

AN EXALTATION OF BLOCKS

ROSALIE NEILSON

APPENDUM – BORDER OUTLINES

How to Use the Section Two Transparent Overlays to Determine 5- to 8-end Twill Tie-ups

The 5- to 8-block outlines in the Transparent Overlays of Section Two are intended to increase the size of the 4-block motifs illustrated on the Design Pages. The outlines were derived from the binary number system of 0's and 1's.

For example, in a 5-column series of numbers, starting with a row of five 0's and ending with a row of five 1's, there are 32 different arrangements of 0's and 1's. To develop the 5-block outlines, the 0's were translated into white squares or background blocks while the 1's were translated into black squares or pattern blocks. The 32 outlines were then rearranged into a twill progression of blocks.

The thirty Transparent Overlays of Volume Two in envelopes 8 to 11 illustrate the definitive number of block outlines for each of the motif groups: 32 for 5-block motifs, 64 for 6-block motifs, 128 for 7-block motifs, and 256 for 8-block motifs.

Because the outlines are arranged in a twill progression of blocks, moving from the center to the outside corners, they also serve as the definitive number of twill tie-ups for each structure, whether it is a 5-, 6-, 7-, or 8-end twill.

There are six tie-ups for a 5-end twill, eleven tie-ups for a 6-end twill, eighteen tie-ups for a 7-end twill, and thirty-three tie-ups for an 8-end twill.

The tie-ups are grouped by the page number of each Transparent Overlay. They are further classified by the number of “up” or raised warp threads (shown as black squares in each column), and the number of “down” or lowered threads (shown as white squares in each column).

Each twill tie-up is delineated further by numbers above and below a horizontal line. The numbers above the horizontal line (representing the order of black squares in the first column of the tie-up) are raised warp threads. The numbers below the horizontal line (representing the order of white squares in the first column of the tie-up) are those that remain in the lowered position. The numeral above each column of the tie-up refers to the border outline on a specific Transparent Overlay.

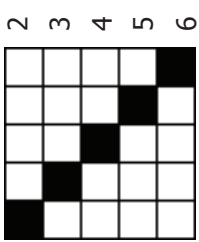
For example, Figure 1.1 is a twill tie-up derived from the five outlines labeled 2.3.4.5.6 on Transparent Overlay 5.1. The figure title is 1U-4D where U symbolizes an Up thread and D symbolizes a Down thread. There are one raised warp end and four lowered warp ends in each column. This is also shown by numerals appearing below the title. Numeral 1 above the horizontal line means one raised warp end and numeral 4 below the horizontal line means four lowered warp ends.

Figure 1.2 shows a twill tie-up derived from 5-block outlines 7.8.9.10.11 where two threads are up and three are down. Figure 1.3 shows a twill tie-up derived from outlines 12.13.14.15.16 where the two threads up and three threads down are shown in a different arrangement.

AN EXALTATION OF BLOCKS

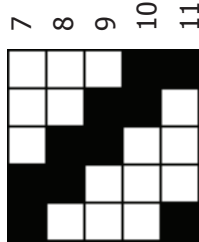
ROSALIE NEILSON

Transparent Overlays 5.1 and 5.2



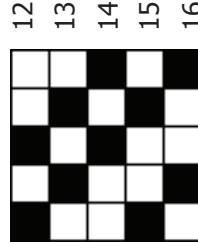
1.1 1U - 4D

$$\frac{1}{4}$$



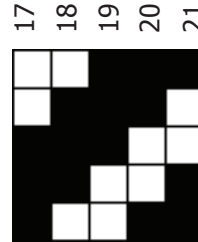
1.2 2U - 3D

$$\frac{2}{3}$$



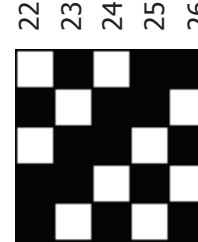
1.3 2U - 3D

$$\frac{1 \ 1}{1 \ 2}$$



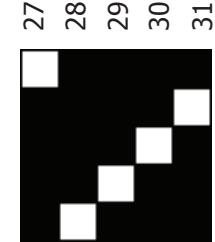
1.4 3U - 2D

$$\frac{3}{2}$$



1.5 3U - 2D

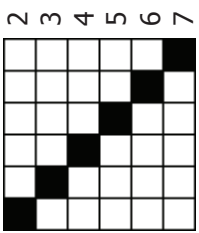
$$\frac{2 \ 1}{1 \ 1}$$



1.6 4U - 1D

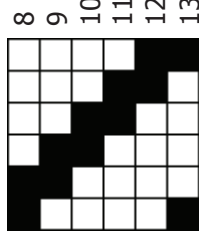
$$\frac{4}{1}$$

Transparent Overlays 6.1 and 6.2



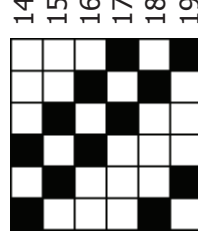
2.1 1U - 5D

$$\frac{1}{5}$$



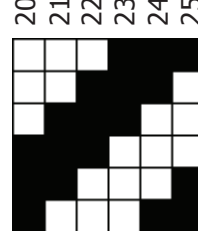
2.2 2U - 4D

$$\frac{2}{4}$$



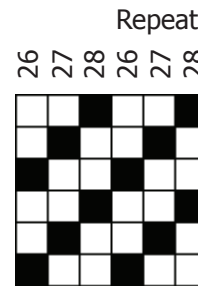
2.3 2U - 4D

$$\frac{1 \ 1}{1 \ 3}$$



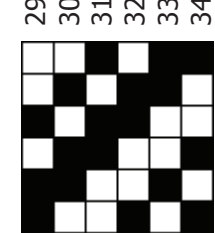
2.4 3U - 3D

$$\frac{3}{3}$$



2.5 2U - 4D

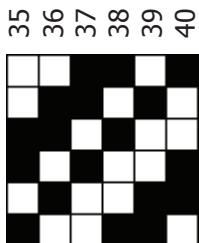
$$\frac{1 \ 1}{2 \ 2}$$



2.6 3U - 3D

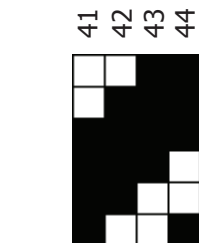
$$\frac{2 \ 1}{1 \ 2}$$

Transparent Overlays 6.3 and 6.4



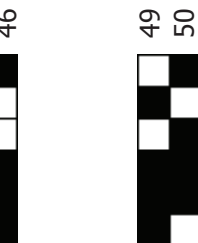
2.7 3U - 3D

$$\frac{1 \ 2}{1 \ 2}$$



2.8 4U - 2D

$$\frac{4}{2}$$



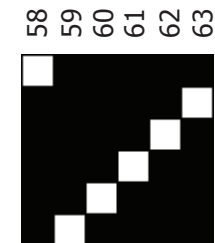
2.9 4U - 2D

$$\frac{3 \ 1}{1 \ 1}$$



2.10 4U - 2D

$$\frac{2 \ 2}{1 \ 1}$$



2.11 5U - 1D

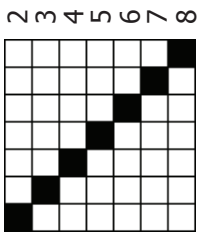
$$\frac{5}{1}$$

The 6-block outlines on Transparent Overlay 6.3 labeled 47 and 48 show an alternating checkerboard border as do the 8-block outlines on Transparent Overlay 8.13 labeled 210 and 211. When transferred to the grid for a 6-end or 8-end twill, they produce a plain weave tie-up arrangement rather than a twill. For that reason, these outlines are not illustrated.

AN EXALTATION OF BLOCKS

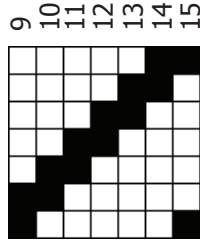
ROSALIE NEILSON

Transparent Overlays 7.1 to 7.3



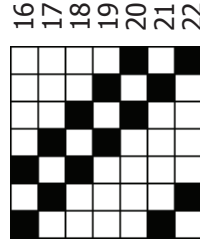
3.1 1U - 6D

$$\frac{1}{6}$$



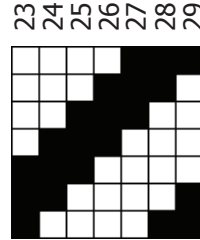
3.2 2U - 5D

$$\frac{2}{5}$$



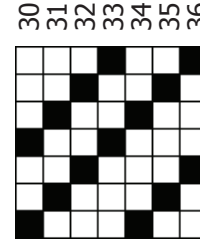
3.3 2U - 5D

$$\frac{1 \ 1}{1 \ 4}$$



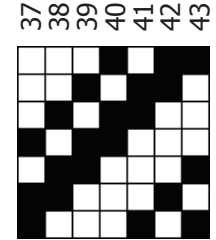
3.4 3U - 4D

$$\frac{3}{4}$$



3.5 2U - 5D

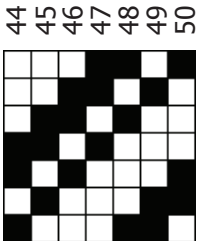
$$\frac{1 \ 1}{2 \ 3}$$



3.6 3U - 4D

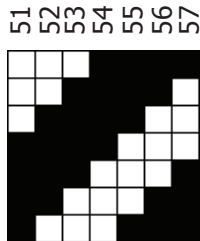
$$\frac{2 \ 1}{1 \ 3}$$

Transparent Overlays 7.4 to 7.5



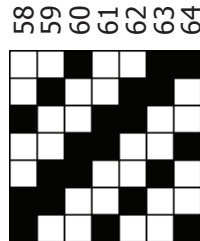
3.7 3U - 4D

$$\frac{1 \ 2}{1 \ 3}$$



3.8 4U - 3D

$$\frac{4}{3}$$



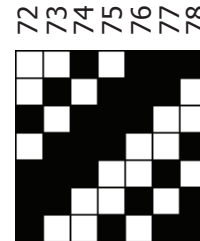
3.9 3U - 4D

$$\frac{2 \ 1}{2 \ 2}$$



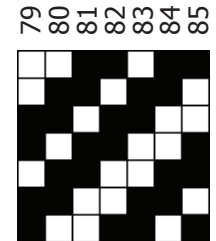
3.10 3U - 4D

$$\frac{3}{4}$$



3.11 4U - 3D

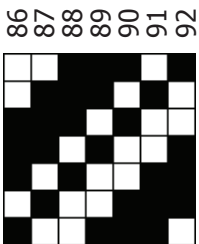
$$\frac{3 \ 1}{1 \ 2}$$



3.12 4U - 3D

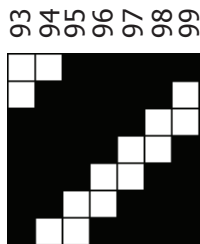
$$\frac{2 \ 2}{1 \ 2}$$

Transparent Overlays 7.6 to 7.8



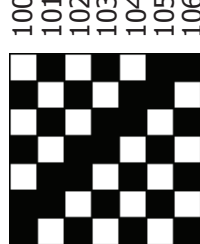
3.13 4U - 3D

$$\frac{1 \ 3}{1 \ 2}$$



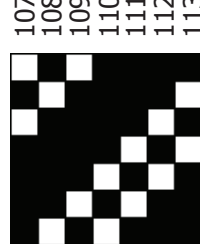
3.14 5U - 2D

$$\frac{5}{2}$$



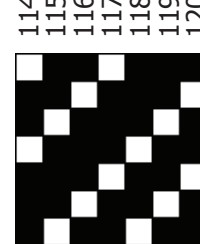
3.15 4U - 3D

$$\frac{2 \ 1 \ 1}{1 \ 1 \ 1}$$



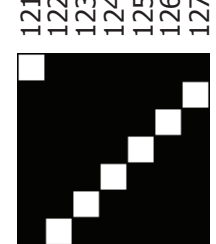
3.16 5U - 2D

$$\frac{4 \ 1}{1 \ 1}$$



3.17 5U - 2D

$$\frac{3 \ 2}{1 \ 1}$$



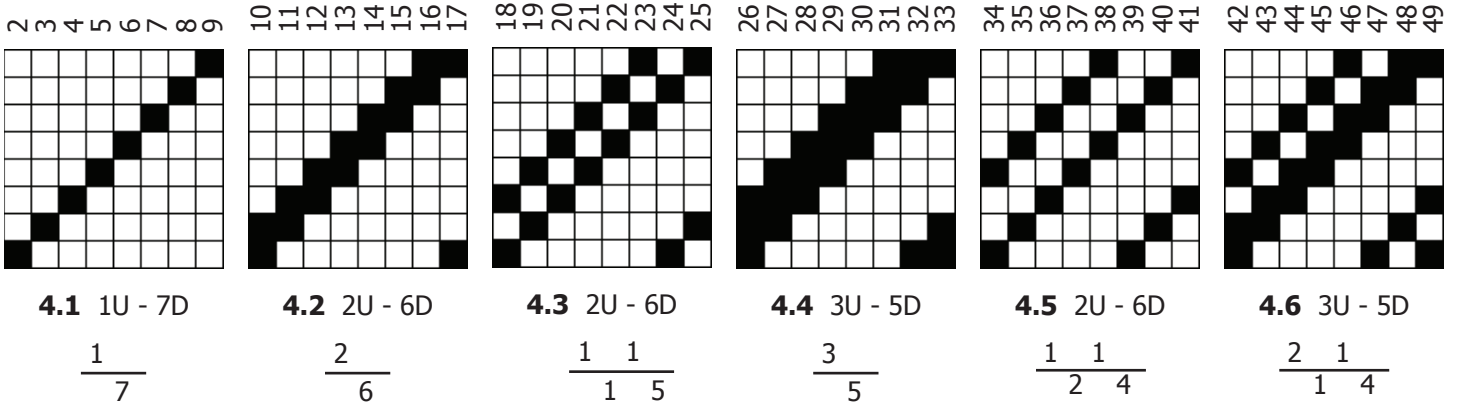
3.18 6U - 1D

$$\frac{6}{1}$$

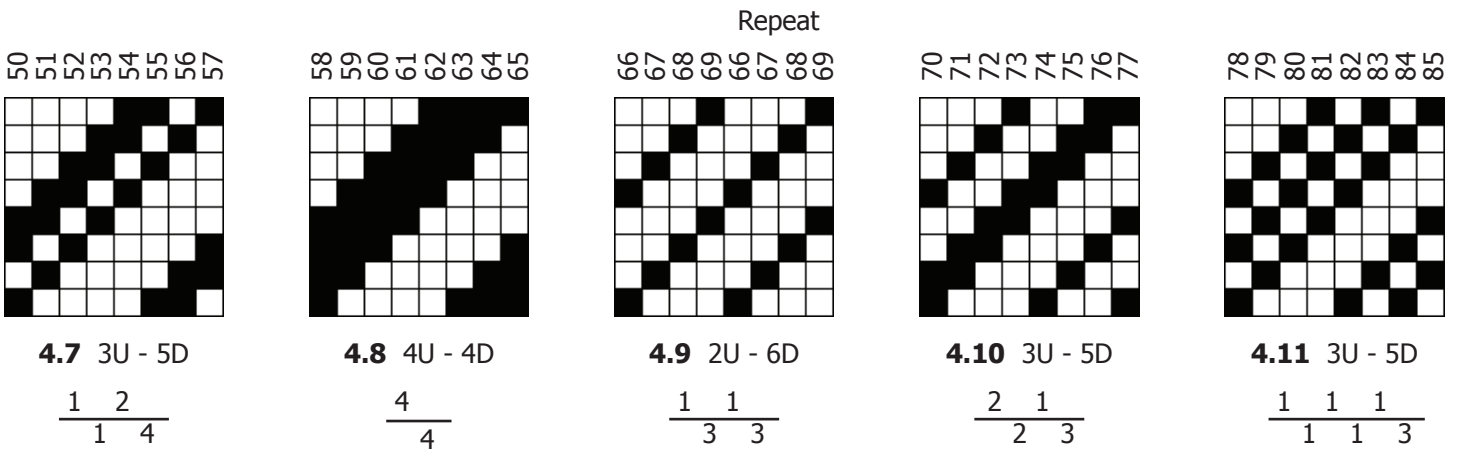
AN EXALTATION OF BLOCKS

ROSALIE NEILSON

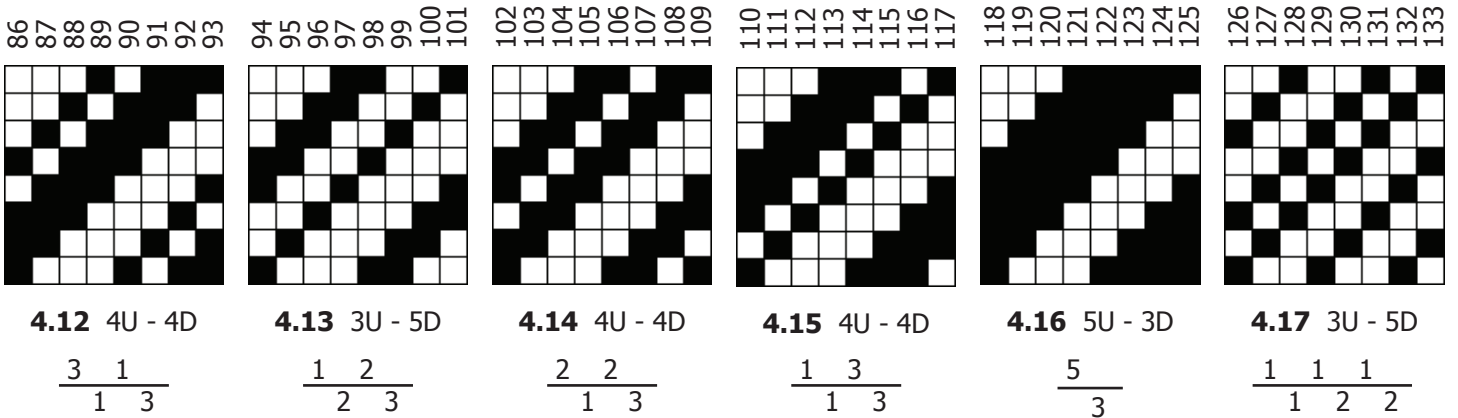
Transparent Overlays 8.1 to 8.3



Transparent Overlays 8.4 to 8.6



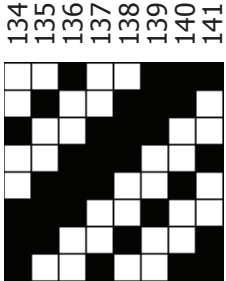
Transparent Overlays 8.6 to 8.8



AN EXALTATION OF BLOCKS

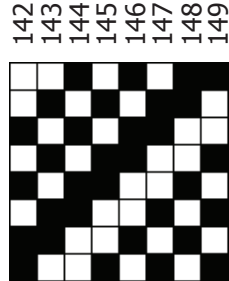
ROSALIE NEILSON

Transparent Overlays 8.9 to 8.11



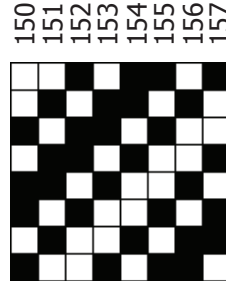
4.18 4U - 4D

$$\frac{3 \quad 1}{2 \quad 2}$$



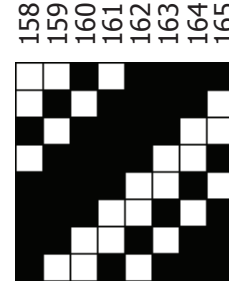
4.19 4U - 4D

$$\frac{2 \quad 1 \quad 1}{1 \quad 1 \quad 2}$$



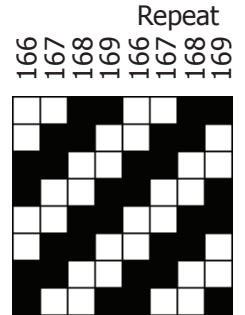
4.20 4U - 4D

$$\frac{1 \quad 2 \quad 1}{1 \quad 1 \quad 2}$$



4.21 5U - 3D

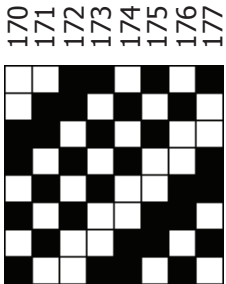
$$\frac{4 \quad 1}{1 \quad 2}$$



4.22 4U - 4D

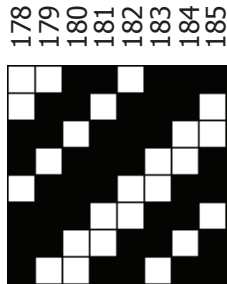
$$\frac{2 \quad 2}{2 \quad 2}$$

Transparent Overlays 8.11 to 8.14



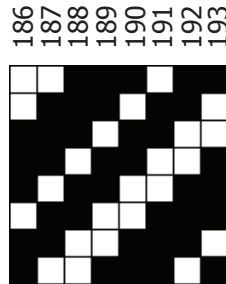
4.23 4U - 4D

$$\frac{1 \quad 1 \quad 2}{1 \quad 1 \quad 2}$$



4.24 5U - 3D

$$\frac{3 \quad 2}{1 \quad 2}$$



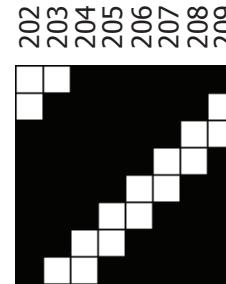
4.25 5U - 3D

$$\frac{2 \quad 3}{1 \quad 2}$$



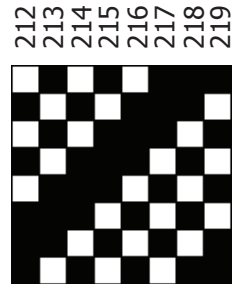
4.26 5U - 3D

$$\frac{1 \quad 4}{1 \quad 2}$$



4.27 6U - 2D

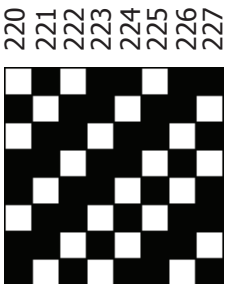
$$\frac{6}{2}$$



4.28 5U - 3D

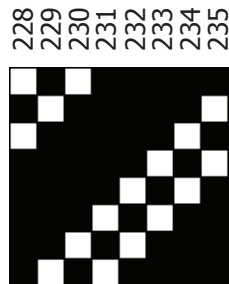
$$\frac{3 \quad 1 \quad 1}{1 \quad 1 \quad 1}$$

Transparent Overlays 8.14 to 8.16



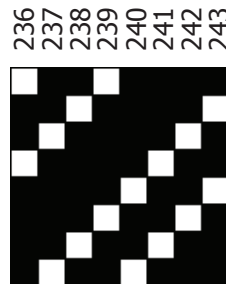
4.29 5U - 3D

$$\frac{2 \quad 2 \quad 1}{1 \quad 1 \quad 1}$$



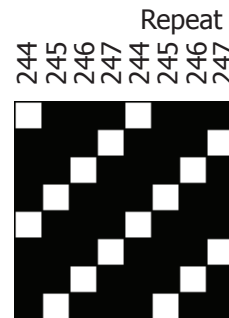
4.30 6U - 2D

$$\frac{5 \quad 1}{1 \quad 1}$$



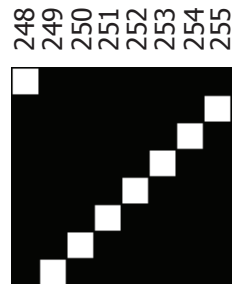
4.31 6U - 2D

$$\frac{4 \quad 2}{1 \quad 1}$$



4.32 6U - 2D

$$\frac{3 \quad 3}{1 \quad 1}$$



4.33 7U - 1D

$$\frac{7}{1}$$

AN EXALTATION OF BLOCKS

ROSALIE NEILSON

BORDER OUTLINE SUMMARY

Arranging the Transparent Overlay outlines into a series of twill tie-ups serves as a visual explanation of how the blocks in the borders are arranged on each Overlay.

5-end Twills

Of the thirty-two border outlines in the 5-block Transparent Overlays, the first and last outlines (all background-colored and all pattern-colored blocks) are eliminated since they don't produce a twill line. The remaining thirty outlines generate six tie-ups which can be divided into pairs of 5-end color-opposite twill lines.

The first pair, Figures 1.1 and 1.6, show one raised warp end in Figure 1.1 and four raised warp ends in Figure 1.6. The remaining pairs of color-opposite twill lines are Figures 1.2 and 1.4, and Figures 1.3 and 1.5.

6-end Twills

Of the sixty-four border outlines in the 6-block Transparent Overlays, the first and last are eliminated, as are the checkerboard outlines of 47 and 48 on Overlay 6.3. The checkerboard arrangement of blocks produces a plain weave rather than a twill tie-up. The remaining border outlines generate eleven 6-end twill tie-ups.

Figures 2.1 and 2.11 are a color-opposite pair with one raised warp end in the first figure and five raised warp ends in the second. There are four more color-opposite pairs: Figures 2.2 - 2.8; 2.3 - 2.9; 2.5 - 2.10; 2.6 - 2.7. Figure 2.4 shows three raised and three lowered warp ends, an equal number of ends in each column.

7-end Twills

Of the 128 border outlines in the 7-block Transparent Overlays, two are eliminated, the first and the last. The remaining border outlines generate eighteen twill tie-ups, divided into two groups of nine color-opposite twill pairs. Figures 3.1 and 3.18 are color-opposite pair with one raised warp end in the first figure and six raised warp ends in the second figure.

The remaining eight color-opposite pairs fall into two categories: figures labeled 2U-5D are opposite to those labeled 5U-2D; figures labeled 3U-4D are opposite to those labeled 4U-3D.

The three pairs in the first category are Figures 3.2 - 3.14; 3.3 - 3.16; 3.5 - 3.17. The five pairs in the second category are Figures 3.4 - 3.8; 3.6 - 3.13; 3.7 - 3.11; 3.9 - 3.12; 3.10 - 3.15.

8-end Twills

Of the 256 border outlines in the 8-block Transparent Overlays, four are eliminated: the first and last, as well as the checkerboard outlines 210 and 211 on Overlay 8.14. The remaining border outlines generate thirty-three 8-end twill tie-ups. Figures 4.1 and 4.33 are the first color-opposite pair with one raised warp end in the first figure and seven raised warp ends in the second.

Color-opposite pairs fall into three categories: figures labeled 2U-6D are opposite to those labeled 6U-62; figures labeled 3U-5D are opposite to 5U-3D. The third category of color-opposite pairs is labeled 4U-4D.

The first category has four pairs: Figures 4.2 - 4.27; 4.3 - 4.30; 4.5 - 4.31; 4.9 - 4.32. The second category has seven pairs: Figures 4.4 - 4.16; 4.6 - 4.26; 4.7 - 4.21; 4.10 - 4.25; 4.11 - 4.28; 4.13 - 4.24; 4.17 - 4.29. The third category has three pairs: 4.12 - 4.15; 4.14 - 4.18; 4.19 - 4.23.

Three twill tie-ups show the coloration of the first four columns 1.2.3.4 repeating in the second four columns 5.6.7.8. This occurs in the color-opposite pair of Figures 4.9 - 4.32 and in Figure 4.22. Figures 4.8 and 4.20 have opposite colors in the eight columns: columns 1.2.3.4 are opposite in coloration to those in columns 5.6.7.8.

It's fun to see how the blocks in the outline borders of the Transparent Overlays relate to the definitive number of twill tie-up possibilities for 5-, 6-, 7-, and 8-end twills.