“DOUBLE JACQUARD”

The Basics. . . .

Double Jacquard is a double bed technique that produces two color designs with no floats on the back. Because a backing is simultaneously knit on the ribber bed while the main bed produces the design, the resulting fabric is thicker and usually more stable than single bed Fair Isle. So, while many designs are suitable for either Fair Isle or double jacquard, the jacquard fabrics have a totally different look and feel to them.

Double jacquard is most practically knitted with a color changer to alternate two colors every two rows. On mid-gauge and chunky machines, there are fewer rows to be knitted and hand changing is not a problem. However, keep in mind that double jacquard is normally knitted on standard and fine gauge machines and that mid gauge and chunky fabrics tend to be much heavier and have more limited uses.

The machine must be able to read each row of the design twice - once for background stitches and once for pattern stitches. On punch card machines, this means using specially punched cards where the design is separated or expanded to show each color in its own row. It is often difficult to see and understand how a design will knit by looking at the cards and beginners are cautioned to use the pre-punched cards available while learning the technique. Once you understand what is happening, it will be quite easy to create your own designs and punch the cards.

The EC-1, on the other hand, allows you to use any pattern for jacquard knitting with a touch of the #6 button. This button does two things. First of all, it tells the EC-1 to read each row of the card twice. Secondly, it takes control of the #1 button so that it commands two rows of pattern selection alternating with two rows of background selection to coordinate with the color changer. In actual practice, you start at the right end of the bed with the background color threaded in the carriage, knit 1 row of background to the left, change color (#1 light changes too) and knit 2 rows of pattern, change color (#1 light changes), 2 rows of background, etc. The electronic also allows you to knit a design that is twice as tall by using the #3 light. In that case, you begin with the carriage on the left end of the bed.

Pitch and needle (NDL) arrangements: Some of the examples that follow are knitted in full NDL rib (FNR) with the beds in half pitch, while others are knitted in 1 x 1 rib with the beds in full pitch. For all of them, begin and end with a NDL on the ribber bed if both edges of the fabric are to be seamed; with a main bed NDL for unseamed fabrics. The bird’s eye method must be knitted with an even number of needles (NDLS) on the ribber.

While jacquard is most commonly knitted in FNR, it limits you to fairly fine yarns. The 1 x 1 rib NDL arrangement will allow you to knit yarns as heavy as those you normally use for stockinette. Think of 1 x 1 jacquard as the double bed version of knitting on every other
NDL. The resulting fabric will be somewhat narrower than it would be with FNR so you won’t be able to knit the largest size garment in this method. In addition to knitting whole garments in 1 x 1 jacquard, you can also produce patterned ribs for cuffs and bands. Punching every other NDL cards for jacquard is possible, but tedious. The method is really best suited for electronic knitting where you can just press the #4 button for jacquard as well as the #4 button to double the width of the design. Because you are only using every other NDL, it will knit normally.

Shaping is best accomplished with increases and decreases or the cut and sew method. Short row methods are not advised. When the end NDLs are on the rubber bed, make single prong incs/dec's on the main bed and two prong incs/dec's on the rubber bed. When the end NDLs are on the main bed, make two prong incs/dec's on the main bed and single prong incs/dec's on the rubber bed.

There is almost always a certain amount of "grin through" - background color effect showing through the pattern areas on the face of the fabric. Some of the methods that follow produce more or less grin through, which might affect your choice of methods. You can also help reduce grin through by adjusting stitch size. For several methods, the rubber is set one or two numbers lower than the main bed so it is important to start with the right stitch size on the main bed to begin with. A good way to gauge a new yarn is to knit a perfect stockinette swatch and then set the dial two full numbers lower for jacquard. The difference in main bed and rubber bed stitch formation is caused by the angle of the beds to each other and to the yarn feeder. In some instances, the close knit bar will help reduce the size of the main bed stitches so that the two beds are more closely matched. Grin through is also affected by the method and carriage settings you use, color contrast and the design itself.

In addition to affecting the grin through, each of the jacquard methods affects the drape and stretch of the fabric which are directly affected by the number of rows knitted on each bed. When both beds knit the same number of rows, the fabric is more balanced and has better drape; when one bed or the other has significantly more rows, the drape will be affected. Remember that every row of your design requires two passes of the carriage - one for background and one for pattern - on the main bed. However, you can change the number of rows knitted on the rubber by setting the Set Levers so that the rubber carriage knits or slips in one or both directions. With the rubber carriage set for plain stockinette knitting, it is the leading Set Lever that determines whether the carriage slips (0) or knits (1), as shown in the charts that accompany each method. When the carriage is set to tuck, the leading Set Lever determines whether the NDLs tuck (0) or knit (1) in that row.

If your sweater has solid, one color areas you must continue to knit in Jacquard or the grin through and texture of the fabric will change. The simplest way to knit solid color areas is to continue knitting all rows with the background color only, retaining all the same machine settings. However, any grin through will be more consistent if you continue to change colors every two rows, knitting two rows of background color on the main bed and two rows of pattern color on the rubber bed only.

FNR is not usually suitable for ribs on jacquard garments and when using 1x1 or 2x2 ribs, they tend to look rather flimsy unless the yarn is doubled. End the rib with the carriage on the right, bring up all empty NDLs, change to half pitch and knit 4 circular rows with a single strand of background color and stitch size as for jacquard. For 2 x 2 rib you must also pick up the purl bar from opposite stitches to fill empty NDLs and prevent holes.

There is no single method that is double jacquard. There are actually lots of different ways to knit jacquard and the following are some of the most common. You should try knitting the same design, using the same yarn in each method so you can evaluate the differences for yourself. Some methods will cause distortion of the design; slip jacquards (knitted with the main carriage set to Slip) tend to be firm and most stable, while tuck jacquards (cam lever to Tuck) have more stretch. No single method is superior - it all
depends on what you plan to use the fabric for. A tailored jacket requires less stretch than a child's sweater. If you work through some of the following methods you will be able to choose the best method for any garment style.

**Slip Jacquard Methods**

Slip jacquard is the basic jacquard method described in your manual. Beginning with the carriage on the right and threaded with the background color, the first pass knits the background NDL and slips the pattern NDL. After changing color at the left side, the next pass of the carriage knits the pattern NDL and slips the background NDL. When the carriage is back on the right the row counter will indicate that two rows have been knitted, although each main bed NDL has only knitted once as either background or pattern, never as both. The ribber NDL, however, will all have knitted twice, producing the typical "Striper" backing of basic slip jacquard. With this method, the backing always has twice as many rows as the face of the fabric and, unless you use very fine yarns, the fabric tends to have somewhat limited drape.

<table>
<thead>
<tr>
<th>Slip Method</th>
<th>NDL set up</th>
<th>Cam Lever</th>
<th>Ribber Set Levers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Slip</td>
<td>FNR</td>
<td>Δ S/J Δ</td>
<td>(I) (I)</td>
</tr>
<tr>
<td>Modified Slip</td>
<td>FNR</td>
<td>Δ S/J Δ</td>
<td>(I) (I) or (I) (O)</td>
</tr>
<tr>
<td>1 x 1 Slip</td>
<td>1 x 1</td>
<td>Δ S/J Δ</td>
<td>(I) (I) or (O) (O)</td>
</tr>
</tbody>
</table>

The Modified Slip method produces single row/color striping backing. Both beds knit the same number of rows because the ribber is set to slip in one direction or the other. Although the fabric is quite balanced and has good drape, it has limited sideways stretch because there are floats between the two layers.

The method your manual briefly describes as "jacquard for heavier yarns" is one of the most useful slip jacquard methods. All of the NDLs on the main bed, but only occasional NDLs on the ribber bed are working. The wrong side of the fabric has floats similar to those formed in fair isle knitting, but they are regularly bound to the back of the fabric by the working ribber NDLs. The length of the floats is up to you to decide and is controlled by the spacing of the working NDLs on the ribber. The manual shows a sample set up using every 4th NDL, but much wider spacing is acceptable as long as the floats are no longer than you would tolerate in fairisle. The stitch size on the main bed should be set for stockinnet (because it almost is!) and the ribber size should be set as it would for knitting rib (probably about half the size of the MB). As each row is knitted, the yarn zig-zags irregularly from one bed to the other. It looks strange because the floats are not completely knitted by a full complement of ribber NDLs as they are in FNR. Don't worry - its right! You only need enough working ribber NDLs to secure the floats. Eliminating all of the other NDLs is what makes this method suitable for heavier yarns. Incidentally, the face of this fabric looks more like fair isle than any of the other jacquard methods. The only draw back to this method is the fact that it can sometimes tend to "rib out". That is, the isolated ribbed stitches tend to show on the front of the fabric. Setting the ribber to knit in one direction and slip in the other minimizes this as does the solid back method.

![Needle set up for heavier yarns](image)

<table>
<thead>
<tr>
<th>Cam lever</th>
<th>Ribber Set Levers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Method</td>
<td>Δ S/J Δ (I) (I) or (I) (O) or (O) (O)</td>
</tr>
<tr>
<td>Solid Back</td>
<td>2 Rs (I) / 2 Rs (O) (O)</td>
</tr>
</tbody>
</table>

**Tuck Jacquard Methods**

Several interesting fabrics can be knitted by setting the cam lever to Tuck instead of Slip. The design and the method of knitting two rows per color, etc. are exactly the same. In the slip methods a NDL either knits or slips in one row and with the following pass of the carriage, the knitter slip and the slippers knit. Each NDL knits once and slips once every two rows (passes of the carriage). When the cam lever is set to Tuck, NDLs either knitting or tuck with each pass of the carriage and at the end of every two rows each NDL has knitted once and tuck once. This method is suitable for somewhat heavier yarns than slip
jacquard and produces a soft, drapey fabric. Because tuck stitches tend to make fabrics wider, this is an excellent method for producing larger sizes. In fact, with extra weight and a large stitch size, you should be able to knit an afghan all in once piece! As an added bonus, some designs are almost fully reversible with this method. On the down side, it is not a good choice when designs have lots of small details - stick to larger, bolder designs. Please note that the ribber knits every row when the main carriage is set to tuck and that tuck jacquards can be knitted on FNR or 1 x 1 NDL set ups.

Tuck Jacquard  FNR  (I) (I)
or 1 x 1

**Solid Back Jacquards**

Jacquards with solid backing are usually knitted in slip with FNR or 1 x 1 NDL set ups. The back of the fabric is a solid color because only one of the colors is allowed to knit on the ribbon NDLs; the other color is slipped every time. In other words, the ribber is set to knit two rows, slip two rows. The SRP-60N ribbers have a driving cam that automatically changes the function of the Set Levers every time you move the COL to change colors. The face of the ribbon carriage shows the Set Levers on (I), but the cams underneath are really being changed every two rows to (O). If you do not have the SRP-60N ribber, it is a simple matter to manually flip both Set Levers up or down every time you change colors at the left.

This method is also the basis for Blister Jacquard, where extra rows are knitted on the main bed only. You can experiment with this by stopping the card (inspection light on) or pressing the #3 light to add extra rows when the pattern color knits. In order for the fabric to blister or pucker, there should be at least twice as many rows on the front of the fabric and these designs need to be specially drawn.

If the cam lever is set to Tuck on both carriages and the ribbon Set Levers change every two rows from knit to slip, the pattern will be produced in double English (Fisherman's) rib. The fabric is not as stretchy as basic tuck Jacquard and the back will be solid colored.

**Bird's Eye Jacquard**

This slip method produces the most balanced jacquard fabric with the least amount of design distortion and grin through. The RJ-1 accessory ribbon carriage or the SRJ-70 ribbon are essential as manually selecting every other NDL, every row is not practical. Bird's Eye is lighter knitting than some of the other slip methods, but produces a narrower, less stretchy fabric. It is the preferred method for knitting multi-colored jacquards. The ribber carriage knits every other stitch, slipping the alternate stitches. On the return row the function alternates so that the knitters slip and the slippers knit - just as the main carriage does. It is absolutely imperative that you have an even number of working NDLS on the ribber bed at all times because the carriage always begins selecting knitting NDLS from the second NDL onward; with an odd number of NDLS the same NDLS would be selected row after row until the carriage jams. Also, you must always increase or decrease by two stitches at the same side in order to maintain the checkerboard backing pattern. A change in that will show as a bad row on the front of the fabric.

If you are willing to do a little hand work, you can try an interesting variation on bird's eye to produce a vertically striped backing. Begin with an odd number of NDLS and knit two rows. Before knitting each of the next two rows bring one empty NDL into working position on the carriage side to fool the carriage into selecting the alternate group of NDLS. Drop any loops that might have formed on these edge NDLS and return the extra NDLS to non-working position before knitting the next two rows.

**Room to experiment . . . .**

Try playing with the basic settings, introducing variables like color, texture and yarn size. If you work with a smooth yarn and a textured one in the same color, the texture will help define the pattern. If both yarns are a different size, you might add some sculptural interest to the surface of the fabric. Try using the #6 light when knitting single bed fairisle. It will work, but the design will be lost to a two color marbled effect.

**This T&T replaces T&T #2**