

MANUAL to Handknit Garment Design iOS

Find detailed instructions for how to use the app below in the Getting Started section. If you want to jump right in, here are a few key things to know:

The app is a companion to either the Shirley Paden Blueprint course, *Handknit Garment Design (KGD)*, or the book, *Knitwear Design Workshop (KDW)*. When you open the app, you will see four separate sections:

1. Upper screen: Tap the upper portion of the screen to learn more about Shirley Paden.
2. Lower screen: Tap the bottom portion of the screen to learn more about the companion book, *Knitwear Design Workshop*.
3. New Design: Tap the center left portion of the screen to start a new design. Refer to HGD or KDW for descriptions of design features.
 - The app opens up ready to work a *Classic Silhouette*. To select *Single Taper*, *Double Taper* or *Dropped Shoulder* tap “Change”.
 - Enter a title and description for your design.
 - Make design selections for neck, shoulders, and length by tapping the options your design uses.
 - Enter your fabric gauge.
 - Enter your body measurements and ease. Explanations for each measurement are given in the app. Tap the button at bottom of page to see them.
 - Tap “Save” in the upper right corner to save measurements and generate Design Element stitch maps.
 - Tap each Design Element to access a detailed stitch map of that element. These maps may be printed using the print features of your device.
 - The entire sleeve is shown, but the other stitch maps must be combined to create the entire front or back garment pieces.
4. Previous Designs: Tap center right to access previously created designs.
 - Open a previous design by tapping its title.
 - Access Design Element stitch maps by tapping “Save” in the upper right corner.
 - Changes to the design choices (project type, neckline, etc.) may change the required measurements and will overwrite the previous measurements.
 - You can delete previous designs by swiping to the left on their name and then tapping “Delete”.
5. The current version of the app assumes the following:
 - Neck width at top of shoulders is set at a default of 50% of shoulder width (outer shoulder to outer shoulder).
 - Shoulder drop for shaped shoulders is one inch (2.5 cm).
 - You may add 0, 2, or 4 selvedge sts (0, 1, or 2 at each side).
 - Hip height is a minimum of 1” (2.5 cm).

Getting Started with the Handknit Garment Design App, a companion tool for Shirley Paden's *Knitwear Design Workshop*

It's exciting and fun to start out on a new knitwear design — choosing yarn and stitch pattern, designing a beautiful pattern flow on the garment, selecting a perfect silhouette. But drafting sleeve caps or armhole shaping may not be as interesting to you. This is where the Handknit Garment Design App comes in. It does the work of designing the slope and shape of the sleeve cap, shoulders, armholes, necklines and even waist shaping, right down to the stitch. You, the designer, will still develop your overall garment design, but having these more tedious details taken care of will make the overall process more enjoyable and build your confidence in a successful outcome.

Begin by developing your overall garment plan, sketching your design and working your swatches as described in *Knitwear Design Workshop*. Select your desired sweater silhouette, enter your measurements and desired ease, then the app will generate stitch-by-stitch charts, or stitch maps, to use when knitting your design.

This document describes the use of the app to create a new design. It covers the *Classic* sweater silhouette in detail. It then goes over special features of *Single Taper*, *Double Taper*, and *Dropped Shoulder* designs. Finally, the document explains how to use previous designs.

Things to note:

- The app designs pullovers (jumpers). If you wish to design a cardigan, you will have to adapt the pullover stitch maps. There are many tutorials for changing a pullover pattern to a cardigan on the internet and in various knitting design books.
- The stitch maps are numbered with rows and stitches. Rows are numbered from bottom up. In some cases, only the edge stitches or rows are shown and the number of stitches or rows between edges is stated.
- The stitch maps that are created by the app flow into each other. For example, the armholes and neck fit together to show the upper body.
- Version (X.X) is designed for a single stitch and row gauge throughout the design. If your design requires more than one gauge, i.e. for a ribbed edge or cuff, you will need to create two separate designs and combine the needed elements in your final pattern.
- If you edit a design you previously saved, the first design is not saved. If you want to use an existing design to start a new design, you may want to print your stitch maps for the first design in case you want to use them later..
- As you work, refer to *Knitwear Design Workshop* for guidance on your design choices.

How to Use the App

The Handknit Garment Design App is a companion to Shirley Paden's *Knitwear Design Workshop (KDW)* and her Blueprint (formerly Craftsy) class, *Handknit Garment Design (HGD)*. Use either or both of those resources to guide you in developing your design. To make the best use the app, you will need to do the following before using the app:

1. Sketch your garment design.
2. Knit and block your fabric swatches.
3. Determine your gauge.
4. Check your body measurements.
5. Decide on design details such as silhouette, desired ease, neck depth and sleeve length.
6. Plan how your stitch patterns will flow over the surface of the garment. Determine if you need an odd or an even number of stitches across the garment piece.

You don't have to create a schematic to use the app. Having a rough sketch or schematic will, however, help you design your garment. You may wish to include your measurements and your desired ease on this rough schematic, but you don't need to calculate stitches and rows — the app will do that for you.

Once you have gathered this basic design information with the help of *KDW* or *HGD*, you can begin using the app to help you generate the pattern for your original design.

Starting with the home page, you will see four separate sections.

1. Upper screen: Tap the upper portion of the screen to learn more about Shirley Paden.
2. Lower screen: Tap the bottom portion to learn more about the companion book, *Knitwear Design Workshop*.
3. Previous Designs: Tap center right to open previously created designs.
4. New Design: Tap center left to start a new design.

Working with New Designs

Using the Classic silhouette, we will use the app to design a pullover.

1. From the Home page of the app, tap *New Design* to start designing.
2. The app opens up a data entry page. Select your desired design features and add the required data necessary in steps 3 - 8 below.
3. Project Type and Description
 1. The app opens to the Classic Silhouette project we are using for this example. The "Change" button allows you to change to a *Single Taper*, *Double Taper*, or *Dropped Shoulder* design; these designs will be discussed later.
 2. Enter a name for your design in the Project Title box. Tap on the box to open the keyboard.
 3. Add notes, such as which yarn and needles you used, in the blank box below the Project Title box.
4. Units: Choose whether you will be entering measurements in inches or centimeters. Use the same units for all of your entries.

Working with Key Design Features

Select whether your design has a **round** or a **V-neck**.

- The app designs neck openings to be 50% of the total shoulder width for *Classic*, *Single Taper* and *Double Taper* designs and 40% of the total shoulder width for *Dropped Shoulder* designs.
- Back neck depths are shaped over $\frac{3}{4}$ " / 2cm.
- Round necks are shaped to have a pleasing curve. You choose the depth.
- V-necks are designed to be shaped by binding off at the edge. Use a sloped bind off, as described in *KDW*, to create a smooth edge.
- The width of any applied band is not included in the neck depth or shoulder width. Enter the depth of the neck BEFORE a band is applied (i.e. depth to be entered for a neck with a 1" ribbed neckband would be 1" more than the depth of the opening in the finished garment).

Select whether your garment shoulders are **shaped** or **straight**.

- If shaped, the app will shape the shoulders over 1" / 2.5 cm.
- If straight, the app applies no slope is applied to the shoulder.

Select whether the length of your garment is **standard** or **cropped**.

- The app determines a **standard** garment length by adding the waist-to-underarm measurement, the hip-to-waist measurement, plus the hip height measurement. The total of these measurements will be the length to the underarm. You must enter a hip height of at least 1" (2.5 cm) for the app to work properly.
- For a Classic silhouette garment, the app determines the sweater length by adding the length to the waist and the waist to hip measurement. Note that this measurement is defined as the length from the waist to the fullest part of the hip OR to the point on the body where the bottom edge of the sweater hits. For cropped length sweaters, use the second definition.
- For cropped length sweaters, the app also determines sweater length by adding the length to the waist plus the waist to hip measurement.

Enter information about your stitch pattern and swatch.

If your design requires either an odd or an even number of stitches, select **Yes**. If not, select **No**. An example of a stitch pattern that needs an odd number of stitches is a 1x1 rib that starts and ends with a knit stitch. An example of a design that needs an even number of stitches is one with a stitch pattern that evenly divides around a center line. If you select **Yes**, options are given to select **Even** or **Odd** stitch counts for the body pieces (front and back worked separately) and for the sleeves.

Enter the gauge from your knitted swatch in the units initially selected (inches or cms). This gauge is per 1 inch or 1 cm, not 4 inches or 10 cms. You may enter a value between 1 to 24 for either stitches per in/cm or rows per in/cm. In depth instructions for measuring gauge are given in both *KDW* and *HGD*.

You may enter 0, 2, or 4 in the Selvedge Stitches space. Enter 0 if you do not want any selvedge stitches on your garment pieces. Enter 2 for a 1 stitch selvedge on each side of the garment piece or enter 4 for 2 stitch selvedges. The app does not add selvedge stitches to necklines.

Enter your measurements and desired ease. Review measurement definitions by tapping the button at the bottom of the screen as needed, noting the following:

- Shoulder width, in this case, refers to the body measurement across the width of the back from shoulder bone to shoulder bone, not the width of a garment shoulder strap.
- Chest/Bust is the total circumference, not the width of the front or back piece.
- Neck Depth is the garment measurement from the inner edge of the garment shoulder strap to the lowest point in the neckline; i.e. how deep a V-neck or scoop neck is. Note: This is different from the body measurement, Front Neck Depth, which is the body measurement defined as the difference between the height of the back of the neck and the front base of the neck.

For your reference, the following design values are applied in the generated designs:

- Shoulder shaping is done over 1"/2.5cm.
- The initial armhole bind off at each edge of armhole varies by size:
 - Size 30"/76cm initial bind off is 0.5"/1.5cm
 - Greater than size 30"/76cm but less than 48"/122cm initial bind off is 0.75".
 - Size 48"/122cm and up have an initial armhole bind off of 1"/2.5cm.
- The initial bind off for a V-neck may be 1 or 2 stitches depending on whether the stitch count is odd or even.
- The upper work-even section of the sleeve is 2.5"/6.5cm unless the sleeve is 4"/10cm or less in length. If that is the case, the upper work even section is 0.75"/2cm. The app will adjust for an extremely tapered sleeve by shortening the upper work even section to as few as 0 rows.
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Save your measurements and generate stitch maps by tapping on *Save* in the upper right-hand corner of the screen. If you have not entered a required field, you will see an error message. Go back and complete or correct the field, then tap *Save* again. If you do not have all of your information ready when you start the design, you can enter values that are approximately correct. Reopen and add correct values to the design later. Remember to save your work. See *"Using Previous Designs"* below for more information on this.

Using Design Segments to Knit Your Garment

Once you tap *Save*, you will see a list of design segments for your garment. The Sleeve is a complete garment piece. The other segments (Lower Body, Armhole, Front and Back Neck) combine to create the front and/or back of the garment.

Open the Design Segment of interest by tapping on its button. Use your usual screen actions (i.e. pinch with your fingertips to reduce or enlarge the size of the image or tap and hold to move the image within the screen) to see all of the image. The image is what is called a stitch map of the Design Segment. Each square represents one stitch.

Cast on information is at the bottom of the stitch map, including total selvedge stitches. Divide the selvedge stitches between both sides (for example, 4 selvedge stitches means put 2 on each side). Numbers located within the leftmost or rightmost square of the stitch map indicate the row number. Right Side rows are odd-numbered and Wrong Side rows are even-numbered, assuming the piece is worked flat.

Shaping is indicated by adding or deleting squares along the edges. If a square is added to a row, work an increase in the same row. If one or more squares are deleted, bind off that many stitches at the edge. A number placed above the bound off edge indicates how many stitches to bind off. Use a sloped bind off, as described in KDW and HGD, for a smooth edge. Depending on your design, you may wish to substitute decreases for the bound off stitches.

For the Sleeve, you have all the information needed to knit that piece. The other Design Segments combine to form the front or back of the garment.

For the front or back, begin with the Lower Body segment. As for the sleeve, cast on information is at the bottom. The stitch map shows only the sides of the piece to save space and allow greater detail to be given where it is needed. Simply add in the center stitches that are shown. For example, a piece that is 113 stitches wide will only show 3 stitch map squares on each side with “- - 107 - -” in between them. The row will be $3+107+3$ stitches long, or 113 stitches.

Work the piece by casting on the indicated number of stitches and work the indicated number of rows, increasing or decreasing as indicated by more or fewer squares. If you have designed a very deep neckline that begins before armhole shaping, review the neckline section *for more information*.

For armhole shaping, stitch maps are given for both the right and left edges of the garment. The stitch maps are as wide as is needed to show every stitch in the armhole shaping, plus a few center stitches. The remaining center stitches are indicated with a number. Selvedge stitches are included in these numbers.

Work the edge stitches by binding off as indicated by the map, the same as for the sleeves described above. At the top of the stitch map, the remaining rows to be worked even on the outer edge of the body to achieve the desired armhole depth (including ease) are indicated. After finishing these rows, you will be at the point where shoulders will either be bound off or shaped into a slope, depending on your prior design decisions.

IMPORTANT: This design element does NOT include the neckline shaping, which will begin before you finish the armhole in most cases.

Back Neck and Front Neck design segments are worked along with the Armhole, usually after armhole shaping is finished. This case is described next; special cases where the neck is deeper than the armhole shaping are described later.

The stitch maps for Back and Front Neck show the entire neckline and include any final shoulder shaping. Calculate when to begin neckline shaping by comparing the number of rows in the neckline stitch map to the number of rows worked even above the armhole shaping, as given in the Armhole stitch map. Follow these instructions.

Note the number of rows worked even above the armhole shaping in the Armhole design segment. This number is **A**.

Note the number of rows in the neckline shaping BEFORE shoulder shaping begins. Look at the outside edge of the stitch map and note the last row before the shoulder bind off begins.) For reference, this number is **B**.

Is **B** a smaller number than **A**? If so, subtract **B** from **A**. The resulting number is **C**. Begin neckline shaping on the next row, Row **C+1**.

If **B** is a larger number than **A**, see the next section on working necklines that begin before armhole shaping is finished.

To start the neckline on Row **C+1**, work as many stitches as shown before the center bind off on Row 1 of the neckline stitch map. Join a second ball of yarn, and bind off the indicated number of stitches for the center of the neckline. Work on across to the end of the row. Finish this side of the garment piece, working neckline bind offs and shoulder shaping as shown by the stitch map.

For the back neckline, it may be that the neckline shaping begins at the same time or a row or two later than the shoulder shaping. In this case, simply begin with Row 1 of the Back Neck immediately after finishing the Lower Body.

In rare instances (a very deep V-neck, for example), neck shaping may begin during or even before armhole shaping. In such cases, follow the instructions below.

Note the number of rows in Armhole shaping PLUS the number of rows worked even above the armhole shaping. This number is **X**.

Note the number of rows in the neckline shaping BEFORE shoulder shaping begins. Look at the outside edge of the stitch map and note the last row before the shoulder bind off begins. This number is **Y**.

If **Y** is a larger number than **X**, subtract **X** from **Y**. This number is **Z**. Begin neckline shaping when **Z** rows remain to be worked in the body. Work the neckline shaping as described above and after finishing **Z** rows, begin armhole shaping and continue neckline shaping.

If **X** is a larger number than **Y**, subtract **Y** from **X**. This number, for reference, is **W**. Begin neckline shaping after having worked **W** rows of the armhole shaping, beginning on Row **W+1**.

EXAMPLE 1: Neckline worked ABOVE armhole shaping. In this example, measurements and design choices entered into the app gave the following:

1. Number of rows worked even above armhole shaping, **A** = 50.
2. Number of rows worked for neckline shaping before shoulder shaping begins, **B** = 30.
3. **B** is a smaller number than **A**, so we subtract it from **A**. (**A** - **B**), or $(50 - 30) = 20 = \mathbf{C}$.
4. We would work 20 rows above the armhole shaping even, then on Row **C+1** (Row 21), we would begin following the neckline shaping stitch map to work the neckline as described above.

EXAMPLE 2: Neckline worked beginning BELOW armhole shaping. In this example, measurements and design choices entered into the app gave the following:

1. Number of rows in armhole shaping PLUS the number of rows worked even above the armhole shaping is $(10 + 50) = 60 = \mathbf{X}$.
2. Number of rows in the neckline shaping BEFORE shoulder shaping begins is 68 = **Y**.
3. **Y** is a larger number than **X**, so subtract **X** from **Y**. $(\mathbf{Y} - \mathbf{X}) = 8 = \mathbf{Z}$.
4. The design (in this example) specified 100 rows in the lower body. The neckline shaping would begin when **Z**, or 8, rows remain to be worked in the lower body, on Row 93.

EXAMPLE 3: Neckline started DURING armhole shaping. In this example, measurements and design choices entered into the app gave the following:

1. Number of rows in armhole shaping PLUS the number of rows worked even above the armhole shaping is $(10 + 50) = 60 = \mathbf{X}$.
2. Number of rows in the neckline shaping BEFORE shoulder shaping begins is 56 = **Y**. **X** is a larger number than **Y**, so subtract **Y** from **X**. $(\mathbf{X} - \mathbf{Y}) = 4 = \mathbf{W}$.
3. Begin neckline shaping after having worked **W** rows of the armhole shaping, beginning on Row **W+1** or Row 5 of armhole shaping.

Completing Your Garment

Many collars or edgings are possible for finishing your pattern. *KDW* gives many examples and explains how to work them. Estimate yarn requirements following instructions given in *KDW* or *HGD*.

Working with *Single Taper*, *Double Taper*, and *Dropped Shoulder* Designs

The standard garment length of the *Single Taper* design is determined by the Hip Height measurement - the distance below the fullest part of the hip at which the garment is planned to end. The bottom edge of a cropped garment for the *Single Taper* design falls at the waist and the garment increases in width from the waist to the bust.

The app will also design reverse *Single Tapers*, such as an A-line sweater, where the garment decreases in width from the lower hem (hip-length or lower) to the bust. If there is no difference in circumference between the lower circumference and upper circumference of the so-called *single taper* garment, it will result in a classic silhouette shape.

Once the maximum bust width is achieved in any of the tapered designs, 2.5"/6.5cm will be worked even before the underarm by default.

For the Double Taper silhouette, waist shaping will begin at least one inch (2.5 cm) above the hem in most cases. After the minimum width is achieved, the app designs the piece to be worked even for 1.5" (3.5 cm) for the waist. The hem falls at a point determined by adding the length to the waist plus the waist to hip measurement. Note that this measurement is defined as the length from the waist to the fullest part of the hip OR to the point where the hem is to fall. For cropped length sweaters, use the second definition.

For the Dropped Shoulder silhouette, note that garment sleeve length is affected by shoulder drop. The app subtracts half the width of the body from the neck to wrist measurement to determine the garment sleeve length. You may think of the neck to wrist measurement as "neck to the end of the sleeve". If you want shorter sleeves, measure from the neck to where you want the sleeve to end.

The Dropped Shoulder silhouette does not have waist shaping. As for Single and Double Taper, hem length is determined by the Hip Height measurement.

Working with Previous Designs

Tapping the *Previous Designs* section of the home page opens a list of all of the designs you have created in the app. To access stitch maps for these designs, simply tap on the design and tap *Save* to move to the *Design Elements* page.

Any changes you make to existing measurements or design elements (i.e. changing from shaped to straight shoulders or choosing a new silhouette) will replace the original entries. This change may also require new measurements to be added. It is recommended that you make these changes only if you are prepared to re-enter measurements if you change your mind.

IMPORTANT: Changing entries in an existing design does not create a new design; it overwrites the one that was there!

You may delete designs that you no longer need. Open the list of previous designs. Swipe left on the name of the design you wish to delete. Tap *Delete*. If you are sure you want to delete the design, tap *OK*. If not, tap *Cancel*.

Printing

Print the design elements by tapping *Print* in the upper right-hand corner of each design element. Select printer and the number of copies desired.