

The Underarm Curve

Now we have to decrease a few more stitches, one stitch at the beginning of the next fourteen rows, which means we decrease seven more stitches at each armhole edge of the vest.

In the size small, we only decrease one stitch at a time for this part of the shaping, then work all the way to the end of the stitches from the previous row. (For some of the larger sizes, with more stitches to remove, we actually bind off stitches for several more rows.)

We decrease away a stitch at the beginning of row three, and we'll point the slant of the decrease at the edge we're creating so that the decrease will be mainly invisible (see chapter 160). Since the decrease occurs at the beginning of the row, we make row three one stitch shorter at its right edge.

																					3						
2																											
1																											
a																											
	9	1	9	0	8	9	8	8	7	8	6	8	5	8	4	8	3	8	2	8	1	8	0	7	8	7	7
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1												

When we finish the row and turn to the private side, we decrease again. We have to show row four as one stitch shorter at its beginning, since that's where we do the decrease. But from the public side's point of view, that means the decrease and the blank space that indicates the loss of a stitch are placed at the left edge of the chart.

4																																												3
2																																												
1																																												
a																																												
	9	1	9	0	8	9	8	8	7	8	6	8	5	8	4	8	3	8	2	8	1	8	0	7	8	7	7																	
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																													

Note that since we have to do a decrease on the private side of stockinette, we have to use the correct purl directional decrease for what's charted as an SSK/SKP on the public side, which is an SSP/SPP (see full details about directional purl decreases in chapter 160).

Here are rows five

																																													5
4																																												3	
2																																													
1																																													
a																																													
	9	1	9	0	8	9	8	8	7	8	6	8	5	8	4	8	3	8	2	8	1	8	0	7	8	7	7																		
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																														

and six.

6			5
	\	/	
4			3
	\	/	
2			1
	^	^	
a			
	91 90 89 88 87 86 85 84 83 82 81 80 79 78 77	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1	

Each row has a decrease at its beginning, so we have to show that each row is one stitch shorter at that spot.

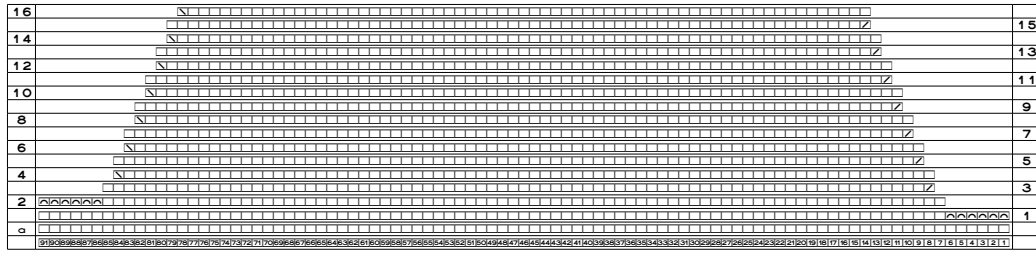
We keep doing the same decreases at the beginning of the next ten rows, and when we've finished showing all the underarm decreases, we have this chart:

16			15
	\	/	
14			13
	\	/	
12			11
	\	/	
10			9
	\	/	
8			7
	\	/	
6			5
	\	/	
4			3
	\	/	
2			1
	^	^	
a			
	91 90 89 88 87 86 85 84 83 82 81 80 79 78 77	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1	

Even though we've temporarily removed stitches sixteen through seventy-six (so we could use a bigger font size), each half has gone from the fifteen stitches shown at the beginning in row A to the two stitches that remain after decreasing thirteen stitches total at each armhole.

Full Chart of Underarm Shaping

Since it's difficult to get a real sense of what's going on because we've omitted the plain stockinette in the middle of the chart, let's look at the full chart showing all the stitches.



If we look really closely (or zoom in if we’re reading the electronic PDF), we can see that we have decreased away thirteen stitches total at each end, leaving us stitches fourteen through seventy-eight inclusive, which is sixty-five stitches. The instructions say that for the size small, we work evenly on sixty-five stitches after completing the underarm shaping, so that’s a good check.

In yarn, we would now work evenly to the design (or desired) armhole depth.

Work the Armhole Depth Correctly

In the schematic in chapter 410, the top of the shoulder is shown unshaped for simplicity. But we do need to realize that on this vest, the shoulder line is actually on a slant upward from the outer edge of the shoulder to the neck, since we do a gradual binding off of the shoulder stitches instead of binding off all of them on a single row (which is an equally valid choice).

Because of the shaped shoulder, the armhole depth really goes from the top of the underarm ribbing to the **lower** end of the shoulder line, which is at the armhole edge.

Even more critically, we need to know if the armhole measurement includes the underarm ribbing or not, because we have to account for the ribbing’s height. Since the ribbing will take up some of the vertical armhole measurement, we have to work the main fabric of the vest **longer** than the finished armhole depth by the height of the armhole ribbing.

For the chapter 410 vest, the ribbing is one inch tall per the instructions. Since the finished armhole depth for the size small is eight inches, we have to work **nine** inches past the underarm bind-off before we begin the shoulder shaping. When the armhole ribbing makes the armhole one inch shorter, then we get the correct final armhole depth of eight inches for the size small.

For garments with sleeves, we probably just measure the armhole depth from the beginning of the underarm shaping to the beginning of the shoulder shaping, period. We always need to check the project’s schematics and measurements, then work accordingly.

Shoulder Shaping

The shoulder shaping for the size small is very straightforward. We bind off three stitches at the beginning of eight consecutive rows.

If we start with the last row of the underarm-shaping chart, we can do the exact same procedure as we did with the underarm decreases to show how each shoulder row gets three stitches shorter. We'll again label the last row before the shoulder shaping starts as a "foundation row," since the actual project row number would depend on our row gauge and the armhole depth we need. If we use foundation row B as the last row before shoulder shaping begins, we can use B1 through B8 as the row numbers so that our discussion of the shoulder shaping will be clear. We also get to make the chart font just a bit larger since we're starting with fewer stitches.

b		
b	b 1	
78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14		

We now bind off three stitches on the first shoulder shaping row. We'll continue using curve symbols to indicate that the first three stitches are gone.

b	b 1	
78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14		

We work all the way to the end of row B1, then turn to the private side, bind off the first three stitches, and work all the way to the end of row B2.

b 2	b 1	
b	b 1	
78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14		

We do the same thing for another six rows.

b 8	b 7	
b 6	b 5	
b 4	b 3	
b 2	b 1	
b	b 1	
78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14		

There are four "stairsteps" on either end and forty-one stitches remain (stitches twenty-six through sixty-six inclusive), as directed by the written directions and representing the number of back neck stitches put to a stitch holder (stitch count n in appendix 528).

We can also use ordinary spaces to indicate the stitches bound off at the beginning of the eight shoulder rows.⁵

⁵ If you did some counting, yes, you're correct; the chart is technically wrong in how many knit symbols are shown. If you really want the gory details, then check out appendix 529.

If you have a vest (or even a sweater with set-in sleeves), take a look at the back. You'll probably see this general shape: horizontal lines at both underarms that curve to become vertical lines along the armhole edges, finishing with diagonal shoulder lines moving upwards from the armhole edges to the sides of the neck (or, for unshaped shoulders, a straight line all the way across the top).

It's Not as Bad as It Looks

Do the two-row-tall stairsteps at the underarm curves and shoulder bind-offs seem awkward? They do look a little bit sharp on paper; there's no denying that. The result in yarn isn't quite so, well, angular, and once we've joined the shoulders and added the ribbing, all the shaping will look smooth.

But if we really want to smooth out the shoulders, we have at least two options. We can do a decrease at the end of a row before a row that starts with bind-offs, or we can short-row the shoulders. See chapter 432 for adapting the chart here for both techniques.

Alternative Charts

Since there's no real point in showing all that plain stockinette, we could remove quite a lot

The font is still pretty small because the page margins here are so big. With this chart in a landscape-oriented document with half-inch margins, the symbols can be 9.5 points.

Let's Use Some Real Row Numbers

Suppose for our size small vest, we need to work the exact nine inches of underarm depth indicated in the instructions from chapter 410. If our row gauge is seven rows per inch, then from the underarm bind-off to the start of the shoulder shaping, we need to work nine inches times seven rows per inch, for a total of sixty-three rows. Just to avoid any more confusion than we already have, we'll bump that to sixty-four rows so we can start the shoulder shaping on a public-side row.

So we would work the sixteen charted rows for the underarm shaping, then we would work an additional forty-eight rows on the sixty-five stitches we have left. Those rows would be numbered seventeen through sixty-four inclusive if we put them all in the shaping chart.

When we turn at the end of row sixty-four to begin the shoulder shaping on the public-side row, we see that we do the eight rows of shoulder shaping on rows sixty-five through seventy-two inclusive.

In the following chart, the row between the two blank rows indicates that we simply work evenly on stitches fourteen through seventy-eight for rows seventeen through sixty-four. When we turn at the end of row sixty-four, we begin the shoulder shaping.

72			222										
			22	222									
70			222	22		71							
			2222	222									
68			222	2222		69							
			222222	2222									
66			222	222222	2222	67							
			22222222	222222	2222								
64			22222222	22222222	2222	65							
						17							
16			22222222	22222222									
			22222222	22222222	2								
14		2	22222222	22222222	2	15							
		2	22222222	22222222	2								
12		2	22222222	22222222	2	13							
		2	22222222	22222222	2								
10		2	22222222	22222222	2	11							
		2	22222222	22222222	2								
8		2	22222222	22222222	2	9							
		2	22222222	22222222	2								
6		2	22222222	22222222	2	7							
		2	22222222	22222222	2								
4		2	22222222	22222222	2	5							
		2	22222222	22222222	2								
2		2	22222222	22222222	2	3							
		2	22222222	22222222	2								
0		2	22222222	22222222	2	1							
		2	22222222	22222222	2								
	9	19	0	8	9	8	7	6	5	4	3	2	1
	7	8	7	7	6	5	4	3	2	1	0		

V-Neck Shaping

Sweater patterns often start with the back because it typically has shaping only for the arm-

holes and shoulders.⁶ Then we work the front with all the same shaping we did on the back while “at the same time” doing the front neck shaping.

Keeping track of simultaneous shaping at two armholes, two sides of the front neck, and two shoulders can be tricky. Charting makes it clear where to do all of it.

Adding the Front Neck to the Back’s Chart

In many cases, all our hard work charting the back’s shaping becomes our starting point for charting the front. For our sample vest, that big section of plain stockinette that we just removed from the back’s complete shaping chart is where we’re going to wind up putting the front neck’s shaping.

The Initial Chart

We know that the size small is ninety-one stitches wide, so the V will be centered on stitch forty-six (see issue one in appendix 528). Since we need to decrease twenty stitches on each side of the V’s single dead-center stitch, that means we need to show at least forty-one stitches of the front. The written-out instructions tell us that we’re supposed to start the V-neck and the armhole shaping on the same row, so here’s “foundation row A” again, except that we need to focus on the central stitches instead of those at the ends of the row. Out of the central forty-five stitches shown below, two stitches will remain on each end when we’re done decreasing.


a	
	68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24

The First Decrease Row

We’re supposed to put the center stitch on a holder, and we need to decrease one stitch on each side of it. We will want to mirror-image the decreases, and we can decide which one to do on each edge. Since we know from chapter 160 that we’ll get the most invisible decreases if the decrease symbol’s slant points at the diagonal line being formed, we’ll work an SSK before the center stitch and a K2tog after it. Let’s use a symbol with a down arrow for the stitch put on a holder.

		1
a		
	68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24	

The symbols at the center of row one indicate that we’ve

 decreased one stitch on each side of the front’s dead-center stitch forty-six and

⁶ Some designs do have back neck shaping as well, which we would chart with the same techniques we’re about to discuss for charting the front neck. See chapter 445 for full details.

The Entire Front Shaping

If we combine this partial chart with the one showing the back’s underarm and shoulder shaping, we can see exactly how—and where—all of the front’s shaping will be worked.

You may have noted in the chart above that the entire V-neck shaping is in a single column. If I’d spent a few seconds in thought before I eagerly jumped right into charting, I would have put each side of the neck in its own column, and even the single stitch at the bottom in its own column. Why? Because the only way I could keep the stitches separated as I worked my way upward was to use more and more spaces as the neck opening got wider and wider. So I had to do a lot of extra work compared to having each half of the V-neck in its own table column and then just setting the columns to be left or right justified, especially considering the problem I have with counting. Sigh.

We need forty (technically thirty-nine) rows to complete the V-neck while “at the same time” doing the underarm shaping on the first sixteen rows. When we finish the V-neck shaping, we’ll have to work evenly until we’ve done the same number of total rows on both front necks as we did on the back between the underarm bind-offs and the start of the shoulder shaping. Those additional rows are again indicated by the blank row, and each part of the shaping is now in its own table column.

b8		AAA			AAA		b7
b6		AA			AA		b5
b4		AA			AA		b3
b2		AA			AA		b1
b							
40							
38							39
36							37
34							35
32							33
30							31
28							29
26							27
24							25
22							23
20							21
18							19
16							17
14							15
12							13
10							11
8							9
6							7
4							5
2							3
0							1

Lesson Learned

Put each part of the shaping in its own table column. (Yes, I'm repeating this one, because it makes creating and modifying charts so much easier.)

Let's Use the Same Real Row Numbers

On the back, we figured out the row numbers of all the shaping rows based on the design's nine-inch underarm depth and a working gauge of seven rows per inch. We saw that we started the shoulder shaping on row sixty-five, after starting the underarm shaping on what we called row one.

We can put those numbers in the front's chart as well. Between the blank lines, the single row with both a public- and a private-side row number means that on each shoulder, we work those twelve stitches for twenty-four rows (rows forty-one through sixty-four inclusive).

72		~~~~~			~~~~~		71
70		~~~~~			~~~~~		69
68		~~~~~			~~~~~		67
66		~~~~~			~~~~~		65
64		~~~~~			~~~~~		41
40		~~~~~			~~~~~		39
38		~~~~~			~~~~~		37
36		~~~~~			~~~~~		35
34		~~~~~			~~~~~		33
32		~~~~~			~~~~~		31
30		~~~~~			~~~~~		29
28		~~~~~			~~~~~		27
26		~~~~~			~~~~~		25
24		~~~~~			~~~~~		23
22		~~~~~			~~~~~		21
20		~~~~~			~~~~~		19
18		~~~~~			~~~~~		17
16		~~~~~			~~~~~		15
14		~~~~~			~~~~~		13
12		~~~~~			~~~~~		11
10		~~~~~			~~~~~		9
8		~~~~~			~~~~~		7
6		~~~~~			~~~~~		5
4		~~~~~			~~~~~		3
2	~~~~~	~~~~~			~~~~~	~~~~~	1
0	~~~~~	~~~~~			~~~~~	~~~~~	

Since we work twenty-five rows (rows forty through sixty-four inclusive) after the end of the V-neck shaping, then at our working gauge of seven rows per inch, there will be a completely vertical edge about 3.5 inches tall between the final decrease of the V-neck and the neck edge of the shoulders. If we want to have the V's diagonal edges go all the way up

to the top of the shoulder shaping (that is, to rows seventy-one and seventy-two), we have to change which rows have decreases. Several options are explained in chapter 432.

A Reminder: Working with Two Balls of Yarn

Once we do the split for the V-neck, we have two choices:

- ☉ Work both front shoulders at the same time with separate balls of yarn.
- ☉ Finish one front shoulder, then work the other one.

Let's not get confused as we do the front neck and shoulder shaping.

Front Neck Shaping

After we work stitches forty-four and forty-five together for the decrease on the left neck edge on row one, we have to decide how we'll finish working the front. Will we turn and work back to the left armhole, or will we join a second ball of yarn to work the right front neck simultaneously?

If we choose to work each side separately, then we will need to put the right front neck stitches on a holder so we don't strain them while we finish the left front neck.

Shoulder Shaping

At each shoulder we'll have to work rows B1 through B8, but unlike the back's shoulder shaping, we'll work evenly every other row on both halves of the front.

For the left front shoulder (stitches fourteen through twenty-five), we'll bind off at the beginning of public-side rows B1, B3, B5, and B7, but we'll work evenly all the stitches on the even-numbered private-side B rows.

For the right front shoulder (stitches sixty-seven through seventy-eight), we'll work evenly all the stitches on the odd-numbered public-side B rows while binding off at the beginning of private-side rows B2, B4, B6, and B8.

“Right Front: Work as for Left Front, Reversing All Shaping”

Who doesn't hate these words in a cardigan pattern? On the flip side, it's easy to understand why project instructions use it! But if we put the given front's shaping in a chart, then it's easy to reverse it all for the other front.

Here's a chart for the top shaping of the left front of a very small V-neck cardigan. As we've done before, we're calling the last row before the shaping starts our “foundation row.”

Designed Left Front		
8	□ □ □ □ □ □	
	∇ □ □ □ □ □	7
6	□ □ □ □ □ □	
	∇ □ □ □ □ ∇	5
4	□ □ □ □ □ □ □ □	
	∇ □ □ □ □ □ □ ∇	3
2	□ □ □ □ □ □ □ □ □ □	
	∇ □ □ □ □ □ □ □ □ ∇ ∇	1
a	□ □ □ □ □ □ □ □ □ □	
	NMLKJIHGFEDCBA	

How do we reverse this left-front shaping so we can make the right front? First, we'll add some columns to the chart to hold the right front's symbols so it's easier to mirror-image everything.

Reversed Right Front		Designed Left Front	
		8	□ □ □ □ □ □
			∇ □ □ □ □ □
		6	□ □ □ □ □ □
			∇ □ □ □ □ ∇
		4	□ □ □ □ □ □ □ □
			∇ □ □ □ □ □ □ ∇
		2	□ □ □ □ □ □ □ □ □ □
			∇ □ □ □ □ □ □ □ □ ∇ ∇
		a	□ □ □ □ □ □ □ □ □ □
			NMLKJIHGFEDCBA

Since we've put a private-side foundation row in the left front's chart, the right front's "foundation row" will be the public-side row one.

Reversed Right Front		Designed Left Front	
		a	□ □ □ □ □ □ □ □ □ □
	ABCDEFGHIJKLMN		NMLKJIHGFEDCBA

Remember that because we can only bind off at the beginning of the row, one front will start shaping on a public-side row while the other front will have to start shaping on a private-side row. Row one of the left front starts with two bound-off stitches, so we'll have to do those bind-offs at the beginning of the right front's row two.

Reversed Right Front		Designed Left Front	
2	∇ ∇ □ □ □ □ □ □ □ □		∇ □ □ □ □ □ □ □ ∇ ∇
	□ □ □ □ □ □ □ □ □ □	1	□ □ □ □ □ □ □ □ □ □
	ABCDEFGHIJKLMN		NMLKJIHGFEDCBA

Since the left front’s row one ended with a decrease, we have to end the right front’s row two with the mirror-image decrease. Here’s the right front’s complete row two, with the rest of the row’s stitches followed by the decrease whose direction has been flipped.

Reversed Right Front	
2	
1	
ABCDEFGHIJKLMN	

Designed Left Front	
1	
a	
NMLKJIHGFEDCBA	

Note that for our reversed front, the boxed stitch letters run in the opposite direction. I’ll freely admit that trying to mirror-image each row without those identifiers was, well, difficult. With them, though, it’s quite easy to double-check immediately that each reversed row is accurate.

Since the left front’s row two is worked evenly, our right front’s row three is also worked evenly.

Reversed Right Front	
3	
2	
1	
ABCDEFGHIJKLMN	

Designed Left Front	
2	
1	
a	
NMLKJIHGFEDCBA	

Our right front’s row four decreases a stitch from each end, like the left front’s row three.

Reversed Right Front	
4	
3	
2	
1	
ABCDEFGHIJKLMN	

Designed Left Front	
3	
2	
1	
a	
NMLKJIHGFEDCBA	

We continue to invert each row, using the boxed letters to help put the stitches, decreases, and blank spaces in the proper spots.⁷

⁷ Since the charts are so small, I have once again contradicted myself by showing each front in a single table column instead of putting each portion of the shaping in its own table column. That means I have to use spaces to move stitches left and right instead of being able to set all the separate table columns to be either left or right justified so the stitches move automatically to the proper spot. In a larger project, I’d put each section in its own column (once I remembered to).

Reversed Right Front		Designed Left Front	
		8	
8			7
		6	
6			5
		4	
4			3
		2	
2			1
		a	
	ABCDEFGHIJKLMN		NMLKJIHGFEDCBA

On a good day, I might be able to do all the reversing in my head and have no trouble knitting the “other” front without charting it. But my days are filled with the same interruptions yours are filled with. Working the reversed front from a chart means we have a much smaller chance of making a mistake.

Intarsia by Charting

Suppose we want to create a garment for each family member from the same graphic. Here’s just one idea, using the flag of Texas. The knit squares represent white, while the colored No Stitch symbols indicate which stitches are red and blue. (You’ll be able to see the individual stitches by zooming in a bit in the electronic PDF.)

While I made my chart the hard way (you don’t want to know), there are programs out there that can lay any size grid over any kind of image. Since row gauge in knitting is usually tighter than stitch gauge (we usually have more rows than stitches per inch), then we likewise need a grid with more rows per inch than stitches per inch. If we don’t account for the difference in row and stitch gauge, the image will be squashed (as this example would since the knitting font’s symbols are basically square).

