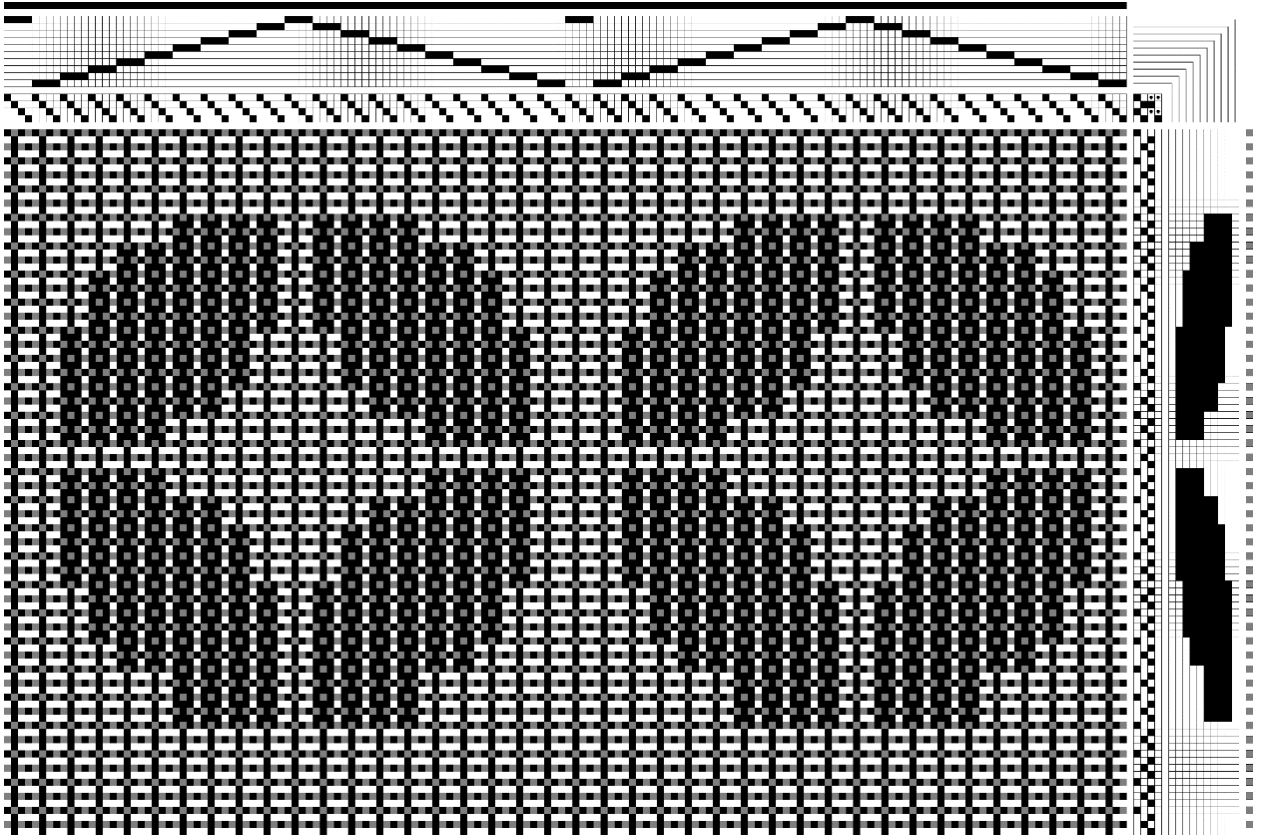
Summer/Winter Alternating



Summer/Winter Birdseye



Summer/Winter x-effect



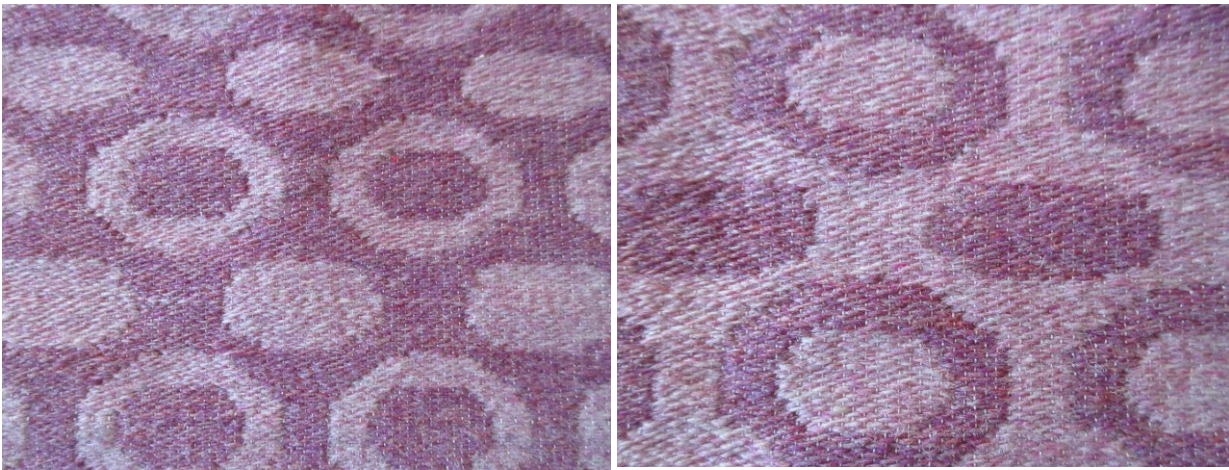
Summer/Winter Columns (Dukagang)

WEAVE STRUCTURES REQUIRING LOOM MODIFICATIONS

STRUCTURES– REQUIRING ONLY PATTERN HEDDLES AND GROUND HEDDLES

For the following group of weaves, **taquete**, **samitum**, **lampas** and **Beiderwand**, tie down warps do NOT pass through the pattern harness. For the following drawdowns and descriptions, I found all sources agreeing that a second warp is required but it need not pass through the pattern heddles. For this presentation, except the Samitum sample, I have prepared each project as two warps – one on the warp beam and one weighted as a supplemental warp. The samitum had the tie down threads separated from the pattern threads at loom setup.

PLEASE NOTE: FOR TAQUETE AND SAMITUM WARP DOES NOT NEED TO PASS THROUGH SHAFTS WITH LONG EYE HEDDLES. The Taquete example shows weaving the fabric on a loom with two warps and the long eye heddles filled. Only the secondary tiedown weft is treadled and the pattern created by raising selected leashes. The Samitum example shows two warps (beamed together) with the tiedown warp passing through the regular heddles and the ground warp passing only through the pattern heddles. EITHER WAY will work with these two weaves.



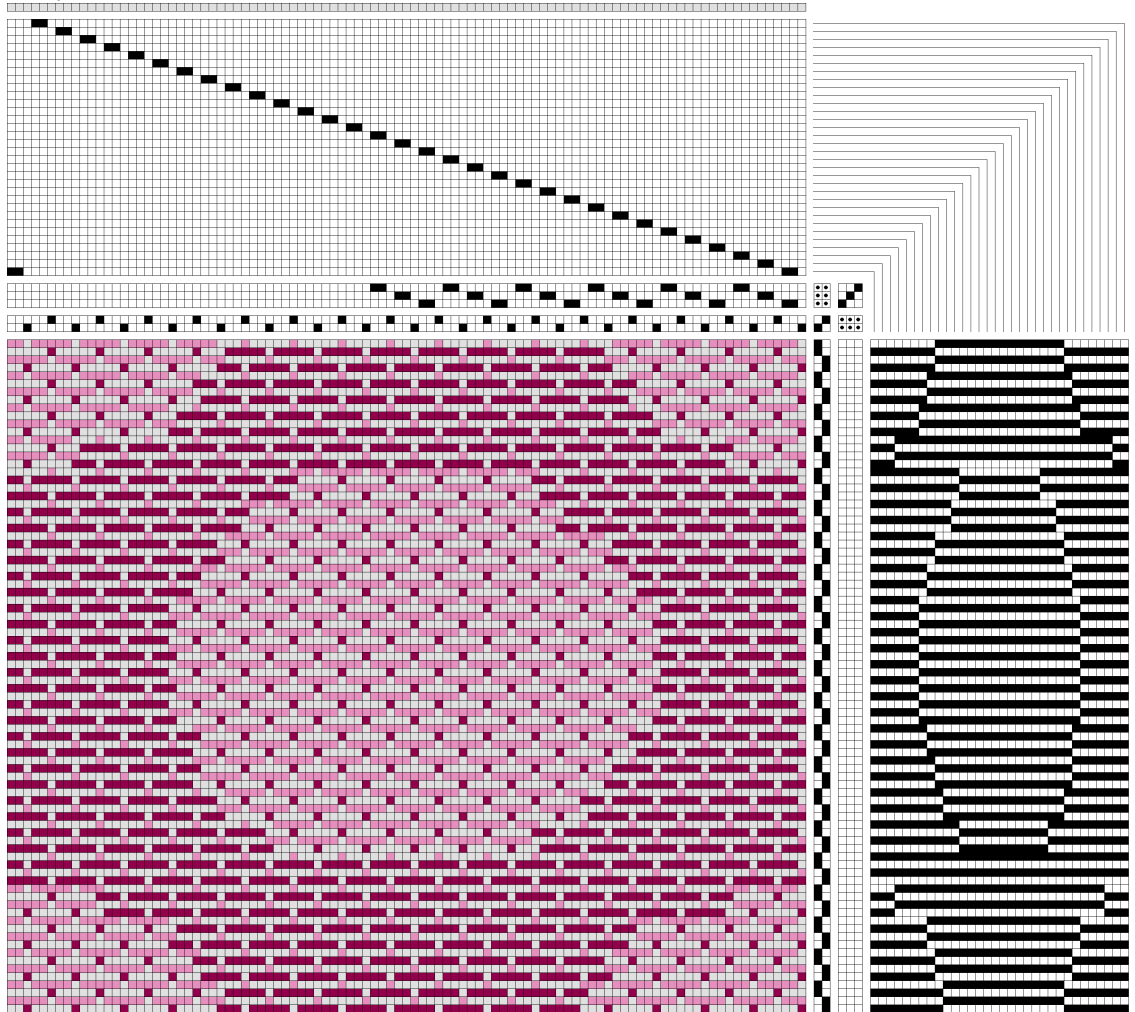
Taquete – front and back Ratio 3:1 Two colors Fully Reversible



Samite – front and back Ratio 2:1 Three colors with 4th color

added only where needed. This fabric is NOT reversible.

Taquete



This draft shows the use of an existing warp that was used for lampas, 3 shafts used for the twill ground and 2 for the plain weave pattern areas. There is a 2:1 ratio between ground and pattern weaves. It is successfully converted to weaving taquete by using only the 2 plain weave shafts, raising the leashes to form the pattern, and never treading the ground shafts with the long eye heddles

NOTE: The left side of the draft shows the simplest form for setting up taquete on a drawloom. The ground warp needs only to pass through the pattern heddles so that the pattern can be drawn. The secondary shafts with regular eye heddles are then treadled in plain weave to create the interlacements. The **ground warp threads do not interlace** – they simply fill the spaces between the secondary warps, placing the weft either on the face or the back of the fabric.

The fabric from both threadings is identical.

NOTE: The empty squares indicating no treading or tieup for the warp ends in the pattern harness is correct. Those threads are manipulated **ONLY** by the drawcords or drawpulls.

Taquete is probably the oldest tied structure under consideration here. Sources find that it might have been developed by tapestry weavers to make patterning more efficient. Pieces have been discovered using both techniques in the same textile. The structure requires two warps, main and binding. The binding warp can have any ratio and remains locked inside the fabric while the main warp works in passes of 2 picks –one positive and the other negative to completely cover

the warp on two sides in opposite coloration. The lack of interlacements on the binding warp can lead to differential takeup.

A pass is two picks, a decoupure is 2 passes. For each graphed pattern row, 4 picks are needed.

This structure on the drawloom requires alternating opposites of each pattern row. It is quite difficult with a pattern shaft drawloom and a very difficult exercise on the single unit drawloom. This is an application that lends itself to the use of pattern saving lashes – it takes an “A” and a “B” lash for every pattern row.

Usually warp color is consistent and wefts alternate, being of rather equal weight. Three color taquete is possible, but probably only practical in selected areas rather than the whole piece.

This draft is based on the first three warps used to experiment with Lampas and Beiderwand. Ratio is 3:1. Ground warp is 20/2 unmercerized cotton, pattern warp is 30/2 unmercerized cotton. I had wondered about the fabric quality, leaving three coarser warps on the inside of the fabric, but the spacing of the secondary warp let use of a Harrisville Shetland (1800 ypp) wool give a pleasant hand. Patterning comes from changing the pulls on every ROW – 2 pulled picks for each liftplan row. Two liftplan rows constitute one pass. The decoupure – for one step in the design consists of this one set of passes. In other words, FOUR picks and FOUR pulls are needed for every row of the pattern design.

To weave this pattern in taquete, the weaving sequence would be:

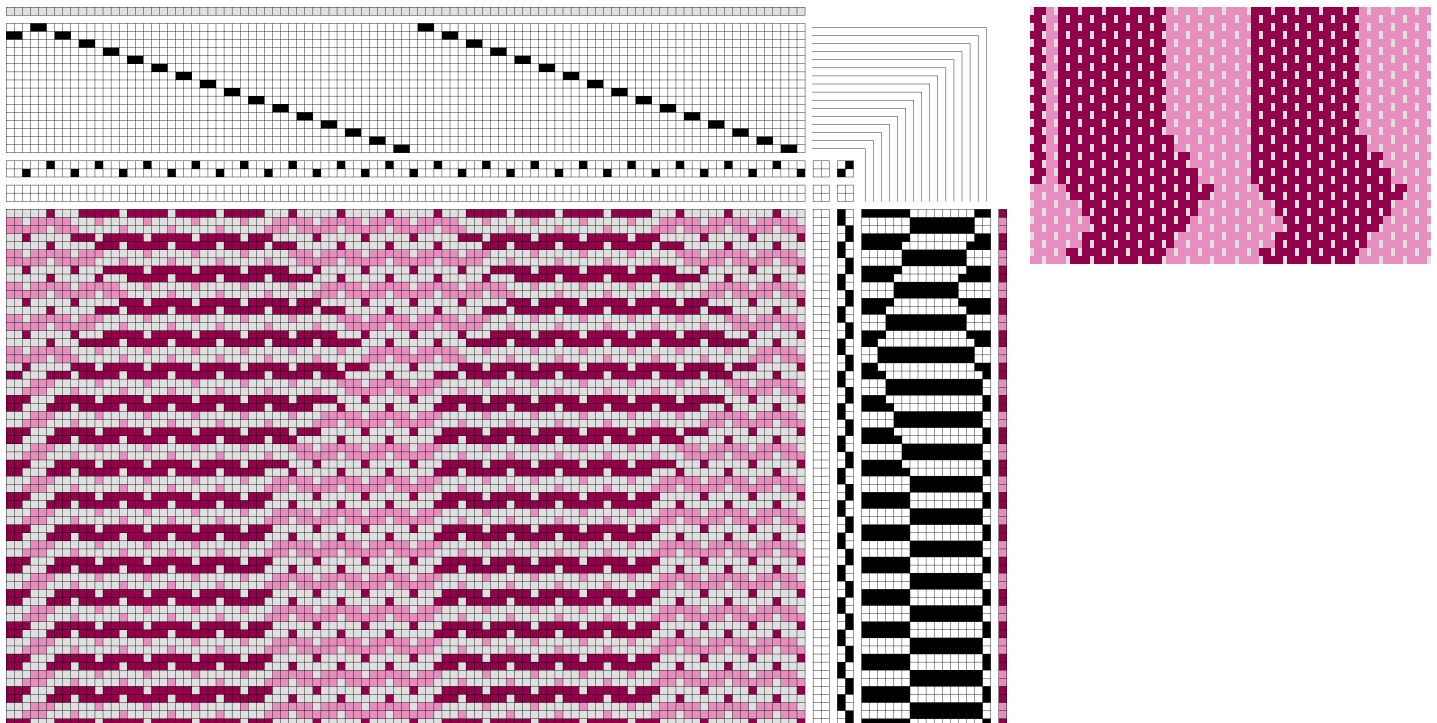
Pattern Row 1: 1A, 1B, 1A, 1B

Pattern Row 2: 2A, 2B, 2A, 2B

Now, how does one set up the drawloom to do this efficiently?

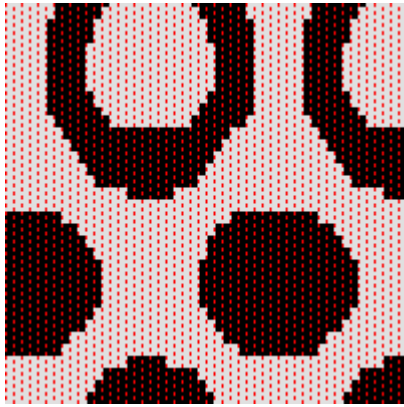
The most efficient setup would be to create pattern saving lashes, 2 for each row. Then the lashes for Row 1 could be pulled A, B, A, B – meaning that each lash could be used twice. For those weavers with the overhead draw warp systems, picking those rows could be done in such a manner that first the A lash is tied and pulled. At that point, the cords for the B lash remain unpicked. These cords can be made into the B lash.

NOTE: The pulling sequence can also be changed to A B B A, reducing the number of row changes. However, with more than 2 colors, this no longer works as well.



Draft showing taquete set up without long eye heddles and utilizing the more efficient pull method – A B B A

The fabric simulation shows how the primary warp is pulled inside the structure and never shows on the surface. This



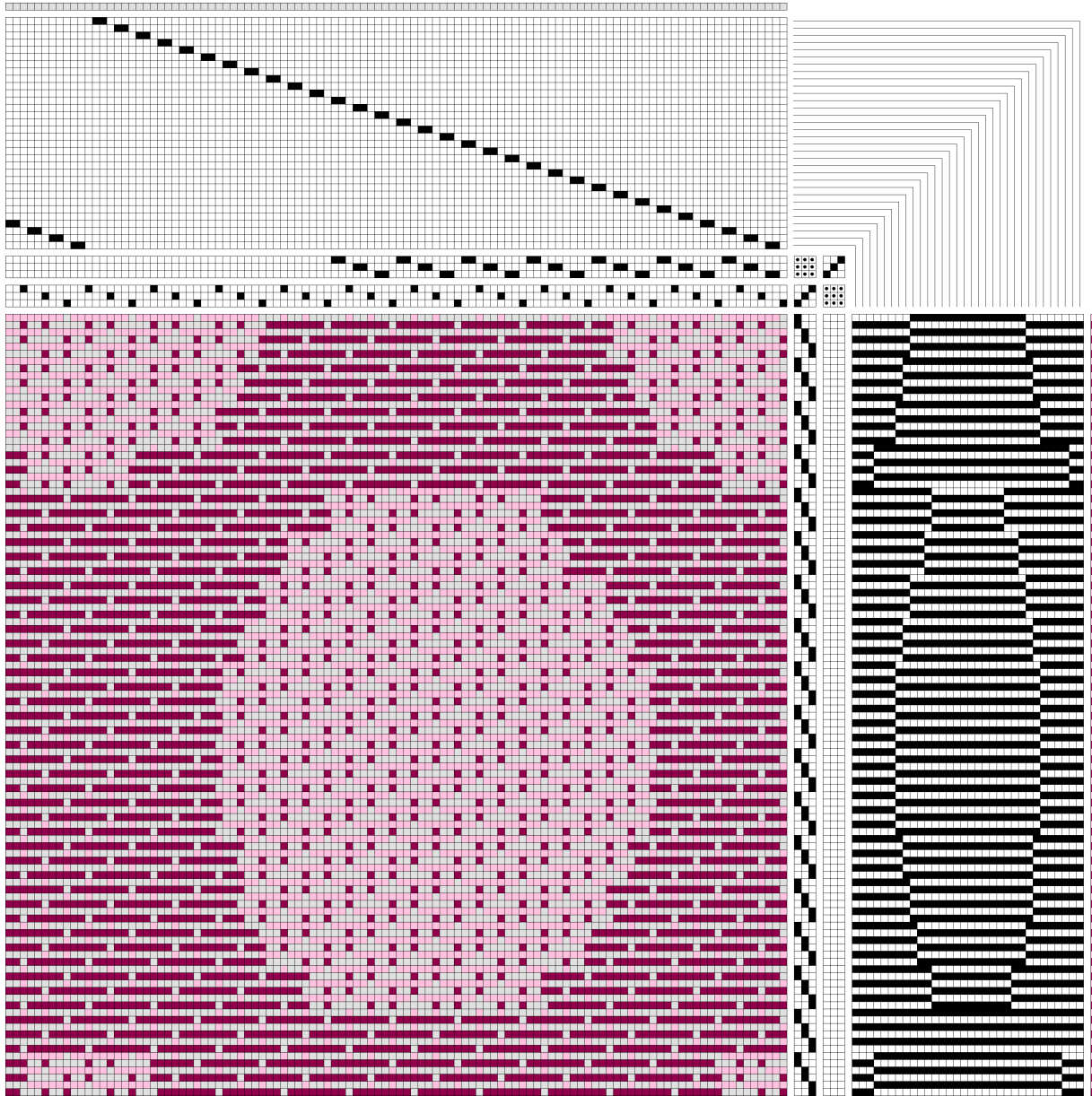
means that most of the tied warps for lampas or Beiderwand can also be used for taquete – ignoring the primary warp (becomes the inner warp that never shows on the face or back of the fabric) and relying on the secondary warp (plain weave) to create the structure. This presents interesting possibilities for a ratio other than the usually recommended 1:1 for taquete setups.

NOTE: In Becker’s “Pattern and Loom” as well as other sources, a “cross harness” drawloom is shown – consisting of many pattern storing lashes that span the loom across the width instead of front to rear of the loom. This type of looms looks like an ideal candidate for taquete and samitum (coming later) and is still found in regions where these two structures have a historical background.

Samitum

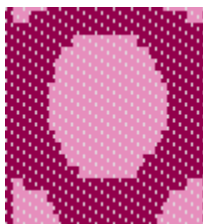
Samitum is the counterpart of taquete – a twill on both faces, but NOT reversible. Similar to the preceding setup, the primary warp from a lampas on the loom becomes the inner warp that is not seen on the surface. The secondary warp produces a pure twill surface on both sides of the fabric.

Again, only the tie down warp is treadled. This 3-end twill requires 3 passes of two picks (6 picks) to complete the decoupage. This, as with taquete, will require heavy lifting on a modern drawloom. The most efficient setup would be for a set of pattern saving lashes with an A and B cord for each pattern row. Then each set of cords would be pulled three times for the decoupage.



This is the draft for a 2-color samite that is woven at the end of a lampas warp using a 3-end twill for both ground and secondary warp. The draft shows that whether the long eye heddles are threaded or not does not make any

Here is a



difference in the construction of the fabric.

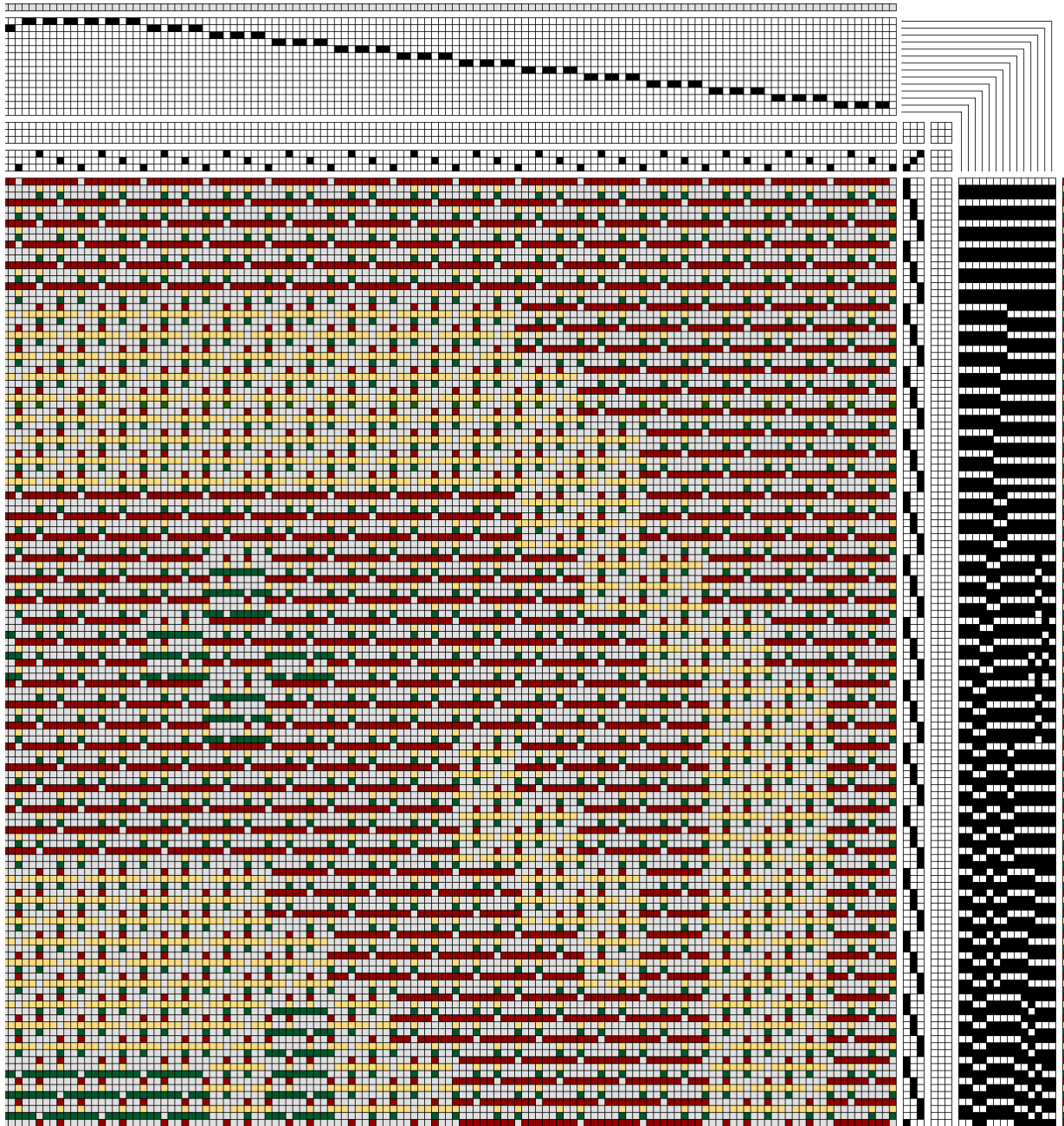
simulation of the resulting fabric.

Historically, samite was woven with designs in roundels that were often polychrome, that is in more than 2 colors. The easiest way to add a third color would be to follow this draft and place weft color band sections that coordinate with the pattern and add color interest to the design.

The more difficult version of this is the 3-color polychrome samite, detailed on the next few pages. The pattern was developed as just 2 colors, and then the liftplan altered to show a third color in a few areas.

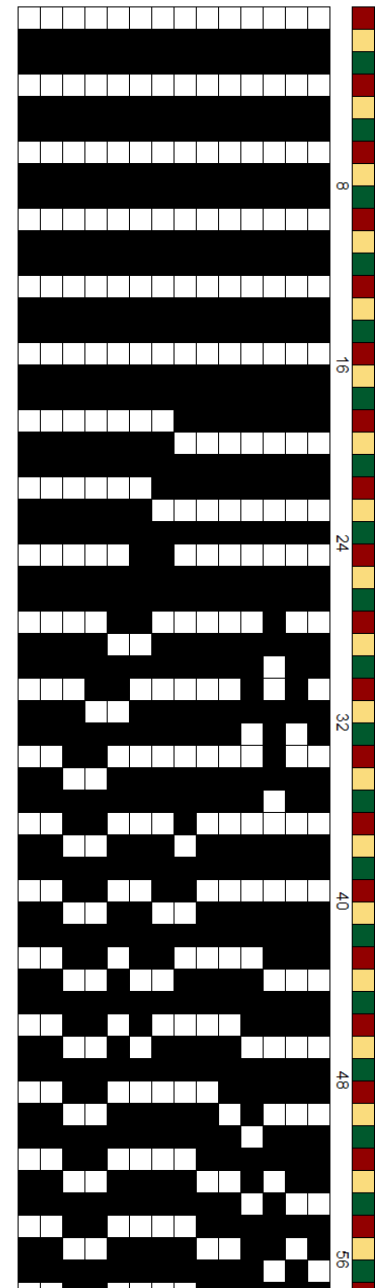
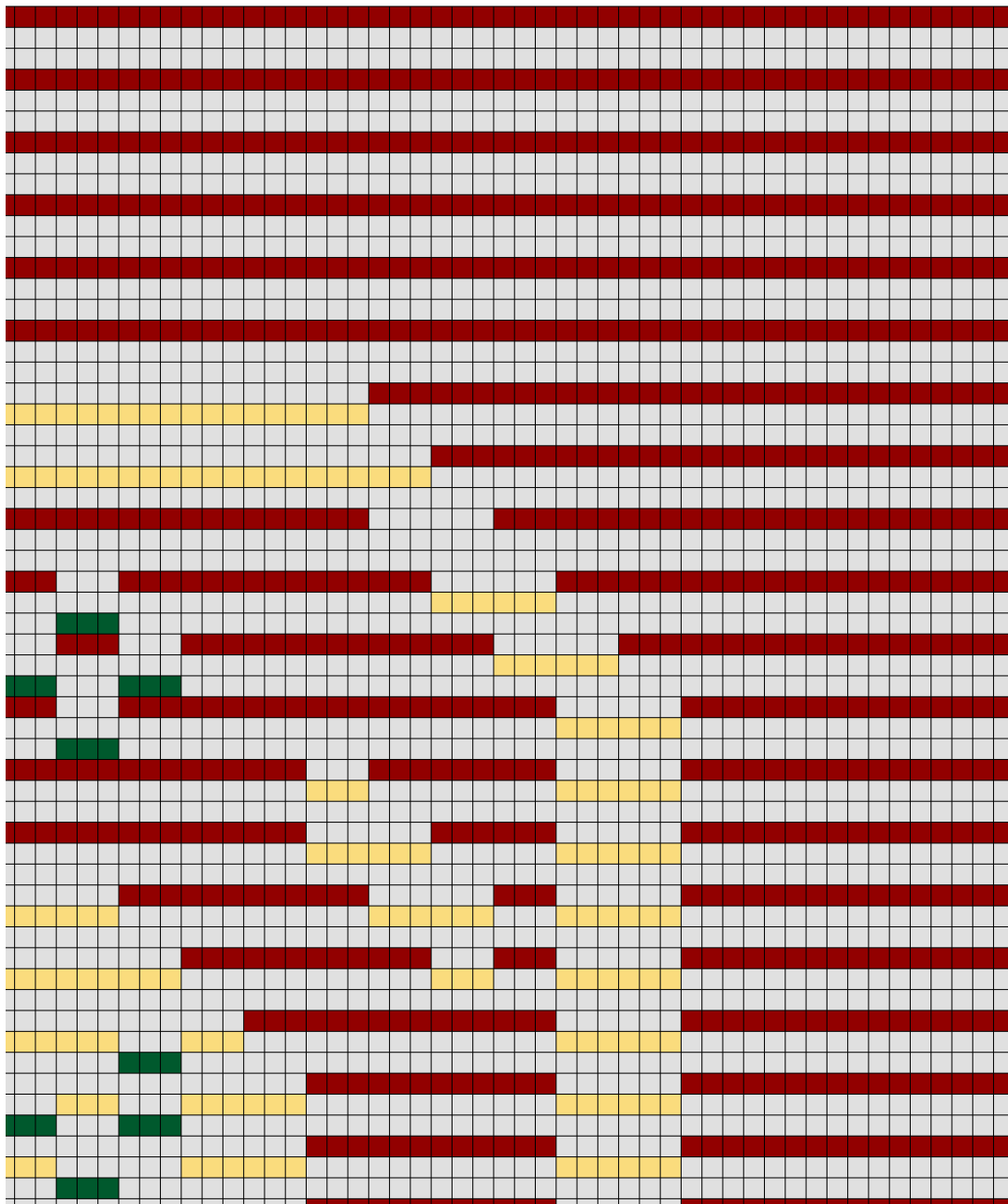
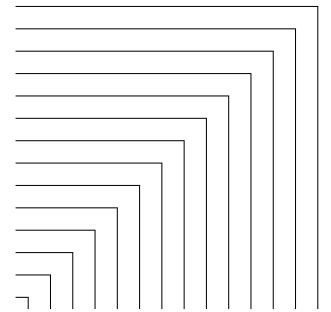
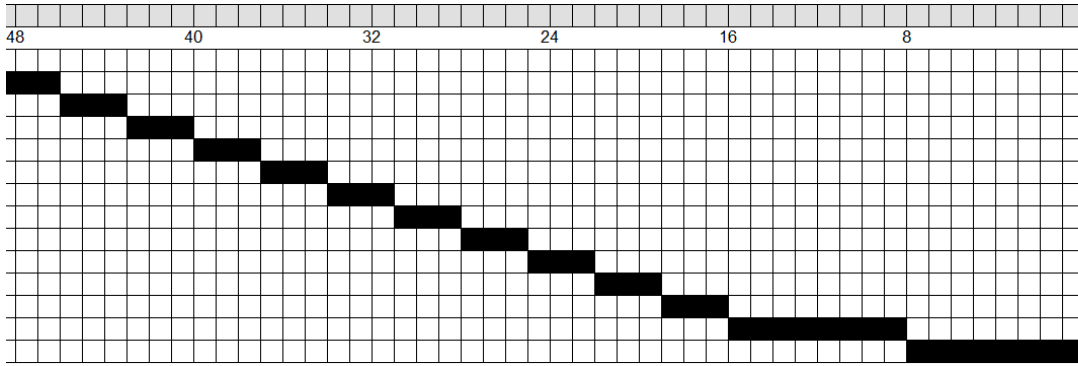
Polychrome Samite

Here is the draft for a 3-color roundel in samite. A pass is 3 picks, a decoupure is 3 passes. For each graphed pattern row, 9 picks are needed. To correct the aspect ratio, 2 graphed pattern rows are woven. This makes 18 picks per pattern row.



Note that the color sequence is arranged so that when weaving background areas, the background color is woven with no cords or pulls and the colors not to appear on the surface are placed together so that they can both be woven with the opposite – all cords pulled.

The next diagram is the one used to actually execute this fabric. There is only one “row” shown for each pattern row(decoupure). It is understood that when weaving, each of these “rows” should be executed at least three times – once for treadle one, once for treadle two and once for treadle three. In the case of the sample presented here, each “row” needed to have this sequence executed twice (2 decoupires) to make the aspect ratio appear more squared. It proved easier to follow in this format, showing the alternation of pattern rows and colors than trying to follow each pick in the file. The expanded detail on the next page shows a detailed view of the liftplan for a 3-color rendition of the roundel design.



Expanded detail for 3 color polychrome samite.

Notes and comments

A 1:1 setup is, similar to taquete, tedious unless tying on from a prior setup.

As with taquete, three color work is time consuming and probably best only in selected areas.

Samitum is a smoother version of the taquete – provides contrasting color effects with a very nice surface.

Both taquete and samitum are not easy to weave on the drawloom because of the requirement that each pattern row must be executed first as a positive and then as a negative. Even if done with pattern lashes, 2 lashes per pattern row are still needed.

For 2-color work (A and B) you need three picks of A and three picks of B for a decoupage. The letters (A and B are the colors, the numbers are the treadles – 1, 2, or 3.

Sequence A1 B1 A2 B2 A3 B3 (this sequence requires a change for every row. It provides the smoothest surface.) Weaving this way ensures no gaps in the fabric but is very slow – the A1 pick is the exact opposite of the B1.

OR

A1 A2 B2 B3 A3 A1 B1 B2 A2 A3 B3 B1 (this sequence allows two rows to be woven before changing the pulls. It also increases the chance of very slight skips in the appearance of the fabric.) Working this way is easiest if the weaver makes an index card with the weft sequence to tape to the loom console.

The aspect ratio of taquete and samite are controlled somewhat by the ratio of the warp threads. I found that a 2:1 ratio worked well with 3 color fabrics. 1:1 is better for 2 color work, but that is very tedious to set up.

Also, using an extra color for polychrome effects is easiest when done in carefully planned stripes in the piece rather than alternating 3 or 4 colors.

Books always refer to samite as an early drawloom weave. The period where it was popular was from 1st to 11th century. Historically there were a few interim fabrics on the way to the next class of tied weaves. The terms proto-lampas and pseudo-lampas are discussed in John Becker's "Pattern and Loom" and in following source monograph.

Historical Footnote

Taquete and Samitum were probably the first two tied weaves historically. Lampas came later.

It seems that there were some steps to move from the stricture of only plain weave or only twill in a compound fabric. Proto-lampas and Pseudo Lampas are two of those that incorporate more complexity in the cloth.

Sources that discuss these developments include:

John Becker, "Pattern and Loom", pp. 133-168

From the Medieval Textile Study Group (Complex Weavers)

https://www2.cs.arizona.edu/patterns/weaving/webdocs/mnm_mt31.pdf

<http://www.medievaltextiles.org/gallery/gallery.html>

Taqueté, Samit and Lampas (proto-lampas, pseudo-lampas, takeup binding and lampas) mostly from SAMIT & LAMPAS A.E.D.T./CALICO MUSEUM

<http://www.weavinglibrary.org/2012/11/taquete-samit-and-lampas-proto-lampas.html>

STRUCTURES- REQUIRING PATTERN HEDDLES, LONG EYE HEDDLES AND GROUND HEDDLES

Lampas

Lampas is defined:

“Term used exclusively for a figured weave in which a pattern, composed of weft floats bound by a binding warp, is added to a ground weave formed by a main warp and a main weft. The ground weave is variable. The weft threads forming the pattern may be main, pattern or brocading wefts: they float on the face as required by the pattern and are bound by the ends of the binding warp in a binding which is ordinarily tabby or twill and is supplementary to the ground weave.” Burnham, 1980, p. 82

Here is where the Drawloom shines in making original tied fabrics. The very definition is broad and allows the weaver considerable freedom in designing a project. The binding warp threads do NOT pass through the pattern harness. (If the binding threads pass through the pattern heddles, only tied lampas will be the result. For the flexibility of making both, tie threads should pass only through the secondary regular heddles in the main harness.)

Lampas is a juxtaposition of two structures in 2 layers that are interlaced in some or all parts of the fabric. Untied lampas has some areas of two-layer pockets of double weave and tied lampas has the two layers connected in all areas. Because of the pockets that occur, it is wise to choose an all over pattern without large blocks of solid structural area or buckling can occur.

Ratios in lampas can be 1:1 but are often 2:1, 3:1 or even up to 7:1. Creative design ideas are found in Alice Schlein’s monograph.

One pass is 2 picks, one main, one secondary. A decoupage is a complete set of passes for the main structure. For 3-end twill, 3 passes complete the structure – so 6 picks are needed. For 4-end twill, 4 passes are needed including 8 picks.

Lampas has one structure for the main warp and another for the binding warp. However, the same structure can be used for both – as in the lampas subset known as Beiderwand. Often the binding warp is finer than the main warp. Often the main weft is finer than the pattern weft. Use of two structures and varying weights of yarn allow variations in color and texture that make for a wide variety of fabrics.

The binding warp passes through regular heddles at the front of the ground harness. The binding ends pass through the heddle eyes so that they lie flat and even with the main warp and form an even shed. This will involve experimenting with shaft height until an even shed is achieved.

Lampas is tied up so that more than one treadle can be pressed during weaving, allowing the weaver to produce tied AND untied lampas on the same warp. Since the ground shafts on a drawloom are held in “neutral” position with elastics or counterweights, they will not fall when not in use. The treadles for the main structure are tied only to the shafts with the long eye heddles which are connected to the pattern heddles. The treadles for the secondary structure are connected only to the shafts with regular heddles that are not connected to the pattern harness. It is quite possible, then, to depress one of the secondary treadles along with the main treadle for tied lampas. Unlike damask, all connections are filled for each structure/treadle set used.

The basic loom setup for lampas is the same as for Beiderwand, (pp. 20ff). Only the number of shafts needed for each structure may vary. The weaver will still need to have basically two sets of treadles.

Lampas is a two-sided fabric. Either side can be declared the “right” or outward side, but the fabric is never fully reversible. Because it consists of two layers, it does not have drapery, supple qualities. It is more suitable for upholstery, draperies, wall coverings, jackets and other garments than for scarves, runners and delicate fabrics. Use of fine threads definitely allows for more attractive and versatile fabrics. Because lampas uses at least 2 warps and 2 wefts, there are many possibilities for color effects. Varying yarn grist for the pattern weft can also produce interesting effects.

Basic Untied Lampas drawdown

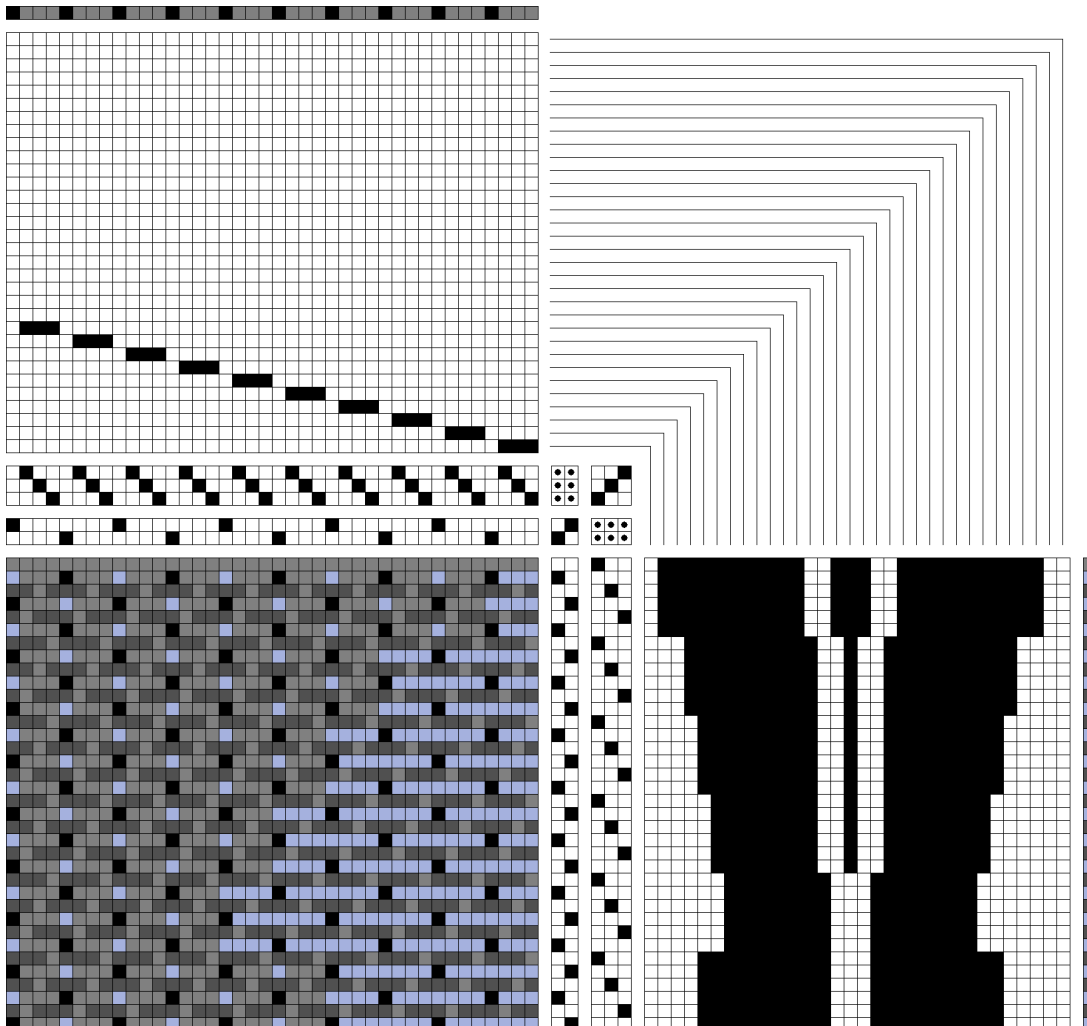
Primary structure 3-end twill, weft effect

Secondary structure plain weave

Ratio 3:1

Primary warp 20/2 cotton Secondary warp 30/2 cotton

This treadling variant has the areas with primary structure on top as two distinct layers. This can produce a “poufy” effect that can be used for special effects.



Basic Tied Lampas drawdown

Primary structure 3-end twill, weft effect

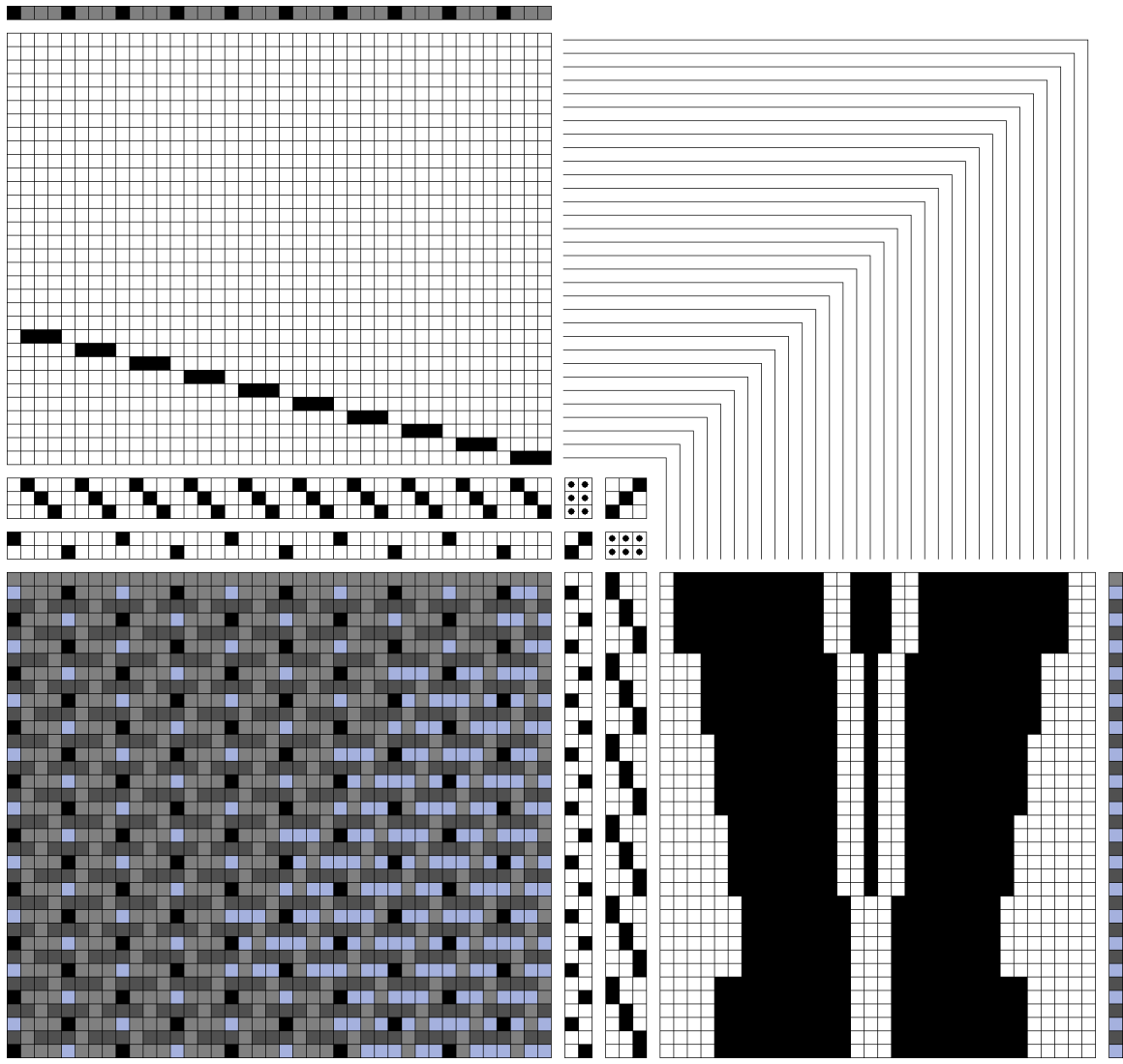
Secondary structure plain weave

Ratio 3:1

Primary warp 20/2 cotton Secondary warp 30/2 cotton

NOTE: the treadling using 2 treadles at a time is possible because of the setup for lampas on a countermarche drawloom.

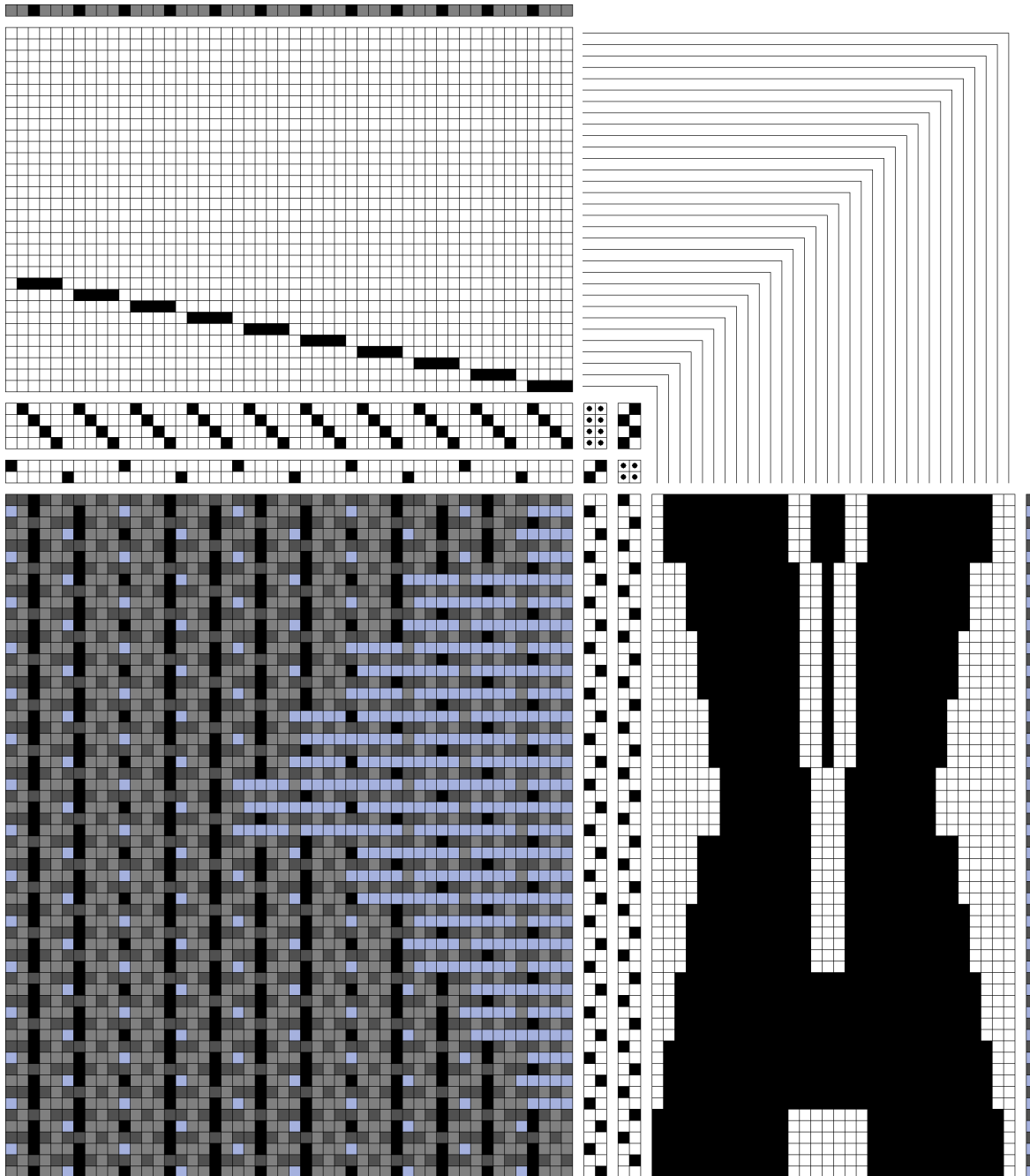
In this treadling variant, the primary layer is tied so that is not two separate layers. This minimizes any striping on the reverse side and keeps the areas of primary fabric on top from "puffing".



Beiderwand

Beiderwand is a subset of lampas that is normally woven 4:1 with both structures as plain weave. 2:1 Beiderwand variation is smoother.

One pass is 2 picks, one main and one secondary. One decoupure is 2 passes or 4 picks.



Basic Beiderwand

Primary structure AND secondary structure plain weave

Ratio 4:1

Primary warp 20/2 mercerized cotton white

Secondary warp 20/2 unmercerized cotton blue



18th Century Beiderwand – Schleswig Holstein. Cotton and wool. Tuch & Technik (museum) Neumunster



Contemporary Beiderwand – same museum – loom set up by Andreas Moeller, Hamburg (for full photo, see cover page)

1. Primary warp passes through long eye heddles on shafts 3-6. Pattern warp passes through normal heddles on shafts 1 and 2.



2. Primary warp passes through maillons and pattern heddles, secondary warp passes between leashes and only the standard heddles. Note the routes for each warp.



3. Treadles. Shafts 1 and 2 are tied on the left. Shafts 3-6 are tied on the right. This setup needs only 4 treadles. Unlike most countermarche tieups, each set of shafts is tied independently.



Contemporary Beiderwand from Jacquard Looms, Altes Pastorat, Meldorf, Germany



More contemporary Beiderwand – Altes Pastorat, Meldorf Germany. This pattern is pictured in Ulla Cyrus’ “Manual of Swedish Weaving” and other basic weaving texts. I have a pillow in this pattern from the 1980’s. For a very long time this was one of only a few patterns because reproducing worn loom cards took most of their time. When visiting in 2019 we were impressed to see that computer advances have made it more efficient to generate Jacquard card sets and their pattern choices were much more varied.

Finished Objects



Lampas pillows from Lampas Warp #1. Red pillow currently in “Feuer und Flamme” exhibit from Weben+.



Lampas bedspread, primary warp 20/2 mercerized cotton, secondary warp 8/2 Heather from Jagerspun.

Design is adapted from a cross stitch design that I purchased after our 2018 trip to Ashford Products and New Zealand.

The Koru pattern lends itself well to an allover design.

In this case, rather than take individual leashes as a pixel, there are 3 leashes and 3 pattern rows in one “point” of the design.

DESIGN THOUGHTS

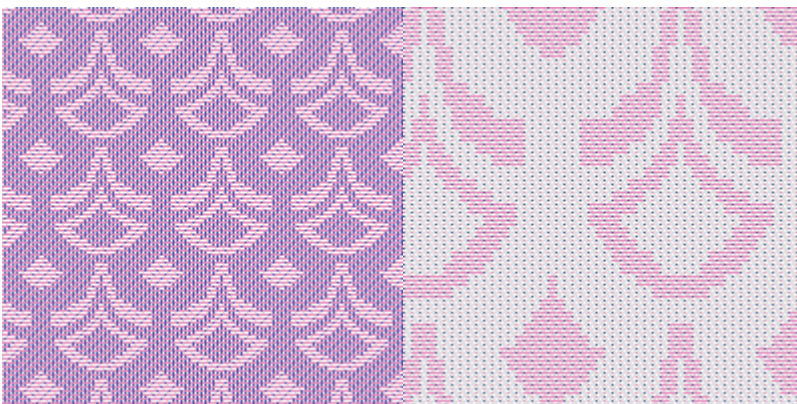


Since Lampas (including Beiderwand) is a 2 layered weave and in the untied version the layers are separate, it is worth considering a pattern that is somewhat evenly divided over the surface. If there are large areas of separate layers, there is the possibility of puffiness or collapse in those areas. Of course, the puffiness can be used as a feature as well. The puffy appearance can be enhanced by use of differential shrinkage or fiber content. This consideration can also play a role in deciding if the pattern should be rendered in positive or negative format (see Warp #2, Koru pattern). Very detailed patterns with single pixel features will not

always be distinct in a lampas fabric. The choice of yarn for primary and secondary weft will make a great difference in the texture of the fabric. If the yarns are similar in size, the fabric will be relatively smooth. If there is a difference in grist, the fabric takes on an embossed texture. Choosing different fibers for the two yarns also affects the finished fabric. Cotton makes an excellent primary weft – it is soft, fluid and blends into the background. Silk (or rayon) lends additional flexibility and drape. Linen stiffens the final fabric.

For secondary weft, one can choose similar colors, sharp contrasts, different drape and texture. Adding a thin metallic strand such as Lurex can give a festive effect.

Changing Ratio will change the detail of the fabric. Here are fabric swatches from the same design – 1:1 and 3:1 Each rendering shows 200 ends and 200 picks.



On the left, the ratio is 1:1 alternating grey primary and blue pattern warps and pink/white wefts.

On the right, the same colors in the draft as 3:1 produce a larger pattern and vastly different coloration.

Of course, when using less contrasting colors, the major effect will be in the size and detail of the patterning.

PREPARATION AND LOOM MODIFICATIONS

The first decision to be made is what type of tied fabric will be made. Particularly with lampas there is wide latitude in structures, setts and materials. It will be time consuming to set up the loom, so up-front planning is helpful.

1. Which tied weave will it be? Taquete, samitum or lampas? Something else?
2. What will the ratio be? 1:1 is inefficient on a Drawloom as that would mean only a single thread in each leash. 2:1 or 3:1 is quite nice. 4:1 and only plain weave is the variant form known as Beiderwand.
3. If lampas, which structures will be used for the main warp and the secondary warp?
4. What warp materials are being used? For lampas, the secondary (tie down) warp is often thinner than the main warp.
5. Determine probable sett. The warp is sleyed using the main warp as a guide. The sett chosen corresponds to the ground weave structure and warp thread size. The tie down warp is included in the dents of the reed along with the main warp. This is similar to doubleweave where the warp sett in reed includes both layers, but each layer has only half that density.

Example 1: 20/2 cotton main warp, 2/1 twill structure – designated sett 36 epi (12 dent reed/3 ends per dent). With a ratio of 3:1, one tie down warp, 30/2 cotton was included in every dent.

The total ends per inch of reed becomes 48, but the fabric density is 36 epi for a twill with the extra ends forming the pattern areas.

Example 2: 20/2 cotton main warp, plain weave, 4:1 ratio – main warp sett 34 epi (17 dent reed, 2 per dent), secondary warp 30/2 cotton – one end in every other dent for a total of 42.5 ends per inch in reed.

Example 3: 20/2 cotton main warp, 3/1 twill, 2:1 ratio – main warp sett 38 epi, (17 dent reed, 2 per dent), secondary warp 30/2 cotton – one end in every dent for a total of 55 ends per inch.

6. Make a draft or drawdown of how the structure will be set up on the loom. Experiment with a few variations.

Loom Requirements

LOOM

A BASIC DRAWLOOM WITH FOUR TO EIGHT GROUND SHAFTS IS REQUIRED. EITHER PATTERN SHAFT OR SINGLE CORD LOOMS WILL WORK. Possibly the pattern shaft loom is better suited to the fabrics discussed here. They generally react well to all over patterning reminiscent of the rich Renaissance versions we see in older paintings. All weaves discussed here require a variety of loom modifications. Since the tied weaves have essentially two warps, main and secondary (ground and pattern), the weaver has a choice of using a second warp beam, warping both together and weighting one with a rod to allow for tension disparities as they happen, or beaming the main warp on the warp beam with the secondary warp suspended on weights and a separate set of lease sticks.

Good loom depth supports good results. Do not try to make the back beam/breast beam distance too small. Since each loom will have different features, assess your loom well before starting a project and make sure you have good access to the parts you need to modify and use during warping and/or correcting.

TWO WARPS ARE INVOLVED – REQUIRING A SOLUTION FOR DIFFERENTIAL TAKEUP



For a short warp, both main and secondary warps can be beamed together. Longer warps require that main and secondary warps be chained and beamed separately. Without a second warp beam, the tie down warp may be beamed as a supplemental warp weighted from the back beam. Extra lingos make excellent warp weights. Particularly Lampas with two different structures is prone to significant differential takeup.

Note: I used a weighted supplemental warp anchored with lingos. Multiple sections work best. The takeup on the supplemental warp was much more than the primary warp on the beam. In more than one instance, I tied on to the supplemental warp, was able to weave close to the

tieon, advance a bit, and keep on weaving.

THE GROUND HARNESS CONSISTS OF TWO SUB-HARNESSES.

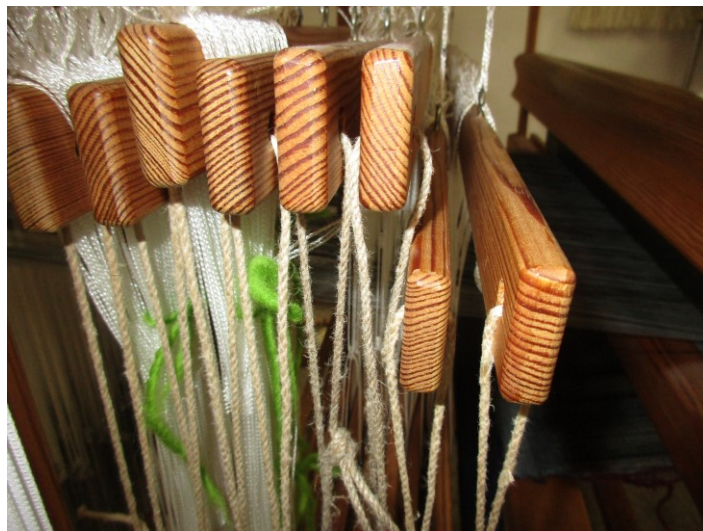
The first (the shafts at the back of the harness) are for the main warp. The required number of shafts needed for the structure is outfitted with long eye heddles.

The secondary group is at the front of the ground harness, containing the correct number of shafts outfitted with normal eye heddles.

If the project is for lampas with 3-end twill ground and plain weave pattern structure, three shafts with long eye heddles are required along with 2 shafts with standard eye heddles.

The hanging height of each group of shafts is addressed in the section for “Preparing the Shed”.

Here is my shaft arrangement for the samples – three shafts at the rear that are not used, three shafts with long eye heddles for the ground, and 2 shafts with standard eye heddles for the pattern. Because the three unused shafts do not disturb the fabric as it is woven, they simply remain in neutral position with long eye heddles pushed to the side.



TYING ON NEW WARPS

It improves efficiency when projects for tied weaves are somehow “normed” in terms of number of warp ends, thread weight, and structures used. That facilitates tying on new warps behind the pattern heddles. In more than one instance, one of the two warps came to an end while the other still had weaving length. Either way, it was possible to tie on the ending warp, get the tension evened out, and continue to weave until the knots came very close to the fell line.

Advancing the warp just past the knots, a bit of tension adjustment (especially the supplemental threads) kept the warp going with very little waste.



Using this technique also allows the weaver to change warp material or color without needing to do the complete loom setup. It is even possible to redesign the arrangement of leashes on the pattern shafts or change the number of pattern shafts – as long as the number of warp ends and ratio remains the same.

Warping and Setup

Beam warps as usual using whatever arrangement chosen for the project.

Threading Pattern Heddles

The main warp is threaded into the pattern heddles as usual. The main difference is interleaving the secondary (pattern) warp between the leashes.

Threading the ground harness means entering the threads from a leash (2, 3, 4, etc.) into the long eye heddle group, followed by a supplemental tie down warp entered in the first shaft used by the secondary structure. The next leash threads are put in the next long eye heddles followed by a supplemental in the second shaft of the secondary tie down structure. If the secondary structure requires more shafts, continue with the ends in the next leash put into the long eye heddles followed by a secondary warp entered in the next shaft of the secondary structure.

Continue in this manner until the warp is threaded.

It is also possible to thread the main warp into the long eye heddles first, and then enter the tiedown threads between the leash groups into the correct heddles.

NOTE: I have done this complete setup twice now. Each time, it has taken at least 2 weeks of concentration to achieve correct threading and a clean usable shed. It definitely merits planning a type of fabric that can be varied so that tying new warps from the back can be used. It is rather easy to tie on a different secondary warp in midstream as well.

Sleying the reed is a bit easier. In Sample 1 there are 3 main warp ends and 1 supplemental end in a dent. In Sample 3, there are 2 main warp ends in each dent with 1 supplemental end in every other dent. Since setts are flexible, it is a good idea to calculate a regular and easy sleying sequence that may alter the main structure sett somewhat but makes preparing your loom much less frustrating. The samite samples were woven with one group of pattern and corresponding ground thread in one dent.

Tying up the loom for lampas is interesting, to say the least. The main warp has a set of treadles that are tied to the shafts with long eye heddles and a set of treadles that are tied to the secondary warp shafts with regular heddles. The

independence of these tieups allows a countermarche loom to operate with more than one treadle depressed. **Tied lampas** entails depressing the main warp treadle together with the secondary treadle that belongs to that pick for the main fabric, followed by the secondary treadle (of that pair) alone for the secondary or pattern pick. **Untied lampas versions** have the weaver depressing first the main pick alone followed by the appropriate secondary pick alone.

While a bit daunting for the first repeat or so, it is entirely possible to weave both tied and untied versions of the same lampas fabric without changing the loom setup. **NOTE:** the use of “neutral” untied positions is not used for tied weaves, all connections are tied either rising or sinking.

NOTE: TIED BEIDERWAND according to this definition DOES NOT EXIST. The double plain weave on multiples of 2 cancels itself out and leaves warp ends with no interlacements. I concur with Alice Schlein that “Tied Beiderwand” has no connection to the tied lampas drawdowns in this presentation.

As Alice Schlein writes in her monograph “Lampas for Shaft Looms”:

“In 1982, Clarita Anderson, Judith Gordon, and Naomi Whiting Towner published an intriguing monograph entitled “*Beiderwand?*”, in which they examine the controversy in the naming of coverlets in various museum collections. The terminology is indeed a puzzle, but the authors conclude that the structure called Beiderwand has two distinct warps, with areas of true double weave and areas of integrated cloth; while the structure called Tied Beiderwand has no areas of double weave and has a single warp which functions sometimes as a ground and sometimes as a tie-down warp. Based on these conclusions I would say that Beiderwand is a form of lampas and Tied Beiderwand is not. Please note that the terminology “Tied Beiderwand” does not relate in any way to my use of the terms “tied” and “untied” in previous sections of the present monograph.” P. 65

I refer you to the Anderson/Gordon/Towner monograph for more information about this interesting historical puzzle, with many explanatory drafts and woven examples.

Preparing the shed. The threads in the primary warp (long eye heddles) should be at the bottom of the heddle eye when at rest. The threads in the pattern warp should pass through the center of the heddle eye at the height of the primary warp threads. At this point, the beater height, back beam height and drawloom console will need evaluation. With leashes pulled, the threads pulled down for the primary warp should rest evenly on the shed floor. Primary warp ends that are not raised should make a clean shed in the ground structure. Once even tension is achieved on both warps, weaving may begin. **NOTE:** This step can take longer than when adjusting the shed for damask. The tension on both warps needs to be evened out. The shaft height might need adjustment. The treadle height and tieup cords might need tweaking. The reward for patience is that as long as you weave with the chosen structures, tying on from the back will not require adjusting the shed. (For a rough idea of shaft height, thread path and tieup see Basic Beiderwand.)

This process will be time consuming. In May 2019 we visited Tuch & Technik in Neumunster. While photographing and studying the Beiderwand drawloom (pp. 22-25), a guided tour came through. We stayed to listen to the commentary – which included musing that “no one ever makes these fabrics today”. I opened my iPad and showed photos of the two lampas pillows I had just completed. The guide was quite open and friendly and said that that loom we were viewing had taken SIX MONTHS to set up (including redoing the comber board) with the help of “a genius from Hamburg”. I queried “Andreas Moeller” – he replied “yes”. After spending nearly two months adjusting my first lampas setup (not 8 hours a day, but things did not go swiftly) I suddenly no longer felt quite as awkward. For those not familiar – Andreas Moeller is the German weaver in Hamburg who has invented the rather revolutionary “Flying 8” looms and accessories.

Include 12-18 inches of warp for testing your setup – threading, slewing, tieup, shed. For my Beiderwand warp, this much was needed to achieve accurate results.

SAMPLES

Loom Setup #1

Primary structure – 2/1 warp faced twill

Secondary structure – plain weave

This uses 5 ground shafts – 3 shafts with long eye heddles and 2 shafts with normal heddles.

Primary warp - 20/2 cotton, sett 36 epi

Secondary warp – 30/2 cotton

Reed – 12 dpi with 3 primary warp and one secondary warp end per dent.

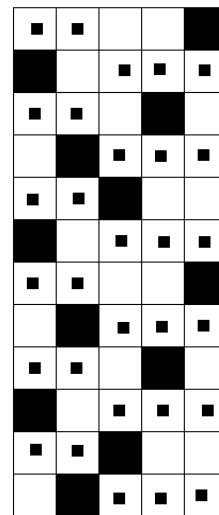
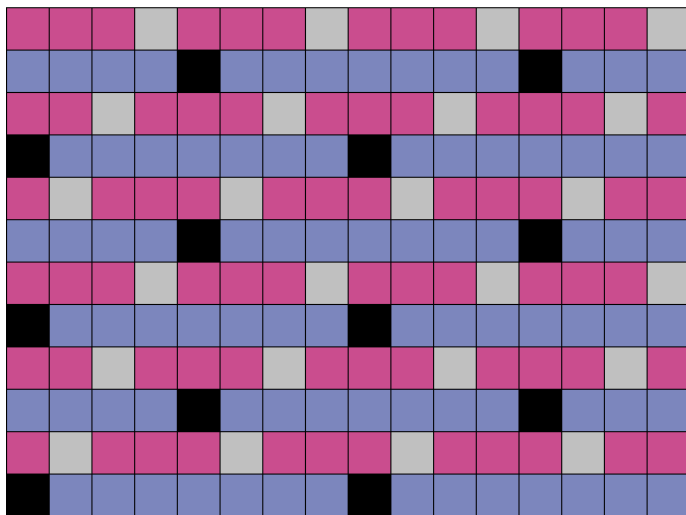
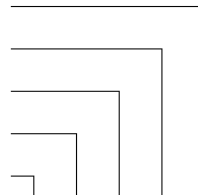
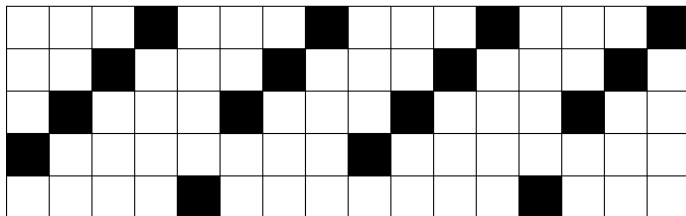
Primary weft – thread approximately the same weight as 20/2 cotton – 20/1 linen, 60/2 silk, 20/2 cotton

Secondary weft – a variety of thicker threads in wool, cotton, silk, rayon or linen (here is where experimentation is most enjoyable)

Pattern threads are spread over 32 pattern shafts in a straight draw – 8 repeats for a total of 256 leashes and a width of about 20". (Museum examples of antique complex fabrics shows many of them to be only 18" to 24" wide).

Drafting for a Lampas warp involves two parts – the fabric structure and the pattern liftplan.

The structure drawdown is rather basic. **Here are three representations of the same fabric, in three styles. Pick the one you prefer and continue to work that way.**

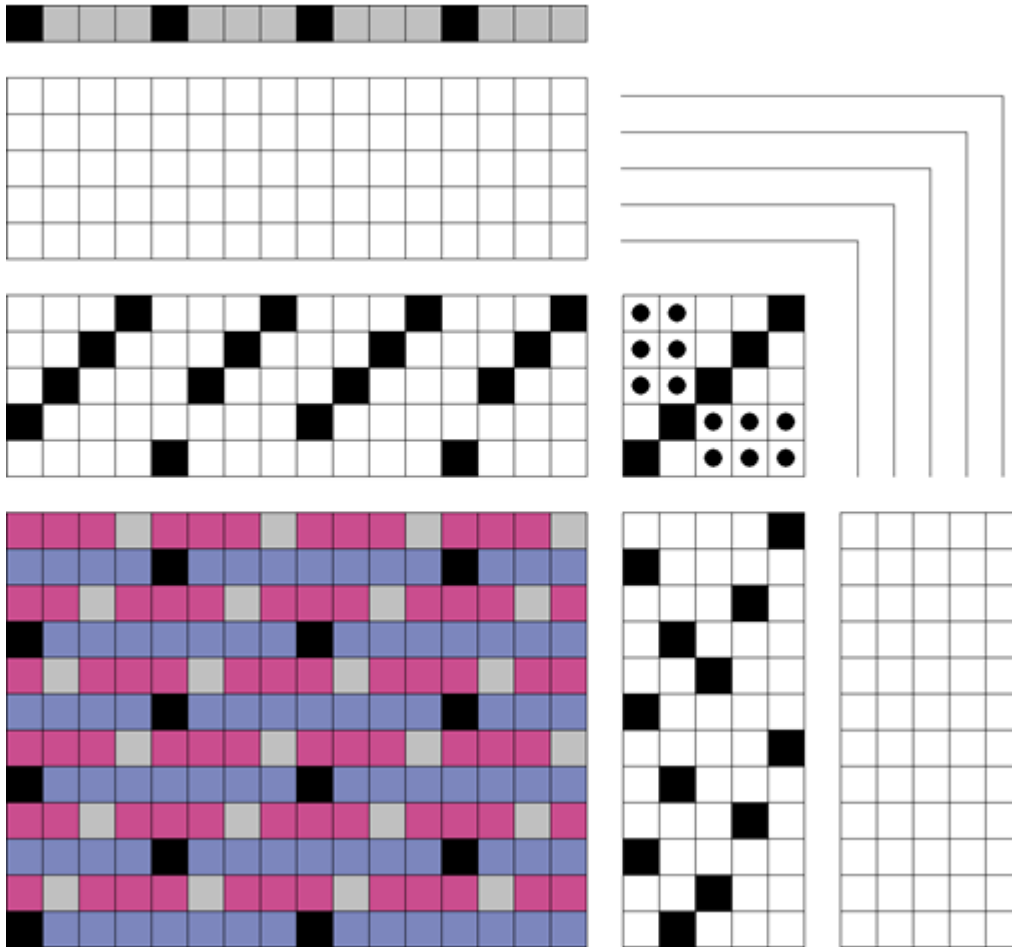


Ground fabric in Weavepoint 8 showing liftplan. There is an issue with standard weaving software as there is no distinction between the primary and secondary warps, which work independently. I am using black squares to indicate

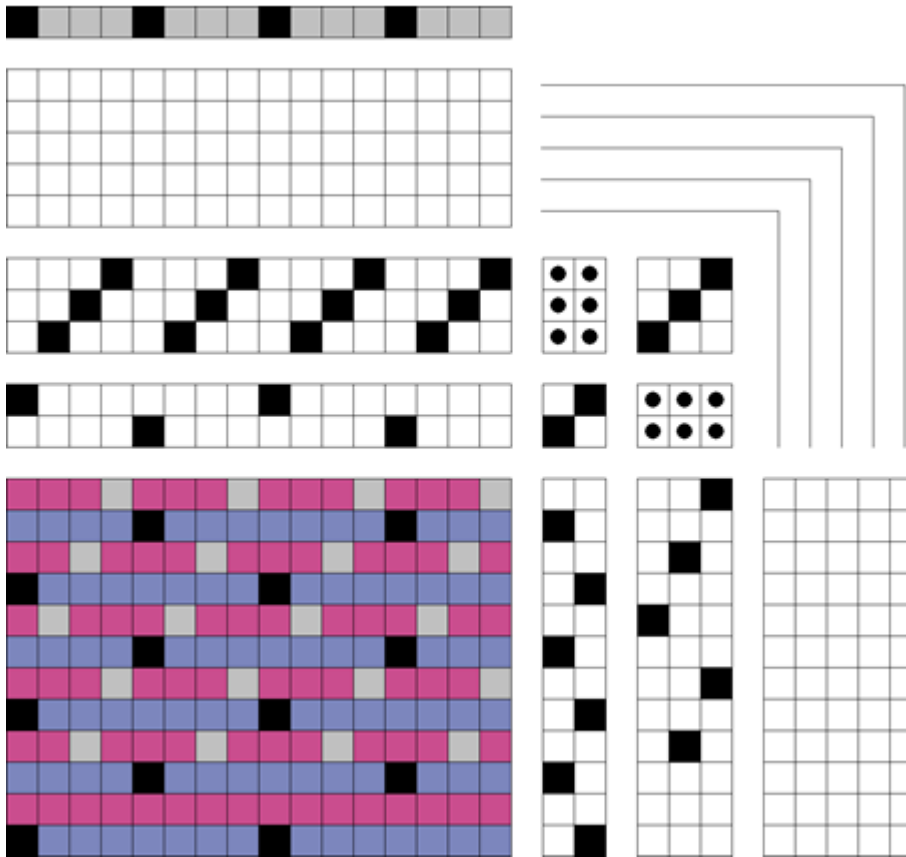
rising shafts and placing an extra symbol in the connections that are NOT tied. The support from elastics or counterweights keeps those marked connections in an unmoved or neutral position.

The first two columns (left to right) weave the secondary cloth and the three at the right weave the primary cloth. Each cloth is woven separately, and the layers are stitched where the secondary is on top and separate where primary is on top (untied), or layers are tied in both areas (tied).

Here is the same drawdown in Weavepoint Complex Drafting Module. The drawdowns here allow representation of the second pattern harness (the top grid that is currently empty) as well as the ground harness displayed exactly as the first plate. A major feature of this Complex Drafting module is that the symbol for "NO CONNECTION" can be put into any draft with an Alt-click).



This drawdown shows the basic fabric structure. If treadled as written, without pattern shafts or drawn pattern, the primary fabric will be on the underside and only the secondary cloth will display on the top layer. They will be stitched whether the fabric is being woven in the tied or untied version. This representation shows both primary (shafts 3-5) and secondary (shafts 1 and 2) warps in the same threading and treadling grid.

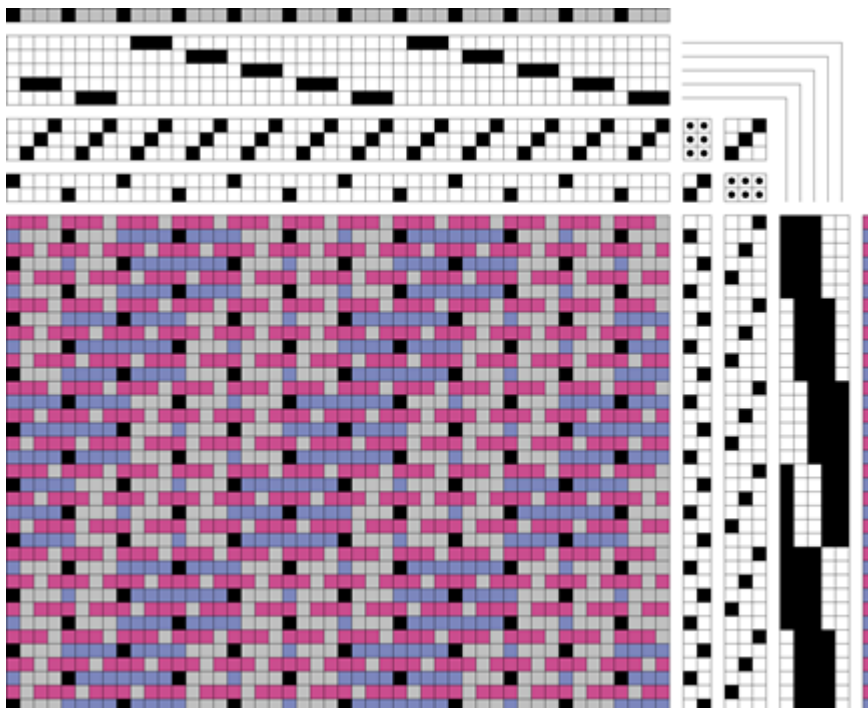


Weavepoint Complex Drafting also has another way to depict these tied weaves. The weaver can show each warp in its own grid. The result is shown in the next diagram:

Designing in this mode allows the weaver to change the structures used, the tieup for either primary or secondary warp independently. Once the basic fabric is settled, the pattern and liftplan are added.

This example uses 5 pattern shafts. Threading can be straight, pointed or an irregular sequence.

Draft with Pattern threading and liftplan.



Here is the structure represented with the full power of Weavepoint Complex Drafting Module.

Now, the pattern harness has been integrated into the drawdown showing three threads in each leash, threaded in the long eye heddles in a 3-end twill.





The secondary or tiedown warp ends do NOT pass through the leash but go directly to the two shafts with normal eye heddles to control the plain weave pattern weft.











At left is the lift plan showing which cords or handles to pull.



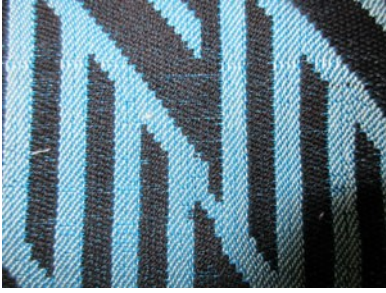


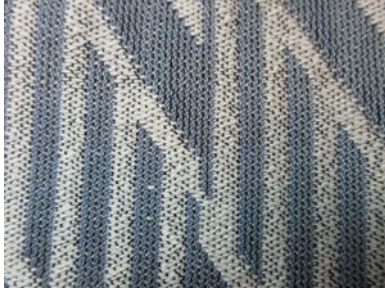
The treading alternates between the primary and secondary set.

LOOM SETUP #1 Lampas/Taquete









DETAILS OF SAMPLES MADE ON WARP #1

Warp #1		
STRUCTURE Lampas Ratio 3:1		
Primary Warp 20/2 mercerized cotton, light gray		Secondary Warp 30/2 unmercerized cotton, black
Sett – 48 epi – 12 dent reed with 3 primary and 1 secondary warp per dent		
32 pattern shafts – primary structure 3-end twill – secondary structure plain weave		
5 ground shafts – 2 for plain and 3 for twill		Each structure tied separately
Front	Back	Description
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, red</p> <p>Secondary weft 8/2 wool, red</p> <p>Pattern PRINCESS INGRID UPHOLSTERY</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, grey</p> <p>Secondary weft 20/2 wool doubled, black</p> <p>Pattern PRINCESS INGRID UPHOLSTERY</p>


Front	Back	Description
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/1 linen, hot pink</p> <p>Secondary weft 20/2 worsted wool, purple heather</p> <p>PATTERN—JAPANESE FLOWER</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, periwinkle blue</p> <p>Secondary weft 20/2 worsted wool, doubled, purple</p> <p>Pattern—JAPANESE FLOWER</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, dark blue</p> <p>Secondary weft 16/2 unmercerized cotton, doubled, dark blue</p> <p>Pattern—PAPER TABLECLOTH #1</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 30/2 silk, rust</p> <p>Secondary weft silk noil, brown</p> <p>Pattern—PAPER TABLECLOTH #1</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 30/2 silk, light turquoise</p> <p>Secondary weft coarse silk single, turquoise</p> <p>Pattern—JAPANESE FLOWER</p>

Front	Back	Description
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 silk, red</p> <p>Secondary weft silk noil, doubled, pink</p> <p>Pattern—MODERN GEOMETRY</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 10/2 mercerized cotton, turquoise</p> <p>Secondary weft 10/2 mercerized cotton, black</p> <p>PATTERN—MODERN GEOMETRY</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 8/2 unmercerrized cotton, blue</p> <p>Secondary weft 8/2 unmercerrized cotton, white</p> <p>Pattern—MODERN GEOMETRY</p>

DETAILS OF WARP #2

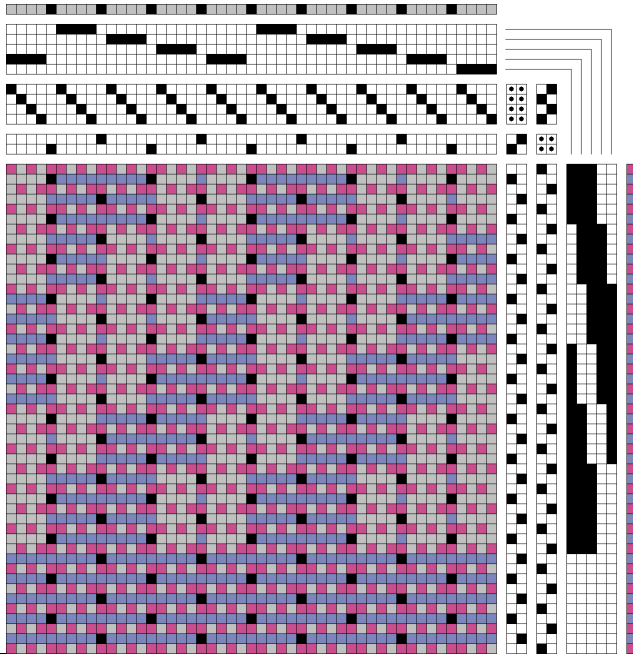
STRUCTURE: LAMPAS RATIO 3:1		PRIMARY STRUCTURE: 2/1 twill, weft faced
SECONDARY STRUCTURE: plain weave		PATTERN HARNESS: 32 SHAFTS STRAIGHT THREADING
SETT: Primary 36 epi, Secondary 12 epi for a total of 48 epi sleyed 4 per dent in 12 dent reed		
WARP:		
Primary 20/2 mercerized cotton, blue		
Secondary 30/2 unmercerized cotton, black		
Front	Back	Description
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, same blue as warp</p> <p>Secondary weft 8/2 wool heather, navy</p> <p>PATTERN KORU (Liftplan with secondary background)</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/2 mercerized cotton, same blue as warp</p> <p>Secondary weft 8/2 wool heather, navy</p> <p>PATTERN KORU (Liftplan with primary background)</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/1 linen, white</p> <p>Secondary weft 8/2 wool heather, navy</p> <p>PATTERN CIRCLES</p>
		<p>Tied Lampas</p> <p>WEFT MATERIAL: Primary weft 20/1 linen, white</p> <p>Secondary weft 8/2 wool heather, blue/grey</p> <p>PATTERN CIRCLES</p>

DETAILS OF WARP #3

Ratio 3:1		Primary Structure 2/1 twill, weft faced
Secondary Structure: plain weave		Pattern Harness: 32 shafts, straight threading
Warp:		
Primary 20/1 unmercerized cotton, white		
Secondary: 30/1 unmercerized cotton, white		
Sett: Primary 36 epi, Secondary 12 epi for a total of 48 epi sleyed.		
4 per dent in 12 dent reed		
Front	Back	Description
		<p>Untied Lampas</p> <p>WEFT MATERIAL Primary weft 20/1 linen, light grey doubled with silver Lurex</p> <p>Secondary weft Boucle rayon, cotton doubled with silver Lurex</p> <p>Pattern PAPER TABLECLOTH #2</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL Primary weft 60/2 silk, white</p> <p>Secondary weft rayon boucle 8/2</p> <p>Pattern ARROW</p>
		<p>Untied Lampas</p> <p>WEFT MATERIAL Primary weft unmercerized cotton (same as warp), white</p> <p>Secondary weft 16/2 unmercerized cotton doubled, blue</p> <p>Pattern PAPER TABLECLOTH #2</p>
		<p>Tied Lampas</p> <p>WEFT MATERIAL Primary weft 20/2 unmercerized cotton (same as warp), white</p> <p>Secondary weft 16/2 unmercerized, doubled, two close shades of yellow</p> <p>Pattern PAPERTABLECLOTH #2</p>

Front	Back	Description
		<p>Untied Lampas WEFT MATERIAL 60/2 silk, blue Secondary weft 8/2 Tencel, navy Pattern PRINCESS INGRID UPHOLSTERY</p>
		<p>Tied Lampas WEFT MATERIAL Primary weft 60/2 silk, blue Secondary weft 8/2 rayon boucle, purple Pattern PRINCESS INGRID UPHOLSTERY</p>
		<p>Untied Lampas WEFT MATERIAL Primary weft 20/2 mercerized cotton, blue Secondary weft 8/2 rayon boucle, purple Pattern PRINCESS INGRID UPHOLSTERY</p>
		<p>Taquete WEFT: Harrisville Shetland in contrasting pinks Both faces use the binding warp leaving three inner warp ends inside the fabric giving it more stability.</p>



LOOM SETUP #2 Beiderwand



This draft show how the loom was set up to do the Beiderwand samples.

Main warp is threaded on 4 shafts but treadled on only two.

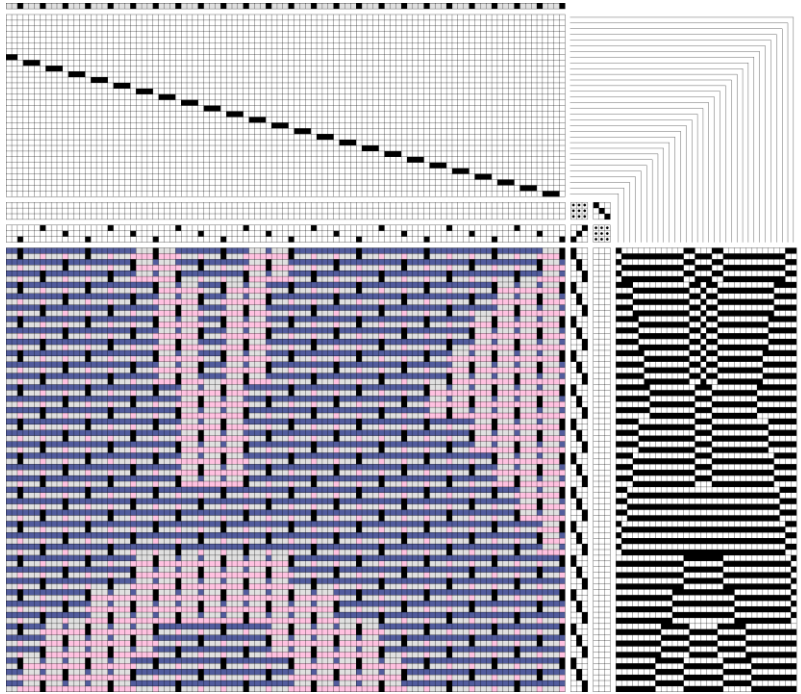
Details of Warp

Ratio: 4:1		Primary structure: Plain Weave	
Secondary structure: Plain Weave		Pattern Harness: 50 Pattern Shafts Point Threading	
Warp:			
20/2 Primary warp mercerized cotton white			
20/2 secondary warp mercerized cotton white		4 shafts primary – 2 shafts secondary	
Sett: began with 40epi for ground tabby – 4 primary + 1 tiedown per dent, 10 dent reed (black weft) Changed to 9 dent reed with 4 primary + 1 tiedown for better aspect ratio			
Allows for Beiderwand as well as other variations on structures up to 4 shafts)			
Front		Back	
			










House on left with 9 dent reed, house on right with 10 dent reed. 9 dent reed gave design more squared appearance.

Loom Setup #3 Samitum



Taquete and Samite Samples

Samite		
Ratio 2:1		Primary Structure 2/1 twill
Secondary structure none		
Warp		
White tram silk, doubled		Weft color tram silk from Lunatic
Sett 20 warp units/inch (Warp unit consists of two pattern warps and one ground warp)		
Front	Back	Description
		2 Color throughout.

		<p>3 Color throughout.</p>
		<p>4 Color (3 colors worked throughout, 4th color only entered where needed.</p>
		<p>Taquete – Details, Lampas Warp #3. WEFT: Harrisville Shetland in contrasting pinks Both faces use the binding warp leaving three inner warp ends inside the fabric giving it more stability.</p>

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Weavepoint Complex Drafting 7.0

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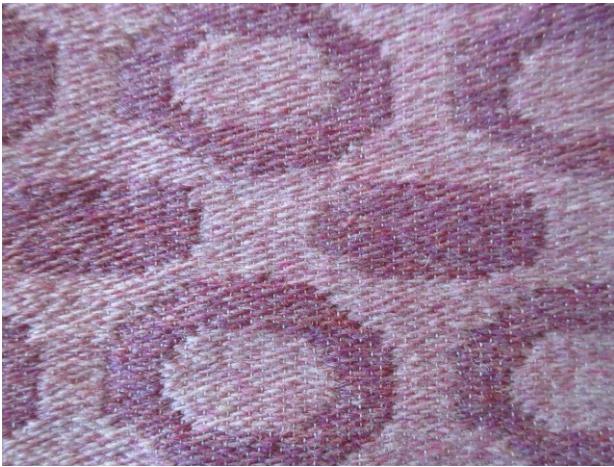
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TAQUETE – 2-COLOR



SAMITUM – 4-COLOR



LAMPAS – 2-COLOR



BEIDERWAND – 2-COLOR



This publication addresses how to produce complex fabrics from the past on a drawloom, extending the capabilities of the loom past damask, op-phamta and simple tied weaves such as summer and winter. The classic traditional tied weaves—taquete, samitum, lampas and the lampas subset called Beiderwand are discussed in detail.

Loom modifications as well as design considerations are presented.

Extensive samples as well as reference material are included.

This material presupposes a working knowledge of double harness (drawloom) weaving as presented in Sara's first book "When a Single Harness Simply Isn't Enough".

Sara von Tresckow has been weaving since the late 1970's, first in Germany, and since 1990 in Wisconsin. Her venture into drawloom weaving began in 2003. She and her husband Hans are owners of The Woolgatherers, Fond du Lac, Wisconsin - a complete fiber shop for spinners, weavers and fiber artists. Sara teaches and weaves using the shop as a studio. Hans builds small looms, repairs spinning wheels and creates spinning stools well known for their comfortable nature.

