

INTERPRETING PROFESSIONAL DRAFTS

By Harriet Tidball

The weaver who is constantly searching for fresh ideas, new drafts and designs, further knowledge, usually turns to highly recommended weaving books for his new sources. The four-harness weaver can find each handweaving book a new adventure, full of ideas and designs. But how often it happens that the owner of a multiple-harness loom buys an expensive book recommended for multiple-harness patterns, and meets only the terrible disappointment of finding that it contains nothing he can use or even understand. Usually he will find none of the familiar drafts, tie-ups, weaving directions or even photographs, which have been his guides in four-harness weaving; or if he finds one of these, the other elements are missing so he is helpless as far as using the designs is concerned. And unfortunately, study of the text of these books, if it happens to be in English, brings little enlightenment. Books which have brought these disappointments are *A HANDBOOK OF WEAVES* by Oelsner and Dale, *TEXTILE DESIGN AND COLOR* by William Watson, *FABRIC STRUCTURE* by John H Strong, *2500 ARMATURE-INTRECCIO* by Eugenia Poma, *GEWEBE TECHNIK* by Bruno Hauptmann.

The fault, "Dear Brutus," is not in the books, but in the handweaver's limited understanding of the draft forms used in the weaving trade, for which these books are intended. The drafting systems are seldom explained, because the authors of these books pre-suppose that only a professional who understands drafts will be using the books. But actually, the drafting system is simple enough—just an abbreviation of the forms used by the handweavers—and anyone can learn it easily and quickly. There are a few facts to know about the professional drafts:

Professional drafts are usually a square diagram, drawn on cross-section paper.

Within this diagram, the interpreter must be able to read the threading draft, the tie-up draft, the treadling draft.

The threading draft is determined by reading horizontally (from right to left or from left to right, as the weaver prefers),

The treadling draft is determined by reading vertically (from top to bottom or from bottom to top, as the weaver prefers).

The tie-up draft is determined by reading the squares between the tie-up and treadling drafts—that is, by reading the diagram.

In making an analysis of a diagram to determine these points, the first step is to determine the extent of the draft and of the treadling sequence by finding where horizontal and vertical repeats start. This is done by examination and comparison. It is best for the handweaver to start the upper right-hand

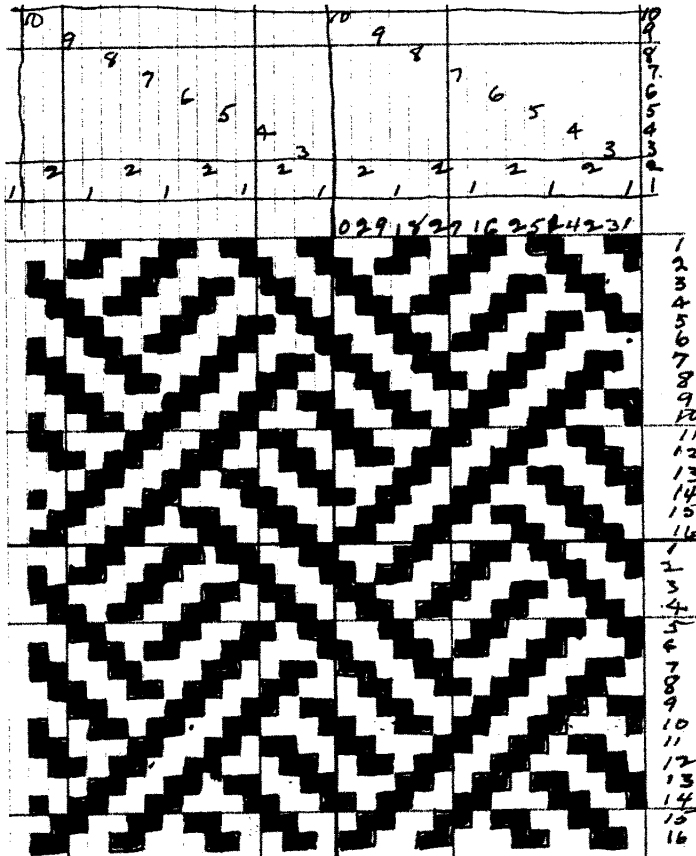
corner of the diagram (power-loom drafters usually start at the lower left) and compare the pattern of filled squares until an exact repeat is evident. Place a mark where the repeat starts, and then compare further horizontal lines, working downward, to check this point for accuracy. It is a good idea to draw a line down the diagram at this repeat point. Then, starting at the upper right-hand corner again, make comparisons downward to determine the extent of the treadling repeat. Draw a horizontal line across the draft here. One now has a full repeat of the draft and treadling marked off. This may be a square (as it is for all of the braided twill diagrams) or it may be an oblong, if there are more or less shots in the repeat than threads in the draft.

The next step is the determination of the draft. This is done by assumption, if no draft is given. The assumption is that each thread of the draft is carried on a separate harness—which means that one assumes a twill draft on as many harnesses as there are threads in the full draft repeat. Above the diagram, number the squares starting with “1” at the right. This is not the case with the braided twill drafts, which start with a twill in most cases, followed by a group of ends threaded to a different harness arrangement. (Since most books give the draft if it is other than twill, the method for determining the exact draft need not be taken up here. But the weaver who is interested in this phase will find it in the July 1956 Shuttle Craft BULLETIN, included in the “Analysis” Monograph Series, \$2.50.)

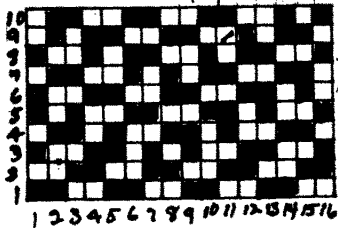
The next step is determining the treadling directions, and for this one simply assumes one shot for each horizontal row of the single-repeat diagram. Therefore, at the right-hand side of the diagram, starting at the top, number the squares 1, 2, 3, 4, etc.

The third element, the tie-up is the diagram itself, but the ties are read crossways instead of up or down. To read the tie-up, start with the top horizontal line (shot 1) and set down the number which lies above each dark square of the first line, connecting the numbers with dashes. Then read and set down the number above each dark square on the second line (shot 2) of the diagram. Continue thus until the numbers for filled squares for each line of the diagram have been noted. These constitute the tie-ups for each treadle, and may then be written in graphic tie-up form.

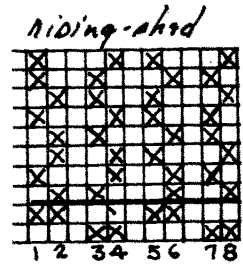
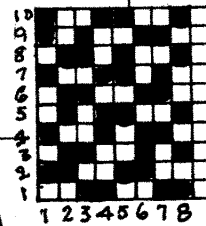
For an example of this method I am giving here my own worksheet for a 10-harness braided twill. This design was taken from Hauptman, *GEWEBE TECHNIK*, and since the threading was not a straight twill, the draft was given with the diagram. The draft was informally copied first, substituting harness numbers for the graphic squares so as to make the drawing of the diagram easier. The diagram was copied below the draft. The extent of the draft on the diagram was determined (two repeats in both threading and treadling were given) and the two lines drawn which in this case divide the diagram into four identical squares. The analysis could have been started at any one of the corners of any one of the squares, but it is simplest if one starts at the upper right-hand corner. The shed numbers, one to sixteen, were written down



- 1-4-7-9-10
- 2-4-5-7-10
- 2-3-6-8-9
- 1-3-4-6-9
- 1-5-7-8-10
- 2-3-5-8-10
- 2-4-6-7-9
- 1-3-4-6-9
- 1-5-7-8-10
- 2-4-5-7-10
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- 2-4-6-7-9
- 2-3-5-8-10

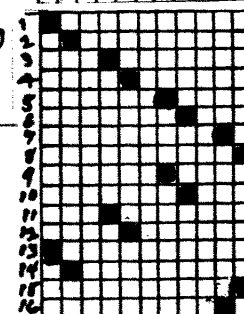
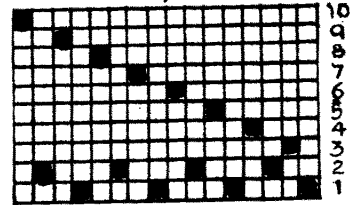
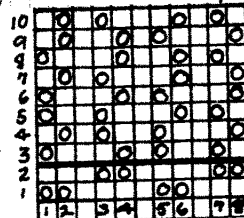


- converted tie-up*
- ① 2-4-7-9-10
 - ② 2-3-5-6-8
 - ③ 1-3-6-8-9
 - ④ 1-4-5-7-10
 - ⑤ 2-5-7-8-10
 - ⑥ 2-3-4-6-9
 - ⑦ 1-4-6-7-9
 - ⑧ 1-3-5-8-10
 - ⑨ 2-5-7-8-10
 - ⑩ 2-3-4-6-9
 - ⑪ 1-3-6-8-9
 - ⑫ 1-4-5-7-10
 - ⑬ 2-4-7-9-10
 - ⑭ 2-3-5-6-8
 - ⑮ 1-3-5-8-10
 - ⑯ 1-4-6-7-9



heading
1 2 3 4 5 6 7 8

final tie-up draft



treading

the right-hand side of the diagram. The harness numbers for each shed were then determined, and will be seen at the right of the diagram. These series of numbers are then changed to a tie-up draft which is drawn out here using black squares. (In American handweaving usage the sinking-shed tie-up, which diagramming the black squares gives, is represented by "x" for each harness number. The filled square is given here because it gives a more graphic representation of the tie-up, and also because this is the system used in most of the Scandinavian and Finnish books, so the handweaver needs to be familiar with this tie-up form.) The next problem taken up here is that of converting the sinking-shed tie-up to a rising-shed tie-up. This conversion is made by listing the omitted numbers for each shed, and this list of harness groups is seen below the diagram. (This conversion may be done as the last step, if one wishes.) Then an analysis-by-comparisons was made of the sheds. The third shed was compared with the first; the fourth with the first and second; the fifth with the first, second and third; the sixth with the first, second, third and fourth; and so on. Each shed which was exactly the same as a previous shed was given the same number as the previous shed. It was found that the first eight sheds were all different so they retained their original numbers. Then the ninth shed was found to be identical to the fifth, so the number "5" was placed at the right; the tenth was the same as the sixth, so it was so numbered. The circled figures at the right show that the last eight sheds repeat the first eight, but in a different order. Therefore the complete tie-up is included in the first eight sheds so this tie-up is drafted for both sinking and rising shed, with separations made between pairs of treadles for graphic clarity. The sinking shed tie-up is given because diagrams are usually made from it, but the rising-shed tie-up is the one to which the loom is tied, since multiple-harness looms have rising sheds.

Finally, the treadling order as shown by the shed numbers (1, 2, 3, 4, 5, 6, 7, 8; 5, 6, 3, 4, 1, 2, 8, 7 repeat) is diagrammed under the tie-up, in the manner used in the Swedish handweaving books.

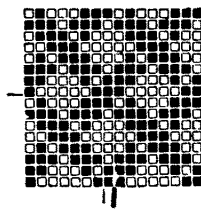


Figure 1

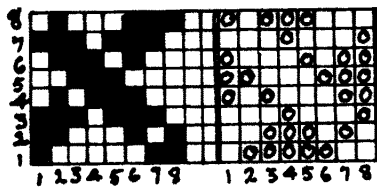


Figure I—

A HANDBOOK OF WEAVES, by G H Oelsner, Fig. 586, page 122, a Fancy Twill on eight harnesses, requiring eight treadles. Oelsner usually gives more than a single draft repeat, but marks off the extent of the draft with a small line at the bottom of the diagram, and the extent of the shedding with a small line at the left side. Thus, the lower left-hand corner is intended for the analysis. In this particular diagram there was an error in the draft indication, suggesting a 7-thread draft when it is obviously eight threads. (Though errors are rare in the technical books, one must be ready to correct them if they do occur.) Since the draft is plainly an 8-harness twill and the shedding or treadling order is plainly 1, 2, 3, 4, 5, 6, 7, 8, we set down only the eight-thread square from the lower-left corner. The rising-shed tie-up is made from this by placing circles in each of the white squares of the diagram.

Figure 2—

Oelsner, Fig. 394, page 84, a Broken Twill for ten harnesses, requiring ten treadles. Since this is not a plain twill threading, the draft is given below the diagram. Read the draft from left to right, top to bottom, and redraft in the conventional manner: 1, 2, 3, 4, 5, 1, 2, 3; 6, 7, 8, 9, 10, 6, 7, 8. The line at the left of the diagram shows the extent of the shedding repeat: ten sheds. The tie-up is read from above the first five threads and the 9th, 10th, 11th, 12th, and 13th threads of the draft.

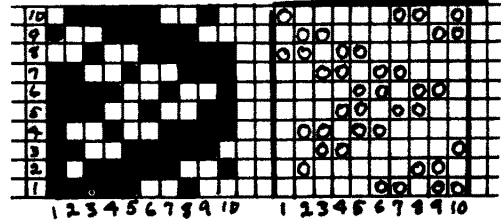


Figure 2

Figure 3—

Oelsner, Fig. 59, page 18, an Uneven Twill on seven harnesses, requiring seven treadles. A single repeat of the draft and shedding is given in black face, while the balance of the diagram is shaded. The formula at the right is a type of tie-up indication which may be used when each shed has the same up-and-down thread relationships, sheds always progressing forward by one thread by simply taking the last one and putting it at the beginning. This becomes:

Shed 1—2 ends up, 1 down, 1 up, 1 down, 1 up, 1 down.

Shed 2—1 down, 2 up, 1 down, 1 up, 1 down, 1 up.

Shed 3—1 up, 1 down, 2 up, 1 down, 1 up, 1 down.

This is an easier way to derive the tie-up: by placing dark squares on the "up" threads for each shed, or the rising-shed "o" symbol for each of the "down threads.

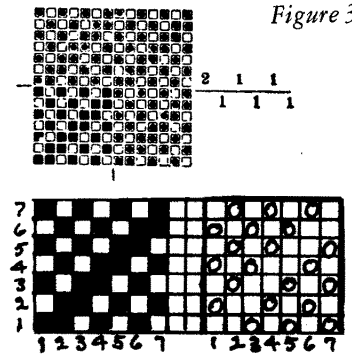


Figure 3

Figure 4—

2500 *ARMATURE-INTRECCIO*, by Eugenio Poma, number 12031/1. In this book only twill drafts are given, starting with 8-harness twills and extending as high as 40-harness twills. The diagrams show only a single repeat of the draft and the shedding sequence. The number of harnesses required is further indicated by the first two figures of the draft number, as in this 12-harness draft which has a number starting with 12. All square diagrams require as many treadles as harnesses, but the oblong diagrams require more, and often so many more that the use of the pattern is impractical. In some cases, however, the clever weaver will find tie-up duplications which will give a shortened tie-up, as was done in the case of the braided twills.

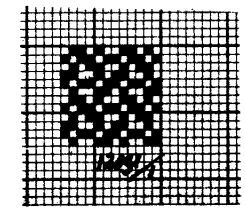
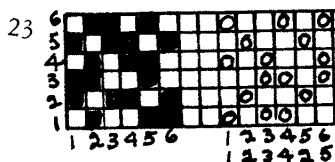
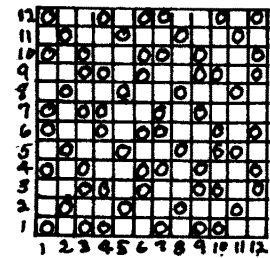


Figure 4



Close examination reveals this to be a 6-harness twill, requiring five treadles as 2 and 5 are identical.



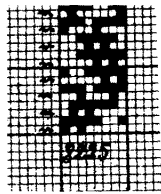


Figure 5

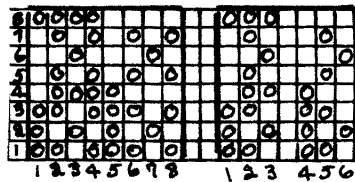
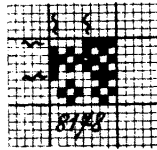


Figure 5—

Poma, number 8225, a very beautiful 8-harness twill on sixteen treadles. The little signals at the left of the diagram indicate that a second weft color may be used on alternate sheds. Number 8148, an 8-harness twill requiring eight treadles suggests an additional color for each fourth thread in both warp and weft.

Figure 6

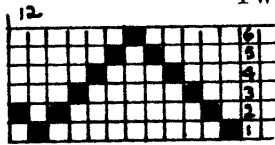
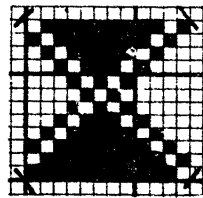
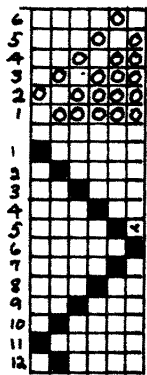


Figure 6—

FABRIC STRUCTURE, John H Strong, Fig. 143, page 91, shows a 6-harness Waffle Weave draft. The extent of this draft suggests a 12-harness draft on twelve treadles, at first sight, and it might be so drafted. However, very slight examination reveals that this may be threaded on six harnesses, as a Point Twill, and woven on six treadles.

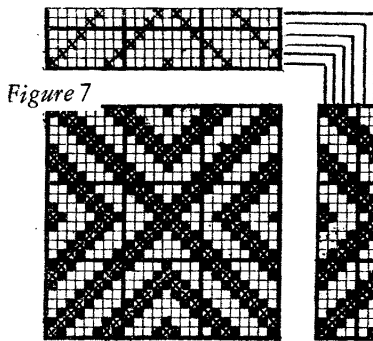


Figure 7

Figure 7—

TEXTILE DESIGN AND COLOUR, by William Watson, Fig. 54, page 55. This is a full draft with the diagram, the 6-harness Herringbone threading and the shed order (requiring six treadles) down the side. Watson introduces many of his groups of related diagrams with full information of this kind, and then omits the details other than the diagram for further ones, but with a little study the weaver can find what he wants. The shaded squares indicate optional ties, so this diagram actually shows two patterns.

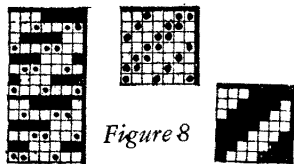
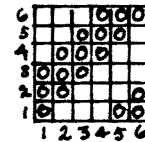
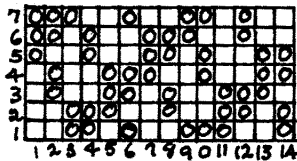


Figure 8

Figure 8—

Watson, Fig. 45, page 46. This 7-harness twill is another one of Watson's explanatory diagrams. It shows how two simple 7-harness twill tie-ups, both requiring seven treadles, are combined by alternating the shots, to give a Combination Twill design requiring fourteen treadles. The dots and filled squares in this diagram are not intended as color symbols, though the use of two alternating colors often gives an interesting effect in the Combination Twills.



The diagrams in Hauptman, beautifully presented in multiple-color, have a more complex interpretation than those in the English books, so they will not be taken up here.