

# WeaveMaker Mi

*for Macintosh and Windows*

**User's Guide and Reference Manual**

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## **If You Hate Reading Manuals...**

WeaveMaker Mi is easy to use, forgives mistakes, and makes sense to weavers. If you understand how looms work and how to do drafts by hand, and you know your way around the computer, you can jump right into creating your own designs, treating this manual as a reference for additional information.

Be sure you note these features of WeaveMaker:

**Undo** Don't worry too much about making a mistake. You can "undo" the last five things you did (and Redo them).









**Cornucopia** WeaveMaker Mi creates designs on its own. Using this feature will save you countless hours of labor, and will show you new, fresh weave structures and color arrangements.


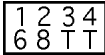
**Color** Color control is exacting and thorough in WeaveMaker. A reading of the sections of the manual on color will greatly help you work with color.

So please explore.



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**The  
WeaveMaker Mi  
Audience**

## **You, the Designer**

WeaveMaker is the perfect software tool for you, the intermediate to advanced designer of woven fabrics, working for a mill or as a free-lancer, designing by hand or with CAD software, and wanting to

- increase your personal productivity
- spend more time on design and less on tedious thread-by-thread editing
- create fresh, new looks
- use longer repeats
- use color more effectively
- tackle complex weave structures and color arrangements
- generate full-featured mill tickets

WeaveMaker is highly automated. Much of the work you now do by hand, it does automatically. And communicating your ideas to the mill is a snap.

WeaveMaker puts enormous emphasis on color accuracy. Used carefully, WeaveMaker helps ensure that the color you see on the screen, and the color you see on paper, match the color of your yarn samples.

## **Prerequisites**

You do not have to be a **weaver** to be a **designer**. But to do woven design, you have to understand the essentials of what the weaver and the loom do.

Thus, to make effective use of WeaveMaker, you need some basic weaving design knowledge. WeaveMaker is a rather technical design program, emphasizing weave structures and color arrangements. If your only interest is recoloring designs done by other people, or doing color arrangements that consist of broad, simple stripes on a plain weave, you will find WeaveMaker helpful, but there will be parts of it which you will never touch.

But by learning a bit more about weaving, you **can** get into those more advanced parts of WeaveMaker, and this will help your designs, your profits, and your value as a designer.

And because WeaveMaker generates detailed mill tickets which help ensure that your designs are effectively communicated to the mill, you do not have to waste time writing out lengthy descriptions of your design.



### **The Advanced Designer**

For the advanced designer, WeaveMaker is heavenly. Never before have you been able to generate dozens of designs *per minute* (rather than per day). You can navigate instantly between just structure, just color, and full color-and-weave views of your design.

You can do things in whatever order appeals to you. Want to start with a color arrangement and add a weave later? No problem. Or do the structure first, and then drop in color. Or go back and forth: design a structure, add color, then adjust the structure (temporarily taking color away if you wish), then do more color. No problem.

And powerful whole-fabric float analysis lets you quickly sort out impractical designs. Or, since the whole-fabric float display instantly reacts to your changes, you can take a float-ridden design and edit it manually, getting immediate feedback on the effect your changes make in the floats, so in the space of a minute or two you can salvage a design which before you would have abandoned.

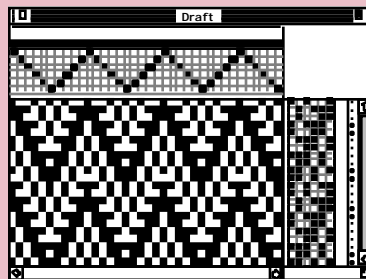
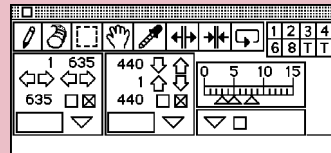
### **Surface Patterns**

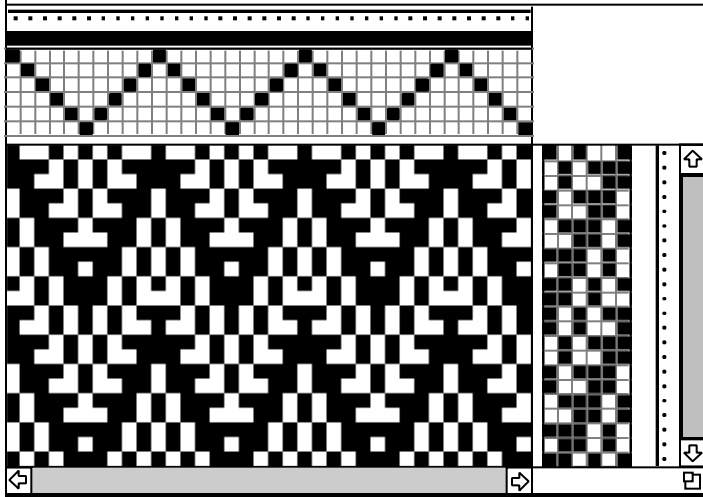
If you are interested in surface patterns, but not weaving per se, you will find WeaveMaker useful in its “automatic” mode. Without learning a thing about threadings, tie-ups, draw-downs, ends, or picks, you can still generate lovely designs in WeaveMaker. And when you see an on-screen design you like, you can immediately turn it into a full-color TIFF or PICT file, and transfer it into your favorite Macintosh surface pattern design program (such as *Surface Magic*<sup>™</sup> from Designer Software).



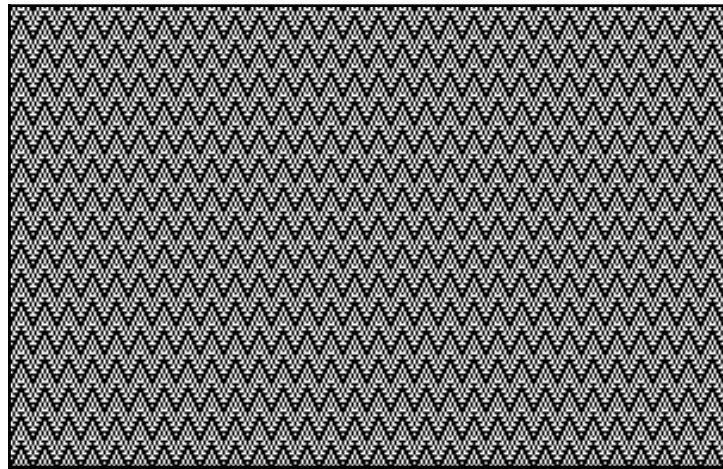
# Getting Started

An introduction to the tools you will use to create your new designs.





*Sample Design window (above) and Fabric swatch window (right).*



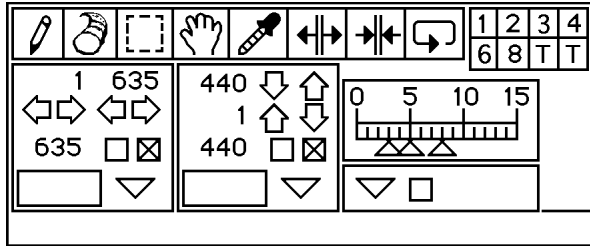
**Colorway Window**

Warp Colors			Weft Colors		
Major	Minor	Accent	Major	Minor	Accent
A			A		
300			300		
1					

New    ⏪    ⏩   

**Schemes Window**

- ▶ Threading
- ▶ Tie-up
- ▶ Treading
- ▶ Peg Plan
- ▶ Warp Colors
- ▶ Weft Colors
- ▶ Automatic



*Tools Window*

When you launch WeaveMaker, you see five windows and a set of menus. The windows are described below (and see illustrations on these two pages).

**Tools** Tools for drawing, coloring, and repeating.

**Design** Similar to a hand-drawn design, with grids for indicating threading, tie-up, and treadling (or peg plan).

**Fabric** A swatch of fabric at 72 ends per inch.

**Colorway** Color chips for colors which will appear in the fabric.

**Schemes** Controls for the design cornucopia.

In designing weaves, you will spend most of your time working in the Design window, with trips to the Tools windows to control color, repeats, and copy & paste editing.

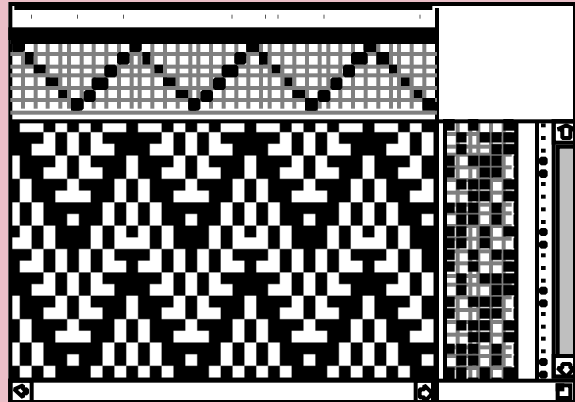
When you want WeaveMaker to create patterns on its own, you will turn to the cornucopia tool (second from the top left in the Tools window) and the Schemes window. Having WeaveMaker create spontaneous patterns is very easy (please see “Cornucopia” in the Index for places to find more about this topic).

To create your own fabric designs, or modify ones which WeaveMaker creates, you should read the next two sections (“Design Window” and “Tools Window”).

WeaveMaker gives you powerful tools for incorporating colors into your designs. Colors are created within palettes. Think of a palette as a color database which stores colors until you need them. Colors are (literally) dragged from a palette into a colorway for use in a fabric. Creating multiple colorways is quick and convenient. Please see “Color” and “Colorways” in the Index for places to find more about this topic.



# Design Window



## Design Window

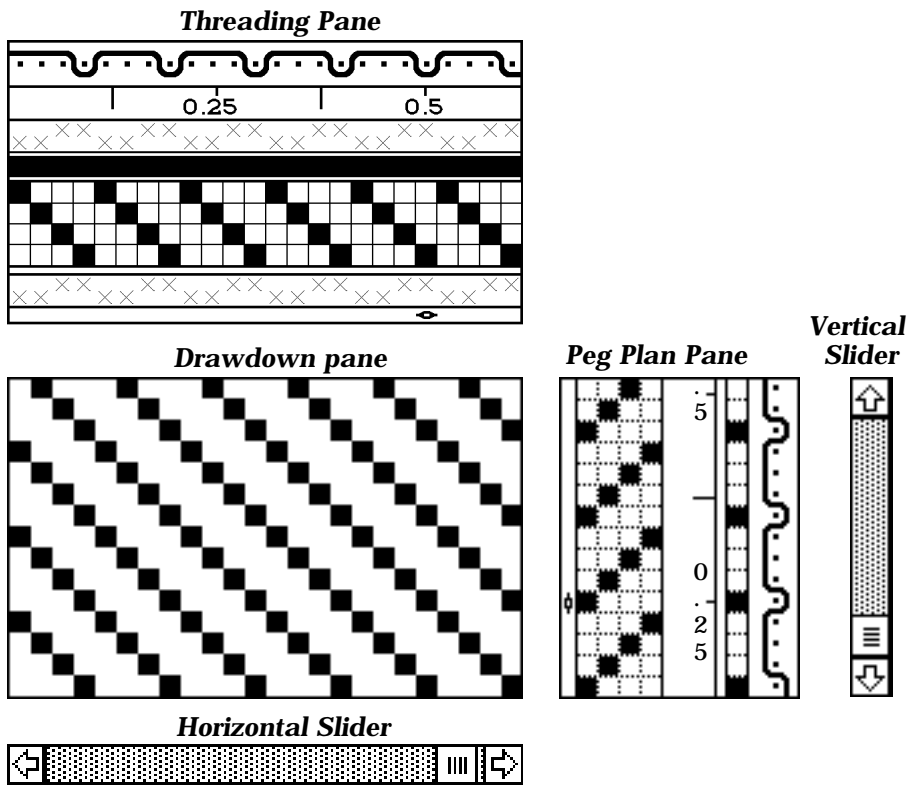
The Design window mimics a traditional fabric design as you would draw it on graph paper. The window is made up of several parts which you can explore separately in this section. Start with the “exploded” view of the Design Window below.

## Threading Pane

The threading pane (bottom illustration on facing page) controls the threading. You specify how the warp passes through the heddles, the color of each warp thread, and indicate denting.

In the threading pane, each horizontal row corresponds to one harness (or shaft). Each column represents one thread in the warp. A black square means

## Design Window—Exploded





the warp thread represented by that column is controlled by the harness represented by that row.

Since the threading pane has a variety of levels of magnification (“zoom” levels), the ruler is useful in helping you judge the real-world appearance of the fabric.

### Denting

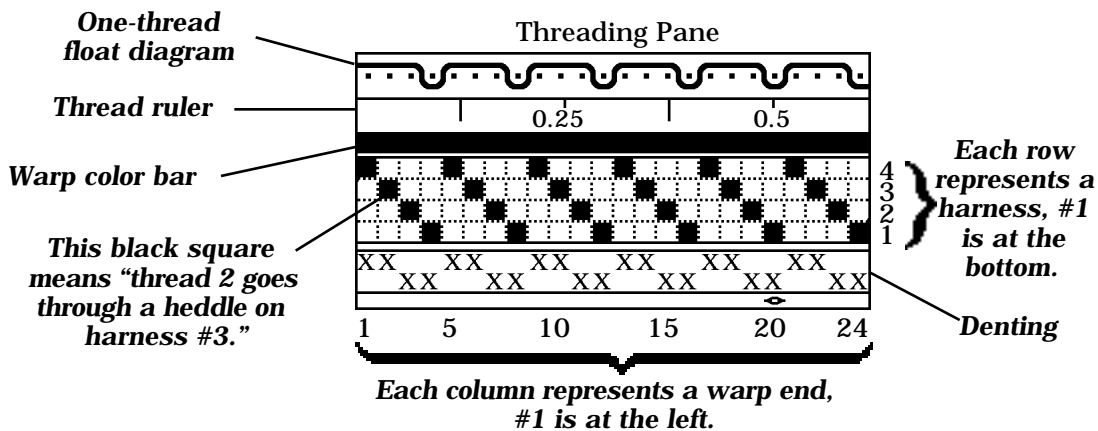
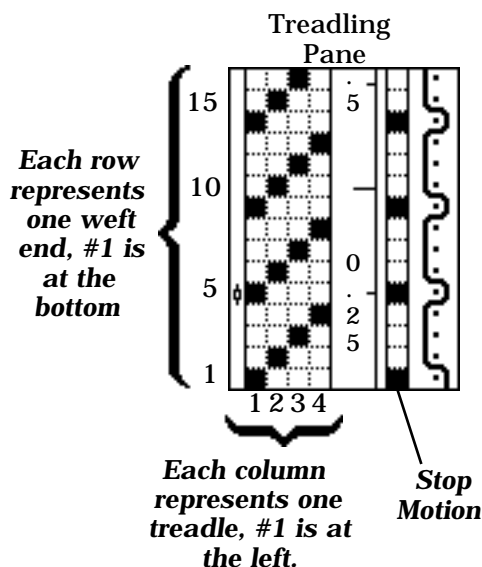
The denting grid lets you mark denting groups in the threading. Please see “Denting” in the Index for places to find more about this topic.

### Stop Motion

The stop-motion grid lets you specify how closely the weft is beaten. Please see “Stop Motion” in the Index for places to find more about this topic.

### Treadling or Peg Plan Pane

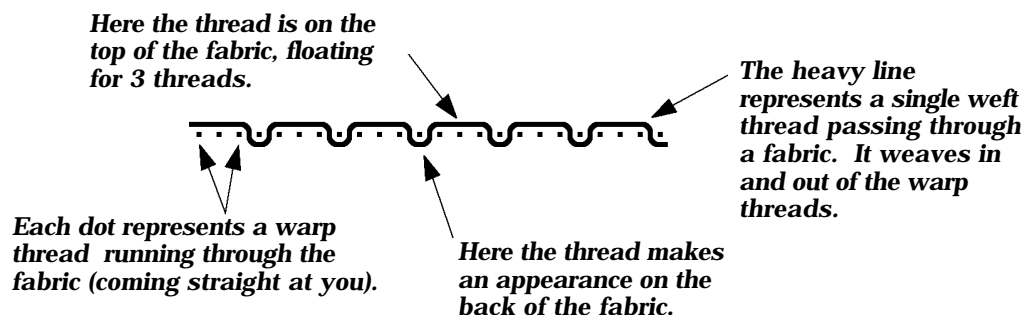
The treadling pane (see illustration below) is similar to the threading pane, except that here rows represent weft threads and columns indicate treadles.





## Float Diagram

The single-thread float diagram (illustration below) shows how a single thread passes through the fabric (for other ways of viewing floats, please see “Floats” in the Index). The example given here is of a diagram of a weft thread passing over and under 24 warp threads. Notice that the float is at most 3, and this thread is mostly on the front of the fabric (the front is at the top). This tells you something about the structure of the fabric at this thread. It also suggests that the color of this thread will mostly affect the front of the fabric, because this thread spends most of its time there.

*(Note: the float diagrams are only displayed at magnification “8.” If you change to another display scale the float diagrams disappear. They reappear when you return to magnification 8. See “Change Scale” in the Index for information on changing scales).*

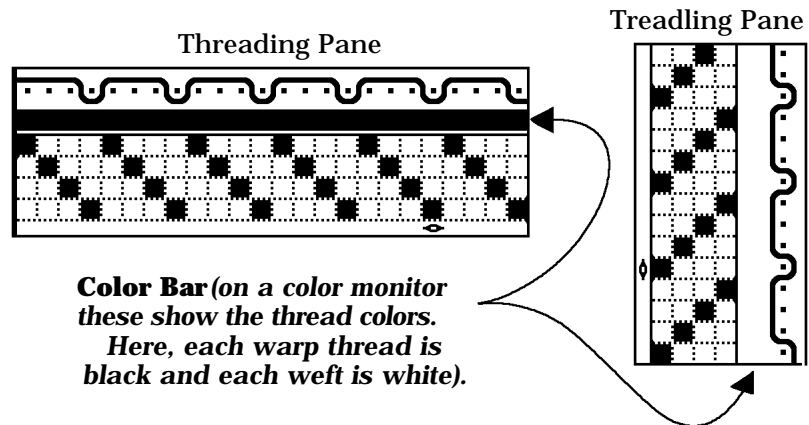
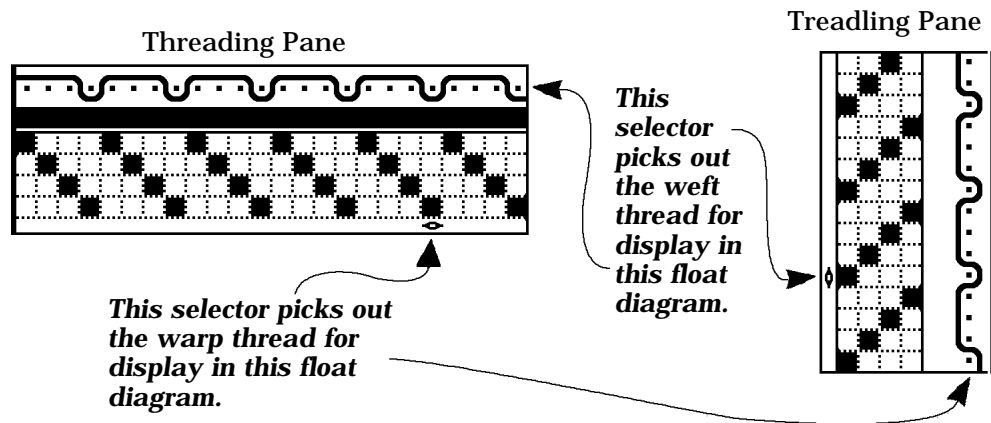


You select which thread to display by moving the thread selector. There are two selectors, one for warp threads and one for weft. They are the marks shaped like  and  which appear along the inner edges of the threading and treadling grids (see illustration on facing page). The thread next to the thread selector is the one which appears in the float diagram. Move the thread selectors by clicking and dragging them with the mouse.

## Color Bars

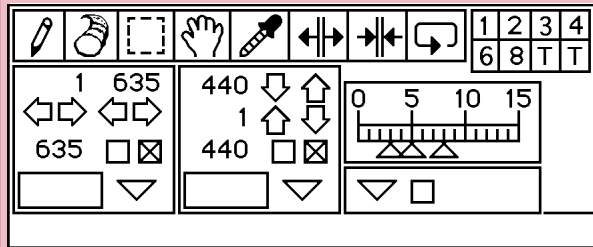
The color of each thread is shown as a box within the color bar (lower illustration on facing page).

## Float Diagram Thread Selectors





# Tools Window



Pencil



Cornucopia



Marquee



Eyedropper



Hand (Resize a Marquee)



Hand (Harness Shuffle)



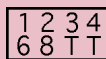
Insert Threads



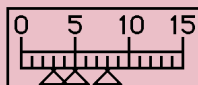
Delete Threads



Wrap




Change Scale



Float Intervals

The Tools Window is a small window which floats above the others whenever WeaveMaker is active (see detailed view on the next page). Its tools help you manipulate structure and color. You choose a tool by clicking on it. It turns black, confirming your choice.

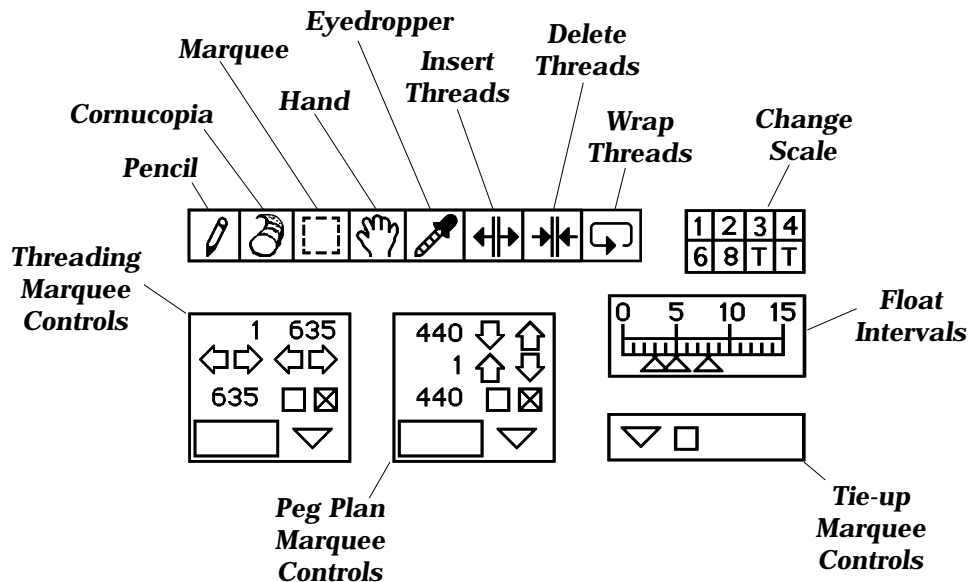
The cursor also changes its shape (to remind you of which tool you have activated) when you position it over a part of the screen where it's appropriate to use the selected tool. So, if you click on the pencil tool, the cursor will remain the standard arrow cursor (  ) until you move it over one of the grids in the design, at which point the cursor will change to the pencil. This behavior helps you determine where it is appropriate to use the tool. The next few pages explain all the tools in detail.

You can move this window around on the screen, or hide it by clicking in its close box. Make it visible again using "Show Tools" in the "Windows" menu.



## **Pencil**

Use the pencil tool to edit the threading, treadling, tie-up, or peg plan grids. Click with the pencil to attach/detach a thread from a harness, add/remove a tie-up or peg, or edit the treadling. Clicking on a square reverses its color. If you hold the mouse down and move it around, the change occurs in each place the pencil passes over.



 **Cornucopia**

Use the Cornucopia to “pour out” weaving elements created by WeaveMaker’s spontaneous pattern generator.

Click on the Cornucopia tool and then position the cursor over any of the grids in the design window (threading, tie-up, treadling, peg plan, or color bar). The cursor changes to a cornucopia. Click and watch WeaveMaker generate a new design. If you click in the threading, WeaveMaker generates a new threading and then draws the new fabric. Its behavior is similar if you click in the tie-up, treadling, or peg plan. If you click in the color bar, you

get a new color arrangement. You can click over and over with the Cornucopia; each time you get a new pattern.

Unless you restrict it, the Cornucopia fills the entire grid. You can restrict its range of operation using the marquee tool (please see “Marquee” in the Index for places to find out about using the marquee). If you draw a marquee, the Cornucopia can be used inside the marquee, and whatever pattern it puts there is then repeated following the repeat block rules (please see “Repeat Blocks” in the Index for places to find more about using repeat blocks).

Through the Schemes window you can encourage the Cornucopia to draw certain kinds of patterns (please see “Schemes” in the Index for more about the schemes window). In addition, of course, you have control over where you click with the Cornucopia. For example, if you have already threaded your loom you probably do not want a new threading generated spontaneously, so you would be careful to avoid clicking in the threading in such a case.


WeaveMaker also has an “automatic” mode where the spontaneous pattern generator (the engine which drives the Cornucopia) creates a complete fabric every few seconds. Each pattern stays on the screen long enough for you to “freeze” it in place if you like it. Please see “Schemes” in the Index for more about automatic spontaneous pattern generation.

Regardless of how you use it, any design created by the spontaneous pattern generator may be further edited, just as you would edit a pattern you created from scratch. All the power of all the WeaveMaker tools is available for making modifications.



### **Marquee**

This tool marks out portions of the threading, tie-up, treadling, or peg plan grids for manipulation by the Block tools (please see “Repeats” in the Index for more about the block tools), the Actions (flip, rotate, invert, and so on), the Copy and Clear commands, and for confining the area of operation of the Cornucopia tool. So, for example, if you wish to clear a portion of a grid, first select the part to be cleared (using the marquee tool) and then invoke Clear from the Edit menu.

When a marquee tool is selected the cursor turns into a plus sign (+) which is skinny ( + ) or fat (  ) depending on the scale that is in effect.

Click and drag this cursor in any of the grids in the design window to form a marquee (or “block”). First, click with the plus cursor at one corner of your desired block (illustration on the right).



Next, keep holding the mouse button down and drag the plus cursor to where you want the other corner of the selection to be. A dashed box will appear as you do this (second illustration below). You have now successfully established a block.

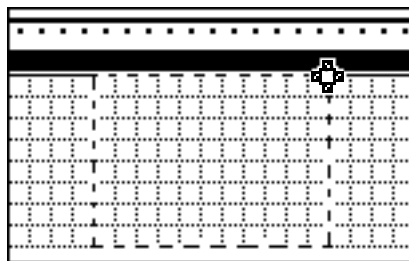
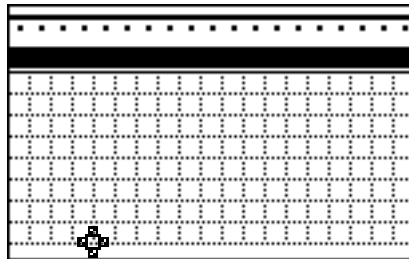
(Although you cannot see it here, when you do this for real you will see the dashed box outline "crawl." The Macintosh terminology for this is "marquee," because it's like the lights around a movie theater or hotel marquee.)

Dismiss the marquee by unchecking the marquee checkbox in the Tools window (please see "Marquee" in the Index for details).



### **Eyedropper**

This tool "picks up" a color from the warp or weft colorbar. If you have several colors which are difficult to distinguish among by their appearance on the computer screen, the small amounts of color displayed in the warp or weft colorbars are not useful for distinguishing the exact shade of color assigned to a thread. In this situation, use the eyedropper to pick up a color in question. The name of the color is displayed at the bottom of the colorway window. The color is also loaded into the crayon, which may then be used to click the color into other threads.



### **Hand (Resize a Marquee)**

In a grid with an active marquee (please see “Marquee” in the Index for details), this tool changes the size or position of the marquee. Click on the Hand tool and then move the cursor over an existing marquee. The cursor will change to a hand or an arrow. Click and hold down the mouse button (when the cursor is a hand) to reposition the marquee without changing its size. Or, when the cursor is an arrow, click and hold down the mouse button and then move the mouse to change the size of the marquee.

You can also change size of a marquee through the Tools window. Please see “Marquee, resizing” in the Index for details.

The keyboard cursor keys will move a marquee by exactly its width or height. A marquee in the threading, for example, is moved to the left (right) by the left (right) arrow cursor key. If the marquee is 20 threads wide, it will move by 20 threads each time the cursor key is pressed. Similarly, the up (down) keyboard cursor keys move a marquee in the weft by exactly its height.

### **Hand (Harness Shuffle)**

In a grid without a marquee, this tool helps you rearrange the order of the grid elements. For example, in the threading grid you can change the order of the harnesses. To do so, click in the threading. The entire harness which is under the fingers of the hand turns blue. Now move the mouse vertically. Notice that you are literally dragging the harness into a new position. Release the mouse when you have moved the harness to its desired new position.

A similar effect is possible in any of the other grids.

Also, note that as you move a grid element around, parallel changes take place in the other grids. This ensures that your shuffling does not change the fabric design one whit.

The shuffle may be used to simplify threadings or treadlings. It can also help you study your design by letting you move harnesses next to each other, which may make it easier to compare them. If you are training an assistant in doobby weaving, the shuffle is a good teaching tool, as it helps illuminate the relationship among the grids.

### **Insert Threads**

This tool adds one or more threads in either the warp or weft. Click on the tool, then move over the threading, treadling, or peg plan. Click at the boundary between two threads and hold the mouse button down. A line appears (green on color monitors). Move the mouse to the side (threading) or vertically (treadling or peg plan) and the grid will open up. Create as much space as you wish for new threads.

### **Delete Threads**

This tool deletes threads from the warp or weft. Click on the tool, then move the cursor over the threading, treadling, or peg plan. Click next to the thread you want to delete, then move the mouse over the thread while continuing to hold down the mouse button. The thread to be deleted will be darkened (red on color monitors, otherwise black). If you want to delete a group of threads, move the mouse over the entire group. When you release the mouse button, the darkened threads will be deleted.

### **Wrap**

This tool shifts the threading, treadling, or peg plan left-to-right and top-to-bottom; that is, shifting can occur in any direction as the tool is clicked and dragged. Click on the tool, then click in the threading, treadling, or peg plan and hold the mouse button down. Now move the mouse. As you do so, you will see the contents of the grid shift to follow the mouse.

If used within an active marquee (please see “Marquee” in the Index for details), only the area within the marquee is shifted.

The Wrap tool does not throw anything away; ends or picks shifted out of one end re-enter on the opposite end.

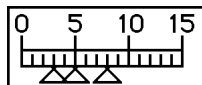
### **Change Scale**

Click in the “Change Scale” box to change the display scale of the design. The letters “T” stand for “ten” and “twelve.”

Aside from the obvious change in how much of the drawdown you can see, the only other effect of changing scale is that the float diagrams do not appear at any scale other than 8.

## Float Intervals

When displaying all of the floats at once (please see “Floats” in the Index for details), the colors used to represent various float lengths are set in the Tools window. In the diagram shown below (which also appears in the Tools window), there are three triangles which indicate three float lengths:



the left triangle indicates 3, the middle 5, and right one 8. This means that WeaveMaker will use these rules in showing floats:

- a) floats of less than 3 will be in white,
- b) floats from 3 to 5 will be in green,
- c) floats from 6 to 8 will be in blue,
- d) floats of more than 8 will be in red (despite the fact that the float scale ends at 15, floats of any amount above 8 will be in red, even floats of more than 15).

## **Repeat Blocks**

Draw a partial threading or tie-up or treadling and have it copied over and over, automatically and quickly, throughout your design.

## Introduction

A repeat block lets you draw a partial threading or tie-up or treadling and have it copied over and over, automatically and quickly, throughout your design. Repeating a block is the basic way you build patterns by hand in WeaveMaker. The size and extent of the repeat are under your control, and you can use as many different repeat blocks as you wish within a single design.

If you already know about blocks and want detailed information on using the block tools, you can skip ahead to “Block Tools” (please see “Block Tools” in the Index). Examples of using repeat blocks to build some familiar patterns is given in the “Using Repeat Blocks” section.

The 3 by 3 cell straight draw threading illustrated at the right is an example of a block. Such a block can be automatically copied (by WeaveMaker) to form the threading illustrated below.



In fact, any rectangular array of cells can be a block.

WeaveMaker lets you mark out an area (using the marquee tool) to be a block. This marking persists until you dismiss the block.

## Repeat Block Example

The illustrations on the facing page show a threading grid with 25 threads and 8 harnesses. Part of the grid (6 threads wide) is outlined with a dashed line (second illustration) created with the marquee tool (please see “Marquee” in the Index for details). The outlined area is the **block**.

The plain block, as drawn by the marquee tool, is then converted into a repeat block (third illustration) by clicking on the repeat rectangle in the Tools window. The appearance of the gray “wings” alongside the marquee is confirmation that this is a repeat block. In the gray area, WeaveMaker repeats everything done within the block.

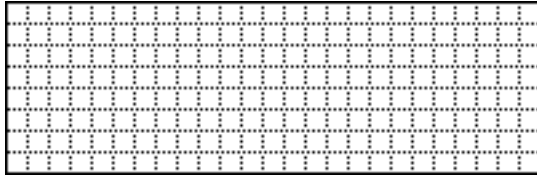
Select the pencil tool and move it over the grid. You’ll find it has three properties:

- a) Clicking on a square in the block area fills in the square.
- b) Filled-in squares within the block are repeated to the edge of the grid (that is, throughout the shaded area in the above figure).
- c) Clicking again in any filled-in square erases it and its copies.

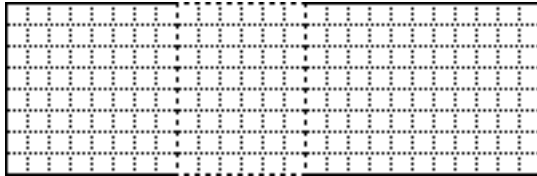
Suppose that with this pencil you mark three cells in the block (the ones which are blackened in

## Creating a Repeat Block

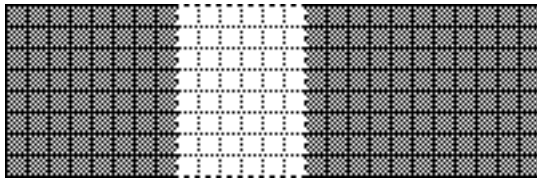
Here is a 25 thread portion of the threading grid:



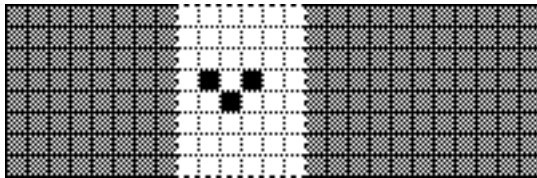
The marquee tool marks out a plain block:



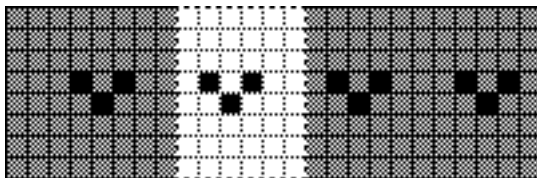
which is converted to a repeat block:



Now anything drawn in the repeat block:



...gets repeated in the shaded sections



the fourth figure on the facing page). Notice that the cell you clicked, and the ones at regular intervals to the right and left, are blackened. This kind of magical graph paper would make drawing designs quick, precise, and fun.

Any actions you take inside the block are automatically repeated throughout the gray part of the grid.


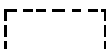

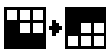




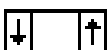


There are several variations on the straight copying illustrated here (the repeats can be reflected in various ways, or they can creep up or down). These options are taken up in detail in the next section.

Please see “Repeats, examples of using” in the Index for examples of using blocks to create some common fabric patterns.





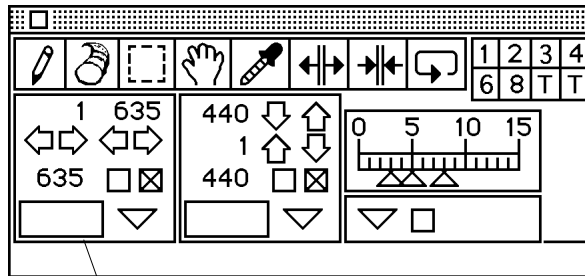
# Block Tools

Stop	
	
	
	
	
	

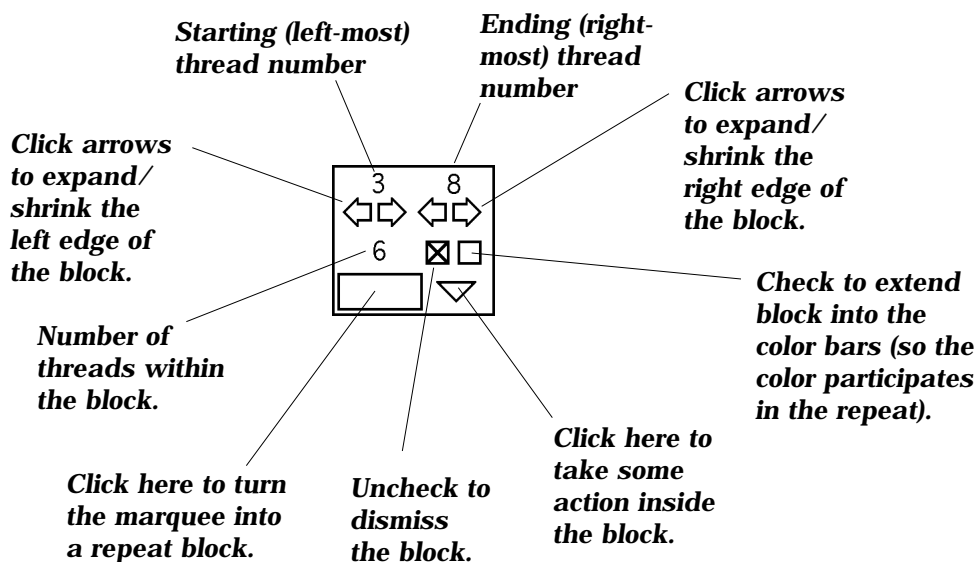
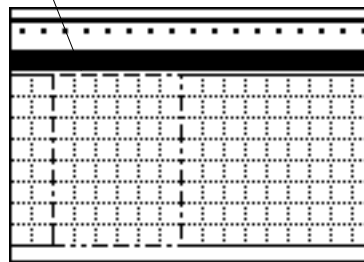
## Controlling a Block

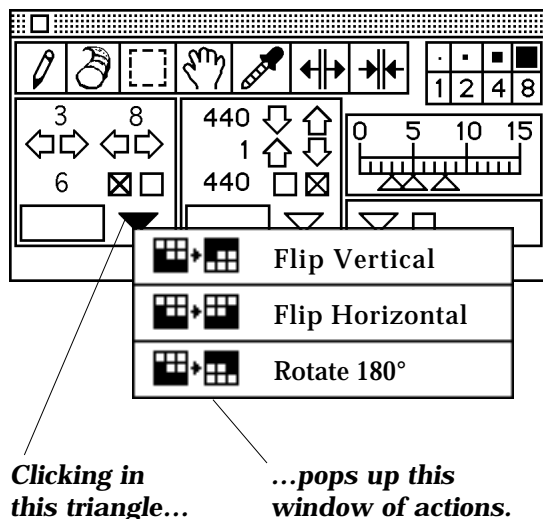
Once you create a plain block using the marquee tool (please see “Marquee” in the Index for details), you control its behavior and fine-tune its size using the “Blocks” part of the Tools window.

The illustration on the right shows a threading grid with an active block (the white area outlined with the dashed line is the block). Immediately above it is a diagram showing the part of the Tools window through which you control the threading block. Below is an expanded view of the Tools window, showing the function performed by each of the threading marquee controls.



*This part of the Tools windows...controls this block in the threading.*





### Actions

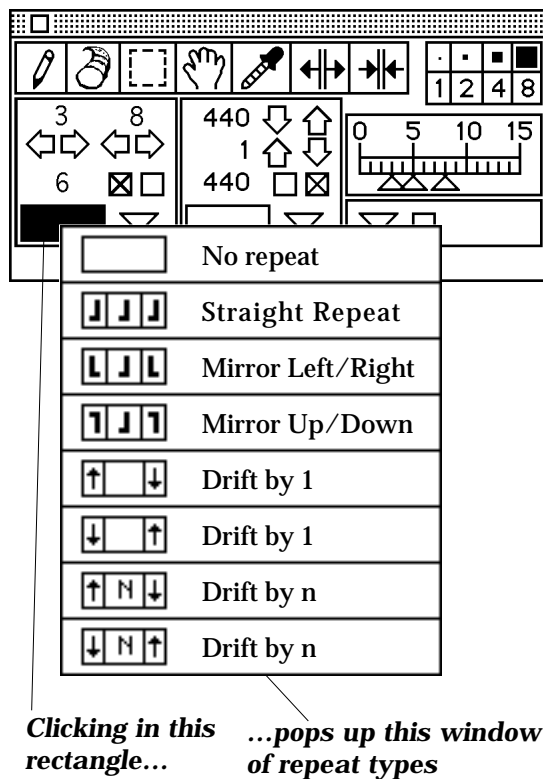
Actions can only be done when there is a block active.

If you click on the actions triangle in the Tools window, a menu of actions pops up (left).

Run the mouse over the actions menu while holding the mouse button down. Note that the action under the mouse turns black. Releasing the mouse over a blackened action directs WeaveMaker to proceed (to *not* take any action, move the mouse off the pop-up window and release the mouse button).

When you release the mouse button, the pop-up menu disappears. The action you selected, if any, is then performed.

Actions are done once, immediately upon releasing the mouse. They do not affect the grid in the future (in contrast with block repeats, which are described in the following section).



### Block Repeats

If you click on the repeat rectangle in the Tools window, a menu of block repeat types pops up (left).

Run the mouse over the types while holding the mouse button down. Note that the type under the mouse turns black. Releasing the mouse over a blackened type directs WeaveMaker to

proceed (to **not** take any action, move the mouse off the pop-up window and release the mouse button).

When you release the mouse button, the pop-up window disappears. The repeat type you selected, if any, is then performed and the reminder rectangle is filled with a picture of the tool you selected (illustration at right).

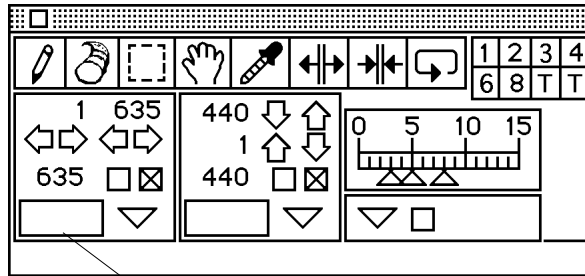
Each grid (threading, treadling, tie-up, or peg plan) has its own set of block tools. These are explained in detail in the following section.

When you first select a repeat type, it takes place immediately (that is, the contents of the block are repeated). The repeat persists until you dismiss the block or set the repeat type to “no repeat.”

When you dismiss the block, the repeat type is not forgotten. Its picture remains in the reminder rectangle (as illustrated above right). If you reactivate the block, the repeat type immediately is resumed, as though you had just selected it with the mouse via the pop-up menu.

### Types of Repeats

Each grid has its own set of block actions and block repeats, as shown in the illustrations on this and the facing page. Repeats or actions with an identical icon



***A reminder of the repeat type appears here. This remains even if you dismiss the marquee. If you reselect the marquee, this repeat type immediately applies. You may set the repeat type (or set it to “no repeat”) at any time, regardless of whether there is a marquee active.***

***These are the available types of repeats. They apply in the threading and in the treadling/peg plan. There are no repeats in the tie-up.***


	No repeat
	Straight Repeat
	Mirror Left/Right
	Mirror Up/Down
	Drift by 1
	Drift by 1
	Drift by n
	Drift by n













have identical effect, regardless of which grid they are in. Thus, the section “Using Repeat Blocks” (please see “Repeats” in the Index) explains the operation of each tool without regard to which grid it is used in.

Repeat blocks can be used in the threading, treading, and peg plan. Use as many different ones as you wish.

Repeat blocks apply to color as well if they are extended into the color bar.

### Summary of Block Actions

*The block tools listed below all carry out a transformation within the block. Each picture is meant to suggest an action. For example,  shows the contents of the block being flipped upside-down.*

-  *Flip upside-down.*
-  *Flip right-to-left.*
-  *Rotate 90°.*
-  *Rotate 180°.*
-  *Rotate 270°.*
-  *Interchange black and white.*
-  *All Black.*
-  *All White.*
-  *Copy upper left triangle to bottom right.*
-  *Copy lower left triangle to upper right.*
-  *Copy lower right triangle to upper left.*
-  *Copy upper right triangle to lower left.*

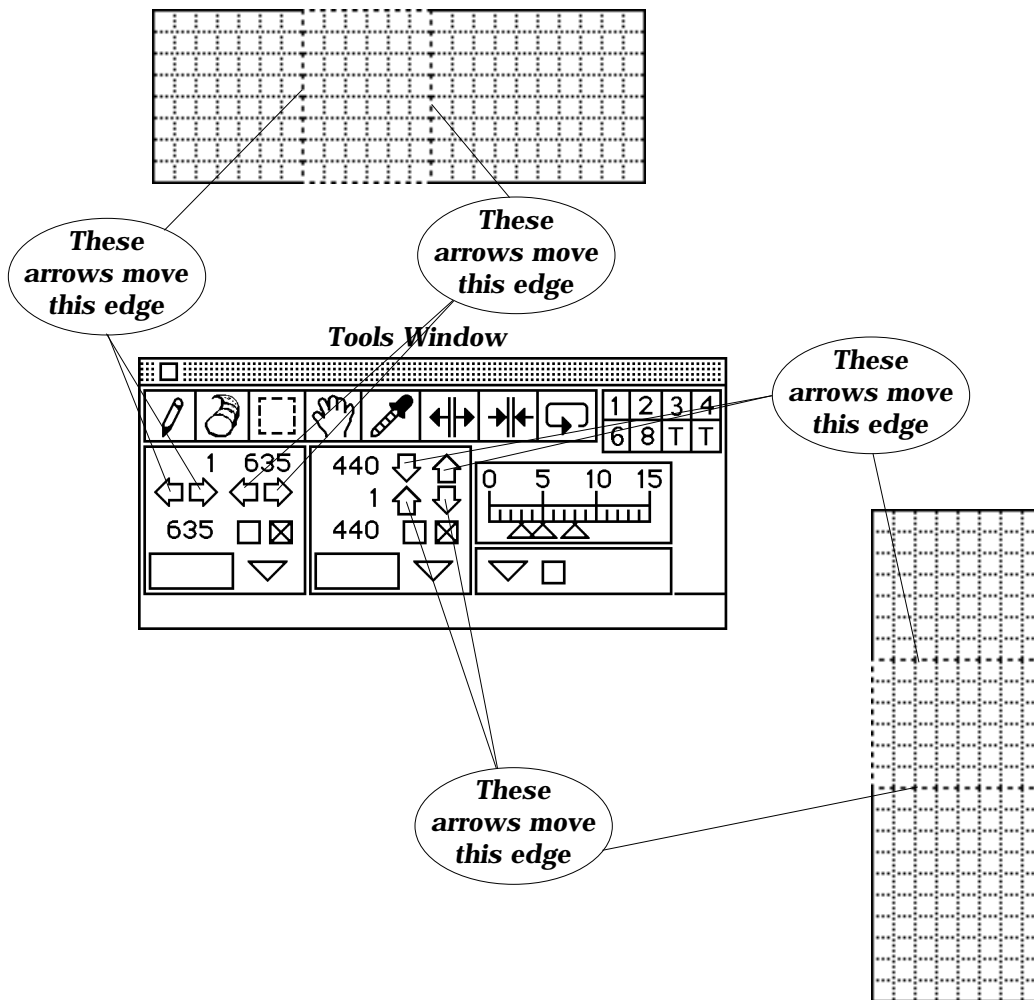
### Hand Tool (Resizing a Block)

You can change the size of a block without redrawing it from scratch. Please see "Repeats, resizing" in the Index for details.

You can also make refinements to the size of a block by clicking any of the hollow arrows in the Tools window (see right and below).

### Resizing Arrows

There are eight hollow arrows in the Tools window which are used to adjust the size of a marquee (please see the illustration below). Each time you click in an arrow, it moves the edge of the marquee by one thread.




## **Using Repeat Blocks**

Each of the repeat block types offered by WeaveMaker is used here to construct a familiar fabric. The discussion emphasizes blocks in the threading, but the same technique works in the peg plan or treadling as well (repeat blocks are not used in the tie-up).

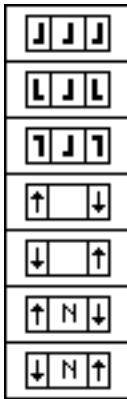
There are seven kinds of blocks which differ in how they copy to the right and left.

The next three columns illustrate the basic operation of each type of repeat.

Each repeat is represented by a small icon which reminds you of how that particular block style does its repeats. The small “backwards L” figure in the icons helps illustrate how the repeats work.

For example, in the first icon each of the three L’s is in the same orientation, suggesting a repeat in which each block is an exact copy of its neighbor (straight repeat). The second icon (the  figure) shows a repeat in which successive copies of the block are flipped right to left (horizontal mirror). The third type of repeat flips successive images top to bottom (vertical mirror). The last four types of repeats (the ones with the arrows) shift each repeat by one or more threads up or down (drifts).

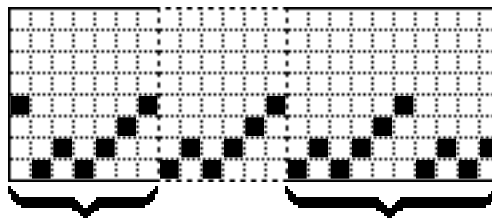
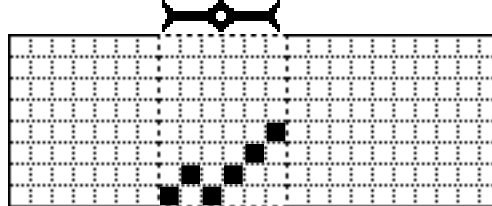
The first two drifts (without the “N”) drift by 1 each time they repeat. The last two drifts (with the “N”) drift by an amount you specify.



### Straight Repeat

A straight repeat copies what you do, over and over, to both left and right.

*If you draw this...*

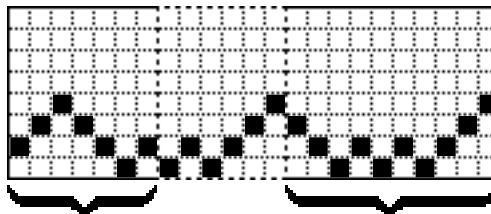
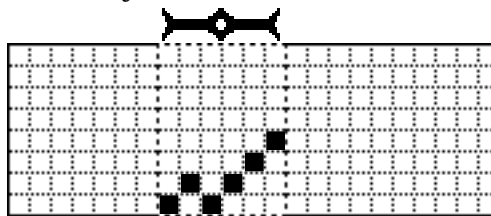


*WeaveMaker does this...*

### Horizontal Mirror Repeat

A horizontal mirror repeat flips its copies left-to-right at each repeat. It also eliminates one thread right at the point where it repeats.

*If you draw this...*



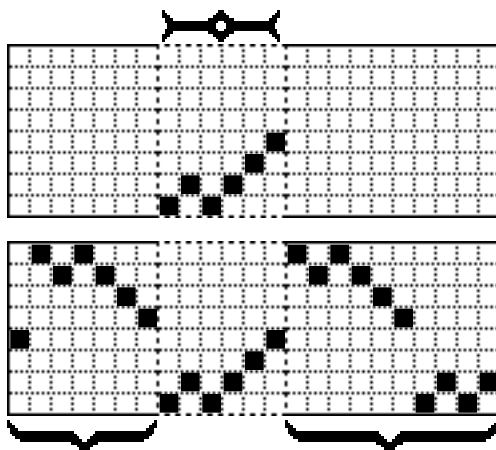
*WeaveMaker does this...*



**Vertical Mirror Repeat**

A vertical mirror repeat flips its copies top-to-bottom at each repeat. The block is repeated as a whole; nothing is deleted along the edge.

*If you draw this...*

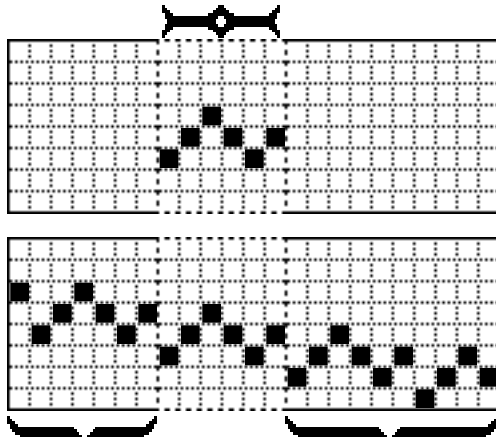


*WeaveMaker does this...*

**Drift Repeat**

A drift repeat slides each copy up or down by one harness (up in one direction; down in the other).

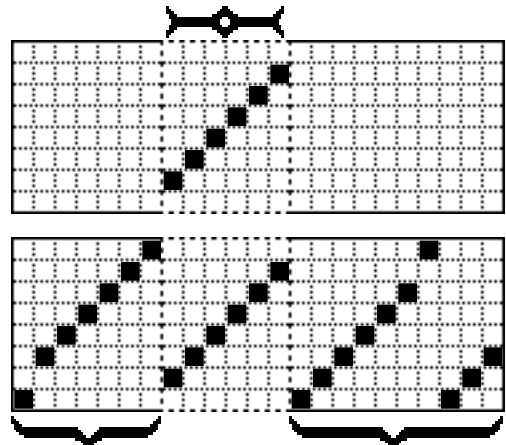
*If you draw this...*



*WeaveMaker does this...*

When a drift repeat runs out of harnesses, the repeat “wraps around,” as this example shows.

*If you draw this...*



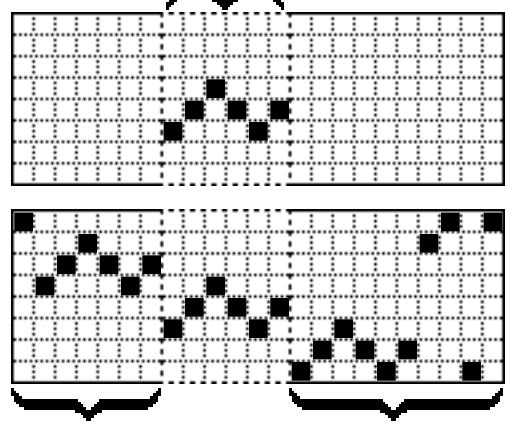
*WeaveMaker does this...*

**Drift by N Repeat**

The drift can also shift each repeat by more than one harness (these have an N in their symbol).

*If you draw this...*

N=2

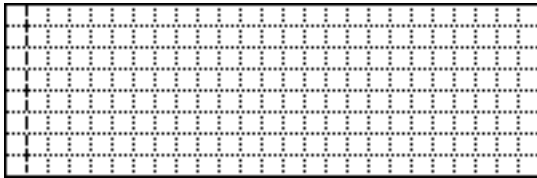



*WeaveMaker does this...*

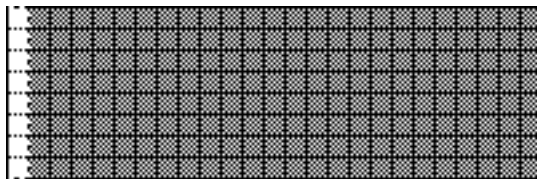
## Straight Draw Threading

You can create a straight draw threading with three mouse clicks:

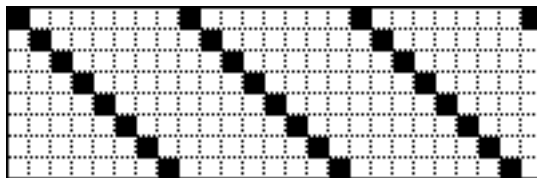
1. Draw a block which is one thread wide and applies to all 8 harnesses:



2. Select the  repeat. The screen now looks like this:

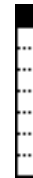



Click with the pencil tool in the topmost square of the block to produce a straight threading (the dashed line and the gray have been removed to make this illustration clearer):

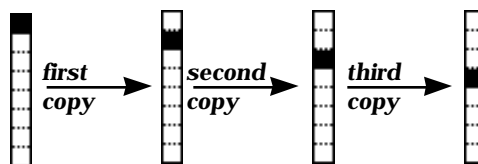


To see why this works, note that the block in this case is just one grid square wide but covers all

harnesses. So it looks like this after the top square in it has been clicked:



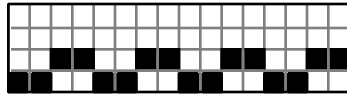
But this is a repeat block, so whatever you do in it gets copied to both right and left. In this case copying to the left isn't possible, but copying to the right is. The copies are not exact copies, because you selected the fourth kind of repeat () , which shifts the squares down by one grid position in each copy made to the right (the shift is upwards in copies made to the left). So the sequence of copies looks like this:




Eventually the repeat has to wrap around because it reaches the bottom edge of the grid. This sequence of events leads to the "straight draw" threading.

### Basket Weave

Here is a typical threading for basket weave:



This can be built from a repeat of a 4 by 4 block. Using the straight repeat block tool (  ), set up this block:



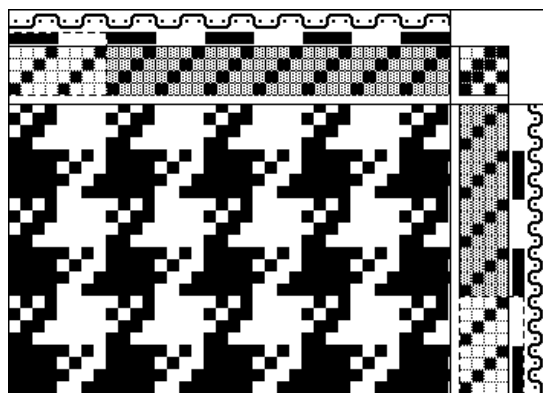
Blacken the four squares of the basket weave threading in the block. WeaveMaker copies this throughout the rest of the threading:



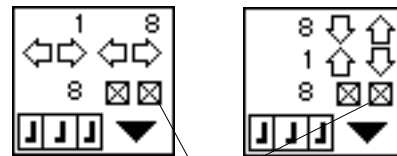
### Hound's Tooth

The illustrations at the bottom of the page show the repeat blocks used to construct a hound's tooth pattern. The warp and weft are identical. A repeat block covering 8 threads is used; note how the colors are repeated.

*Hound's Tooth*





*Hound's Tooth*  
 Illustration of "marquee" parts of Tools window while drawing Hound's Tooth

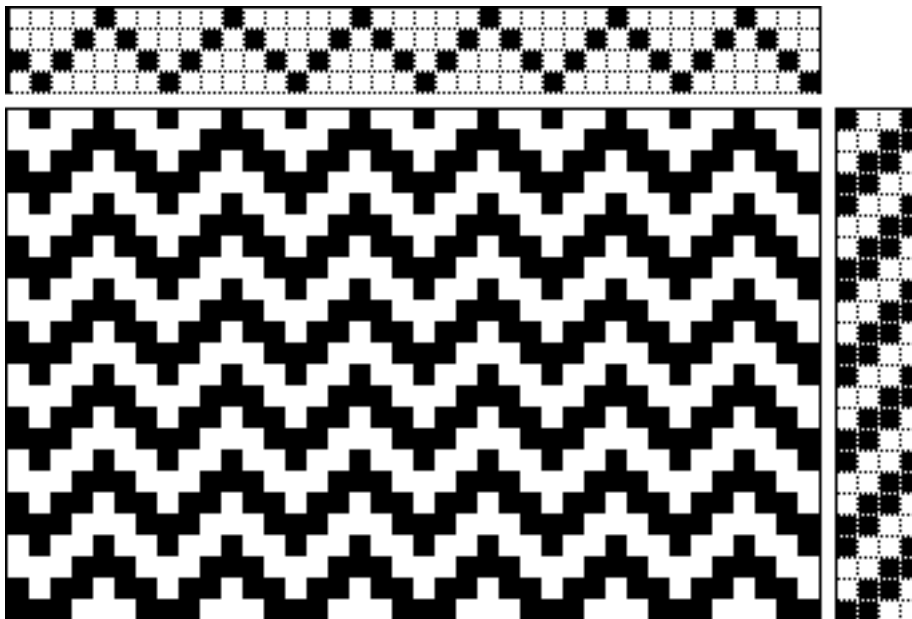
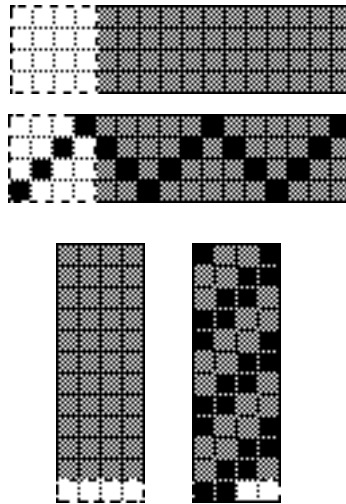


*A checkmark here indicates that the marquee extends into the color bars. Hence the repeat block applies to color as well as structure.*

## Herringbone

Consider the threading and peg plan for the herringbone fabric shown below. The threading is built using the horizontal mirror tool (  ), while the peg plan

is very easily done with the  tool, as illustrated immediately below.



# File Menu

New Design

Open...

Save

Save As...

Close

New Palette

Open Palette...

Save Palette

Save Palette As...

Export Fabric...

Export Grids...

Grid Options...

Export 3-D...

Print Options...

Print Preview...

Page Setup...

Print Palette...

Continue

Quit

## New Design

Sets up a new, blank design of 300 warp and weft threads, 8 harnesses, and 10 treadles. Please see “Loom Menu” in the Index for more information on changing the size of the design.

You can specify some other default size and type of design to be created by New Design using the Preferences command in the Edit menu. Please see “Preferences” in the Index for details.

File
New Design
Open...
Save
Save As...
Close
New Palette
Open Palette...
Save Palette
Save Palette As...
Export Fabric...
Export Grids...
Grid Options...
Export 3-D...
Print Options...
Print Preview...
Page Setup...
Print Palette...
Continue
Quit

## Open

Reads a saved design from disk, allowing you to pick up work where you left off after you did a Save (see below).

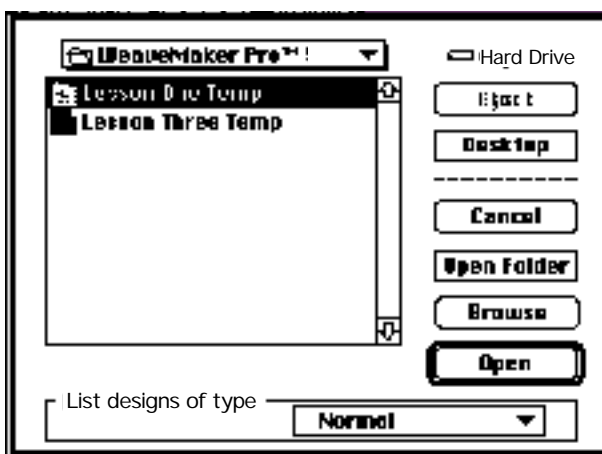
You may repeat New and Open until you have a total of three designs active. Then both New and Open will gray out, indicating that you have to Close a design before using New or Open.

## File Type

If you click on “Normal” and hold the mouse button down, a list of readable file types pops up:

**Normal** shows files created by WeaveMaker. When Normal is selected, WeaveMaker only lists design names that are in WeaveMaker format.

**All Files** shows you the names of all files on disk, regardless of how created. Not all of these will necessarily be valid design files.



### **Save As**

Puts a copy of your design on either your hard drive or floppy disk, and allows you to name your new design. This lets you quit out of WeaveMaker, go away, and come back later and pick up where you left off (use Open to recover your design).

Similarly to Open, both **Save** (see below) and **Save As** allow you to specify the file format. WeaveMaker defaults to .wmd files, the standard WeaveMaker format.

It is beyond the scope of this document to describe the idiosyncrasies of design formats other than that used by WeaveMaker. If you understand other formats that may be listed and need to create designs in those formats, please do so. However, you are cautioned against routinely saving WeaveMaker designs in any format other than “.wmd.” There are subtle differences among formats, and WeaveMaker cannot always warn you when you have selected a format which is not sufficiently robust to contain all the required information about your design.

### **Save**

If you are working on a previously saved design, **Save** will save over that copy, destroying the way it looked when you opened it. If you want to keep both the original and the new form, use **Save As** and give the file a new name.

### **Close**

Removes a design's windows from the screen. To resume work on the design use Open. If you have made changes to the design and have not Saved those changes, Close will ask you whether it should save them. Reply yes or no.

### **New Palette**

#### **Open Palette**

#### **Save Palette**

#### **Save Palette As**

Palettes, which are WeaveMaker color databases, are the subject of a separate series of sections devoted to color. Please see “Color” in the Index for details.

### **Export (Fabric, 3-D, Grids)**

Use these commands when you want to take information from WeaveMaker into another program, by creating a TIFF file which can then be opened, imported, or placed in some other program.

Export Fabric creates an a file representing just a fabric, without the accompanying threading, tie-up, treadling, or peg plan grids.

Export 3-D creates a file which captures the image created by the “Show Fabric in 3-D” command (please see “3-D” in the Index for details).

Export Grids creates a file which resembles one of the design grids (threading, tie-up, treadling, or peg plan).

### **Grid Options...**

Determines precisely how a grid is exported.

### **Print Options**

Lets you select the way you want your design to be printed. Printing is covered in full in a separate section (please see “Printing” in the Index for details).

### **Print Preview**

Shows you (on the screen) what you would get if you did a Print command. Use this to verify that you got your Print Options correct.

### **Page Setup**

Lets you select the paper orientation (normal or sideways), paper size, and print scaling prior to printing. Use Print Preview to verify your selections.

### **Print**

Sends a copy of your design to the printer. Printing is covered in full in a separate section (please see “Printing” in the Index for details).

### **Continue**

Shuts down WeaveMaker, automatically saving your work in a temporary (unnamed) file. The next time you start WeaveMaker, your designs are automatically reloaded, so you can start in working again, just as though you had not shut down WeaveMaker.

### **Quit**

Shuts down WeaveMaker. All open designs are closed. If you have unsaved changes, you will be asked whether they should be saved (reply yes or no).



# Edit Menu

Undo	
Redo	
Cut	▶
Copy	▶
Paste	
Clear	▶
Clear Colorway	
Clear Entire	▶
Select Entire	▶
Lock Warp	▶
Lock Weft	▶
Algebraic	▶
Remarks	
Preferences...	

## Undo

Undoes whatever you last did in WeaveMaker. If you click in the threading, for example, Undo will reverse the effect of that click. Undo handles even large-scale changes. If you change the size of the loom, Undo will put it back the way it was.

You can repeat Undo up to five times; each time you click it, it undoes one more thing. Redo has the opposite effect of Undo.

## Watch Out for

- Undo cannot reverse the effects of Close or Save. If you close a design without saving it, and you reply “no” to the query “Save changes to WeaveMaker design?”, those changes are lost for good. In a similar vein, if you do a Save using the name of an existing file, and you reply “replace” to the query “Replace existing file?”, the old version of the file is destroyed for good.
- Undo only remembers the last five things you did. It cannot undo something you did earlier.
- Undo applied to changes to individual thread color changes undoes all color changes made since you touched the color patch in the Colorway window (it undoes everything you

Undo	
Redo	
Cut	▶
Copy	▶
Paste	
Clear	▶
Clear Colorway	
Clear Entire	▶
Select Entire	▶
Lock Warp	▶
Lock Weft	▶
Algebraic	▶
Remarks	
Preferences...	

recolored with the currently selected color).

While Undo works on pencil and crayon clicks, it’s generally easier just to click again with the tool rather than using Undo, because both tools have the property that a second click in one spot is an Undo of the first click.


## Cut, Copy, Paste, Clear, Select

These commands duplicate, move, or erase pieces of the threading, peg plan, tie-up, treadling, or drawdown. You can copy and paste within WeaveMaker or into other applications such as a word processor or drawing program. And these commands work across

grid boundaries, so you can (for example) copy a threading and paste it into a tie-up or treadling (and vice-versa).

**Cut, Copy, and Clear** operate on an area you have designated with the Marquee tool or with Select Entire. Therefore, before using them you must set up a selection (please see “Marquee” in the Index for details). Cut, Copy, and Clear are grayed out if you have not established a selection.

**Copy** copies your selection to the clipboard. From there it can be pasted into any grid within WeaveMaker, or into other applications such as word processors or painting programs.

**Paste** copies the clipboard into the threading, tie-up, treadling, or peg plan at one or more places you select. To paste, first select Paste from the menu. The cursor shape changes to  indicating that you can now paste (this is the Paste cursor). Move the paste cursor to the upper left hand corner (threading) or upper right hand corner (peg plan, tie-up, or treadling) of where you want to paste, and click. The contents of the clipboard will overlay the selected portion of the design. You may paste over and over again, as many times as you wish.

If you paste between the threading and the treadling or peg plan, the image will be rotated by 90° (a “tomp as writ” effect).

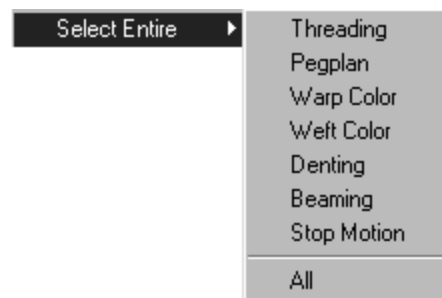
**Clear** erases the selected area to white.

**Cut** combines copy and clear. First it copies the selection to the clipboard, then it erases the selection from the grid.

**Clear Colorway** puts the colorway back to the way it would be on a new design. Only two colors are defined, black in the warp and white in the weft.

**Select Entire** creates a selection exactly enclosing one part of the design (the entire threading, for example). This is useful for copying an entire threading, treadling, or peg plan.

Clicking on Select Entire “pops up” a small submenu as shown, to permit you to select just the grid you desire.



**Clear Entire** combines Select Entire and Clear. It permits you to conveniently clear the threading, tie-up, treading, peg plan, or color bars.

### **Lock Warp, Lock Weft**

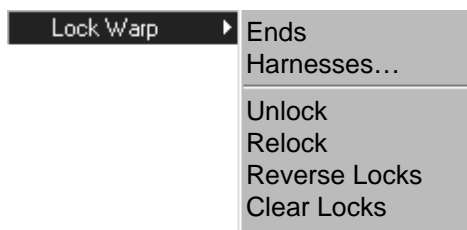
Some designs naturally divide into two parts, for example, a pattern and a ground (or tie-down). In WeaveMaker, you can divide your design into two parts and then temporarily lock either part while you work on the other.

For example, you might input the ground for a design, and then lock it while you work on the pattern. This is particularly useful when working with the Cornucopia tool (please see “Cornucopia Tool” in the Index for details). You can create and lock a ground, and then use the Cornucopia tool to try out various patterns.

In the threading, you can separately lock harnesses and individual ends. For example, you might want to lock the first two harnesses. Or, you can lock every third end. These will typically be done in combination.

In the peg plan, you can separately lock pegs and picks.

When you click on Lock Warp, a pop-up menu appears:



If you choose Lock Ends, the cursor changes to a small padlock. Move the cursor over the threading and click on any ends you wish to lock. Locked ends will turn gray. Continue clicking with the padlock cursor until you have locked all the ends you wish to lock. Clicking on a locked end unlocks it. Then, click on any of the tools in the Tool window to deselect the padlock cursor and end locking mode.

If you choose Lock Harnesses, you will then be asked to specify the range of harnesses you wish to lock. Those harnesses will turn gray as well.

Once you have established your locks, notice that you can no longer edit the grayed-out ends and harnesses. If you click with the Cornucopia tool in the threading, only the unlocked threads/harnesses change.

You can temporarily remove the locking by choosing “Unlock.” You can restore the locking by clicking “Relock.” Use “Reverse Locks” to lock every unlocked

thread and to lock every unlocked harnesses.

Locking in the peg plan or treading follows these same rules.

### **Algebraic (Input)**

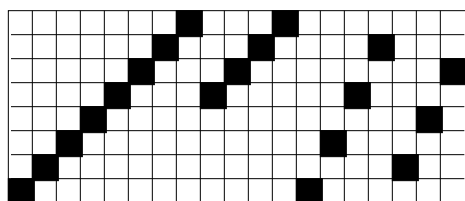
Algebraic input is used to create threadings, tie-ups, peg plans, treadlings, dentings, beaming, and color arrangements by typing the harness/treadle/end/pick/color numbers and letters rather than clicking in a grid. If you have a threading, for example, which consists of a list of harness numbers, you can use algebraic input to convert those numbers into a WeaveMaker threading.

When you click on Algebraic, you pick one particular part of your design to input algebraically.

The rules for Algebraic input depend on the design element you are entering. Please consult the following sections for details.

### **Threading, Treading**

As an example, the expression “1-8 5-8 1 3 5 7 2 4 6” yields this threading:



Here are the exact rules:

a) The values you type specify the threading from left to right, starting with end number 1 (treading is from bottom to top, starting with pick 1).

b) Harnesses (or treadles) are identified as a number, so (for example) 1 means “harness 1”. Put a blank between successive harness numbers.

c) Straight draws can be specified by giving the starting and ending harness numbers. For example, 1-8 means “a straight draw from harness 1 to harness 8.”

d) Repeats are indicated using parentheses and a repeat number. So, for example, the expression “3(1-8 1-4)” means “make a 1-8 straight draw followed by a 1-4 straight draw, and repeat that sequence 3 times.” Repeats can be nested.

e) If the expression specifies fewer ends than are in the design, the ends you have specified are repeated across the design. For example, if you have specified 200 ends in your design and you enter “2(1-8) 1 2 1 2” as your threading expression, which only defines the threading for the first 20 ends, the result will be your 20-end pattern repeated 10 times, as though you had actually entered “10( 2(1-8) 1 2 1 2).”

### ***Color Arrangement (Warp/Weft)***

a) The values you type specify the color arrangement from left to right, starting with end number 1 (weft is from bottom to top, starting with pick 1).

b) Colors are indicated by letter codes. You may use either uppercase or lowercase letters. Warp letters will automatically be converted to uppercase, and weft to lowercase. The left-most warp color chip in the Colorway window is chip "A," the next is "B," and so on, without regard to the major/minor/accent divisions. The weft colors are treated similarly, with the left-most chip being "a." You may put a blank between color codes, but this is not required.

c) Repeats are indicated using parentheses and a repeat number. So, for example, the expression "4(ABC)" means "color 12 threads by repeating the color arrangement ABC four times." Repeats can be nested. Repeating a single letter can be done by using the repeat count without parentheses ("AAA" can be written "3A").

d) If the expression specifies fewer ends (or picks) than are in the design, the pattern you have specified is repeated across the design.

### ***Denting***

a) The values you type specify the denting arrangement from left to right, starting with end number 1.

b) Denting is indicated by a number, which indicates the number of ends to place in the dent. For example, "2 2 2 2" means "put the first two ends in the first dent, then the next two ends (threads 3 and 4) go in the next dent, et cetera." Use 0 to skip a dent (in effect, you are saying "put no ends in this dent." For example, "3 0 1 1" means "put the first three ends in the first dent, then leave the next dent empty, and then put one end in each of the next two dents."

c) Repeats are indicated using parentheses and a repeat number. So, for example, the expression "4(2 1)" means "put two ends in the first dent, and then put one end in the next dent, and repeat this pattern four times." Repeats can be nested.

d) If the expression specifies fewer ends than are in the design, the pattern you have specified is repeated across the design.

### **Beaming**

a) The values you type specify the beaming arrangement from left to right, starting with end number 1.

b) Beaming is indicated by using the letters “b” and “t” to mean “bottom beam” and “top beam.” You may put a blank between codes, but this is not required.

c) Repeats are indicated using parentheses and a repeat number. So, for example, the expression “4(bbbt)” means “put the first 3 ends on the bottom beam, and then put one end on the top beam, and repeat this pattern four times.” Repeats can be nested. Repeating a single letter can be done by using the repeat count without parentheses. The expression used just above could also have been written as 4(3bt).

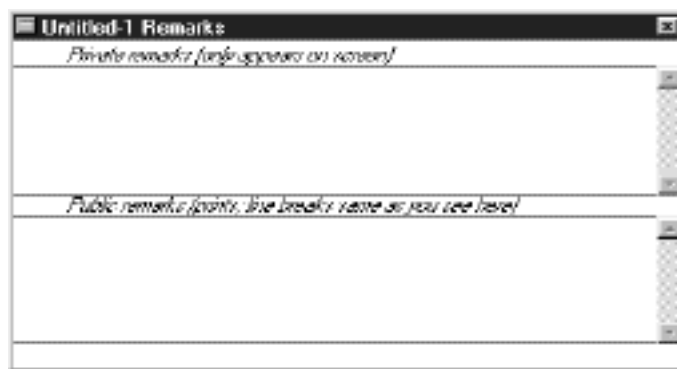
d) If the expression specifies fewer ends than are in the design, the pattern you have specified is repeated across the design.

### **Remarks Window**

With each design you create, you may type comments which are kept along with the design (so when you save your design to disk, your comments are saved along with it). The Remarks window is illustrated at the bottom of this page.

### **Preferences**

Use this menu item to define the characteristics of your loom, so when you launch WeaveMaker or use New, you will get a blank design with the right number of harnesses, treadles, and the proper choice of tie-up or peg plan.







# Loom Menu

## Loom

12 Harnesses  
20 Treadles  
600 Warp Threads  
500 Weft Threads  
50 Ends per inch  
80 Picks per inch

Peg Plan  
Treadling  
Tromp as Writ  
Color Tromp  
Double Beam

Back Side  
Omit Structure  
Omit Color ☹E

Turn Fabric 90°  
Turn Weave 90°  
Exch Warp-Weft Colors

Warp Floats  
Weft Floats

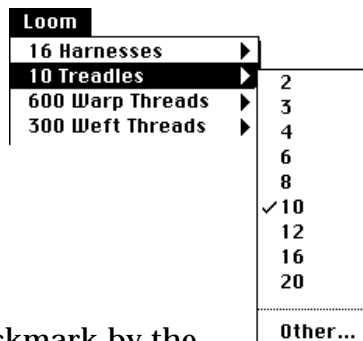
## Setting or Querying the Loom Size

The first six items in the Loom menu control the size of the loom (number of harnesses, number of treadles, number of warp ends, number of weft ends, and threads per inch). They also show the current settings of those values.

The example given here deals only with querying and setting the number of treadles, but the same approach is used with any of these items.

12 Harnesses 20 Treadles 600 Warp Threads 500 Weft Threads 50 Ends per inch 80 Picks per inch
Peg Plan Treadling Tromp as Writ Jacquard Color Tromp Double Beam
Turn Fabric 90° Turn Weave 90° Exch Warp-Weft Colors
Back Side Omit Structure Omit Color      ⌘E
Warp Floats Weft Floats

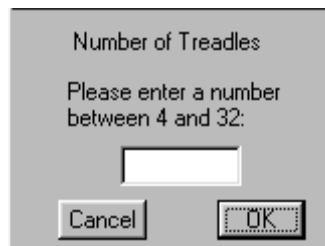
Clicking on “Treadles” causes a subsidiary menu of sizes to pop up (illustration below). The



checkmark by the “10” shows the design is sized for that number of treadles. To change the size, release the mouse over the desired size.

If the size isn’t one of the standard ones then it appears in parentheses after “Other...” A loom with 13 treadles would have a checkmark on the last entry, which would read “Other (13)...”

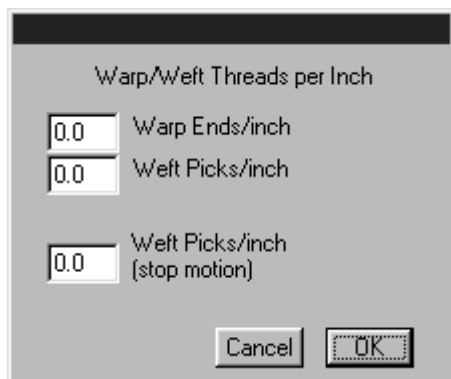
To set a nonstandard size select “Other.” You will be asked to type in the desired number of treadles.



### **Threads/Picks per Inch**

Selecting either “Ends per Inch” or “Picks per Inch” brings up a dialog box (see illustration below) where these values may be entered.

Values may be entered to the nearest 1/10 of an inch.



The Design window rulers (please see “Design Window” in the Index for details) are scaled based on the values set for ends per inch and picks per inch. The on-screen rulers are quite accurate.

### **Stop Motion**

If you wish to have portions of the weft beaten more tightly than normal (so-called “stop motion”) you can indicate a second picks per inch value (see illustration above) which indicates the tighter spacing.

To use this alternate value, make sure the stop motion grid is visible in the weft (please see “Stop Motion” in the Index for details). White squares in the

stop motion grid indicate normal weft spacing, while black squares indicate stop-motion and use of the secondary picks per inch value.

### **Tie-up-Peg Plan Conversion**

WeaveMaker will convert a tie-up/treading design to a peg plan form, and vice-versa. If you are presently using the tie-up/treading form, you will see a checkmark by “Treading” in the loom menu, or by “Peg Plan” if you are in peg plan mode. To convert from one to the other, select the new form you want in the Loom menu.

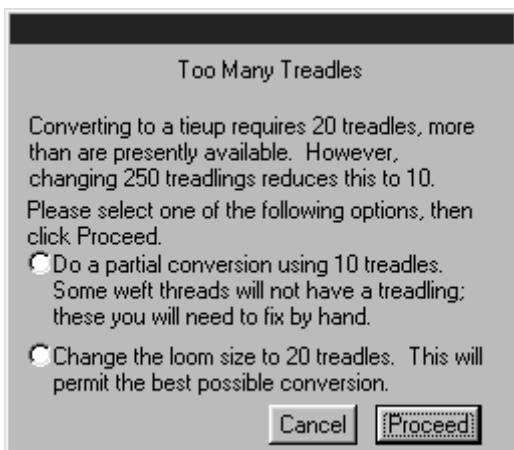
It is always possible to convert a tie-up/treading to a peg plan. However, not all peg plans can be converted to tie-up/treadings with a reasonable number of treadles. If the peg plan can be converted to a tie-up/treading that is within the number of treadles you have assigned to the loom, the conversion proceeds without further ado. If not, WeaveMaker deals with the problem by calculating the number of treadles that are required, and then asking you to select one of two options. An example of the type of message it displays appears at the bottom on the next page.

If you elect to proceed with the existing number of treadles, click the radio button (small circle)

conversion. In this example, you would have to edit 250 treadlings in the converted design. You can easily find the omitted treadlings, as they are entirely blank (that is, you would expect in this case to find 250 weft threads which do not have any treadling).

If you want to increase the number of treadles in the design (thereby reducing the number of edits necessary), click the second radio button and then click Proceed. WeaveMaker will not increase the number of treadles beyond 32 in any circumstances, so you may still get a partial conversion if the number of treadles needed exceeds 32.

Of course, you can always click Cancel and abandon the conversion effort altogether. In this case, no change is made to your design.

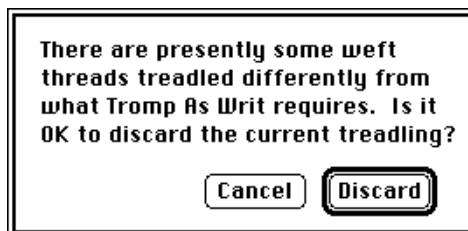


### **Tromp as Writ**

There are several forms for tromp as writ. All of these derive the treadling from the threading, which is the general meaning for tromp as writ.

While tromp as writ is in effect, any changes made to the threading are reflected immediately in the treadling. The treadling is displayed but is grayed out, reminding you that you cannot edit the treadling.

Upon entering this mode, any existing treadling is discarded, although you will be first asked for your permission through a message (see illustration below).

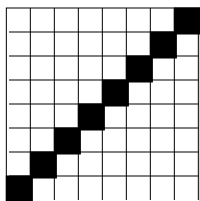


**Normal**

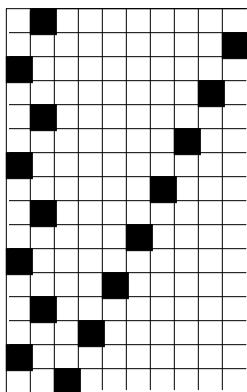
Makes the treadling and threading equivalent for as long as it's checked.

**Tabby**

Creates the treadling by interleaving the threading with a tabby on two treadles. The treadling is thus twice as long as the threading and two more treadles than there are harnesses. For example, the straight draw threading



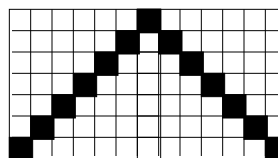
becomes



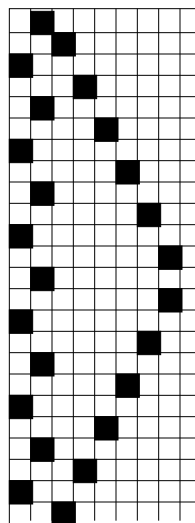
in the treadling.

**Overshot**

Similar to "tabby," but the threading is modified slightly before being placed into the treadling. For example, "points" in the threading are flattened, as shown in the following example.



becomes



**Jacquard**

Helps you treat a WeaveMaker doobby design as a jacquard weave.

WeaveMaker is designed as a doobby weaving program, not as a jacquard design program. But some of the cornucopia patterns, while beautiful, have such long floats that they will not successfully doobby weave. One solution to this problem is to weave them as jacquards. WeaveMaker's jacquard mode is provided to help you do this.

This topic is treated at length in the "Jacquard" section (please see "Jacquard" in the Index for details).

**Color Tromp**

Makes the weft colors and color arrangement a precise copy of the warp colors and color arrangement as long as this item is checked. Any changes made in the warp coloring are instantly reflected in the weft.

This feature makes it easy to create square plaids.

**Turn Fabric 90°**

Interchanges the threading and treadling and the warp and weft color arrangements, which is equivalent to turning the fabric 90° on a loom.

This option is only available for a tie-up design. In general, a peg plan cannot be used as a threading, which is the reason for this restriction.

**Turn Weave 90°**

This is similar to Turn Fabric 90°, except that the warp and weft colors and color arrangements are not altered.

**Exch Warp-Weft Colors**

Interchanges the warp and weft colors and color arrangements.

### **Back Side**

As its name suggests, when this menu item is checked the drawdown shows the reverse side of the fabric. This does not actually reverse the fabric, it merely temporarily reverses the display.

### **Omit Structure**

Checking this menu item causes the drawdown to be displayed as though you were working strictly in plain weave. Whatever threading, tie-up, treadling, or peg plan in place is temporarily ignored.

Use this display setting if you want to see just the effects of your warp and weft color arrangements, without being distracted by how they interact with the structure of the fabric.

### **Omit Color**

Checking this menu item causes the drawdown to be displayed in black and white. This gives the clearest possible view of the structure of the fabric.

Use this display setting when you are doing complicated color-and-weave design and you temporarily want to see just the structure you have created.

### **Warp Floats/Weft Floats**

WeaveMaker provides several ways to analyze floats (please see “Floats” in the Index for details). This section discusses how to see all the floats in your fabric at once.

The Warp Floats and Weft Floats commands show you all the floats in the entire fabric, all at one time. By clicking on a particular float that you see in this view, you can immediately shift to the more detailed float view and fix the problem. Indeed, both float modes can quite naturally be active at the same time.

Warp/Weft Floats finds all floats in the fabric and then colors them according to the following system (which you are free to modify to suit your needs):

<b>Float Length</b>	<b>Color</b>
up to 3	white
3-4	green
5-7	blue
8 and over	red

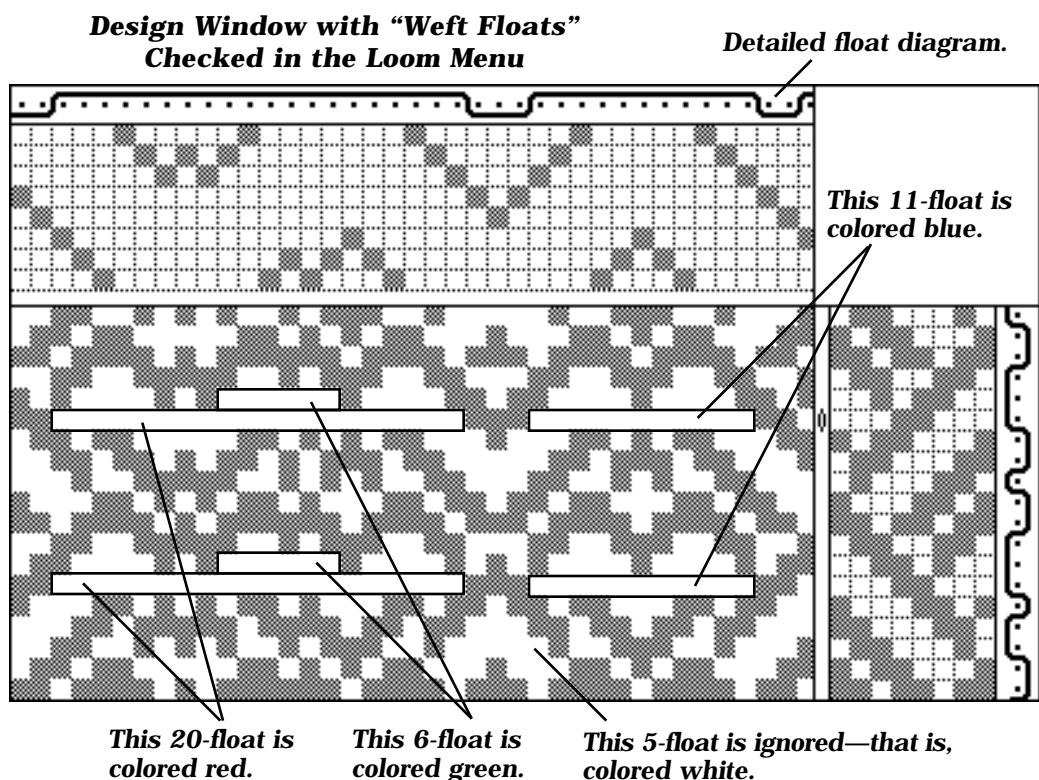
The illustration on the facing page shows how such a display is formed (the horizontal white

boxes would be solid colors on the computer screen).

Because the float displays use color to show float locations, you may wish to use "Omit Color" (see at left) so your fabric colors do not get mixed into the float display.

### **Float Controls**

You can control both the float lengths which are displayed and the colors used to display them, using the Tools menu (please see "Tools" in the Index for details).



The colors shown illustrate the weft floats display with the float controls (in the Tools window) set to give green for floats of 6 to 10, blue for 11 to 15, and red for 16 and over.

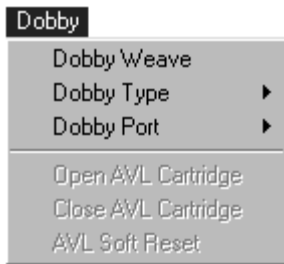


## **Dobby Menu (Dobby Loom Controls)**

Some looms have electronic devices built in which permit them to be connected directly to a computer, which then controls the lifting of the harnesses. The Dobby Menu has the commands you need to directly drive various doobby looms.

With WeaveMaker, you can use your computer to drive your loom at the same time someone is using your computer for an entirely different purpose. Details on the loom controls and simultaneous use of your computer are on the following pages.

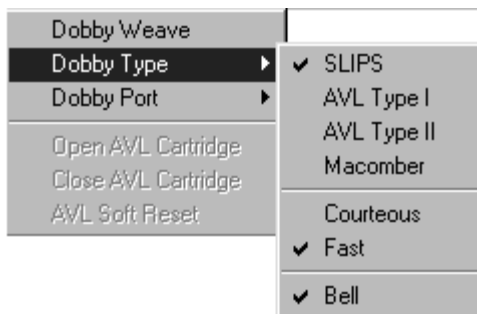
There are three entries in the Dobby menu which give you tools for controlling the loom:



These are considered here in reverse order.

Use **Dobby Port** to indicate which port on your computer is connected to the loom: modem or printer.

Use **Dobby Type** to how your loom operates. The loom hardware expects to receive information from WeaveMaker in a certain form.



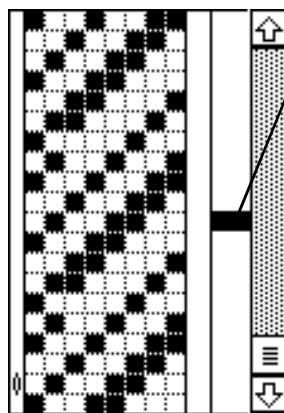
This menu item lets you choose WeaveMaker in the proper protocol for signalling information to your loom. Dobby Type is more fully covered in the following section. WeaveMaker drives AVL, Macomber, and SLIPS doobby looms.

Once you have Dobby Port and Dobby Type set properly, use **Dobby Weave** when you are ready to start weaving. You can weave from either a peg plan or a tie-up design.

### Courteous v. Fast (Dobby Type)

With WeaveMaker, you can use your computer to drive your loom at the same time as someone else is using other software on the computer. So, for example, you can sit at your loom

*When Dobby Weave is set, this heavy bar appears in the Peg Plan to mark the active pick.*



*To change the active pick, click with the mouse next to the desired pick. The bar will move to confirm your selection.*

and weave while someone else does word processing or plays games on the computer. Or, if you are the one doing word processing, you can weave using WeaveMaker while you wait for a long document to print. If you want to do this type of simultaneous use, select "Courteous" mode in the Dobby Type menu. This tells WeaveMaker to share computer time with other applications you have launched.

A difficulty with courteous mode is that sometimes the computer will be busy doing something else when you are ready to treadle the loom. In this case, you have to wait. If you have exclusive use of the computer, there is no need to be courteous to others, and you should select "Fast" mode in the Dobby Type menu. This directs WeaveMaker to take over the computer completely, fully devoting it to communicating with the loom, which eliminates the delays which can arise in courteous mode.

If you select Fast mode, WeaveMaker will not update the computer's display screen as you weave (it puts all its energy into keeping up with the loom). In courteous mode, however, WeaveMaker keeps the screen updated. Depending on what you are weaving, you might want to select courteous mode just for the fact that you can visually track what you are weaving.

## SLIPS Looms

SLIPS is a set of rules which describe how a computer and a dobby loom communicate. Several manufacturers use SLIPS. The discussion which follows centers on the Baby Wolf loom from Schacht Spindle, but any SLIPS-compliant loom will follow the same general outline of operation.

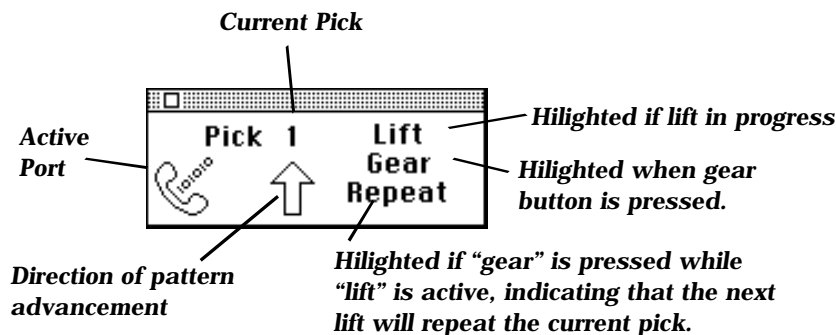
For Schacht Spindle Looms, such as the Baby Wolf, set the Dobby Type (Dobby menu) to SLIPS.

There are two basic strategies for using WeaveMaker with a Schacht loom. If you wish to weave rapidly (more than 15 picks per minute, say), make sure Fast is checked and Bell is not.

If you do not weave extremely rapidly, select Courteous mode. This lets other applications run on your Macintosh even while you are weaving, and it provides better screen updating, so you can easily and accurately track your weaving by consulting the screen of the computer.

**Suggestion: on SLIPS (e. g., Schacht Spindle) looms, turn on your loom electronics before putting WeaveMaker into dobby weave mode (if you do it in the reverse order, the start-up signals from the loom are seen by WeaveMaker, and these look just like a normal "gear" button signal, which fools WeaveMaker into advancing to the second pick. This does not cause any damage, but it is inconvenient to then have to put WeaveMaker back into pick 1).**

Here is how the Tools window looks while you are weaving on a SLIPS loom:



### ***Dobby Bell (Audible Go-ahead)***

WeaveMaker has both a visual and an audible way to help you while you are actually weaving (that is, when you are Dobby Weaving).

The audible signals are provided in case you cannot see your computer screen from your loom (there is no need to take your eyes off your work to look at the computer).

### ***Normal Treadling***

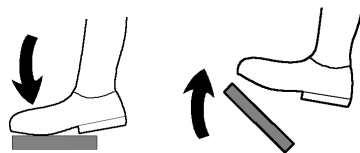
The normal cycle of treadling consists of hearing the computer beep, then treadling the loom (see illustration below).

When you release the treadle, the harnesses return to rest, WeaveMaker calculates the next lift. You then hear the beep which signals you that you can once again treadle the loom.

When the computer beeps,



you treadle the loom.



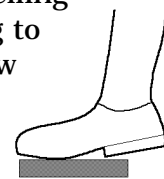
### ***Abnormal Treadling (Incorrect lift)***

There are several reasons why normal treadling can fail. The computer may not send the lift information to the loom fast enough, static may interfere with

the communication between the loom and the computer, or the doobby mechanism may fail to engage properly.

To recover from an incorrect lift:

a) Press and release the Gear button before releasing the treadle. The computer will give two short beeps, telling you that it is going to repeat the lift. Now release the treadle, wait for



the computer

to beep (start of a normal cycle), and

***To repeat a lift, press Gear while holding the treadle down.***

then treadle the loom normally.

b) If you do not or cannot use method (a), you can use the up or down arrow on the keyboard to move forward or backward one thread (depending on the direction you are weaving). The computer will then beep to signal the start of a normal cycle.

### ***Reversing Direction***

If you are using a Schacht Comby unit, you can reverse direction at the start or end of any normal lift (that is, at any time when the harnesses are in rest position). Simply press and release the Gear button. You will hear two long, slow beeps, at which point you can start a normal treadling cycle.

### **AVL Looms**

AVL Compu-Dobby looms can be driven directly from WeaveMaker, or you can transfer information about your peg plan from WeaveMaker into an AVL cartridge, whereupon you can doobby weave without having your computer connected to the doobby unit. The immediately following section deals with directly driving the loom. If you are interested in AVL cartridge operations, please proceed to the section entitled “Open AVL Cartridge” on the next page.

### **AVL Dobby Weaving**

Make sure you set the Dobby Port menu item to correctly reflect how you have cabled your computer to the loom. AVL users can ignore the earlier discussions of “Fast” and “Courteous”—either mode works well with AVL looms.

### **AVL Loom Switches**

AVL Compu-Dobby looms have six push-buttons located on a control box mounted on the right-hand side of the castle (near the black doobby box). WeaveMaker responds to these buttons during weaving (if you are weaving from a cartridge, the buttons have somewhat different meanings).

#### ***SKIP Switch***

Skip the next pick.

#### ***REVERSE Switch***

Reverse the direction of weaving.

#### ***PATTERN Switch***

Go to pick #1 and set the weaving direction to forward.

#### ***SAVE Switch***

#### ***RESUME Switch***

#### ***TABBY Switch***

These are all ignored.

### Open AVL Cartridge

Dobby looms from AVL have a cartridge (a box the size of a pack of cigarettes) which stores up to five peg plan patterns. Storing patterns in the cartridge lets you weave without having your computer connected to the loom. WeaveMaker fully supports AVL cartridge operations.

When you ask to open the cartridge, you will see a window like the one shown below. The five cartridge storage areas are represented by the five rectangles on the left of the screen. Here, only the first storage area is in use; the others are all empty.

You move information between WeaveMaker and the cartridge using copy and paste. Clicking on any of the five storage areas blackens it. Use Copy to pick up information from the cartridge

and then use paste to put it into a WeaveMaker design. To put information into a cartridge, reverse the steps.

### Close AVL Cartridge

Tells WeaveMaker that you are done reading or writing information to the cartridge. Remember: no changes actually occur in the cartridge until you click "Save" in the cartridge window.

### AVL Soft Reset

Sends a "software reset" command to the loom. This is helpful in switching the loom's dobbie device between regular weaving mode and cartridge read/write mode.

The screenshot shows a window titled "AVL Generation II Cartridge". It contains a grid of storage areas on the left and a summary table on the right. The first storage area is labeled "Pattern #1" and "26 Picks" and contains a grid of 26 small squares. The other four storage areas are labeled "Unused". The summary table shows "Cartridge Space" with "In Use" at 26, "Free" at 2656, and "Total" at 2682. There are "Erase All", "Cancel", and "Save" buttons. A note at the bottom states: "Note: no permanent cartridge changes are made until you click 'Save'. Clicking 'Cancel' leaves the cartridge unchanged."

Cartridge Space	
In Use	26
Free	2656
Total	2682





# Views Menu

## View

Threading  
Denting  
Warp Ruler  
Beaming  
Warp Colorbar  
Warp Color Grid  
Warp Float Diagram

Peg Plan  
Treadling  
Weft Ruler  
Stop Motion  
Weft Colorbar  
Weft Color Grid  
Weft Float diagram

Design Window  
Fabric Window  
Tools Window  
Colorways Window  
Schemes Window  
Remarks Window  
Cursor Position

*names of active designs*

The View menu controls the amount of information displayed on the screen. You can show or hide entire windows, or in the case of the design window, various parts within the window.

### **Design Window Elements**

The first two sections of the Views menu control the amount of information displayed in the Design window.

The illustration on the facing page shows these parts.

### **Showing or Hiding Windows**

The third block of entries in the View menu control the display of entire windows. Releasing the mouse over one of these items makes the corresponding window come to the front and become visible. Windows may be closed by clicking the mouse in their close box (the small box at the top-left corner of the window).



**Denting**

Selecting “Denting” in the Views menu reveals the denting grid immediately below the threading (see illustration at bottom of page).

The denting is shown as two rows of X’s, aligned with the threading (one X per end). A series of X’s in the same row indicate that the corresponding ends are to be placed in the same dent. When an end’s X switches to the opposite row, this indicates that the end should be placed into the next dent. For example,

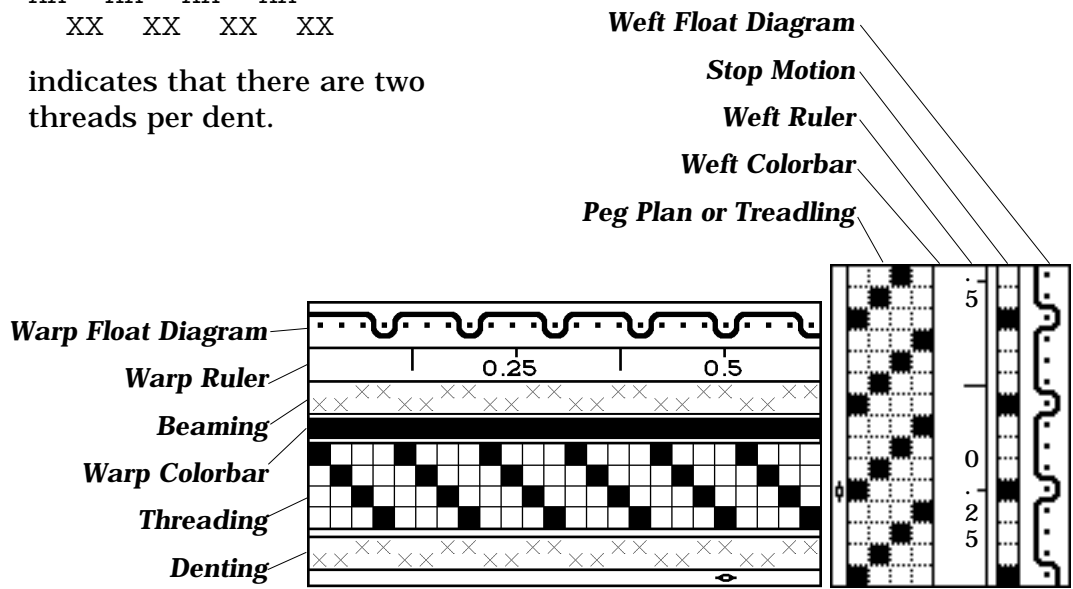
```
X X X X X X X X X X
  X X X X X X X X X
```

indicates that each thread goes in a separate dent, while

```
XX XX XX XX
  XX XX XX XX
```

indicates that there are two threads per dent.

When the cursor is over the denting grid, it turns into a square. Clicking on any X moves that X to the opposite row. Typing 1, 2, 3, or 4 on the numeric keypad while the square cursor is over an X causes a red line to appear to the left of that position, indicating a skipped dent. The number of dents skipped corresponds to the key value typed (1 to skip 1 dent, 2 to skip 2 dents, and so forth). Type 0 (zero) to eliminate a skipped dent.



### **Stop Motion**

If you are designing for a loom that provides stop motion control, you can indicate that you want to trigger the loom's stop motion on a particular pick by blackening the square next to that pick in the stop motion grid (see illustration on previous page).

The effect of setting stop motion depends upon the design of the loom. In general, what "stops" in "stop motion" is the advance of the fabric. Normal weaving and beating goes on as usual, but since the fabric isn't advancing, the fill (weft threads) gets packed more tightly at this point in the fabric, which creates a distinctive texture at that point. Or, if colors are chosen appropriately, the extra threads can create a visual effect on the surface of the fabric.

The stop motion grid is printed out alongside the peg plan.

### **Show Cursor Position**

This controls the display of the cursor position when the cursor is positioned over one of the grids in the Design window. The display occurs in the Tools window.

### **Active Window Names**

The names of all active (open) designs and palettes appear at the bottom of the Windows menu. The one with the checkmark is the frontmost design, the one you are presumably editing. Clicking on an unchecked design name causes its windows to come to the front.

# Library Menu

An extensive collection of fixed weave structures is available through the Library menu. Note that, unlike WeaveMaker's cornucopia, the Library weaves are static—they always give the same weave, each time you use them.

## Library

- Threading ▶
- Tie-up ▶
- Treadling ▶
- Peg Plan ▶

- Plain Weave
- Basket Variations
- Straight Twill Variations
- Point Twill Variations
- Diamond variations

- Alternate
- Check Variations
- Log Cabin Variations

- Network
- About Network...

The library menu provides a collection of standard, fixed weave structures: threadings, tie-ups, treadlings, and peg plans.

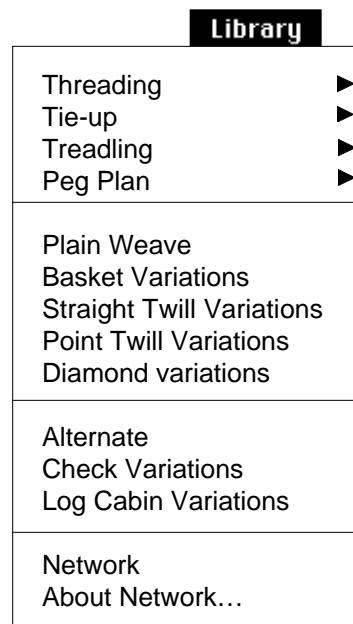
The first four items in the Library Menu help you quickly set up certain standard loom warp or weft configurations, such as tabby (plain weave), straight draws, and point draws. As their names suggest, these change only the threading, tie-up, treadling, or peg plan.

The remainder of the Library menu are whole-fabric designs. Each of these fills in all of the threading, tie-up, treadling, and peg plan, which in turn gives an entirely new weave structure.

Several color arrangements are also provided in the Library menu.

Those items which end in the word “Variations” generate a different weave or color arrangement each time they are clicked. There will be a family resemblance among the patterns they create, but you can click again and again to get countless variations.

If you have a favorite weave structure you’d like to see added to the Library menu, you can either send Designer Software the design elements (threading and peg plan, for example) or a sample of the fabric, the latter approach being the more expensive.



# Special Menu

## Special

Heddles/harness  
Floats Histograms  
Repeats

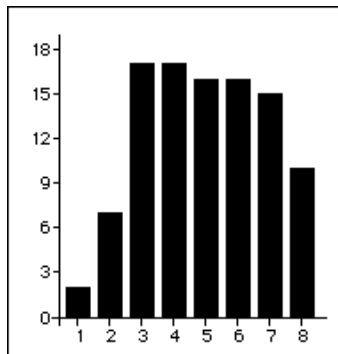
Split Harness...

Show Fabric in 3-D  
Fabric Swatch

Yarn Conversions...

### **Heddles/Harness**

This displays a chart showing the number of heddles assigned to each harness. For example, here is the chart for a particular design done on 8 harnesses:



From the chart, you can see that harness #1 has very few heddles in use (2, actually), and harness #2 has fewer heddles than most of the rest.

This chart may be useful in helping you decide whether your design could be woven on fewer harnesses. In the example shown here, harness #1 probably could be eliminated without seriously altering the design.

Another use for the chart is to help you estimate the lifting weight of each harness.

### **Repeats**

This command brings up a window in which repeats for the weave structure and color arrangement are displayed. As you work on your design, you can refer to this window at any time to see what repeats you have created.

This function is most useful when you have been using a variety of tools to create a design (the marquee, pencil, copy/paste, insert/delete), and now you want to begin analyzing what it is that you have created.

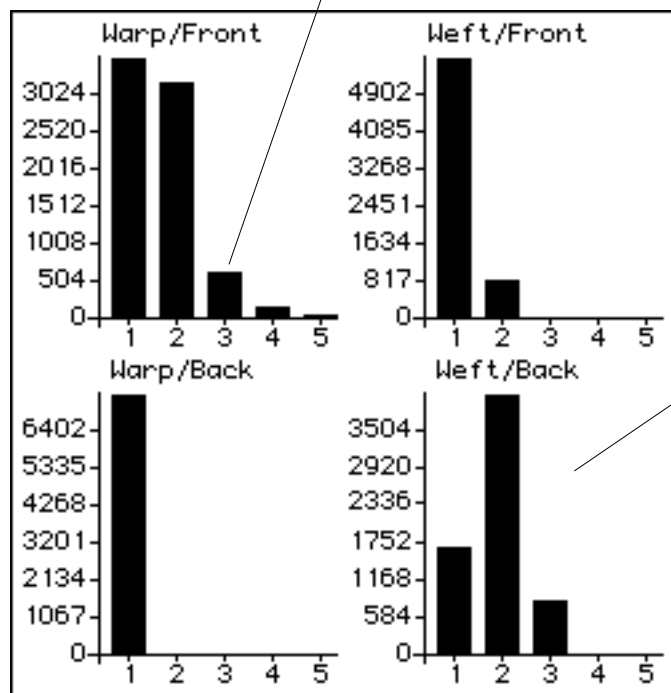


### Float Histogram

This displays a chart showing the float lengths in the design (see illustration below). All four float types are shown simultaneously (the types are: warp floats on the front of the fabric, weft floats on the front, warp floats on the back of the fabric, and weft floats on the back).

The length of each black bar is proportional to the number of floats of that length and type. The chart does not tell you where these floats appear in the fabric, simply that they appear somewhere. For a way to directly look at where the floats occur, please see “Floats, whole fabric” in the Index.

*This bar indicates that there are about 600 floats of length 3 in the warp on the front of the fabric.*



*This Weft/Back chart suggests that most (about 4,000) of the weft floats on the back of the fabric are of length 2; about half that many are of length 1, and a few (600 or so) are of length 3. None are longer than 3.*

## **Split Harness**

This command helps you redistribute the heddles without altering your fabric design. The heddles which are presently on one harness are rearranged so they are on two harnesses.

Splitting a harness adds one harness to the design. The new harness receives half the heddles from the harness you split; the rest stay on the original harness.

For example, if you split harness #2 in an 8 harness design, you will then have 9 harnesses. Harness #2 will have half as many heddles as it did before. The heddles removed from harness #2 are moved to harness #9.

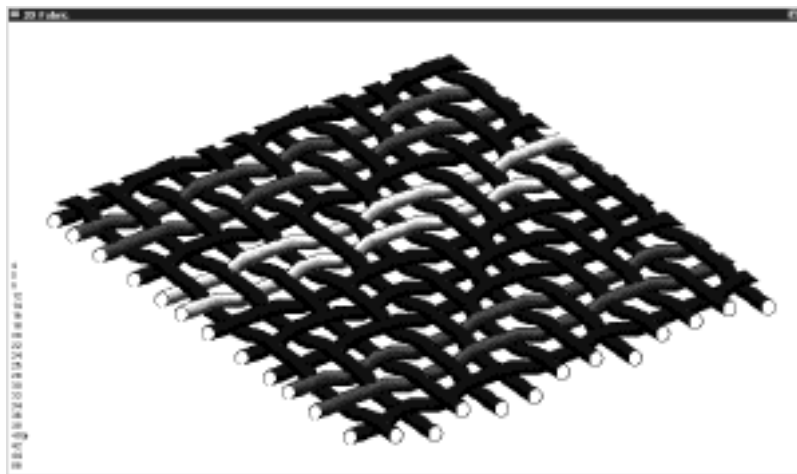
If you do not want the new harness to remain as harness #9, use the Hand tool to do a harness shuffle (please see “Hand Tool” in the Index for details).

## **Show Fabric in 3-D**

This brings up a window (see illustration below) displaying a highly magnified view of the fabric structure and color arrangement, using a very smooth yarn (monofilament, for example). Various levels of magnification are provided.

Only the bottom-left corner of the design is shown.

The intent of the “3-D” view is educational: it is a great way to show people the details of a fabric structure, and it can also help you understand the fabric better.



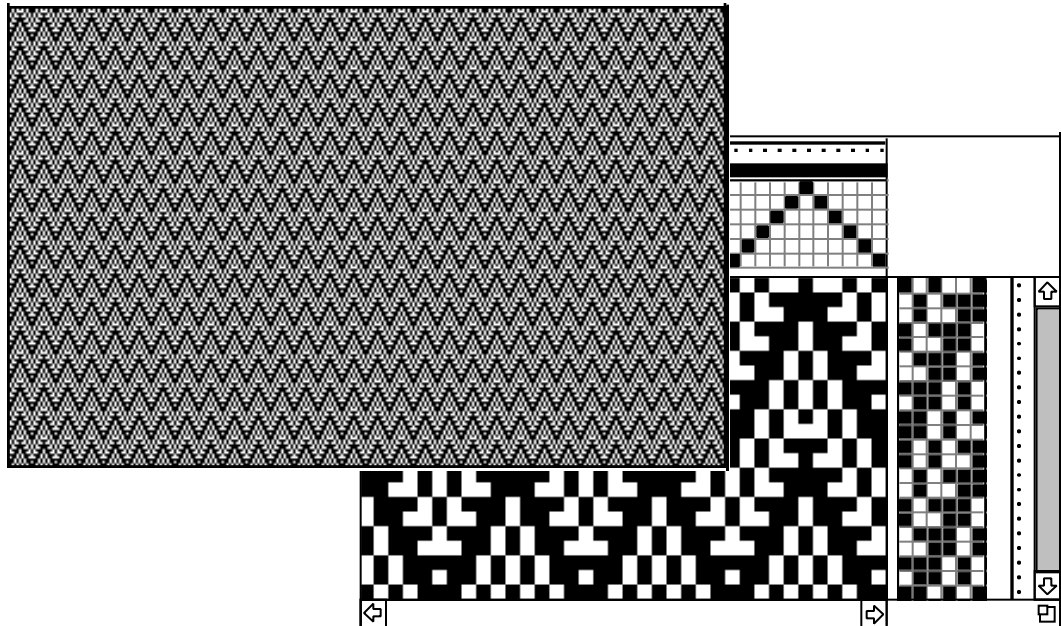
## Fabric Swatch

This controls how the background Fabric window displays a colored example (swatch) of your design (see illustration at bottom of page).

When you click on this menu entry, it reveals several options:



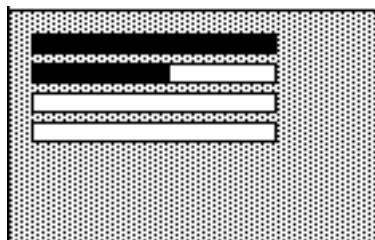
*The format of this window is controlled by the "Fabric Swatch" menu item in the Special menu.*



### ***One Pixel Per Thread***

This view shows the color and weave as though the fabric were woven at the same ends and picks per inch as the dots on the screen (roughly, 72 ends/inch and picks/inch). The primary value of this view is that it is created nearly instantaneously on nearly any model of computer. Thus, it is most useful when you are working rapidly and need to get a rough check of your design.

Since it is easy for the computer to create this view, using it does not slow the computer down, and thus your design work is not disrupted by the computer stealing time away to work on creating a rendered image of the fabric.



***Fabric Window with Weave Simulation in Progress***

### ***Weave Simulation***

The term “weave simulation” means creating a picture of what a fabric would look like if it were woven, without actually weaving it, taking into account the weave structure, thread colors, thread spacing, and yarn characteristics.

The resulting picture can be displayed on the screen or printed out.

WeaveMaker will do a weave simulation using several different types of uniformly dyed yarns of equal size and spacing.

### ***On-Screen Simulation***

To create a weave simulation on the computer screen, select “Weave Simulation.”

The Fabric window will immediately gray out and several horizontal white bars will appear. These turn black as the weave simulation progresses (see illustration at left).

After the weave simulation is complete, the Fabric window fills with the weave simulation picture (see facing page).

As the computer screen is fairly low resolution (70 to 80 DPI), the fabric detail can be difficult to make out. For this reason, you can temporarily double the size of the display by selecting the “Fabric Simulation (2X)” option. It shows the same simulation

picture blown up to twice its regular size.

Several styles of yarn are available in the simulation. You cannot, however, design your own yarns, nor scan them in from real life.

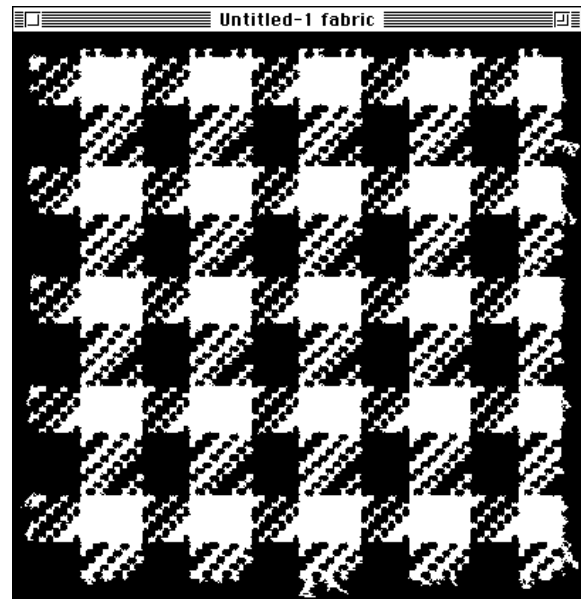
The ends per inch and picks per inch settings are taken from those set in the Loom menu.

The Settings entry lets you select a yarn type for the simulation. Selecting Settings brings up this window:

Yarn Characteristics	Color matching
<input type="radio"/> Gassed	<input type="radio"/> Screen
<input type="radio"/> Fuzzy	<input type="radio"/> Printer
<input type="radio"/> Hairy	<input type="checkbox"/> Solid Blacks
<input type="radio"/> Brushed	

The “gassed” yarn is smooth, with few loose fibers. The “fuzzy” yarn, as its name suggests, simulates a quite fuzzy (for example, wool) yarn. The “hairy” yarn is even fuzzier.

When printing a weave simulation, some printers fail to produce convincing black areas (areas of solid black may have a washed-out, gray appearance). If this happens, try using the “Solid Blacks” setting. This reduces the quality of the simulation, but gives more solid blacks.





# **Of Mills and Money...**

## **“Yes, We Can Weave Your Dobby Design...We’ll Do It as a Jacquard”**

Only one of the following statements is true.

#1. Every design created within WeaveMaker is weaveable on a doobby loom, assuming the loom has the same number of harnesses as the design.

#2. Every design created within WeaveMaker is equally easy to weave on a doobby loom.

The first statement is literally true. If you design a fabric in WeaveMaker, it will have a threading and peg plan, which means it can be placed onto a doobby loom (although you can design something with such extreme floats that it will fall apart). All the WeaveMaker schemes produce doobby-weavable fabric designs.

But the second statement is false, at least given the current state of automation of looms (more on that point later). Here in fact is how you can go about creating a fabric which fails the “easy to weave” criterion:

- a) Set WeaveMaker to 32 harnesses.
- b) Use a ZigZag threading, with no marquee (so there is no repeat).
- c) Put 15 colors in the warp.

d) Use a color cornucopia scheme which doesn’t repeat.

If you want to try this, just as an experiment, do the design in peg plan format with “Random Walk” as the peg plan scheme. The resulting designs, while wild, are perfectly doobby weaveable.

Indeed, Designer Software has a client who uses WeaveMaker to directly drive the doobby unit on a delightful Macomber 32-harness pneumatic-assist doobby loom. For each pick, the computer sends the harness lift data to the loom’s doobby unit, and compressed air then actually raises the harnesses. The weaver merely has to throw the shuttle and bring the beater forward. Only the weaver’s hands move; her feet are at rest.

### **So Where’s the Rub?**

There are two rubs, actually. First, little (if any) commercial fabric is hand-woven on 32 harness looms! Many readers may be in the situation of never having seen such a loom, and few production studios can boast of owning one. Second, and more seriously, regardless of the number of harnesses involved, some designs are easier to thread and weave than others. And mills tend to charge more for things which take longer to weave or place added demands on their weavers.



### **Keeping it Dobby**

There are some practical guidelines to follow to ensure that a doobby design is indeed doobby-weaveable on a commercial scale.

The goal here is necessarily limited. It is beyond the scope of this manual to fully explore the intricacies of the relationship among designs, mills, prices, and commercial success as a designer. But in using WeaveMaker, the power of the schemes is such that designs which are beautiful on the screen but are hard to weave can easily crop up. So what follows are suggestions about how to approach the WeaveMaker schemes so as to avoid the problem of paying jacquard prices for designs which are weaveable on doobby looms.

### **Designing for the Loom**

Most commercial doobby looms have some form of advanced automation applied to the shuttle and the doobby mechanism. In many cases there is direct computer control. So the complexity of the peg plan is usually not a factor financially. If the shuttle can automatically pick up its thread, then the weft color selection is also fairly highly automated, so complex weft color arrangements are okay.

Hand warping and threading are commonplace, however. A complex color arrangement or threading slows down the process of getting the loom ready to weave, and increases the likelihood of mistakes creeping in. Mills naturally wish to charge more for designs which slow them down or increase their liability for mistakes.

From these observations come a few very general suggestions about harnessing WeaveMaker's powerful structure and color schemes:

#### ***Simple Warp, Complex Weft***

Keep the threading as simple as possible. Put the complexity into the peg plan.

One of the nice features of WeaveMaker is that you can work out a threading, lock it in place, and then use the cornucopia to explore many peg plans.

#### ***Have the Color Meet the Weave***

Ensure that the warp color repeat and the threading repeat fit together. One should be an even multiple of the other.

#### ***Weft Blankets***

Weave several different fabrics in succession on one threading. WeaveMaker's tools make it easy to explore a wide variety of designs which can be built against a common warp.

a given threading. Look for threadings which give a rich variety of designs.

In doing this, you can either give the warp a very simple color arrangement (like, all black, say), or discuss with your mill the possibility of tying a new warp onto the existing one (sometimes it is relatively easy to stop the loom, tie a new warp onto the existing warp, and thus change the warp color arrangement without actually re-threading the loom).

### ***Warp Blankets***

Useful effects can be achieved by inserting short stretches of complex threadings into a threading which has overall simplicity. To try this yourself, first set up a straight draw threading. Then draw a marquee around a part of that threading and click inside the marquee with the cornucopia tool. Notice how WeaveMaker confines the effect of the cornucopia to the boundaries of the marquee.

By carefully using this feature of WeaveMaker, you can easily build warps which have substantial stretches of simple threading, interspersed with more challenging arrangements.

### ***Benign Simplification***

WeaveMaker often will give you ideas which you can then im-

prove upon. One way this happens relates to complexity. Suppose, for example, you use a cornucopia and like the effect it creates, but the resulting design is too complex. Use the pencil tool and carefully click away at the complexity (try turning jaggy threadings, for example, into straighter draws). Often you can make a significant simplification of the threading without sacrificing the nifty visual feature that WeaveMaker originally showed you.

### ***Automated Looms***

Looms are getting increasingly automated. As they do, the power of WeaveMaker to create unconventional designs can be more readily harnessed. Today most looms are more highly automated in the weft than in the warp. But seek out mills which have robotic threaders. Some such threaders require a human to thread the first repeat, with the robot then doing the rest of the loom. If that is the case for you, then design fabrics which make strong use of warp repeats.

As looms in general become more automated, and as mills replace older equipment with such newer designs, you should be able to use more and more of WeaveMaker's full powers in the warp. Meanwhile, always design with one eye firmly fixed on the realities of weaving in commercial mills.

# **Cornucopia Structure Schemes**

**Controlling the Cornucopia's  
Spontaneous Generation**

## Introduction

**Schemes** are the groups of rules WeaveMaker uses to automatically generate threadings, peg plans, tie-ups, treadlings, and color arrangements (in what follows, the term **weave element** will be used to mean any one of these).

By using schemes effectively, you can rapidly create complex fabric structures and color arrangements which would be tedious (to say the least) to do by hand. As a result, you can create fabric designs which are unlikely to be created by anyone who is not using WeaveMaker. Moreover, you can create designs more rapidly with schemes than you could manually. Consequently, understanding and using schemes is important.

Because schemes are **rules** for generating a design element, there is no way to catalog all the designs a scheme can create. Schemes are by their nature open-ended. By way of contrast, if WeaveMaker had a dictionary of 200 threadings, for example, they could all be listed in this manual. But a scheme is not like a dictionary; a scheme is not simply a list. A single WeaveMaker threading scheme can generate thousands of distinct threadings.

And there are lots of threading schemes. So just listing all the threadings WeaveMaker can create would be challenging (the books would fill many shelves). Since WeaveMaker has schemes for color arrangements as well as fabric structures, all told there are millions and millions of designs which the WeaveMaker schemes can create.

Still, it is possible to give a general sense of the types of design elements each scheme creates. In the following pages you will find descriptions of each scheme. Each scheme is characterized by a general description (in words) followed by some examples of the types of design elements and fabrics which that scheme typically generates.

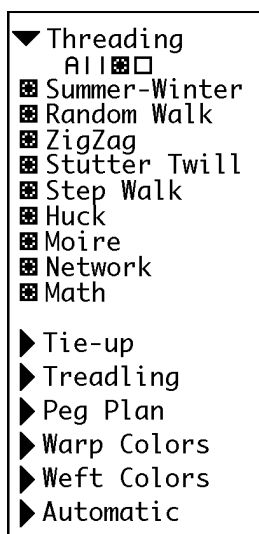
*Schemes in WeaveMaker are add-on modules (sometimes called "plug-ins"). Some of the schemes illustrated here are optional, and must be purchased separately from the base WeaveMaker Professional. Please contact the Sales department at Designer Software for details on optional and custom schemes.*

## Schemes Window

The Schemes window checkboxes (see illustration of the Schemes window below) and the Cornucopia tool control the WeaveMaker schemes. For more information on the Cornucopia tool, please see “Cornucopia Tool” in the Index.

There are two ways you can have WeaveMaker generate designs. In “automatic” mode, WeaveMaker takes over operations and generates a new pattern every few seconds, until you intervene and stop it. Alternatively, “manual” mode lets you more explicitly use the spontaneous generation feature by clicking in any grid (threading, tie-up, treadling, or peg plan)

### Schemes Window



with the Cornucopia tool, which then changes just that element of the design. In the latter case, you exercise complete control over where and when new patterns are generated.

## Turning Schemes On & Off

When you click with the cornucopia tool, or when WeaveMaker automatically generates a pattern, one of the eligible schemes is chosen at random and its rules then do the actual pattern generation. Through the schemes window, you control which schemes are eligible for use.

For example, when you click on “Threading” in the schemes window, the threading entry “opens up” and you will then see a list of threading schemes (please see illustration at left). Because schemes are constantly being added to WeaveMaker, your copy of the software will doubtless have more scheme names than are illustrated here.

Any scheme name which has an X in its checkbox is eligible for selection. If you temporarily do not want a particular scheme used, remove its checkmark by clicking on the checkbox or the scheme name. Click again to restore the checkmark.

Some of the scheme names, such as Summer-Winter, will

look familiar to any weaver. Others, such as Random Walk, may not. But whatever the name, each scheme is a set of rules for generating a pattern using a combination of strict requirements and an element of randomness. So each time you use a scheme, you get a pattern which is reminiscent of the previous use, but with some new twist.

To learn more about the characteristics of a particular scheme, try using it. Uncheck all the other schemes (the easiest way is to click the white box next to the word “All”) and then click on the scheme name, and then use the Cornucopia tool to click in any grid.

### **Automatic Mode**

Clicking on Automatic in the schemes window reveals a set of controls for handling automatic mode. Clicking in the “Automatic” checkbox starts (or stops) automatic mode. In this mode, a new pattern is generated once every few seconds. You can sit back and watch the patterns go by. If you see a pattern you like and want to “freeze” it, just exit Automatic

mode. The pattern will remain on the screen, so you can edit it or save it.

The patterns generated in automatic mode respect the scheme restrictions you specify through the other parts of the scheme window.

Automatic mode normally alters all the design elements and the warp/weft color arrangements. Click on the padlocks (not pictured) to “lock in” design elements you want to keep as they are.

### **Scheme Examples**

The next few dozen pages show examples of the “base” schemes (which are shipped with every copy of WeaveMaker) and optional schemes (which may be separately purchased).

There are also special-purpose and proprietary schemes (which are developed for the exclusive use of a particular customer) which are not illustrated here. Please contact the Sales department at Designer Software for the particulars.

All the examples are in black and white because these all show structure schemes (which

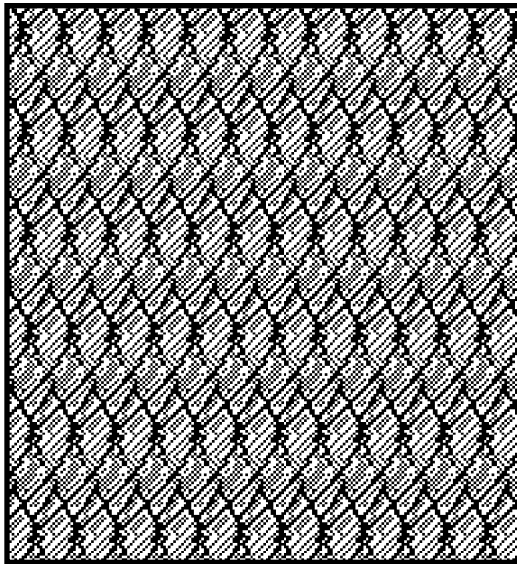
determine the weave). Schemes for doing color arrangements are covered in the “Cornucopia Color Schemes” section (please see “Color, Schemes” in the Index).

The early examples are all based on a straight draw threading on 8, 12, or 16 harnesses. More complex threadings are introduced later in the section.

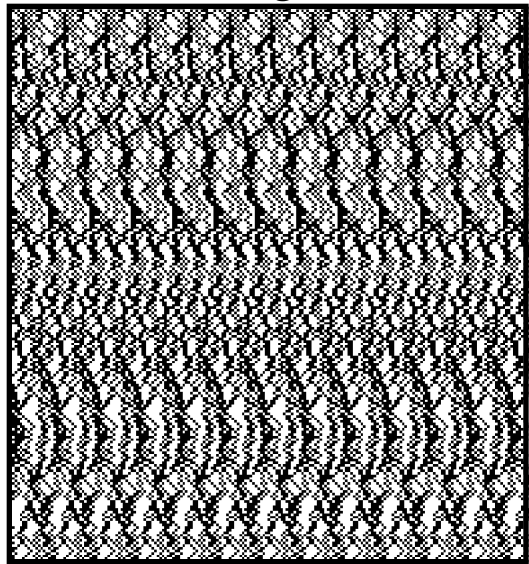
Schemes based on tie-ups are illustrated separately (please see “Schemes, Tie-ups” in the Index for details). All tie-up fabrics can be automatically converted to peg plans for commercial mill weaving (please see “Conversion” in the Index for details).

*Various peg plan schemes are shown, applied against a simple straight draw threading. These examples show how complex fabrics can be created which remain inexpensive to doobby weave, because they confine the complexity to the peg plan.*

***Random Walk Peg Plan***

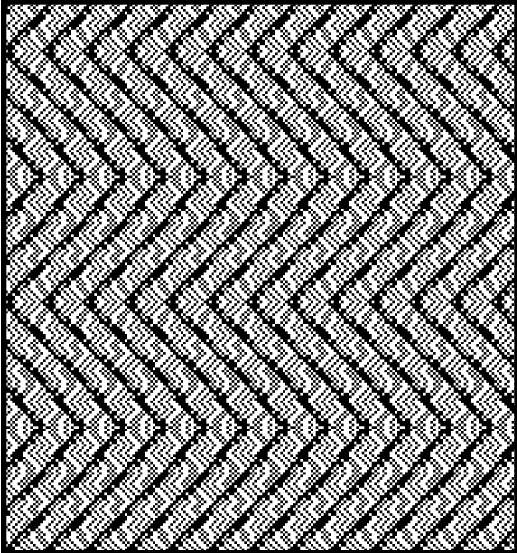


***Random Walk Peg Plan***

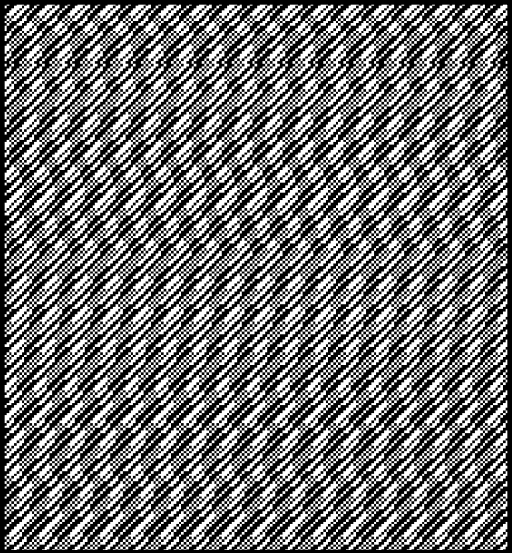


Various peg plan schemes are shown, applied against a simple straight draw threading. These examples show how complex fabrics can be created which remain inexpensive to doobby weave, because they confine the complexity to the peg plan.

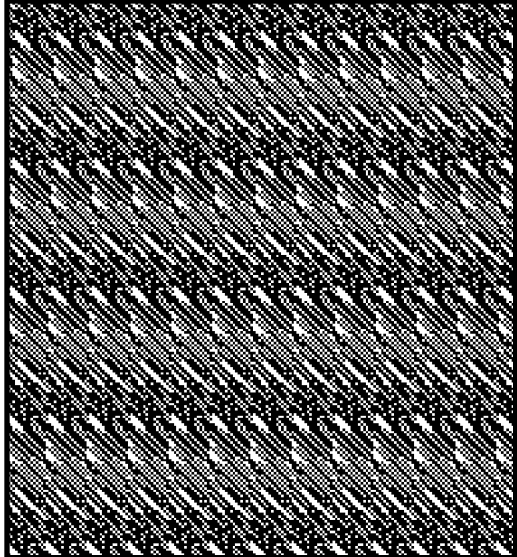
***Twill Overlay Peg Plan***



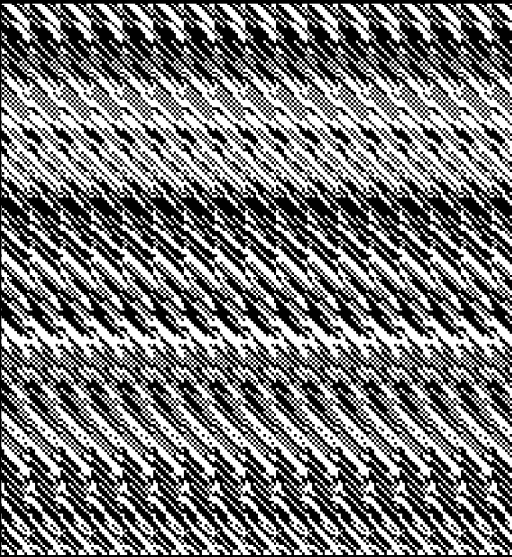
***Twill Overlay Peg Plan***



***Slashes Peg Plan***



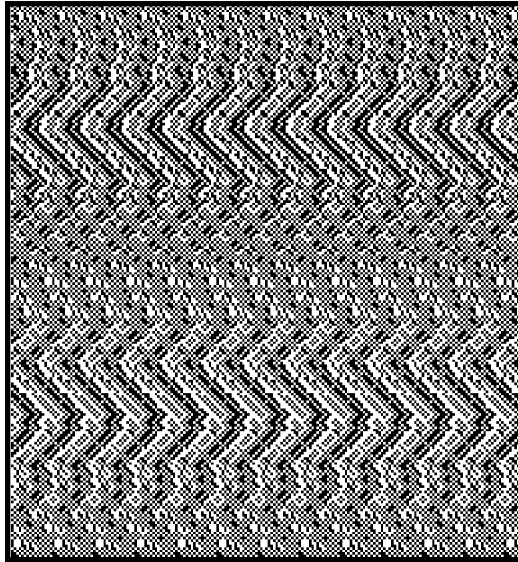
***Slashes Peg Plan***



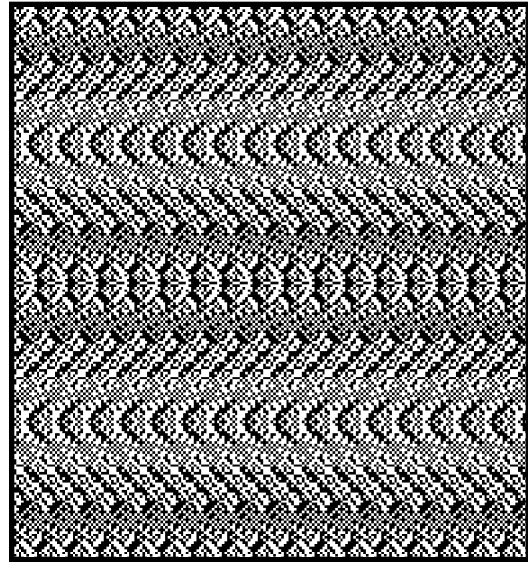


*Various peg plan schemes are shown, applied against a simple straight draw threading. These examples show how complex fabrics can be created which remain inexpensive to doobby weave, because they confine the complexity to the peg plan.*

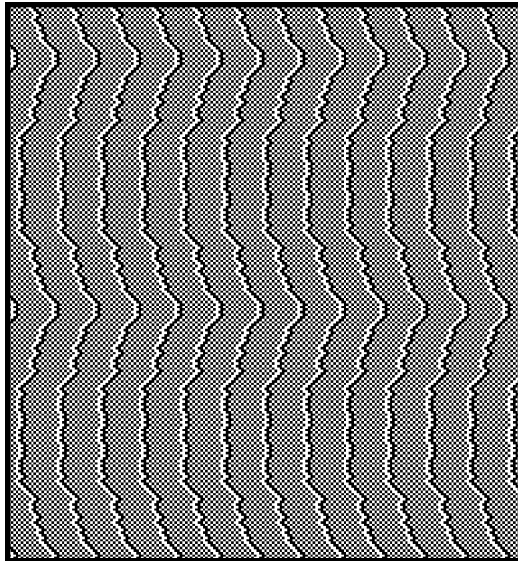
***Tabby Twill Peg Plan***



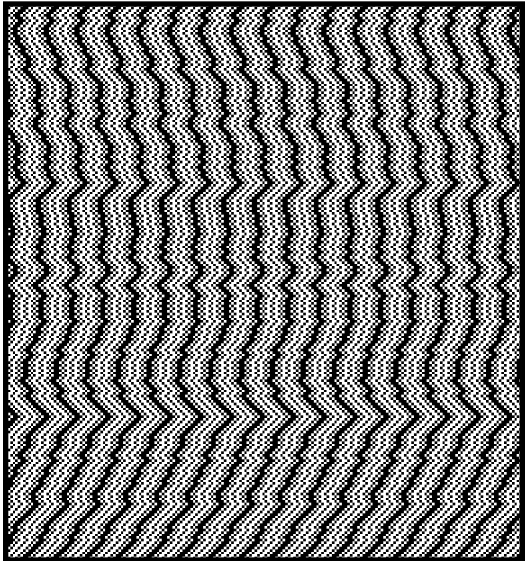
***Tabby Twill Peg Plan***



***Twill Walk Peg Plan***

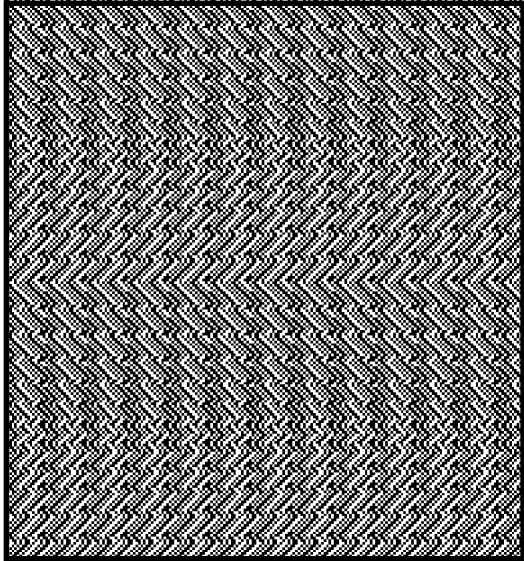


***Twill Walk Peg Plan***

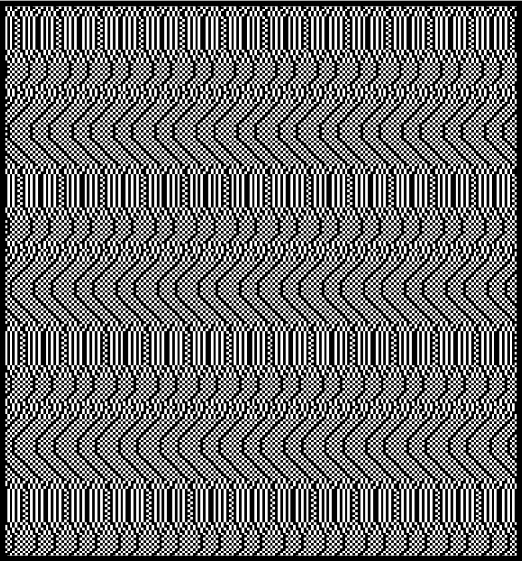


Various tie-up schemes are shown, applied against a simple straight draw threading. The treadling varies from example to example. These samples show how complex fabrics can be created which remain inexpensive to dooby weave, because they are based on a simple threading.

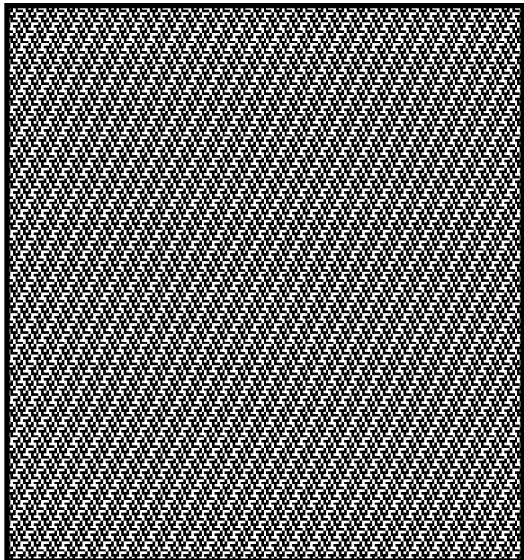
***Twill Tie-up***



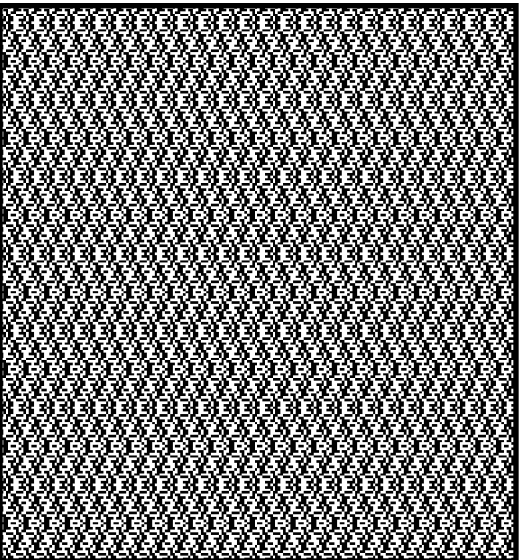
***Twill Tie-up***



***Double Twill Tie-up***

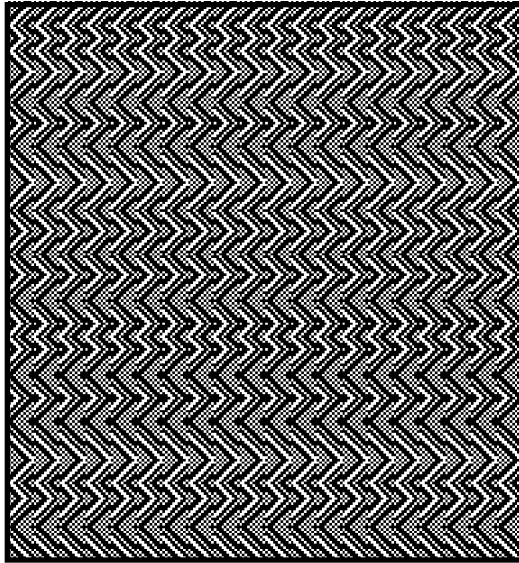


***Double Twill Tie-up***

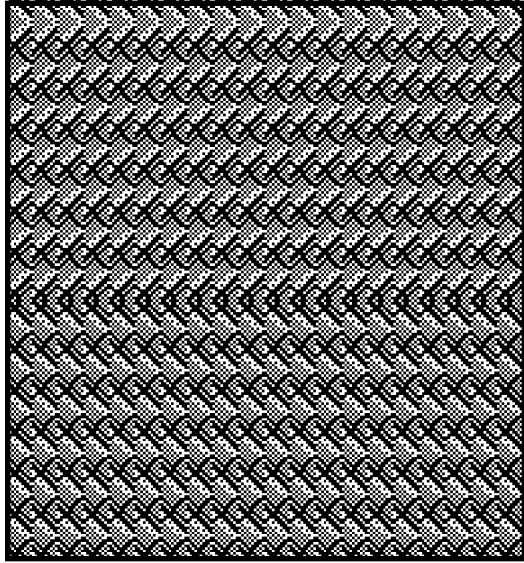


*Various tie-up schemes are shown, applied against a simple straight draw threading. The treadling varies from example to example. These samples show how complex fabrics can be created which remain inexpensive to doobby weave, because they are based on a simple threading.*

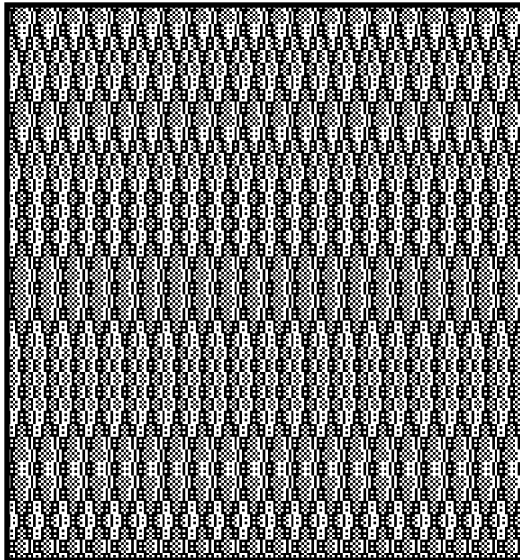
**Wrapped Twill Tie-up**



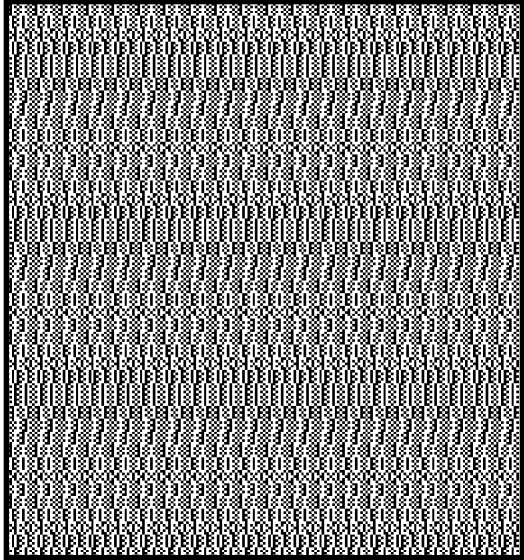
**Wrapped Twill Tie-up**



**Huck Tie-up**

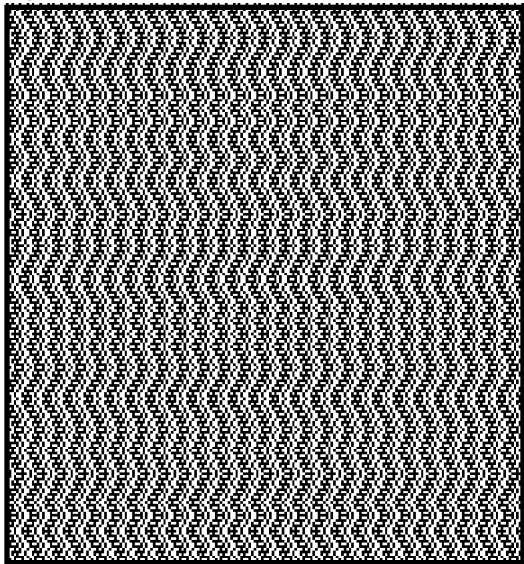


**Huck Tie-up**

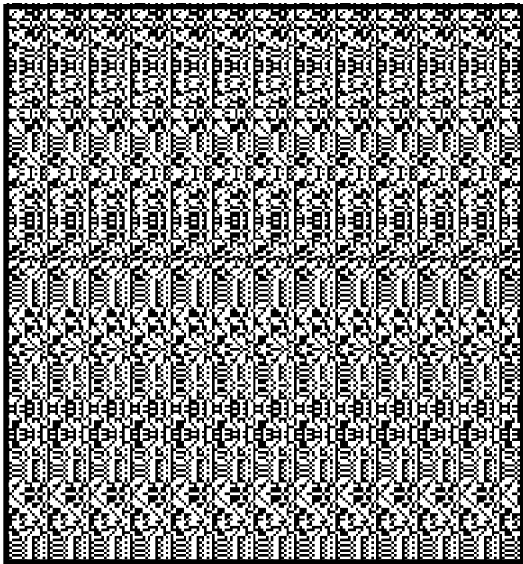


*Various tie-up schemes are shown, applied against a simple straight draw threading. The treadling varies from example to example. These samples show how complex fabrics can be created which remain inexpensive to dooby weave, because they are based on a simple threading.*

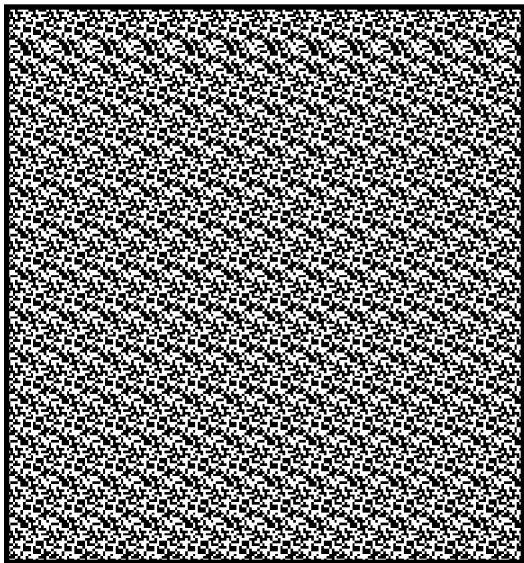
**Symmetric Tie-up**



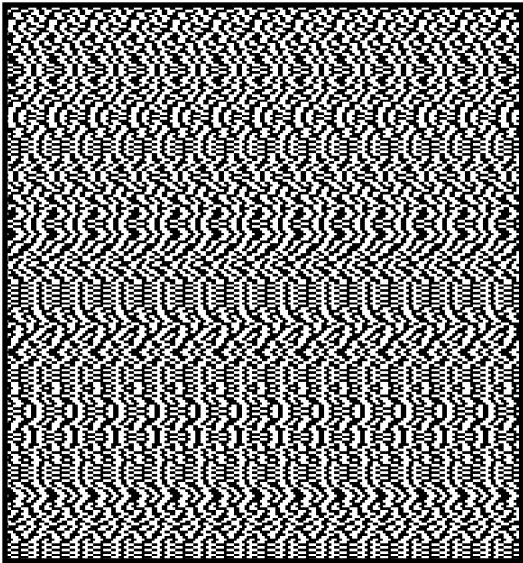
**Symmetric Tie-up**



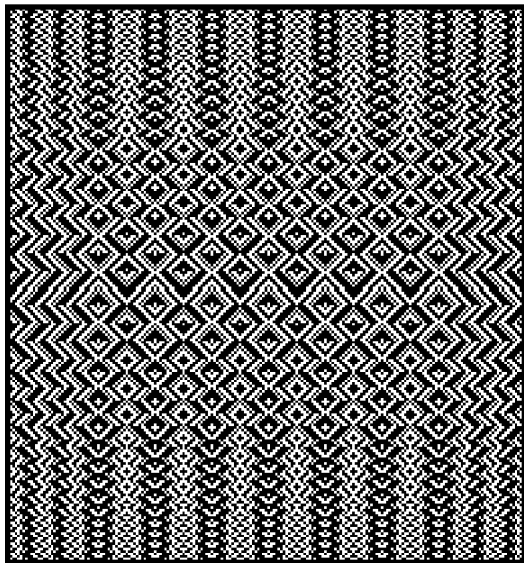
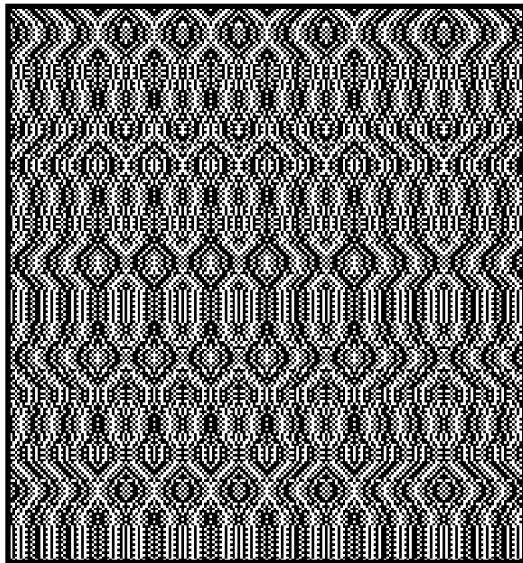
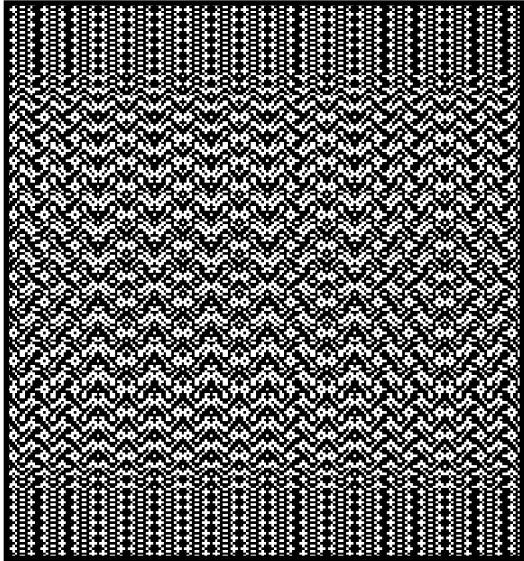
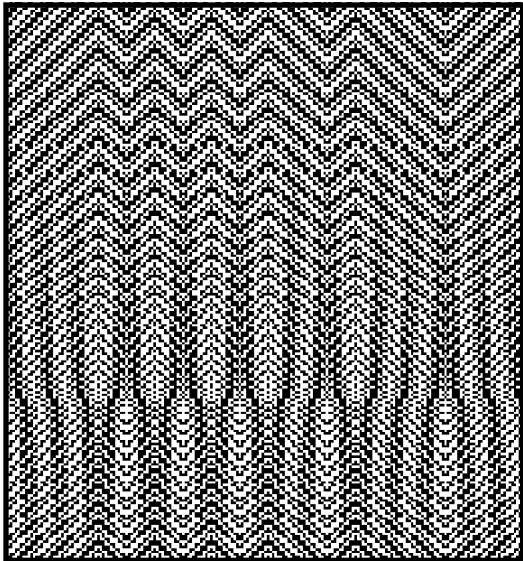
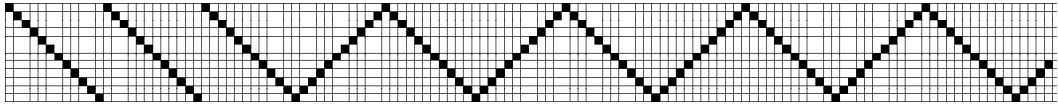
**Latin Square Tie-up**



**Latin Square Tie-up**



*These show how a slight increase in the threading complexity (“straight draw with occasional reverses”) makes a large change in the fabric appearance. All use tie-up schemes applied against the threading shown below (entire threading is not shown).*





# **Threading Schemes Catalog**

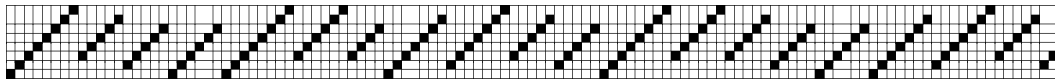
Threading and treadling schemes are no different, aside from which grid they work within. The examples given here are all for threadings, but turned sideways they are equally valid as treadlings.

**Network**

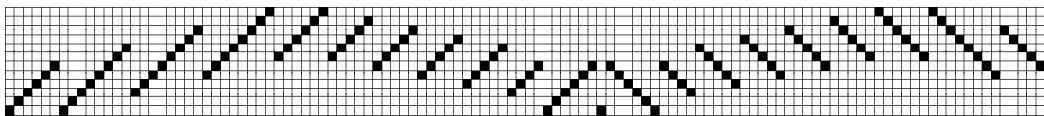
The Network scheme gives threadings (or treadlings) which are straight draws which (a) do not cross all harnesses and (b) systematically shift their starting harness number (see illustrations below).

Used in place of a traditional straight draw in a twill, the effect is to give complex twill-like structures (top two fabrics on facing page).

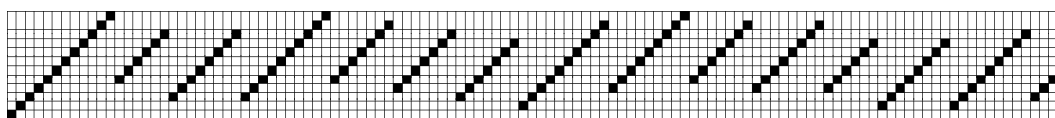
*Network Sample Threading #1*



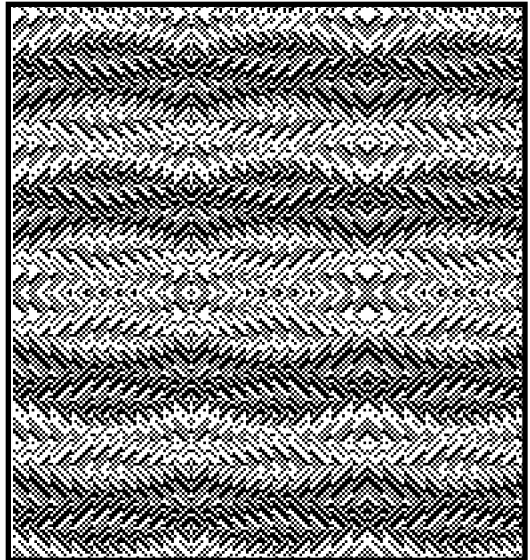
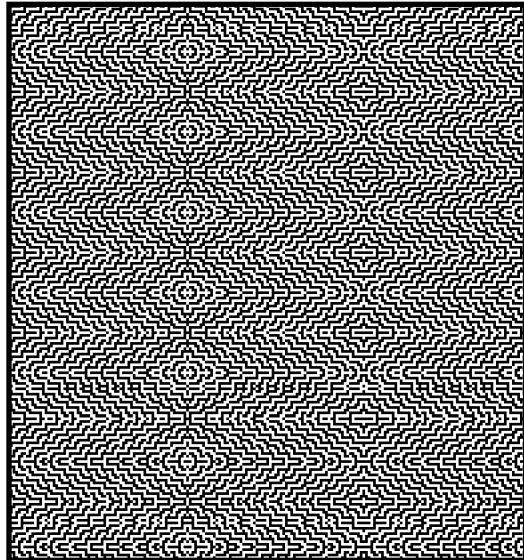
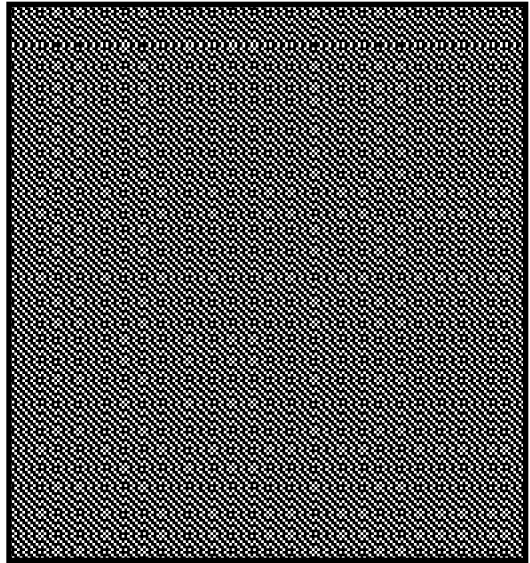
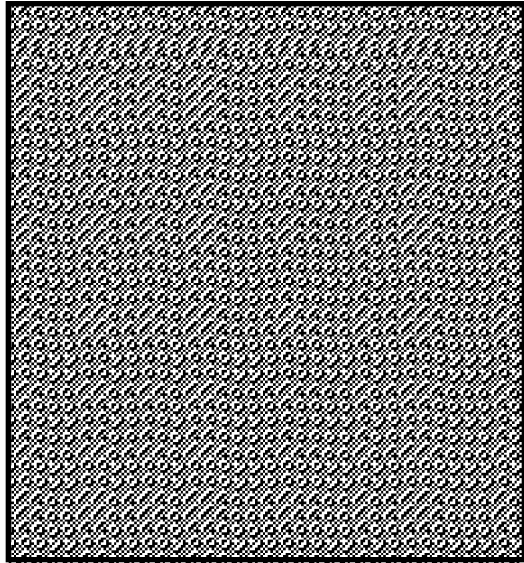
*Network Sample Threading #2*



*Network Sample Threading #3*





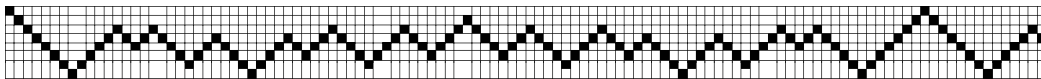


## **Step Walk**

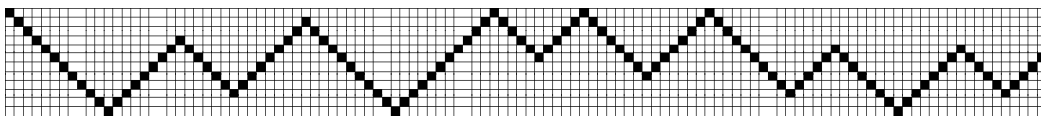
The Step Walk scheme gives threadings (or treadlings) which are modified point draws (see illustrative threadings below, and sample fabric designs on the facing page). The threading consists of straight draws in alternating directions, with widely varying draw lengths.

Unless you constrain them with a marquee, step walk threadings do not have natural repeats.

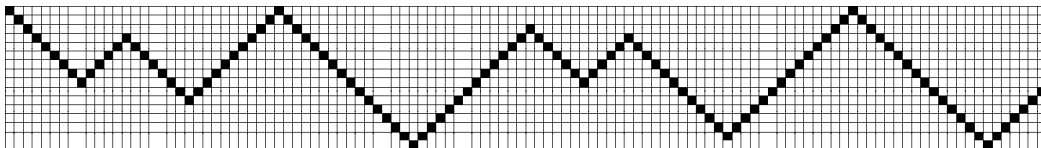
*Drift Sample Threading #1*

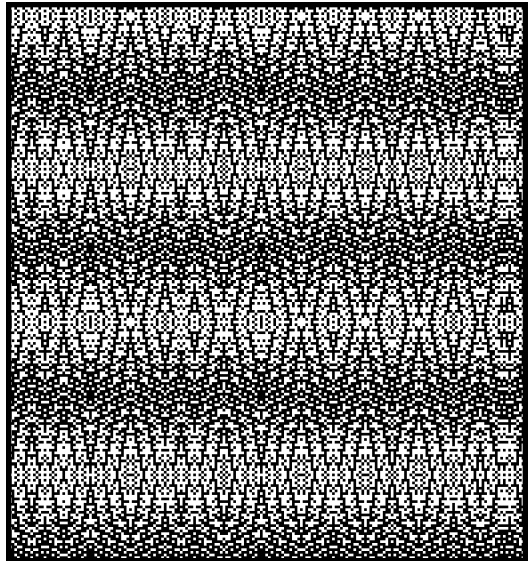
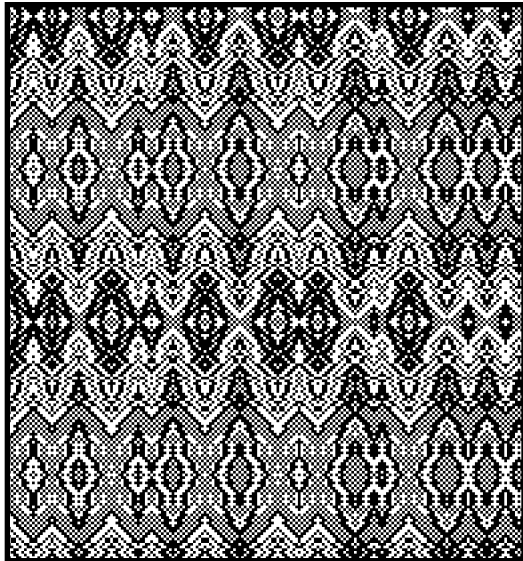
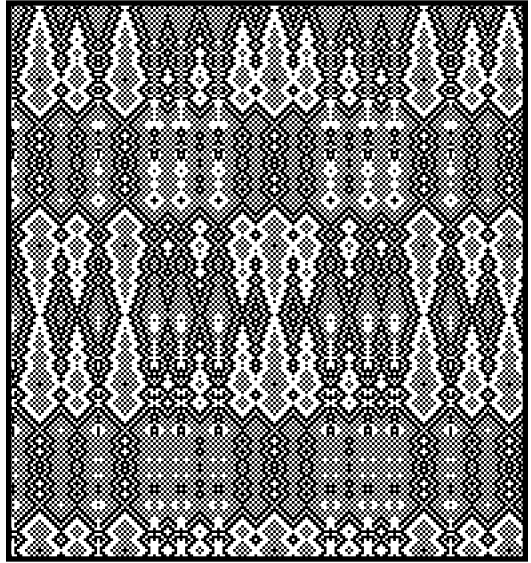
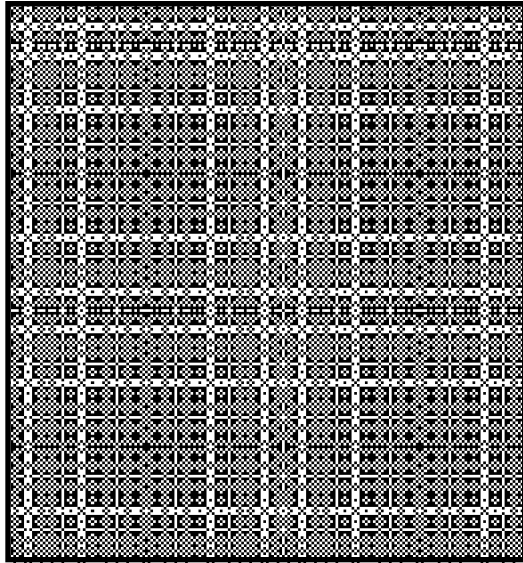


*Drift Sample Threading #2*



*Drift Sample Threading #3*



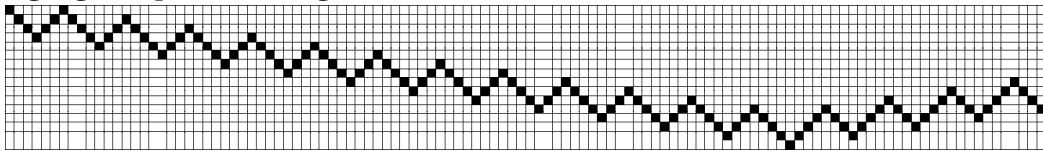


## **ZigZag**

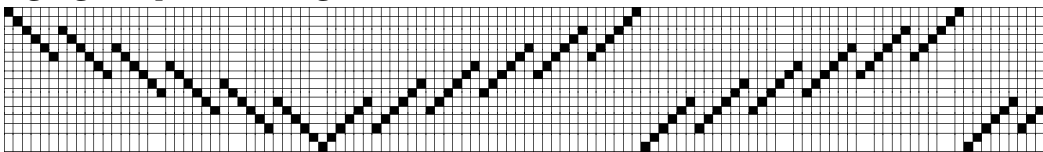
The ZigZag scheme gives threadings (or treadlings) consisting of short straight draws of unequal, but systematic, length (see examples below). They can have a natural repeat.

A wide range of fabric designs are possible with this scheme (see facing page).

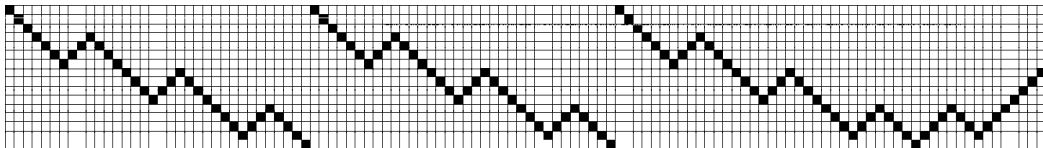
*ZigZag Sample Threading #1*

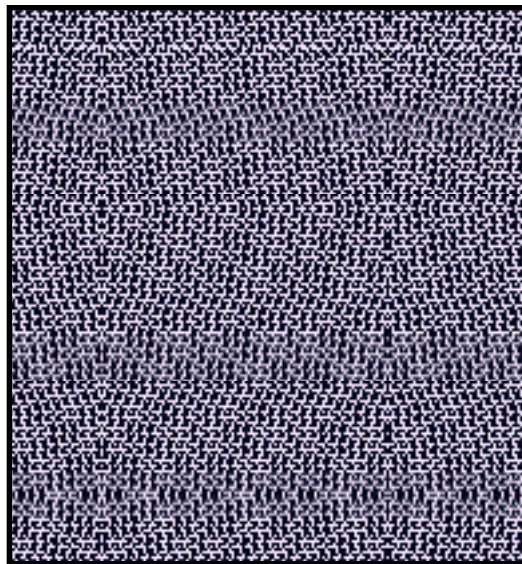
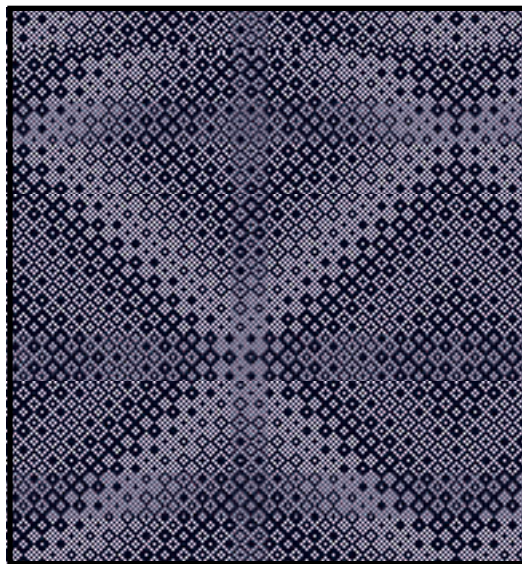
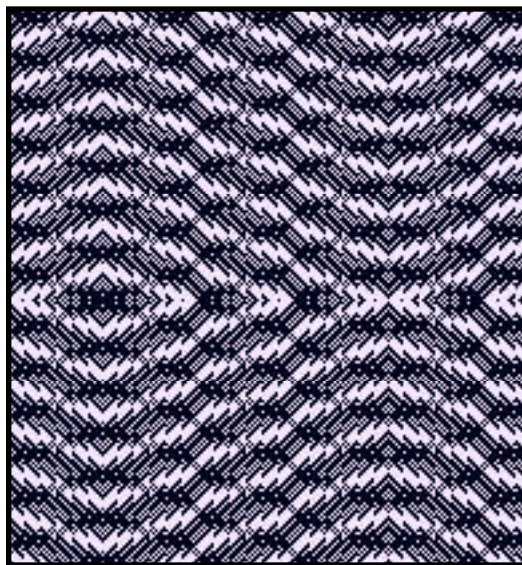
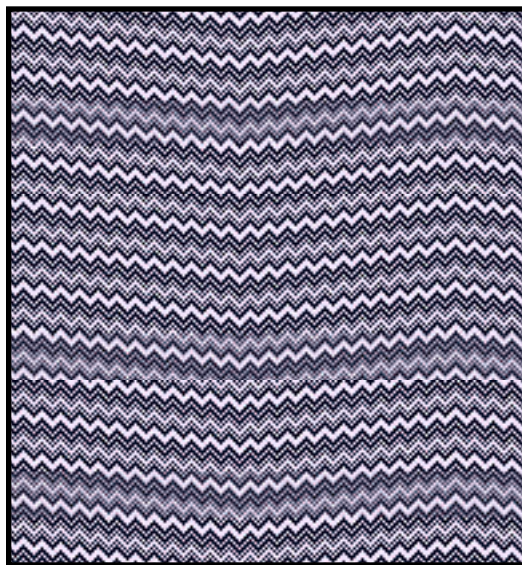


*ZigZag Sample Threading #2*



*ZigZag Sample Threading #3*



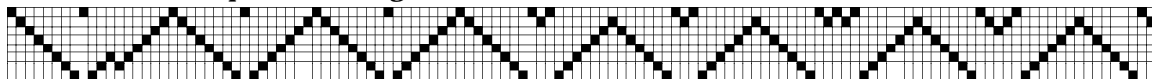


## **Stutter Twill**

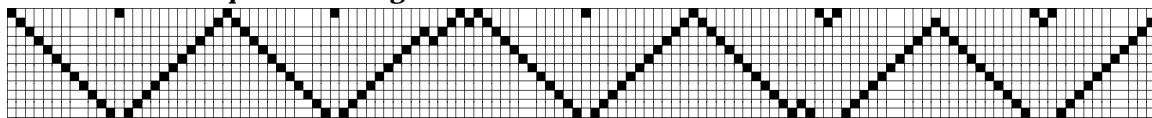
The Stutter Twill scheme gives threadings (or treadlings) consisting of normal point draws, except that they have hiccups (see examples below). The effect of this is to give a slow variation in the pattern across the fabric. The illustrations here show this effect across the warp.

The amount of variation across the fabric is different each time you invoke the scheme; try it several times to get exactly the effect you want.

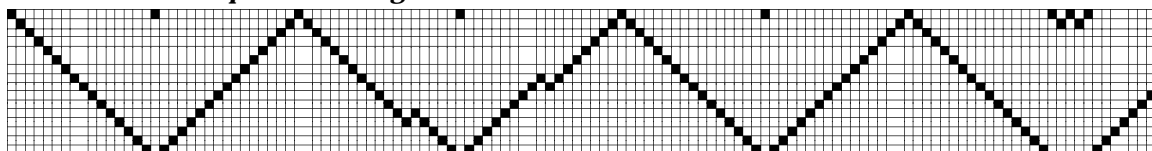
*Stutter Twill Sample Threading #1*



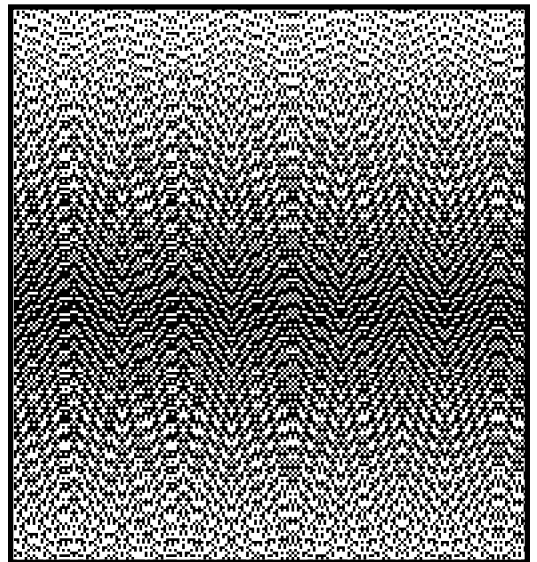
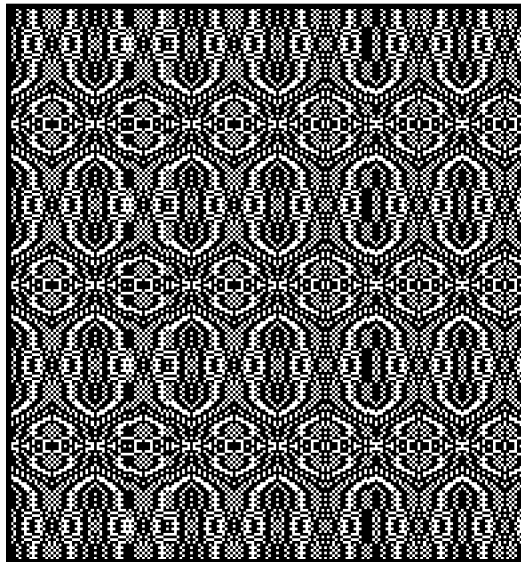
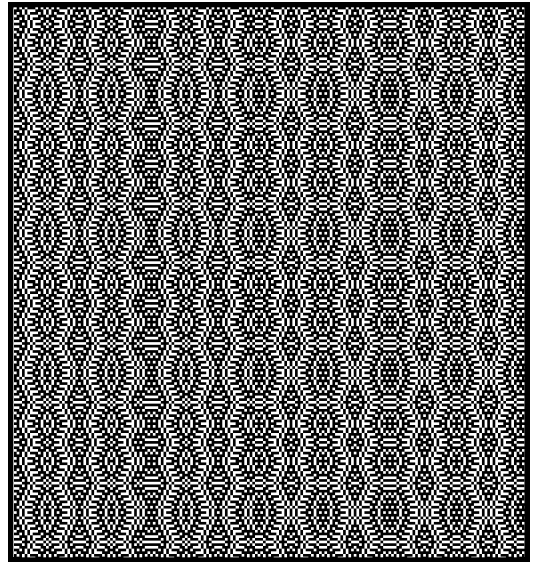
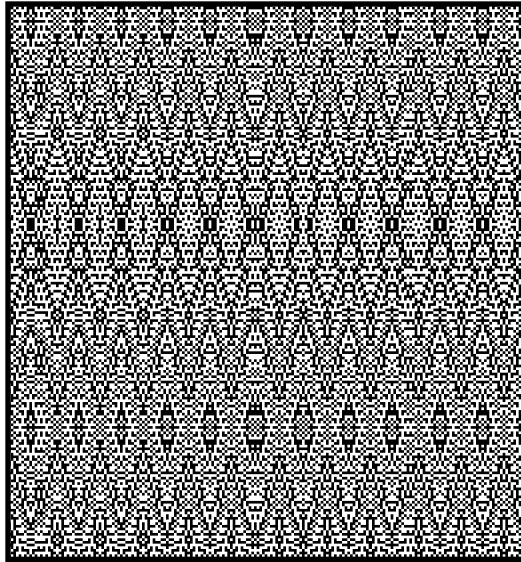
*Stutter Twill Sample Threading #2*



*Stutter Twill Sample Threading #3*











# **Tie-up Schemes Catalog**

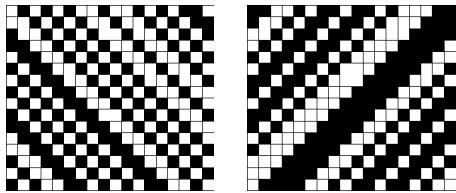
Production weaving on tie-up looms is no longer done, but many designers still like to design with a tie-up (some designs just make more sense that way). A tie-up allows for trompas-writ designs, which are often lovely. And the treadling which goes along with a tie-up frequently has a more obvious repeat than would the equivalent peg plan.

Similarly, the rules which WeaveMaker schemes employ are sometimes more easily stated for a tie-up than for a peg plan. So WeaveMaker offers many tie-up schemes.

Since WeaveMaker will instantly convert any tie-up design into a peg plan design, feel free to design in either format.

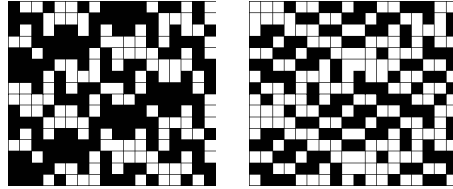
WeaveMaker tie-ups may be broadly divided into two groups. One group, illustrated here, are general in nature and work well with a variety of threadings and treadlings. The second group (for example, summer-winter, overshot, huck, moire) are special-purpose ones designed to be used with specific threadings and treadlings. These are discussed in the “Whole-fabric Schemes Catalog” (see “Schemes, whole fabric” in the Index for details).

### **Twill Tie-up**



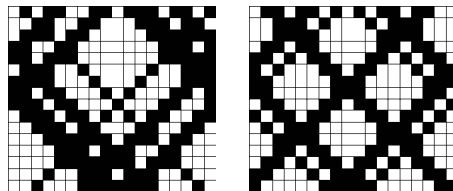
The Twill tie-up scheme provides a wide variety of simple twills.

### **Double Twill Tie-up**



The Double Twill tie-up scheme generates two twills within a single tie-up (one is on the even treadles, the other is on the odd treadles). Use these with a straight draw threading and treadling and notice that two distinct twills often appear (the effect is most obvious when the twills are strongly defined and run at a distinct angle to one another).

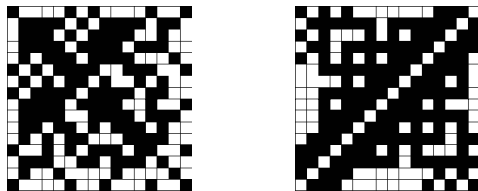
### **Wrapped Twill Tie-up**



The Wrapped Twill tie-up scheme treats the tie-up like a barber’s pole, creating a twill which endlessly spirals within the tie-up. The effect combines left and right slanting twills which strongly connect, giving long, pronounced twill lines (this is particularly evident if the tie-up is square).

The scheme produces tie-ups with large blocks of black and white, which in turn lead to long, adjacent floats. While these produce strongly defined structures in the weave, they may not be acceptable fabrics. Using the pencil tool, you can quickly insert tabby into the tie-up, which usually will bring the floats under control without destroying the design.

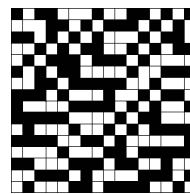
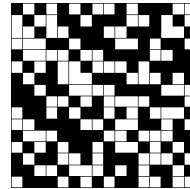
### **Symmetric Tie-up**



The Symmetric tie-up scheme produces tie-ups which are symmetric about the diagonal, hence the name. Works only in a square tie-up.

Try these with a tromp-as-writ treadling, using a straight draw threading, point draw (for more symmetry), or one of the threading schemes which gives fairly long straight draws.

### **Latin Square Tie-up**



The Latin Square tie-up scheme, while based on a mathematical concept completely unrelated to weaving, nonetheless produces a huge variety of fine-grained patterns. Works only in a square tie-up.

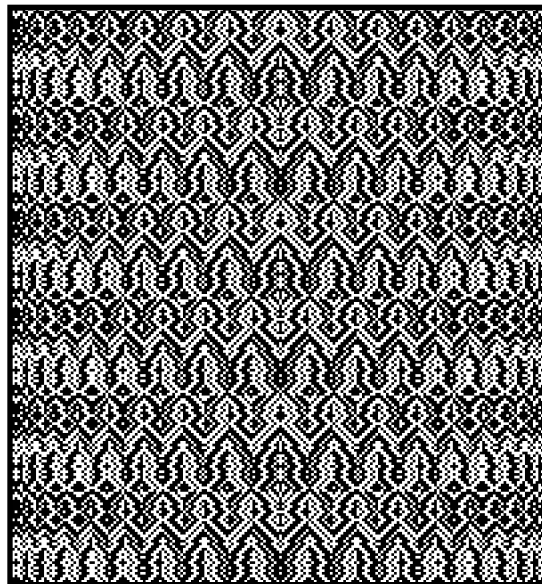
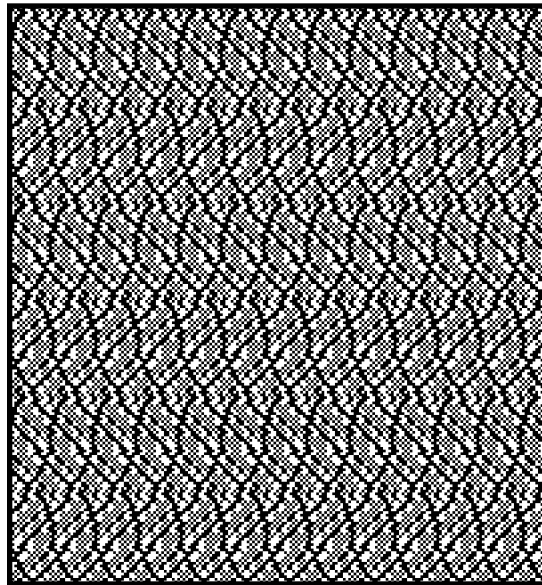
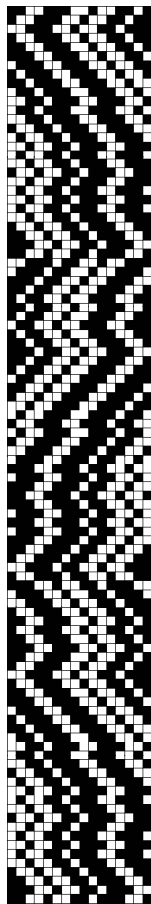
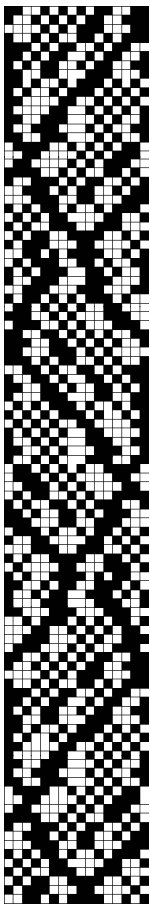
Try these with a tromp-as-writ treadling, using a straight draw threading, point draw (for larger figures), or one of the threading schemes which gives fairly long straight draws.



**Peg Plan  
Schemes  
Catalog**

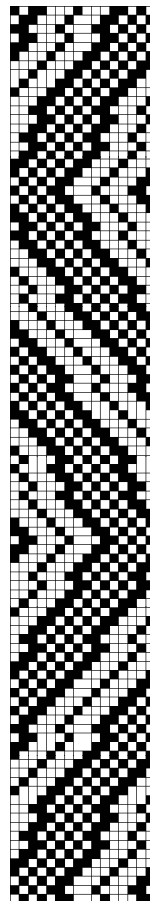
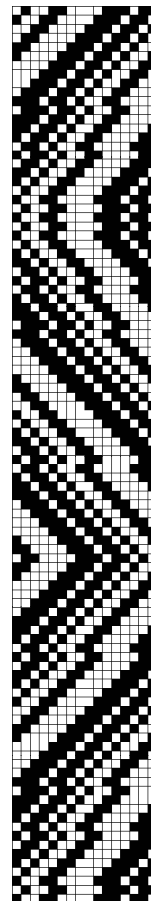
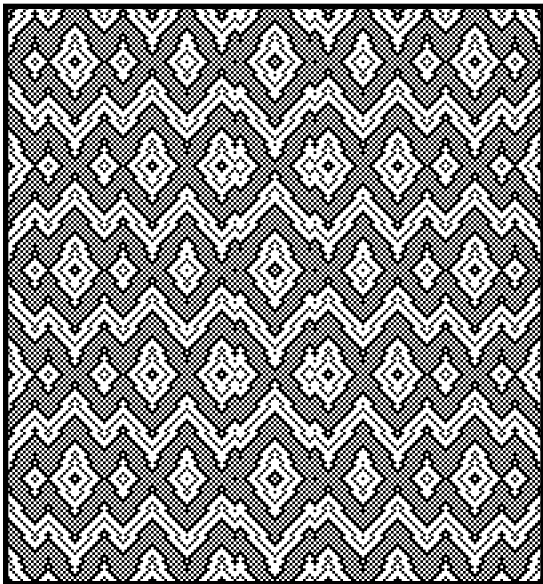
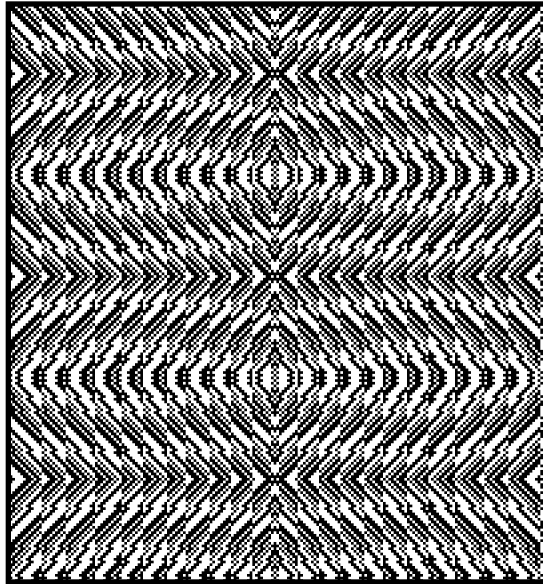
### **Twill Overlay**

This scheme gives an unstructured, random-walk double-twill peg plan. Used without constrain it produces a mess, but it works well when confined within a marquee (as in the examples given here).



**Twill Walk**

This scheme gives a unstructured, wandering twill peg plan, without repeats. It works best when confined to a marquee and repeated (as was done in the examples given here).



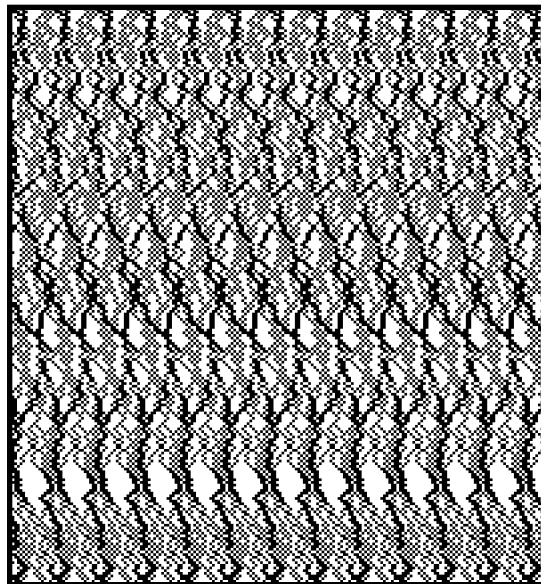
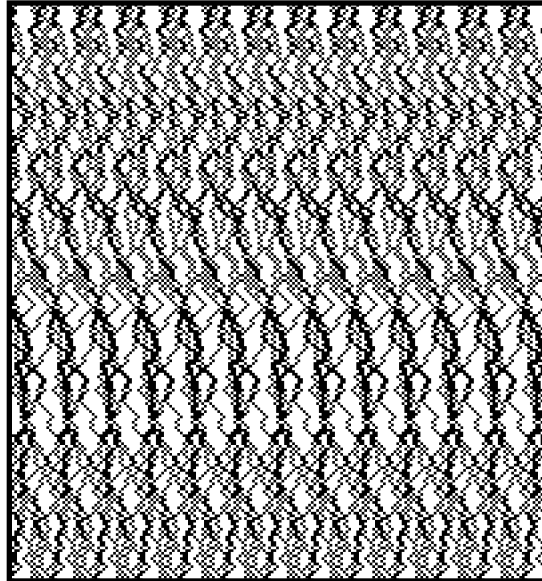
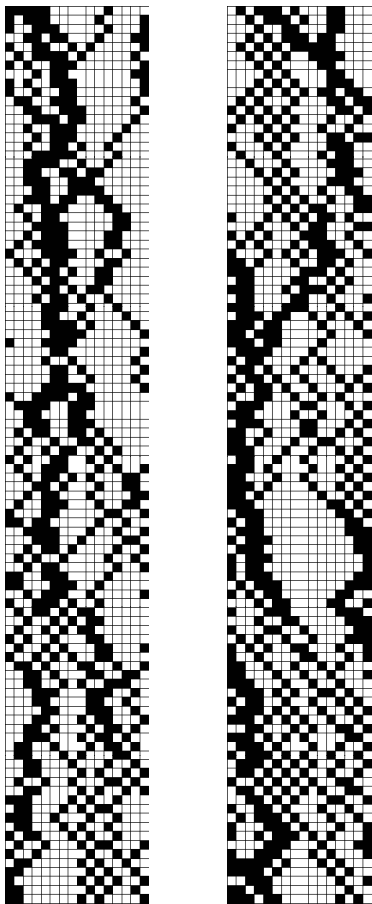
### **Random Walk**

The Random Walk peg plan produces a restless, non-repeating pattern which always look tangled (a “deranged cat’s cradle”).

Watch for long floats in the weft, which are easily fixed by inserting plain weave with the pencil tool into the white gaps and solid black areas in the peg plan.

Random walk peg plans are hard

for the eye to follow; consider using them sparingly with a marquee to impose a repeat.

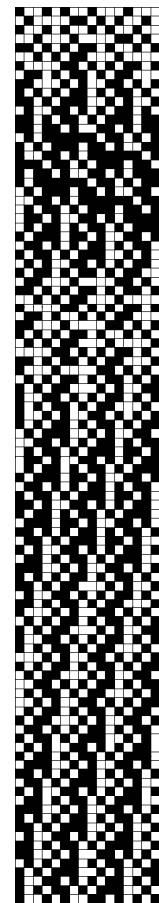
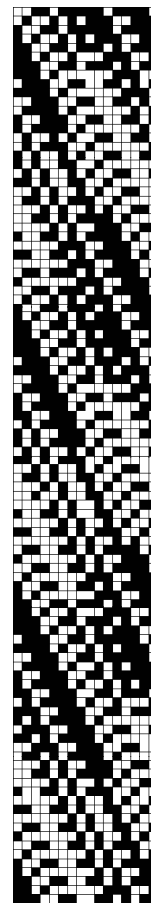
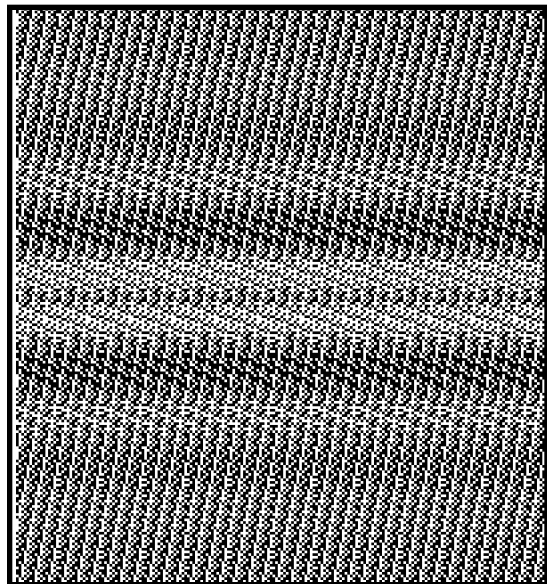
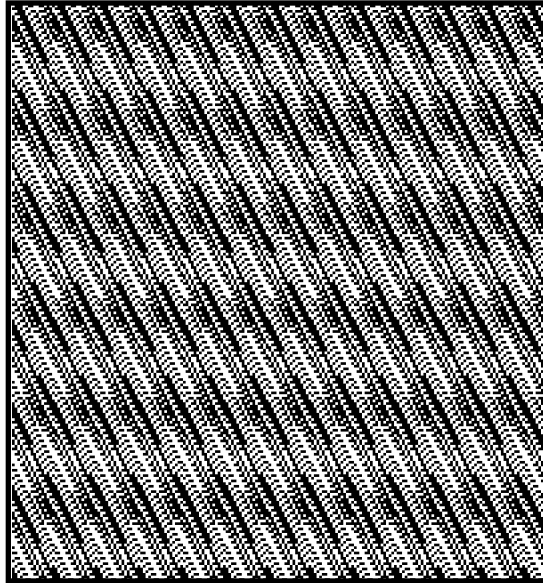




### **Ripple**

These peg plans are unbalanced; they give above-average exposure to the warp in some places, in others the weft is more pronounced. There is a slow drift

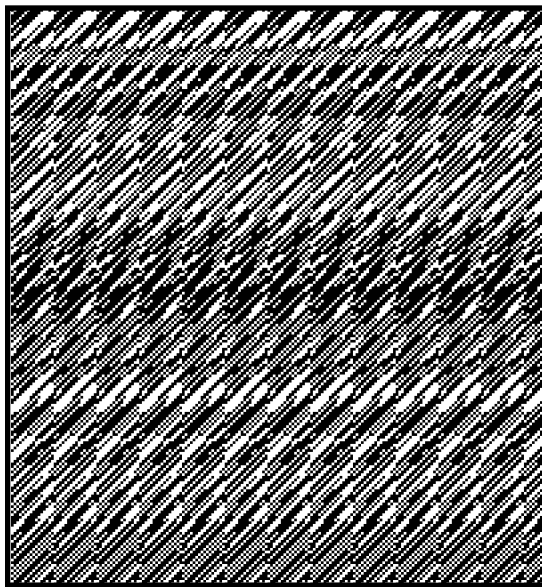
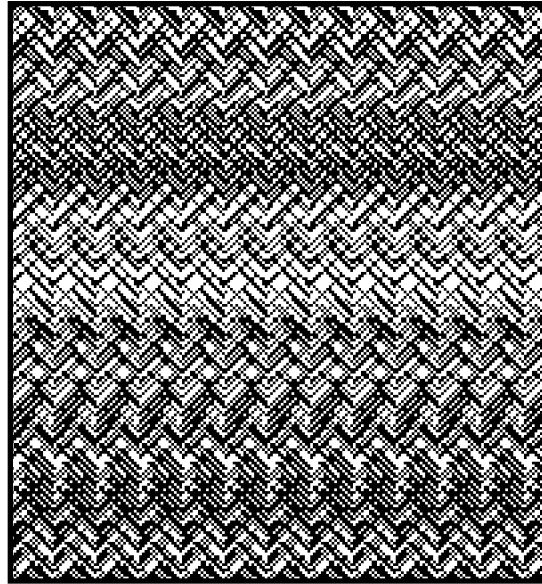
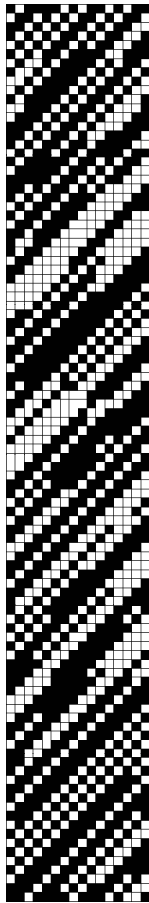
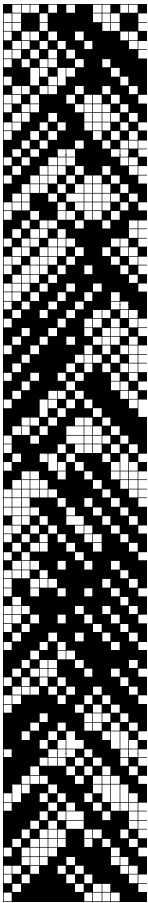
from one condition to the other. In the illustrations at the left, the warp is shown in black, so this effect is particularly easy to see.



## Slashes

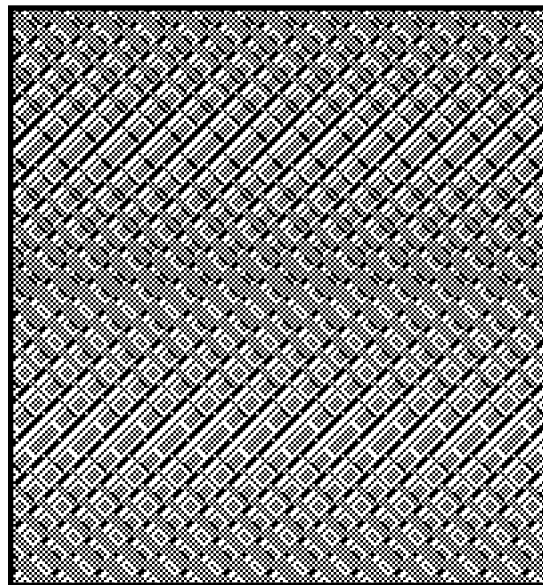
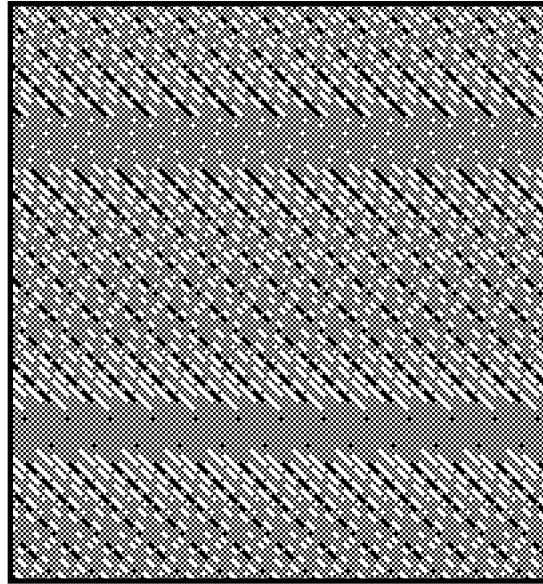
As its name suggests, this scheme gives many short twill strokes which either crisscross (top illustration at right) or run parallel (bottom illustration at right).

There is not usually any natural repeat in this effect, so use a marquee and a repeat block to impose more order.

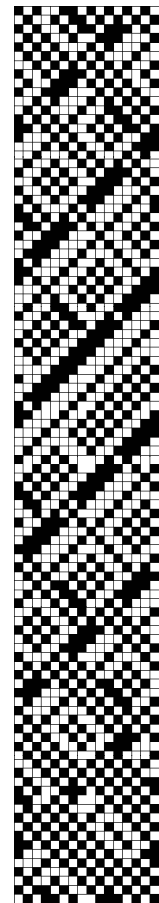
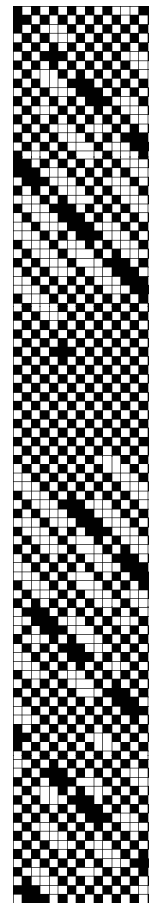


### **Tabby Twill**

This scheme creates a blend of tabby and twill. The illustrations on the left show horizontal bands of nearly pure tabby separated by bands of twill-like regions.



The examples shown here were selected because they show the “tabby & twill” effect clearly; many of the fabrics generated by this scheme are more complex and subtle than those shown here.





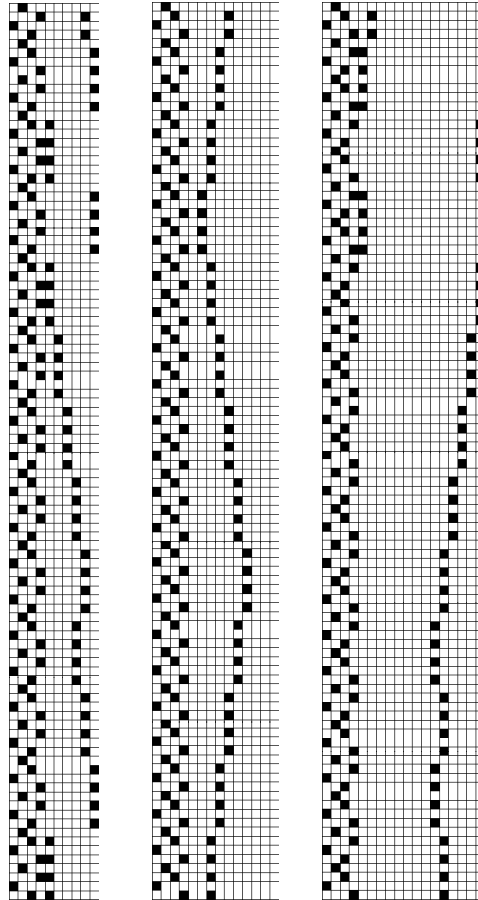
# **Whole-Fabric Schemes Catalog**

Some schemes need to be used together to get the most out of them. Such schemes are covered here.

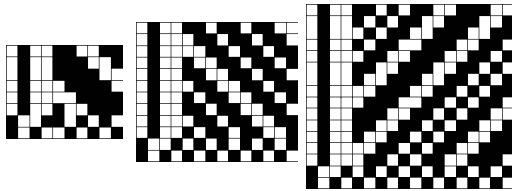
## Summer-Winter

This classic design requires a coordinated threading, tie-up, and treadling. WeaveMaker provides a scheme called “Summer-Winter” for each of these weaving elements. Weaving elements appear here for 8, 12, and 16 harnesses (treadlings at right, tie-ups and threadings below), and sample fabrics created from them appear on the facing page.

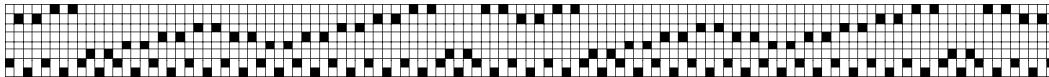
## Summer-Winter Sample Treadlings



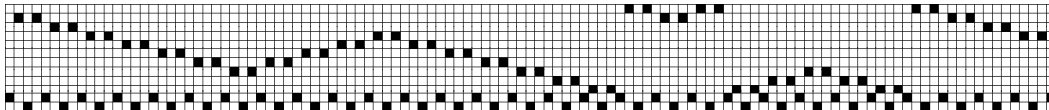
## Summer-Winter Tie-ups, 8, 12, and 16 harness



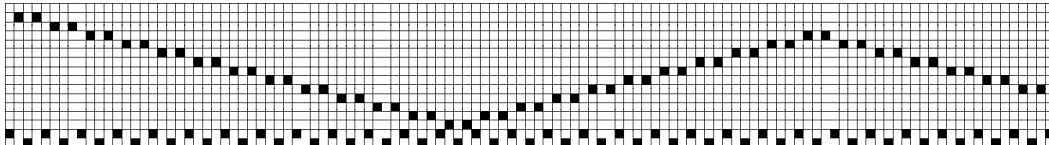
## Summer-Winter Sample Threading #1, 8 harnesses



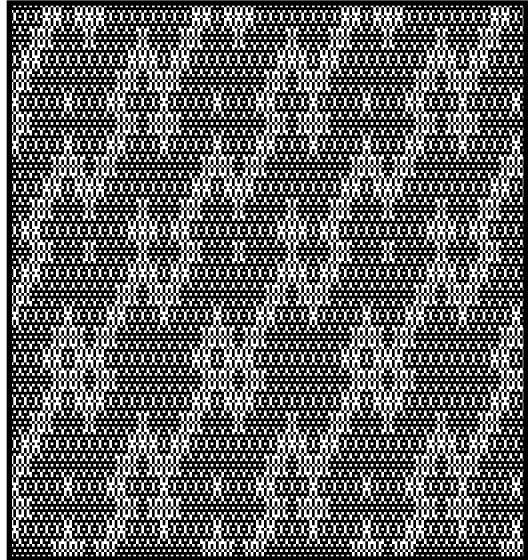
## Summer-Winter Sample Threading #2, 12 harnesses



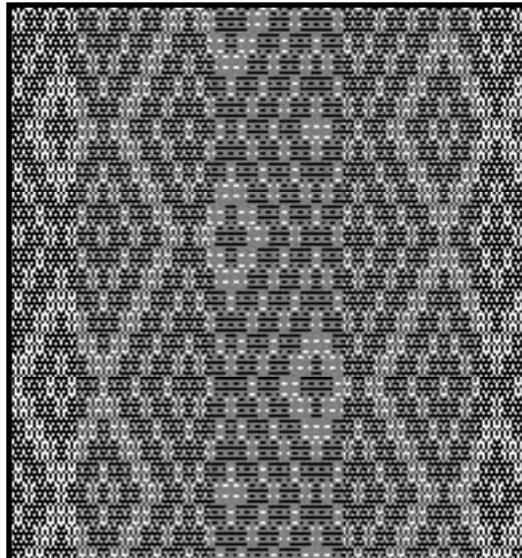
## Summer-Winter Sample Threading #3, 16 harnesses



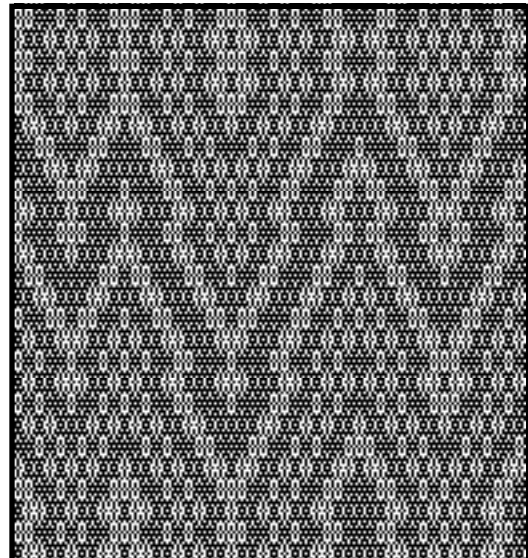
**Threading:** Summer-Winter (8)  
**Tie-up:** Summer-Winter (8 by 10)  
**Treadling:** Summer-Winter (10)  
**Harnesses:** 8 **Ex #1**



**Threading:** Summer-Winter (12)  
**Tie-up:** Summer-Winter (12 by 14)  
**Treadling:** Summer-Winter (14)  
**Harnesses:** 12 **Ex #2**



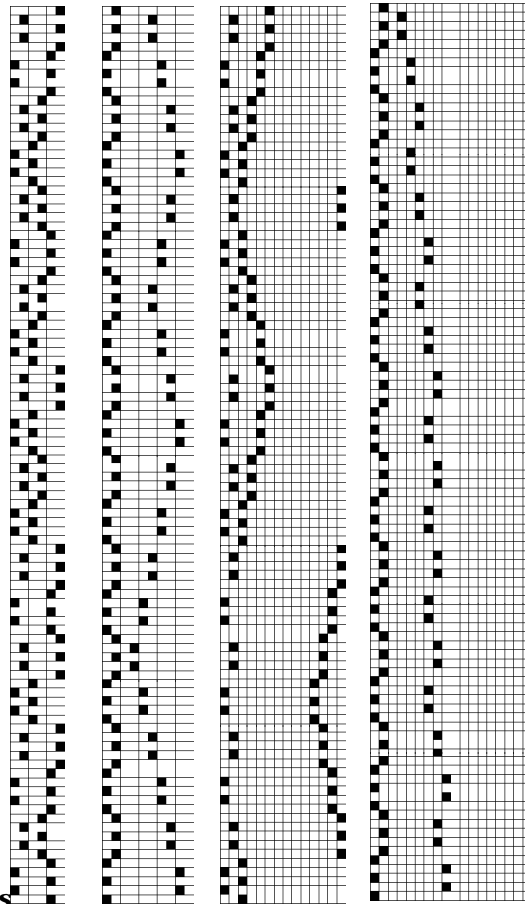
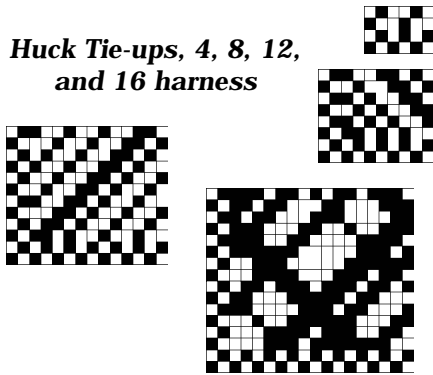
**Threading:** Summer-Winter (16)  
**Tie-up:** Summer-Winter (16 by 18)  
**Treadling:** Summer-Winter (18)  
**Harnesses:** 16 **Ex #3**



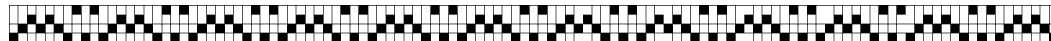
## Huck

This generalization of a classic design requires a coordinated threading, tie-up, and treadling. WeaveMaker provides a scheme called “Huck” for each of these weaving elements. Weaving elements appear here for 4, 8, 12, and 16 harnesses (treadlings at right, tie-ups and threadings below), and sample fabrics created from them appear on the facing page.

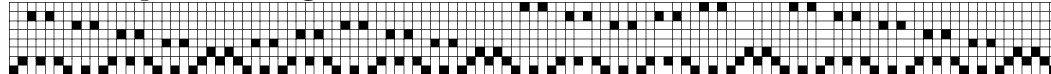
*Huck Tie-ups, 4, 8, 12,  
and 16 harness*



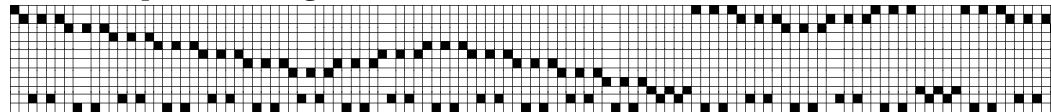
*Huck Sample Threading #1, 4 harnesses*



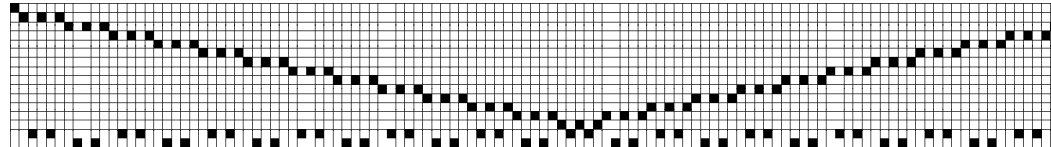
*Huck Sample Threading #2, 8 harnesses*



*Huck Sample Threading #3, 12 harnesses*



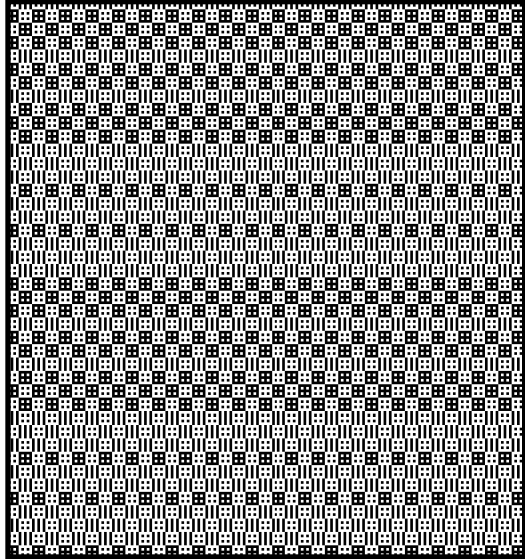
*Huck Sample Threading #4, 16 harnesses*





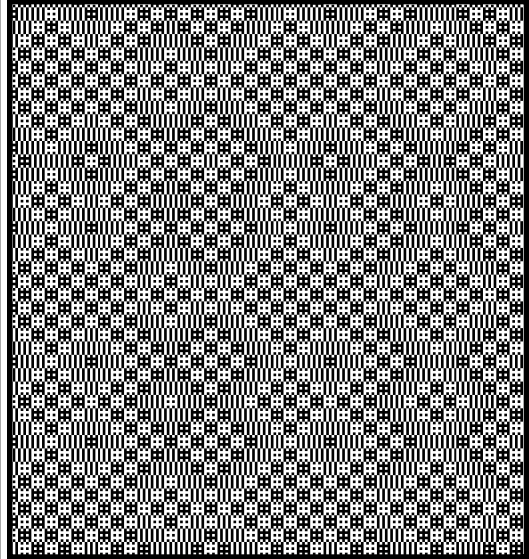
**Threading:** Huck (4)  
**Tie-up:** Huck (4 by 6)  
**Treadling:** Huck (6)  
**Harnesses:** 4

*Ex #1*



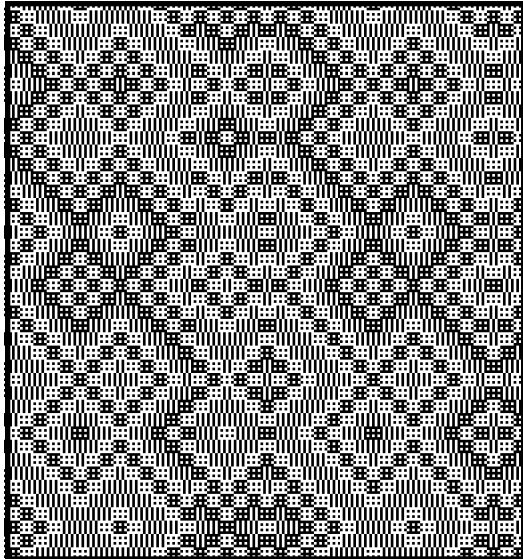
**Threading:** Huck (8)  
**Tie-up:** Huck (8 by 10)  
**Treadling:** Huck (10)  
**Harnesses:** 8

*Ex #1*



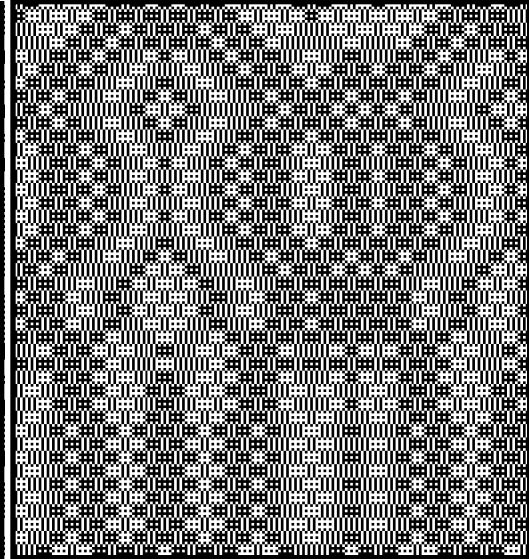
**Threading:** Huck (12)  
**Tie-up:** Huck (12 by 14)  
**Treadling:** Huck (14)  
**Harnesses:** 12

*Ex #3*



**Threading:** Huck (16)  
**Tie-up:** Huck (16 by 18)  
**Treadling:** Huck (18)  
**Harnesses:** 16

*Ex #4*



## Divided Designs

It is possible to independently design two fabrics and then combine their threadings, tie-ups, treadlings (or peg plans) into a single design and weave them as a single fabric on a single loom.

The resulting weave structure will, under certain circumstances, retain some properties of the original ones, and new (and unusual) features are also likely to appear.

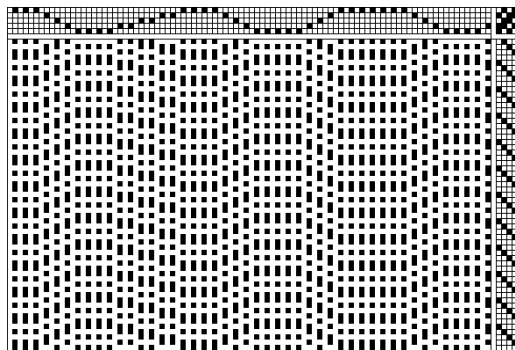
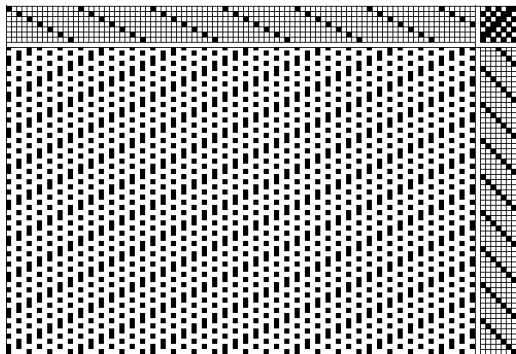
This technique of combining two separately-designed fabrics is called a “divided design.”

The two designs at the bottom of this page illustrate two such separate fabrics. Note that each design omits every other thread, a convenience when subsequently merging the designs. The fabric on the left uses seven harnesses while the one on the right uses five harnesses.

The two designs are merged into a single design by alternating the threadings, putting the tie-ups corner-to-corner, and using the treadlings side-by-side. The figure on the facing page shows the resulting design.

Divided design fabrics can have long floats once the merger is completed. Use WeaveMaker’s full-fabric float analysis tools to detect and correct this problem.

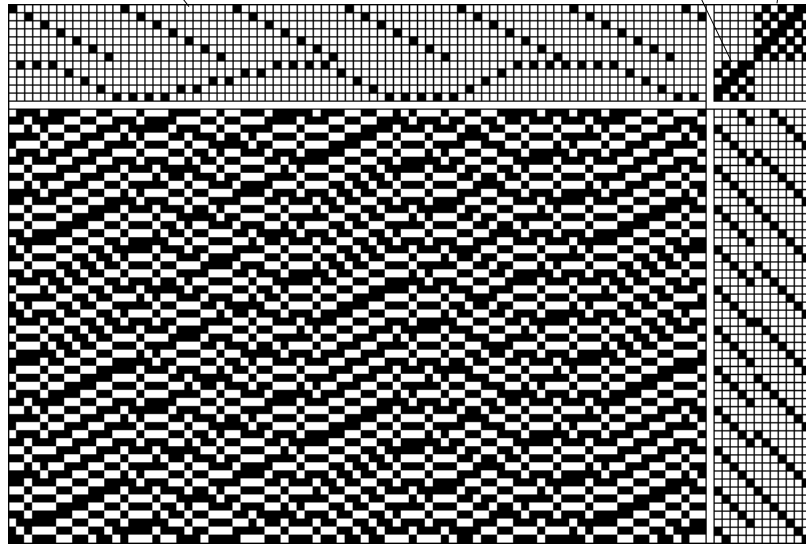
Because the final fabric has to be woven on a loom which has as many harnesses as the sum of the harnesses for the original fabrics, creating interesting final fabrics tends to require a high harness count.



*The bottom 5 harnesses are from the left-hand fabric, the top 7 from the right-hand fabric. Because every other threading position in the original fabric designs was blank, a complete threading appears here.*

*This is the tie-up from the right-hand fabric.*

*This is the tie-up from the left-hand fabric.*

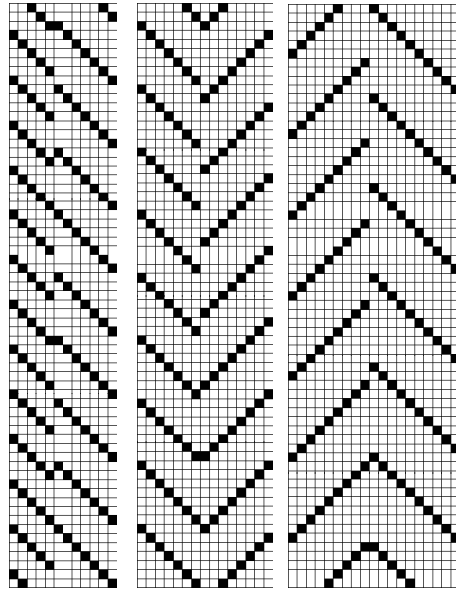


*The left-most 5 treadles are from the left-hand fabric, the right-most 7 are from the right-hand fabric.*

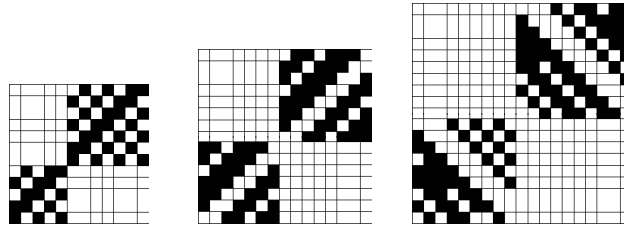
## Moire Scheme

WeaveMaker has coordinated threading, tie-up, and treadling schemes, under the name Moire, which create a divided design fabric design (see the previous page for a definition of “divided design”).

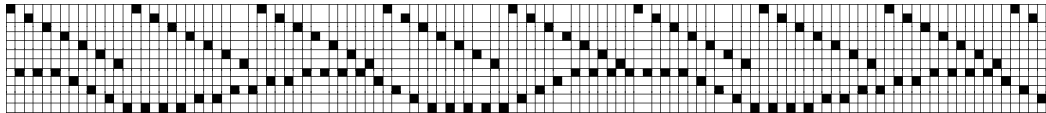
Weaving elements appear here for 12, 15, and 19 harnesses (treadlings at right, tie-ups and threadings below), and sample fabrics created from them appear on the facing page.



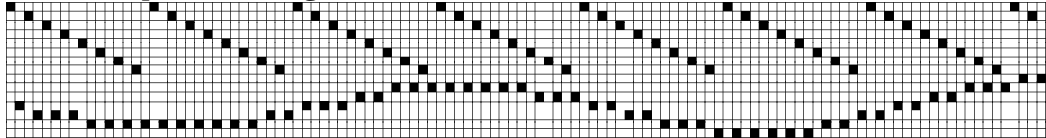
*Moire Tie-ups, 12, 15,  
and 19 harness*



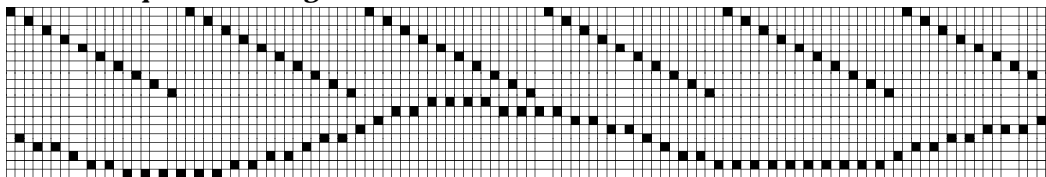
*Moire Sample Threading #2, 12 harnesses*



*Moire Sample Threading #3, 15 harnesses*

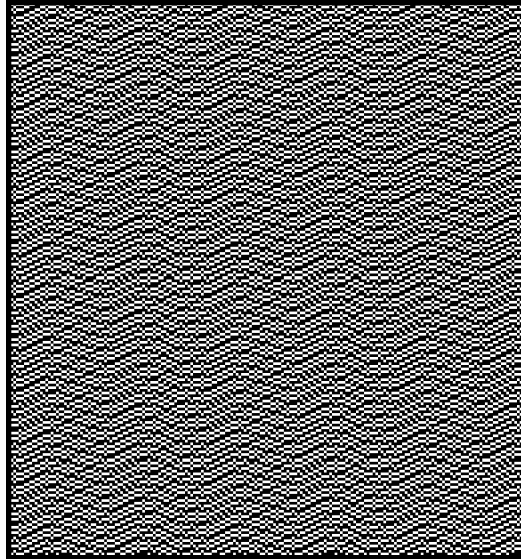


*Moire Sample Threading #4, 19 harnesses*



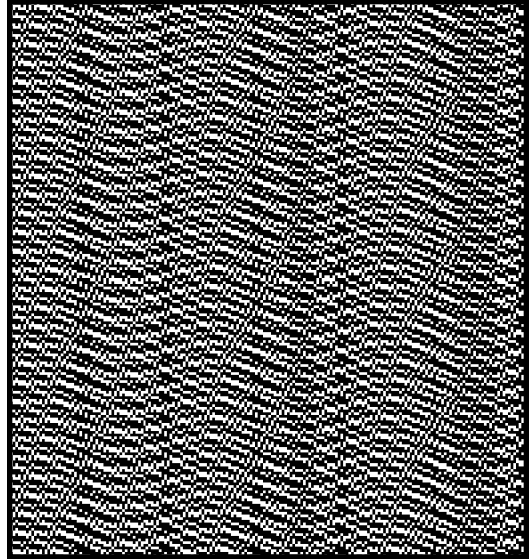
**Threading:** Moire  
**Tie-up:** Moire  
**Treadling:** Moire  
**Harnesses:** 12

**Ex #1**



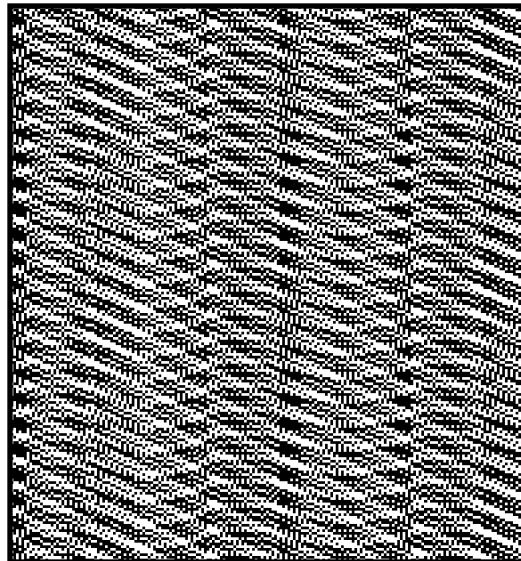
**Threading:** Moire  
**Tie-up:** Moire  
**Treadling:** Moire  
**Harnesses:** 15

**Ex #1**



**Threading:** Moire  
**Tie-up:** Moire  
**Treadling:** Moire  
**Harnesses:** 19

**Ex #3**





# **Creating Color**

## **Color Overview**

Bringing colors into a fabric is a two-step process in WeaveMaker.

### **Step 1 (Palette)**

Colors are created, named, and edited (matched) in a Palette file, a type of WeaveMaker file devoted exclusively to color. Once defined in a palette, a color may be conveniently used in many different fabrics.

### **Step 2 (Colorway)**

To use color in a fabric, the desired colors are dragged from a palette file into the fabric's colorway window (see "Color Dragging" for more about this). From the colorway, colors are assigned to individual threads in the warp and weft either manually (using the color crayon) or automatically (using the cornucopia tool).

## **The Challenge of Color**

Achieving a precise color match between the computer screen and the printed page is difficult.

Matching both the screen and printed color to a yarn sample is especially challenging.

WeaveMaker's approach to color makes this process manageable and effective, although it does not make it trivial.

For professional results with a minimum of effort, carefully con-

struct a color palette before putting colors into a fabric. Scattering ill-defined colors (ones which are not correctly screen/print matched, or which are unnamed) through a library of fabrics creates a difficult color management challenge, and will inevitably lead to errors which, if they reach to the mill, will have disastrous consequences.

It is especially important to assign meaningful names to your colors. WeaveMaker tracks colors by the names you give them, and by the names of the palette files in which they are stored. If you thoughtfully assign color names, then any color you see in a fabric can be easily and reliably traced back to a color chip within a palette.

## **Palettes**

A WeaveMaker **palette** is a color database in which you can create, name, match, and save colors. A palette is quite separate from and independent of any fabric you design. Colors you define in a palette will probably wind up being used in many different fabrics. Colors defined in a palette become associated with a specific fabric when they are moved into that fabric's colorway window (see "Color Dragging" for details).



A color definition consists of several kinds of information:

- 1) Screen color. This is a set of red/green/blue (or hue/saturation/value) numbers which cause the computer to correctly display the color on your monitor.
- 2) Printer color. This is a set of red/green/blue (or HSV) numbers which cause your printer to print the same color as appears on the screen. Rarely if ever would these printer values be identical with the screen values.
- 3) Color name. This is the name you use to describe the color.
- 4) Technical Description. This is a description you can send to a mill or dyer so they correctly match your color when they produce yarn.
- 5) Group Codes (up to 3 per color). These are codes you assign to the color. Group codes are completely arbitrary. You may use them (or not) as you wish.

For example, if you have some colors which are to be used for wall coverings and others to be used on the floor, you could group code all the wall colors as "W" and all the floor colors as "F." This still leaves the second and third group codes available for some other use. You might therefore use the second group code to tag all reds as "R" and all blues as "B." You might then use the

group three codes as, for example, "C" for cool colors and "W" for warm colors.

WeaveMaker uses these codes to group and sort colors, which can help you quickly locate the right color within a palette. So, you could ask to see all the colors which are for use on walls, or all the reds, or all the warm colors.

You may define as many palettes as you wish. Any two palettes can be simultaneously available (display on screen) within WeaveMaker. A given fabric can draw its colors from as many different palettes as necessary.

Once you define a color, WeaveMaker keeps its description intact wherever you use it. This means in particular that the printer color codes are always kept associated with their corresponding screen color. Thus, careful construction and calibration of colors within a palette will pay off when it comes time to print fabric samples.

### **Creating a Palette**

A palette is displayed and edited in a Palette window (see illustration at bottom of next page).

Select **New Palette** in the File menu to start defining a new palette. A new palette window will be displayed. It contains two permanent colors, black and

white. These colors will always be the first two colors in the palette.

To define a new color, click the word “New” at the bottom of the palette window. The Color Picker window will be displayed (see illustration on facing page).

The Color Picker has a color box that displays hue and saturation simultaneously. The scrollbar at the right controls the brightness (value) of the entire box.

Click in the color box and move the mouse around while holding down the mouse button. Notice that the color in the rectangle just below the box changes continually to show you the color you are defining. Move the brightness slider down to add black to the color (decrease

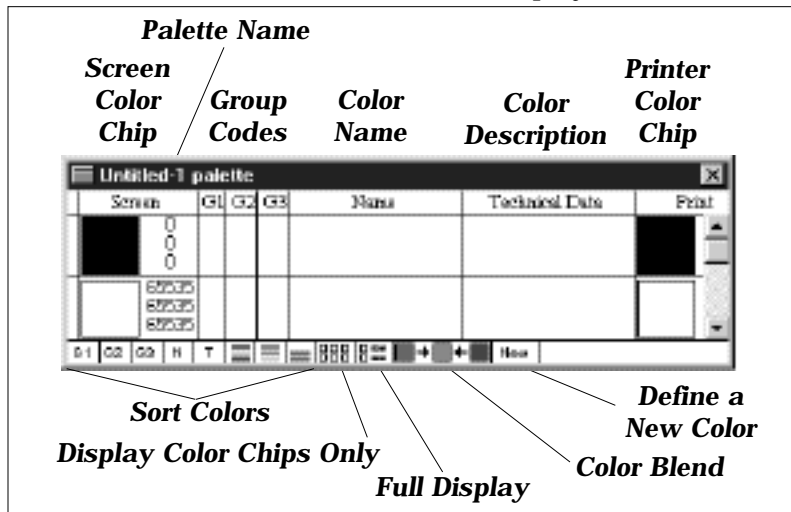
brightness) or towards the top to remove black.

If you know a specific set of “color numbers” for the color you wish to define, type them directly into the HSL (hue/saturation/lumens) or RGB (red/green/blue) text fields.

Once you have defined the exact color you want, click the OK button. The Color Picker window disappears, and WeaveMaker adds the new color to the palette.

You can immediately use this new color in a fabric. However, your new color is not yet completely defined. It is only a screen color: it lacks a name, a description, and it has not yet been color matched to your printer. Some suggestions:

**Palette Window: Full Display**



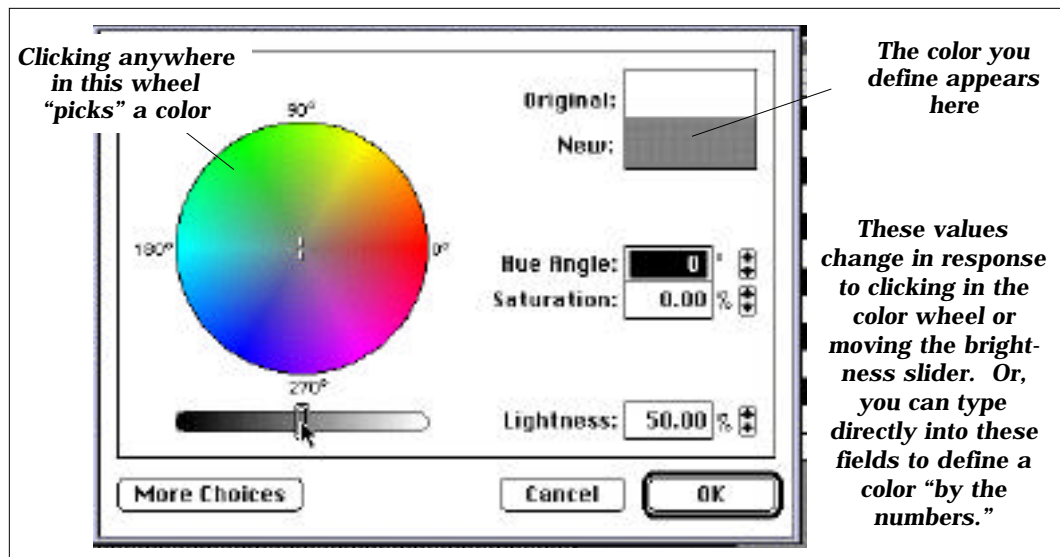
a) If you are working at a rough design stage, and approximate colors are good enough, then it should be sufficient to define a palette of screen colors. This is particularly true if the colors you are using are far apart in appearance (that is, they can be distinguished strictly by how they look on the screen).

b) If you have colors which are close together in appearance, at the very least you should name each of them. You can then use the names to double-check yourself if you have trouble distinguishing close colors.

c) If you are using colors which must be accurate, especially if they must print accurately, you should finish the printer color matching (described below) before using the colors in a fabric.

Having said all that, however, it is worth noting that you can define colors in any order you wish. WeaveMaker does not impose a requirement that colors be defined in any specific order or way. You can start by roughly defining your colors, then add names as that becomes appropriate, and leave printer

### The Color Picker

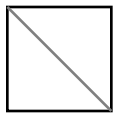


*(Your "Color Picker" may not appear precisely as illustrated here, as Macintoshcomputers ship with any of several differing pickers.)*

color matching (for example) for last. It is slightly more work to take the latter approach, and there is substantially greater risk of making mistakes, but you can try various approaches to defining colors to see what fits best with your working style.




### Naming Colors

To name a color, click in the “Name” box to the right of the screen color you are naming (see illustration below). Similarly, click in the “Technical Data” box to enter a technical description of the color.



Colors which do not have full descriptions (name and technical data) have a dashed diagonal line through them as illustrated to the left.

**Click in this box to start entering a name for this color (the third color in the window)**

Screen	G1	G2	G3	Name	Tec1
	0			Black	
	65535			White	
	37158				03-33
	37569				
	38804				

### Color Matching

When you first define a screen color, the corresponding printer color is set equal to the screen color. In an ideal world, this would insure that the printer printed a color which exactly matched the screen color.

However, real printers (and real video displays) are imperfect devices. In practice it is usually necessary to send a different color value to the printer than is sent to the screen. Color matching, then, involves finding the right combinations of color values so displayed and printed colors closely match each other.

The first step in color matching is to print the entire palette. Use the Print Palette command in the File menu. For newly-defined colors, the color values sent to the printer will be identical to the screen values you have defined.

Next, examine the printed palette. Some of the printed colors will be close to correct, while others will be remarkably wrong.

To get a better color match, work with one problem color at a time. The overall strategy involves having WeaveMaker print a set of color chips, each slightly different from the target color (WeaveMaker calculates a set of RGB values each differing slightly from the ones used to

print the problem color). You then inspect these printed color chips and pick the one which looks closest to what you want. You then use the RGB values for that chip as the new printer values. The procedure is diagrammed below.



Use the Print Options dialog to tell WeaveMaker to print variations on a single color rather than printing the entire palette (see illustration on the next page).

Once you have achieved a color match between the screen and color, WeaveMaker will remember the correspondence. Whenever you drag that particular screen color into a







fabric colorway or another palette file, the printer color goes along with it. Whenever you print a fabric containing this color, WeaveMaker automatically substitutes the printer color for the screen color when sending color information to the printer. This is one reason it is important to correctly define your colors before using them in a fabric—there is no easy way, after a period of time, to examine a color chip and ascertain whether its printer color codes are correctly set.

**Printer Color Matching**



1. Initially, the screen and printer colors are identical:

<b>Screen Color</b>		<b>Printer Color</b>	
-------------------------	---	--------------------------	--

2. In Print Options, select "Variations on Selected Color." Now, "Print Palette." The printout will consist of a large number of color chips, each slightly different in color:

	11110 23232 40432		12220 23232 40432		11110 24322 40432
	11110 23232 54232		11110 33962 40432		22110 24332 50432

3. Pick the color chip which is closest to the desired color. Next to it are three numbers (red, green, blue). In the Palette window, double-click on the printer chip, which brings up the Color Picker window. Enter the three numbers from the printout in the Red, Green, and Blue fields. Click OK. Now the new printer color is associated with the original screen color:

<b>Screen Color</b>		<b>Printer Color</b>	
-------------------------	---	--------------------------	--

## Using Color

Once you have built a palette, its colors may be used within fabrics. A color is moved from a palette into a fabric colorway by dragging a color chip from the Palette window into the Colorway window, and then, from the colorway, assignments are made to individual thread colors.

The palette display can be changed to a more compact form

in which just the screen color chips are shown. Click the left display button at the bottom of the palette window (“Display Color Chips Only” in the illustration at the bottom of the facing page). This palette format minimizes the amount of screen space used by the palette window, and is very convenient for selecting colors and dragging them into the colorway window.

**Palette Printing Options**

**Print:**

Entire palette

Variations on selected color:

Mostly darker colors

Mostly lighter colors

Large steps (for bad mismatch)

Small steps (for fine tuning)

0.56

0.69

Margins (inches)

0.56

0.35

Minimize paper usage

Page titles:

Cancel OK

### Print Options Dialog

*This is the Print Options (from the File menu) for palettes. The “Entire Palette” prints all colors within the palette in the frontmost window, using as many pages as necessary. “Variations on selected color” prints a number of color chips, each a slight variation on the currently-selected printer color chip.*

## Sorting Colors

Colors within a palette can be sorted by clicking any of the sorting buttons (see “Sort Colors” in the illustration at the bottom of this page). Note that permanent black and white (the first two colors in every palette) do not participate in sorting.

G1,G2,G3 - sort into alphabetical order by group codes. For example, clicking G1 sorts all the palette color chips so that their G1 codes are in ascending alphabetical (or numeric) order.

N - sort into alphabetical order by color names.

T - sort into alphabetical order by technical description. If you have assigned technical codes from any of several commercially-available color classification systems, this sort order will likely also sort the colors into a useful visual order.

Red/Green/Blue button - sort the color chips into hue order.

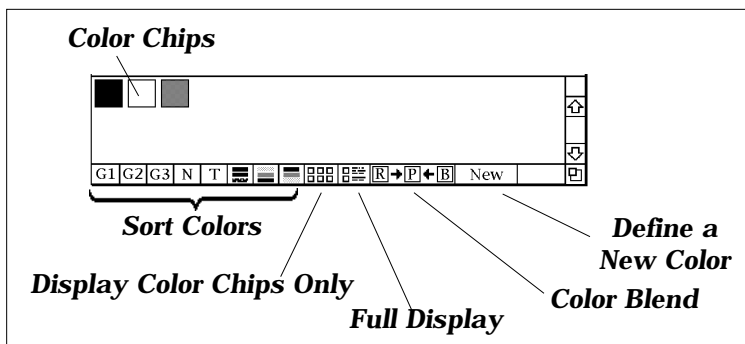
Color chips with a low hue number (pure red, for example, has zero hue in WeaveMaker’s numbering system) will appear at the front. This will be followed by colors of blue hue and on into the greens.

Note that some reds have high hues (reddish purples are a good example) and so will come last, while others (with a slightly orange cast) have low hue numbers and so come near the front. You will thus see “reds” at both the front and the rear of the sort order.

Light Gray/Dark Gray - sort the color chips by brightness (amount of black). Low brightness color chips come to the front.

Red/Pink - sort the color chips by saturation. Low saturation colors (those nearest to the center of the color wheel) come to the front.

**Palette Window: Display Color Chips Only**

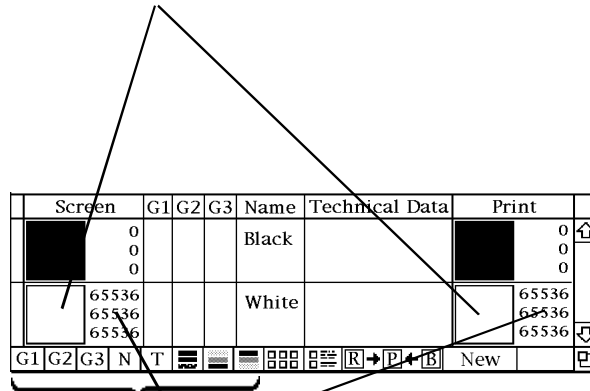





## Editing Colors

To edit an existing color in a palette, double click either on a palette color chip or on a set of RGB numbers (see illustration below).

Warning! Editing a color in the palette does just that: it edits the color in the palette. It does not edit the color in the design. To edit a color within a design, first edit it in the Palette window, and then drag the new color into the Colorway window of the design.

*To visually edit a color using the color wheel, double click on the color chip you wish to edit.*



Screen	G1	G2	G3	Name	Technical Data	Print
	0			Black		
	0					0
	0					0
	65536			White		65536
	65536					65536
	65536					65536

Below the table is a toolbar with icons for G1, G2, G3, N, T, and a 'New' button. A bracket is drawn under the G1, G2, G3, and N icons.

*To edit the RGB numbers directly, double click on them.*



# Using Color

The preceding section (“Creating Color”) explained how colors are created, named, and matched to the printer through a WeaveMaker palette file.

The following material assumes you have successfully created a palette and now wish to use those colors in a fabric.

To use color in a fabric, the desired colors are dragged from a palette file into the fabric’s colorway window. That topic is covered in the section entitled “Color Dragging.” From the colorway, colors are assigned to individual threads in the warp and weft either manually (using the color crayon) or automatically (using the cornucopia tool). See “Coloring Fabrics” for the details.

## Colorway Window

The colorway window has a number of fields and controls. These will be explained in detail in the following sections. But here is an overview of how the window is organized.

The colorway window has six columns and one or more rows of color chips (opposite page, bottom). Each row is a colorway for your fabric, so the number of rows depends on how many colorways you want to work with.

The columns divide the colors into six groups, which help the color cornucopia schemes assign colors to the fabric. If you are not planning on using the cornucopia for color, you can ignore the columns and put color chips wherever you wish.

Across the bottom of the colorway window are a set of buttons. These add colorways, delete colorways, and delete individual color chips.

*Click on the gray color chip to get this gray cursor (which is always the color of the chip you clicked on).*



## Color Dragging

Colors chips are moved from the palette into a fabric colorway by dragging them with the mouse. Colors can be dragged the other direction as well, that is, from a colorway to a palette.

When you click on a color chip the cursor changes to a fat cross (illustration on facing page). Hold the mouse button down and move the mouse. The color cross follows the mouse. Move the cross cursor over a color chip in the palette or the colorway, and the chip changes to the color of the mouse. Release the mouse button to make the change permanent.

For example, suppose you have the palette and colorway windows illustrated here (below and facing page). You wish to change the black in the warp (colorway window) to the gray shown in the palette window.

Click on the gray color chip in the palette, then drag it on top of

the black chip in the warp/major area of the colorway. Note that the black chip turns gray. Release the mouse while the chip is gray, and it will remain the new color.

Any color chip may be dragged in this fashion. Color chips may be dragged within a palette, within a colorway, or between palettes.

All information associated with the color chip (such as its name, technical description, and printer color value) go along with the chip when it is dragged.

## Adding Colorway Color Chips

To add a color chip to the colorway (rather than changing one which is already there), drag a color from the palette onto one of the column headings (such as "Major" or "Minor"). The heading turns black. Release the mouse. A new color chip will appear under that category.

*Fabric's colorway window before dragging (below) and after (right). The gray chip from the palette will be dragged on top of the black chip in the*

*warp/major position, which turns the black chip to gray. Releasing the mouse button while the chip is gray makes the color change permanent.*

Warp Colors				Weft Colors		
Major	Minor	Accent		Major	Minor	Accent
a1				b2		
1	■			□		
New	↔	⊗	%			

Warp Colors				Weft Colors		
Major	Minor	Accent		Major	Minor	Accent
a1				b2		
1	■			□		
New	↔	⊗	%			

## Coloring Fabrics

Once a color has been established within a colorway, it can be assigned to individual threads in a fabric. There are two ways to do this.

### Manual Coloring

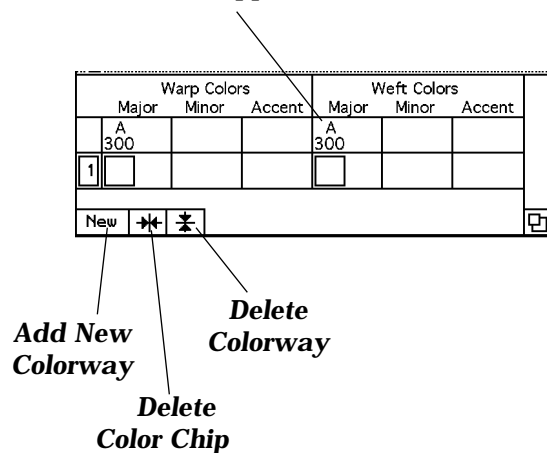
Momentarily clicking on any color chip within the colorway window gives a colored crayon (the cursor changes into a crayon). Click with this crayon in the color bars of the design window to assign color to individual threads (see “Color bars” in the Index for more about the color bars).

### Cornucopia Coloring

Clicking with the cornucopia tool in the color bars of a fabric causes WeaveMaker to assign colors automatically. The colors are drawn from the appropriate parts of the colorway (warp colors from the pool of warp colors, weft colors from the pool of weft colors).

For most cornucopia color schemes, most of the threads will be colored using colors chosen from the “major” category, some threads will be given “minor” colors, and just a few threads will have “accent” colors.

*Each color chip is assigned a letter code (used in printing and algebraic input). Under the letter code is the count of threads assigned this color. If this color is not used in the design, no number appears.*



## Colorway Tools

The tools at the bottom of the Colorway window (see illustration on facing page) create and delete colorways and erase individual color chips

To use the delete tools, first click on the tool to select it, then move the cursor into the part of the Colorway window which holds the color chips. The cursor changes shape to match the tool you selected. Click the mouse button to activate the tool. The color chips which are to be deleted turn red. Releasing the mouse button deletes all the highlighted chips.







## Multiple Colorways

WeaveMaker provides a simple mechanism for associating multiple colorways with a fabric.

Each row of color chips across the colorway window defines a distinct colorway (all the examples shown so far have just one row of colors, meaning the fabric has one colorway).

To start a new colorway, click the “New” button at the bottom of the colorway window. A second row of color chips appears:

*Two Colorways*

	Warp Colors			Weft Colors		
	Major	Minor	Accent	Major	Minor	Accent
	a1			b2		
1						
2						
	New			%		

The colors in the fabric are always taken from one row of the colorway at a time. The colorway number (at the extreme left of the window) outlined in black is the active colorway. Clicking on a colorway number (such as the “2” in the illustration) makes it the active colorway.



If the second colorway in the example is changed by dragging color chips from a palette and rearranging color chips within the colorway window so it looks like this,

then there are two ways the fabric might be colored.

If the first colorway is selected, the warp will be colored with some threads black and some gray (depending on what coloring you did with the crayon or a

color cornucopia). The weft will be entirely white.

If you then click on the second colorway to make it active, the fabric will be recolored. Every warp thread which was black will now be gray; every gray warp

Warp Colors				Weft Colors		
	Major	Minor	Accent	Major	Minor	Accent
	a1			b2		
1						
2						
New						

thread will become white; and every weft thread will change from white to black.

These changes are immediately reflected in the on-screen fabric displays. You can set up a number of colorways and rapidly compare them by simply clicking on the colorway numbers and studying the changes you see in the fabric display.

When you print a fabric in color, the active colorway is used to determine the fabric colors in the printout.

# **Cornucopia Color Schemes**

## **Color Cornucopia**

The cornucopia tool creates a wide variety of color arrangements automatically. When you click with the cornucopia tool in the color bar of the warp or weft, a selection of colors, chosen from the color chips you have placed in the colorway window, is used to construct an entirely new color arrangement.

In creating a color arrangement, the cornucopia follows one or more sets of rules known as “schemes.” There are four ways you influence how color arrangements are constructed:

### ***Scheme Selection***

By judicious selection of schemes, you can most strongly influence the types of color arrangements the cornucopia tool gives you. Some schemes give fine-grained color arrangements, others give bold stripes, and still others do sweeping “fades” where one color gradually dissolves into another. Some schemes follow the weave, building a color arrangement based on the weave structure.

### ***Major/Minor/Accent***

The “major/minor/accent” color categories in the colorway window strongly influence the color cornucopia.

### ***Marquees and Repeat Blocks***

The color cornucopia tool obeys the rules of repeat blocks (Please see “Repeats” in the Index for more about controlling repeats). So you can use the cornucopia tool to build a small color arrangement, which then gets repeated over and over to build up the entire fabric color arrangement.

### **Getting Started**

Just to get started exploring the color cornucopia, you may temporarily ignore the schemes, because until you specify otherwise, all the scheme rules are in effect.

- To try the cornucopia tool, first drag some color chips into your colorway window (please see “Colorway” in the Index for more about Colorway window). Put at least two colors in the Warp/Major area.
- Click on the cornucopia tool in the Tools window (it will turn black. Please see “Tools” in the Index for more about the Tools window).



- Position the cursor over the warp colorbar in the design window (please see “Colorbar” in the Index for more about the colorbar). Notice that the cursor changes into a cornucopia shape.
- Click with the cornucopia on the colorbar.

Notice that a new color arrangement is created, using the colors you placed in the “warp” columns of the colorway.

### **Color Scheme Selection**

A “scheme” is a set of rules which define how colors are selected from the colorway, and how the selected colors are assigned to individual threads.

Each copy of WeaveMaker comes with a set of color schemes built in. You can elect to use as many of these schemes as you wish. Through the Schemes window, you mark schemes as being eligible or ineligible (see “Schemes, turning on and off” in the Index for more on this topic).

Each time you click with the cornucopia tool, WeaveMaker picks exactly one scheme from the list of eligible schemes, and uses that scheme to build a new color arrangement.

The individual scheme rules vary widely in complexity. A complete description of each scheme is given in the “Color Schemes Catalog.”

Color schemes are enabled or disabled the same way weave structure schemes are enabled or disabled (see “Schemes, turning on and off” in the Index for more on this topic).

### **Scheme Colors**

A scheme has to “know” which colors are available to participate in the new color arrangement. If you click in the warp color bar, the scheme responds by only using colors from the three “warp” columns of the colorway window. Similarly, colors from the weft columns are used to build weft color arrangements.

The same color can appear in both the warp and the weft. Indeed, the same color can appear multiple times, for example, in both the Major and the Minor areas.

### **Color Emphasis**

When building a color arrangement, the color schemes use lots of the “major” colors, less of the “minor” colors, and the “accent” colors are used sparingly. A great deal of control can be exercised over the color schemes by carefully considering how color chips are placed within the six columns of the colorway window.

### **Blends**

A “blend,” as performed by WeaveMaker, creates a gradual change of color across a series of threads, such that the eye is fooled into seeing one color fade into another color. A blend only involves two colors of dye (two yarn colors), but by carefully placing the colors within the fabric, a dithered color effect is created (just as a dot matrix printer uses a handful of ink colors to simulate a much larger range of colors).

# **Color Schemes Catalog**

### **Color Schemes Table**

The table of color schemes (below) summarizes how the various schemes interpret the position of chips in the colorway window.

<b><i>Color Scheme</i></b>	<b><i>Major/Minor/Accent</i></b>
Alternate	Successive thread colors come from different color categories.
Partition	Ignored; all colors are used.
Two-Color Blend	Uses pairs of colors, one from major and one from minor. If no minors, pairs are major/ accent.
Blocked Blend	Uses pairs of colors, one from major and one from minor. If no minors, pairs of majors are chosen.
Stripe Blend	Ignored; all colors are used.
Thin Stripes	Ignored; all colors may be used.
Partition Blend	Color pairs chosen from two different classes, unless only majors are present, in which case they are used in pairs.
Math	Stripes of a minor color are bordered by (typically) by a major and an accent.

### **Alternate**

This scheme is a generalization of traditional “end-on-end” coloring (e. g., Chambray).

### **Two Color Arrangements**

If there is exactly one color chip in the Major, one in the Minor, and none in the Accent, Alternate assigns every other thread every other color (or, equivalently, all the odd numbered threads are given one of the colors and the even numbered threads the other color).

This is the simplest way to use Alternate, and is what is usually meant by the term “end-on-end color arrangement.”

### **Major/Minor Arrangements**

If there are more than two colors, but all colors are in either the Major or Minor (no Accent), then Alternate assigns all the odd numbered threads from colors in one category and the even numbered threads from the other category.

Since this rule leaves considerable leeway, especially if there are many color chips present, each time you use this scheme you will get a different color arrangement. But they will all have a fine-grained look which is characteristic of Alternate.

### **Major/Minor/Accent Arrangements**

If colors are present in all categories, Alternate becomes quite complicated. It follows two rules:

- (a) No two consecutive threads receive colors from within the same Major/Minor/Accent group. So, if a thread is colored using a Major color, the next thread will be colored from either the Minor or the Accent colors.

*Schemes in WeaveMaker are add-on modules (sometimes called “plug-ins”). Some of the schemes illustrated here are optional, and must be purchased separately from the base WeaveMaker Professional. Please contact the Sales department at Designer Software for details on optional and custom schemes.*

### **Partition**

Create a series of stripes of widely varying widths, using all colors regardless of their classification.

The order in which the colors appear is different each time you use this scheme, but the order is fixed within each specific color arrangement. For example, suppose you have four colors called A, B, C, and D. The first time you use this scheme it might choose to use the colors in the order CABD. It will use that order across the entire width, so color C would not appear next to color B anywhere. But the second time you use the scheme, it might decide to use the order DABC. In this case, every time you saw a stripe of color B it would be immediately followed by a stripe of color C.

Note: because of the mathematical constraints on this scheme, it only works on certain counts of threads. If you give it a number of threads which it cannot handle, it acts like the Partition Blend scheme instead (see facing page).

### **Two-Color Blend**

A two-color blend (see “Blends” in the Index for a definition of blends).

The two colors are taken from the majors if there are neither minor nor accent colors present. If there is at least one minor color, then the two colors are selected by taking one major and one minor color. If there are no minor colors but there is at least one accent color, then the two colors are selected by taking one major and one accent color.

The area to be colored is broken up into a series of stripes, of widely varying widths. Within each stripe the two colors are blended (see “Blends” in the Index for a definition of blends).

### **Blocked Blend**

Creates a series of wide stripes of roughly equal width and does a two-color blend within each stripe.

If only major colors are present, pairs of them are used to create the blends. If both minor and major colors are present, each blend uses one major color and one minor color. Accent colors are ignored.

See also “Partition Blend.”

**Partition blend**

Create a series of stripes, narrower than those used in Blocked Blend and unequal in width, and does a two-color blend within each stripe.

Colors are chosen in pairs for the blends. The two colors come from different color categories, unless there are only major colors, in which case the major colors are chosen in pairs.

See also “Blocked Blend.”

**Thin stripes**

Creates relatively thin stripes of colors taken from all color categories.

**Math**

Creates a smooth mathematical function and uses the value of the function at each thread to determine which color class to use and which color from the class. This produces stripes of widely varying widths. Sometimes the stripes are arrangement symmetrically about the center of the area being colored, and sometimes not.

Faithfulness to given color class proportions varies with shape of the function.

Creates surprisingly conservative stripes when used with a small number of major and minor colors, but can also generate wildly asymmetric patterns.





# Printing

### Print Options Dialog Box (Fabric)

Machine Varn Switch Drawdown Page

Threading Size 5 Reels Filled Color None Lines Thin

Repeat Levels 0  All Ends  From  to

Overleg None

Threading Size 5 Reels Filled Color None Lines Thin

Start on new page Repeat Levels 0  All Ends  From  to

Tie-up Size 2 Reels Filled

All None Make Default Set to Cancel OK

Machine Varn Switch Drawdown Page

Varn Name  Start on new page

Varn Colors Repeat Levels 0 Style Table  Start on new page

Grand total  Subtotal repeats

Varn Name  Start on new page

Varn Colors Repeat Levels 0 Style Table  Start on new page

Grand total  Subtotal repeats

All None Make Default Set to Cancel OK

Machine Varn Switch Drawdown Page

Fabric Swatch  Show color chips  Include chip descriptions

Entire fabric  First  ends and first  picks

Matches threading/page size

Pread 72 TPI  Varn Simulation

All None Make Default Set to Cancel OK

Machine Varn Switch Drawdown Page

Drawdown Size 5  Grid grid  Jacquard colors  Solid Jacquard

Entire fabric  First  ends and first  picks

All None Make Default Set to Cancel OK

Machine Varn Switch Drawdown Page

Summary

Header:  Page titles:

Footer:  File name  Page numbers  Today's date  File date

Margins: Left 5 Right 5 Top 5 Bottom 5

All None Make Default Set to Cancel OK

## **Printing**

WeaveMaker can print out fabric design specifications in a wide range of formats. It can create customized pages which closely resemble the typical forms one would have professionally printed.

Broadly speaking, there are two ways to approach printing of a fabric design in WeaveMaker. These are called “Custom Forms” and “Print Options.” Note that for printing a palette, you will always use Print Options (there is no custom forms option for palette printing). It is also possible to combine some aspects of Custom Forms with Print Options. All these possibilities are more fully explained below.

## **Custom Forms**

A “custom form” tells WeaveMaker exactly how the printout is to appear on a page. When you are using WeaveMaker with a custom form, you simply go to the Print command in the File menu when you are ready to print. Since WeaveMaker already knows how the page is to appear, you do not have to take time to specify the layout.

The description of the custom form is created in advance by the developers at Designer Software. Typically, a custom form is

**Print Options Dialog Box (Palette)**

**Palette Printing Options**

**Print:**

**Entire palette**

**Variations on selected color:**

**Mostly darker colors**       **Margins**     

**Mostly lighter colors**

**Large steps (for bad mismatch)**     

**Small steps (for fine tuning)**

**Minimize paper usage**

**Page titles:**

created on behalf of a customer who runs a business which already has an established way of printing out fabric design specifications, and wishes to have the software create a printed page closely resembling the one already in use.

To tell if you are using a custom form, look in the File Menu. If “Print Options” is grayed out, then you have a custom form installed, and you can go directly to Print Preview or Print.

Custom form information is contained in a file named “Layout” in the Customize folder. When WeaveMaker is launched, it first looks for a Customize folder, and then for a Layout file within that folder. If you move WeaveMaker to a new location on your hard drive, make sure you move the Customize folder along with it; otherwise, WeaveMaker will not be able to find the Layout file, and you will no longer be able to use your custom forms.

### **Print Options**

Using the Print Options, you select information to be printed, and then WeaveMaker creates a printed output containing exactly that information. In addition to selecting what to print, you also can influence the appearance of the printed page, but the degree of control is much

less than with a custom form.

Once you have selected your options, use Print Preview to see what your printout will look like, and finally use Print to actually print.

If a design window is front-most the printing commands in the File menu (Print Options, Print Preview, and Print) will be appropriate for a fabric design printout (see illustration on previous page). If a palette window is front-most, they will be appropriate for printing a palette (see illustration on facing page).

### **Hybrid Print Options**

It is possible to have some parts of the printout controlled by a custom form, and other parts be controlled by the Print Options. A typical example would involve controlling the Summary information through a Custom Form, and having the remainder of the printout be controlled through the Print Options.

### **Creating a Custom Form**

Custom forms are controlled by a Layout file contained in the Customize folder. Typically, a Layout file will be created by Designer Software. Please contact our Sales department for details.

**Fabric Printouts Overview**

There are various kinds of information which can be printed for a fabric design. You select what to print by checking any combination from the items listed down the left edge of the Print Options window. Examples of the available printout formats are illustrated here and on the following pages.

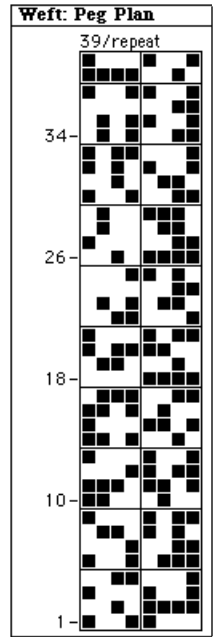
Jones Mills  
7732 River Road  
Andromoloma, CA 93212

Date	5-29-95
Reference	JMF-32-95
Harnesses	8
Ends per inch	42
Picks per inch	22
Ends	280
Picks	84

**Fabric Summary**

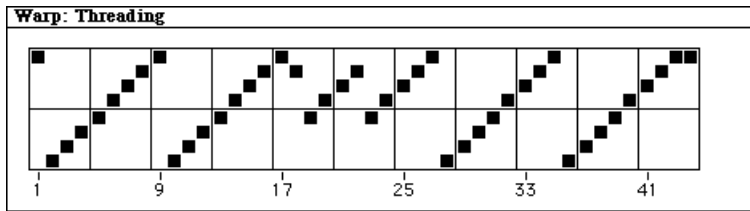
The printout starts off with an optional fabric summary (illustration at top). This gives an overview of the fabric dimensions and construction. You printout may not have exactly the same fields as show on this summary (you may have a custom layout that changes the appearance), but the information printed will be appropriate for your design.

If you have included any written instructions for the weaver (in your public remarks window), they will print in the summary section.



**Threading and Peg Plan**

The threading and peg plan are printed next, as illustrated here.



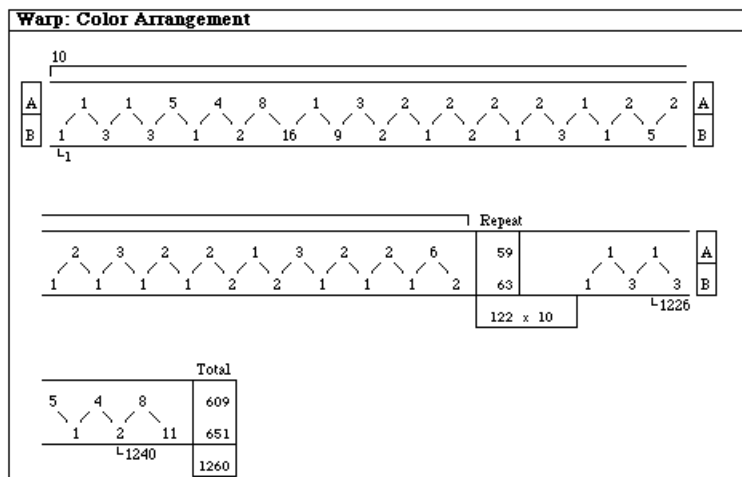
### Warp Yarn Description

The warp yarn description (illustrated below) shows the yarns used in the warp. A very similar chart shows the weft yarns.

Warp: Yarn Descriptions						
Color	Name	Dye	Size	Size	Size	Contents
A	Pink Gray	22-281 + 82	1/30			90 Wool, 10 Cotton
B	Almost Black	P372	2/50			90 Wool, 10 Cotton

### Warp Color Arrangement

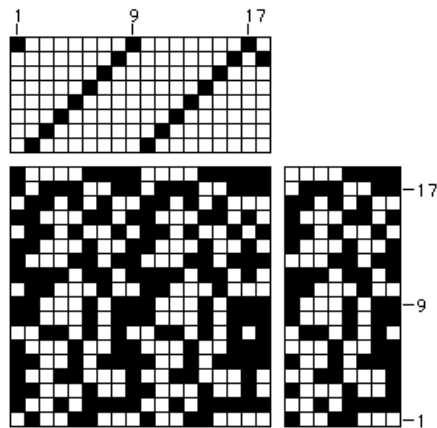
The illustration at the left shows a typical warp color arrangement chart (with two colors and a repeat, in this example).



The weft color arrangement appears in a similar chart.

### Drawdown

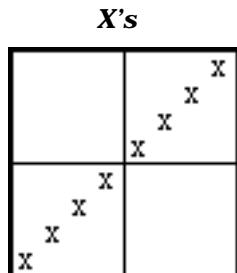
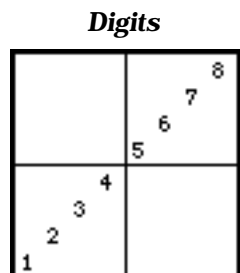
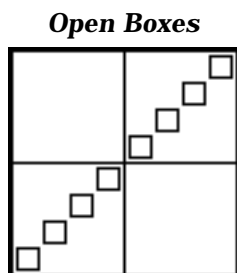
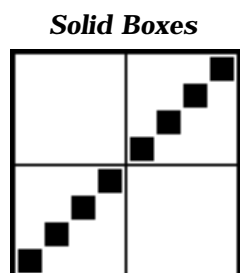
A drawdown can be useful to give the weaver a summary of the weave structure of the fabric. A typical drawdown is illustrated at the left.



## Diagram Symbols

When creating a diagram, WeaveMaker uses one of four possible ways of marking positions (solid, open, digits, X's). In the Print Options dialog, click on the "Items" popup to select the style you want.

Only one option can be in effect at a time. Here are examples of each marking option:



## Diagram Sizes

Several diagram sizes are available, as controlled by the Size popup (and see illustrations below).

You can specify whether you want a heavy ruled line every 8 position (see the examples below):

**Grid size #4**

**Small grid, thin lines**

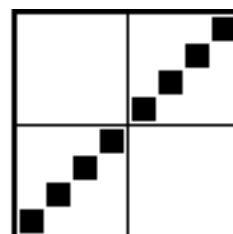


**Small grid, thick every 8**



**Grid size #7**

**Large grid, thick every 8**



Suggestion: the "digits" option combined with a small grid produces rather tiny characters. Use this only on a very high quality printer for under-40 viewers.



### Printing Warp and Weft Colors

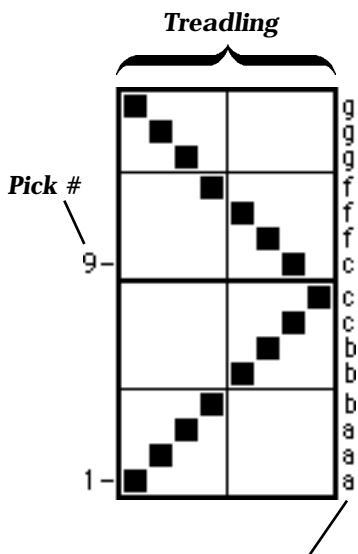
Thread colors can be indicated by a letter code or with a grid. Check (in Print Options) the option you want (you may check them both if you wish to have the colors displayed both ways at once).

Below is an example of each, for a fabric in which each color is used on three successive threads:

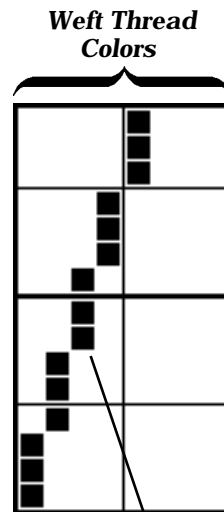
### Page Annotation

Each printed page can be annotated with the date, the name of the design, the save date of the design file, and a page number. These are controlled in the "Headers, Footers, Margins" section.

Put a check mark next to any combination of the annotation



*These show the colors as letters. "aaa" indicates that threads 1, 2, and 3 are all one color (whatever color is denoted by "a", which you will need to make note of).*



*Here the colors are shown by position, each column corresponding to a different color. The left-most column corresponds to color "a," the second to color "b," and so on.*

**Drawdown**

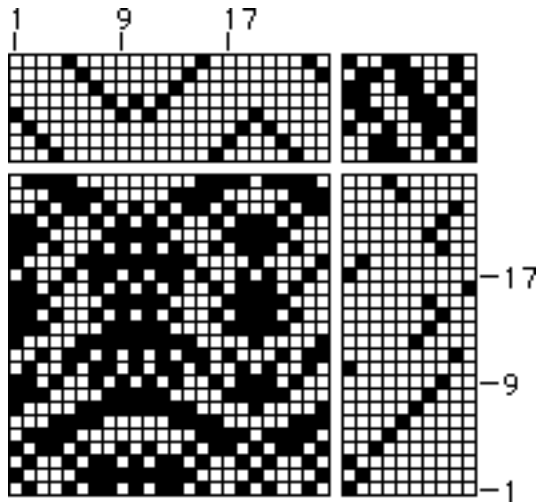
Selecting “Drawdown” in Print Options directs WeaveMaker to print the entire drawdown, including threading, tie-up (if appropriate), treading or peg plan, and the fabric drawdown proper.

This will likely take up multiple pages of output unless your fabric is quite small (under 50 ends and picks).

The pages are printed in such a way that they can be taped or glued together to produce a

single large sheet which fully describes the fabric. The intent is to let you describe every detail of the threading and warp/weft color assignments, the treading or peg plan to use for the actual weaving, and show the fabric well enough to let the weaver or mill double-check their work as they actually produce the fabric.

Here is an example of a full drawdown printout for a fabric of 24 ends and 24 picks on 8 harnesses and 10 treadles on a tie-up loom (for clarity, the thread color codes have been omitted).



### **Threading Diagram**

Selecting “Threading Diagram” in Print Options directs WeaveMaker to print the threading as a diagram.

The threading diagrams follow the same basic plan as do the peg plan diagrams, and have the same size, labeling, and formatting options.

Please turn the page for a complete description of these options.

### Peg Plan Diagram

Selecting “Peg Plan Diagram” in Print Options directs WeaveMaker to print the peg plan as a diagram. What follows are samples showing the formats WeaveMaker can produce.

The diagrams below illustrate the basic forms of a peg plan diagram.

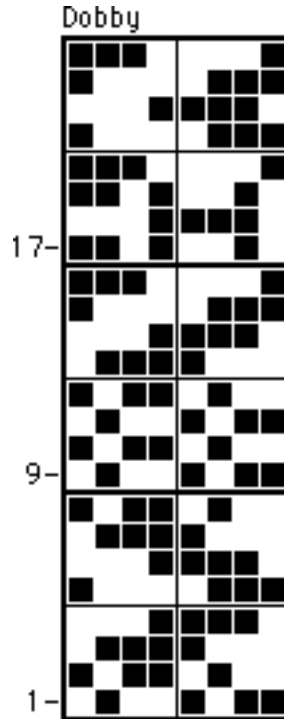
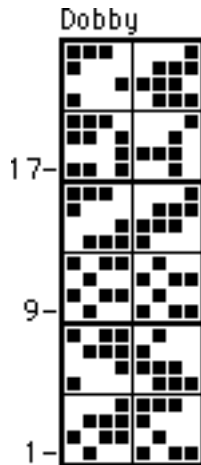
Pick #1 is at the bottom, harness #1 is at the left. After every four harnesses or picks there is a line; this alternates between being a thin line and a thick line, which helps your eye track through the diagram without error. Several sizes of squares are available.

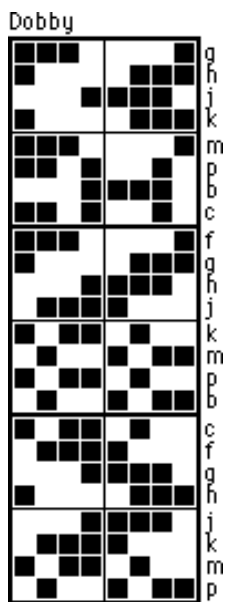
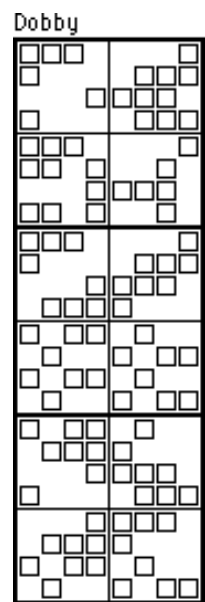
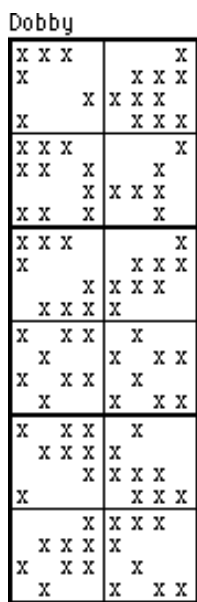
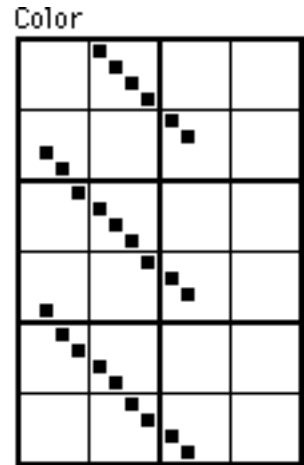
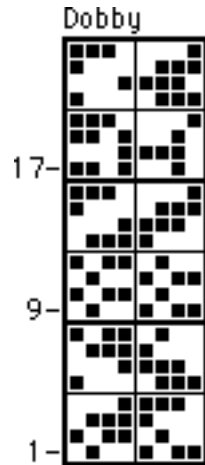
The three diagrams (opposite page, left) show variations on the basic diagram (they all

represent the same information, however). The one on the extreme left uses harness numbers in place of the solid black squares. The middle diagram uses X's, while the one at the right uses open squares.

Color can be shown with a letter code by each pick (opposite page, right, shown in large format), or in its own separate grid. Note that each of these diagrams is showing the same color information.

Note: if you want only thin separator lines, uncheck “thick lines” in Print Options.





## Tie-up Diagram

WeaveMaker does not at this time provide a separate tie-up diagram. However, the draw-down diagram includes a tie-up.

## Fabric Swatch In Color

Selecting “Fabric Swatch” in Print Options causes WeaveMaker to produce a single page of output showing the fabric drawn at a scale of 72 ends per inch. A typical page of output (letter size) is large enough to show about 500 ends and picks.

Alternatively, you can select the “Weave Simulation” option, which directs WeaveMaker to print a realistic fabric swatch.

This output will normally be done in color. You can force it to black and white (necessary if printing to a non-color printer) by selecting “Omit Color” in the Loom Menu. This converts the on-screen drawdown to black and white, and causes the “Fabric Swatch” print option to send only the colors black and white to the printer (warp will be interpreted as black, weft as white, or you can select “Back Side” in the Loom menu to reverse this color

assignment). Weave simulations require a color printer.

## Warp/Weft Colors Table

Selecting “Color Table” in Print Options adds one page to the printout. The page holds two tables, similar to the example below, giving the color codes used in the warp and weft, the count of ends or picks in each color, and the percentage of ends or picks which are of each color.

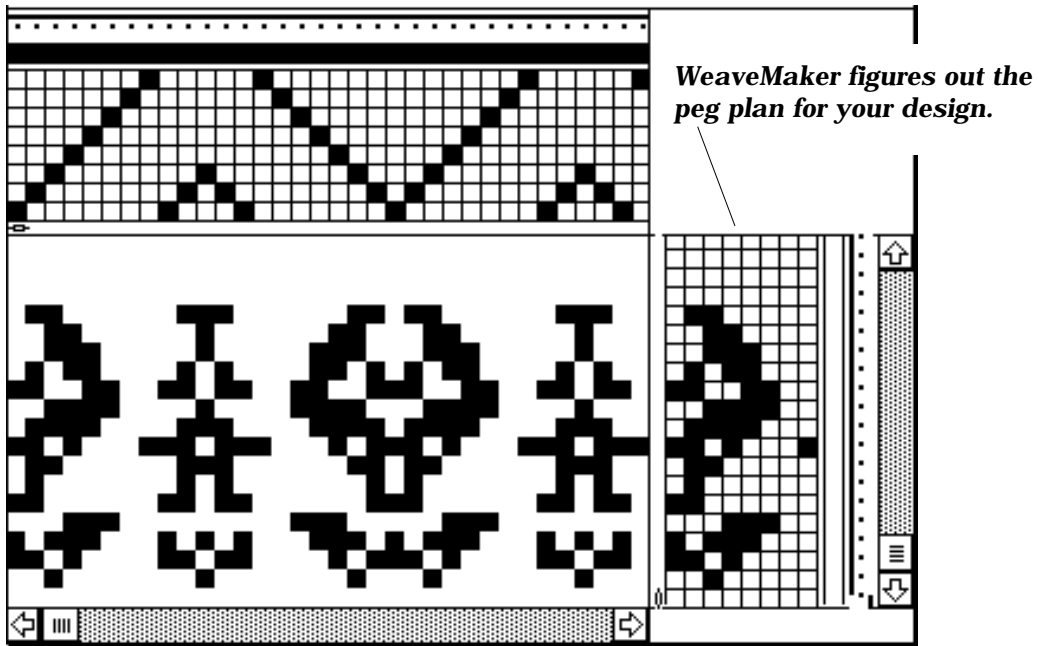
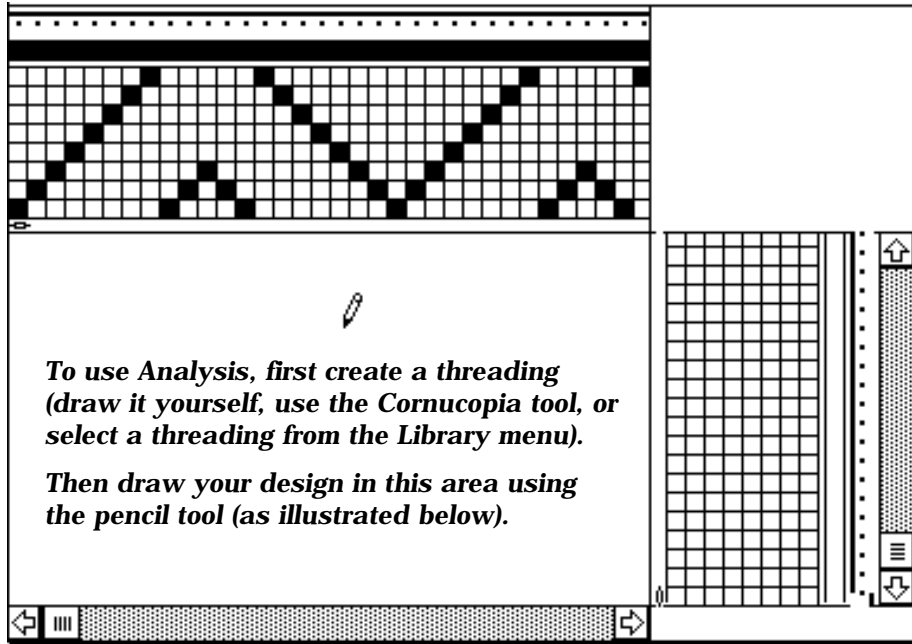
The example shows a warp arrangement of 50 ends, using 7 separate colors. Each color is identified by an arbitrary code letter. In this example, each color is used for either 5 ends or 10 ends.

In the actual printout, there will be two tables; one for warp and one for weft.

The code letters, while arbitrary, are consistent throughout all WeaveMaker printouts for a given design. Thus, color “g” in this table names the same color as the color letter “g” where it appears in a warp or weft threading table (in some other design, however, “g” would be a different color than that used for this design).

Warp Colors	Color Code	Ends	%		
888-23	a	1	59	25.2%	Powder Blue
33-212	b	2	58	24.8%	Light Blue
22-212	c	3	59	25.2%	Midday Sky
Custom "C"	d	4	58	24.8%	Misty Sunshine
	Total		234		

# **Analysis**



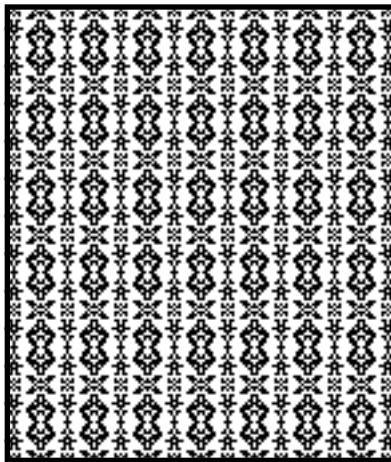


### **Analysis**

Analysis is the process of determining the threading and pegplan, or threading, tie-up, and treadling, that produces a given weave. In other words, in analysis, you start with a weave and work backwards to the threading and peg plan which will produce that weave.

WeaveMaker will perform an analysis at any time. When you want to edit the weave, click in the drawdown area of the design window, and the peg plan (or tie-up, if you are designing for a tie-up loom) will be changed to reflect what you drew. Note that this happens immediately and automatically; you do not have to tell WeaveMaker to analyze your design, it just does it.

*The design analyzed on the facing page yields this fabric:*



For example, consider the sequence of steps illustrated on the facing page. In the top figure a threading has been filled in. Then, as illustrated in the lower figure, you use the pencil tool to draw a design. WeaveMaker figures out an appropriate peg plan.

If you then repeat the figure with vertical mirroring (see “Repeats” in the Index), you get the design illustrated at the bottom of this page.

You may click in the weave at any time. For example, it is perfectly reasonable to change the threading, then edit the weave, then change the threading, then edit the peg plan, then change the weave, and so on and so forth. WeaveMaker does not impose rules on you: you can create and edit your design as the spirit moves you.



**Jacquard**

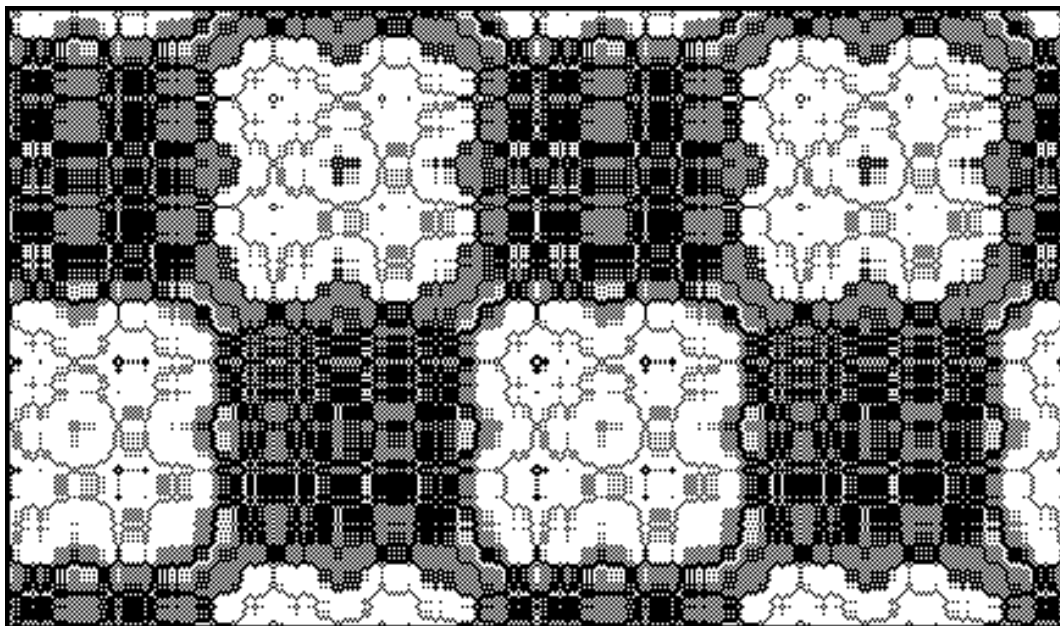
WeaveMaker is fundamentally a dobby weaving program. However, its cornucopia generates designs which can stretch the limits of dobby weaveability. Indeed, used at, say, 32 harnesses, some combinations of cornucopia settings are practically guaranteed to generate unweaveable designs.

And yet many of these designs are beautiful, and certainly they tend towards the unusual. Thus, designers using WeaveMaker will see designs they like but which they are disinclined to dobby weave.

There are several possible solutions to this dilemma. One would be to use WeaveMaker's CAD tools to improve the weaveability, a quite practical approach but one which may reduce the qualities of the design which make it so attractive. Another would be to interpret the design as a knit fabric rather than a woven one. Another would be to use a jacquard loom in place of a dobby loom.

This section deals with the latter approach—recasting a WeaveMaker design for dobby weaving.

*32 harnesses, tromp-as-writ, Random Walk threading, Wrapped Twill tie-up.*



### **Conversion to Jacquard**

Select “Jacquard” in the Loom menu to convert a doobby design into a jacquard design. You may wish to save your doobby design first, as there is no general method available to convert a jacquard back to a doobby should you change your mind (but you can use Undo if you accidentally convert a doobby to a jacquard).

When you do this, the following changes will occur to the design window:

a) The existing threading, tie-up, treadling, and peg plan will be erased, as these are irrelevant in jacquard weaving. The grids which held these elements are still present in a one-harness or one-treadle form, but this is only done to enable you to continue to use the selection tool and thus create repeat blocks; the grids themselves will always be empty.

b) The drawdown is converted to black and white. In a WeaveMaker jacquard drawdown, color denotes a type of weave, not the color of the fabric at that point. Thus you start off with two types of weave (the assignments of weaves to colors is up to you, so “white” and “black” weave types will be whatever you wish them to be).

### **Jacquard Editing**

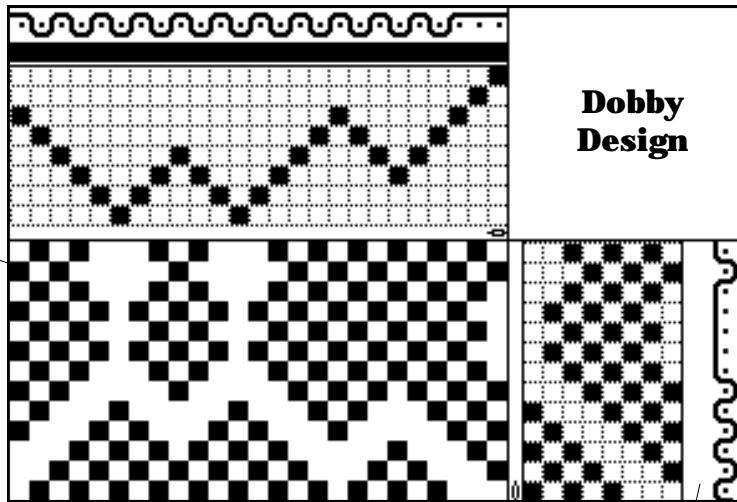
While in jacquard mode, you will use the crayon tool to set colors (weave types) in the drawdown. But you can also use the crayon tool to change thread color assignments in the warp and weft (just as you would in a doobby design). In the former case, you are using color as a code to show the weave type, while in the latter the colors stand for themselves.

If you edit the colors in the Tool window, you will be editing both the weave-code colors and the thread colors.

Clicking a square in the drawdown with a crayon changes that square to the crayon color.

Hold down the command key and note that the cursor changes to a pencil. Use this to set a square to black or white (click once for black, click again for white, click again for black, et cetera).

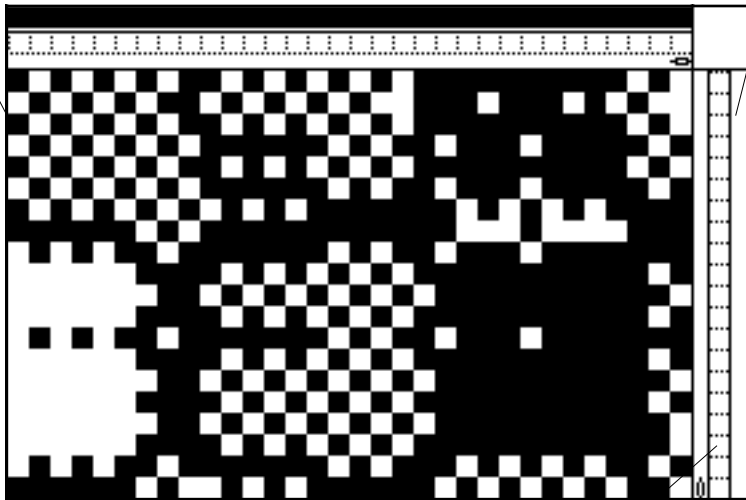
*In a dobby design, each square in the drawdown represents a place where a warp thread crosses a weft thread. Black conventionally signifies the warp thread going over (on top of) the weft thread, while white means the weft thread is on top.*



*In the jacquard design, each square in the “drawdown” represents a space which will be filled with a particular type of weave. The color of the square is a code which describes the kind of stitch used in this area. Here there are only two colors (black and white), so there are just two kinds of stitches. Use the color crayons to assign colors (see text for details).*

*In either design, these colors show the color of the threads which make up the fabric.*

**Jacquard Design**

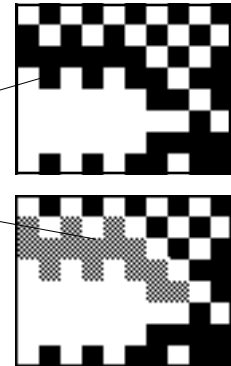


*This grid, which in a dobby design would show the threading, does not contain any information in a jacquard design. However, you can use the selection tool in this area to set up repeats just like the repeats WeaveMaker offers for dobby designs.*

If you hold down the control (“ctrl”) key and click, the square under the crayon changes to the color of the crayon, plus all squares which are in contact with that square and are the same color as it also change to the new color (see illustration at right).

This lets you set large, connected areas of the design to a new weave quickly.

*Clicking here with a gray crayon with the ctrl key held down yields this:*



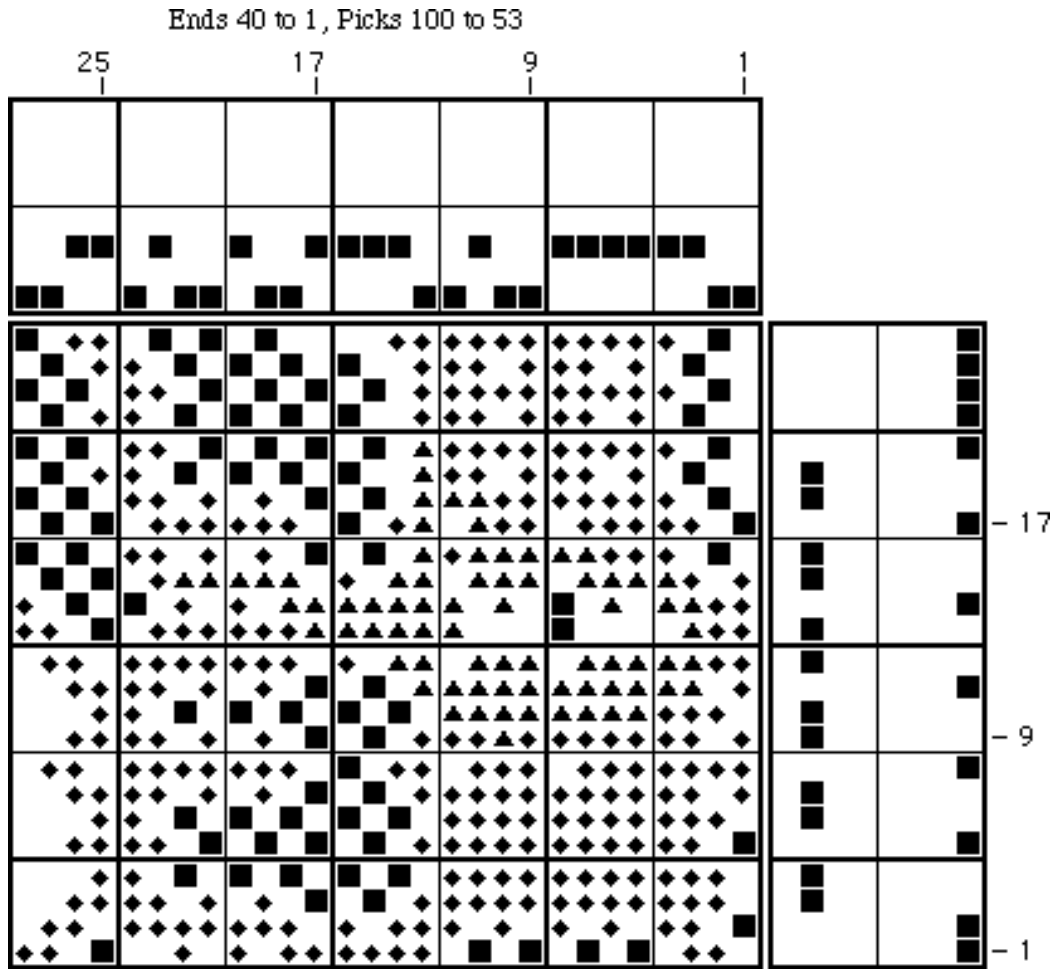
### **Jacquard Printing**

The diagrams on the facing page illustrate some points about WeaveMaker’s jacquard printing.

Note in particular that the weave codes, which are represented by various colors in the jacquard drawdown, are converted to weave symbols in the printout. These guide the mill in setting up the loom.

The thread colors appear in the printout just as they would in a WeaveMaker dobby printout, and all the same options of grid size and formats for showing colors are available to you.

## Sample Jacquard Printout



*White squares in the jacquard drawdown appear here as blank space; black squares are black here; and colored squares become symbols (such as triangles or diamonds).*



# **Facts and Figures**

## **Facts and Figures**

### ***Colorways***

An individual colorway (one row across the colorway window) can contain up to 16 color chips. This means that WeaveMaker limits a fabric to 16 colors (total across warp and weft) in its color arrangement.

A single fabric cannot have more than 40 distinct colors, total, in all its colorways. This is the same as saying that the total number of unique colors which can appear in the colorway window is 40.

If a given color appears in several different colorways, it still only counts as one color.

A fabric can have up to 5 colorways (there can be up to 5 rows of color chips in the colorway window).

### ***Designs***

Up to 3 designs (designs) may be active at one time.

### ***Ends, Picks***

The number of ends or picks can be as few as 1 or as many as 1,000.

Note: special versions of WeaveMaker are available which can handle more than 1,000 ends or picks.

### ***Harnesses***

WeaveMaker handles any number of harnesses from 4 to 32.

### ***Palettes***

Up to 2 palettes may be active at one time.

A palette may contain up to 72 screen colors. Note that the printer colors do not count towards this limit (in some strict sense, then, a palette might be said to contain up to 144 colors, counting both screen and printer colors). Permanent black and white count towards this limit (restricting you to 70 colors of your own creation).

### ***HSL***

WeaveMaker uses the standard numbering system for encoding colors as hue/saturation/lumens (HSL).

Each color component ranges from 0 to 65,535. White has a value (brightness) of 65,535 and a saturation of 0. Black has a value (brightness) of 0.

### ***RGB***

WeaveMaker uses the standard Macintosh numbering system for encoding colors as red/green/blue (RGB).

Each color component ranges from 0 to 65,535. White has red, green, and blue all set to 65,535. Black has red, green, and blue set to 0.

***Treadles***

WeaveMaker handles any number of treadles from 4 to 32.



# Technical Assistance

**Phone:** (530) 893-4915  
(800) 626-9615

**Internet:** [info@avlusa.com](mailto:info@avlusa.com)

We welcome your questions, comments, and suggestions for improvements. When you call us you reach someone who knows the products inside out, because we all design and help create the products.

Improvements in our products come partly from our own ideas, but more so from suggestions from our customers. So we would love to hear from you.

AVL is located in the Pacific time zone of the United States. We answer the phone unless we're asleep, so call us anytime. Our answering machine is always on alert, and we return phone calls. We monitor our electronic mail frequently, so that's another great way to get in touch with us.



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