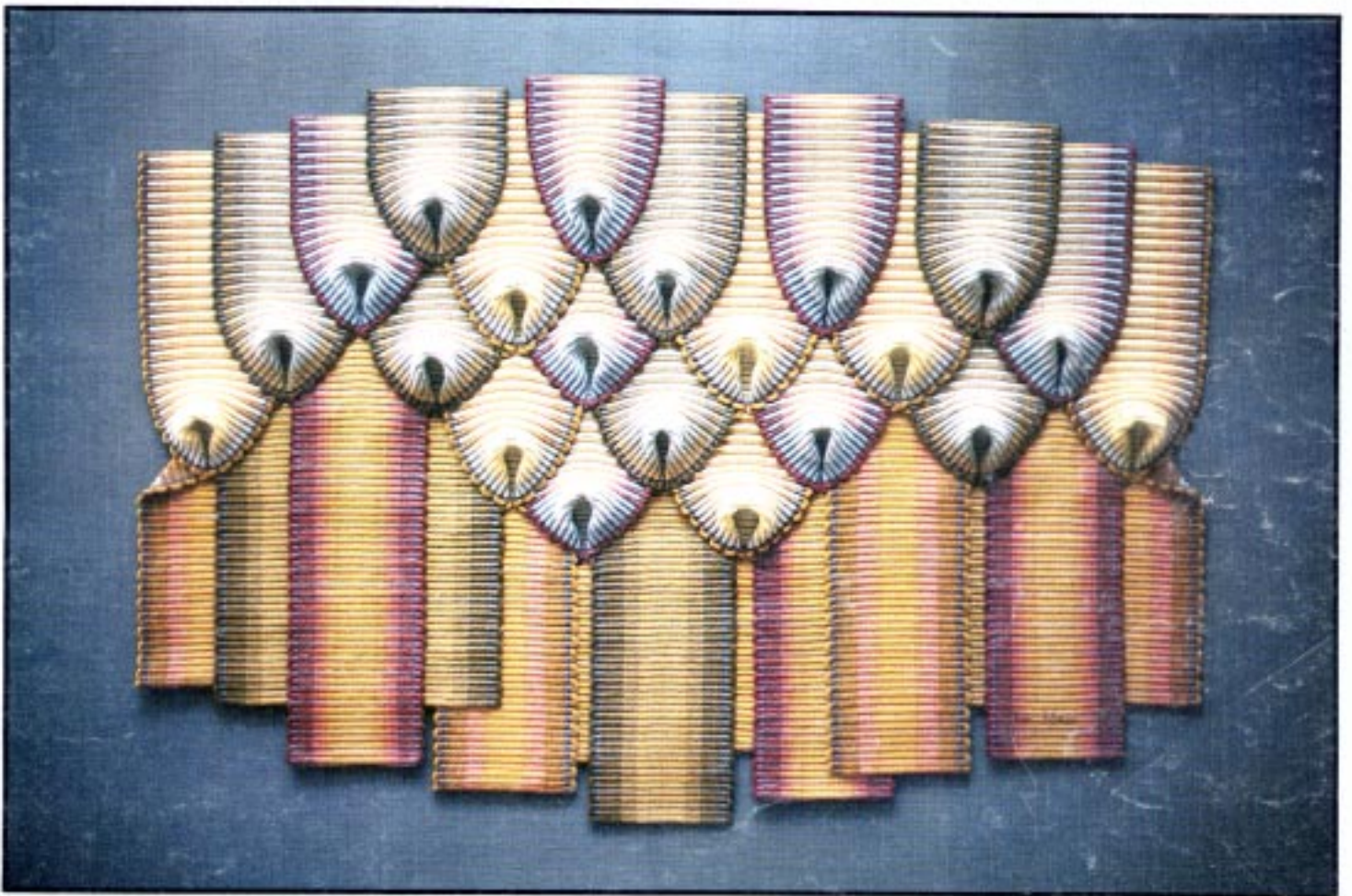


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Volume VII, Number 4, Issue 28

Spring 1983



- Designing for interior spaces

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The Weaver's Journal

Quarterly Journal for Textile Craftspeople

Volume VII, Number 4, Issue 28

Spring 1983

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LETTER FROM THE EDITOR

Many weavers like to weave projects for the home and for the walls of offices and public spaces but, before getting started, maybe a little more time should be devoted to the concept "designing for interior spaces". Architectural space, light and furnishings are the main elements to consider. It seems that Scandinavian weavers do this almost instinctively, perhaps because their artistic expressions are so fundamentally based on tradition. American weavers, on the other hand are continually exposed to a helter-skelter of traditions and innovations and are torn apart by the desire to try everything. They have no problem to edit new design elements in, but have not yet learned to edit some of the inappropriate ones out.

This issue deals with textiles for interior spaces and we do thank all the artists and teachers who have shared their very personal thoughts on the subject of design.

As usual, in *The Weaver's Journal*, the articles on design are complemented by articles on techniques. This is most evident in the series of articles on REP, a weave structure chosen for its versatility and the fact that it can be done on a small number of shafts.

Rugs are among the most important projects that weavers make for the home. Many professional weavers have specialized in rugs. They usually do both commission and limited production work. Two of America's best known rug weavers, Barbara Hand and Anne Brooke, have written thought-provoking articles on their careers and philosophy. Other articles on rugs are more project-oriented.

The concern for scaling up loom controlled patterns in order to be in harmony with larger interior spaces is dealt with by Ronnine Bohannan in the series on REP

and also by Pat McClland who has a completely different approach. On the other hand, the concern for breaking up large surfaces into more intimate patterning is just as valid and is exemplified by a heavily patterned tablecover and pillows.

Now, if you really want to create your own very special space from scratch, weave a chuppa as Millicent Horger did; a space in which to make wedding vows.

Technical articles include double weave and plaited twills.

Finally, you will learn to shed all your fears about computers invading the field of handweaving. All you have to do is become a faithful reader of our new series written by Earl Barrett, which is starting in this issue. It is especially geared to weavers who would like to know more about computers but who don't even know enough at this point to start asking questions.

I sincerely hope that this issue will give all weavers new momentum and a desire to look around, studying interior spaces with its forms that are generated by the architecture and furniture, its light and its texture. Weavers have the power to give these spaces a humanizing touch through the beauty and tactile quality of woven textiles.

Anyone concerned with what's fashionable in home decor should remember that there is a clear predominance of coordinates. Everything in a room is in tune with the rest. Nothing should be around which looks like it had been added afterwards. There is also a trend for finer fabrics. Relief comes from shapes rather than from texture.

Clotilde

A FEW ANNOUNCEMENTS

Shereen Laplantz is coordinating a national conference on basketry. She would like to collect the names of all guild and study groups with special interest in baskets. Shereen LaPlantz, 899 Bayside Cutoff, Bayside, CA 95524

In the October '83 issue, *The Weaver's Journal* will feature bast fibers such as ramie, hemp, jute. Any information on the cultivation, preparation, spinning and weaving of these fibers will be most appreciated. Deadline, June 15, 1983. P.O. Box 2049, Boulder, CO 80306.

ERRATUM

The Weaver's Journal Vol. VII, #3, issue 27, Jan '83, pp. 54, 55, 56.

Photo 4. Lift H2, insert a pick-up stick, and pull the raised warps forward to weave a tie-down row.

Photo 6. H3 forms alternate tie-down row.

Photo 7. H4 forms a solid dark pattern row.

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MAIL BAG

"I have a computer system that has North Star Basic, CBasic, and 8080 Assembler languages. I also have a 16 harness dobbie loom.

I am interested in acquiring a program for balanced weaves in one of the above languages. I am especially looking for a program that will generate any one of the following series from the other: threading, tie-up, pedal order and draw-down."

Lee Kirschner
Everett, WA

Earl Barrett, Computer Consultant to The Weaver's Journal: I have not encountered a program that would meet your needs without a lot of translation. The programs that I know about consist of seven for the Apple II and one for the TRS-80 Model I/III.

Your requirement that the program be able to analyze a design and generate a threading, tie-up and treadling order narrows the field considerably. Of the seven Apple programs, only one has that capability. This is Pattern Weaver I, written by Janet A. Hoskins of Winnipeg, Canada.

Unfortunately, this program is only available on an Apple II DOS 3.3 disk. If, however, you could obtain a listing of the uncompiled Applesoft code from Ms. Hoskins, it should be possible for you to translate it to CBasic and compile it on your machine.

If any reader has worked with this problem, I would appreciate hearing from you. Is there a weaving program for the IBM PC computer I have missed?

"I think the Fall Issue was a great issue, so much of interest in it for spinners as well as weavers. I hope you will continue to have articles on various fibers such as you had in this one as there is so much to learn about different fibers, cotton, silk, and wool, etc. that we don't know.

Irma Green
Los Angeles, CA

Editor: We will continue with fibers. Look for more bast fibers next Fall.

"I really like the direction your periodical is heading. I like the depth of the articles and count on getting plenty of firm information. I think you should actively work for more articles on multiharness and unusual weaving equipment. I work on an Upphemta attachment as well and feel many are not even aware of what can be done on it. I liked your article on weaving in Quebec and would enjoy seeing more on specific weaving traditions."

Myrna Golay
Annandale, N.J.

"The article on Jack Larsen is most interesting. In the fifties, I belonged to the Twenty-Five Weavers and at my first meeting with the group, Jack Larsen was the guest speaker. I remember he was showing us woven wall paper. We were very impressed. And he has come a long way."

Esther Foster
Claremont, CA

"... your magazine is one of the most pleasant things I've discovered in quite some time. It is great for me—a beginning weaver. So many challenges!"

Brenda Leidemer
Halifax, Canada

"I used the woven woolen whimsies again this year out of your magazine. It is such a success. Even at the Nursing Home where my mother used to live, they are using them to decorate and putting them on parcels instead of bows. I taught them how to make the whimsies. I had them in our newsletter a few years ago and asked your permission.

Maybe you should reprint them next year in time for Christmas for new subscribers or people who don't have back issues."

Clementine Pauli
Editor, Weaving and Whatknots
Calgary, Canada

Editor: Woven Woolen Whimsies was published in October 1977 (Vol. II, No. 2, issue 6). If we ever have room for a "filler", we will publish them again.

"We are adding this subscription to our weaving library in memory of three guild members who passed away this year. We feel it will be a long lasting remembrance for all.

Keep up the excellent work!"
Margot Taylor
Woodstock Weavers

Editor: This is a fine idea and we are honored that we can help keep the memory of three handweavers alive.

"I just borrowed the Fall 82 copy of *The Weaver's Journal* from a friend and it's really a marvellous issue. . . We have a (guild member who gathers wild flax in the spring (after winter has processed it) and she spins it on her drop spindle for warp for weaving rag rugs."

Eileen Shannon
Lac La Haehe, Canada

"I have read about your magazine in two Swedish magazines, *Hemslöjden* and *The Scandinavian Weaving Magazine*.

I so much want to have pen friends in the USA, with the same interests as me: weaving and all other kind of textile handicraft.

I am 26 years old, have two children 4.5 and 2 years old. I am training to be a teacher in "textile handicraft". I don't know what these teachers are called in English.

Could you please help me? I should be so happy. It's nice to know about things, if they are alike or not alike in your country.

Maria Wadensten
Falkenberg, Sweden

Editor: If you would like to write to Maria, here is her address.
Maria Wadensten
Ludvig Nordströms väg 4
31100 Falkenberg, Sweden

"The Winter issue is excellent! I thoroughly enjoyed the way the designers' philosophies were combined with their construction methods. It made good reading, not to mention the inspiration—and even a bit of disagreement. That's what it's all about, right?"

Thanks for the comprehensive review of Weft-Writer.

Susan Hick
Englewood, CO

"I just received my issue of *The Weaver's Journal*. It's always a joy and a delight and I read it over and over. The teaching articles are the very best!

Thank you for a really good magazine."

Margaret Goodband
Walpole, MA

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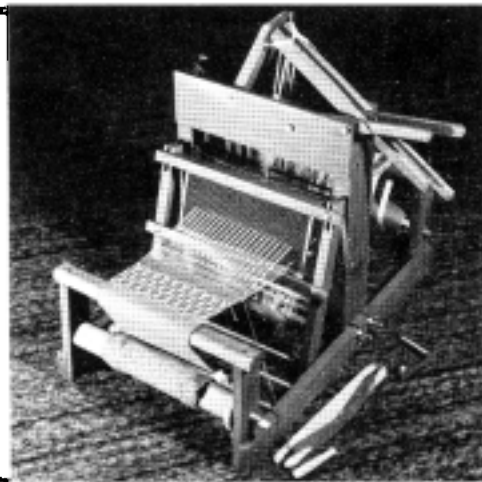
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Let's sit down and talk rep.

REP WEAVES

Introduction by Clotilde Barrett

In her book "The Primary Structures of Fabrics" Irene Emery¹ conducts an interesting discussion about the meaning of the word REP. According to her: "Rib or rep are both widely used (often interchangeably) as generic terms for ribbed textiles, regardless of the direction of the ribbing or the exact nature of the weave." She goes on to define warp rep and weft rep. Both are weaves in which the direction of the ribbing is distinguished: one vertical, the other transverse or horizontal. However, there is no unequivocal rule as to what direc-

tion is associated with which term. Maybe we handweavers could all agree on the following definitions which are based on Irene Emery's research.

REP—A weave structure which is predominantly plain weave and which has a ribbed effect.

WARP-WISE REP—A rep in which the ribbing is vertical; i.e., in the direction of the warp.

WEFT-WISE REP—A rep in which the ribbing is transverse (horizon-

tal); i.e., in the direction of the weft.

WEFT FACED REP—Regardless of the direction of the ribbing, this is a fabric in which the weft predominates and covers the warp.

WARP FACED REP—Regardless of the direction of the ribbing, this is a fabric in which the warp is sett so close as to cover the weft.

The weaves that are featured in this study of REP are for the most part warp faced rep with weft wise ribbing. The contributions of Bibi-

ane Proulx, Elizabeth Kolling-Sommers, Annette Robitaille, Ken Weaver and Ronnine Bohannan reflect the strong commitment of these weavers to the exploration of this fabric structure. Bibiane Proulx has authored a book on REP². It is primarily devoted to, but not limited to, warp faced rep. Her article here gives some insight into the various uses of the word REP and gives an overview of the number of design blocks which warp faced rep makes possible; also the type of designs that can be woven and the methods of drafting. While Bibiane Proulx describes a project with a 2-color unconventional 4-shaft 4-block design, Elizabeth Kolling-Sommers made two projects using simpler versions of warp faced weave: a table runner and a rug which technically only require two shafts.

Annette Robitaille makes an in-depth study of drafting and designing 4-shaft warp faced rep. She gives step by step instructions for preparing drafts and weaving plans for 4-block patterns involving 2 or more colors.

Ken Weaver has taken REP weaves out of the realm of functional weaving. He produces hangings and three dimensional walls on an architectural scale. He is constantly uncovering new and imaginative facets of REP weaving. In this article he is sharing his paths towards discovery.

Ronnine Bohannan explores the large patterns which the technique of REP makes possible. she is aided in her design work by a computer which encourages one to play with colors and large graphics.

PRACTICAL HINTS FOR WARP FACED REP

CHOICE OF WARP

The Canadian handweavers of Quebec choose 8/2 cotton sett at 45 to 48 epi (180 to 190/10 cm). Occasionally they use a very smooth synthetic of the same grist. The traditional U.S. weaver seems to like perle cotton, either 10/2 sett at

60 epi (240/10 cm) or 5/2 sett at 30 to 36 epi (120 to 140/10 cm). The nontraditional weaver will, of course, explore other yarns. Ken Weaver writes about his preference for wool; Ronnine Bohannan favors rayon. I have seen small jewel-like rep weaves in which the warp was corded silk. Wool, more so than worsted, tends to give problems with sticking when the shed is opened but Ken Weaver tells how he solves this. Remember also, that while it takes a little more time to get a good clear shed, this weave has few picks per inch and thus progresses rather fast. Yarns with no elasticity such as linen and sticky yarns should be avoided, as well as most synthetics.

The warp should be beamed very tightly.

The selvedge edges are neater if the warp is threaded with solid borders instead of the usual end-on-end alternation of a dark and light warp thread.

CHOICE OF WEFT

In warp faced rep a heavy pattern weft alternates with a thin binder weft. The binder weft can be any thin smooth yarn. A neutral color or one which matches the border warp is least obtrusive. I prefer to lay the binder weft in each shed. The pattern shed is thus woven with both the thick and the thin yarn; the opposite shed is woven with the thin yarn alone. By using this system one makes sure that the outer warp threads will always be encompassed by a weft yarn.

Traditionally pattern wefts are a heavy soft cotton (mop cord, Aunt Lydia's rug yarn). However, there are virtually no restrictions as to what can be used. It doesn't even have to be a fiber! Strips of anything, tubes, ropes, anything may be tried. It does not even have to be uniform in thickness but if not, a comb beater has to be used instead of the loom beater.

The weft should be pulled in tight at the edges. If a bundle of yarns is used as weft, twist them tightly together where they turn to make

the selvedge. See Fig. 1. Use thumb and index to take hold of the weft bundle and twist toward you. This technique avoids loose straggly loops.

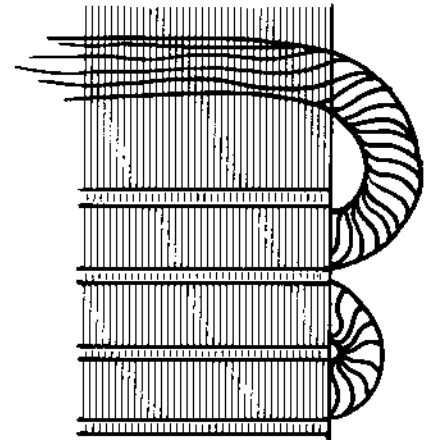


FIGURE 1

The pattern weft is sometimes wound on two shuttles, each carrying half the thickness of the weft. Both shuttles are entered in the same shed from opposite sides, giving the selvedges a symmetrical look.

FINISHING

Start and end a project with a few picks using the binder weft only. Finishing the fringe with overhand knots is quite common but with a heavy warp the knots may become too crowded. Finish with hemstitching, twining, machine stitching and other non-bulky techniques.

THREADING

If the threading of 40-60 epi (160-240/10 cm) turns you off, read the article "Enjoy Threading Your Loom" elsewhere in this issue.

SHADOW WEAVE

Four-and-more shaft warp faced rep may be looked upon as a warp faced shadow weave. This relationship is not studied in this series of articles but is alluded to by Bibiane Proulx and Ronnine Bohannan.

1. Emery, Irene. *The Primary Structures of Fabrics*. 1966 The Textile Museum, Washington, D.C.

2. Proulx, Bibiane April, *Reps*. 1979 Les Editions La Tirelle, Canada



Two modern style rep weave carpets, both woven on the same threading by Georgette Parent.

REP WEAVE

by Bibiane April Proulx

HISTORY

In his *Master Weaver*, Stanislas Zielinski writes: "the word REP has probably the same root as 'rib'. Still for some unknown reason, rep weave is seldom called by this name." According to his *Encyclopedia of Handweaving*, the term RIB WEAVE is frequently used in

industrial weaving with no corresponding term in handweaving.

Rep weaves were very popular in Scandinavia and came to America by way of their colorful weaving books showing several types of mats, among which were plenty of beautiful RIPSMAFFOR. In Swedish language, that word means

REP mats (plural); RIPSMAFFA for a single one. MAFFOR is not a weaving technique itself, but simply the plural of mat, rug, or carpet. It is used for *all kind of mats*. This confusion remained for a long time in America through our oral and written teaching. I found that mistake of ours, when reading a Swedish weaving book with the help of a Swedish-English dictionary. I told this to Mr. Zielinski, who took notes and wrote it in his *M. W.* review, January 1957 issue.

MULTI-LANGUAGE GLOSSARY

REP	MAT	IDENTIFICATION
English: Rep, repp.	Rug, mat.	Rep rug: rep mat.
Finnish: Ripsi.	Matto.	Ripsimatto.
French: Repp.	Tapis, carpeppe.	Tapis, carpeppe de repp.
German: Rips.	Teppich	Rips-teppich
Italian: Repp.	Tappeto (single)	Tappeto di repp.
	Tappeti (plural)	
Spanish: Repp.	Tapis (single)	Tapis de repp.
	Tapises (plural)	
Swedish: Rips.	Matta (single).	Ripsmatta, ripsmattor.
	Mattor (plural).	

DEFINITIONS

Rep weave is a derivative of plain weave. It is either weft rep or warp rep. It usually has a transverse (horizontal) corded effect. This is produced either by a single coarse weft or by alternating two weft picks of different size; the one for the ground is at least as fine as the

warp, the one which creates pattern ribs is thick.

The conventional WEFT-REP weaves are produced on a balanced plain weave setting. The ridges are produced by weaving picks with a heavy weft. Between these picks one may weave one or more picks of tabby with a ground weft. Plain rag rugs belong to that category of weaves.

The TIED WEFT REP weaves are produced on a straight draw. The pattern weft floats over 3 warp ends and is tied down by the 4th. This weave has also a balanced plain weave ground. The effects are more striking than the ones mentioned above. The tie-downs are made by lifting any one shaft of a 4-shaft loom. For example, weave one pick of pattern weft by lifting shaft 1, then weave 3, 5 or more picks of plain weave with a finer ground weft. The pattern weft could be woven by alternately lifting shaft 1 and 3 or by alternating 2 and 4. Tabby shots are woven in between pattern shots.

Other WEFT-REP weaves can be woven on 2 or 4 block drafts when a heavy weft is used as pattern weft with or without a ground of finer tabby picks. Colonial overshoot and crackle weave are rep weaves in European French terminology because the name REP is given to a weave as soon as the pattern weft is heavier than the ground weft. Overshoot is called *reps lancé*, which means pattern floats across the entire width of the warp. Crackle is called *reps taqueté*, meaning that the pattern weft is tied down by every 4th or 5th warp end.

All these techniques are beyond the scope of this article which will concentrate on warp-faced rep.

WARP-FACED REP WEAVES SETT

A perfect warp-faced rep has to be sett very closely, at least *twice as close as for balanced plain weave*. For instance, with 8/2 cotton yarn, sett at 96 ends per 10 cm (24 epi) for

tabby, you need twice as many warp ends for rep; e.g., 192 ends per 10 cm (48 epi). When using a new yarn never tried before, you find the right number of ends needed, by wrapping it around your finger or a ruler and count how many turns you can see over the length of 2.5 cm (1") or 10 cm (4"). Multiply this number by 2 to get the correct sett for warp-faced rep weave.

WEFT

In order to produce horizontal ridges, the pattern weft has to be thick and, to be perfect, it has to be *entirely covered by the closely sett warp*.

There are two general types of warp-faced rep weaves:

- a) RIB weave ("bengaline").
- b) REP weave ("épinglé").

RIB WEAVE (Photo 1A) is well known in industry under various names such as bengaline, faille, gros-grain, moiré, ottoman, sicilienne (from the Italian island, Sicily), according to the size of the ribs or the nature of the warp or the weft. They are mainly woven in a single color but handweavers sometimes add colors as stripes or as simple patterns (Photo 2). Patterns are made by alternating dark and light warp threads. RIB WEAVE is threaded on a straight draw and treadled as plain weave. When the warp ends are heavy and sticky, it is advised to use a broken threading 1, 3, 2, 4; treadled 1-2, 3-4.

REP WEAVE (*épinglé*) is woven with a thick thread making the ridge of the fabric, followed by a binder of the same grist as the warp threads, producing the furrow of this textured material (Photo 1B).

Most of the handwoven rep weaves are made of a 2 color warp alternating a dark and a light thread. If the color of the pattern weft is the same as the border color or close to it, the selvages will look smoother. The color of the binder is generally the opposite of the pattern weft color but sometimes it is the same. *The binder is always put in the opposite shed of the pattern shed.*



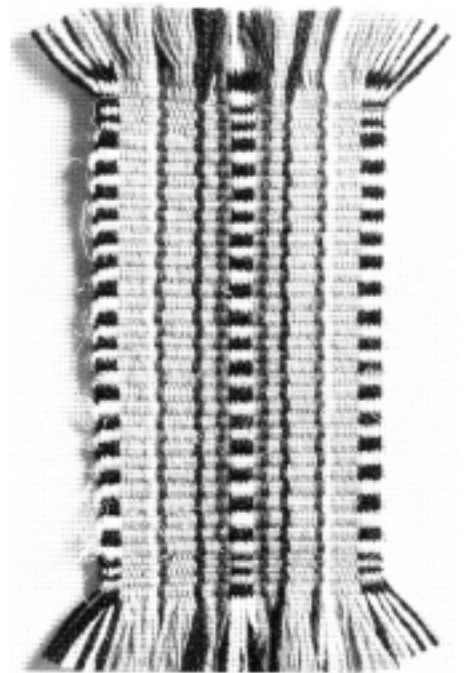
1A, below 1B, above

TWO BLOCK PATTERNS ON TWO OR FOUR SHAFTS

Two block patterns can be woven on a 2 shaft loom. The order in which the colors are threaded distinguishes the two blocks. Block A: 1 dark, 1 light; block B: 1 light, 1 dark. In the threading draft, dark color is represented by X, the light color by O. See Fig. 1.

The same color order applies when a two block rep weave is woven on a 4 shaft loom.

When one wants to change colors of the pattern during the weaving, one skips the binder, weaving 2 consecutive pattern picks and resume the regular rhythm of: 1 binder shot, 1 pattern shot, . . . Another way is to skip a pattern pick and weave 2 consecutive binding picks.



2. Rib weave

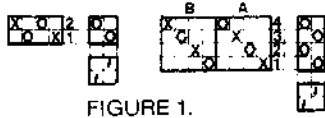
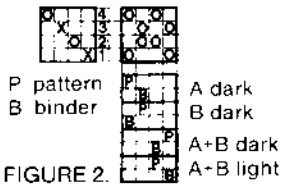


FIGURE 1.



P pattern
B binder
A dark
B dark
A+B dark
A-B light

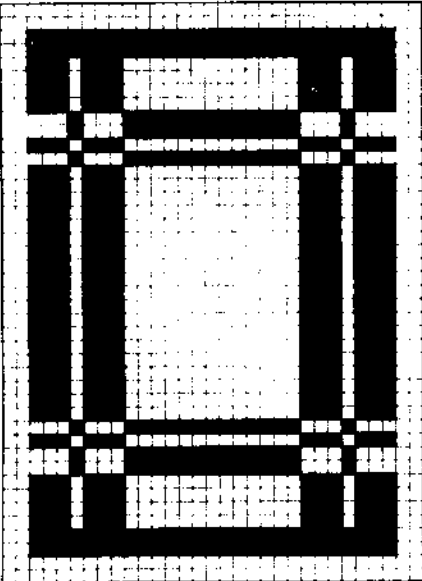


FIGURE 3.

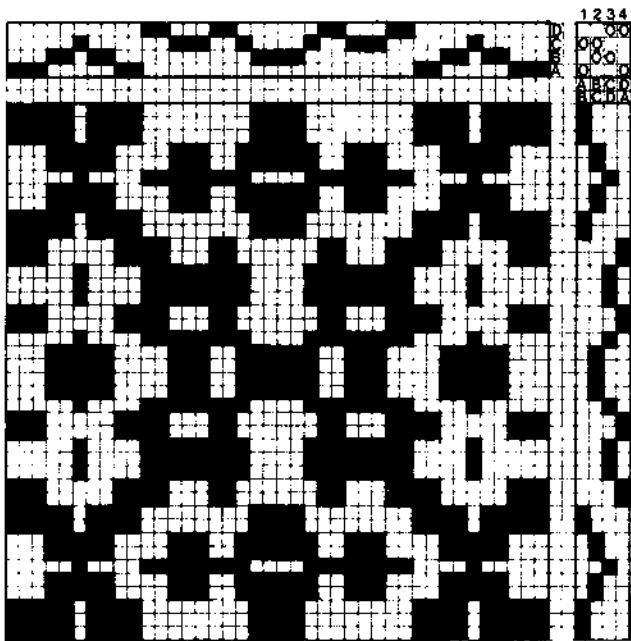


FIGURE 7.

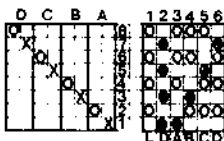


FIGURE 8.

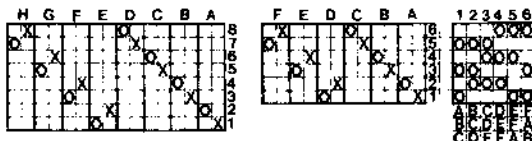


FIGURE 9.

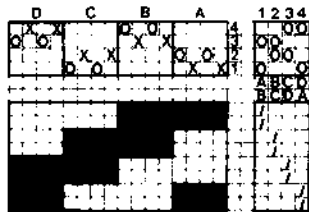


FIGURE 4. treading for pattern weft

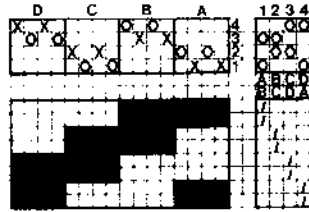


FIGURE 5. treading for pattern weft

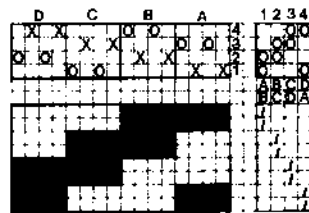
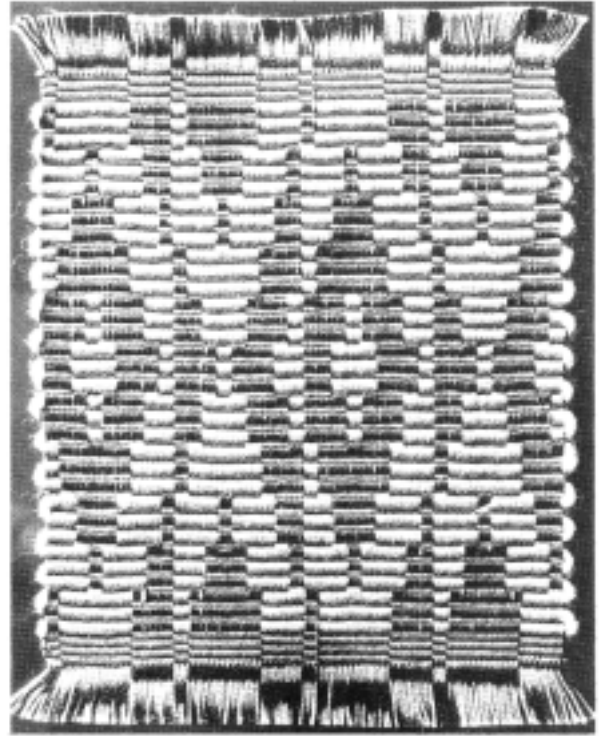


FIGURE 6. treading for pattern weft



4. Asymmetrical modern rep



FIGURE 10.

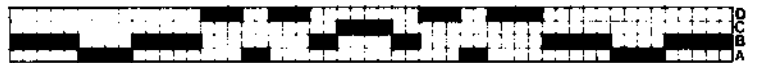


FIGURE 11.

ABOUT THE AUTHOR: Bibiane April Proulx is a weaver, teacher, and author residing in Quebec. She learned her craft by studying for four years with noted weavers such as Germaine Galerneau, Jacques Plasse-Lecaisne and Stanislas Zielinski. Bibiane has had 28 years of teaching experience, mostly adult education courses sponsored by the Ministère de l'Éducation du Québec. She has also taught classes for the blind in the United States. She is the author of Reps and is a regular contributor to the Canadian publication, La Terre de Chez Nous.

Bibiane April Proulx conducts classes on various weaving techniques and is available for lectures and workshops.

A third way is to keep alternating the pattern pick and the binding pick but throw both in the same shed to pass from one block to another (See Fig. 2). Fig. 2 also shows the treadling which weaves dark (or light) in both blocks, thus across the entire width of the project. This is an advantage that can help you to design beautiful pieces with a contemporary look. The blocks should be large sized and the patterns in proportion with the article to cover. See Fig. 3.

Multi-block threadings give the possibilities of making 2 kinds of patterns: traditional style and modern style.

FOUR BLOCK PATTERNS ON FOUR SHAFTS—TRADITIONAL STYLE

Traditional patterns are made of 4 connected blocks moving along a diagonal line. The blocks are of any desired size. The diagonal progression of the blocks occurs both in the threading and in the treadling.

Fig. 4 shows a draft for traditional patterns. The **Scandinavian method** of drafting is used here in which each block is threaded on two consecutive shafts.

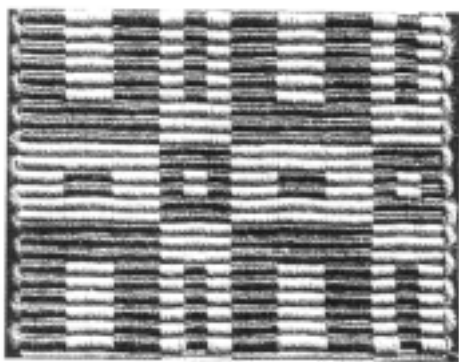
Mr. Zielinski's method in his *Master Weaver*, shows another way of drafting traditional rep weave. However, 1/1 alternation of dark and light is not maintained throughout. See Fig. 5.

Finally, there is the **American method** of threading in which the blocks are not threaded on consecutive shafts. See Fig. 6.

In treadling these warp-faced 4 block patterns, 2 adjacent blocks always weave pattern at a time, meaning that each wanted block works with the preceding or the following one. (This is also true for crackle weave).

- | | |
|---|---------------------------------------|
| A | with B on left side or D to the right |
| B | with C on left side or A to the right |
| C | with D on left side or B to the right |
| D | with A on left side or C to the right |

Figs. 4, 5 and 6 show the tie-up and treadling.



3. Asymmetrical modern rep

	dark	light
tr. 1	in A and B	in C and D
tr. 2	in B and C	in D and A
tr. 3	in C and D	in A and B
tr. 4	in D and A	in B and C

PROFILE OR SHORT DRAFT

To start a rep weave project, one has to draft first a profile on graph paper. Each block takes one row of graph paper. Each square symbolizes a unit which itself represents several threads, according to the sett to be used and the size of the pattern. The basic pattern is drafted with the help of the threading profile and with a treadling profile which is identical to it (woven as the blocks are drawn in). See Fig. 7. Variations are made by varying the treadling order of the blocks.

FOUR BLOCK PATTERNS ON EIGHT SHAFTS

This multiplicity of shafts gives the opportunity of designing with each block independently from others. One block may be dark while the three others are light or vice versa. It is also possible to get all dark threads on the top and light ones underneath. The tie-up depends on the pattern draft which was to be worked out on graph paper ahead of time. Fig. 8 shows the tie-up for dark in A, B, C, D and solid dark, but many other combinations are possible.

EIGHT BLOCK PATTERNS ON EIGHT SHAFTS

The same operations which led from a 2-block draft to a 4-block draft may be applied to six and eight shafts. This will permit one to get as many blocks as there are shafts. On a 6-shaft loom, you can get 6 blocks. See Fig. 9.

MULTI BLOCK PATTERNS IN MODERN STYLE

Modern style patterned rep weave has bold geometrical designs of opposite colors.

In order to get opposite designs on 4, 6, 8 shafts, one has to draft a break when writing the profile draft. Similarly to broken twill, there is a break in the profile draft when one skips 1 block on 4 shaft patterns, one skips 2 blocks on 6 shaft patterns, one skips 3 blocks on 8 shaft patterns. See Fig. 10.

Designs may be symmetrical or asymmetrical, but they have to be large to belong to that style. (Photo 3). If not, they make pleasant patterns, looking rather like a twill derivative (Photo 4).

Modern rep weave is suitable for several practical uses such as floor and table mats or runners, bed-covers, upholstery fabrics, wall-hangings, cushions, bags, church paraments and vestments, but everything has to be woven with yarns that suit the purpose. It is not as well known as the traditional weave. So, let us start now to make handsome *Modern Rep* weaves.

PROJECT

Modern style rep weave floor coverings, both woven on same threading by Georgette Parent.

Warp: 8/2 brown and cream cotton.

Weft pattern: mop cotton
binder: 8/2 brown cotton

Sett: 48 epi (200/10 cm)

Total number of warp ends: 1040 + borders.

Profile draft: See Fig. 11.

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- Zielinski, S. A., *Master Weaver*, Vol. 11, Issue 32.
Zielinski, S. A., *Encyclopaedia of Hand-Weaving*. The Ryerson Press, Toronto, Ontario, Canada, 1959, 100 pp.
Proulx, Bibiane April, *Reps, Technique de creation de tissage traditionnel et moderne*. Les Editions La Tirelle Enr., Quebec, Canada.
Frey, Berta, *Practical Weaving Suggestions*. Vol. 4, p. 55. (Published by Lily Mills, Inc.)



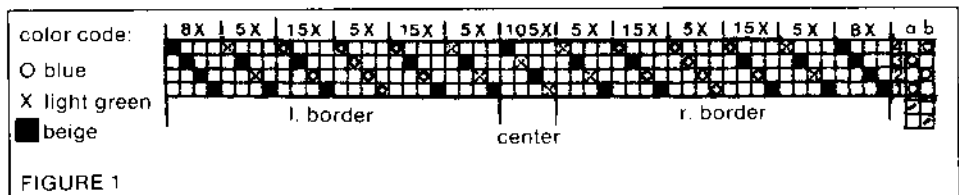
WARP-FACED TABLERUNNER IN RIB WEAVE

by Elizabeth Kolling-Summers

Inspired by inkle weaving techniques, this tablerunner displays warp-faced design based on alternating horizontal stripes and vertical patterning.

Warp: perle cotton, size 10/2 (Usdan-Kolmes Industries (UKI)—light green (#45), blue (#44), beige (#43). Amounts needed for the pro-

ject include: 5 oz. (141.8 g) of light green, 2 oz. (56.7 g) of blue, and 5.5 oz. (156 g) of beige.



Weft: synthetic, heavy rug yarn (Aunt Lydia's—beige). Note: this comes in 1.6 oz. (45.4 g) skeins, with 70 yd (64 m) per skein. Three skeins are needed for this project.

Sett: 60 epi (240/10 cm), sleyed 6 ends per dent in a 10-dent reed or 4 ends per dent in a 15-dent reed.

Width in reed: 14" (35 cm)

Total number of warp ends: 844

Length of warp: 3 yards (2.74 meters) Note: with warp-faced weaving, allow for take-up when figuring the length of the warp. Take-up is generally 15% of the project length, varying according to the thickness of the weft. For this project, take-up was 10" (25.4 cm) or 13%.

Threading, tie-up, and treadling: see Fig. 1

To help avoid ripples in weaving, slightly stretch the weft while placing it in each shed.

Measurements: When removed from the loom, the tablerunner measured 66½" x 13¾" (168.9 cm x 34.9 cm). After handwashing in lukewarm water, it measured 59" x 13¾" (149.9 cm x 34.9 cm).

Finishing: Along each warp edge, tie snug overhand knots in thread groups of 8. Trim the fringe to 1½" (3.8 cm), or desired length. ■

FOUR-SHAFT, TWO-BLOCK WARP FACED REP FLOOR COVERING

by Elizabeth

Kolling-Summers

In this rug the warp-faced pattern is created by alternating thick and thin wefts. The design has only 2 pattern blocks and can be woven on a 2-shaft loom.

Warp: unmercerized cotton, size 8/2 (Usdan-Kolmes Industries—dark green (#12), plum green (#4), polo tan (#6). Amounts needed for this project: 3 oz. (85 g) dark green, 5 oz. (141.8 g) plum green, and 8 oz. (226.8 g) polo tan.

Weft

binding weft: unmercerized cotton, size 8/2 (Usdan-Kolmes Industries—plum green), 1 oz. (28.35 g).

pattern weft: 4-ply heavy cotton cord (Mop Cotton). 14 oz. (396.9 g) are needed for this project.

Sett: 45 epi (177/10 cm), sleyed 3 per dent in a 15-dent reed.

Width in reed: 22" (55.88 cm)

Total number of warp ends: 992
Note: because this requires a lot of heddles, it is wise to count the number of heddles on the loom.

Length of warp: 3 yards (2.74 meters)

Threading, tie-up, and treadling: see Fig. 1.

Treadling order: see Fig. 2.

For the pattern weft, lift the shafts as shown in Fig. 2. Follow each pattern pick with a bindings pick thrown in the opposite shed. Skip the pattern pick when passing from one treadling block to another.

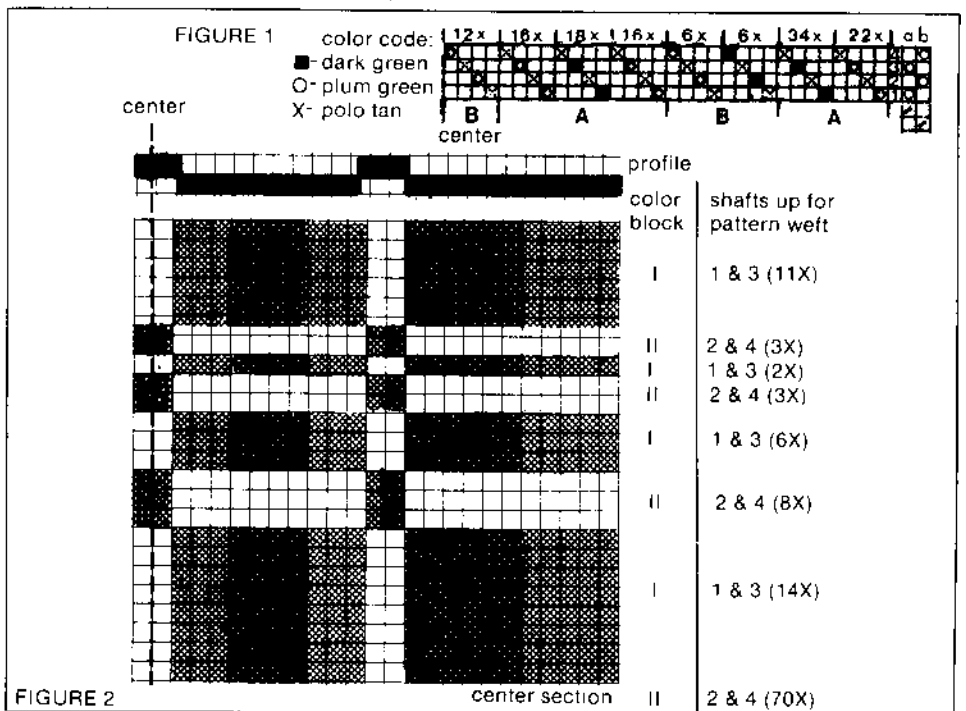
Measurements: When taken off the loom, the rug measured 22" x 55" (55. x 139.7 cm)



Finishing: Along each warp edge, tie overhand knots in thread groups of 12.

With each thread group of 12, do a

3-stranded braid using 4 threads as 1 thread. After braiding for 2" (5 cm), tie an overhand knot and trim excess fringe to 1/2" (1.27 cm).■





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Claude Robitaille

Four-block warp rep table runner.

FOUR-BLOCK WARP REP by Annette Robitaille

The interlacement described here produces patterns which, as the name WARP REP suggests, depend entirely on the color arrangements of the warp threads. The warp is sett very close and covers the weft entirely.

WARP AND WEFT

Warp rep interacements require

three types of threads.

1. **Warp threads:** For each block two colors are threaded in alternating order. The warp is sett very close.
2. **Pattern weft:** A heavy yarn which produces the pattern blocks.
3. **Binding weft:** Usually a yarn of the same grist as the warp. This weft binds the warp between suc-

cessive pattern picks.

THREADING

Each block is threaded by alternating two threads of a different color: X usually indicates the dark color; O usually indicates the light color. The threading of each block starts with X. The alternation of X and O is essential to the technique.



Claude Robitaille

Four-block warp rep rug.

THREADING PROFILE

1. **Traditional arrangement of the blocks:** The blocks are in ascending or descending order (similar to straight or point twill), causing diagonal progressions. See Fig. 1



FIGURE 1

2. **Contemporary arrangement of blocks:** The blocks skip around (similar to skip twill), causing adjacent blocks to be opposites of each other. See Fig. 2. Each block may be enlarged by increasing the number of warp threads. However, the number of threads must remain a multiple of 2.



FIGURE 2

TREADLING

For each weft pick two shafts are up while two remain down. The binding weft is always thrown in the shed opposite to the shed of the pattern weft.

A block may be lengthened by repeating the pattern pick and the binding pick.

TREADLING PROFILE

1. **Traditional order of the blocks:** The blocks are treadled in ascending or descending order. See Fig. 3. The block patterning relates to the drawdown of a $\frac{2}{1}$ twill.

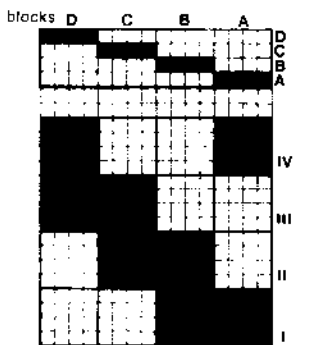


FIGURE 3

2. **Contemporary order of the blocks, also called "on opposites"** The blocks skip around; this causes the diagonal progression to break up. Adjacent blocks are well-defined and opposites of each other. See Fig. 4. Note that, when treadling on opposites, the first pattern pick of the second

block has the same shed as the last binding pick of the first block.

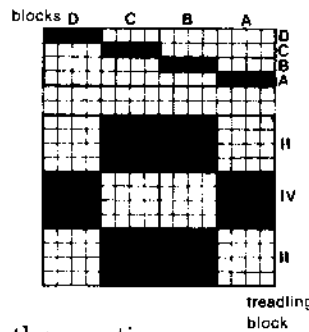


FIGURE 4

There are three options:

A. Throw the first pick of the second block and the last pick of the first block in the same shed.

B. Omit the last binding pick of the first block, thereby weaving two pattern picks in succession.

C. Omit the first pattern pick of the second block, thereby weaving two binding picks in succession.

DRAFTING 4-BLOCK WARP REP BY THE SCANDINAVIAN METHOD.

See Figs. 5 and 6.

Threading:

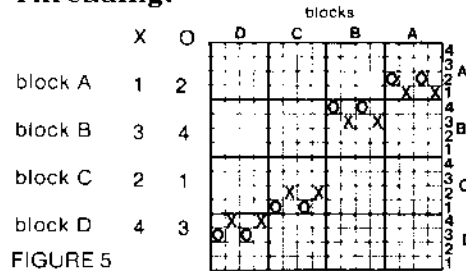


FIGURE 5

Treadling of the pattern weft:

	sinking	rising	dark in blocks	light in blocks
block I	2-4	1-3	A+B	C+D
block II	4-1	2-3	B-C	D-A
block III	1-3	2-4	C+D	A+B
block IV	2-3	4-1	D-A	B+C

Note that the binding weft is always thrown in the shed opposite to the shed of the pattern weft.

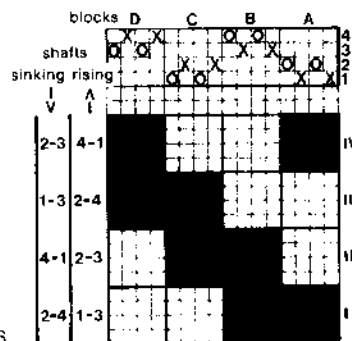


FIGURE 6

DRAFTING 4-BLOCK WARP REP BY THE AMERICAN METHOD. See Figs. 7 and 8.

Threading:

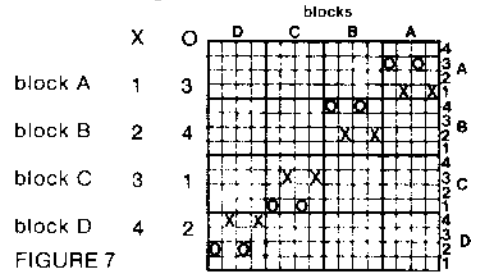


FIGURE 7

Treadling of the pattern weft:

	sinking	rising	dark in blocks	light in blocks
block I	3-4	1-2	A+B	C+D
block II	4-1	2-3	B+C	D+A
block III	1-2	3-4	C+D	A+B
block IV	2-3	4-1	D+A	B+C

Note that the binding weft is always thrown in the shed opposite to the shed of the pattern weft.

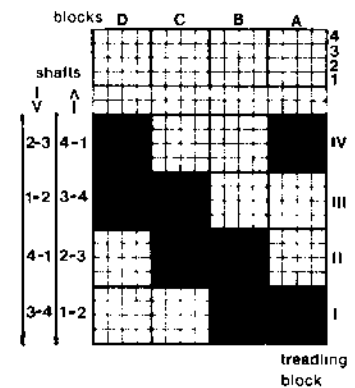


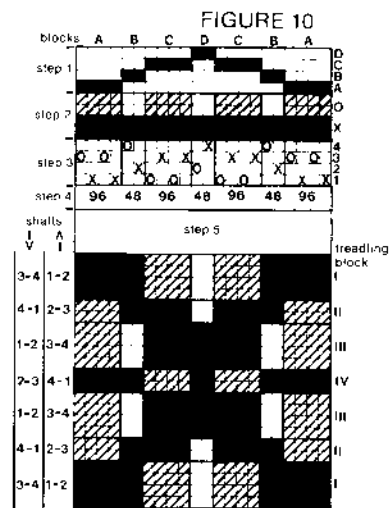
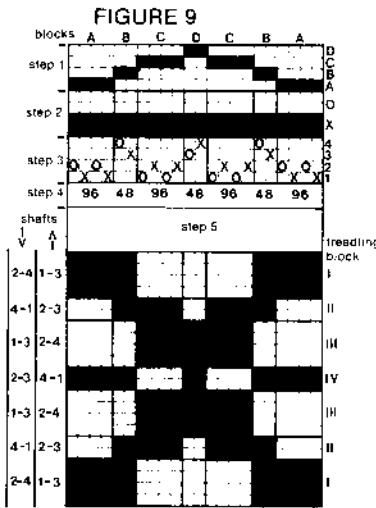
FIGURE 8

STEPS IN DESIGNING. See Figs. 9 and 10.

1. Make a threading profile according to the order in which the blocks will be threaded and according to the width of each block.

2. Establish a color key on the lines marked X and O. Each block will have its own set of two colors. Fig. 9 shows a 4-block, 2-color pattern. Fig. 10 shows a 4-block, 3-color pattern.

3. Establish the threading according to the Scandinavian Method



(Fig. 9) or the American method (Fig. 10).

4. Establish the sett and the number of warp threads in each block.

5. Draw the block pattern for which the treading profile is the same as the threading profile or "as the blocks are drawn in".

New patterns are designed by varying the treading order and by elongating the blocks.

PROJECTS

3-COLOR 4-BLOCK WARP REP RUG

Warp: 8/2 cotton in 3 colors: wine ■ (X or dk), pink ▨ (0 or lt. #1), caramel |] (0 or lt. #2).

Weft

pattern: 12/4 rug yarn (cotton or synthetic, such as Aunt Lydia's)
binding: 2/8 cotton, color wine.

Sett: 48 epi (190/10 cm) in a 12-dent reed.

Width in the reed: 27" (68 cm).

Drafting Method: Scandinavian. See Fig. 11.

Treading: See Fig. 11, read from bottom to top. Repeat section A and section B as often as needed and end with section A.

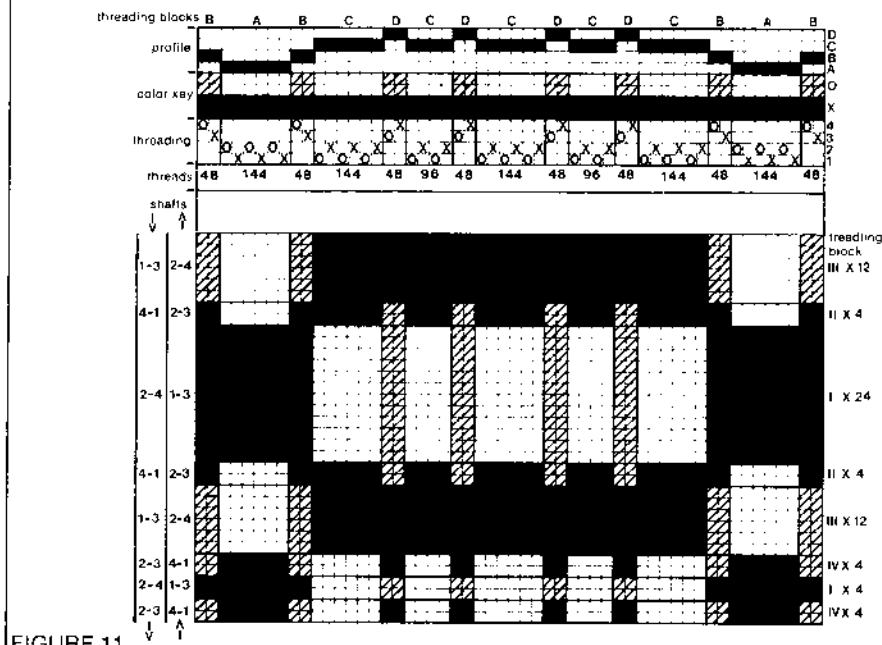


FIGURE 11

3-COLOR 4-BLOCK WARP REP TABLERUNNER

Warp: 8/2 synthetic (Orlec) in 3 colors, brown ■ (X or dk), pumpkin ▨ (0 or lt. #1), green □ (0 or lt. #2).

Weft

pattern: 12/4 rug yarn (cotton or synthetic, such as Aunt Lydia's).
binding: 8/2, brown.

Sett: 48 epi (190/10 cm) in a 12-dent reed.

Width in the reed: 11 2/3" (29.3 cm).

Drafting Method: American. See Fig. 12.

Treading: See Fig. 12. Read from bottom to top. Repeat section A and section B as often as needed and end with section A.

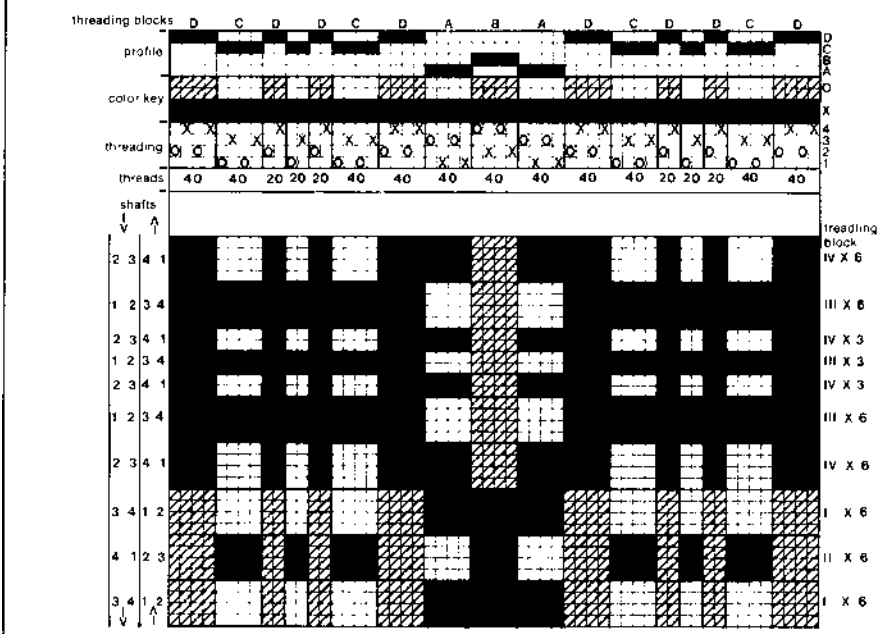
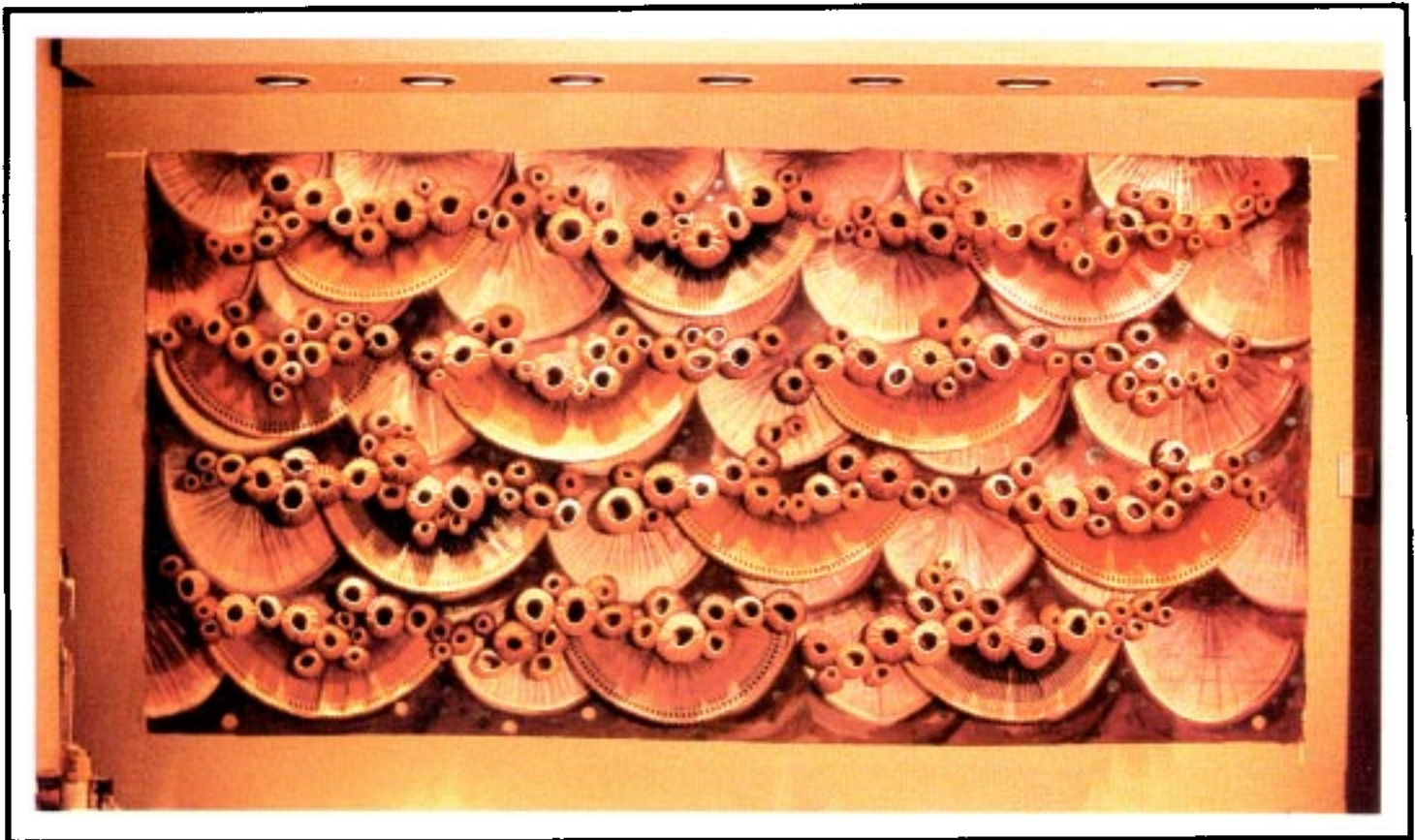


FIGURE 12



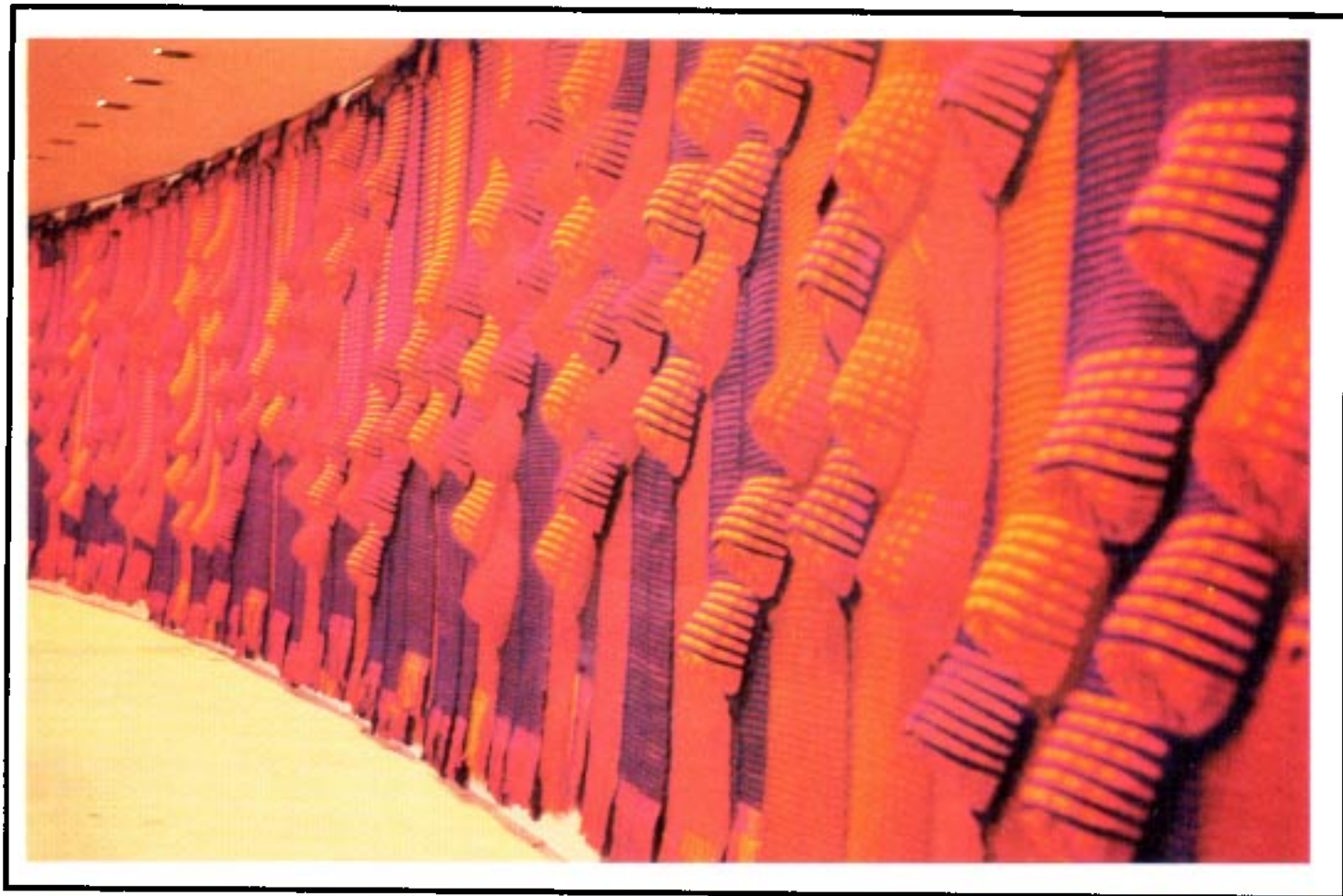
4. 8' X 16' *Barnacles & Fans* on painted wall for the lobby of City Hall, Spokane, Washington.

KEN WEAVER ON REP WEAVING

My first weaving, done in 1964 while a student in architecture, was a combination of tapestry and inlay techniques. My teacher, Jane Lorendo of Auburn University, gave me the basics of warping, threading and weaving and sparked in me the excitement and love of weaving. I had become very discouraged with architecture, so, when my first hanging, a 4' x 6' (1.2 x 1.83 m) impressionistic view of waterlilies, sold for a high price, I was encouraged to continue on in weaving, after completing my architecture degree. I moved to New York and was most fortunate to secure a handyman/apprentice job with Jack Lenor Larsen—to me the ultimate fabric designer. I was inspired by his creativity and, I think, most of all by his thoroughness toward detail. He encouraged me to go on to Cranbrook Academy of Art, 1967-69, where I was free for 2 years to do all the weaving and



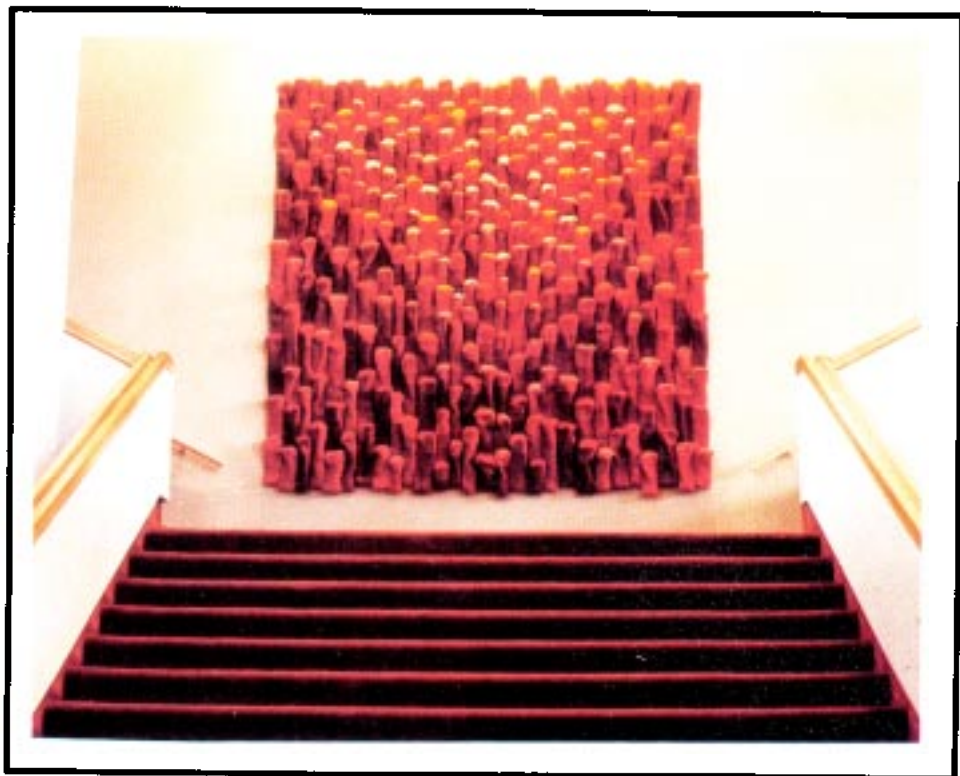
5. 4'h. X 6'w. X 6"d. two section, *Tubular Forms* hanging, commissioned for a private residence through Ruth Voldig Gallery, Ltd., Chicago.



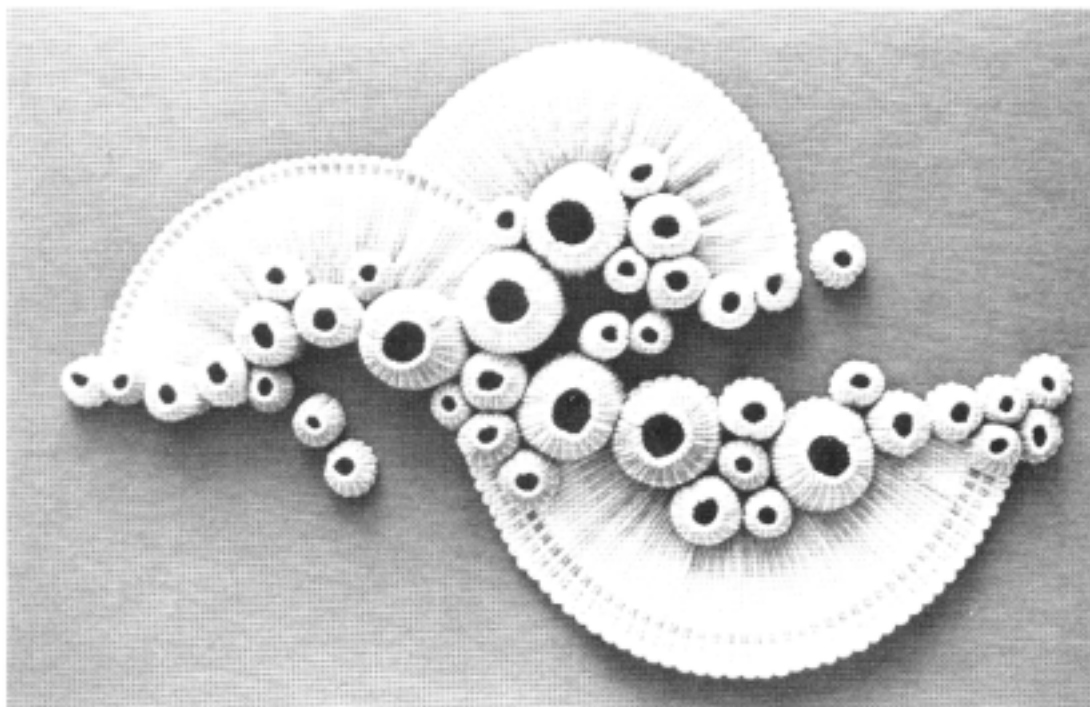
2. 9' h. X 64' w. X 8" d. *Mask Forms* hanging woven for the Renaissance Center in Detroit.

experimenting most weavers go through. At Cranbrook and for about two years thereafter I explored pattern weaving, rug weaving, casements, overshot, summer-winter, tapestry, double weave, and my own development of filling-faced rep geometrics.

One day in 1971 while eating breakfast I was examining the Guatemalan runner on the table and noted its warp faced rep weave with inlaid flowers, chickens and geometrics. This was my first encounter with warp faced rep weave and I soon set up my loom with 20 e.p.i. (80/10 cm) of 3 ply rug wool and started experimenting. One of the very first things I learned was to handle the warp very carefully and to put it on the warp beam under strong tension. I found that a rep warp would not weave on 2 shafts as it was much too dense to separate, so I spread it over 8 shafts



6. 10' X 10' *Vertical Ridge Forms* hanging woven for the Colony Square Hotel, Atlanta.



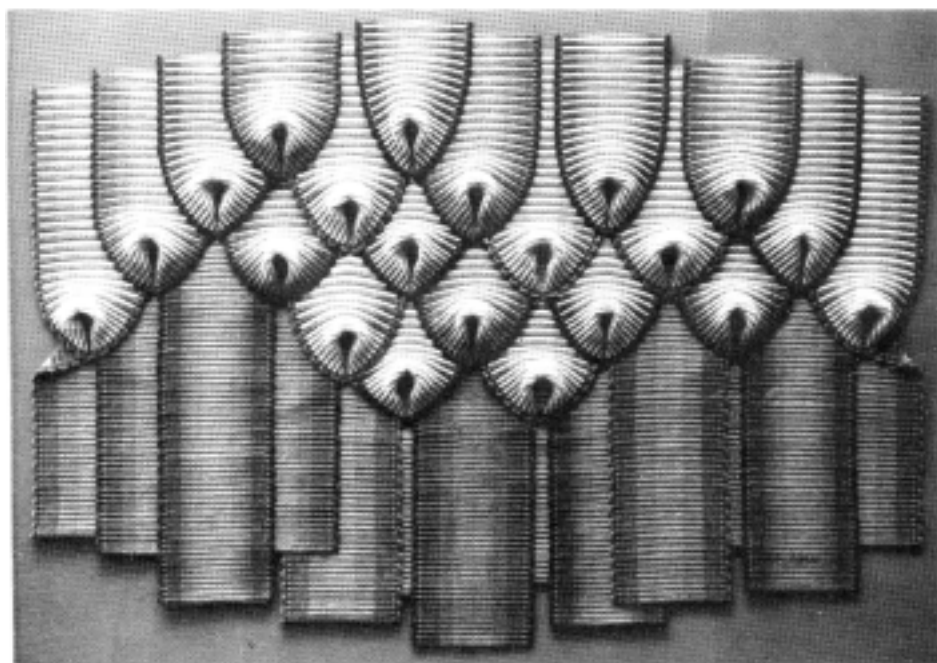
3. 4'h. X 6'w. X 8'd. Barnacles & Fans hanging.

and opened the alternating plain weave sheds by treading several treadles in sequence, each with another shaft of the final shed connected. In other words, to get the even shafts (2, 4, 6, 8) up, I pressed one treadle connected to #2, then one next to it connected to 2 and 6, then 2, 4, 6, then 2, 4, 6, 8 and I could pass my shuttle through. To get the odd shafts (1, 3, 5, 7) up, I would

press #1, then 1 and 5, then 1, 3, 5, and finally 1, 3, 5, 7 and pass the shuttle through the shed. The filling threads of my rep hangings have always been around 20 threads of 3 ply rug wool, though I have used up to 100, run off onto the warping mill and then wound around rag shuttles. I use these "fat picks" alternating with "thin picks" of a 10/2 linen for a basic rep

fabric and vary the sequence of fat and thin picks according to the pattern I've designed into the even and odd sheds.

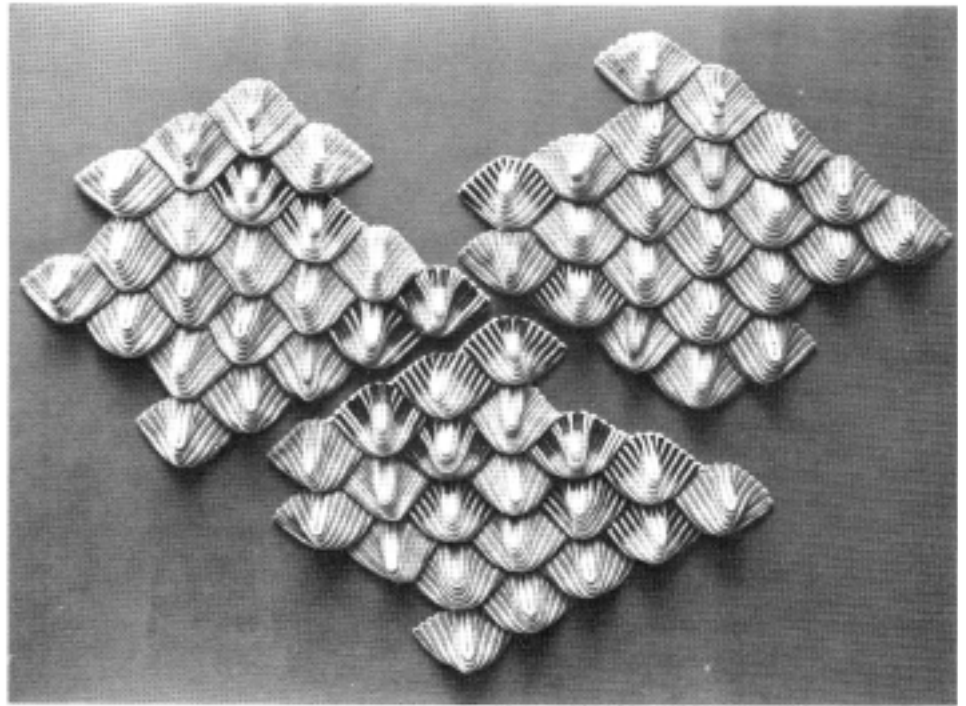
Since doing my first warp-faced rep hangings, I've done hundreds with geometric designs, geometric and free form high and low piles, inlays of wools and novelty yarns to create landscapes, and even inlays of plexiglas mirror strips. I began to get bogged down and stagnated in these basically flat and repetitious rep hangings and one day began to experiment with a long rep weave strip and found it was very easy to shape and yet was strong and retained that shape well. This was the opening up of a whole new and exciting area for me: my "sculptural" rep hangings. "Mask Forms" (see Photo 1) was one of the first of these sculptural techniques. The maximum I've carried this to was a 9½ x 64' (2.9 x 19.5 m) piece for the Renaissance Center in Detroit in 1977 (see Photo 2). This technique is basically narrow (10"-16" or 25-41 cm) rep strips shaped and sewn by hand separately, fitted together and sewn into one piece. The warp is figured so that one shed is dark or dull and the other "accent shed" is light or strong.



1. 5'h. X 7'w. X 6'd. Mask Forms hanging.

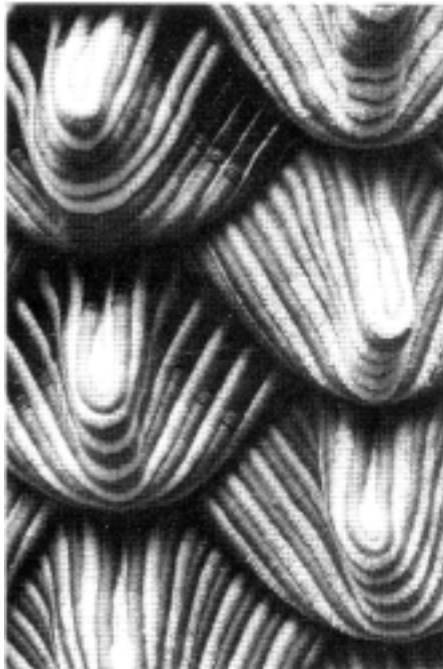
One day while studying some barnacles on a piece of wood I had picked up at the beach, I realized I could weave barnacles by including into the very edge of my warps a 10/5 linen. After weaving a strip, about 5" wide by 30" (12.7 x 76 cm) long, I sewed the ends together and pulled on the linen "drawstring" to draw in the mouth of the barnacle. Warp face rep is great for drawing in as it is so pliable. This first drawstring made me realize I could create other shaped pieces with this technique, so I added "fans" to my barnacle pieces (see Photo 3). These fans have drawstrings about every inch along the width of the warp and the strings are pulled tighter and tighter toward one edge. The most exciting piece I've done with "barnacles and fans" was a commission by the Spokane, Washington, Arts Commission for an 8' by 16' (2.45 x 4.9 m) piece for the lobby of Spokane City Hall (see Photo 4). I designed the piece and supervised/instructed the weavers of the Inland Empire Handweavers Guild to weave it. For this piece we painted the wall with latex paint in a design coordinated with the barnacles and fans that were installed over it. The entire wall became the art piece. It was most gratifying working with the weavers of the guild and seeing their enjoyment, anxieties and excitement in creating this piece.

Another sculptural technique I've done in rep weave is "tubular forms" (see Photo 5) in which the rep strips are rolled, sewn and stuffed into tapering tubes. These tubes are then sewn together into whatever shape I want. "Vertical ridges" is made by weaving rep strips which are cut into pieces and machine sewn into tapering boxes which in turn are hand sewn onto a full size rep backing. The 10' x 10' (3.05 x 3.05 m) piece (see Photo 6) I wove for the Colony Square Hotel in Atlanta required 14 rep warps, each 16" (41 cm) wide and 40' (12.2 m) long. These were shaped and sewn onto the 10' x 10' backing. Whenever I sew rep elements together, I use a 10/5 linen in a



7. Three section Cone Forms hanging. Overall dimensions are 5 1/2'h. X 8'w. X 8"d. Each section is 3'h. X 4'w.

curved needle. If the rep strips are woven of all wool (I have at times crossed the wool warps with synthetics, which are harder than wool) my Singer sewing machine has little trouble sewing off the strips before they are cut, though it is difficult when making shapes such as the vertical ridges or cones to sew double thicknesses of rep fabric.

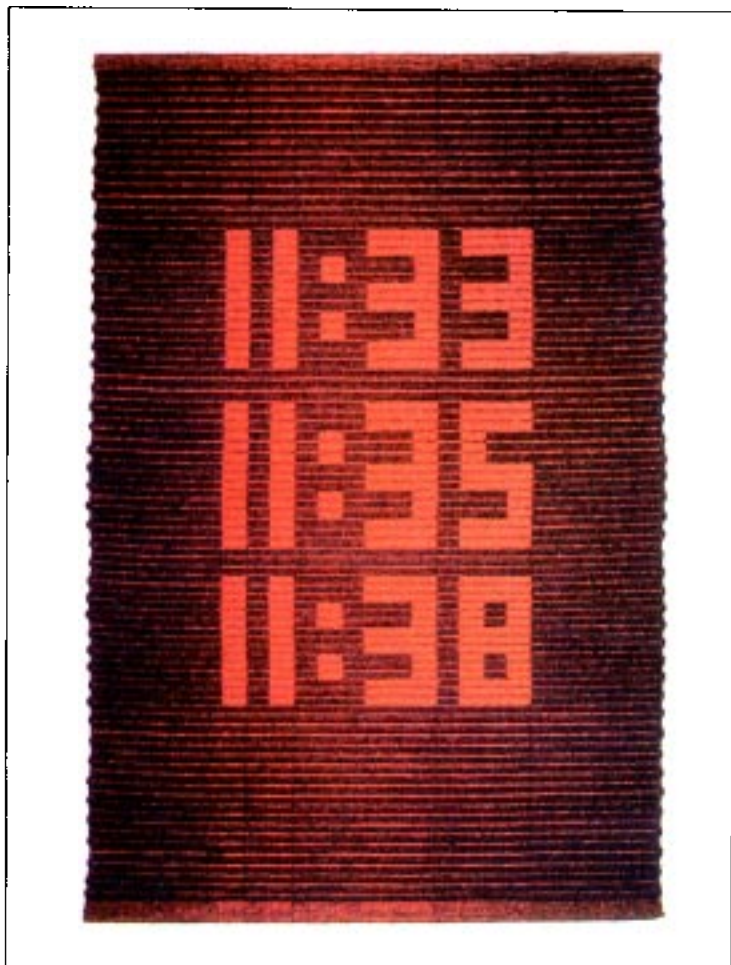


7. Detail of Cone Forms hanging.

My most recent technique, "Cone Forms", (see Photo 7) is strips cut into small pieces which are machine sewn into "cones" which are then hand sewn together into the final hanging. I love this technique and the resultant hangings as they reflect my love of the rhythm and reflections of the sea.

I'm now working with rep warps of 36 to 42 e.p.i. (140 to 165/10 cm) of 2 ply wool, which gives a much smoother surface, crossed with about 30-40 combined, 2 ply wool threads for the fat picks and one 20/2 linen for the thin picks. I've begun to combine chenilles, silks, rayons and other yarns into the warps; this is very exciting to me.

At this point in my career, I'm really struggling with the serious content of my art. I have many new areas I want to explore and others I want to develop further, but I have little time for these as I must devote all my time to doing the commissions which limit me yet allow me to live and exist as an artist/weaver. I hope some day to be able to weave only what I feel are real "art pieces" and make my living by the sale of these through the galleries and agents by whom I'm represented across the country. ■



"Five Minutes In February" by Ronnine Bohannan

DESIGNING REP WEAVES WITH THE AID OF A COMPUTER

by Ronnine Bohannan

I enjoy the patterns created by weaving but often they are so small and repeated so many times they blend together and go unnoticed. Drafting weaving patterns on a scale larger than they are usually woven made me realize that I wanted to weave enlarged patterns. How could I make one pattern repeat large enough to demand attention? What weaving technique could enlarge patterns and remain structurally sound? How could I get large areas of color without spending the tremendous amount of time required to do tapestry? Warp-faced weaving has been the answer to these questions for me.

My first experience with warp rep was an attempt to use cotton welt

cord as a weft. Welt cord has limited visual appeal and therefore I determined to use it as a structural material, but to cover it, much as the core in coiled baskets. This led to setting the warp very closely. After a few such experiments I took a workshop on warp rep weaving from Ken Weaver. It was very exciting and opened up new possibilities using the warp-faced technique. Then as luck would have it I joined a study group on shadow weaved by Clotilde Barrett. Here I discovered how to get designs based on twills into warp rep weaving. I now felt ready to try a warp-faced rug. I chose to work with wool. My previous warp-faced pieces had been done in cotton or rayon and when I attempted to use wool I ran into a number of problems. Jack

looms do not give much of a shed when warped with closely sett wool. I completed that rug but was discouraged from doing any more with my present equipment. Deciding this was a technique I wanted to pursue, I ordered a countermarch loom with double back beams.

Shortly after the countermarch loom an APPLE II personal computer arrived in our house. My husband, Bruce, knowing a computer could color in squares much faster than I could, offered to write a program to do just that. This has proved a marvellous tool, it does drawdowns in minutes, even does color and weave effects. I have come to depend on the computer in the design phase of my work. It allows me to see many variations of a design, to change proportion, to play with color. I created designs which I probably would not take the time to draft with paper and pencil. It is as I said a marvellous aid. And it has in part influenced my work. The *WEAVER II** program is in low resolution graphics and displays a weave structure in a 40x40 thread grid. This results in a bold video display or printout. This boldness is especially appealing to me and can be easily rendered in warp rep fabric. I use our computer to design moderate to large wall panels and I now prefer to use rayon for warp, as it is easier to work with and I do love the shine.



Ronnine's Worksheet

**Weaver II*, computer software by Bruce Bohannan, 2212 Pine St., Boulder Co 80302.

AN INTRODUCTION TO COMPUTERS FOR WEAVERS

by Earl W. Barrett

As regular readers are aware, *The Weaver's Journal* has supported the application of microcomputers to the textile arts and crafts with enthusiasm for the last three years. One of our services to our readers is reviewing computer programs of relevance to weaving. Although I have received favorable feedback from readers about these reviews, I have also had some comments to the effect that my reviews were hard to understand because of the computer jargon. I came to realize that I had made an unjustified unconscious assumption when writing those articles and reviews; namely, that I was addressing a readership who had already acquired their computers and were familiar with their use and with computer vocabulary. I also realized that I might have inadvertently discouraged some readers from becoming interested in computer applications to weaving. My purpose in this series of articles is to rectify this error and, I hope, to arouse interest on the part of readers who are presently indifferent or even hostile to using computers in aid of their craft.

WHO'S AFRAID OF THE BIG BAD COMPUTER?

The word "computer" itself may trigger hostile reactions. There are at least two common reasons for this. Many of us have had the maddening experience of receiving computer-printed duns every month from a large company threatening us with a collection agency if we don't pay a bill that we know we paid six months earlier. Or, the word may bring back ugly memories of dreary hours spent doing algebra and trigonometry homework back in high school or college.

Artists may also feel that any process that involves a computer is, ipso facto, devoid of any creative

element, is not really "done by hand", and that he/she has no control over what takes place.

The fact is, that the modern personal computer really deserves another name. The first electronic digital computers were, it is true, designed and built to do scientific and engineering calculations that had to be repeated thousands of times without error and so were impossible for unaided humans to do. But this association with arcane mathematics is neither essential nor desirable. What a computer actually does is to accept **information** (not necessarily numerical) as **input**, perhaps store it in **memory**, manipulate it in accordance with instructions contained in a **program**, also stored in memory, and display the results as **output** in some form usable by humans.

The word "computer" should therefore be equated with "*information processor*" rather than with "*number-cruncher*".

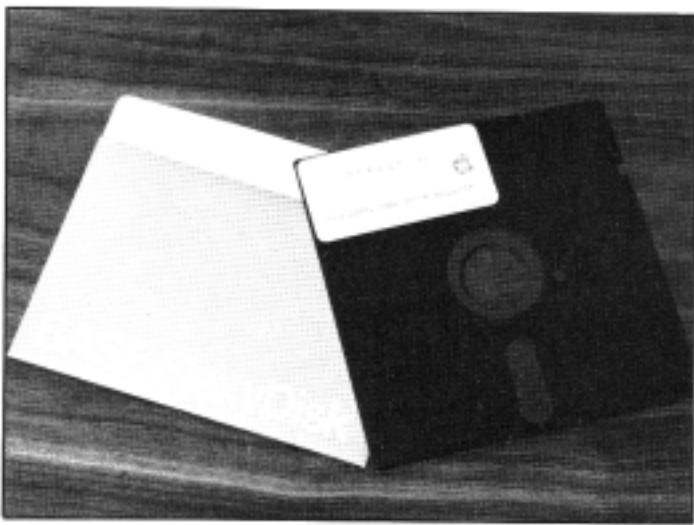
Another myth that must be dispelled is the much-worn science-fiction theme of computers "taking over" from humans on their own initiative and running the world. The idea is absurd. The only control a computer has over the world outside its case is through its out-

put devices. It is hard to imagine controlling the world by displaying text or pictures on a video display or a typewriter. Furthermore, a computer can only do what it is told. Especially with a personal computer, you, the user, are in control; if it does something you don't expect, then (barring an unusual equipment breakdown) the error is yours. If all else fails, you can always pull the plug on the machine.

The personal computer is simply a tool to accomplish certain tasks. Viewed in this way, it is no different from your loom or spinning-wheel. Once understood, it can save the weaver a lot of time, effort, and material, as well as be a source of leisure-time fun and creative exploration. What sets it apart from other tools is the vast range of jobs it can do. Besides being able to simulate a loom and analyze a fabric, it can keep all kinds of records such as bibliographies, recipes, lists of names with addresses and phone numbers, do all the bookkeeping for your business, balance your checkbook, control a home security system, play music that you arrange or compose, serve as a drafting machine, let you play video games, etc. The list is endless!



1. Computer keyboard



2. Diskette



3. Disk drive

COMMUNICATING WITH THE COMPUTER: INPUT DEVICES

The computer receives its input information in a variety of ways. **Alphanumeric** (alphabetical-/numerical) information may be entered at the **keyboard** that is always a part of a small computer system. It is laid out like a typewriter but with a few extra keys that control some computer functions (see Photo 1). The keyboard is used when the user wants to enter new information. **Magnetic media** allow input of previously-recorded information. The earliest small computers used **cassette tapes**, the same kind used for music or other audio recording, together with an ordinary portable cassette recorder. This has the advantage of being inexpensive, but is awkward and slow. Newer systems use **magnetic disks** because they allow faster location of a desired block of information. These disks fall into two classes: **hard disks** and **floppy disks**. Hard disks, as the name implies, are rigid platters coated with a magnetizable layer, while floppies are thin plastic wafers coated with the same material. Hard disks can store much more information per unit area than floppies, but they, and the **disk drives** that read and write on them, are very expensive and somewhat finicky about their environment. They are essential, however, when a great deal of

related information must be accessed at one time, as when printing out mailing labels for magazines or huge inventory lists. Most users' needs, however, are met by the floppies, which come in two popular sizes, the 8-inch (20.3 cm) diameter variety used mostly by business computers, and the 5¼-inch (13.3 cm) **diskettes** that are standard on most personal machines. Photo 2 shows a typical 5¼" floppy and Photo 3 a disk drive.

Information is stored on these disks in a way similar to a phonograph or videodisk. The main difference (and a very important one) is that the information is not stored on a spiral path from outside to inside. Instead, the disks are formatted in concentric-circle paths called **tracks**. Each track is further divided into **sectors**, each of which holds the same amount of information. Under computer control, the **read/write head** of the disk drive is guided to the desired track, and then reads from (or writes to) the appropriate sector. This allows **random access** to information on any part of the disk, without having to search it from the edge. This is why disks are preferable to cassette tapes as **mass-storage** media; cassette systems only allow **sequential access**, starting from the beginning of the tape and scanning until the desired data are found. Disk access is faster and fully automatic.

Often the input information is not alphanumeric, but positional. This is the case when one wishes to put a dot or draw a line on an output device. While **graphic** input can be entered at the keyboard, it is much more efficient to use a device that allows faster and more precise positioning or drawing. Several devices are in use: **game controllers**, the **joystick**, the **graphics tablet**, and the **light pen**.

Game controllers are more often called "**paddles**" because they were first used in video games such as "pong" to move a simulated ping-pong paddle on a video screen. They are supplied in pairs,



4. Pair of paddles

each consisting of a box with a knob and pushbutton. One knob sets the horizontal position of a point on the screen and the other the vertical position. The buttons are used to initiate special actions; firing of weapons in video games is a typical example. Another use is to cause the drawing of a pre-programmed shape or pattern at the location determined by the knob settings.

The joystick is a merger of two paddles so that both the vertical and horizontal positions can be controlled by one hand. This provides a more natural movement; pushing the stick away from you moves the vertical position upward on the screen while pulling it toward you moves it down. Moving it left or right causes corresponding horizontal displacements while diagonal movements produce corresponding diagonal shifts. Two pushbuttons are supplied with a joystick, thereby permitting control of either of two special actions at any time.

A pair of paddles is shown in Photo 4 and a joystick in Photo 5.

A graphics tablet provides an even more natural way to get graphical data into a computer. It is simply a small drawing-board; each point on the board, within set margins, corresponds to a point on the video screen. One either moves a stylus (in the more expensive models) or a pantograph arm (in the less expen-

sive) to move around the screen. The graphics tablet enables the user to do drafting or freehand drawing on the screen, or to trace over an existing drawing. See Photo 6 for an example of a pantograph-type graphics tablet.

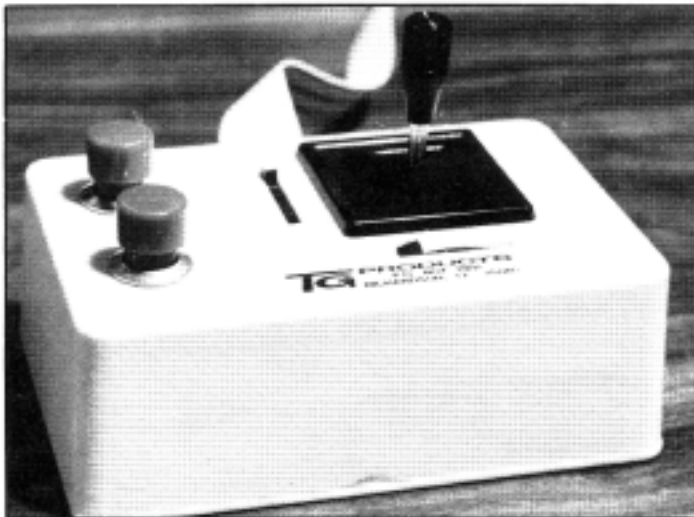
A light pen operates in a manner identical to a graphics tablet, but uses the video screen itself as the drawing-board. One can either "draw" directly on the screen, or put a drawing on the screen that has been stored on disk or generated by a program and modify it at will with the pen.

Any design created with these graphic input devices resides in the computer's memory as long as it is not erased or the computer is not switched off. It can also be stored on a diskette or cassette tape for later retrieval and re-use.

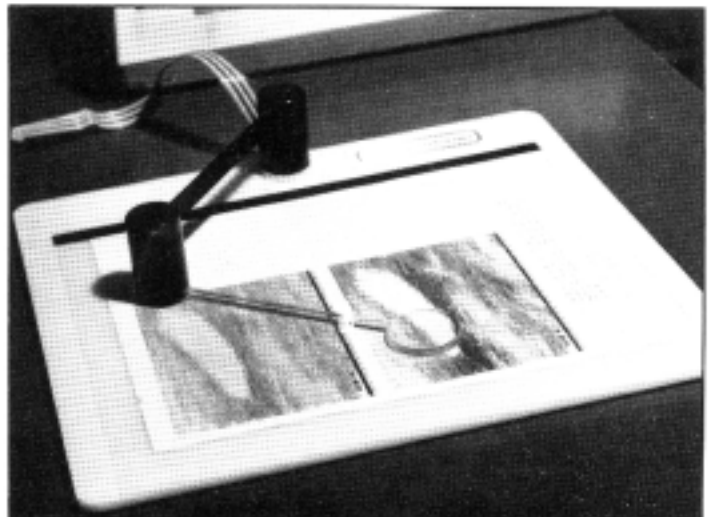
All of the input devices discussed so far are either an integral part of the computer or are physically close to it; such devices are usually called **peripherals** in computerese. It may be desirable on occasion to have your personal computer communicate with other more powerful computers to do jobs that are too big for yours to handle. You may wish to exchange programs or data or just chat with a friend on the other side of the country or the world. Or, you may want to join a network where (for a suitable fee) you can tap into a huge and varied **data base**. To do this, you need a

means by which your computer can send and receive information over the telephone. A device called a **modem** fulfills this function; it translates data from the computer's internal format (to be discussed later) into a sequence of tones that the telephone system can handle. It works both ways, i.e. it can accept information on the phone and pass it as input to the computer, or accept output from the computer and send it over the phone line.

A potentially very useful input device that is becoming available for small computers is the **speech processor** or **voice recognition system**. It allows the user to instruct the computer by speaking into a microphone. In addition to enabling visually-handicapped people to use computers, this device can be a great help when a user needs to enter data that he reads from, say, the dial of an instrument and must not take his eyes off the dial. It is also a boon to non-touch typists who need to enter a lot of tabulated information. Unfortunately, speech processors require computers to have very large memories. Only very recently has the memory capacity of small computers begun to approach the minimum amount needed for speech processing to advance beyond the amusing-toy stage. It is likely, however, that it will become a very important input mode in the future.



5. Joystick



6. Graphics tablet

THE COMPUTER COMMUNICATES WITH YOU: OUTPUT DEVICES

As in the case of input, output information falls into three main classes: alphanumeric, graphic, and acoustic. For the first two, three devices are in common use at present: the **printer**, the **video display** or **screen**, and the **plotter**.

Even the most primitive computers of the forties and early fifties used some kind of printer for output. Electric typewriters and Teletype™ machines handled the job for these early computers. In recent years, however, printers especially designed for small computers have been developed; they are generally more cost-effective, lighter in weight, and easier to maintain than the older general-purpose printers.

Printers are divided into two main classes, depending on how the character images are put on the paper. In one category are those

printers that are essentially keyboardless typewriters controlled by the computer. These use type fonts cast in metal or plastic, but, rather than putting the type on a ball or cylinder, each character is at the end of a radial arm attached to a central hub. This simplifies the mechanical design because the spoked-wheel has only to move in one plane, while cylinders or balls must undergo compound rotations and translations to select the right character. Because the type wheel resembles a large daisy, these printers have acquired the generic name **daisy-wheel printers**. Because their printed output looks just like that of a good electric typewriter, they are frequently referred to as **letter-quality** or **correspondence-quality** printers.

The other type of printer forms characters in a quite different way; namely, by building them out of dots. Instead of a type wheel, a **print head** is moved horizontally across the paper at a constant rate

of speed. This head is a block holding a vertical array of fine hard-metal rods pointing at the ribbon and paper. Each rod is driven by its own little electromagnet. As the head moves across the paper, a little computer built into the printer decides which rods must be pushed in proper sequence to leave the character image on the paper. Printers in this class are called **dot-matrix printers**. See Photo 7 for a typical example.

One superiority of the dot-matrix printer is its high printing speed: 50 to 400 characters per second (CPS) as compared with 25 to 50 CPS for the daisy-wheels or about 10 CPS for a skilled typist doing 100 words per minute (WPM). Another advantage is that it can be designed to print graphic output as well as alphanumeric, i.e. it can provide **hardcopy** on paper of whatever is shown on the video screen. A third is that, generally speaking, dot-matrix printers are cheaper than daisy-wheels (though the gap is narrowing). The disad-

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vantages of dot-matrix machines are: (a) the characters are not as sharp-looking as those printed by daisy-wheels; (b) the print heads are more costly to replace than daisy-wheels when they wear out; and (c) they can be disagreeably noisy.

This last handicap does not apply to one sub-class of dot-matrix printer. Instead of printing the dots by **impact**, they are generated by a heated rod touching the paper (there is no ribbon). For this reason, such machines are called **thermal printers**. They are very quiet in operation, but suffer from one very severe handicap. They require special chemically-impregnated paper that darkens with time even if stored in the dark. Copy done on these printers is therefore perishable; it can become unrecadable after a few months, so thermal printers should not be used for archival material.

In the early days of computers the printer and keyboard were often

combined into a single input-output (I/O) **terminal**. Nowadays, the video display is favored for output unless hardcopy is needed. There are two reasons for this. The first is speed; characters can be put on the screen at rates of 1000 CPS or more. The second is the possibility of editing. On a printer, the Moving Finger writes and, having writ, moves on, but the types of video displays used with personal computers allow you to lure it back to cancel half a line or as much more or less as you like. Other advantages of the video display are: (a) that it displays graphics as readily as text; (b) that it normally requires less maintenance than a printer; and (c) that it can display color much more cheaply and quickly than a printer can. Its obvious drawback is that it cannot provide a permanent copy. However, most computers will allow you to store the information needed to recreate the text or graphics on cassette or diskette for later retrieval.

Video displays fall into a number of categories. They may be **monochrome** or **color**. The monochrome screens display white, green, or amber characters on a black background. Color displays are divided into two classes: **composite** or **RGB** (red-green-blue), depending on the kind of video signal that they accept. I will discuss these more technical details in a later article; it will suffice to say here that RGB displays are more expensive and give the sharpest color pictures, but only the more expensive personal computers are able to send them the right signals. Most small computers that provide for color at all will work only with composite color displays. Video displays also come in a variety of sizes, from 5" (13 cm) diagonal screen measure in portable systems through the most popular 12" or 13" (30 or 33 cm) sizes up to the giant-screen projection systems.

The physical relationship between the display and the computer differs from one computer to another.



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1. Text must be typewritten, legible spaced.
2. Drafts and line drawings must be on separate sheets of paper and numbered.
3. Photos (if used) must be on separate sheets, numbered by a list of captions.
4. The upper left-hand corner of the first page of the manuscript should contain contestant's name, address, and category entered.
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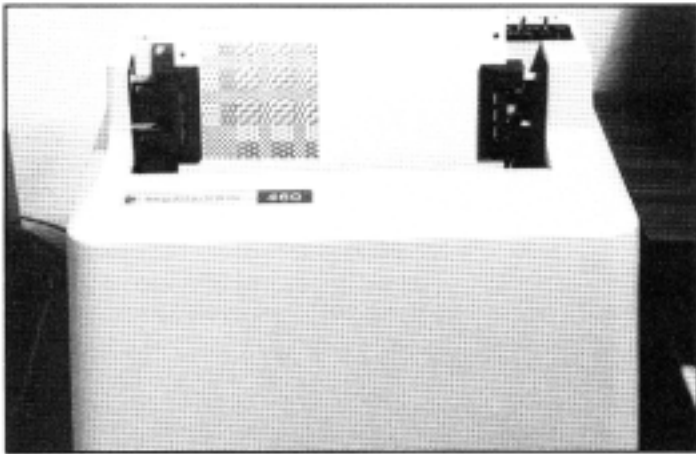
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7. Dot-matrix printer

Some computers have the display as an integral part of the package, along with the keyboard. Others, especially those that are business-oriented, have neither keyboard nor video and require a **video terminal** (keyboard and display packaged together) to be purchased separately. Most home machines, however, have the keyboard built-in and provide a socket at which a composite video signal is available and leave it to the user to provide his own display. The



8. Monitor

cheapest way to go in this case is to run this video signal into a **modulator** which transforms it into a television signal on an unused channel (preferably UHF) that can then be received on a regular home TV receiver. This economy is offset by a less-sharp display than can be obtained with the other option, namely a **monitor**. It is similar to a TV set and costs about the same (but cannot receive broadcasts). It connects by a cable to the video output socket on the computer,

thus establishing a "closed-circuit" TV system. This arrangement gives sharper pictures and eliminates interference from appliances such as microwave ovens, etc., that can plague the "open" modulator-home TV setup. Photo 8 shows a typical 13" color monitor.

The smallest portable and "pocket" computers use **liquid-crystal (LCD)** displays, the same kind used in most digital watches. Because these only show a line or two

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of text, they are not useful for displaying weaving graphics; we will not concern ourselves further with them.

The magnetic media, cassette and diskette, accept information from the computer and store it and are therefore two-way I/O devices, as is the modem.

Direct hardcopy of graphic information, with higher resolution than printed graphics, is obtainable with a **plotter**. This device draws dots or lines, in monochrome or color, under computer control. It is capable of the best graphics, but is rather expensive and slow in operation.

Techniques for output of sound under computer control are much more highly developed than those for sound or speech recognition (input). **Sound synthesizers** are available for both music and speech. With these you can arrange or compose music for as many as 16 "instruments" or voices in stereo, or have the computer give vocal

reports of its operations. This last capability is more than just a novelty; it opens up the world of computers to the blind and also allows the computer to furnish critical data to someone whose eyes are totally involved with another essential task, such as driving a car or flying an airplane. Modern speech synthesizers can even be programmed to have voice inflections (pitch and volume variations) so that they do not have to speak in a "Robbie the Robot" monotone unless you want them to.

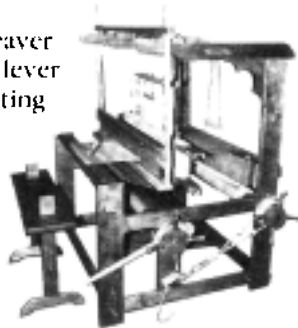
In the last two sections I have covered the I/O devices that are of the greatest general interest. There are, of course, many specialized computer applications that require dedicated I/O devices. The generic term for such input devices is **sensor**, and for the output devices, **controller**. A burglar alarm system, for example, might have an infrared or ultrasonic sensor in each of many rooms, and a controller to turn on a siren or bell. It might also send a warning through

a modem over the phone to a police station or security officer telling just what room and building have been entered. Another example of interest to weavers is a controller for a dobby loom; at least two such systems (including the loom) are on the market today.

This concludes our introduction to computer I/O devices. In writing this article I have broken with the traditional approach used in introductory books on computers. Usually, the books start with simplified explanations of the interior workings of the machines and then take up the topic of I/O. I feel, however, that it is better to introduce newcomers to the peripherals first because the latter are to some extent already familiar. A keyboard is familiar in its everyday guise as a typewriter; a video display as a TV set, etc. In the next article in this series we will explore the "innards" of the computer, learn how it handles information internally, and acquire some more essential computer vocabulary. ■

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RUG WEAVING: ONE WEAVER'S APPROACH

by Barbara Hand

2. "Chinese Lattice in Reds", 50" x 70". Barbara Hand, 1981

Part I

The challenge of weaving as a career.

As a full-time rug weaver, I frequently hear comments such as "If only I had your discipline, I could get a lot done too." Such comments usually reflect a sense of being overwhelmed in the face of the enormous task of learning apparently required for making a successful career as a weaver. Where should I start? Can I ever learn enough to be able to do anything worthwhile? Can I ever be really creative? If my own experience over the past eleven years has taught me anything, it is that the task of becoming a successful

weaver is not easy, but it is manageable. In addition to luck, success requires persistence. But it also requires confidence in one's own capacities and, in particular, in one's capacity to make the best of the many problems and difficulties, challenges and opportunities, one will face. Because of differences in temperament, interest, and opportunity, no two weavers will follow an identical path, face exactly the same problems, and suffer exactly the same discouraging setbacks. But if the first obstacle to success is to give in to the sense of being dwarfed by the enormity of the task, the second is to lose confidence and equilibrium in the face of problems and set-

backs encountered along the way. One thing that is helpful and encouraging is to learn of others who have faced such things and in their own ways surmounted them. The responses which others make to a common problem, for example, may not be directly applicable to one's own unique situation. Yet the sense that it is really possible to surmount difficulties is encouraging. And even if the particular responses are not directly applicable, they may be suggestive and may indirectly aid us in finding our own appropriate responses. It is in the hope of offering such encouragement and some useful observations as well, that I enter upon the following discussion of some of the

problems and challenges which an aspiring career-weaver will almost unavoidably face. There are many such matters which relate primarily to the business end of a successful weaver's efforts: I will not consider those, but instead suggest organizing a workshop with Libby Platus on the artist in business. I will focus primarily on those problems and challenges which concern the creative process directly. And, considering them as I have met and responded to them, I will draw out what I think I have learned so far as that is something it might help others to know.

When I started weaving, I had no idea it was going to lead to a career. Like many weavers I know, I had a vague interest in a lot of things, but I really did not know enough about weaving to know what I wanted to do. I had been working on an MFA in painting when I took my first weaving lesson. That day was the last on which I touched my brushes. What I had found was a fascinating, yet puzzling, activity which completely captured my interest. The next step was to figure out how to weave, to learn all there was to know. It did not take long to discover that the latter was a naive notion, if not an impossibility. I spent a year producing double-weave "art-cloth" pieces, the sort of weaving which my first teacher was involved in and which was in vogue at the time. All the while something kept asserting itself in me. I think it was the realization that, if I was going to master the craft of weaving, I was going to have to concentrate my efforts into a fairly narrow area. I chose rug weaving as the place for such concentration, and hoped that a thorough understanding of this area of weaving would provide a residual understanding of other areas. The choice of rug weaving was a fairly logical step for a painter; it meant moving from the wall to the floor. But more importantly, it meant I could still use color and design, along with texture, to express myself creatively. A rug, well done and suited to its purpose, seemed able to

be a work of art, an integral part of our environment which would contribute to the enjoyment of our daily lives. The major problem at that time was simply how to learn to weave such rugs.

My first step was to take a three-day workshop at the Mannings in Pennsylvania, and my second step was to purchase *The Techniques of Rug Weaving* by Peter Collingwood. Both steps were important, but the second had the most fundamental effect. Weavers are fortunate in that they can find a good book and go off for ten years and teach themselves their craft. That is exactly what I did. Armed with Collingwood, I moved to Montana, sat down, and started at the beginning. At that time, I felt totally dependent on the book; in fact, it was rarely out of my sight. But I also felt a kind of patience with that dependence: a willingness to devote this time to learning, exploration, curiosity, study, mistakes and frustration. I figured that I would weave thirty rugs, in all the techniques possible, and then take them all apart and start over. What I hoped for at the beginning was that, even though I was dependent on the book at the start, I would gain understanding and insight at some point along the way, and take off on something that was truly original and my own. I did not know what form that insight might take, and when or how it would occur. But I always held the hope that it would come in time.

I spent the first year weaving twills: four shaft, eight shaft, broken and pointed, spots and skips. I wove Navajo saddle blankets, and Krokbragds, simple and complex. I wove block weaves. As I experimented, I often found that one choice, one decision, one step, led to the next in a steady progression and development. But I also found that that was only one side of the learning process. Too often, when I ventured doing something a bit out of the ordinary, I found myself running into a dead end, laboring in an experiment that was unsuccessful. Such times of failure

can be discouraging, and raise self-doubt. Time is always precious and using up large amounts of it on an unsuccessful piece seems a real waste. A number of experiences of that sort can begin to undermine one's confidence. Nonetheless, I found that such times did not end up being merely negative; indeed, it is precisely such failure which generally enabled the most learning. What usually happened for me was that I had to stop and re-think what I was doing and the direction in which I was going. Yet if I did not panic during such "dead time" (as I call it), but was patient through the frustration and self-doubt, I found all sorts of new ideas eventually coming out of this kind of time. Indeed, there was a freshness and new energy which pervaded the work which followed out of such periods. I never looked forward to, or anticipated, going through such times, but they were essential and important.

The first year's effort took me to the point of weaving block weaves and using the shaft-switching technique. As I was able to learn through the mixture of successes and failures, I finally began to feel that my own ideas about design were gaining strength and were achieving freer rein. It was at this time, having woven thirty rugs (and not taking them apart!), that I had my first one-person show. When I look at the photos of the work now, I see the debt owed to Collingwood. His influence is everywhere. But I also see my own beginnings as an artist-weaver, someone who was starting to gain a grip on craftsmanship and technique. Much more exploration and experimentation would be required, however, before my own creativity could emerge in much independence.

I returned to the loom and for the next three years wove every shaft-switched idea I could dream up. Commission work followed the first show, as did invitations for other shows.

So there was much work to be done and sufficient opportunity to exhi-

bit. What I discovered was that both ways of working were challenging and fruitful, but for different reasons. The commission work required a certain type of creative thought, to work within the limits set by the client and the setting. The discipline required for successful planning and execution of a commission piece enabled me to learn in ways that otherwise I would not have learned. And it was very exciting, and encouraging to further work, to come up with a satisfactory solution and a happy client. On the other hand, it was equally exciting to set aside a period of time and, starting in with one idea, to follow a natural progression as that idea led to another and then another. The two modes of working functioned in counterpoint to each other. The original work done for exhibition generated the commission work for the next year. And the generation of new ideas in connection with the commission work, opened up further avenues to be pursued independently. What ultimately resulted was a body of work which was increasingly original and more clearly than ever my own.

The point I have finally reached in the last year is a natural development for a creative weaver. I have become frustrated with the limits of the techniques I have been using, and have felt the need to invent new ones. In particular, the limits of three-end block weave and shaft-switching have become pressingly apparent. Only two colors, dark and light, can be used on any one line. Frustration with this led me to new experimentation, and the eventual development of a whole new way for weaving intricately designed rugs. I call the technique "double-warp overlay". A discussion of its nature is not to the point in the present context, but I will present the details of the technique in the second part of this two-part article. My point here is simply that, because of a many-sided learning process over nearly ten years, I have finally reached a level of skill and knowledge which has

enabled me to create not merely new examples of rugs woven under established techniques but also a new technique. I would emphasize that I think this was made possible not by some peculiarly great gifts of mine, but for reasons that are well within the range of the aspiring career-weaver who would apply herself or himself in a disciplined and appropriate way.

Let me conclude, then, by drawing out and underlining the general insights into the creative process which my experience so far seems to have taught me and which would probably apply to other weavers. To begin with, if one is to become successful in the many-sided and complicated craft of weaving, one will have to find early a narrower field in which to concentrate one's endeavors. Rug weaving appealed to me, but any relatively limited field may serve the purpose. Secondly, in learning the techniques relevant to the particular form of weaving chosen, one needs to trust and to follow up the ideas, the possibilities, which emerge spontaneously along the way, and to proceed in a patient, steady, and single-minded way to learn both craftsmanship and creative variation at one and the same time. Thirdly, when the inevitable failures and unsuccessful experiments occur, one needs to respond to these as opportunities for re-thinking, re-directing, and re-dedicating one's efforts. They open up the way to very important forms of learning. Fourthly, when such efforts have led to the place where both commission work and independent exploratory work are possible, one can profitably pursue both, and can find them complementing each other, enhancing both one's craftsmanship and one's creative capacities. There is some tension between the two because of somewhat conflicting demands on time and creative energies. Yet this tension can be managed to the benefit of both craftsmanship and creativity. Finally, through the discipline of varied work within a limited field, the preparation needed for a

more basic form of creativity in weaving is provided, and one may find the need—and the capacity—to innovate, to create weaving techniques which answer directly to one's needs as a creative artist. Although the path which I have taken (as I said at the start) is not in its particulars a path for anyone else, nonetheless there seem to be these five general insights into the creative process which I have learned by taking it. If my particular stress on being a self-taught weaver seems to slight the taking of courses and workshops, I do not mean that as a general conclusion to be drawn. Yet I do think it is extremely important to spend a considerable amount of solitary time puzzling things out for yourself. For it is only then that you gain your very own knowledge of the craft and of your own creative abilities. It can be discouraging to proceed in this way, and it can be lonely. But it is ultimately well worth doing.

Part II

Double-warp overlay: a design tool.

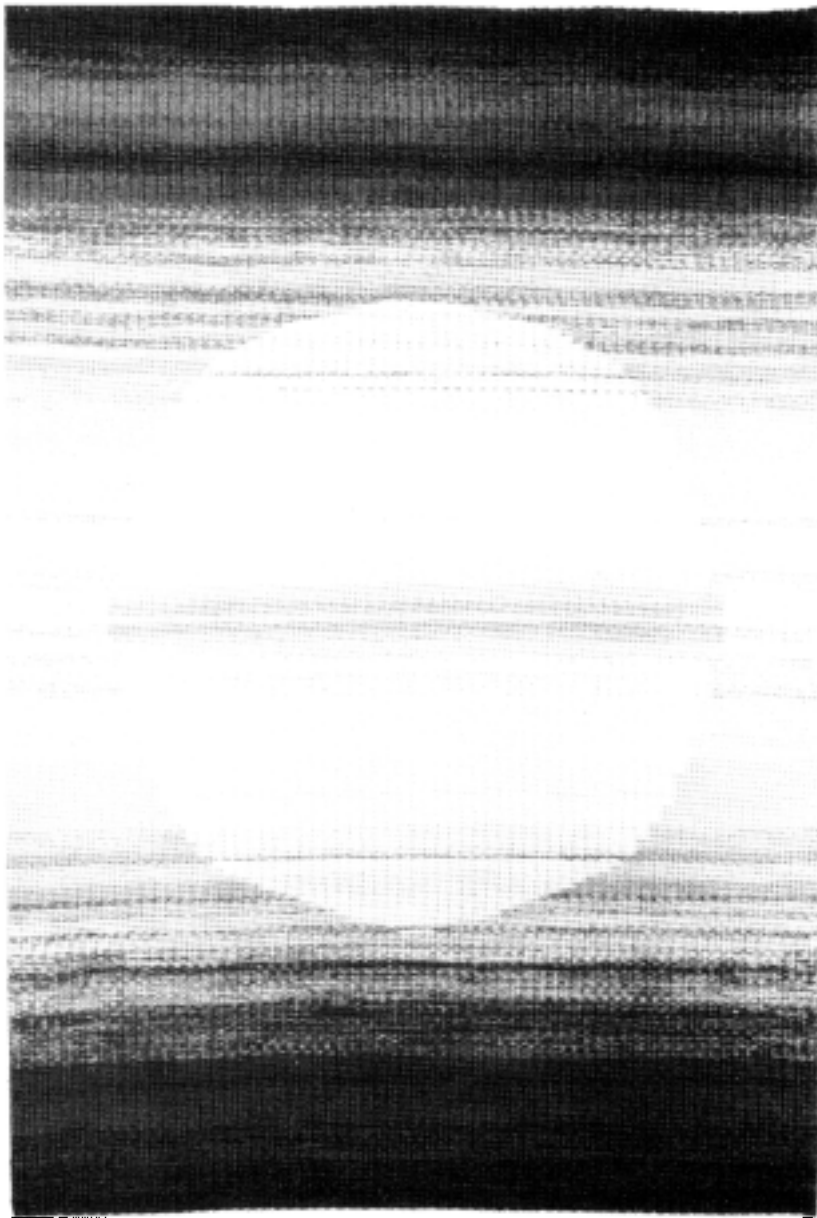
What follows is a discussion of the rug weaving technique which I have been developing and using this past year. I am very excited by the possibilities this technique opens up for more varied and less geometric rug designs. Although I have not explored this technique as fully as I would like, I want to share what I have learned thus far. I do want to say straight off that each time I use the technique I discover new things I can do with it. So keep in mind that this is an initial explanation and not the final word.

I have been weaving shaft-switched rugs for a number of years and at the same time weaving wall and window pieces plus large room dividers in the Theo Moorman overlay technique.¹ Some time ago I began wishing that I could get the freer designs which are possible

1. *Weaving as an Art form, a Personal Statement*, by Theo Moorman. Van Nostrand Reinhold Company, New York: 1975.

photo across: 1. "Poppies", 5' x 7', wool rug by Barbara Hand Jon Schulman photo





Jon Schultman

3. "Montana Sunset", 48" x 90", wool rug by Barbara Hand.

with Theo Moorman's technique into the shaft-switched rugs. Up to that point I had been weaving Chinese lattice designs similar to fret designs (see Photo 2), or fairly simple geometric shapes (see Photo 3). I tried to achieve variety and interest by using hand-dyed yarns which were graduated in tone or by using carefully selected combinations of those colors. There are limits to fret designs and careful color shadings when rug sales are brisk and one has to keep coming up with new ideas (I rarely do the same thing twice). I kept trying to figure out how I could add shape and additional color to the shaft-switching rugs or how I could make Theo Moorman more rug-like. What I

ultimately came up with is an adaptation of both Collingwood and Moorman.*

Since I liked the simplicity of the three-end block weave, I decided to expand that structure further. By adding a second warp of lighter weight linen, by adding two more shafts, and by changing the threading sequence of the block weave, I have come up with what I call "double-warp overlay". These changes and additions allow several things to happen.

First of all, the ground weave, which is the basic three-end block

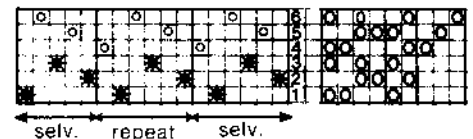
*For a complete discussion of both Theo Moorman and Collingwood's techniques, see earlier *Weaver's Journal* articles.

weave structure, acts as the background in the design, and is double-faced. So far I have used only one threading unit (block) for the ground weave (i.e. threaded 2,3,1, 2,3,1, across the whole rug). But that is only because the designs I have woven have not been developed around changes in blocks. Later I plan to add block changes and shaft-switching to this technique, which will add yet another dimension.

Secondly, because the weave is double-faced and I am using only the 2,3,1 threading for the ground weave, the back of the rug can be completely different from the front. (See Photo 4). The back can be different colors, or can be striped, etc.

Finally, almost any design can be developed on the front. Basically what happens is that the two warps move as one for the ground weave, and the second finer warp is used when and wherever the design is added. An almost tapestry-like design can be achieved while maintaining the double-faced rug structure. (See Photo 1).

Threading order and tie-up:



o Light weight linen
* ground warp

NOTES: I place the tabby treadles in the center simply to separate the treadles controlling the two warps. This is a personal preference. The plain weave is not used in the weaving. I use it to weave in the headings at the beginning and end.

Treadling:

Ground (both warps working as one). Both shuttles, the one that weaves the top surface and the one that weaves the bottom surface, start at the right:

R to L: lift 1346, weave bottom;
lift 14, weave top; beat.

L to R: lift 2356, weave bottom;
lift 25, weave top; beat.

This is a four shot sequence.

To overlay. Both shuttles and the overlay weft start at the right:

R to L: lift 1345, weave bottom;
lift 14, weave top; lift 4, inlay;
beat.

L to R: lift 2356, weave bottom; lift 25, weave top; lift 5, inlay; beat.

This is a six shot sequence.

I place the two ground wefts plus the overlay weft in their proper sheds and then beat all three at the same time. I find this method gives the best coverage, plus saves time and the weaver's energy. (See Photo 6).

The overlay weft is inserted into the overlay warp wherever it is called for in the design. I find butterflies the most useful. However, for wide overlay areas I sometimes use stick shuttles.

The overlay can be put in in a number of different ways depending on the effect desired. The weight of the overlay yarn will determine the density of the coverage. (See Photo 7).

In areas where complete coverage of the ground weave is desired in the design, the weft for the ground weave (front surface) can be reduced to a single thickness and the overlay weft can be increased to two or three strands or more, depending on the weight of yarns used. (See the wheatfields in Photo 5).

I generally use 3-4 strands of 2-ply wool (Crown Colony weight) for each shuttle weaving the ground weave. The number of strands used for the overlay is varied, depending on the effect, from very fine singles to 2- or 3-ply. A raised effect occurs when the overlay is a heavy yarn. This can be an advantage and can be utilized in planning the design. For example, a whole rug could be woven in high-low texture, using heavy yarns for the overlay.

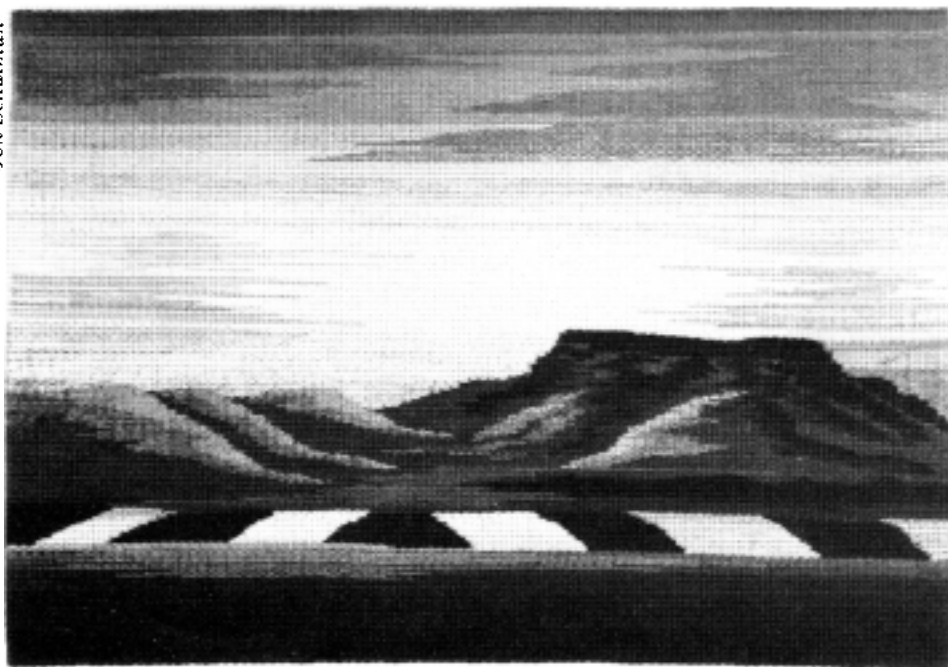
If an area needs to be heavily shaded, the overlay sequence can be woven twice between the ground sequence. That is:

1346, 14, 4,5, 4,5
2356, 25, 4,5, 4,5

Different shading effects occur depending on the thickness of the overlay weft used and the placement of that weft.

6. Beat all three at the same time.

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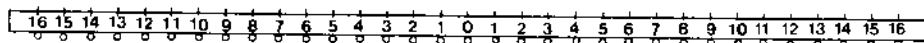


5. "Square Butte," 4.5' x 7', wall rug by Barbara Hand.

1. If the overlay weft is added before each ground sequence (i.e. 4, 1346, 14, 5, 2356, 25), the overlay appears on the underside of the ground weave shot.



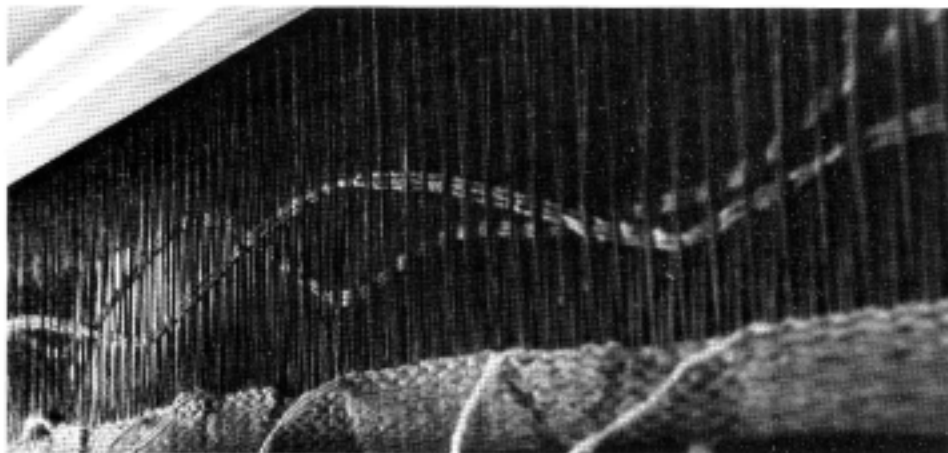
2. When the first sequence is used (i.e. 1346, 14, 4, 2356, 25, 5), the overlay weft will appear on top of the ground weft.



3. When more than one thin overlay weft or heavier weft is used, the overlay will completely obscure the ground weft.



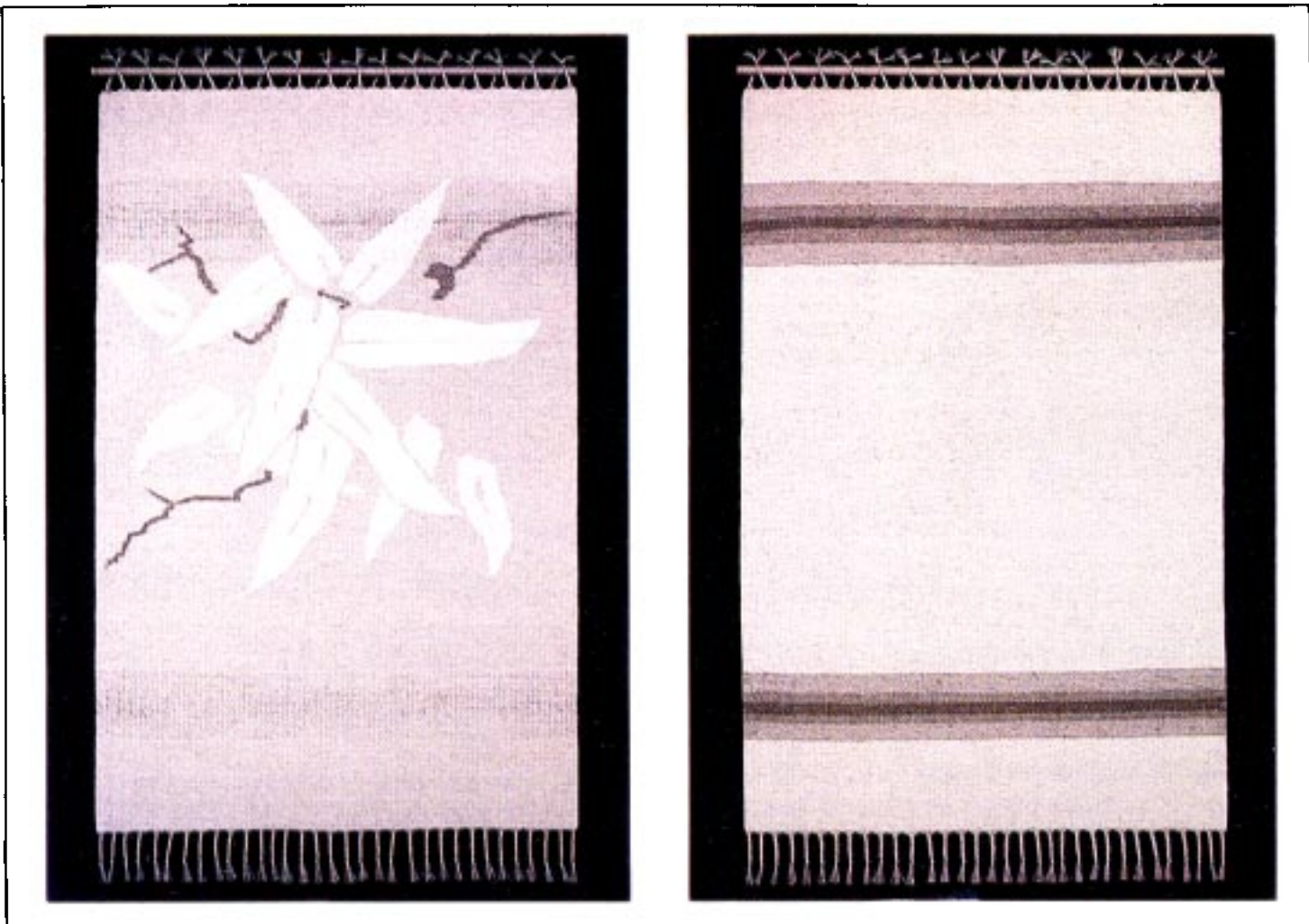
Jon Schulman



The warp ends on shaft 6 are not used as frequently as those on 4 and 5, but occasionally a closer interval is needed to make a smoother curve. The warp end on 6 can be used instead of that on 5 to make the transition. (See the stems of the poppies in Photo 1).

In order to weave my designs more accurately, I place the wooden strip that is used for my shaft switcher

(see Collingwood, p. 315), on shaft 3, to use as a guide. I graph out my design on 10 to the inch graph paper, and let each square represent one 3/4" (19 mm) threading unit. Each threading unit is num-



4a. "Naturally Bamboo", front, 60" x 96", wool, by Barbara Hand

4b. "Naturally Bamboo", back.

bered on the bottom of the graph paper to correspond to the numbers on the shaft-switcher strip. As the weaving progresses, it is then easy to tell exactly where the overlay wefts should be placed across the surface of the rug.

This weave is sett at 4 epi (15/10 cm) for both warps. I use 8/5 linen for the ground warp, 8/2 linen for the overlay warp. Selvedge warps (ground warp only) are doubled and tripled.

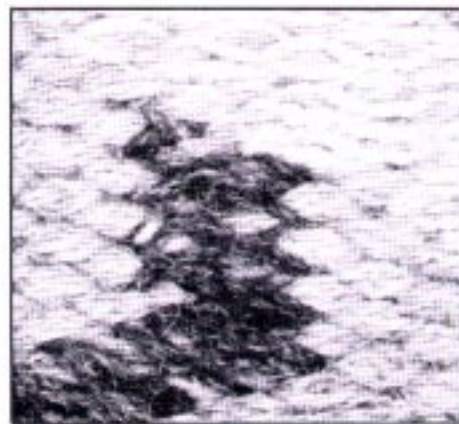


No floating selvedge is necessary if threading is started on shaft 2 and ended on shaft 1.

I always start both shuttles and the overlay weft from the right.

I weave on a 72" (1.82 m) 10-shaft Glimákra counter-march loom with double beams and a custom built beater which is made of laminated oak. The beater is weighted with a steel plate (1/2" X 2" X 70" or 6.4 mm X 51 mm X 178 cm).

Let me conclude this presentation of a new technique by returning to a theme in the first part of this two-part article. The technique I have



7. Detail

just described has proven to be extremely flexible and adaptable to the demands of the type of work I have been doing lately. That type of work has been changing, primarily because of the very adaptability of the technique. For whatever reason, commissions for new work have been mainly for pieces with representational themes, and those pieces have been intended for the wall rather than the floor. Since up until now I have been considering myself to be a weaver of floor rugs, I am not sure how I feel about this change. Nonetheless, I am looking forward to pursuing this new avenue as far as it will take me. As I said in Part I, such a spontaneous emergence of new ideas which need to be followed is an essential part of the creative process. Taking part in that may mean basic changes for me, but that is something which a career as a weaver involves. ■

THE RESULT OF WEAVING RUGS

by Anne Brooke

I began weaving rugs to get out of the production business boredom syndrome. I looked to the rug market as one that would be diverse, demanding and sufficiently varied to keep my interest, as well as allowing enough of a profit to live on. I had spent many years weaving placemats, scarves, bags and clothing. Rugs seemed like just the thing. After seven years in the rug business, I have changed much of my thinking about weaving. I see the person who is not trying to make a living from weaving as having the creative edge on most of us in the production world.

An aspect of any business that is challenging and constantly changing is establishing prices. The method that seems to work best for me is to add together five factors that should be more or less of equal value. These are studio overhead, materials, marketing, labor and profit. These combined costs should add up to make up the wholesale price, half of what the retail customer pays. This method should allow one to hire employees, as the labor and profit costs are separate. After I found dealers to purchase materials from, my major concern was to have an efficient 'work time' for each rug. Eventually, I was able to weave a 4' X 6'

(1.2 X 1.8 m) rug in two days, including time for finishing and warping.

The difficulty that I had was in developing new designs in a rapid enough manner to keep my market happy. Galleries, shops, or designers want a constant trickle of new work that is as good as, and hopefully better than, the last piece that they bought from you. The time I had set aside to design, try out the design, throw it away and try it again was greater than I could allow myself to be away from weaving. A large number of rugs never saw the light of a show. Yet, these rugs were as costly to make as the rugs that I was busily making once the initial designing was done. I found that my non-production rug workshop had turned into a race with myself to create new work while trying to keep up with the orders for old rug designs that I felt should be laid to rest.

When I approached manufacturers with the hope of finding a consistent wholesale market, I was told that the type of people who would buy my work were scattered over too great an area to be able to reach them. This had never been a problem with placemats; rather, the difficulty was making enough of the things. My dilemma was wanting a weaving job that was challenging as well as paying moderately well.

Rugs had turned into a production business; my time was always at a premium, and I didn't feel in the least bit contented with my work.

My current attitude about weaving is that the non-professional weaver has more advantages than the professional does. Without the burden of cost effectiveness and constant originality, the 'hobby' weaver can have the freedom to design for the sake of enjoyment. There are few production weavers who are both making a living from their work and enjoying it. If artistic merit is the major concern for one's work, then it seems obvious to me that you shouldn't be competing with an industrial revolution that happened 150 years ago, but rather spending your time earning an income in a different field and using fiber as a creative medium. ■

ABOUT THE AUTHOR: Anne Brooke is a professional weaver in California. For nine years she operated Anne Brooke Textiles, producing handwoven rugs and fabrics. Anne is a graduate of Marlboro College, Marlboro, VT and Keene State College, Keene, NH. She also studied weaving in Finland.

Anne was a workshop leader and lecturer on rugs at Convergence '82. She has taught at the Cape Breton School of Crafts in Nova Scotia. In August '83 she will conduct a rug workshop at Brookfield Craft Center in Brookfield, CT.



Shaft switched rug by Anne Brooke.

fashion trends

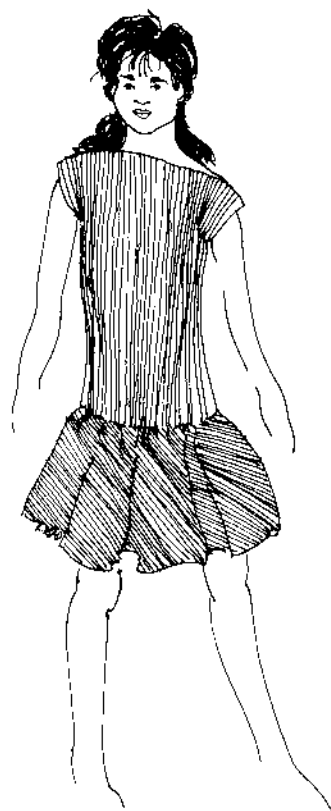
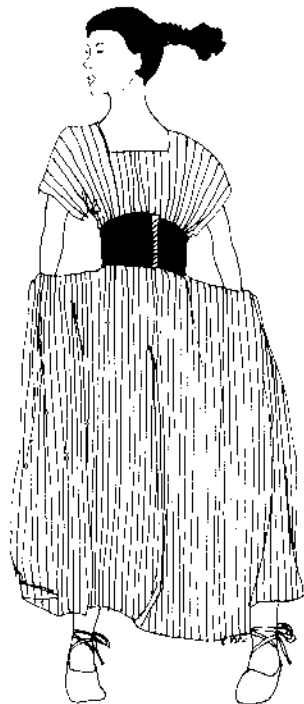
by Susan Hick

When one is housebound by more than two feet of snow, images of grass greening and trees budding seem an impossible dream. Spring always manages to arrive, though, so now is the time to think about the flowers.

The black-and-white combination is not usually associated with Spring and Summer, but it's certainly been decreed by the gurus of fashion as what we'll clamour to wear. Splashes of added color can be chrome yellow, red, bright green, electric blue, or fuchsia. While the positive-negative appears to dominate the scene, it is still possible to work with a wider palette.

The cool, frosted pastels to use are pistachio, mauve, lilac, pink, gold, periwinkle and icy blue, soft rose, and shrimp. Earthier, sun-warmed tones of clay, putty, ochre, bronze, and rust are shown. The hot colors of Summer are turquoise, geranium, jade, and raspberry. And considered neutral are khaki, granite, charcoal, taupe, sand, and cream.

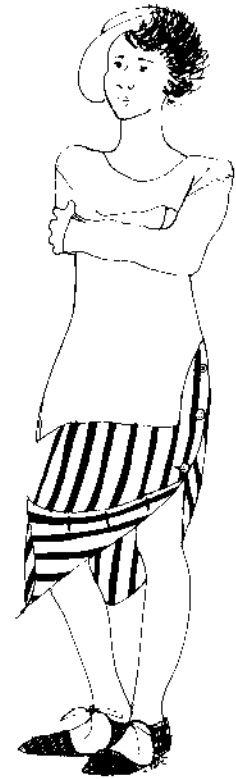
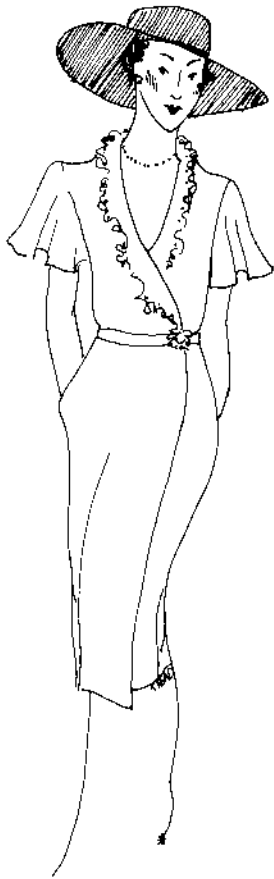
Comes the fun of seeing the colors put together. Stripes will manage to grab the biggest share of service. A black background sets off primary colors brilliantly. A pure matte white ground can take slim, shiny stripes (blue and moss; the primaries, too). Try a taupe ground with skinny stripes of red, coral-orange, rose, and pale pink. Other stripings to test are teal-rust-beige, turquoise-cream, cream-tangerine, muted mauve-deep mango-rust, and yellow-white-mauve-pink.



Then the stripes grow into checks and plaids to become mixable coordinates. Great geometric blocks of color can be produced and turned into harlequin's diamonds. Gingham, tattersalls, windowpanes, and madras are plaids to play with. The madras may use the traditional blues and burgundies or be made fresh in pastels. Try an end-and-end construction in which a colored warp end alternates with a white end; the weft may be the solid color or the white for a pin stripe, or the weft may be alternate picks for a pin dot. Space-dyed yarns give interesting effects to stripes and plaids. Using different proportions of color in the stripes and plaids makes nifty companion fabrics. Don't forget the weaver's technique of utilizing weft colors other than those in the warp to create truly unique cloths. Consider, too, weaving your plains and fancies in different weights for a put-together collection that knows no bounds.

The crispness of linen continues to appeal to designers and wearers. Most are shown as plainweaves, but a light, airy lace plaid would look and feel terrific on a hot day. The linen can always be blended or combined with cotton, rayon, and silk.

Pique, classically cotton and pristine white, comes up in silk, cotton, and even wool, in lots of colors, to produce a wide variety of surface textures. Contrasting cording is a possibility here.



All those wool menswear fabrics touted last Winter are reinterpreted elegantly in fine silks. Silk shantung, shunned for quite a while in favor of the more fluid and floaty silks, is hailed now because its full-bodied nature lends itself to easy informal tailoring and structural shaping.

Old tablecloth patterns have been rediscovered as inspirations for damask and jacquard fabrics in pale shades of linen and silk.

The nubs and slubs among yarns have largely been ignored this season by the industry, but surely the handweaver needn't. Rather than using them for all-over textured fabrics, they'd be striking alternatives in stripe and plaid modes.

Now that you've woven these fabulous fabrications, you have to decide how to shape them. The most exaggerated forms in Spring have been the widely cinched waist and the strapless prom dress. These extremes can be tempered by just considering that they point to an increased body consciousness and an over-all softening. One way to move in this direction is to remember that the waist exists, so a little nipping in will get your idea across. A bolero- or waist-length jacket or a tied surplice blouse sends the same message. One designer translates the returned peplum as swingy fringe below the belted waist of his jackets. A larger, easily tailored blazer can be worn open over a tank top, a tube, a fitted halter, or a camisole.

If not fit at the waist, then how about the hips? Skirts are leaner; slits ease the walking. Many wrap, with sarong-style hems and closures at side front or side back. (Lengths move up and down the leg, most settling just below mid-knee.) A simple sundress has a chemise bodice to the hips and a flounced skirt. A kite-shaped dress fits at the hips and continues tapering from there.

Tidbits to consider: Sleeveless blouses are really vests with wide shoulders and a skimpy top underneath. Cover-ups and toppers are shaped like dusters and men's bathrobes. The divided skirt is not an item on Seventh Avenue but is sure to be popular throughout the rest of the country. T-shirts are frequently cut from wovens instead of knits. Big buttons march in a row on front, side, or back of skirts and dresses and even trim sleeves. Embroideries, appliques, and lacy inserts add riches to plain cottons and linens, as do large, imaginatively-shaped collars of white or solid colors. Keep in mind such extra touches as horizontal tucks and wrap-around pockets.

If you prefer to weave now for Fall, try the fabric ideas suggested here using your woolens and worsteds plus the luxurious—cashmere, alpaca, and silk. To counteract the economic outlook aim for richness in your color choices, whether they be neutrals, brights, darks, or jewels. No need to wear sadness when we weave our own! Meanwhile, check out the flowers. ■

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A QUICK THICK RUG

For a handsome heavy rug, try either the 4-shaft or the 6-shaft version of this two-tie unit weave, better known as Summer and Winter. It is an easy weave which gives beautiful selvages without requiring floating selvedge threads. The only snag is that it requires a heavy beat. If this rug is woven on a light loom you will need a comb, either a coarse tooth dog comb or a tapestry comb. Beat the weft in as hard as you can with the loom beater and, after every four picks, beat once more with a comb across the entire width of the rug.

Warp: 8/6 linen (from Grandor).

Length of the warp: 7 ft (2.13 m)

Warp requirements: 2 500 g spools.

Weft: Very thick wool singles in natural brown and white (Berber Roving).

Weft requirements: 2½ lbs (1134 g) AAE wool, 3½ lbs (1588 g) AAE wool from Grandor (see Product Review).

Sett: 6 epi (25/10 cm) sleyed single, double, etc., in a 4 dent reed. See Fig. 1.

Selvage: See Fig. 1.

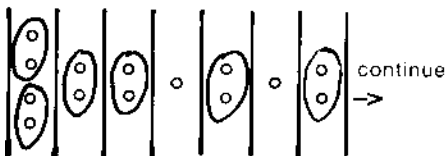


FIGURE 1. Left selvage sleying

Working ends: Note in Fig. 1 that the two warp threads in a circle are "one working end" which means that they go through the same eye of the heddle and are treated in the threading as *one* end.



Width in the reed: 33" (80 cm).

Threading:

4-shaft - see Figs. 2 and 3.

There are 33 units in the profile draft. Each unit has 4 working ends for a total of 132 working ends. Add an end on S1 at the end to balance the threading for a total of

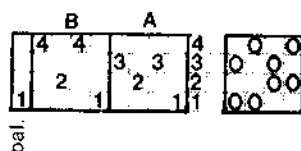


FIGURE 2.

133 working ends. The total number of threads to be cut is 206.

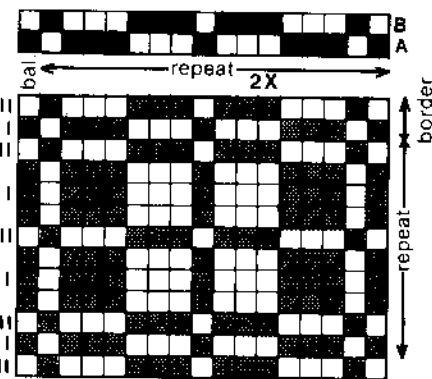
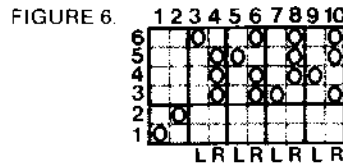
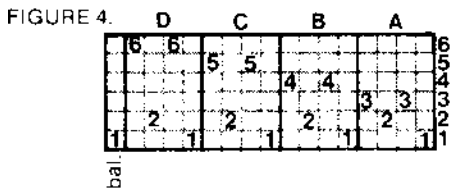


FIGURE 3.



6-shaft - See Figs 4 and 5.

The number of ends is the same as for the 4-shaft pattern.

Weaving: Weave 2 picks of tabby with either color by lifting 1+2, then 3+4 (+5+6). For the pattern, start both shuttles (dark and light) from opposite sides and weave a pick of dark, a pick of light, repeat. The color that weaves the selvedge block is always kept on top and turns at the selvedge *without* interlocking with the second color which weaves the back.

Treading

4-shaft - See Fig. 2

I: tr 1 weave L, tr 2 weave D, tr 3 weave L, tr 4 weave D; repeat.
 II: tr 2 weave L, tr 1 weave D, tr 4 weave L, tr 3 weave D; repeat.
 Repeat the 4 picks of I (or II) according to the number of squares in the pattern of Fig. 3.

6-shaft - See Fig. 6.

I: tr 1 + tr 3, weave L; tr 1 + tr 4, weave D; tr 2 + tr 3, weave L; tr 2 + tr 4, weave D; repeat.
 II: tr 1 + tr 5, weave L; tr 1 + tr 6, weave D; tr 2 + tr 5, weave L; tr 2 + tr 6, weave D; repeat.
 III: tr 1 + tr 7, weave L, tr 1 + tr 8, weave D; tr 2 + tr 7, weave L; tr 2 + tr 8, weave D; repeat.
 IV: tr 1 + tr 9, weave L, tr 1 + tr 10, weave D; tr 2 + tr 9, weave L; tr 2 + tr 10, weave D; repeat.
 Repeat the 4 picks for each square of the pattern shown in Fig. 5.

Finished size: 30" X 36½" (76 X 93 cm).

Use the Philippine edge as warp protector (see Fig. 7) and braid each group of 6 warp threads into a 3-strand braid. End with an overhand knot.

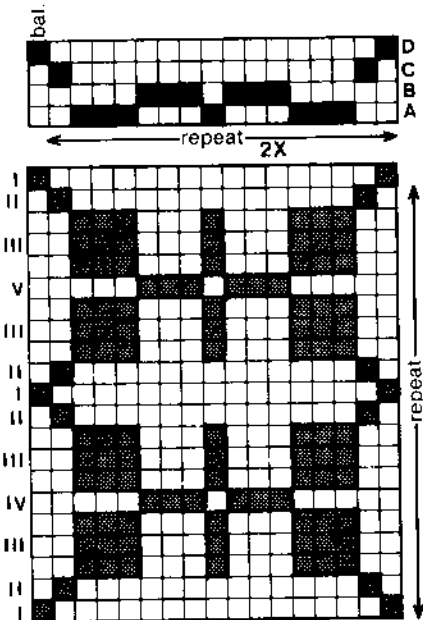


FIGURE 5.

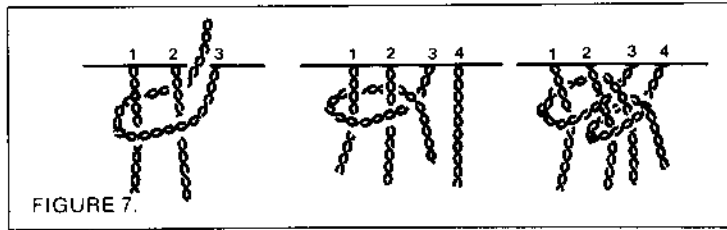


FIGURE 7.

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ARIZONA

Mesa. Apr. 8-23, 1983 Exhibition "Sculpture and Fibre" held in the Gallery, 155 N. Center, Mesa, AZ. Artists: Michael Anderson, Donna Braverman, Carol Shinn.

Prescott. May 21-June 5, 1983. Mountain Spinners & Weavers Guild 4th Annual show "Shuttles & Spindles," at Shariot Hall Museum. For information write: Betty Favour, 1415 Linden Rd., Prescott, AZ 86301

CALIFORNIA

Fullerton. Aug. 14-Sep. 5, 1983 Weavers tour to Ireland and the United Kingdom. Offered by the Fullerton Travel Center with Barbara Baggeroer as director and educational guide. Tour is eligible for college credit. For information: Barbara Baggeroer, 2930 Sequoia Ave., Fullerton, CA 92635.

Mendocino. May 4-15, 1983. Handwoven Art from the Juried Art Show at "Secrets of the Loom" 1983 Conference of Northern California Handweavers. Artisans Guild Store, 45050 Main St., P.O. Box 1515, Mendocino, CA 95460.

Santa Cruz. Mar. 16-Apr. 16, 1983. "Tribute to Weaving": Historical beginnings to modern adaptations. Sponsored by the Santa Cruz Handweavers' Guild. Displays, Demonstrations Held at Santa Cruz City Museum, 1305 E. Cliff Dr., Santa Cruz, CA 95062.

Ukiah. Apr. 30-May 1, 1983. 30th Annual Conference of the Northern California Handweavers. Theme "Secrets of the Loom." Held at Redwood Empire Fairgrounds and Mendocino College. Exhibits, Lectures, Demonstrations. Speaker: Barbro Bengtsson of Sweden. For more information send SASE to: CNCH 83, 2081 Road E, Redwood Valley, CA 95470

COLORADO

Durango. July 14-19, 1983. Intermountain Weaver's Conference on the campus of Ft. Lewis College. Workshops, Seminars, Demonstrations, Commercial Exhibits. For information send SASE to: Lois Self, 8550 E. Cuin Pl., Tucson, AZ 85710

Ft. Collins. May 7-June 2, 1983. 2nd showing Exhibit "Private Spaces, Private Lives". Juried fiber art show sponsored by Northern Colorado Weavers Guild. Juried by Mary Snyder. Exhibited at Lincoln Memorial Center, 417 W. Magnolia, Ft. Collins, CO.

CONNECTICUT

Guilford. May 28-June 18, 1983. Women's Perspective Exhibit. The Mill Gallery, Guilford Handcrafts Inc., Route 77, Guilford, CT. Juried by slides or photos. Application deadline May 1, 1983. Write: Women's Perspective, Guilford Handcrafts, Box 221, Route 77, Guilford, CT 06437.

Guilford. July 14-16, 1983. 26th Annual Guilford Handcrafts Exposition sponsored by Guilford Handcrafts Inc. Application deadline Jan. 31, 1983. Write: Guilford Handcrafts EXPO 83, Box 221, Guilford, CT 06437

FLORIDA

Gainesville. Apr. 22-24, 1983. Florida Tropical Weavers' Guild annual convention. Held at Gainesville Hilton. Commercial exhibits, Displays. For more information write: Pat Gantz, 2747 Oakdale Dr. W., Orange Park, FL 32073

HAWAII

Kaneohe. June, 1983. 2nd Pacific Friendship Fiber Arts Conference. For information SASE to: Elizabeth A. Akana, 466-334 Ikiiki St., Kaneohe, HI 96744.

ILLINOIS

Chicago. Nov. 6, 1982-Jan. 2, 1983. Magdalena Abakanowicz retrospective to premiere in Chicago. This retrospective surveys her work of the last 20 years. From her monumental, three-dimensional woven sculptures of the mid-1960's to early 1970's — the *Abakans* — at The Cultural Center, to her cycles of sculptures based on the human figure dating from the 1970's to the present and collectively called the *Alterations* — at the Museum of Contemporary Art. A recent group of large drawings will complement the sculptures. The installations at each location will be conceived of as total environmental works of art by the artist who will travel from Poland to execute them personally.

Subsequent to its premiere at the Museum of Contemporary Art and The Cultural Center, "Magdalena Abakanowicz" will tour to:

Musee d'Art Contemporain, Montreal - Feb. 10-Mar. 27, 1983
Portland Art Museum and Portland Center for the Visual Arts, Oregon - Feb. 28-Apr. 22, 1984

Dallas Museum of Fine Arts, Texas - Jun. 21-Aug. 19, 1984
Frederick S. Wright Art Gallery, the University of California, Los Angeles - Sep. 23-Nov. 11, 1984.

Following its North American tour, the exhibition will be presented at distinguished museums in Japan.

COMING EVENTS

Deadline for Summer 1983 issue is May 1.

INDIANA

Hanover. June 24-26, 1983. 1983 Fleece and Flax Guild Workshop and Spinning Bee. Held at Hanover College. Spinning and Weaving classes. For more information write: Bonny Wise, 673 High St., Charlestown, IN 47111

IOWA

Ames. Jul. 6-9, 1983. Heirloom to Heirloom Quilters Conference '83. Held at Brunner Gallery and Museum, Scheman Building, Iowa State Center Ames IA 50010. Keynote speaker: Maria McCormick-Snyder

KANSAS

Manhattan. Apr. 22-23, 1983. Kansas Alliance of Weavers and Spinners holding state conference. Sponsored by Weaver's Fancy. For information write: Kay Denton, Rt. 1, Box 53, Riley, KS 66531

MASSACHUSETTS

Amherst. July 13-17, 1983. Before NEWS workshops. Study with Mary Elva Erf, Antonia Kormos, Patricia Lyster, Donna Muller, Marge Rohrer, Mary Snyder. For information write: Mrs. Mary Yusko, 17 Stanley Road, Norwell, MA 02061

Amherst. July 17-22, 1983. Weavers Seminar. University of Massachusetts Amherst, MA 01002. Keynote speaker: Max Lenderman. Special interest groups. Lectures. Swap sessions. Room shows. For information write: Mrs. Mary Yusko, 17 Stanley Road, Norwell, MA 02061

MICHIGAN

Midland. Jun. 17-19, 1983. Michigan League of Handweavers "Divergence" held at Northwood Institute, Midland, MI. Workshops following. Speakers and Leaders: Noel Bennett, Diane Iltter, Dini Moes, Junco Pollack. For further information write: Patli Aiken, 1165 Crooked Lake Dr., Fenton, MI 48430.

MISSOURI

St. Louis. June 3-5, 1983. Missouri Fiber Artists will hold sixth Annual Conference. Held at Washington University. Lectures, workshops, exhibits, fashion show, tours. Keynote speaker: Renie Adams. For more information send mailing label and stamp to: Carlene Fullerton, 1017 Cla-ter-ri Dr., Ballwin, MO 63011.

MONTANA

Billings. May 1-June 3, 1983. Montana Miniature Art Society 5th Annual Competition. Work due April 1. For information write: Mary Blain, 907 64th Street West, Billings, MT 59106

Bozeman. July 4-8, 1983. Eleventh Biennial Conference of the Association of Northwest Weaver's Guilds entitled Fiber Flair sponsored by The Bozeman Weaver's Guild. Held on Montana State University campus. Workshops, Seminars, Commercial Exhibits, Sample Exchange. For information SASE to: Ellen Alvord, 221 Ridge Trail Rd., Bozeman, MT 59715

NEW JERSEY

Laurencville. July 29-31, 1983. The Mid Atlantic Fibre Association is soliciting resumes and class outlines from teachers interested in mini-sessions of the 2nd Mid Atlantic Fibre Conference. For information write: Kava Schafer, Weisel Youth Hostel, R.D. 3, Quakertown, PA 18951.

NEW YORK

New York City. Apr. 29-May 1, 1983. Carol Westfall will present a lecture and 2-day workshop on "Web of India." This is under the auspices of the New York Guild of Handweavers and will be held at 215 W. 23rd St., New York City. For more information, Jackie Davidson, 32 Bank St., NY, NY 10014.

New York City. Apr. 6-30, 1983. Fiber Arts '83, sixth annual juried exhibition of the New York Guild of Handweavers. Held in the Art Gallery of the Abraham Goodman House, 129 W. 67th Street, NY, NY.

New York. 1983 Series of 2 and 3 week summer workshops at Lake Placid. For students of varying proficiency and practicing professionals. For more information write: Office of Special Programs, Parsons School of Design, 66 Fifth Ave., New York, NY 10011

OHIO

Berea. Jun. 17-20, 1983. Midwest Weavers Conference. Theme: "Midwest Fiber Horizons." Held at Baldwin Wallace College, Berea, OH. For information write: Judith Parish, 7335 Norwalk Rd., Medina, OH 44256.

PENNSYLVANIA

Monroeville. Sep. 30-Oct. 2, 1983. Eastern Great Lakes Fiber Conference. Held at West Wing of Expo Mart. Fashion show Exhibits. Commercial Exhibits. For information write: Peggy Cost-Peltz, 101 E. Pittsburgh St., Delmont, PA 15626.

SOUTH DAKOTA

Madison. June 16-17, 1983. Xenakis Academy. Workshops with David Xenakis, Peter Collingwood, Adele Cahlander, Cathy Ingebretsen. Send SASE: Connie Herring, % Golden Fleece, 126 S. Phillips, Sioux Falls, SD 57102.

TENNESSEE

Gallatinburg. Apr. 8-May 30, 1983. "Impressions/Patterns" an invitational exhibition sponsored by Arrowmont School. Two and three dimensional media including fiber by Susan Harlan, Paige Harvey, Anne McKenzie Nickolsen, Arturo Alonzo Sandoval, and Drck Sauer. For more information contact: Clara Versteegen, Arrowmont School of Arts and Crafts, Box 567, Gallatinburg, TN 37738

Gallatinburg. Sep. 26-Oct. 1, 1983. "Surface Design '83/The Artist in Focus." Major presentations and workshops by Lenore Davis, Ana Lisa Hedstrom, Ina Kozel, Edward Lambert, Pamela Scheinman & Shigeko Spear. Demonstrations, Exhibits. For more information write: Arrowmont School of Arts & Crafts, P.O. Box 567, Gallatinburg, TN 37738.

Gallatinburg. Nov. 5, 1983-Jan. 7, 1984. National juried exhibition sponsored by Arrowmont School. 2 and 3 dimensional media. Slide entries due Sept. 10. Juror: F. Clark Stewart, Professor of Art, University of Tennessee. Write: Arrowmont School, Box 567, Gallatinburg, TN 37738

Smithville. Workshops Jun. 27-Jul. 1, 1983—Hand Spinning by Persis Grayson; Jul. 18-22, 1983—Betty Beard, Fashions from the Loom, Aug. 1-5, 1983—Janna Kuttruff, Fibers. For further information write: Appalachian Center for Crafts, Box 347 A-1, Route 3, Smithville, TN 37166.

WASHINGTON, D.C.

Smithsonian Institute, May 1983. National Craft Forum. Crafts Today, sponsored by the Smithsonian. First national forum on connoisseurship and collecting held at the Smithsonian in conjunction with the Washington Craft Show. For further information, write Smithsonian Associates Travel Program, Room 1278, Arts & Industries Bldg., Smithsonian Institution or call (202) 357-2477.

Washington Craft Show, May 5-8, 1983. Departmental Auditorium, 1300 Constitution Ave. NW, Washington, D.C. Open to all craftspeople in the United States. For further information and application forms, write to the Women's Committee of the Smithsonian Associates, Room 3101, Arts & Industries Bldg., Smithsonian Institution, Washington, D.C. 20560, or phone (202) 357-4000.

WISCONSIN

Mineral Point. July 7-9, 1983. First Annual Conference on the Creation of Complex Weave Structures. The conference will accept papers related to little known historic or ethnic woven structures or those involving innovative concepts and techniques including those pertaining to the utilization or modification of equipment. Submissions should be in one of three areas: (a) Ethnic woven structures, (b) Historical research, (c) Innovative manipulation of weave structures. Contributed papers will be allocated 20 min. Send a draft of your paper before the conference. Abstracts of papers should be sent by 10 May 1983 to: Joyce Marquess Carey, School of Family Resources and Consumer Sciences, University of Wisconsin, Madison, WI 53706. For information on accommodation contact: Ken Colwell, The Looms, Shake Rag Street, Mineral Point, WI 53565

Sheboygan. July 16-17, 1983. Thirteenth Annual Outdoor Arts Festival. Held at grounds and areas adjacent to the John Michael Kohler Arts Center, 608 New York Ave., Sheboygan, WI. Juried. Entry deadline: May 1, 1983. 5 slides required. Exhibitions, Workshops. For more information write: John Michael Kohler Arts Center, 608 New York Ave., Sheboygan, WI 53081.

CANADA

Ste-Foy, Quebec. May 13-14, 1983. "Congres Provincial de Tisserands" Conference speakers: Clotilde Barrett, editor/publisher of The Weaver's Journal, and Jean Dufour, master dyer of the Gobelin Workshops in Paris. For information write: Jacqueline Halle-Fourmier, 716 du Chateau, Ste-Foy, Quebec, Canada G1X 3N7.

JAPAN, ITALY AND FRANCE

Japanese Inne, Rome, Paris. June, July, 1983. Parsons in Japan, Italy and France offers college credits under summer skies and purposeful vacations in the visual arts. Information, brochures and applications may be obtained by writing to the Office of Special Programs, Parsons School of Design, 66 Fifth Ave., NY, NY 10011.

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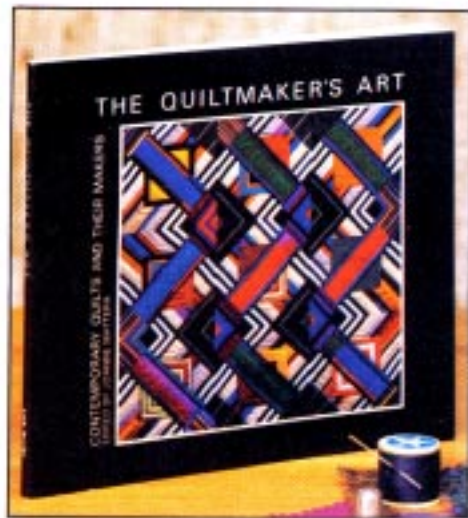
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BOOK REVIEWS

MASTER DYERS TO THE WORLD—Techniques and Trade in Early Indian Dyed Cotton Textiles by Mattiebelle Gittinger. 1982. The Textile Museum, 2320 S Street N.W., Washington, D.C. 20008. 9" X 12" format, 207 pp., paperback. \$20.00 plus \$2.75 P/H. ISBN 0 87405 020 0

This book documents an international loan exhibition, bearing the same title, on view at the Textile Museum (Oct. 8-Jan. 2, 1983); The Field Museum of Natural History, Chicago (Jan. 29-April 20, 1983); and The Asia Society Gallery, New York (May 5-July 31, 1983). It is lavishly illustrated and depicts the achievements of Indian dyers of the 17th and 18th century.

There is a well researched chapter on mordants and dyeplants. They produced the brilliant washfast colors which caused Indian textiles to be a major world trade item. The process of applying surface decoration on cotton cloth is also explained.

The major part of the book deals with changes in designs, materials and techniques and how these interrelate with the patterns of trade, politics, religion and customs. The earliest examples of Indian textiles have been excavated from sites in Egypt which were important trading centers. They date back to before 1500 B.C. The designs created by Indian masters are complex and varied. The author has organized the material according to the patterns of trade, the most important influences on Indian textiles. This helps the reader to better understand the changes that took place and the various ways that techniques and subject matter have been influenced.

This book is very scholarly and goes sometimes into minute details in order to assure the publication of exact records. Yet, the reading is captivating and increases one's appreciation for the beautiful textiles which Indian craftsmen have produced.

Clotilde Barrett

THE ESSENTIAL HANDBOOK OF WEAVING by Rosemary Murray. First U.S. edition, 1982, by St. Martin's Press, 175 5th Ave. New York, NY 10010. 7½" X 9½" format. 160 pp., paperback \$9.95 (cloth cover: \$16.95) ISBN 0 312 26445 3.

This book is written for beginning weavers. However, intermediate weavers will probably pick up a few new tricks and ways to improve their warping techniques.

The reader is first introduced to fibers and their essential characteristics. By working on very simple homemade devices he/she will acquire a feeling for interlacing the yarns and producing cloth. The weaver is then introduced to tapestry looms and techniques and all of a sudden she is exposed to the work of four of Europe's top tapestry weavers. This last section is certainly inconsistent with the rest of the book.

Most of the text pertains to weaving on a harness loom. The reader is introduced to various types of looms and equipment. The preparatory steps for warping and setting up the loom are clearly explained and well illustrated and makes this book very valuable for someone who is learning to weave without an instructor. Techniques for both the rigid heddle loom and the shaft loom are included.

There is an introduction to weaving drafts and the reader learns to weave several popular weave structures. However, there is no fabric analysis nor design theory.

Compared to *New Key to Weaving* by Mary Black which is perhaps the most popular "learn to weave" book in the U.S. *The Essential Handbook of Weaving* is friendlier and leads the beginner into the field with more patience. However, as far as the organization of weave structures is concerned it falls way behind Mary Black's book in depth and in scope.

A few 8-shaft drafts are included, perhaps to satisfy the reader's basic curiosity about what multi-shafts can do.

There is a chapter on correcting errors and one on finishing cloth.

This book is recommended for beginners who need a lot of guidance to get started and those who need extra help in setting up their loom. The content of the book is equivalent to a beginner's weaving course.

Clotilde Barrett

PRODUCING HAND-WOVEN CLOTHING ON A SMALL SCALE by Carol K. Lann. 1979. Published by Mountain Association for Community Economic Development, 210 Center St., Berea, KY 40403. 32 collated mimeographed sheets \$3.25 ppd.

These papers are the result of research on a very important question. "Can a business on the scale of 2-5 weavers producing hand-woven clothing for sale primarily to a wholesale market be a financially successful, ongoing operation?"

I was eager to read the data and the conclusions and I am sure others will too.

I was somewhat frustrated and discouraged with the report because of the low pay scale and other unrealistic data on which the calculations are based. Full-time weavers' salaries are estimated at \$4.00 per hour. If this report was valid in 1979, it certainly has lost a lot of its meaning by 1983.

This booklet reflects hours of work and dedication to the subject and is certainly worth looking at by all those who have raised the basic question.

Clotilde Barrett

THE TREASURE CHEST OF SWEDISH WEAVING by Ingerlise Skjoldebrand. Forlags AB Semic. Distributed in the U.S. by Glimakra Looms 'n Yarns, P.O. Box 16157, Rocky River, OH 44116. 11½" X 9" format, 95 pp., hardcover. \$17.95 + \$2.00 P/H. ISBN 91 552 0981 5.

This is a project book, in English, describing typical Scandinavian textiles. The projects are all for the home, including some throws and shawls which can also be worn.

What makes them typically Swedish is the use of natural fibers (wool, cotton, linen), the skillful use of color which ranges from the most subtle monochromes to the juxtaposition of the most vivid colors, and the selection of weave structures.

The reader of this book will first of all be taken in with the beauty of the projects that can be produced on a hand loom. If he/she has an 8 shaft loom with opphamta attachment, all the projects can be woven. However, there are plenty of 4 shaft patterns; few require 8. The technique of doing opphamta patterning (a type of weft brocade) on a regular loom with the help of a heddle bar and shed stick is used for some of the projects.

The book has a large variety of projects, all illustrated with beautiful color photographs that are truly inspiring. The information is very precise as to warp and weft requirements, size, sett, color orders, etc. The weaver should be able to duplicate exactly what she/he sees in the picture or make variations if desired. The descriptions of the weave structures will puzzle the U.S. beginning weaver. The threading draft is read from left to right and the tie-up from right to left. This and the treadling order are not made very clear. Occasionally the drafts are turned around so that they fit better on the page. This adds to the confusion. However, once the system is understood it is no longer a stumbling block and the reader will be able to enjoy this book fully.

This volume will serve to encourage those who have woven drawers full of samples and never were brave enough to tackle an heirloom project for the home. All the projects described in this book will be cherished for years to come.

Clotilde Barrett

MORE LINEN HEIRLOOMS by Constance D. Galligher, 1982. Monograph Four, Published by The Weavers Guild of Boston. 8½" X 11" format 47 pp., \$5.00. Write to G. C. Goodband, 361 Norwood St., Sharon, MA 02067.

This booklet is the result of a successful cooperation of collectors, a writer and a guild. Twenty-two 19th Century household linens have been analyzed and recorded by the author. These include 4, 8 and 10 shaft twills, 4 and 5 shaft Bronsons, 4 shaft overshots and 4 and 5 shaft M's and O's. Each linen piece has

historical documentation, detailed description and draft. This publication is a valuable record of early American weaving but is rather limited in scope because it is merely a follow-up on a book "Linen Heirlooms" by the same author and published in 1968 by the Charles T. Branford Co.

The Boston Guild is doing a great job of bringing to the public little treasures that otherwise never might be published.

Clotilde Barrett

BOUNDWEAVE by Clotilde Barrett, 1981. Published by The Weaver's Journal Publications, P.O. Box 2049, Boulder, CO 80306. 8½" X 11" format, 92 pp. paperback \$9.95 plus \$1.50 P/H. ISBN: 0-937452-1

For those of you who are interested in boundweave, there is a very good book on this subject on the market by Clotilde Barrett. It explores the design potentials of twills, twill derivatives, and some basic two-tie block weaves. The technique of boundweave produces weft-face fabrics with pattern floats over two or more threads and is suitable for rugs, tapestries, and a variety of other fabrics. Most of the designs discussed can be woven on a 4-shaft loom. The patterns are controlled by the draft and by the color selections of the weft. The principle of shaft switching is included, since shaft switching greatly increases the design potentials for 4-shaft boundweave. Included in the book are explo-

rations of the design possibilities of 3-, 6-, and 8-shaft drafts, tapestry and dye techniques, and colored photos that display boundweave projects by contemporary weavers.

*Clementine Pauli,
Heritage Weavers of Calgary*

GERHARDT KNODEL MAKES PLACES TO BE © 1982. Cranbrook Academy of Art, 500 Lone Pine Rd., P.O. Box 801, Bloomfield Hills, MI 48013. 61 pp 10" X 9" format.

This book was published in connection with an exhibition, bearing the same name, at the Cranbrook Academy of Art Museum, Nov. 16-Jan. 16, 1983.

The book is about Gerhardt Knodel, his experiences, his outlook and his work during the period between June 1980 and November 1982; the two years when the artist took a sabbatical from his position as Head of Fiber at Cranbrook Academy of Art.

The diversity of Gerhardt Knodel's experiences is expressed by several means. Running throughout the book there are photographs which he took during his travels and which recall important sensations he has felt. There are lithographs and collages by the artists and stunning photographic renderings of his large environmental fiber structures. These are presented from many angles in a successful effort to convey the space and light which becomes part of the works.

The text is partially written by Gerhardt Knodel. Together with the illustrations it relates the richness of his experiences and his personal attitudes toward space and architecture. There are also practical discussions of fibers and techniques as well as a description of the process of doing architectural commissions.

The text also includes responses of the audience toward his environmental fiber structures.

The artist and his work are also discussed by Betty Park, a sensitive art critic who helps the reader acquire a better understanding of Gerhardt Knodel as a person and as an artist.

The book ends with descriptive information on all the work done during the period June '80-Nov. '82.

This book is a special tribute to a great contemporary fiber artist.

Clotilde Barrett

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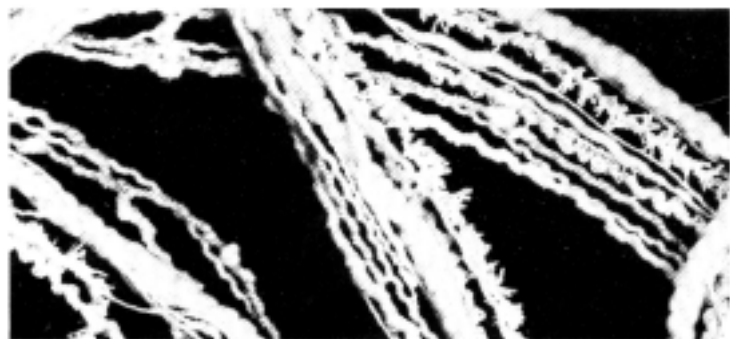
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A HANDWOVEN WEDDING CHUPPA

by
Millicent Horger

When our younger daughter wrote to tell us she planned to marry a Jewish man this summer, I offered to weave him a prayer shawl similar to the one described in *The Weaver's Journal*, Summer, '81. However, he already had a handwoven prayer shawl, so the next letter announced, "John and I have decided what we'd like you to weave for us—the wedding chuppa." (Not that I had contemplated weaving anything else!) The "chuppa", I discovered, after borrowing a book on Jewish customs, is the canopy under which the bride and groom stand during the ceremony. The more I thought about it, the more challenging the idea became. I felt it would be a stimulating weaving experience and was quite flattered to be asked.

There are no rigid rules governing its design or fabric. Being a practical person, my first thought was to make it plain white, perhaps in Swedish Lace or Simplified Damask, so that they could use it after the wedding for a tablecloth. When Laurie brought John home at Christmas-Chanukah time to meet us, I could tell they were not thrilled with this plan. I laid awake thinking about it and the next day offered to add gold borders, gold in the fringes and perhaps a Hebrew symbol someplace in the middle. At once they responded enthusiastically to this suggestion, talked to the rabbi and sketched the words in Hebrew for "Love" and "Peace" (Shalom). They decided the words should be 6" (15 cm) high. So I drew it all out to scale for their approval.



Warp: 20/3 unmercerized cotton (Lily's).

Weft

tabby: Same as warp.

pattern: 5/2 perle cotton (Lily's).
Metallics in the letter area
(Raye's Eclectic Craft
Yarns).

borders: Metallics.

The metallics are gold lame, and gold plus silver lurex, some wrapped together, some singles and some wound with the 20/3 cotton.

Sett: 20 epi (80/10 cm)

Width in the reed: 50" (127 cm)

Length of the warp: 6½ yards
(5.94 m)

Finished length of chuppa: 84"
(2.13 m) plus 18" (46 cm) fringe.

Threading: Ann Mueller's Crackle Weave.* See Fig. 1.

Treadling: See Fig. 1.

*Marguerite P. Davison, *A Handweaver's Pattern Book*. Published by Marguerite P. Davison. 9th Printing 1971 p. 200.

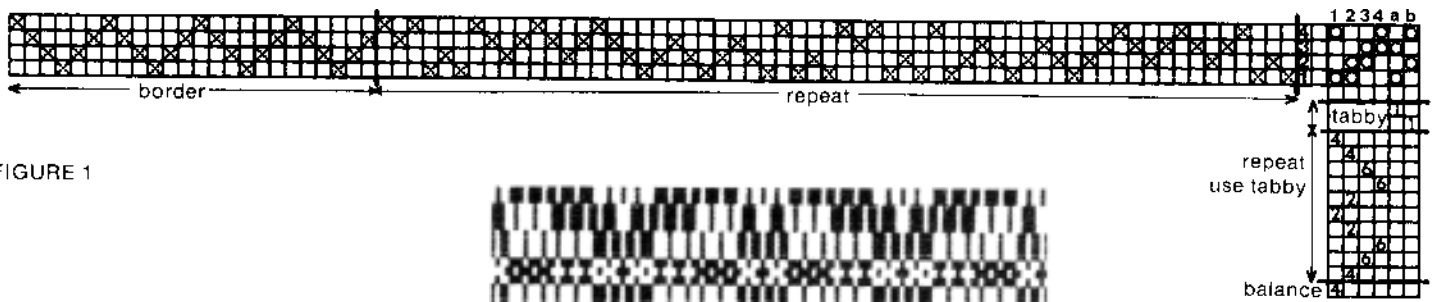
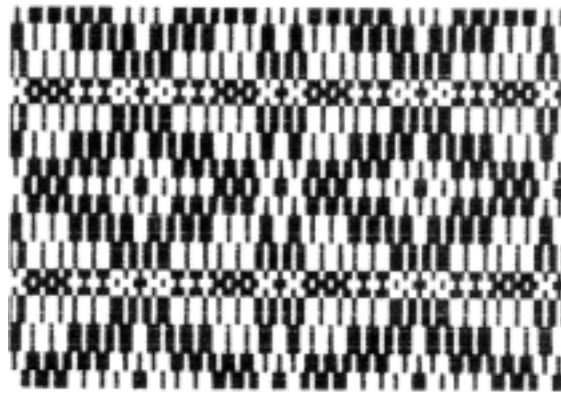


FIGURE 1



The two end sections are in Crackle weave (Fig. 1) with varied metallic borders in the weft on each end, and narrower borders between center and end sections. The center section is woven "on opposites", using treadles 1 and 3 only, with 20/3 tabby between each shot. This gave a simpler background for the letters, but more interesting than plain weave.

The tapestry letters are woven on the reverse side so the joins wouldn't show. Treadle 1, lay perle cotton in the background areas and metallics in the letter areas; weave a tabby pick. Treadle 3, interlock the perle cotton and metallics and weave the metallic letters and the cotton ground; weave a tabby pick. It took me an hour to weave just one inch of the letters!

My husband had me keep track of time spent weaving, and off-loom finishing, including adding luxex to the fringes and braiding them in an intricate way. In one corner I embroidered the date in English, in another the Hebrew year, 5742, both in gold lame. I finger crocheted (Idiot's Delight) 4 strong loops of the perle thread to hold the staffs, reinforced them with woven

squares, and sewed them at the inner edges of the gold borders. Tied to the fringe in each corner are 3 tiny brass bells. 112 hours were chalked up for the entire project.

On the warp end I wove a small tablecloth and napkins to match, minus the letters, for the tea wagon which would be used during the ceremony to hold the Kiddush cup of special wine from Israel.

The cloth won a blue ribbon at the So. Calif. Expo. in July. I was reluctant to enter the chuppa for fear something might happen to my labor of love.

At our garden wedding Aug. 1, four of the young couple's friends held up the chuppa with golden staffs made by my brother-in-law in early spring. During the reception, the chuppa was displayed above the cake table.

John and Laurie had planned to keep it as an heirloom for their children's weddings, but a Jewish cousin is borrowing it for her wedding in a few weeks. It pleases me that it was admired and will be used again.

ABOUT THE AUTHOR: Millicent Horger learned to weave at Kingswood School, Cranbrook, Michigan in 1935. She studied with Lillian Holm, a Swedish weaver, who taught at the school. Millicent learned to weave rugs, tapestries, and linens. The following summer she studied with Anne Walker Fitzgerald at Berea College in Kentucky.

After receiving a BA from Albion College in Michigan, Millicent taught school, married, and raised a family. When she retired in 1976, she and her husband moved to San Diego, and Millicent again took up her craft in earnest. She learned to spin and demonstrated weaving at many of the parks and schools in the area. At the Southern California Exposition each summer, she has collected many ribbons in the Home Arts competitions.

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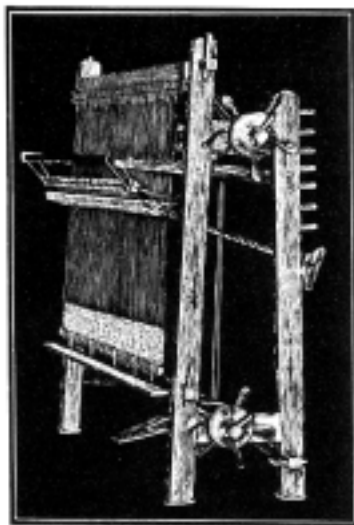
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PRODUCT REVIEWS



The REGINA

GLIMÅKRA TAPESTRY LOOMS

THE REGINA: As a tapestry weaver and teacher, I am always looking for tapestry looms, equipment and materials to recommend to my students and to incorporate in my own work. I was delighted to see Glimåkra's new vertical tapestry loom, the Regina, (complete with foot treadles), at Convergence '82 in Seattle this past July. Since that time I have had an opportunity to test this loom.

When weaving a tapestry, one encounters technical difficulty if the design includes lots of vertical design lines. This is further compounded if the warp is widely spaced, especially if the loom cannot hold the warp tight enough to keep it perpendicular during weaving. Since I wanted to give this loom a tough test, I incorporated both of these potential problems in my project.

I warped the loom the full weaving width (39 inches or 1 m) at 5 epi (20/10 cm) using a 3/2 mercerized cotton. Since I was testing the Glimåkra loom, I decided to use their Borgs yarn for the weft. (Incidentally these yarns come in many sizes and fibers with an excellent color range.) I used KVAL S2 (3200 m/kg, 1600 yards/lb), a medium weight wool. I used only 5 colors and wove with multiple strands (5 at a time), in different combinations to make 14 different colors.

After winding the warp on the warping pegs on the back side of the loom (an especially nice feature), the warp was wound onto the warp beam with the unwound warp hanging down the front of the loom.

With the warp wound to the proper length, threading the heddles and the reed proceeded without difficulty. The loom has 2 shafts with string heddles and I found, much to my surprise, that they were extremely easy to thread. The final step involved tying the warp to the cloth beam and then adjusting the tension.

The tension system on this loom is superior and allows one to get the warp extremely tight (something all tapestry weavers look for), and still be able to open the shed. Since the loom is also equipped with a standard beater and reed it was easy to keep the warp perpendicular throughout the entire weaving process.

The foot treadles are hinged and attached to the shafts by cords. When weaving near the center of the piece, I operated the two foot treadles with both feet, alternating the use of my left and right foot to change the shed. When working in areas near the edge of the tapestry, I was pleased to find that the foot treadles worked equally as well when I only used one foot, moving it from treadle to treadle. (Note: the wider looms are equipped with multiple sets of foot treadles.) The loom makes no noise and the only sound to be heard while weaving is the packing of the weft in place with the tapestry fork.

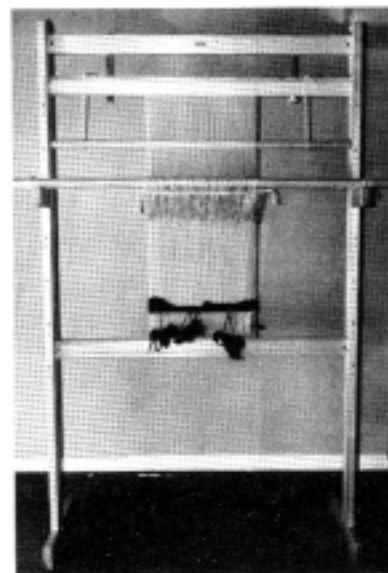
As I wove, I always worked for at least 3 hours at a time. I was able to sit on a normal dining room chair as it was easy to adjust the weaving position of the piece to a comfortable height due to the long weaving distance available between the beater and the lower beam (23 inches or 58.4 cm). The most comfortable weaving position for me was when the weaving line was 7-10 inches (18-25.4 cm) below the reed. This would vary, of course, depending upon the seating and height of the weaver. As a result of this particular positioning, I was able to view at least 14 inches (35.6 cm) of weaving at all times, and by simply removing the shelf at the front of the loom, I could see another 10 inches of the piece as it extended at a gradual angle to the cloth beam. And, if you are a "create as you weave person", this is a terrific advantage as you are able to view 24 inches (61 cm) of the piece without unrolling it.

I spent a total of 25 hours weaving my tapestry and enjoyed using the loom. The entire operation is quiet and smooth. The warping process is quick and easy and the loom is strong with an excellent tension system and smooth operating foot treadles. It is an excellent tapestry loom and I personally recommend it.

The REGINA is available in 3 different sizes—40, 50 and 60 inches (100, 125, 150 cm). The 50 inch loom has 2 sets of foot treadles and the 60 inch version has an optional third set of foot treadles. As of this writing, the prices of the three sizes are \$595.00, \$695.00 and \$845.00 respectively.

For those who prefer to hand manipulate the warp, Glimåkra presents the SARA. This loom has a continuous warp feature that is adjustable up to 55 inches (140 cm) in length, with a maximum width of 39 inches (100 cm). The warp can be wound around the fixed notches (similar to a nail frame) at either 5 or 10 epi (20 or 40/10 cm) depending upon the warping process used.

After the loom is warped, a single cord is used to make string heddles which control one



The SARA

shed opening. The other shed opening is held permanently in place with a dowel. Therefore, the "stick" shed is always open and the weaver only has to create the other shed by pulling on the string heddles when weaving in the opposite shed is required. Although weaving progresses more slowly on a loom without foot treadles, I found this loom easy to weave on as the adjustable tension system is very good and holds the warp tight during weaving. It is also easy to warp and takes up less space. As of this writing, the SARA is currently available in only one size—which gives you a maximum weaving width of approximately 39 inches and a length of approximately 46 inches as there is 9 inches of warp waste. The loom now sells for \$250.00.

For additional information contact Glimåkra Looms 'n Yarns, Inc. P.O. Box 16157 Rocky River, OH 44116 (216) 333-7595 or their Western Division P.O. Box 1271 Sonoma, CA 95476 (707) 938-8229.

Nancy Harvey

LILY BABY YARN

New from B. Blumenthal & Co., Inc., comes Lily Baby Yarn. It is a 3-ply 100% pure soft spun pre-shrunk cotton. This article 950 is available in white, cream, yellow, baby blue, baby pink and baby green. It is great for knitting and crochet and the perfect yarn to weave baby clothes and blankets. The yarn comes in 150 yard (137 m) skeins, put up in 12 skeins to a pack. We tested the yarn by weaving the blanket described on p. 80. This yarn is ideally suited for plain weave although other weave structures whose floats are short and not too frequent will probably give equally satisfying results. Our blanket was a great success, and was very popular with babies who love the softness and mothers who appreciate the easy care.

Clotilde Barrett



PAULA'S PICKER

This is a device for "picking" or "teasing" wool prior to carding, based on a design in Paula Simmons' book, *The Hand Spinner's Guide to Selling*. It does a very effective job of loosening and separating the wool fibers and releasing seeds and other vegetable matter. It is suggested that the wool fleece should be washed prior to picking and carding, and our tests have confirmed much better results on clean wool, as there is less grease to stick the undesirable matter to the wool. One may easily pick 6 to 10 pounds of wool an hour, producing a fluffy opened fleece which can be spun "as is" for a textured yarn, or carded by hand or machine for a more uniform spinning texture.

The construction, of mahogany or red oak, is sturdy and includes 194 ground and hardened picker points. The picker should be handled with great respect because of these points and always locked when not in use with the device provided. PAULA'S PICKER CLAW, \$15, a hand tool rather like a miniature rake, is recommended for holding the wool while gradually feeding it into the picker.

Paula's Picker by Patrick Green, 48793 Chilliwack Lake Road, Sardis, B.C., Canada VOX-1Y0, list approx. \$245, U.S.

Ellen Champion

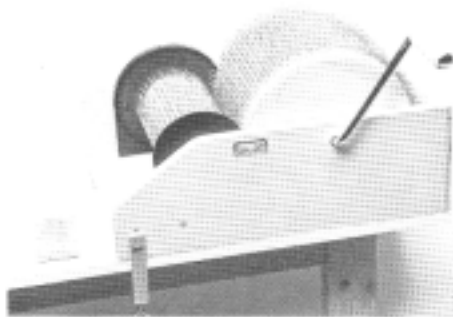
LOUËT SPINNING EQUIPMENT

The Louët spinning equipment is distributed by LOUËT SALES, P.O. Box 70, Carleton, Ontario, CANADA, K7C3P3.

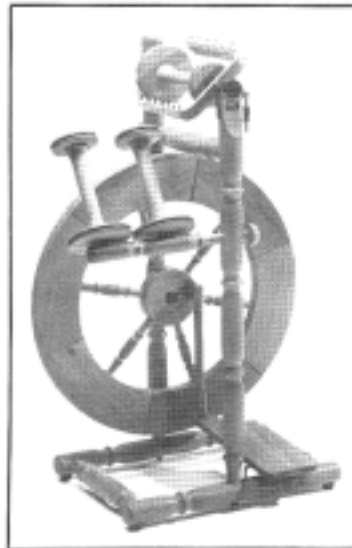
THE LOUËT WOOL PICKER/CARDING-BOARD (list \$128, U.S.) looks somewhat like a rolling pin and board, each covered with carding cloth. It is used to card wool for spinning or felting and produces a very satisfactory batt. It is faster than hand carding and slower than drum carding. For its moderate cost it is a useful tool for the wool worker who does not have access to a drum carder. I took a cardingboard to a county fair spinning demonstration and found children and adults alike were easily able to card without previous experience. A wire brush is included for cleaning.



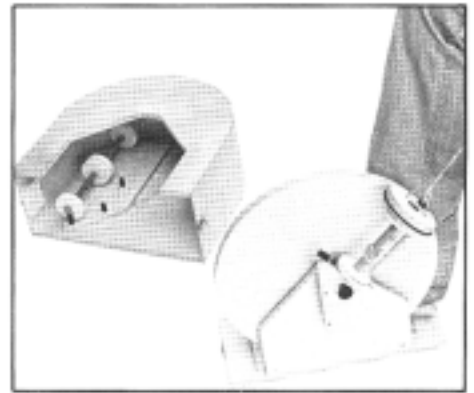
THE LOUËT DRUMCARDER, (list \$240, U.S.) is well designed, efficient and a delight to use. The non-slipping, toothed reduction gearing is completely covered so no wool can become entangled. The drumcarder clamps on two sides of a sturdy table for smooth and easy operation of the turning handle. Feeding teased wool onto the underside of the small roller with the left hand enables it to be picked up and spread along the larger roller being turned by the right hand. When the large roller is full of wool, a screwdriver can be slipped across the join in the carding cloth and slowly lifted, freeing a batt ready for spinning or felting. There is no adjustment needed and cleaning is easy with the open birch frame design and the included wire brush



THE LOUËT S70 TRADITIONAL SPINNING WHEEL (list \$229 U.S.) a castle wheel made of oak, comes ready-to-finish. Its sister, the S71 (list \$274 U.S.) comes finished in a brown semi-gloss lacquer. They are both shipped "knocked-down", ready to assemble in a few minutes with the instructions provided. They have an attractive early American Traditional turned design which would complement traditional living-room furniture. The frame is light weight and easy to carry with a handle bar in a top center location. It would easily go into any car. The drive belt self-adjusts to either end of the reversible bobbin for two drive speeds; from the large end 5:1 ratio, from the small end about 7.5:1. There are 3 large bobbins and a lazy kate for two bobbins attached to the frame front. The bobbins are easily changed, and the lazy kate is easily detached if desired. There are 6 hooks on either side of the flyer. There is one tension screw, up front next to the orifice, for easy



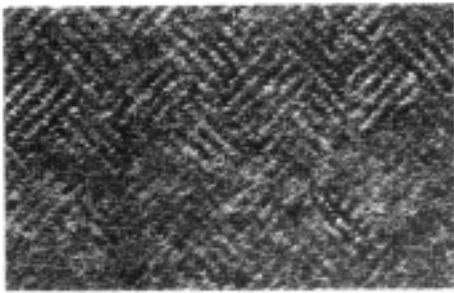
quick adjustments. The orifice, about 1/2" (13mm) is wide and short, so threading is easily done without a hook. Treading is smooth and the wheel is balanced to stop where it can be started again without using the hands. The frame does not try to "walk" while treading. The 20" (50 cm) drive wheel is driven by a single right-foot treadle board which might possibly be used by a left foot. I think a left-foot extension board could be a simple modification and I wonder why it wasn't designed this way. A wider, double-foot treadle would give more versatility and long-spinning-session comfort. A matching skein winder is available as an accessory to attach to the back part of the frame.



THE BABY LOUËT S40 SPINNING WHEEL (list \$223, U.S.) is a portable spinning wheel. It comes with its own box cover with a carrying handle, and is only 15" X 16" X 7" (38 X 40 X 17 cm). Upon removing the cover, the 15 second wheel set-up involves removing the bobbin/flyer assembly from the cover and attaching it to the wheel by means of a rubber belt, hook and two stationary pins. It is then ready to use. The flyer is friction-driven and the tension is regulated by slowing the bobbin with a simple tension screw. The design and construction of this wheel, including double ball bearings and fine finished birch plywood parts, is outstanding. No break-in period is needed and no general adjustments because it is so well thought-out for simplicity. Its spin/treadle ratio (twist delivery rate 3.5 to 1) is a bit slower than average but I have been able to spin from *bulkies* to *spiderwebs* without problems. It has a large 1/2" (13 mm) orifice, and there are two extra bobbins on a rod inside the cover, ready for plying or storage. The treadle is designed for right foot use and would be difficult for the left foot, although spinning can easily be done with the right or left hand. Threading (no hook required) and bobbin changes require bending rather low from a chair. Overall, the Louët S40 is a good choice where space is a problem or when a truly portable wheel is desirable.

Ellen Champion

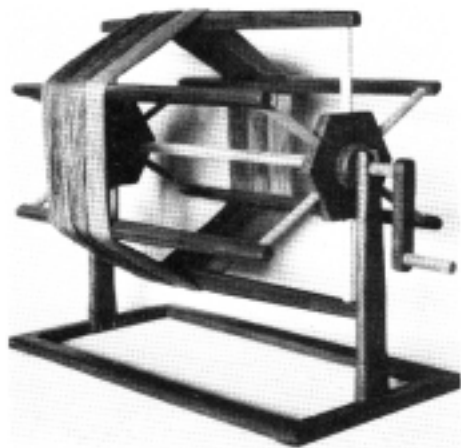
IHANA BRUSHING SERVICE Ihana brushing service, 3005 Hartford, St. Louis, MO 63116, is offering a finishing service for woven woollens which handweavers have desperately needed, yet was unavailable for so long. What they do to your cloth is gigging or raising a nap by brushing in all directions so that there is no special direction to the nap. In order to write this review, I sent a sample of wool woven with Scantex Rangarn which is a single size 3 1/2.



The fabric is a twill weave sett at 20 epi (80/10 cm), which was a good sett for upholstery fabric but a little too tight for garments. The fabric was brushed on one side, although for most customers the brushing is done on both sides. Brushing once gave the fabric a soft brushed look, yet the pattern of the weave was still very visible. Brushing twice raised more nap and obscured the pattern. Next time I will follow the advice of Ihana Service and wash the yardage before sending it in, then, as they say, when it comes back it is ready for the market. I did wash the fabric after brushing and it worked out too.

I was very pleased with the service and I am sure that, once discovered, you will not want to go without.

Clotilde Barrett



TRADITIONAL FIBER TOOLS

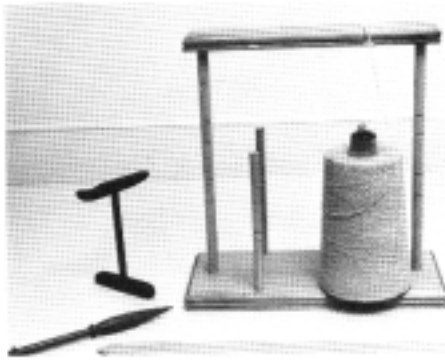
Traditional Fiber Tools has put on the market three pieces of equipment needed by spinners/weavers. They make these tools of a beautiful Brazilian hardwood called Goncalvo Alves. The YARN BLOCKER comes in two sizes (54" (137 cm) skeins or 72" (183 cm) skeins), and either size may be ordered finished (\$95.00/\$110.00) or in kit form (\$65.00/\$77.00). Their SQUIRREL CAGE SWIFT is an invaluable tool for holding skeins while making balls or winding shuttles (\$75.00). The DRUM CARDER NEEDLE is used to remove batts from hand card machines (\$7.75).

So that we could re-view their product, the company sent us a YARN BLOCKER KIT. This kit comes with excellent instructions and a list of everything that is needed to put it together. The only tool needed is a screwdriver. The other items include glue, sandpaper, rags, etc.; items people usually have around the house.

This was the first time that I have built equipment from a kit; I found it most enjoyable. It took me just part of one evening; I ended up with a truly beautiful and well-crafted piece of equipment. It is very functional, too. The main reason for having a yarn blocker is to wind washed yarn on it and let it dry under tension so that the spin will set evenly. The drum can be lifted off its support. The horizontal bars are tapered so that the skeins can slide off. Other uses are to make skeins from balls and also to make warps. Traditional Fiber Tools is going to add pegs to the drum so as to enable making the cross for warping and so to convert the yarn blocker into a warping reel.

A colorful brochure listing the Traditional Fiber Tools product line is available for \$1.00. Write to: Traditional Fiber Tools, 885 Glendower, Ashland, OR 97520.

Clotilde Barrett



WOODCHUCK PRODUCTS Woodchuck products, 324 N. Bluff, Wichita, KS 67208 has a fine line of well-crafted weaving and spinning tools. They pride themselves in their beautiful and special woods.

Among their spinning tools we tested a 5" (13 cm) walnut niddy-noddy. It is very decorative and doesn't need to be used to enjoy. However, it does make neat 23" (58 cm) little skeins, ideal for dyeing experiments. Also very useful for reeling silk, winding fine cottons and spider-web-thin handspun wool.

The tapestry bobbins of Woodchuck are also beautiful to look at and to hold. The one I have is "padouk", an extremely hard and heavy wood from Africa which finishes in a beautiful maroon color.

The standard pick-up stick, 17" (43 cm) long comes in ash, maple or mahogany but can be ordered in any of the exotic woods. A word of caution! I call a pick-up stick a piece of wood that is 3/4" (19 mm) wide and with a long taper. I would prefer to call the 1 3/8" (35 mm) wide product of Woodchuck a shed stick because I would use it to keep a shed open rather than to pick up with it.

Finally, I tested the birch, 4-spindle cone/spool holder. It is handsome, practical and very handy. It will accommodate all my spools except that an extremely fat one will not leave enough room for 3 more. It will take cones that are less than 9" (23 cm) high.

Judging from these few items, Woodchuck does have a way of making their weaving tools very useful and also very attractive.

Clotilde Barrett

GRANDOR INDUSTRIES

Grandor Industries offer a large variety of yarns: 100% cottons, linens, silks, wool and others. Most are imported from Great Britain. For a review of their products we tested the 8/6 linen rug warp and the 100% wool Berber roving. The project was the rug described on p. 43. Grandor carries a good choice of sizes of natural linen rug warp, 8/6, one of the thickest, was chosen especially to work with heavy weft yarns and performed well. The Berber roving is a single, spun with long staple coarse wool, ideally suited for rugs which need durability. Each shade is a blend of naturals. The color effects achieved with these yarns are low-key except when the design has bold pattern blocks as in our sample rug. The yarn is very resilient which is very desirable for rug yarns but which requires hard beating when using it for a weft faced textile. Our rug turned out thick and firm with a nice rustic look. It has a very sturdy quality and will probably last forever.

Retail shops are encouraged to contact Grandor Industries Ltd., at P.O. Box 5831, Sherman Oaks, CA 91403. (213) 784-5855.

For a sample card of their entire collection, send \$2.75.

Clotilde Barrett

LINEN FROM FREDERICK J. FAWCETT

The large variety of linen offered by Frederick J. Fawcett, Inc. gave us the incentive to weave more linen projects for this issue. The company sent us 1/2 lb. (227 g) spools of 10/1 natural dry-spun tow, 10/1 natural wet-spun line, 8/1 (dyed) dry-spun line, 10/1 grey (in the field state or unfinished dry-spun tow). All but the grey flax was incorporated into the linen kitchen towels described on p. 77. These thirsty towels bring oldtime cosiness to the kitchen and are extremely practical.

Yardage for a man's Spring blazer was woven with a textured cotton warp and 8/1 nickel grey (dyed) dry-spun line weft. It was fast and easy to weave. However, in this dry Colorado climate we used one precaution, namely, to soak the wooden bobbins in water before winding them and to keep the wound bobbins in a moistened plastic bag. As a result, the linen lost its wiry character and fed smoothly out of the shuttle.

Clotilde Barrett

SCANTEX

In a previous issue we have reviewed Poppana Bands which are rolls of narrow cotton strips, cut on the bias, imported from Finland by Scantex and used as weft. Scantex also distributes a Finnish wool called RANA YARN. Rana means wallhanging and indeed, the yarn is very well suited to weave fabrics for the interior. It is mothproofed and tested out to be extremely sunfast and colorfast. The yarn is a single, size 3.5, 1982 yds/lb (3994 m/kg) and comes in 100 g (3.527 oz) skeins. The spin is medium which makes the yarn suitable for warp and weft. The rana yarn comes in a tremendous range of colors, a truly beautiful palette. Because of the high quality and the firmness of this yarn we chose to test it for upholstery fabric. See p. 76. This fabric is balanced, has rana yarn for both warp and weft and has as many picks per inch as ends per inch. A sett of 20 epi (80/10 cm) in a 10 dent reed and a $\frac{1}{2}$ twill weave struc-

ture made it ideal for upholstery fabric. It is a firm textile with enough flexibility to follow the contours of furniture. A light washing preserved the crispness of the woven fabric, yet relaxed the fibers to make good cloth. If the yarn were to be used for garments (outer wear), I would have preferred a sett of 18 epi (70/10 cm) for a loftier cloth. Samples of fabric woven with rana yarn were sent to Ihana Brushing Service to raise the nap. The result was a beautiful sensuous fabric suitable for coats and jackets.

The rana wool sample card is available from Scantex, Inc. P.O. Box 552, Larkspur, CA 94939, at \$1.00. (414) 924-9120.

Clotilde Barrett

BROWN SHEEP CO.

Brown Sheep yarns are made with 100% domestic wool. The long staple wool fibers, which are combed into wool top before they are spun, give Brown Sheep yarns their unique quality. It is strong, soft and luxurious. The yarn comes in two sizes of singles (784 yds/lb, 1580 m/kg, and 160 yds/lb, 322 m/kg). Each of these is also available in two-ply. My sample card does not have the full range of color which is still in the process of being completed. Brown Sheep supplies a tightly spun single warp yarn in three natural colors. To test the yarns I wove the table tapestry and pillows described on p. 73. I chose the medium grey wool warp and the finer of the two singles for weft. I used it single for the tabby weft and two-fold for the pattern weft. The colors are the complete range of oranges, from beige to dark red, and a teal blue. My reaction to working with these yarns was very favorable. The warp was even and strong. The weft packed in exactly as I expected it to do. The take-up and shrinkage was low for a wool fiber: from 56" (142 cm) in the reed to 51" (130 cm) after washing (I did weave with a stretcher). The yarn has the luster and strength of worsted yet is soft and manageable. The colors are rich with a soft glow. Washing the piece made it loftier.

Brown Sheep yarns are also suitable for knitting. They are excellent tapestry and rug yarns.

For additional information contact the Brown Sheep Co., Inc., Rte #1, Mitchell, NE 69357, (308) 635-2198.

Clotilde Barrett

GENERATION II

Generation II, "A Compu-Dobby System", is a dual-purpose program for the Apple II or II+ personal computer. It requires 48K of RAM, Applesoft in ROM or language card, and at least one disk drive (DOS 3.3). A printer is optional but desirable for keeping records of data and drawdowns. The program is available for \$75.00 from AVL Looms, Inc., 601 Orange St., Chico, CA 95926.

This program is designed to be the control software for a special doobby loom that is also made by AVL Looms. It was obviously impractical for them to ship the entire system to us for evaluation; we therefore cannot comment on the working of the loom. But the program is also designed to generate drawdowns on the Apple without the need for a loom of any kind. It was written by Tim Trudel, whose earlier weaving programs have been reviewed in this journal (Vol. VI, No. 1, p. 34, July 1981; Vol. VI, No. 3, p. 47, January 1982).

This program bears a strong family resemblance to Trudel's Computer Loom 6.0.0 but is considerably improved over that earlier effort. Generation II is completely menu-driven, with the option of hopping back and forth from one menu to another. Also, error correction is much easier with the new program. These are welcome changes that have increased vastly the "user-friendliness" of this piece of software.

Generally speaking, the program works like most of the others we have seen. One procedure will, however, seem a little strange to non-dobby weavers. There is no menu labelled "Tie-Up". Instead, after completing the threading (140 or less warp ends, with or without borders or repeats, choice of black or white for each thread), you go to the "Peg Plan Menu". Here, instead of assigning shafts to treadles, you assign them as "pegs" in simulated doobby "bars". Then, when weaving in the doobby mode (either on the screen alone, or with the real loom under program control), these bars will be called up in numerical order and the pegged shafts will be lifted. The order may also be reversed at any point in the weaving. The difference between this and a tie-up-and-treading procedure is that, even if a particular combination of shafts is to be lifted many times during weaving, a new bar must be pegged for each such shed.

Non-dobby weavers are not neglected, however. One of the sub-menus under the peg-plan menu offers the 'Tie-Up' Entry option. When you use this, the bars turn into treadles and may be re-used at will.

The drawdown menu allows weaving by peg plan (dobby mode), by treadling, or by specifying the shafts to be lifted for each pick. All of these options are, of course, available on the AVL loom when under program control. In this case, there are some additional manual or foot operations that one must use when actually weaving.

Color-and-weave effects (B&W only) are allowed. Although only 80 picks can be shown on the screen at any one time, the data for 600 bars remain in memory when in the doobby mode.

Another important feature of the program is that a drawdown can be created by treadling or shaft lifting and then be converted to a doobby peg plan by a single command.

We have found only one weak point in the program from the weaver's viewpoint, namely, that when operating in the treadling mode one cannot print out the treadling draft; only the combination of treadling and tie-up (or the whole peg plan) can be printed. This means that the treadling draft is not as graphical. We also note with regret that this program is the first drawdown software we have encountered that is supplied on a "locked" (copy-resistant) diskette, in an extremely non-standard format. While this discourages copying, it also makes any modification of the program equally difficult. We were unable to incorporate our graphics-printing routine and had to be content to save the drawdowns to disk and exit the program to print them. However, the author has made provision for a fairly wide range of printers if one has one of the Grappler™ interfaces installed.

The user manual is quite clear and complete, though not tutorial. It is neatly printed (using a word processor, we suspect) and is supplied in a handsome vinyl 3-ring binder.

In summary, Generation II is a great improvement over its ancestors, and is a welcome newcomer to the family of Apple weaving programs. We recommend it to both doobby and conventional treadle-loom weavers.

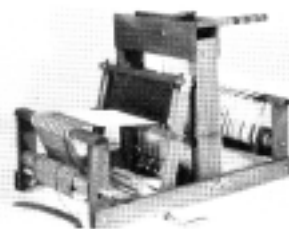
Earl Barrett

PRODUCT NEWS

SILK CITY FIBERS, 155 Oxford St., Paterson, NJ 07522, presents a new collection of yarns with each season. A full year of quarterly mailings is \$10.00 and well worth the price. For each season there is a special collection of colors, fibers and textures that reflect the latest in taste and fashion. Silk City Fibers also has a permanent collection of beautiful timeless yarns and they also sell odd lots. All the samples are well organized and clearly identified. A regular newsletter establishes good communication between the supplier and the stores or professional handweavers.

THE BORGS WOOL SWATCHBOOK is designed by Diane Tramba of the Glimakra Weaving Center, P.O. Box 16157, Rocky River, OH 44116. It is especially prepared for Borgs dealers who can purchase it for \$69.00. Customers can browse through the book and look at successfully executed and finished woven swatches as well as the extensive collection of yarns. Emphasis is placed on the proper sett, finish, color effects, textures and patterns.

One of the new exciting yarns in the Borgs collection is a 2/2 soft cotton which is as suitable for weaving as for crochet and knitting.



SIEVERS LOOMS, Jackson Harbor Rd., Washington Island, WI 54246, announces a 4-shaft table loom especially designed for samplers and workshops. Loom dimensions: 14" (W) X 25" (L) X 18" (H) (35.5 X 63.5 X 46 cm), and folds down to 9" (23 cm) high. The weaving width is 10" (25.4 cm). Made of white pine and white birch, unfinished, easy to assemble. Special quantity prices are available to established guilds.

DESIGNING FOUR-SHAFT DOUBLE WEAVES

by Donna Muller

So many interesting double-weave textiles require eight or more shafts. Multi-shaft double weavers can design in blocks and have countless options for using different weave structures on each surface. What are the options, the design tools, available for four-shaft weavers who are interested in loom-controlled textiles?

Since it requires at least two shafts to make the simplest cloth, it follows that 4-shaft double weaves are limited to the simplest weave structures on each surface: Tabby and basket weave require only two shafts and so the structural possibilities for 4-shaft double weave are tabby/tabby, basket/basket, and basket/tabby.

Within the limits of these two cloth structures there is plenty of room for original designing if close attention is paid to what happens to the cloth as changes are made in ways to connect the two layers. There are four ways the layers of a double cloth can be connected:

1. **Horizontal interlock.** The entire top and bottom surfaces can change places. This causes an interlocking cross-over of warps all across the cloth from selvedge to selvedge where the top warp threads to down and the bottom warp threads come up.
2. **"Raise-the-bottom" stitching.** Some of the bottom warp ends can be raised to weave with the top surface.
3. **"Drop-the-top" stitching.** Some of the top warp ends can be lowered to weave with the bottom surface.
4. **"Sewing" with supplementary weft.** (2) and (3) can be combined, so that some "top" warp threads can catch on the bottom layer at the same time some "bottom" warp threads catch on and weave with the top layer.

These are the technical possibili-

ties. This article will consider how to execute the techniques and then go on to consider how to design using these techniques. The emphasis here is on variations in tabby/tabby weaves. All these ideas can also be applied to basket weave, which will be introduced briefly in closing for those who would like to experiment and apply the ideas further on their own.

A REVIEW OF BASIC DOUBLE WEAVES

First it may be helpful to review 4-shaft double weave, tabby on each surface without any connections between the layers. On a straight-draw threading, with colors *A* and *B* alternating, to weave shafts 1 and 3 (color *A*) as the top layer and 2 and 4 (color *B*) on the bottom, the threading, tie-up and treadling are shown in Fig. 1.

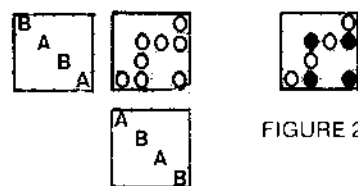


FIGURE 1

It may help newcomers to double weave to think of the tie-up as in Fig. 2. In the first pick, the *A* warp threads on shaft 1 are raised and weaving on top. The *B* warp threads are passive on the bottom. In the second pick, shaft 2, which should be on the bottom layer, is weaving. But to work on the bottom layer, the top layer must be lifted out of the way. So the dark circles in the tie-up can be thought of as lifting, not because they are weaving, but *just to raise them and get them out of the way of the bottom layer.* The second pick beats in sliding under the first pick. The third pick works like the first pick—its tabby mate. The fourth pick must weave the other shaft on the bottom layer, shaft 4, and the top layer must

again be raised out of the way. So shafts 1 and 3 are lifted to get them out of the way while shaft 4 is weaving. The fourth pick slides under the third pick.

Note that two shuttles are used: color *A* on the first and third picks and color *B* on the second and fourth. These four picks are one complete treadling sequence and produce a cloth only 2 weft rows "tall" because progress is divided between the top and bottom layers: the first and third picks are on the top layer; the second and fourth picks are on the bottom.

Now, with the same threading, to weave color *B* (on shafts 2 and 4) on the top, and *A* on the bottom, see Fig. 3.

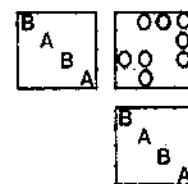


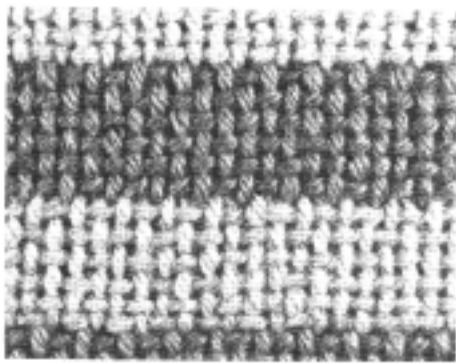
FIGURE 3

On the first pick lift shaft 2 alone and weave with color *B*. On the second pick, to weave shaft 1 on the bottom layer, raise 1 and lift 2 and 4 (the top layer this time) to get them out of the way and weave with color *A*. Third pick, weave shaft 4 with color *B*. Fourth pick, weave shaft 3 on the bottom while lifting 2 and 4 to get them out of the way.

TECHNIQUES FOR CONNECTING THE TWO SURFACES

Exchanging surfaces (Horizontal interlock)

To produce double cloth with a horizontal lock caused by switching the top and bottom layers, first weave color *A* on top for several treadling sequences, then repeat several sequences with color *B* on top. The layers are connected only where the warp threads change



1. A horizontal interlock

from top to bottom. Photo 1 shows an example of this weave structure. Shafts 1 and 3 were threaded in blue, 2 and 4 in tan.

Stitching by raising a bottom warp ("Raise-the-bottom")

The second way of connecting the layers is to raise some of the bottom warp threads to weave with the top layer. Weaving color A (shafts 1 and 3) on the top without connecting the two layers has been covered. In the tie-up of Fig. 4, the first

● stitching riser

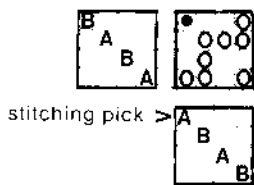
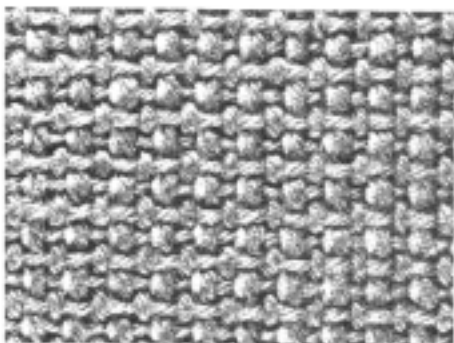


FIGURE 4

treadle has been changed by adding shaft 4. So on the first pick of the sequence, instead of weaving shaft 1 alone on the top layer, shaft 4 from the bottom weaves with shaft 1, and the two layers will be "stitched" all across the web, wherever shaft 4 occurs in the threading.



2. Tan flecks show on the top surface (blue) where bottom warp threads are raised (stitching risers).

Photo 2 shows this weave structure. The tan flecks are the bottom warp appearing where they rise to the blue surface to stitch the two layers together.

There are other ways to stitch the two tabby surfaces by raising a warp from the bottom layer, but these variations will be discussed later as elements for designing.

Stitching by lowering the top warp thread ("Drop-the-top")

This time the basic tie-up (shafts 1 and 3 top, 2 and 4 bottom) is modified to lower a thread from the top layer while weaving the bottom. This can be accomplished by leaving something out of the tie-up which would ordinarily be tied-up and weaving. The bottom layer weaves on the second and fourth picks.

□ stitching sinker

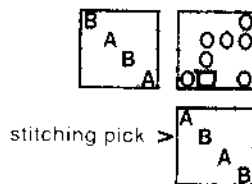
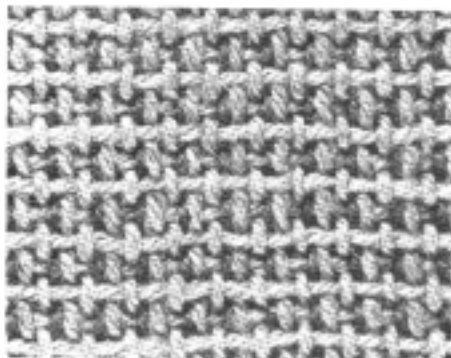


FIGURE 5

So if either shaft 1 or shaft 3 is omitted from the tie-up on one of those picks, it won't be lifted out of the way when the bottom is weaving. It will stay down and catch on the bottom layer. For example, in Fig. 5, shaft 1 is not lifted out of the way on the second pick.



3. Blue flecks show on the bottom (tan) surface where top warp threads are sunk (stitching sinkers).

Photo 3 shows this weave structure. This is the bottom (tan surface) showing where the top blue warp threads have been lowered to weave with the bottom.

Sewing with a Supplementary Weft

This last way to connect the two layers uses an extra pick in the weave sequence where one thread from the bottom is raised and one from the top is lowered.

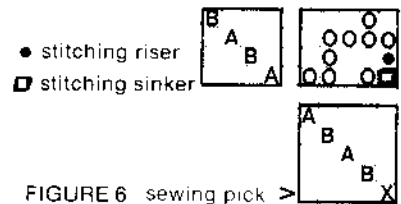
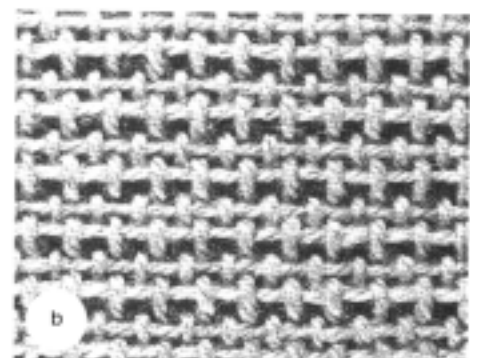
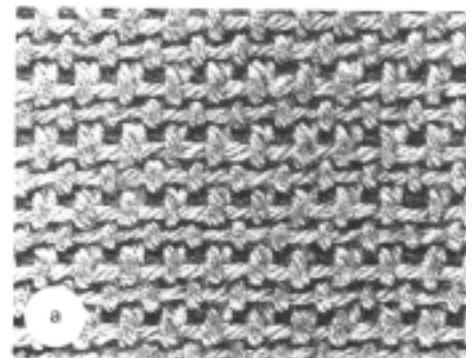


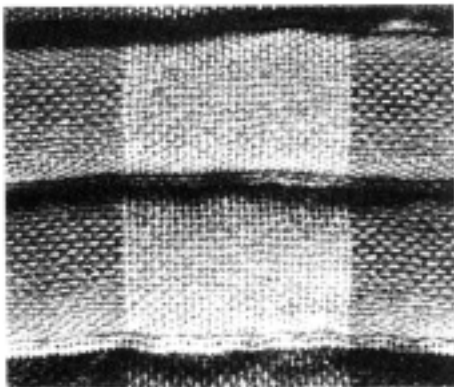
FIGURE 6 sewing pick

In Fig. 6, after completing the regular sequence of four picks without any stitching, a fifth pick is added. By lifting shafts 2 and 3, one shaft is raised from each surface (shaft 2 from the bottom and 3 from the top) and one shaft from each surface is lowered (1 and 4 stay down.) So this fifth pick stitches *over* 1 from the top and 4 from the bottom and *under* 2 from the bottom and 3 from the top, and the two layers are "sewn" together.

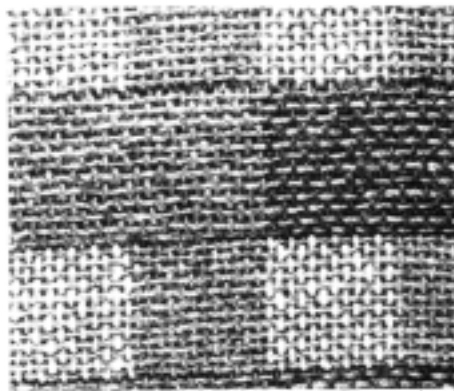


4. A heavy red supplementary weft "sews" top blue surface (a) to bottom tan surface (b).

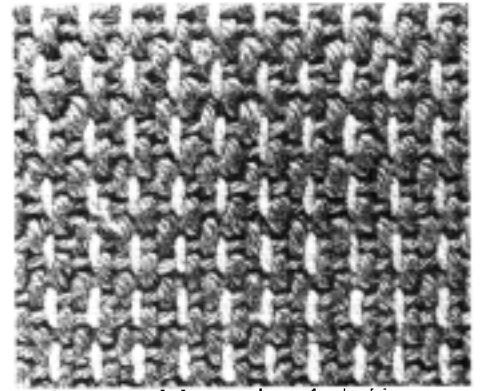
In Photos 4a (top surface) and 4b (bottom surface) the fifth sewing pick was done with a thick red thread to make the weave structure obvious.



5. Some design options using the horizontal interlock.



6. Horizontal interlock with stripes in both "top" and "bottom" warps.



7. Increase of the number of stitching risers.

DESIGN TOOLS

Now these structural principles can be explored and manipulated to use them as design tools. There are two general guidelines to keep in mind.

1. The hand of double weaves is influenced by the frequency of stitching. A good rule of thumb for setting double cloths is to try slightly less than two times the usual sett for a single cloth in the same material and weave structure. For example, a thread that would usually be sett at 12 epi (50/10 cm) in a single layer might be sett at 20 epi (80/10 cm) (10 epi for each layer) in a double weave. *Always sample*, of course.

2. Stitching can be visually emphasized or de-emphasized by varying its position in the weave structure (sometimes strongly influenced by denting), or by experimenting with the color, weight or texture of the stitching thread.

Designing textiles which switch surfaces

In Photo 5, three design options have been exercised to change the look of the horizontal interlock.

1. The two surfaces alternate unevenly. Here one surface was woven for 1½ inches (38 mm), then the layers were switched and the alternate layer (yellow) was up for only one sequence—four picks. This resulted in a thin yellow line running across the fabric every 1½ inches.

2. Before the layers were switched, a "pocket" resulted. This pocket (opened by treading both shafts

of the top surface) was lightly stuffed with polyester batting. When the layers switched, the pocket locked shut. There are many possibilities for using this principle to design for everything from comforters and "quilted" clothing to tea cosies.

3. The strong horizontal stripes produced by alternating plain colored layers (see Photo 1) were somewhat mitigated by putting stripes in the dominant warp (see Photo 5).

The textile in Photo 6 was an experiment in further breaking up the horizontal effect: One layer has one-inch (25 mm) wide warp stripes. The second layer has a color division down the center.

Most of the usual possibilities for designing tabby are available in designing tabby/tabby double weave: Full ranges of colors, textures, stripes and checks and plaids can be explored. The challenge of designing with the surfaces exchanging is in planning ahead to incorporate visually the color and/or texture changes that will occur side-by-side as the layers change structurally.

Designing textiles which stitch by raising a bottom warp

VARYING THE FREQUENCY OF STITCHING

One option to be considered when designing a stitched double cloth is how often to stitch. In the previous example of this technique, the layers were stitched by raising shaft 4 on the first pick of the four-pick sequence. (See Fig. 4 and Photo 2.)

It is possible to stitch on both the first and third picks by raising shaft 4 in both places (Fig. 7).

Photo 7 shows that this experiment results in the tan bottom warp becoming much more prominent on the surface. (Compare Photo 7 with Photo 2.)

It is also possible to lengthen the interval between stitchings by treading the basic unstitched tie-up sequence any number of times before treading the stitching sequence. Always finish the full sequence of four picks (Fig. 8).

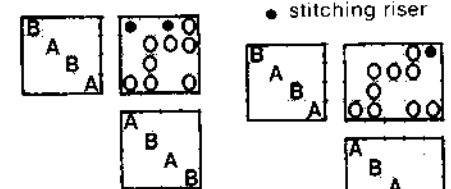


FIGURE 7

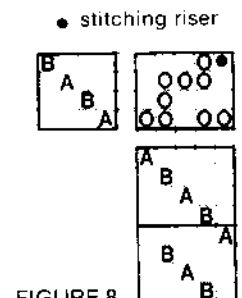


FIGURE 8

As the frequency of stitching varies, there is a visual change in how often the fleck of color from the stitching occurs. As has been mentioned, there is also a change in the hand of the cloth. Cloth with the more frequent stitchings has a firmer hand.

VARYING THE SHAFT AND/OR PICK WHICH DOES THE STITCHING

In Fig. 4, shaft 4 was used to stitch on the first pick alone. Then in Fig. 7, shaft 4 stitched on both the first and third picks. Shaft 2 could also be used to stitch on either the first or third pick—or any of these

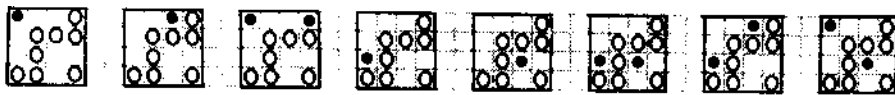


FIGURE 9

options could be combined. The tie-ups for all these possibilities are given in Fig. 9. (Tie-ups only are given with the understanding that they apply to the straight draw threading of alternating colors, and that all four treadles are repeated in sequence.)

What practical difference does this make? Suppose there were color changes in the bottom warp, with shaft 2 threaded one color and shaft 4 another. The flecks of color which rise to the surface to stitch could then be used as a design element.

Depending on the denting, one or another combination may make the stitching more prominent. For example, if the warp is double-sleyed with 1 and 2 together in the same dent and 3 and 4 in the next, and so on, then the stitching in Fig. 10a is less prominent because the warp on shaft 2 tends to slide under the one on shaft 1, and the

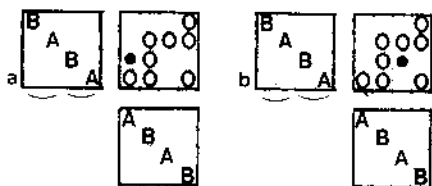


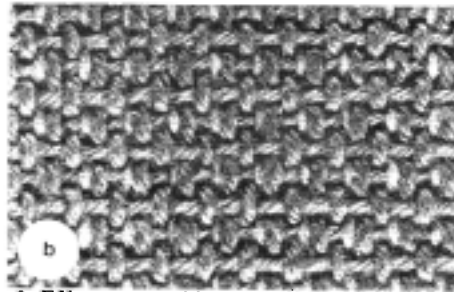
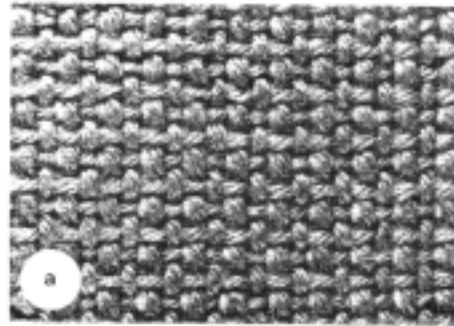
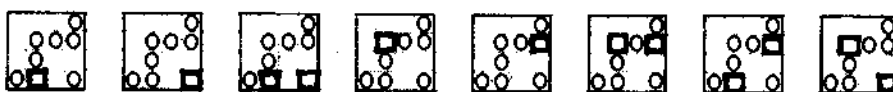
FIGURE 10

one in Figure 10b is more prominent because the reed separates the threads on 2 and 3. The effect is softened by washing, but does not disappear completely; this will surprise no one who has been desperately unable to wash "reed streaks" out of a fine cloth. Photos 8a and 8b show this effect.

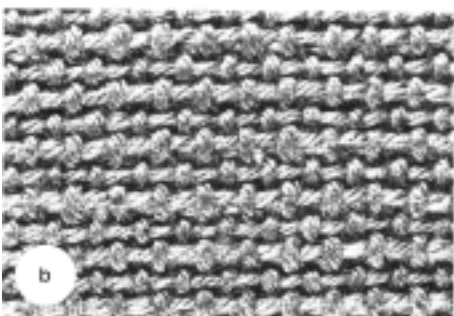
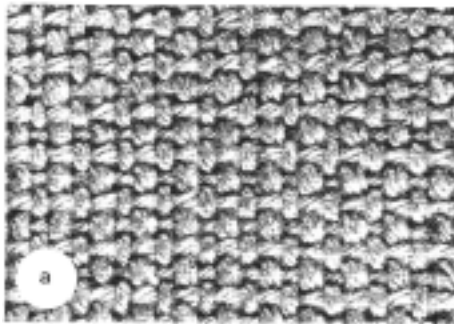
Drop-the-top stitching

Everything about "drop-the-top" stitching is exactly parallel to what has been said about the "raise-the-bottom" method. The

FIGURE 11



8. Effects caused by denting. Ground warp end and stitching end in the same dent (a). Ground warp end and stitching end in separate dents (b).



9. A stitching warp riser shows on the top surface as a vertical warp fleck (a). A stitching sinker shows as a horizontal weft fleck on the top surface (b).

tie-up variations are given in Fig. 11.

Photos 9a and 9b compare the top surfaces of (a) "raise-the-bottom"

and (b) "drop-the-top." A tan vertical warp fleck shows in 9a. A tan horizontal weft fleck shows in 9b, because it fills in where the warp has been lowered. Thus, the stitching method can be selected to produce either a vertical or horizontal design orientation.

Designing Supplementary Weft "Sewn" Double Cloths

In the example given earlier (Fig. 6), shafts 2 and 3 were used on a fifth pick to "sew" two tabby layers together. That idea can be expanded to include all four shafts in the stitching procedure by alternating with shafts 1 and 4 on the stitching pick. See Fig. 12.

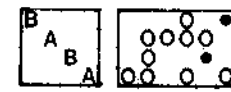


FIGURE 12

sewing pick >

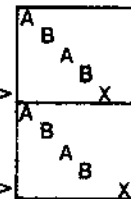
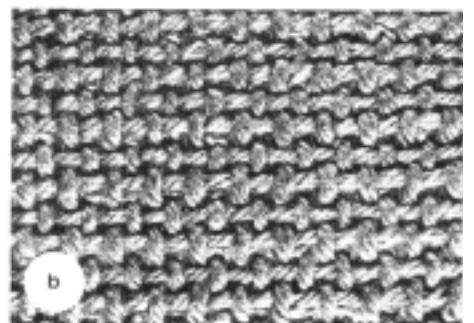
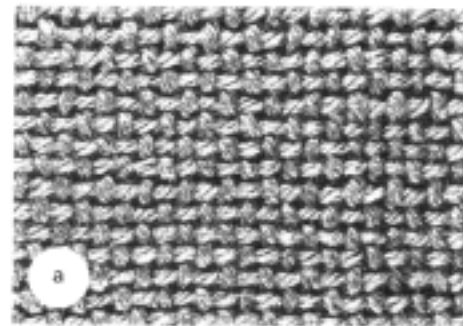


FIGURE 13

sewing pick >

The other optional pair of sewing picks would be tied up as in Fig. 13.

All the options previously discussed for horizontal interlock or the two stitching methods also apply to "sewing"; the firmness of



10. "Sewing" with a supplementary weft can be unobtrusive (a) or emphasized, as a design feature (b).

hand can be changed by varying the frequency of the interlace-ments between layers. By experi-menting with which shafts are used to stitch, and where the stitching pick occurs in the treading sequence, and how the stitching shafts are dented, the sewing can be made more or less *structurally* prominent.

In addition, since any kind of thread can be used for the supple-mentary weft, the sewing can be made *visually* more or less promi-nent. Photo 10a shows a com-pletely unobtrusive sewing. (Hand-sewing thread in a color that matched the top layer was used.) Photo 10b illustrates a more promi-nent structure and thread than 10a. The weave structures in Pho-tos 4a and 10b are exactly the same, but 4a uses a much more prominent sewing pick yarn.

There are two special advantages to this structure:

1. More perfect-looking tabby can be woven on both layers with no distortions because neither warp is being pulled into extra duty by weaving on the opposing surface. (See Photo 10a.)
2. It is possible to sew using all four shafts equally. So this structure would have fewest tension problems on a very long warp.

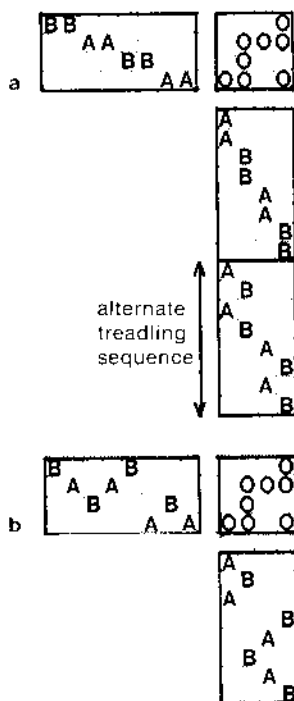
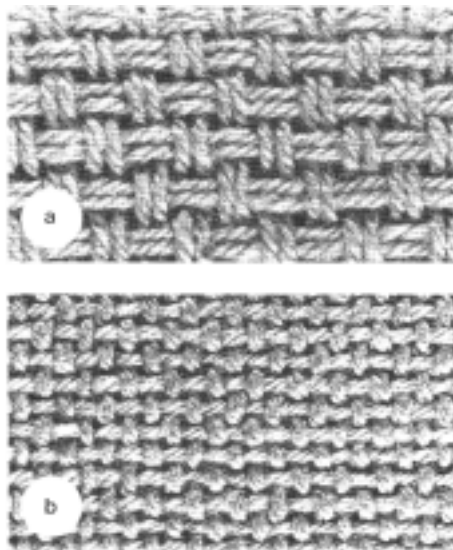
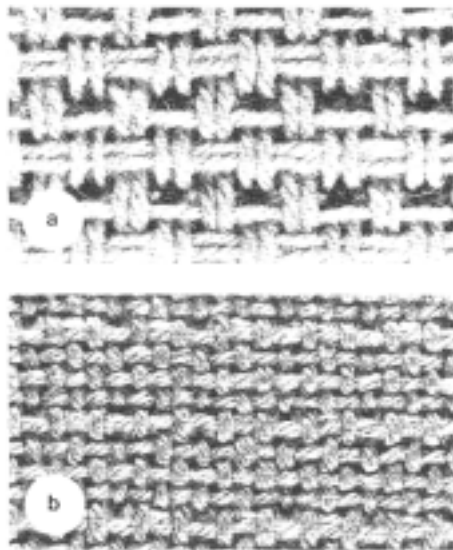


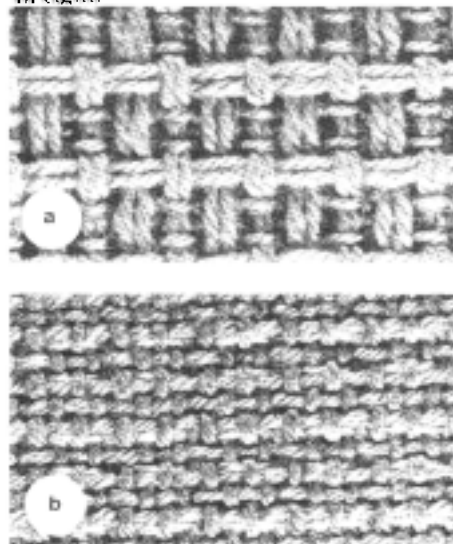
FIGURE 14



11. Top (a) and bottom (b) surfaces of a basket-tabby double weave which was unobtrusively "sewn."



12. Top (a) and bottom (b) surfaces of a basket-tabby double weave which is stitched by raising a bottom warp one pick in eight.



13. Top (a) and bottom (b) surfaces of a basket-tabby double weave which is stitched by raising a bottom warp two picks in eight.

OTHER WEAVE STRUCTURES

All of the variations discussed here have been presented with reference to a tabby/tabby weave structure. All the stitching and sewing options that apply to the tabby/tabby structure also apply to the basket/tabby and basket/basket structures. The drafts for basic unstitched basket/basket and basket/tabby are given in Fig. 14a and 14b.

Photos 11-13 show just some of the structural variations of double woven basket/tabby. Their corresponding drafts are given in Figs. 15-17.

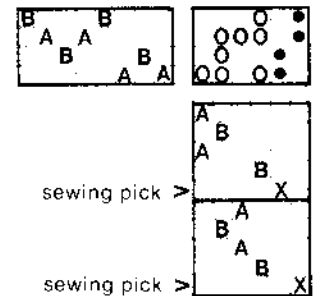


FIGURE 15

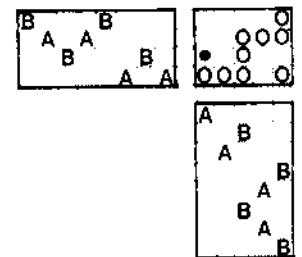


FIGURE 16

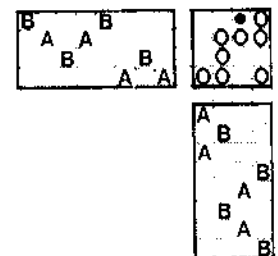


FIGURE 17

As the design options made possible by these structural variations mount up, the creative possibilities and, it is hoped, the enthusiasm for designing original four-shaft double weave textiles also increases. ■

DOUBLE WEAVE PICK-UP WITH STRAIGHT DIAGONAL LINES

by Edith L. Wolter

Double weave pick-up simultaneously weaves two layers of fabric of different colors. A design is created by bringing portions of the lower layer to the top. The corresponding portion of the upper layer is moved to the bottom.

Can you draw a design on graph paper, warp a straight draw (1, 2, 3, 4) and weave a tabby? You can weave double weave pick-up! Have you already woven double weave pick-up? You will enjoy weaving designs with straight, rather than zig-zag, diagonal lines.

Begin a weaving by planning a design on graph paper. A good first project could be pot holders, book-marks or a small hanging. A weavable design includes horizontal, vertical and diagonal lines. The diagonal lines are represented by a stairstep progression on the graph paper (Fig. 1).

Each square on the graph paper represents four warp and four weft threads. Because the graph paper shows only the upper layer of the weaving, each square shows the color of the two warp and the two weft threads on the upper layer. For example, a dark square shows two dark warp and two dark weft threads on the upper layer. It also represents (but does not show) two light warp and two light weft threads on the lower layer.

Yarn selection can be important for double weave pick-up. A smooth yarn, such as cotton, is the easiest to pick-up. With a sticky yarn, such as wool, it may be difficult to have a clear shed. Unfortunate errors may be the result. To have a balanced weave, all yarns should be of the same weight. Two contrasting colors make an effective design.

To calculate the amount of yarn needed for a weaving, plan a warp and weft in plain weave. The yardage calculated will be the

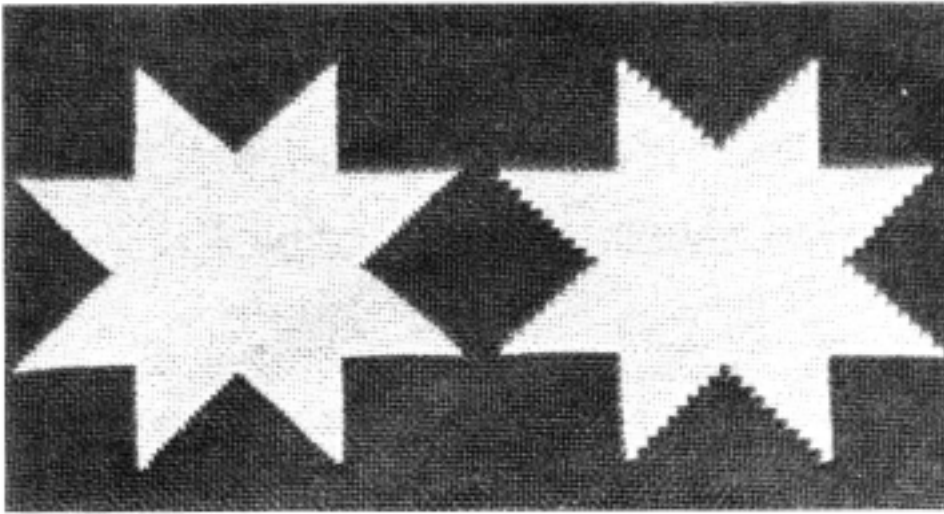
amount needed for *each* of two colors. In other words, twice the quantity of yarn for weaving a single layer of fabric will be required.

Warping for double weave pick-up is a straight draw (1, 2, 3, 4). The sett should be twice the normal ends per inch. A yarn normally set at 10 e.p.i. (40/10 cm) should be set at 20 e.p.i. (80/10 cm) The woven result will be two layers, each with ten warp threads per inch. To be consistent with the weaving instructions which follow, warp a

dark color on shafts 1 and 3 and a light color on shafts 2 and 4.

The weaving of the weft threads will progress smoothly when its leisurely pace is accepted and when the necessary tools are at hand. Two shuttles are needed: one for the dark and one for the light weft. A boat shuttle with a bobbin works well. To prevent tangles in the weft threads and to keep the selvages of the two layers separate, place the shuttle which matches the color of the upper selvedge above the other





shuttle. For example, the sampler (Photo 1) has an upper layer that is dark at the selvages. The first shot is a light shuttle from right to left. The second shot is a dark shuttle from right to left. This dark shuttle, which matches the color of the selvage, should be placed above the light one.

A pick-up stick can easily be made from a quarter-inch (6.4 mm) dowel. Cut it at least two inches (51 mm) wider than the weaving; sharpen both ends in a pencil sharpener, and smooth it with sandpaper. The sharp points make the pick-up fast and easy. The small dowel, when pushed against the reed, allows the opening of a good shed.

Keep the graph paper design handy by the loom. In weaving the weft, the graph paper is read from the bottom to the top. The bottom horizontal row of squares will indicate the design area to be picked-up first.

Finally, a series of cards (Figs. 2 thru 6) with weaving instructions can be attached to the loom as needed. Each card weaves four weft threads: two on the upper layer and two on the lower layer. The completion of the instructions on a card will weave one horizontal row of squares of the graph paper design.

The first card (Fig. 2) will weave a light upper layer. Use these instructions for an area that has no pick-up design, or when the horizontal row of squares on the graph paper is all light.

The second card (Fig. 3) will weave a dark upper layer. Use these instructions for an area that has no pick-up design, or when the horizontal row of squares on the graph paper is all dark.

The third card (Fig. 4) gives the instructions for picking-up a pattern. Let's follow those instructions.

1. Treadle shafts 1 and 3 to lift all the dark threads. The graph paper shows six squares, but remember that each square shows two threads in a layer. Therefore, count *pairs* of threads. Use the pick-up stick to lift pairs 3 and 4 in the center.

2. Keeping the pick-up stick against the reed, treadle shaft 2 and weave a light thread right to left. Remove the pick-up stick.

3. Treadle 2 and 4 to lift all the light threads. Pick up the light areas of the pattern: pairs 1, 2, 5 and 6.

4. Keeping the pick-up stick against the reed, treadle 1 and weave the dark shuttle right to left. Place the dark shuttle below the light one. Remove the pick-up stick.

5. Treadle 1 and 3 to lift the dark threads again. Pick up pairs 3 and 4.

6. Keeping the pick-up stick against the reed, treadle 4 and weave a light weft from left to right. Remove the pick-up stick.

7. Treadle 2 and 4 to lift the light threads again. Pick up pairs 1, 2, 5 and 6.

8. Keeping the pick-up stick against the reed, treadle 3 and weave a dark thread right to left. Place the dark shuttle below the light one. Remove the pick-up stick.

The fourth card (Fig. 5) weaves a straight diagonal line when there is a light area above the diagonal and a dark area below the diagonal. It will weave a diagonal line that moves in either direction: left to right (Fig. 5) or right to left. This card is used with the basic pick-up instructions (Fig. 4) and simply makes two changes.

Let's see how the bottom row of squares is picked up. The first

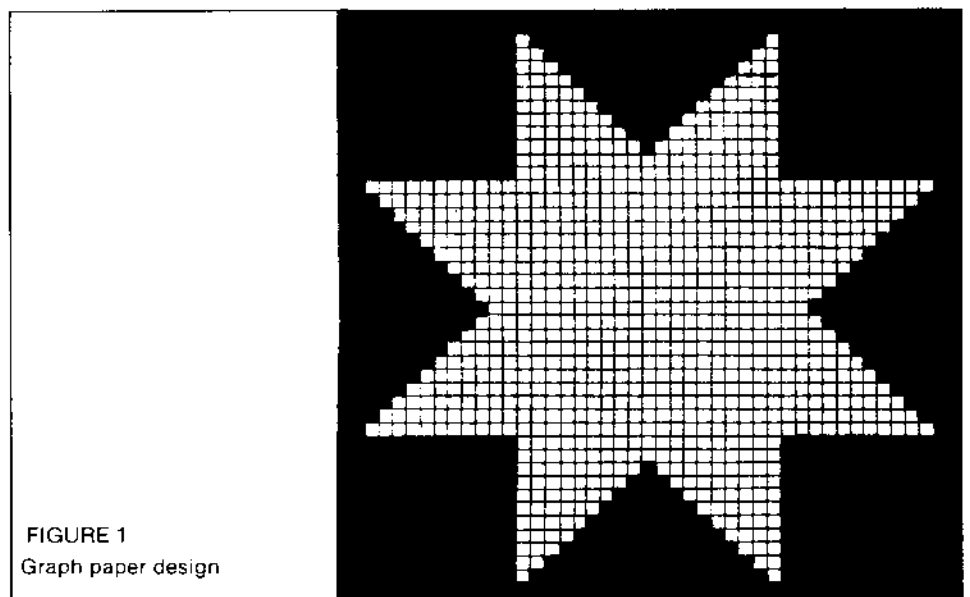


FIGURE 1
Graph paper design

Treadle	Weave
2	light
1-2-4	dark
4	light
2-3-4	dark

Example:

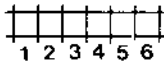


FIGURE 2. Light upper layer

Treadle	Weave
1-2-3	light
1	dark
1-3-4	light
3	dark

Example:

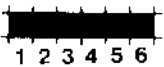


FIGURE 3. Dark upper layer

Treadle	Pick up or weave
1. 1-3	Pick up dark
2. 2	Weave light
3. 2-4	Pick up light
4. 1	Weave dark
5. 1-3	Pick up dark
6. 4	Weave light
7. 2-4	Pick up light
8. 3	Weave dark

Example:

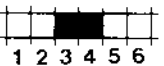


FIGURE 4. Pick-up instructions

In steps 1 and 7 add a single thread to pick-up stick. Example:

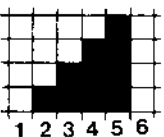


FIGURE 5. Light above diagonal line

In steps 1 and 7 drop a single thread from pick-up stick. Example:

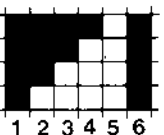
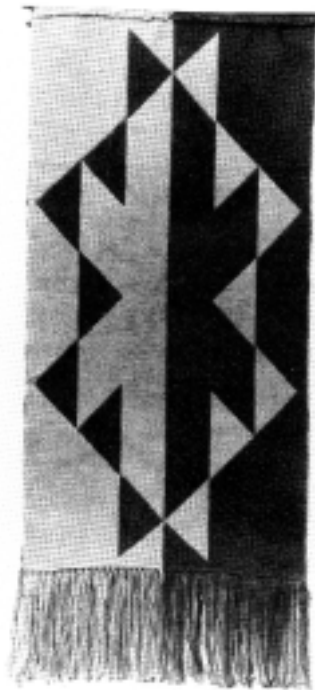


FIGURE 6. Dark above diagonal line



change is in step one which picks up the dark threads. Pick up *pairs* 2, 3, 4 and 5; then pick up a single additional thread adjacent to the angle. ($4\frac{1}{2}$ pairs in the pattern area are picked up.)

The other change is in step seven which picks up the light threads. Pick up pairs 1 and 6; then pick up a single additional thread adjacent to the angle. ($3\frac{1}{2}$ pairs in the pattern area are not picked up.)

The last card (Fig. 6) weaves a straight diagonal line when there is a dark area above the diagonal and a light area below the diagonal. It will also weave a diagonal line that moves in either direction. This card is used with the basic instructions (Fig. 4) and makes two changes.

Let's see how the bottom row of squares is picked up. The first change is in step one which picks up the dark threads. Pick up pairs 1 and 6; then, adjacent to the angle, remove a single thread from the pick-up stick. ($4\frac{1}{2}$ pairs of the pattern area are not picked up.)

The other change is in step seven which picks up light threads. Pick up pairs 2, 3, 4 and 5; then, adjacent to the angle, remove a single thread from the pick-up stick. ($3\frac{1}{2}$ pairs in the pattern area are picked up.)

A little experience will show that the pattern area represents an arithmetical progression. With slash marks indicating rows on the graph paper, the entire triangle (Figs. 5 and 6) progresses in this fashion: $4\frac{1}{2}$, 4, 4, $3\frac{1}{2}$ / $3\frac{1}{2}$, 3, 3, $2\frac{1}{2}$ / $2\frac{1}{2}$, 2, 2, $1\frac{1}{2}$ / $1\frac{1}{2}$, 1, 1, and $\frac{1}{2}$ pairs. This can provide an easily remembered counting system.

With that same experience, a weaver will see the progress of the diagonal line and will see where the pick-up stick belongs. A good way to avoid errors is to pick up the threads that look correct. Then, count to confirm that they actually are correct.

A diagonal line can change from dark over light to light over dark (Fig. 1). When weaving the graph paper row at which the change occurs, drop a thread from the pick-up stick in step one and add a thread to the pick-up stick in step seven. In other words, change instruction cards (Fig. 6 to Fig. 5) in the middle of the sequence.

Sometimes several diagonal lines are woven simultaneously (Photo 2). To prevent confusion, make an instruction card for each angle. Attach these to the loom in the order that they appear on the graph paper.

Now that one project is completed, what's next? Try a small hanging (Photo 2). It is simply a series of triangles which should first be drawn on graph paper. Consider trying a more complicated design, lettering, or a functional weaving. Additional color can be used to create stripes or plaids in one or both layers. The possibilities are endless.

ABOUT THE AUTHOR: Edith Wolter is a graduate of the University of California, Berkeley, a teacher, and the author of several children's books. An advocate of guilds, she considers the Ann Arbor Handweavers' Guild in Michigan the source of her weaving education and is currently President of Silverado Handweavers' Guild in Napa, California. Edith gives guild lectures and workshops but especially enjoys teaching weaving at her daughter's pre-school. Learning loom-controlled weaves is her favorite pastime.

COLOR IN SUMMER AND WINTER

by Philis Alvic

Summer and Winter is a weave structure made up of predominantly warp faced and predominantly weft faced areas. Designing for this structure is done by combining positive blocks and negative blocks. In my work the predominantly warp areas are the positive blocks in the design while the weft becomes the negative or background. The simplest approach to color in Summer and Winter would be to have the warp in a solid color and the weft in a contrasting color. This would produce a strong positive-negative piece closely resembling the paper draw-down of the design. Now, this is something I have never done. It is not because I am adverse to easy solutions, but there are so many interesting ways of working with color in Summer and winter.

Before I begin an accounting of the various ways in which I manipulate color when using Summer and Winter, I want to call your attention to a characteristic of the weave structure. In Summer and Winter neither the warp-faced areas nor the weft-faced areas are exclusively their own color. Each has small flecks of the other area's color. In the warp blocks small dots of the weft color are present and in the weft blocks the tie threads add some of the warp color. Some weavers find this very distracting and put up with it only as a necessary evil of the weave structure. Maybe it is just a difference in attitude, but I like the visual effects of these bits of alien color in the major color area. I feel that it makes a much more interesting surface than a weave structure such as double weave that has exclusive positive and negative color areas. Also, I enjoy the hints of warp stripes always apparent in the weft-faced areas and the linear weft stripes suggesting themselves in the warp blocks. In Summer and

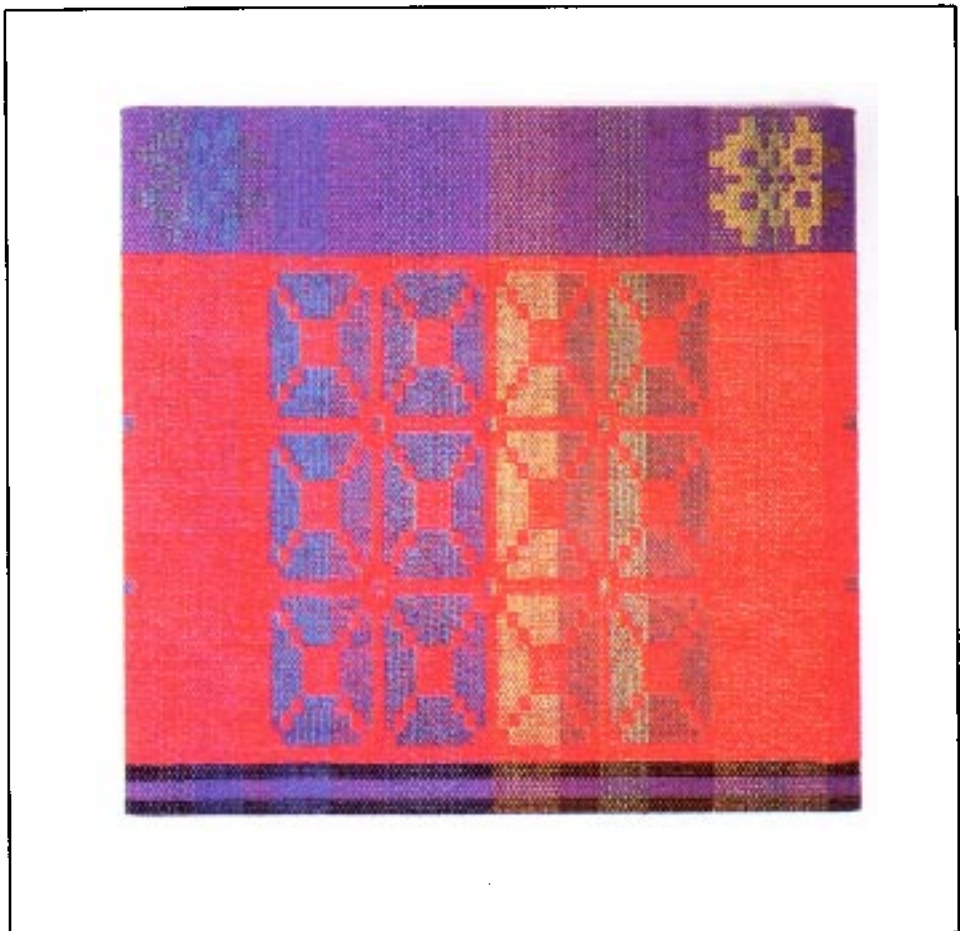
Winter with both warp threads and weft threads visible, the structure is evident. There is no getting away from the fact that the finished piece is made up of many elements interlaced. As an artist who has chosen weaving as my medium, it is important to me that my work look woven and not just something that I could have painted more easily.

In preparing a warp, the weaver has two choices as to color: either a solid color or stripes of different colors. As I have stated before, I have rejected the solid color option. Even within stripes I have rejected the single color as meaning only the same yarn repeated. Within a single color stripe I usually have four yarns repeated to form the width of that stripe. All four yarns

are similar in color, so they read visually as a single color stripe, but in reality they alternate between a smooth and a textured yarn. The smooth yarn is threaded to the tie-down shafts and the textured to the pattern shafts. The textured yarns reveal themselves very nicely in my warp block pattern while the tie threads are kept to a necessary minimum.

There are several ways of handling the striped warp: large color areas, stripes co-ordinated with the design, and stripes random to the design. "Red Dozen" is an example of the large area approach with one-half of the warp blue and the other half green. Within the major divisions I could not resist some variety in color and texture, and therefore let several different blue stripes comprise the blue half and a similar mixture make up the green side. With the two sides of the design symmetrical, the warp color variation becomes a powerful ingredient of the piece.

Gary Schroeder



"Red Dozen", 34" X 34 1/2" woven by Philis Alvic



"Sensible Position", 82" X 41" woven by Philis Alvic

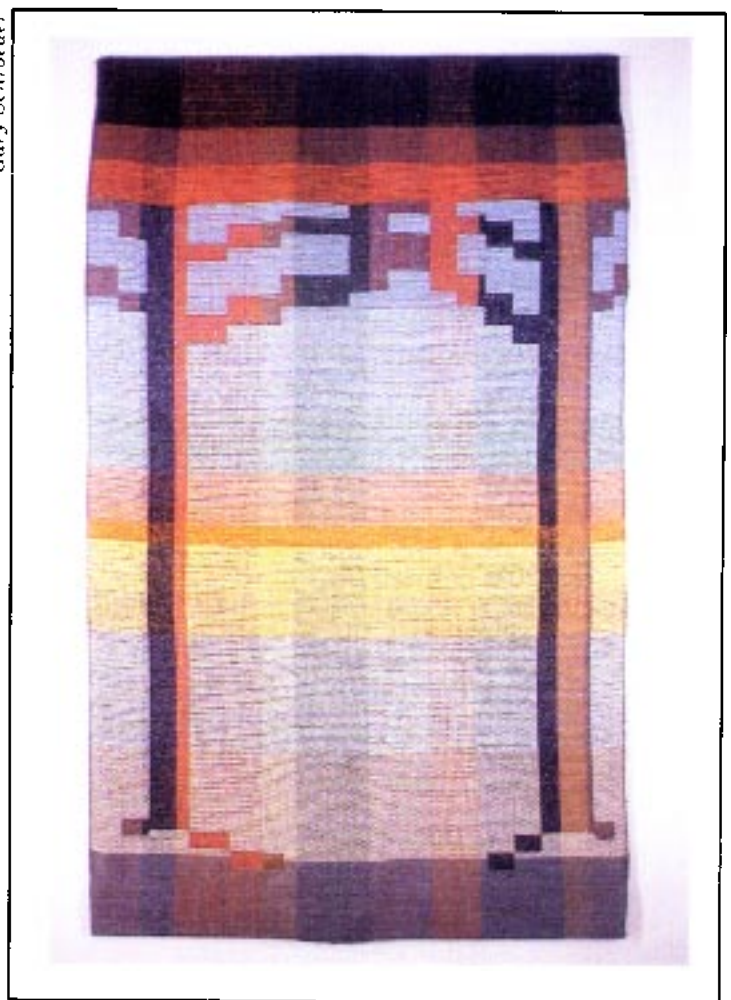
The warp stripes are obviously coordinated with the design in "Sensible Position." Each figure is a different color: orange, pink, or yellow. The vertical border is a separate color warp stripe, too. This technique of using a separate color for each design figure gives individual importance to each item and can have many compositional uses for the artist. In my pieces, I often use the contrasting border that is a warp stripe. Sometimes it is at the true edge of the piece, but more frequently recessed, as in the example shown. There are two reasons for my reliance on the border. First, the artistic reason for it, is that it contains and unifies many sometimes unrelated figures. The second is a practical weaver's explanation; many different textured weft yarns produce an uneven selvage and the strong vertical line on each edge visually helps to straighten the unevenness.

Many different colored black,

brown and dark green stripes are varied at random in regard to the two trees in "Winter's Day Sunset." This was done because I did not want the vertical stripes of the warp to dominate the branching of the tree limbs. As an unexpected bonus, the mixture of colors in the tree trunks gives them sustance. Many very nice visual effects happen with random striping of the warp. I particularly like to use it when I am working with a rigid symmetrical design figure. A word of caution, however. Keep the colors somewhat related to one another, also without strong light-dark contrasts. If there is too much variety in the warp, it will be impossible to choose a weft yarn that produces a distinguishable pattern figure.

Although the warp in any piece is very important and should be thought of as a working partner, the main color manipulation is in the weft. Now, it is considerably

Gary Schroeder



"Winter's Day Sunset", 67" X 40" woven by Philis Alvic

beyond the scope of this small article to delve into the artistic reasons for color selection. But, I will note a few of the ways a weaver can enhance weft color. The most common weft choice for any weaver working in Summer and Winter will be a color that has a great contrast to the warp. It would be very silly to spend hours threading an intricate pattern if the results are so subtle that the figure fades into its ground. Because the weave structure has flecks of the opposing color in both positive and negative areas, there is real danger of shapes melting together if too-similar yarns are chosen. Looking again at the piece "Sensible Position," the weft color is changed and separated by a border stripe for each figure. This is very straightforward, but something happens that gives visual impact to the piece. When the yellow weft stripe crosses the yellow warp stripe, the figure seems to disappear. Of course, the figure is still there and

can be detected when standing close to the piece. Usually it is undesirable to have a figure swallowed up in such a way, but occasionally it can be a valuable tool for emphasis in a piece.

Often in the weft, when I want a single color effect, I will use many small weft stripes of very similar colors. This adds a richness to the surface and also allows me to introduce different textured yarns. It is a technique similar to that of the French impressionist painters modulating color within a single area. There is really quite a wide range of colors that a viewer can look at and still report that the area is red, for example. Mixing random sized weft stripes, similar to the warp striping, of many different reds imparts added interest without disrupting the figure definition. Another technique that has a lot of visual pay-off for almost no work, is to change the color of the tabby thread in different areas of the same piece. Most of us choose the warp color for the tabby, but there is no real reason to limit oneself to a single color. Even two very different colors in the warp and tabby will be mixed optically by the eye when only a short distance from the piece. Variety and vitality can be added to a piece by simply changing the tabby color. Also, it can be used to draw attention to a particular figure. The two orange figures in "Sensible Position," for example, appear to be slightly different colors because the tabby changes from orange to yellow.

In working almost exclusively with Summer and Winter over a six year period, I think that I have discovered many ways of working with color to the best advantage of the weave structure. The flexibility while maintaining control pleases the artist in me, while the weaver that is also a part of me is excited by the wide range of possibilities. In all likelihood, the balance of my creative work over the next several years will continue to be produced in Summer and Winter. ■

ENJOY THREADING YOUR LOOM

by Clotilde Barrett

Warp faced rep at 60 epi! Double weave at 40 epi! Supplementary warp weave at 48 epi! Oh no!

Unfortunately many weavers look at 60, 40, 48 epi and get discouraged before starting. The reason is that they have never developed a pleasant, relaxing, foolproof way of threading.

It does not matter whether you beam your warp first and draw from back to front or if you sley first and draw from front to back. The technique described here is valid for both.

If you have flat steel heddles it is important that the crimped heddle bar slot is on top (see Fig. 1). If you have bought a second-hand loom or if someone else has disturbed the heddles of your loom, do take time off to restring your heddles so that they *all* have the crimped slot on top.

If you have wire heddles, check the twist of the eye. Ideally they should all go in the same direction as shown in Fig. 2. This may be hard to check and difficult to do. With fine wire heddles it is not quite as disastrous if they all are not lined up.

Thread from left to right, whether you sit in front or behind the loom.

If you have sleyed first, you will pick the warp threads from the reed. If you have beamed first you will pick from a set of lease sticks. Keep the device from which you pick the threads close to the heddles. The reed should rest against the castle, the lease sticks should hang from the castle or otherwise be propped up so that they are right behind and close to the eyes of the heddles (see Fig. 3).

Choose the right kind of threading (heddle) hook. Mine is 8" (20.3 cm) long and I use it to thread 2 to 20 shafts. The hook is shown in Fig. 4. If necessary, use a file to get this shape.

Take time off to search for a comfortable sitting position. Find the right kind of stool, disassemble some parts of the loom so that you can reach the shafts more easily, prop up the shafts with sticks and cords if necessary. You will not find all the best solutions the first time around, but with each warp this process will be faster and new tricks will be learned. Do not start threading until you have found the optimum position.

Thread *one* warp thread into a heddle close to you so that the free end that hangs out the heddle is 8" long. Adjust the warp beam ratchet so that no more warp is fed than to give this 8" excess. Or, if you work from front to back, tie the warp chains to the breast beam for the same purpose.

Loosen all the heddle bar supports and slide all the heddles to the right. If you are threading the full width of the loom, count the heddles exactly with two or three to spare. If you are threading a partial width, make sure the number of heddles is sufficient. The excess heddles may be left on the shaft and divided equally to the left and to the right.

Study the threading draft and note repeats or part of repeats that you can remember. The overshot of Fig. 5 could be divided as shown. Note the number of heddles on each shaft for each threading group. Group A has 2 heddles on S1 and one on S2.

For group A, with your left hand, pick two heddles of S1 and one of S2. Move them to the left. With your right hand reach between the 3 isolated heddles and the others and take a small bundle (1" or 25 mm worth) of warp threads. The right hand holds the threading hook between thumb and index and the bundle of warp threads between index and middle finger. If the threading is complex and the number of threads in the threading group is large, count off the correct number of warp threads and hold only these in the right hand.

With the left hand reach to the left of the isolated heddles and at the reed or the cross pick the first warp thread. Pull it out of the bundle which is held by the right hand and hold it taut. The right hand inserts the heddle hook in the eye of the appropriate heddle, hooks the isolated thread and pulls it through. Move the threaded heddle further to the left. Repeat for all other warp threads of the threading group. When a repeat is threaded, count

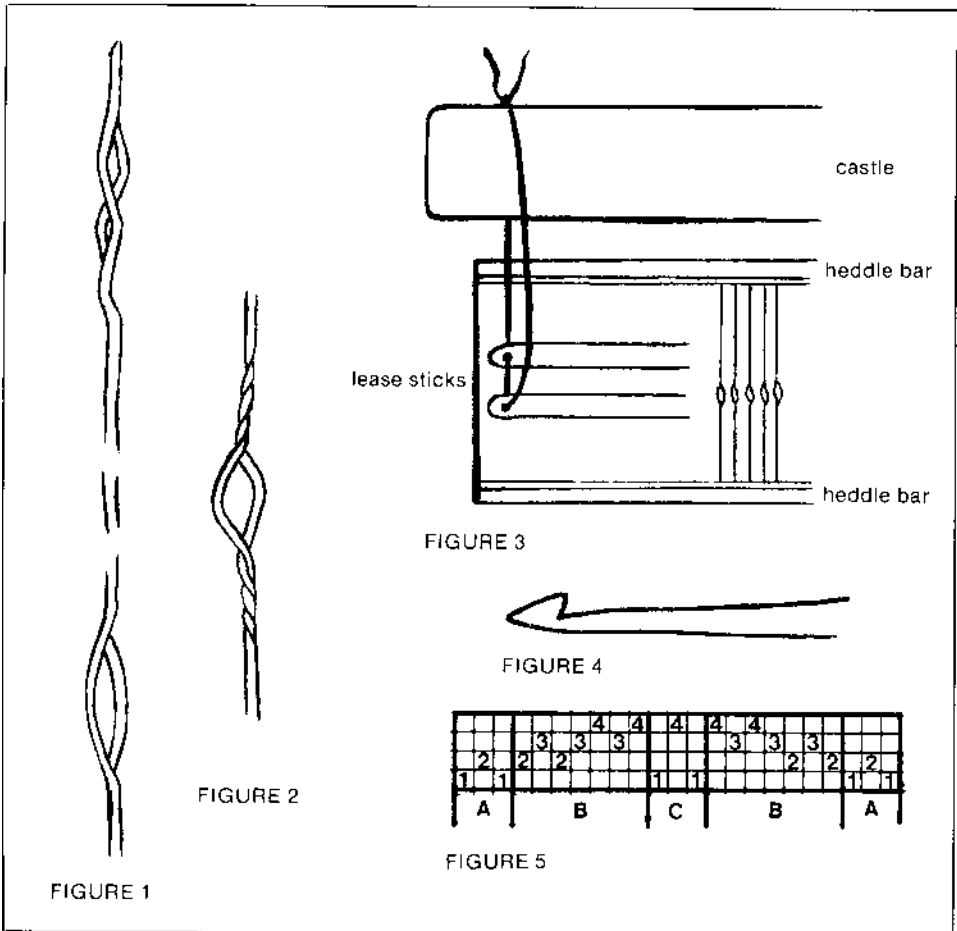
the warp threads for a last check and tie them with a slip knot. Note the position of the heddle bar supports. When you have threaded enough inches to reach one of the supports, secure the heddle bar to its support and continue threading.

There is no need to check or recount after the threading is completed. Continue dressing the loom. Tie on loosely to the apron rod and treadle plain weave (if possible). Plain weave will show the errors best.

If the shed is not clear there is a crossover of warp threads between the heddles and the reed. Take both warp threads out of the reed and adjust them.

If there is a threading error it is likely to be a minor one such as a simple interchange. With a little practice this method will prove to be entirely error free.

All this may take a little time to adjust to but, believe me, it is well worth it. Soon you will enjoy threading your loom and listen to music while you do it. ■



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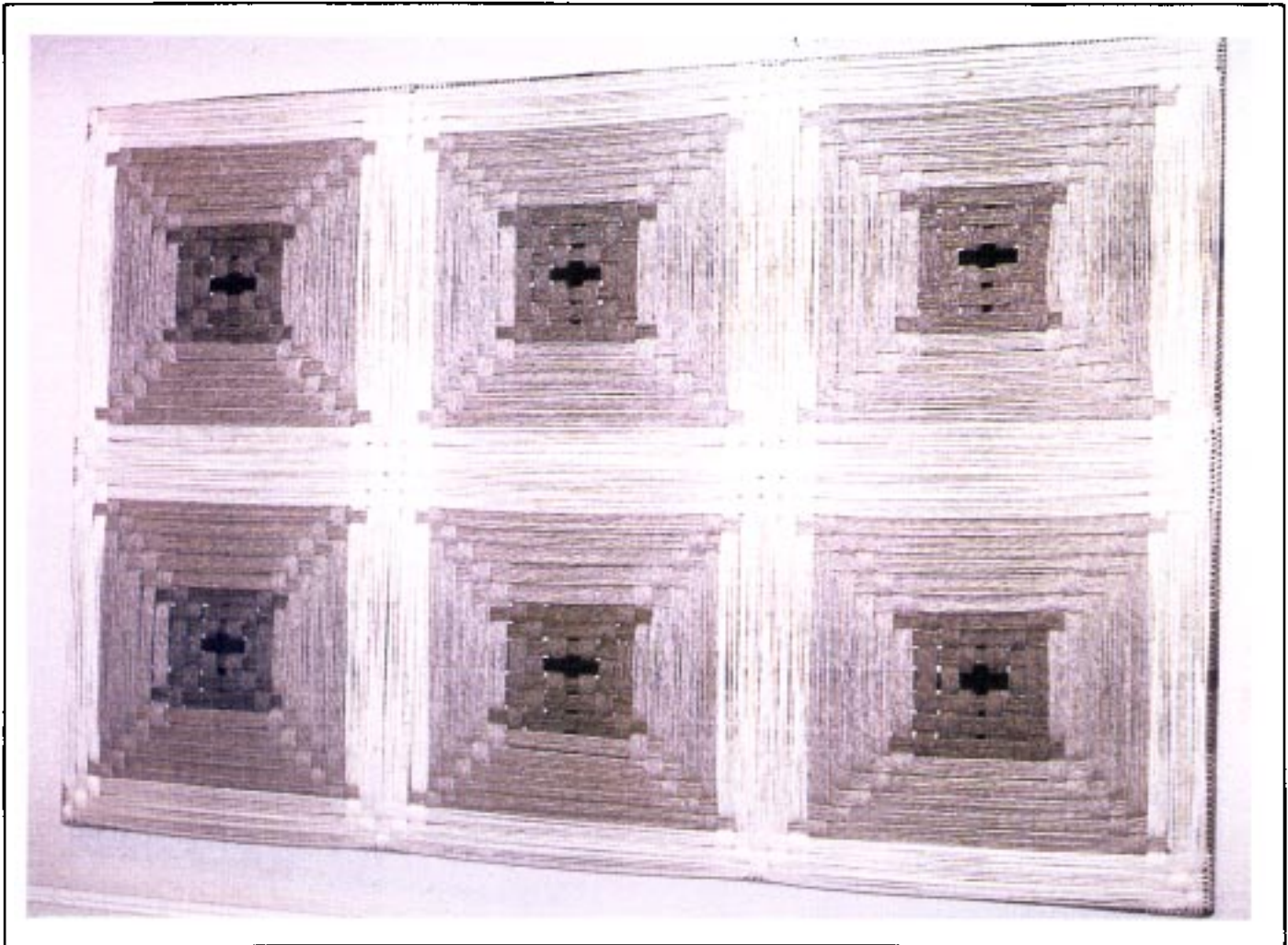
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ENLARGED PATTERNS: A FRESH LOOK AT OLD TECHNIQUES

by Patricia Polett McClelland

Ted Casselman



2. "Varying Shades of Grey", 12 shaft waffle weave, 43" X 65". Collection of the Art Bank of Nova Scotia.

For some time now, weavers have been isolating and exploding single-pattern repeats of overshot, often with stunning effect. Indeed, much of the 'Op Art' of the 60's shows a relationship to such loom woven patterns, whether or not the artist was aware of this technicality.

So may other weaves be enlarged. I have had success with multiple-shaft waffle weave and eight-shaft twills, as well as with Dukagång. Mounted on wooden stretchers so no frame is showing, they are easily shipped and hang as paintings.

For the waffle weaves, heavy (5ply) wool was used, set at 4 or 5 threads to the inch (15 or 20/10 cm). The heavier the yarn and the fewer threads to the inch, the greater the depth of the 'cell'. Threads must be sett for a 50/50 weave, so yarns touch snugly where they intersect—otherwise a sleazy, see-through fabric will result, and the wall or support will show through the work. This is one case where the fabric should be measured under tension on the loom, because it will be stretched tight for hanging. Once cut from the loom it collapses, and it is difficult to estimate the

size of the stretcher required. The deep cells can give an interesting kinetic effect. In one case I used shades of brilliant blue for the cell structure, with a single bright orange in the center of the cell, at the pivot. Viewed straight on, the effect is dazzling—viewed from the side, the orange is not visible, but appears as one walks across in front of the piece (Photo 1).

A plain-weave border on all four sides is the best device I have found for mounting. This is simply wrapped around the stretcher and stapled to the back. There are two

ways to achieve this:

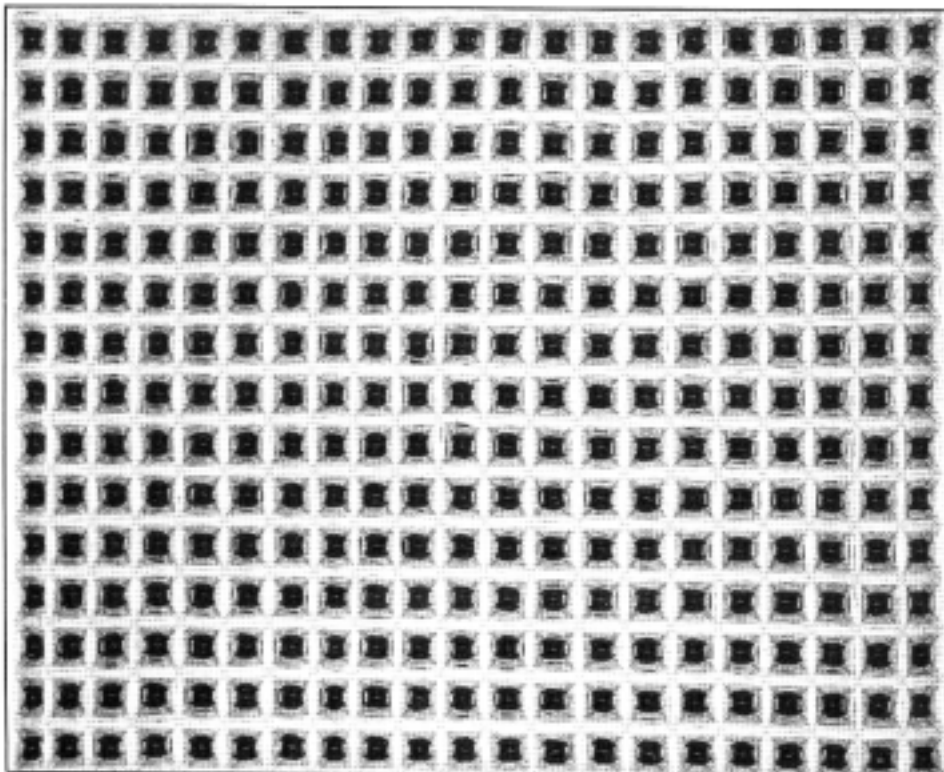
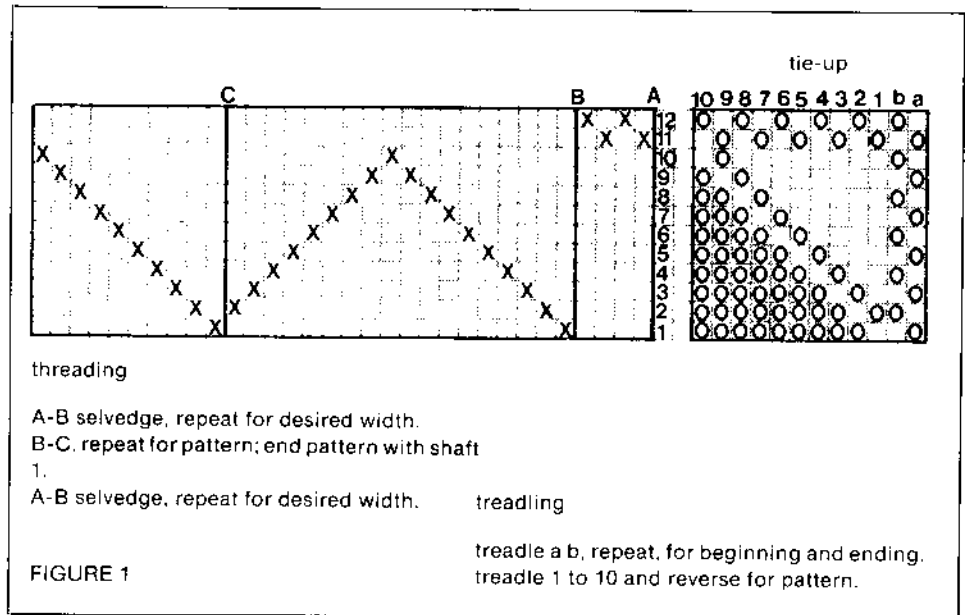
1. If you wish to utilize all shafts available to get the greatest depth possible, the edge threads are sleyed but not threaded, and picked up by hand. I use at least two inches of warp at each edge for the pattern. For the heading, weave plain in the following manner: depress a tabby treadle, using pick-up stick or fingers to lift every other thread on the leading edge. Throw the shuttle as far as possible on the other edge, pick up every other thread at the outer edge and pass the shuttle to the far selvedge. Weave plain weave in this manner for 2 to 2½ inches (51 to 64 mm) treadle pattern, maintaining plain weave edges, then finish off 2 to 2½ inch tabby at the end of the piece.

This is slower than totally loom-controlled weaving but it is surprising how quickly the over one—under one rhythm is established. Bear in mind that you are weaving an art piece and not yardage, and the slower pace is well rewarded.

2. If you wish to reserve two shafts for the plain weave border, speed is increased, but the potential depth is lessened. Thread the selvedge edges (again, approximately 2 inches wide) on the two reserved shafts, pattern as required, then 2 inches plain again. To weave plain weave automatically on the side

edges together with the pattern, simply alternate selvedge shafts on pattern treadles (see Fig. 1).

Fig. 1 illustrates a 10-shaft waffle on a 12-shaft loom, with loom-controlled border. These waffle effects are best done on 8 or more shafts.



1. "Waffle 315", 10 shaft waffle weave, 42" X 50"

In Varying Shades of Grey (Photo 2), I took the experiment one step further, making each 'thread' one inch (25.4 mm) wide, so that I was designing with inches instead of threads, on a one-to-one ratio. To achieve this, I threaded each shaft the number of threads per inch—e.g. 11111, 22222, 33333, etc. Because of the length of skips and the force of gravity, this piece had to be stretched very tightly, so that the long skips were as sag-resistant as possible. Due to the tight mounting and the width of the units, the piece is very shallow—depth was sacrificed to the large pattern units.

These pieces are dramatic whether done in monochromes or using vivid color combinations. I have done wall pieces ranging up to 4 ft (1.2 m) square, and 4 by 5½ ft. (1.2 X 1.7 m). They have been shown in art galleries and are included in public and private collections.



Ted Casselman

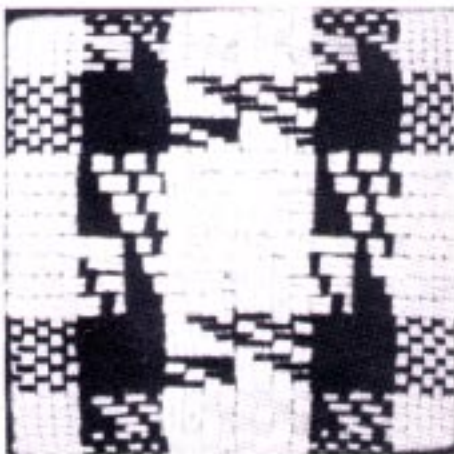
6. "Wave", Dukagång weave, two pieces total 4' X 8', linen and wool.

A series of isolated patterns in 8-shaft twill was titled 'Punctuation'. A repeat and a half were used. The plain weave surround is achieved with either of the methods described for waffle. This plain-weave edge can be as wide as desired, and used on the surface to emphasize the twill texture, as well as for mounting. My work was in black and white, the white being a textured yarn. As a 50/50 balance is desired the yarns must be similar in weight—several strands of one can be used, if necessary (Photos 3, 4, 5).

The Scandinavian Dukagång

technique is a 4-shaft weave that also lends itself to enlargement, and can have satisfying results. The pieces shown here (photos 6, 7, 8) used a heavy 2-ply linen warp set at 8 threads to the inch (30/100 m), threaded double (11, 22, 33, 44 etc). In this way the treadle depressing shafts 1, 2, 3 gave me shaft 4 raised at half-inch (12.7 mm) intervals, so the pattern skip is approximately one-half inch wide. The plain border for mounting is simple and automatically woven. Set the warp 4 to 5 inches (10 to 12.7 cm) wider than the desired pattern weave a plain heading, then start counting the squares of the pattern diagram

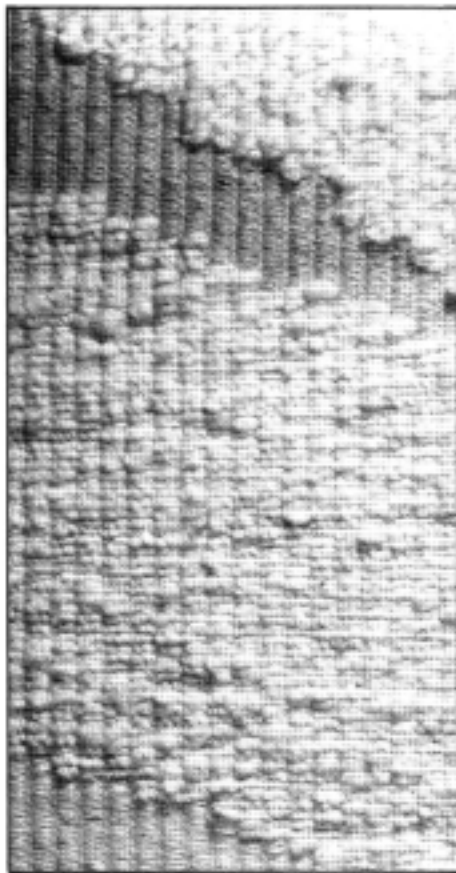
2 to 2½ inches in from the edge. I used textured and smooth yarns for my pattern inlay (some single, some doubled or tripled to adjust size) and two strands medium weight wool for tabby. This is an excellent technique for highlighting wonderfully textured yarns, as they are laid on the surface and the tie down thread, if of a blending color, is quite unobtrusive. I drew the flowing patterns on brown paper first, then transferred them to graph paper. Detailed designs are best left to other techniques, but, at a half inch (12.7 mm) per square, large areas are easily and quickly woven.



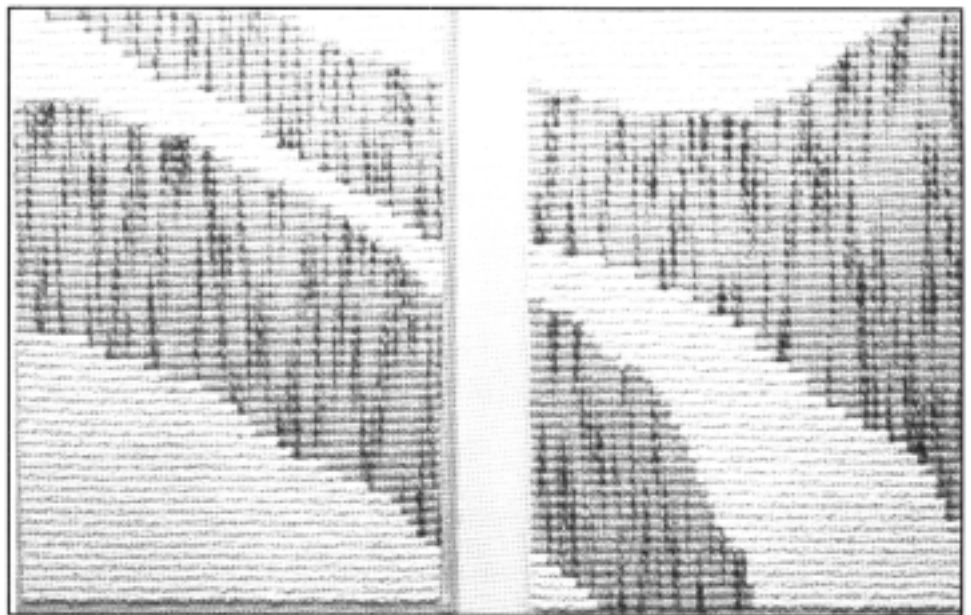
Peter Barss

3, 4 and 5. "Punctuation" Series, 8 shaft twill, 12" X 12" each.

Ted Casselman



7. "Wave" detail



8. "Stria I and II". Dukagång turned 90°, each 2' X 4'

One of these enlarged Dukagång pieces hangs in a Nova Scotia law office, another is in a corporate collection in Alberta, and several are in private collections. As the waffle weave is taken beyond its use for weaving dishcloths, so are these

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TABLE TAPESTRIES

by Clotilde Barrett

I grew up in Belgium where the dining table was one of the most imposing pieces of furniture in the home. It was seldom used to eat on and was reserved for special occasions. It stood, in all its heavy carved oak splendor, in the center of the parlor, surrounded by six straight-backed chairs. Only very important people were invited to sit around the table, either during social calls or for serious discussions.

Although the parlor was the darkest room of the house, it was never gloomy. What brought life and brightness to it was the colorful cloth table cover which seldom was removed. I call it a tapestry because of its charm and aesthetic impact. It could be lace, crochet, embroidered or woven cloth. The centerpiece was usually a vase or bowl overflowing with fresh or dried flower arrangements. This display always reflected the best efforts of the family.

The memories of those colorful textiles have always been dear to me. In our new condo-style living, I have revived the custom of using table tapestries and found it extremely handy. Outside of the meal hours a handwoven cloth covers up the "easy-wipe" synthetic cloth on which we eat. It is practical and very decorative.

The tapestry shown covers a 44" x 60" (111 x 152 cm) table, is all wool and the design is entirely loom controlled. Few weavers would have the equipment to duplicate it. It requires 56" (142 cm) of weaving width, 14 shafts and 24 treadles. It sounds like this is only for doobby owners. Not so: I wove it with 20 treadles but had to retie 4 of them after each 8"-10". Also, this type of loom-controlled patterning can be done just as effectively on an 8-shaft point twill threading as in

the pillows of Photo 2 or on 4-shaft rosepath. With a narrower loom, the cloth will have to be woven in strips or as folded cloth in a double-weave rosepath which requires 8 shafts.

All of the yarns for this project are from Brown Sheep Co. For more information on these yarns refer to "Product Reviews".

Warp: Single, tightly spun wool (1600 yds/lb.), natural grey. 1½ lbs. (681 g) are needed.

Weft: Wool singles (1200 yds/lb. or 2418 m/kg) Approximately 1½ lbs. (681 g) each of dk red (#235), red (#233), lt orange (#231); 1 lb each of orange (#232), beige (#230); ½ lb. of teal blue (#310).

tabby weft: Beige and lt orange used single.

pattern weft: Yarns used two-fold.

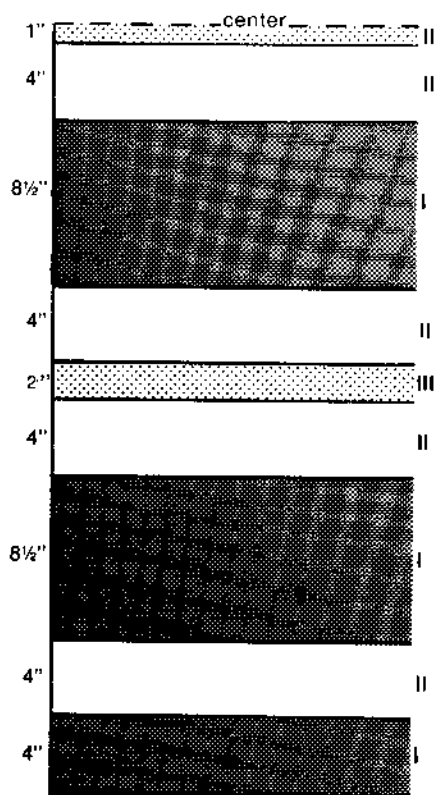


FIGURE 1

14-SHAFT—20-24 TREADLES

Sett: 10 epi (40/10 cm).

Width in the reed: 56" (140 cm).

Length of the warp: 3½ yards (3.2 m).

Threading: 14-shaft straight draw.

Weaving instructions: Alternate a tabby pick and a pattern pick. See Fig. 1.

Band 1—light orange tabby, dark red pattern. See Fig. 2 for the treadling of the pattern picks. Treadle 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and repeat.

	a	b	1	2	3	4	5	6	7	8	9	10	11	12
14														
13														
12														
11														
10														
9														
8														
7														
6														
5														
4														
3														
2														
1														

FIGURE 2

Band 2—beige tabby; pattern picks in red, orange and blue. See Fig. 3 for the tie-up of the pattern picks. Treadle 10 (6X) with orange; tr 1, tr 2, tr 3, tr 4, tr 5, tr 6, tr 7, tr 8, tr 9, tr 6, tr 5 with red; tr 4 (3X) with blue; tr 5, tr 6, tr 9, tr 8, tr 7, tr 6, tr 5, tr 4, tr 3, tr 2, tr 1 with red; tr 10 (6X) with orange.

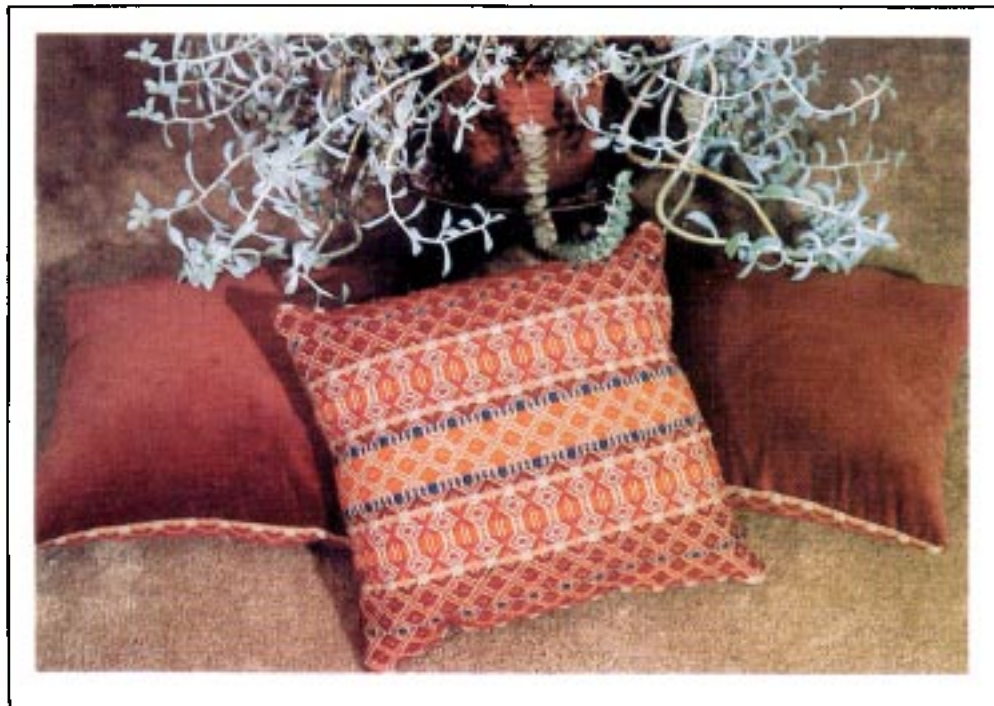
	a	b	1	2	3	4	5	6	7	8	9	10
14												
13												
12												
11												
10												
9												
8												
7												
6												
5												
4												
3												
2												
1												

FIGURE 3

Band 3—beige tabby; pattern picks in red, and blue. See Fig. 3 for the tie-up of the pattern picks. Treadle 1, tr 2, tr 3, tr 4, tr 5, tr 6, tr 7, tr 8, tr 9, tr 6, tr 5, tr 4, with red; tr 5 (4X) with blue; tr 4, tr 5, tr 6, tr 9, tr 8, tr 7, tr 6, tr 5, tr 4, tr 3, tr 2, tr 1 with red.



1. Table tapestry by Clotilde Barrett



2. Pillows by Clotilde Barrett



Detail

8-SHAFT—10-12 TREADLES

On an 8-shaft loom the threading is a point twill (see Fig. 4). Bands 2 and 3 of the table tapestry may be woven as before but use the tie-up of Fig. 4 instead of Fig. 3.

The patterns of the pillow only require 10 treadles: a, b and 1 through 8 of Fig. 4.

Band a—light orange tabby; pattern picks in beige, dk red and blue. Treadle 6 (3X) with beige; tr 1, tr 2, tr 3, tr 4, tr 5, tr 6, tr 7, tr 8, tr 7, tr 6, tr 5, tr 4, tr 3, tr 2, tr 1, tr 2, tr 3, tr 4 with dk. red; tr 5 (2X) with blue; weave the 18 dk red picks in reverse order; tr 6 (3X) beige.

Band b—beige tabby; pattern picks in orange and red. Tr 1, tr 2, tr 3, tr 4, tr 5, tr 4, tr 2, tr 1 with red, tr 1 (3X) with orange; repeat the 9 red picks.

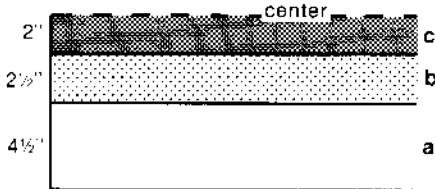


FIGURE 5



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										a	b	1	2	3	4	5	6	7	8	9	10	
							8					8	0	0			0	0	0			
						6	7	7				7	0	0			0	0	0	0	0	0
					5							6	0	0			0	0	0	0	0	0
				4								5	0			0	0	0	0	0	0	0
			3									4	0	0	0	0	0	0	0	0	0	0
			2									3	0	0	0	0	0	0	0	0	0	0
			1									2	0	0	0	0	0	0	0	0	0	0
												1	0	0	0	0	0	0	0	0	0	0

FIGURE 4

← repeat →

Band c—beige tabby; pattern picks in beige, dk red, blue and orange. Treadle 6 (3X) with beige, tr 1, tr 2, tr 4 with dk red, tr 5 (4X) with blue; tr 6, tr 7, tr 8, tr 7, tr 6, tr 5, tr 4, tr 3, tr 2, tr 1 with orange. Tr 1 weaves the

center pick. Reverse the treadling sequence.

These bands may be extended, modified and repeated for the designs of table tapestries. ■

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PLAITED TWILLS

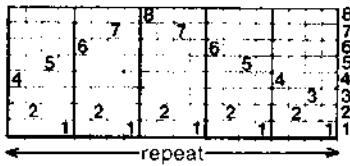


FIGURE 1

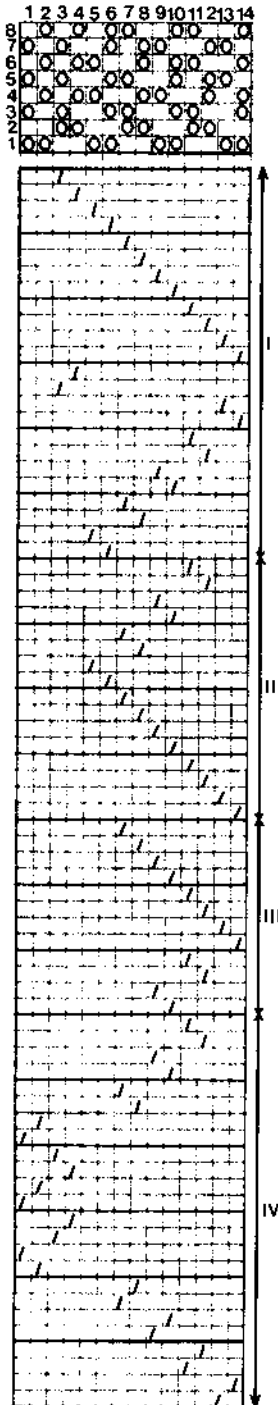


FIGURE 2

Plaited twills are a type of fancy twill in which the twill lines seem to interlace. Numerous examples are found in the pattern book of industrial weaving designers. Usually these weaves are threaded on a straight draw and require a very high number of shafts.

From the research by Eunice Smith on weave structures that can be woven on two-tie twill threadings it became evident that many beautiful plaited twills could be woven on this threading on a greatly reduced number of shafts. The projects shown here are woven on an 8-shaft loom and require 8 to 12 treadles. The structure is basically a 2/2 twill but at various points the twill lines take off in opposite directions to give the plaited effect.

SAMPLER OF UPHOLSTERY FABRICS

These samples of upholstery fabric are woven with Rana Yarn from Scantex. For more information on these refer to the "Product Reviews".

Warp: Rangarn #85 (blue).

Weft: Rangarn #17 (brown), #84 (red); #86 (teal); 1 skein of each.

Width in the reed: 16" (40 cm).

Length of the warp: 5 yards (4.6 m, 3½ skeins of Rangarn).

Sett: 20 epi (80/10 cm) in a 10 dent reed.

Total number of ends: 320.

No floating selvedge is used. Experiment by starting at the right and at the left and see which one gives the better selvedge.

Threading: See Fig. 1; repeat 16 times.

SAMPLE 1: Brown weft, tie-up and treadling: see Fig. 2, I

SAMPLE 2: Teal weft; tie-up and treadling: see Fig. 3.

SAMPLE 3: Brown weft; tie-up and treadling: see Fig. 4.

SAMPLE 4: Red weft; tie-up and treadling: see Fig. 5.

SAMPLE 5: Teal weft; tie-up and treadling: see Fig. 2, II.

SAMPLE 6: Brown weft; tie-up and treadling: see Fig. 2, III.

SAMPLE 7: Brown weft; tie-up and treadling: see Fig. 2, IV.

The fabric does not change appreciably after washing.

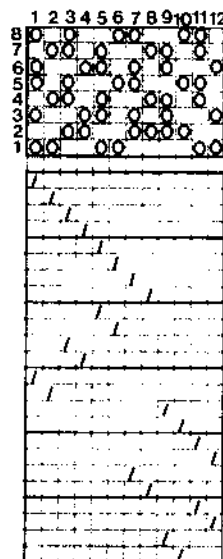


FIGURE 3

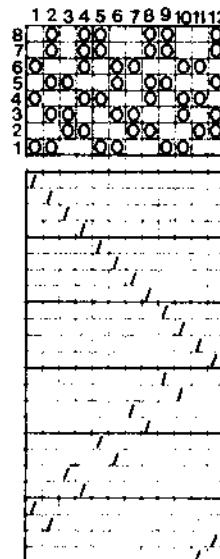


FIGURE 4

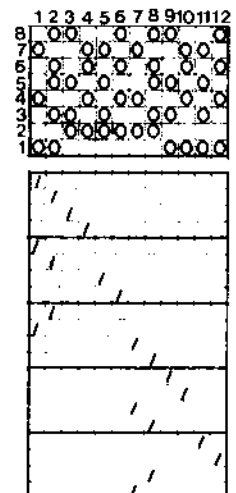
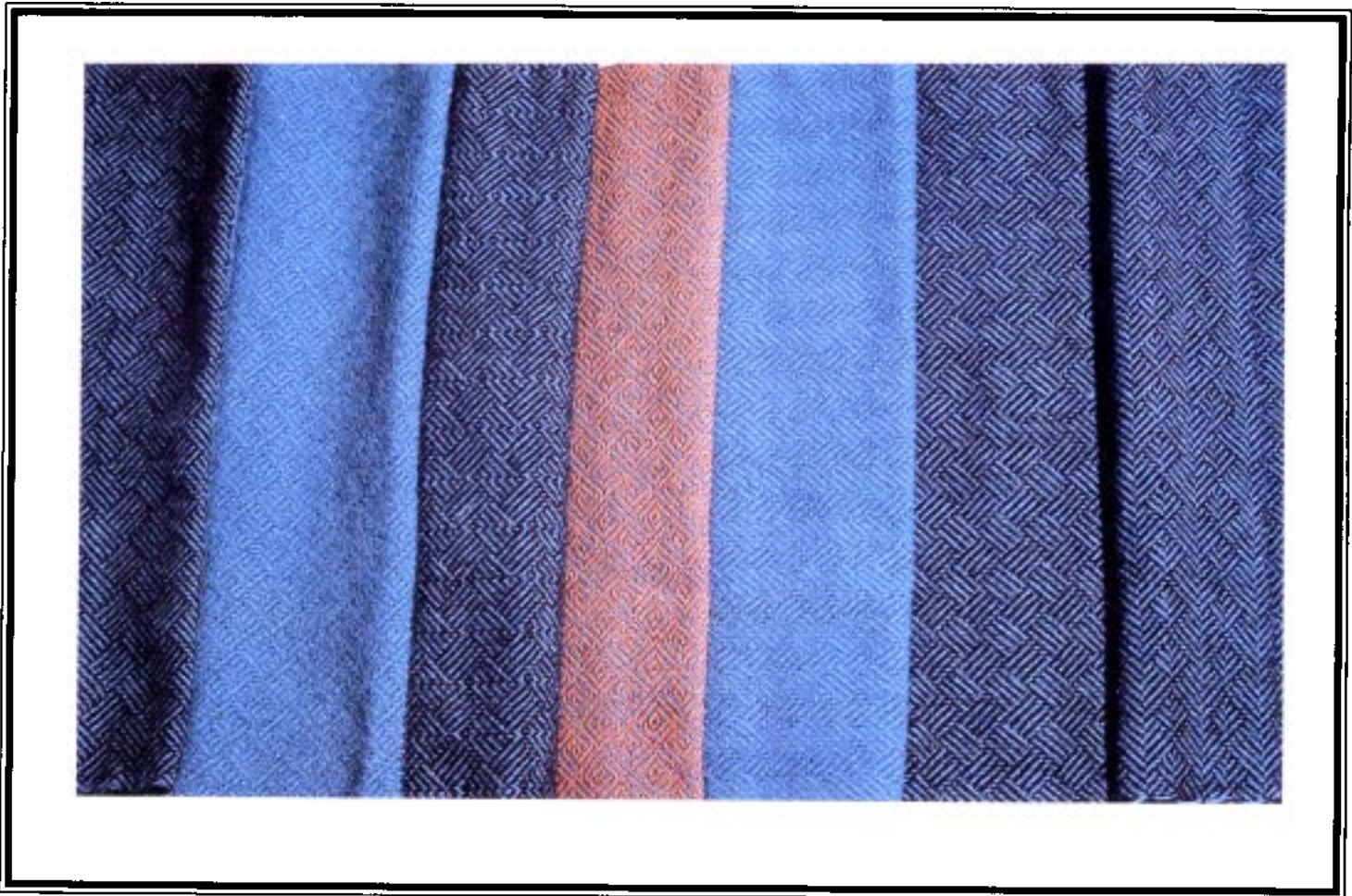


FIGURE 5



Upholstery fabrics: sample 1 left, to sample 7 right.

LINEN TOWELS

The linen towels are woven with Frederick Fawcett linens. For more information on these yarns refer to "Product Reviews".

Warp: Dry spun line in nickel grey (1 spool), tan (½ spool), white (¼ spool), size 8/1.

Color arrangement of the warp:

W	6	6	6	6	6	6	6	6	
T		14		6			14		
G	20		14			40			56

center

Weft: 8/1 white tow

Width in the reed: 20" (51 cm)

Threading: See Fig. 1. Do not balance the threading; start shuttle on the side where threading begins.

Tie-up and treading: See Fig. 2 II.

Length of the warp: 4 yards for four towels.

Finishing: Hemstitching on the loom with 2 ply line linen. ■



Linen towels

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A good baby blanket is soft, smooth, machine washable, non-allergenic and does not shed any loose fibers. For such a blanket 100% pure soft spun cotton is ideal. For information on the Lily Baby Yarn used for this project, refer to "Product Reviews".

After a few experiments with twill it was decided that a plain weave gave the most satisfying result: firm but supple and without floats which could hook on things.

Warp: 100% cotton in two colors (Lily Baby Yarn, article 950 #11 yellow, #60 baby green)

Weft: Same as warp.

Yarn requirements: 12 skeins of green and 12 skeins of yellow are sufficient for 2 blankets.

Sett: 10 epi (40/10 cm).

Width in the reed: 40" (100 cm).

Color order of the warp:

G	3	1	5	1	8	1	5	1	3		
Y	1	13	2	2	1	2	2	1	2	2	14

← repeat 55 ends 7 times →

Total number of warp ends: 400.

Threading, tie-up and treadling: Plain weave.

Color order of the weft: Same as warp. Carry the second color along with the outer selvage thread.

Length on the loom: 48" (122 cm).

Size off the loom: 37½" (W) X 43" (L) (95 X 109 cm) + fringe.

Size after machine washing and drying: 34½" (W) X 39½" (L) (88 X 100 cm). ■



Rug of dyed cotton yarns by Gilbert Wright

This rug, based on an orange-peel pattern, is, except for color, a modern version of a bedroom rug woven more than fifty years ago. The original, from a historic house in southern Maryland, had become frayed and Gilbert Wright, a weaver in Silver Spring, Maryland, was asked to study the fabric and weave a replacement. Thick (4-ply) cotton yarn (mop yarn) was used for weft; ordinary carpet warp was used for both warp and tabby.

Today's fiber-reactive dyes, combining chemically as they do with cotton fiber molecules, produce more brilliant shades of color than dyes available to weavers a generation ago, making these items suitable for wall hangings as well as rugs in modern homes. On the same threading draft, using different treading sequences, one can produce an endless number of designs.

Warp: Carpet warp (8/4 cotton). This yarn comes in many colors.

Weft

tabby: Same as warp.

pattern: Thick (4 ply) cotton known as mop cotton.

Yarn and dye requirements: Two 800 yard (732 m) tubes (1/2 lb. (227 g) size) carpet warp; two hundred yards (183 m) of thick cotton; three tins of DYLON cold dye*.

Sett: 15 epi (60/10 cm) in a 15 dent reed.

Threading: See Fig. 1.

Thread A to B for right border, thread B to C and reverse (C to B) for first full repeat, thread B to C and reverse (C to B) for second full repeat, thread B to A for left border. Double the last two warp ends on each side; add a floating selvedge.

Total number of warp ends: 363, includes 8 selvedge threads.

TREADLING: Alternate a tabby pick and a pattern pick.

Treading sequence for the pattern picks:

- Block A 2X
- C 2X
- D 2X
- A 2X
- B 3X
- C 3X
- D 3X
- A 3X
- C 1X
- A 3X
- C 1X
- A 3X
- C 1X
- A 2X - reverse

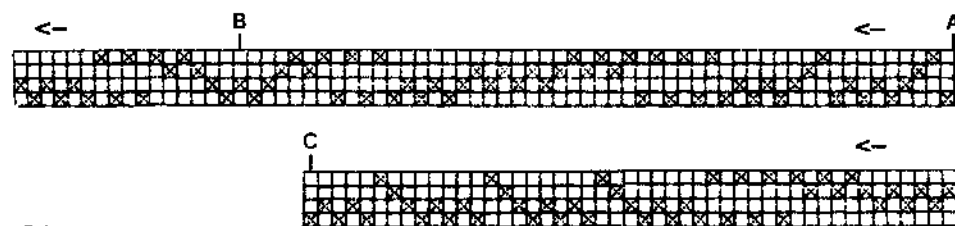
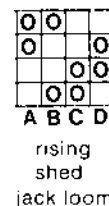
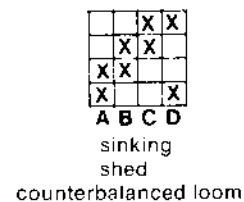


FIGURE 1

This treading sequence comprises one repeat. The finished rug consists of eight repeats. Weave six picks plain weave at beginning and end.

Finishing: At edge of rug tie groups of 6 or 8 warp ends in overhand knots for fringe.

NOTE ON USING FIBER REACTIVE DYES

Dylon produces superb results when following Kay Read's procedure as given in her article in *The Weaver's Journal*, Vol. IV, No. 2, Oct. 1979, pp. 42-47. When making up the salt-soda dye bath solution, Eastman Kodak sodium carbonate, obtainable from photo supply stores, is better than Arm and Hammer washing soda (also sodium carbonate).

Since his retirement as a muscologist several years ago Gilbert Wright learned to weave by attending workshops and classes for weavers in the Washington, D.C. area. His primary interest is in pattern weaving, chiefly of rugs and wall hangings.

**Editor: Procion MX dyes are the fiber reactive dyes most used by textile artists. It is manufactured by ICI. Dylon is one of the trade names under which Procion MX is sold.*

Reprint of Kay's salt and washing soda recipe and process for batch dyeing. It dyes one pound of fiber.

Presoak item in a weak vinegar solution before dyeing.

1. Dissolve 3 Tbsp. washing soda in 1 Cup hot water. Set aside.
2. Dissolve Dye. (3 Tsp. dye for medium shade) in 2 gal. of hot water.
3. Add cloth and stir for 5 minutes.
4. Remove cloth and add salt (14 Tsp. salt for medium shade) and dissolve well.
5. Return cloth and stir for 15 minutes.
6. Remove cloth and add predissolved washing soda.
7. Return cloth and agitate for 5 minutes.
8. Leave in dye bath, stirring every 5 minutes, for 15-40 min. or longer depending on desired shade.
9. Remove, rinse well in cold water and then in hot. To finish, wash in a mild detergent.

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BY BETTE HOCHBERG

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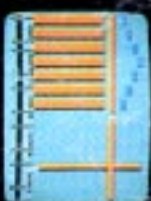
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Simple familiar commands make it easy to use



Thread the loom.
VIEW LEVEL 1



Repeat the Draft.
VIEW LEVEL 2



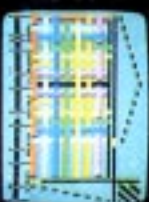
Tie up the pedals.
VIEW LEVEL 0



Weave the pattern as you prefer...



Or treadle-as-drawn-in.



Each thread [warp and/or weft] can have its own COLOR....
VIEW LEVEL 5



SIZE, [warp]...
VIEW LEVEL 2



and SPACING [weft]...
VIEW LEVEL 3



Insert warp or weft threads.



Fill in warp or weft threads.



Erase warp or weft threads.



You can zoom in, ...
VIEW LEVEL 1



out...
VIEW LEVEL 2



farther out...
VIEW LEVEL 3



and farther out...
VIEW LEVEL 4



You can examine the front of your fabric rising shed.



Or the back of your fabric falling shed.

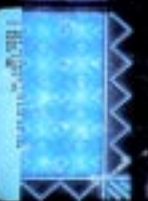
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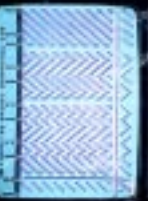
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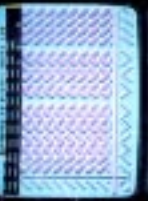
8 SHADES of 1 color



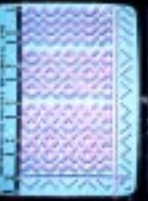
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pattern with the tie-up from a second



and the treadling from a third.

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