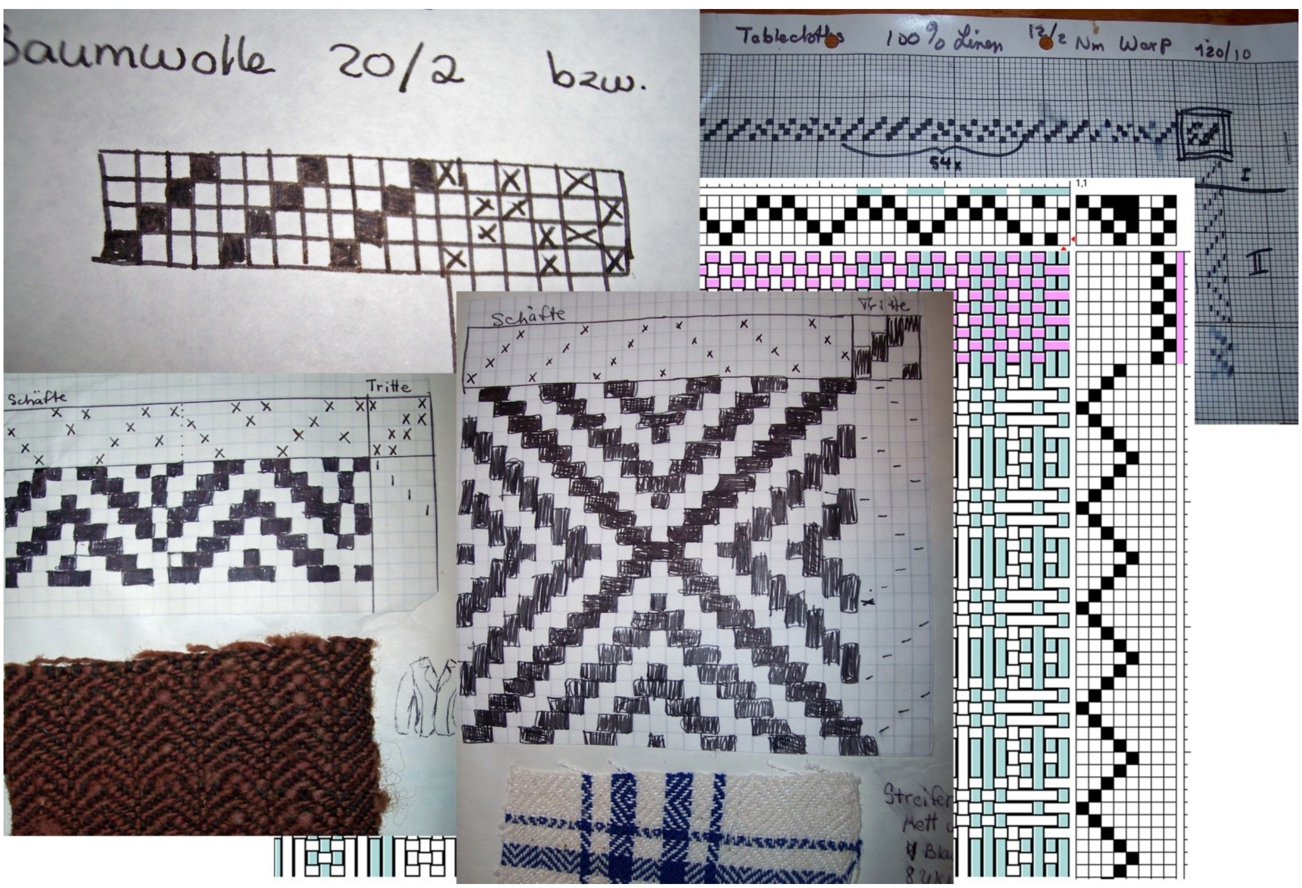
BASIC DRAFTING FOR HANDWEAVERS

AN INTRODUCTION TO DESIGNING FABRICS

SYMBOLS
TERMINOLOGY
METHODOLOGY
PRACTICAL APPLICATIONS

PRESENTED
BY

Sara von Tresckow
The Woolgatherers Ltd., LLC
35 N. Main St.
Fond du Lac, WI 5935
www.woolgatherers.com



When we wish to weave a length of fabric, we need a plan. That plan is called a **"draft".** This draft uses symbols on a gridded background to represent how the threads will be place and manipulated on a loom to create the desired cloth. This "draft" is constructed in much the same way as a road map – with clear symbols showing how the fabric will be constructed.
Page 2 shows some of the symbols used to create weaving drafts. Since these are conventions and not absolutes, one should use caution and study the introduction of each new book or source of weaving patterns to verify that the conventions used are those normally used.
It is important to identify the starting corner for drafting and weaving. European drafts often begin at the lower right corner while North American drafts begin at the upper right. If the execution is somehow reversed, the cloth will be fine, but the conceptual understanding becomes more difficult.

Conventions for Basic Drafting Workshop

1. Threading and treadling begin in upper right hand corner.
2. Shaft 1 is the shaft closest to the castle
3. Treadle 1 is designated by the leftmost column on the draft
4. Black square on the draft means lifted warp thread
5. Black square on the tieup means lifted shaft

Every draft has three basic components:
1. Threading
2. Tieup
3. Treadling

On the 2 following pages, clear illustrations from Doris Goerner's "Woven Structure and Design, Part 1" are reproduced to illustrate the notation used in weave drafting. Just as music is written on a special grid and maps are printed with a "legend" explaining the symbols used – for State Parks or County Parks - weave drafts are schematic representations of fabric. The notation shows how to "play" the cloth, or how to follow the symbols to completion.

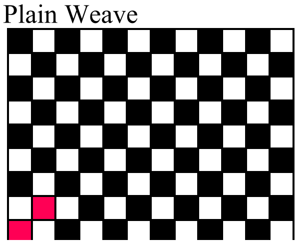
Most woven fabric fits one of three categories:
1. Plain Weave
2. Twill Weave
3. Satin Weave

There are many "derivatives" to the above.

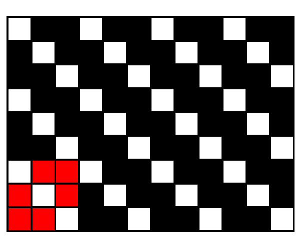
. The Three ground binding systems from which all weaves are derived.
1. Plain weave - Weaving consists of interlacements of two thread systems – warp and weft. Plain weave in its simplest form is raising all even numbered warp ends followed by raising all odd numbered threads. A method for making two sheds is necessary – we'll use 2 shafts on a horizontal loom here.
2. Twill weave- in twill weaves, the intersections are set over one thread and proceed in a diagonal fashion, min. 3 ends/3 picks
3. Satin weave – in satin weaves the intersections are not contiguous min. 5 ends/5 picks
The most prominent exceptions to ground bindings are barleycorn (lace spot weave) and rosepath (similar to twill but bends the rules). Curiously, exceptions seem to fall into the favorite weave structures of 4-shaft handloom weavers.

When planning a weaving project, it is a good idea to simplify the draft as much as possible. If there is a complicated threading, try to make the tieup and treadling as straightforward as possible. If there is a choice between a complex threading or a complex treadling, keeping the threading simple allows more variations on the loom as several complex treadlings can be developed. If your loom is difficult to tie up, it is quite possible to alter a draft to fit your existing tieup so that you do not need to change it for every project.

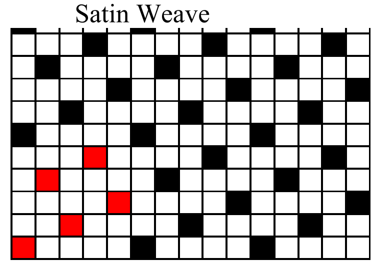
Plain Weave

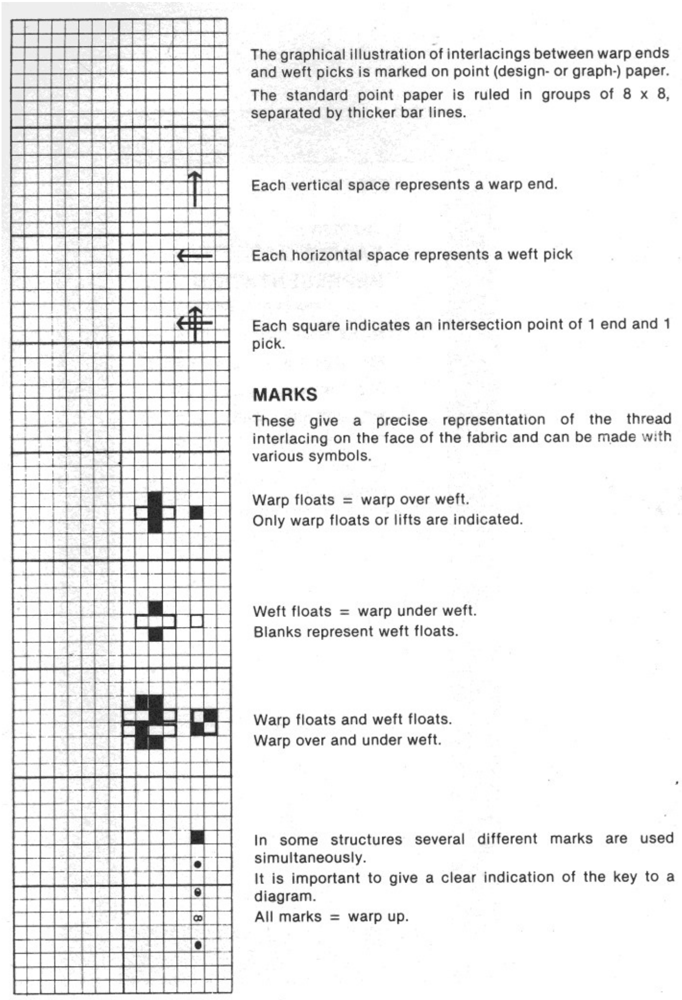


Twill Weave



Satin Weave





The graphical illustration of interlacings between warp ends and weft picks is marked on point (design- or graph-) paper.

The standard point paper is ruled in groups of 8 x 8, separated by thicker bar lines.

Each vertical space represents a warp end.

Each horizontal space represents a weft pick

Each square indicates an intersection point of 1 end and 1 pick.

MARKS

These give a precise representation of the thread interlacing on the face of the fabric and can be made with various symbols.

Warp floats = warp over weft.
Only warp floats or lifts are indicated.

Weft floats = warp under weft.
Blanks represent weft floats.

Warp floats and weft floats.
Warp over and under weft.

In some structures several different marks are used simultaneously.
It is important to give a clear indication of the key to a diagram.
All marks = warp up.

Diagram of how a warp thread proceeds from the warp beam to the cloth beam, showing how that is represented in conventional drafting notation.

The top picture shows the threads on a loom proceeding from the warp beam, pictured at the top to the cloth beam – pictured at the bottom with plain weave fabric winding on.

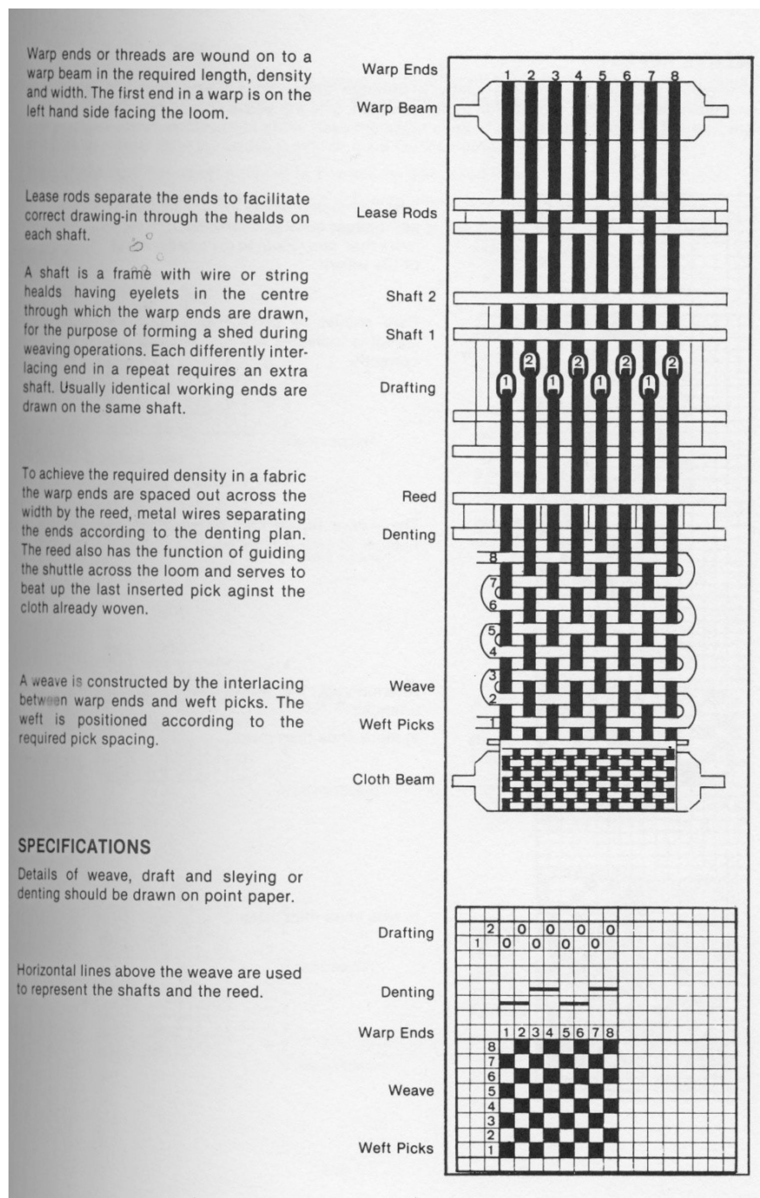
The lower diagram shows the weave draft that corresponds to this diagram of cloth on the loom.

Diagrams on p. 2 and 3 reproduced with permission of WIRA Technology Group, Leeds, England

Basic explanation of drafting marks.

Before learning to draft weaving projects, the weaver needs to settle on a basic set of markings that remain constant with each new draft.

In the event that a magazine or book with a different system of notation is being used as a reference, these other markings should be "translated" so that the finished draft is consistent with the others in the weavers' notebook.



Warp ends or threads are wound on to a warp beam in the required length, density and width. The first end in a warp is on the left hand side facing the loom.

Lease rods separate the ends to facilitate correct drawing-in through the healds on each shaft.

A shaft is a frame with wire or string healds having eyelets in the centre through which the warp ends are drawn, for the purpose of forming a shed during weaving operations. Each differently interlacing end in a repeat requires an extra shaft. Usually identical working ends are drawn on the same shaft.

To achieve the required density in a fabric the warp ends are spaced out across the width by the reed, metal wires separating the ends according to the denting plan. The reed also has the function of guiding the shuttle across the loom and serves to beat up the last inserted pick aginst the cloth already woven.

A weave is constructed by the interlacing between warp ends and weft picks. The weft is positioned according to the required pick spacing.

SPECIFICATIONS

Details of weave, draft and sleying or denting should be drawn on point paper.

Horizontal lines above the weave are used to represent the shafts and the reed.

Plain Weave – or Tabby can be woven on just 2 shafts as Fig. 1

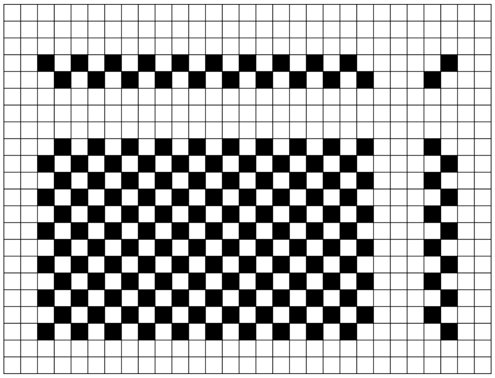


Figure 1

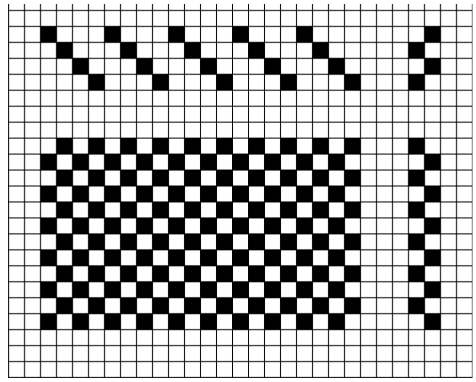


Figure 2

If the loom is threaded on more than 2 shafts, the treadles can be tied up to produce a tabby by lifting every other thread on each pick – alternating between shed A and shed B – as in Figure 2.

Many pattern threadings allow a combination of treadles that produce tabby. However, some structures like M's and O's have some skips that are unavoidable, producing a look alike "false" tabby.

Basic Twill Weaves – 2/2 Twill

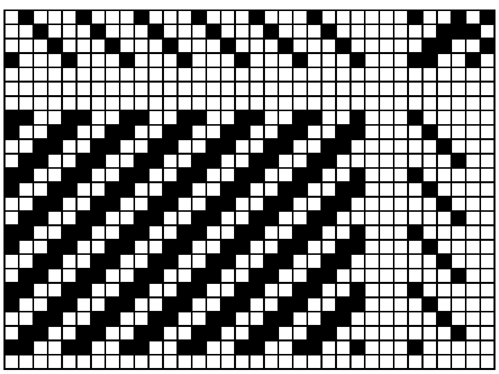


Figure 3

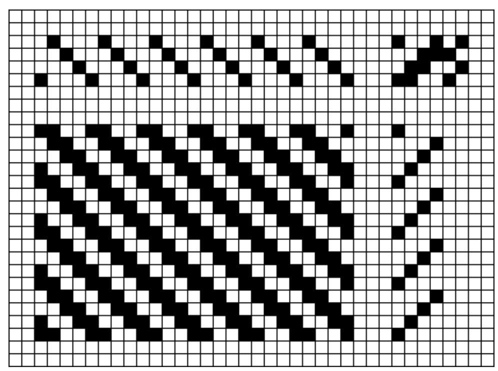


Figure 4

Basic straight twill weave, shown here on 4 shafts and 4 treadles in the left and right slanting versions. This type of threading is known as straight draw – the warp threads pass through the heddles in a straight sequence from the last shaft to the first, or first to last. First, the treadling changes direction. (Fig. 4).
In Fig. 5, the tieup is reversed and in Fig. 6, the threading changes direction. All 3 produce the same fabric.

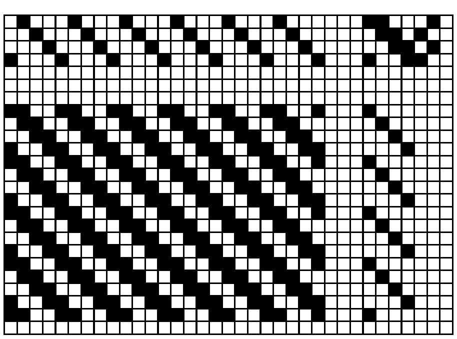


Figure 5

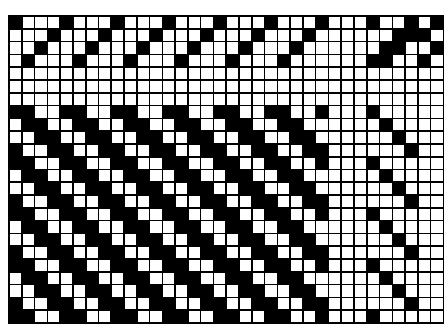
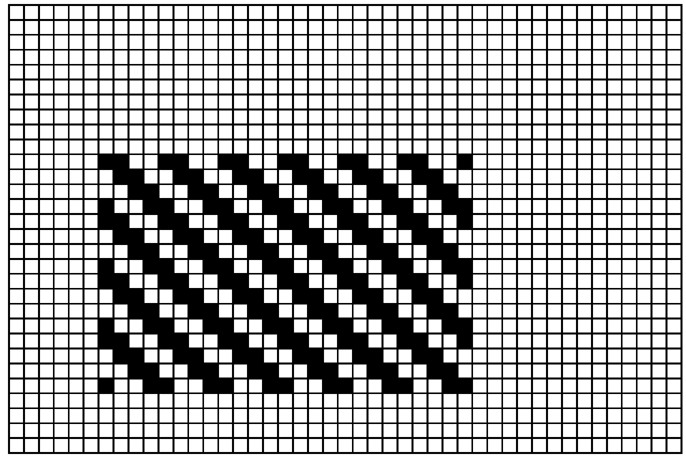


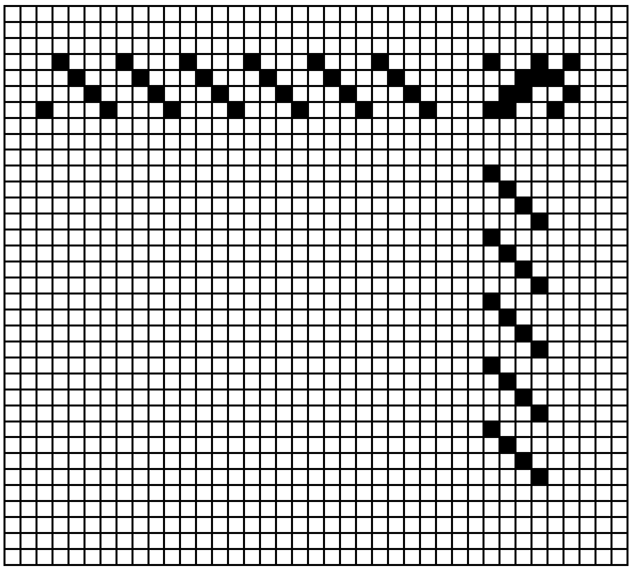
Figure 6

This is a picture of 2/2 twill fabric.
Please enter

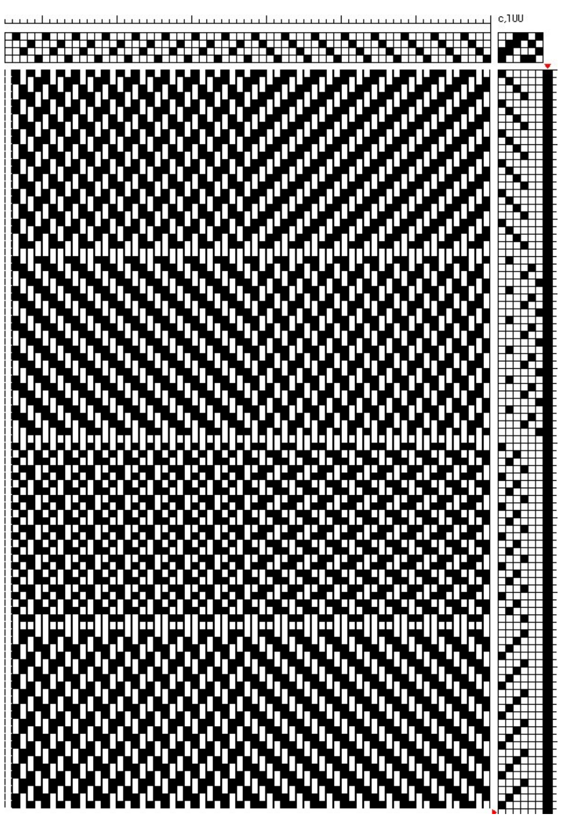
A. Threading
B. Tieup
C. Treadling

You may use an example from above or develop your own drawdown.
There is more than one way to present this cloth.





This is a drawdown for twill fabric.
Using what you know about how to identify a raised warp thread, fill in the fabric diagram.



A B

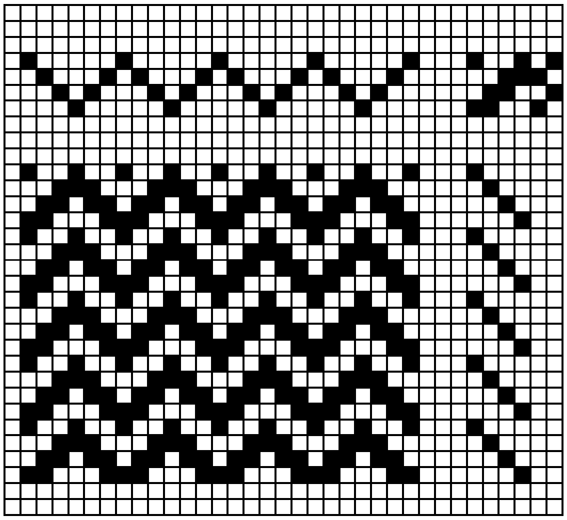
1 A twill sampler. Threading on left side is “broken” and right side is “straight.
With the same tieup, 4 different treadling sequences are used.

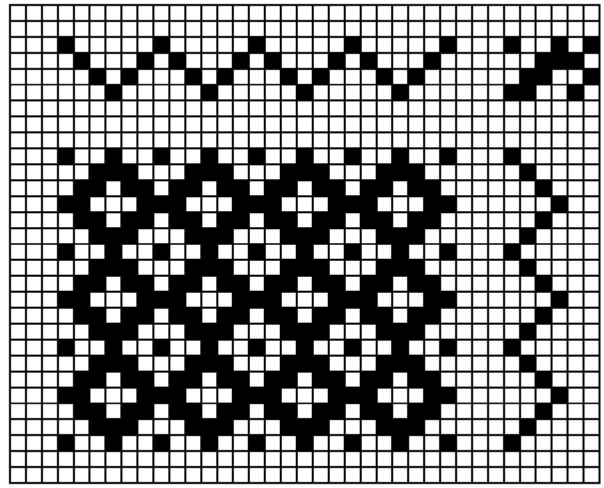
2

3

4 Note:
Weaves 2A and 4B are identical, produced by different combinations.
Weaves 1A, 2B, and 4A are also the same broken twill, though 2B has a slight variation in direction

Point Twill and Variations – Here the threading, treadling, or BOTH zigs and zags.

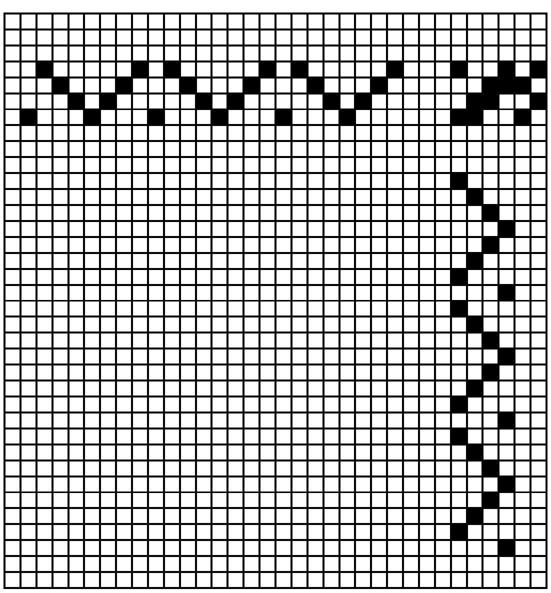


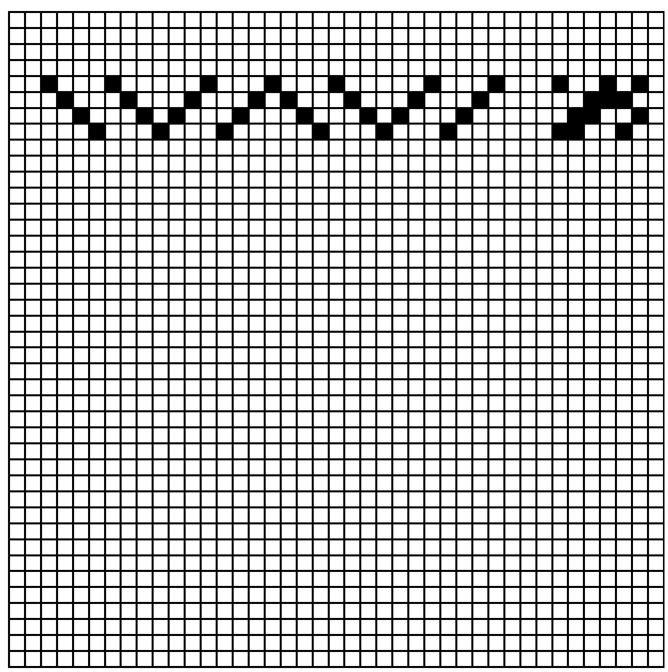


Left, point twill in threading, straight twill treadling – horizontal striped pointed twill.
Right, point twill in threading AND treadling – diamonds.

Exercises:

1. Fill in the weave structure for the Diagram shown at LEFT below.
   This zigzag threading is known as ROSEPATH – when the V has
   Been made, a heddle is threaded On shaft one, and the V sequence
   Begins again from shaft 4.

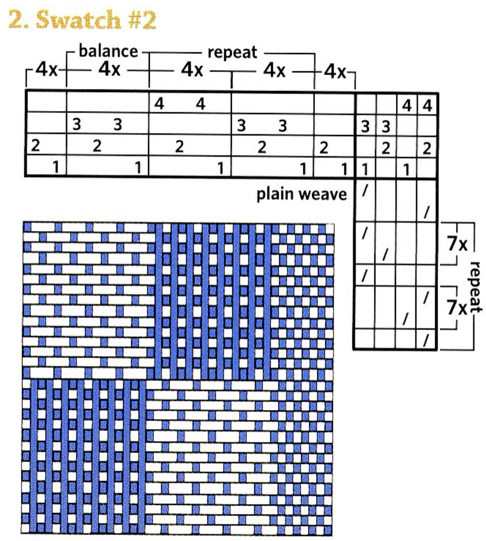




2. Develop a weave structure for the diagram at RIGHT above. You may choose “tromp as writ” or develop your own treadling sequence

There are many types of weaving notation. A few of the most common are shown below.

Draft from “Handwoven” magazine. This drafting style uses numbers and slashes to show the components

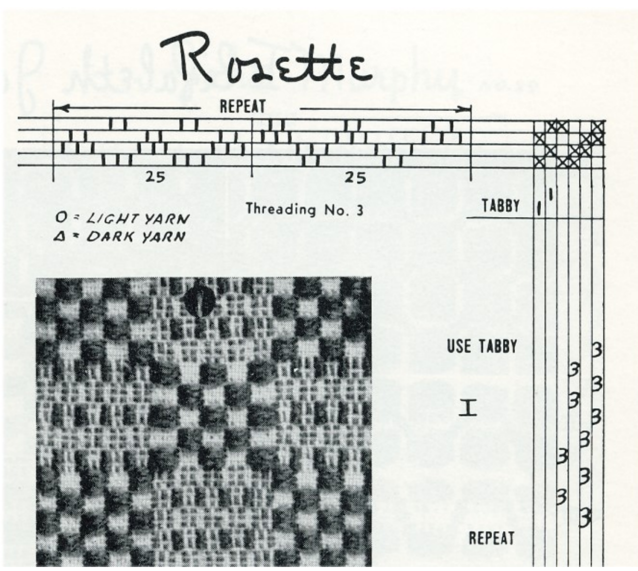


Repeats are marked in sections labeled “4x” = 4 times, or 7x = 7 times.

This draft saves paper, but for setting up a project with centered pattern it can be put on graph paper in the style that we have been working with today.

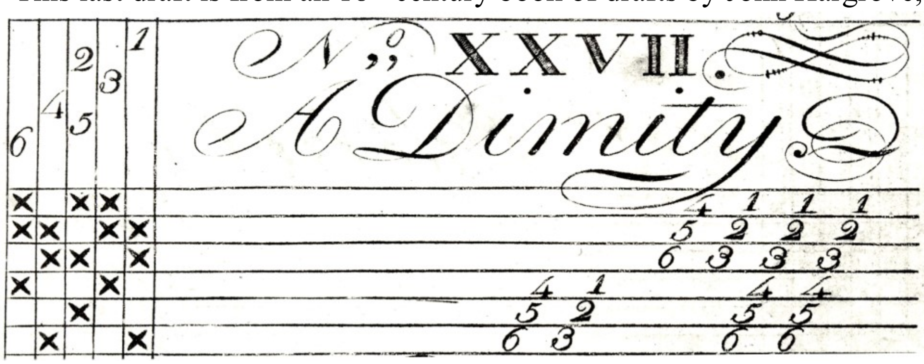
If using a weaving software program, it is not difficult to type the information into a new draft and be able to see the whole cloth on the screen, which is very useful setting up the loom.

Draft: “Handwoven”, May/June 2009, p. 42.



The draft pictured here is from Marguerite Porter Davison’s “Handweavers Pattern Book”, p. 119. This draft shows a small overshot pattern with a notation about “using tabby”. To avoid a very fussy looking treadling scheme, this draft shows the number of times that a pattern block should be treadled – in the case of block 4 – the weaver would treadle 6, 1, 6, 2 – 3 times, and then move to block 2 – 3, 1, 3, 2 – 3 times. Again, a paper saving way to draft a weave with a long treadling sequence. Surprisingly, after a few repeats, this sequence becomes quite e
asy to remember.

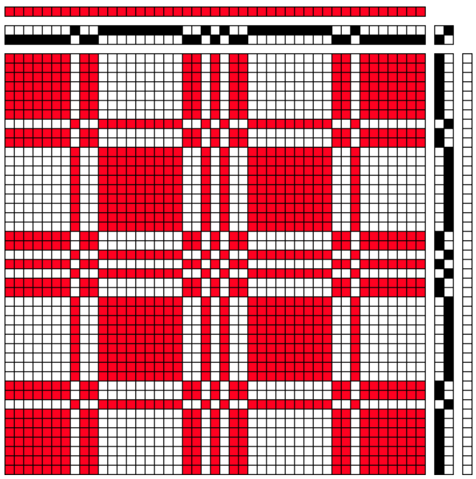
This last draft is from an 18th century book of drafts by John Hargrove, an American weaver. His



notation is followed in numerical order for both threading and treadling. This draft can be typed into a weaving program and yield excellent results in the form of a weaving draft that is easily implemented.
The threading, for instance, is thafts 1 through 6 twice, followed by 1 through 3 twice and lastly by 4 through 6 twice. Treadling would be 1, 3, 2, 4, 3, 5.

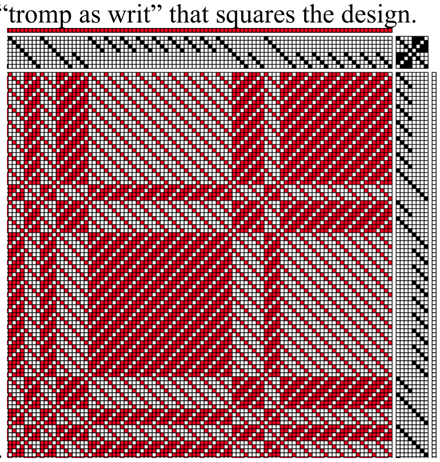
PROFILE DRAFTING

Profile Drafting is a way of designing a geometric pattern that at first does not have a particular weave structure, using blocked squares. The smallest profile contains 2 blocks.

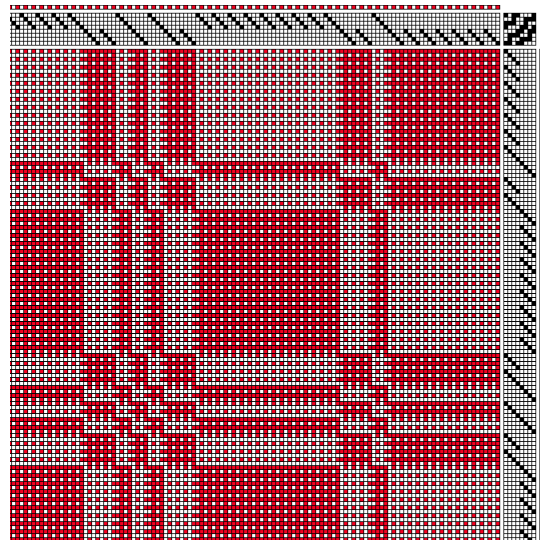


This nice checked patterning is not ready to be interpreted in a weave structure. Which weave structure is not specified. It is up to the weaver to determine which fabric structure will best make the desired fabric.

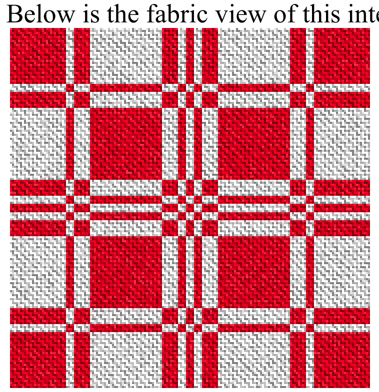
One very common “translation” of this pattern is into turned twill. Turned twill is using both sides of an uneven twill structure – 3/1 and 1/3The block on shaft 1/treadle 1 is A. The block on shaft 2 and treadle 2 is B. Since this is a 4-shart twill structuret the threading for the loom will need 4 shafts for each block, or a minimum of 8 shafts. If we thread block A on shafts 1 thru 4, we will thread block B on shafts 5-8. The tieup shows the assignment of the profile square for Block A in the lower left quadrant of the tieup square. The assignment for Block B is in the upper right quadrant. In this case, treadling is “tromp as writ” that squares the design.



It is also possible to use this profile to make a doubleweave. We now have two faces for the fabric. Plain weave needs 2 shafts. Plain doubleweave needs 4 shafts. Plain doubleweave with 2 blocks needs twice that number – 8 shafts. Block A is threaded on shafts 1-4 and Block B threaded on shafts 5-8 Where the turned twill was woven with a solid color warp and single weft color, the doubleweave version now needs color alternation in both warp and weft to make the pattern display correctly.



Below is the fabric view of this interpretation of our profile.



There are translation functions in most weaving software programs. They will show quickly if the profile lends itself to a particular structure. If we try this profile as a spot Bronson design, problems ensue. One of the rules for spot Bronson is that the blocks move from shaft to shaft – 1 step at a time and there can be no string of blocks on the same shaft without ugly floats. Float length is also a consideration if Monk’s Belt is considered for this pattern. The large squares would have 18 end floats. At 30 epi, this wouldn’t be a fatal flaw, but at 12 epi, the design would need to be altered to have smaller floats..

Naturally, when more than two blocks are used, the number of shafts needed on the loom to execute these drafts also increases. To determine how many shafts are needed, calculate how many shafts are needed for one block (4-end twill or doubleweave need 4) and multiply by the number of blocks. Three blocks would need 12 shafts for either a turned twill or a doubleweave. For four or five blocks, this requires many shafts. There are also “economical” structures like summer and winter that require only one shaft for a pattern producing block plus 2 shafts for tabby, so a 5 block summer and winter textile needs only 7 shafts – but many treadles.

Experimentation with profile drafts greatly expands a weaver’s design possibilities. As with any new technique, it is best to begin with just 2 blocks until the concept of translating this profile into a “real” weave becomes second nature.

Exercise:

Using the graph paper provided, make up a small profile draft with 2 or 3 blocks.
Translate this design into a turned twill with 4 ends (1/3 and 3/1).
Points to consider:
1. Direction of Twill
2. Straight or Broken? Or one block straight and one block broken?
3. What other structure would you like to try with this profile?

Resources

Books on Weave Drafting:

Lundell, Laila	"Big Book of Weaving"	Trafalgar Sq. Press, 2008
Getzman, Ulla	"Weave Structures the Swedish Way"	Vav Stuga Press, 2006
Goerner, Doris	"Woven Structure and Design" Volumes 1 and 2	WIRA Technologies, 1989
Eriksson, Mariana	"Warp and Weft"	Vav Stuga Press
Parson, Asa & Sundstrom, Amica	"The Weaving Handbook"	Trafalgar Sq. Press, 2021

Software for Weavers

PCW Fiberworks
Pixeloom
Weavepoint
WeaveIt
Pro Weave
Weavemaker

Internet resources:

www.handweaving.net

Attached are blank sheets of graph paper with strong divisions after 4 or 8 squares to be copied and used for practicing.

Project Title:

Project Title:

Project Title:

Project Title:

8-shaft Weavers Pattern (Patron) Paper