

# **THE KNITTING ARCHITECT**

*by*

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**Published by Knitting Fever Inc.**

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This book is intended for the sole purpose of advancing the craft of knitting in this country.

Of all the developed countries of the world, America falls last in knitting. There is a very good reason for this. America has had no need to knit until the late 1970's when oil prices became so high and oil so scarce that people had to lower their thermostats considerably. There is nothing more comfortable than a sweater for inside wear, and many Americans became aware of this. Designers became aware of this too and started to produce expensive and interesting hand-made sweaters. This added fuel to the knitting market. More and more hand-made sweaters were being shown in magazines, in fashionable boutiques, on celebrities. This new excitement encouraged many people to try knitting. Hence the problems.

1. There were not enough yarn shops.
2. There were not enough knowledgeable people at the customer, retail, wholesale, and teaching level.
3. There were no schools teaching knitting.
4. There were not enough yarns available to meet the sudden demand.

Problem number 4 was solved to a great extent. Today America imports a great deal more yarn than it did five years ago.

Problem number 3 is being valiantly attacked by small knitting stores across the country, teaching their customers as best they can to knit and purl. Other efforts are in the works on the part of certain organizations concerned with the advancement of knitting.

Problem number 1 has also been diminished to some extent since there are many more knitting stores today in America than before.

The only problem that has not been touched is that of making people knowledgeable in this craft. There is more to knitting than just knitting and purling. It would be foolish to imagine that a brick layer could build an apartment house from scratch. You need an architect first to draw plans. This is work requiring knowledge, experience, and precision.

In the other developed countries of the world, knitting has been practiced for so long, has been established so firmly, that the customers at the retail level are the architects. All they need is the yarns and the needles and they will custom design and knit. In America, not only are the customers novices, but in many cases so are the shop owners and/or their employees. So what does one do?

Many store owners rely on patterns and books supplied by yarn companies. The success of this method is limited. This approach was originally intended for the more knowledgeable European knitters who can adapt the patterns on their own to their specific needs.

A revolutionary newcomer to our industry is the Knitting Instructor™ computer. It produces knitting patterns for just about any style and measurements. Anyone without computer or knitting knowledge can operate it. Even though on its own it represents the greatest step forward our industry ever took; even though it is the most practical and functional tool ever devised for our industry; still it does not teach people how to become the architect.

This is what I hope this little book will do. I hope it helps the retail customers — I hope it helps the store owners or the would be store owners and their employees — I hope it helps the designers and would be designers — I hope it helps all the manufacturers and importers of yarns — I hope it helps establish the wonderful craft of knitting firmly in America. So many big hopes for such a little book. Oh well, you know what they say about small packages!

## Necessary Data

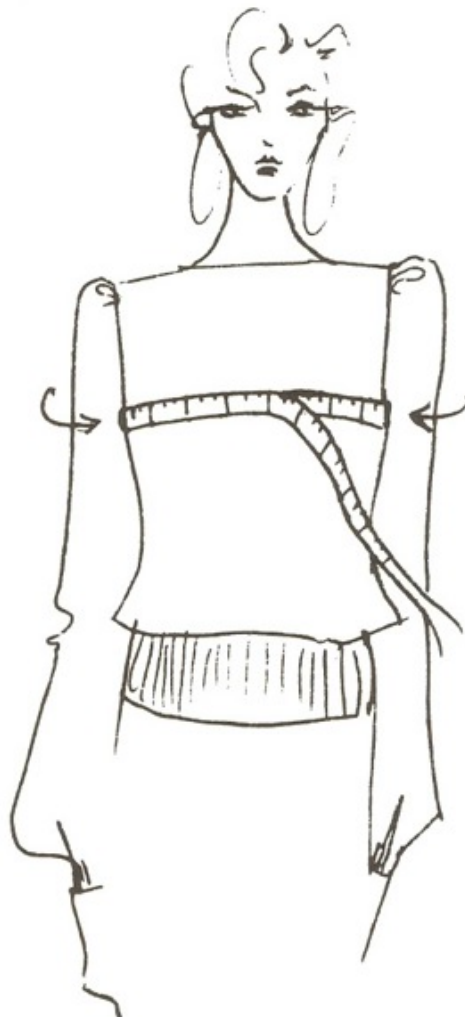
We will begin here to become knitting architects.

Before we undertake a project, it is important to understand what it actually represents. We will learn to write a plan (directions) for the construction of a garment. This garment will be built of yarn and the unit will be the stitch. Relate this in your mind to a house and the stitches to the bricks. To build a house you need dimensions. Same for knitting a garment. To build a house of bricks, you must know the measurement of the bricks. Same for knitting a garment. To build a house you need understanding of shape and style. Same for knitting a garment.

## Measurements

Let's temporarily forget about the house. To make a sweater pattern you must first have the measurements you wish the sweater to be. This is not the measurements of the body to fit into the sweater, but based on those body measurements you will formulate numbers adapted to suit the look and style desired. The necessary measurements are:

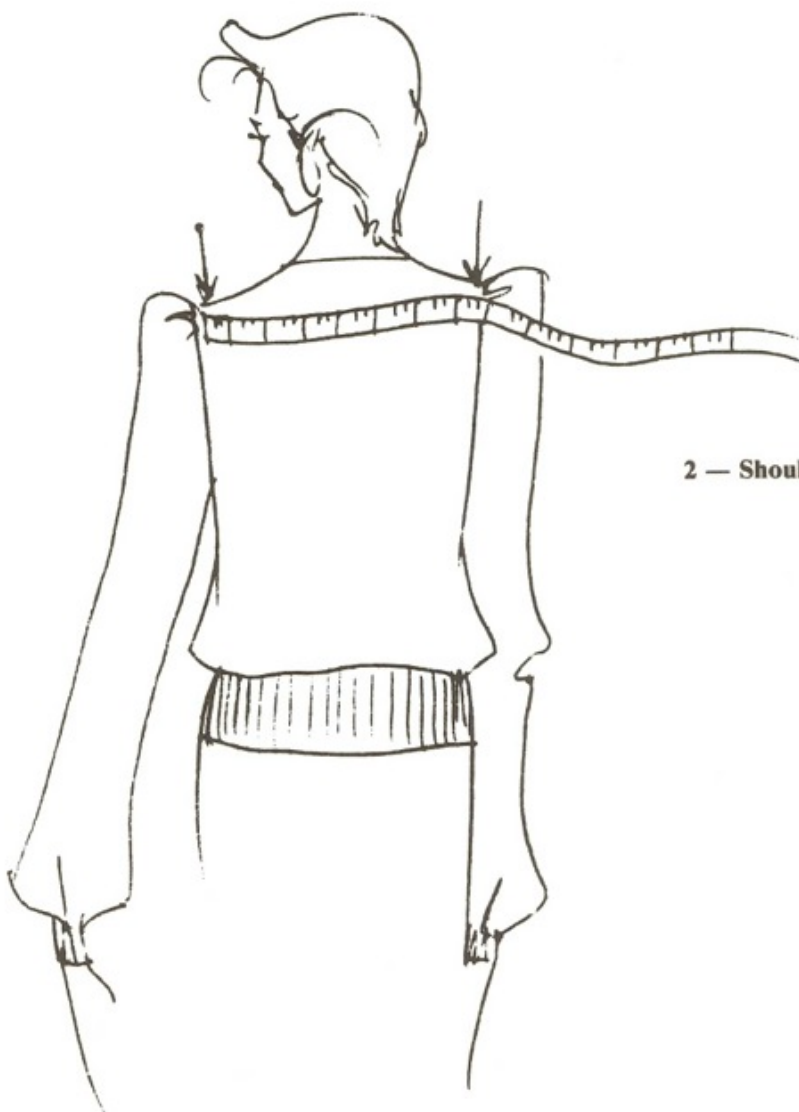
1. **Chest Measurement:** It is taken around the chest at the widest place. This body measurement is then adapted to suit the style and look of the garment and also the person's preference. For example, a casual drop shoulder pullover for a person with a 36 inch chest would be figured out on a 39 to 42 inch measurement, not on a 36 inch. A short dressy pullover would be figured out on 36 inches however.



1 — Chest Measurement



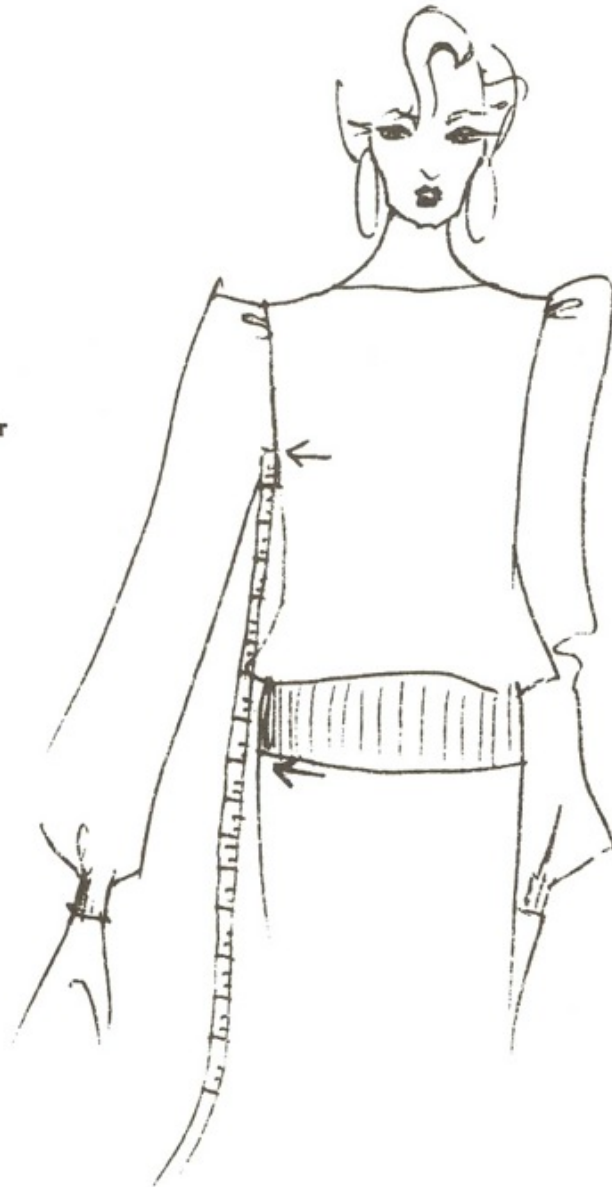
2. **Shoulder Measurement:** This is a very important measurement. The chances are that if the shoulders fit properly, the sweater will look good even if it is a little too wide, too long, etc. But if the shoulders don't fit, then everything else will seem not to fit. This measurement is taken across the back from arm joint to arm joint. My suggestion is to reduce this measurement by  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches depending on the nature of the yarn used. Some yarns stretch more than others or weigh more than others. This added to the weight of the sleeves and the pull placed on the shoulders everytime the sweater is put on compounds the problem and explains the need for the adjustment. It compensates for the stretch.



2 — Shoulder Measurement

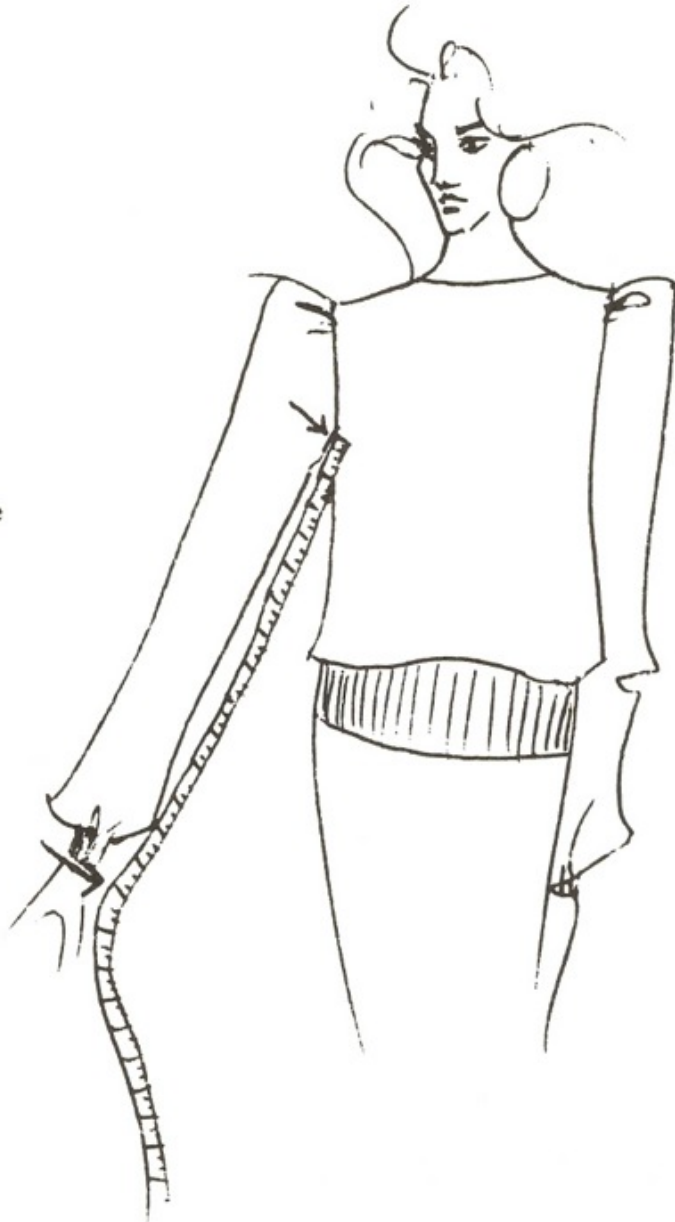
3. **Length of Sweater:** This measurement is taken from the underarm down. **Whenever measuring from the underarm you must start 2 inches below the armpit.** This is where your armhole will start. You must always think of fit and comfort. Whatever length you have measured you must add one or more inches to it to allow for the desired amount of ease and blouson.

3 — Length of Sweater



4. **Length of Sleeve:** The sleeve length is also measured from the underarm (2 inches below armpit) to the wrist for long sleeves or to where you wish to stop them for shorter sleeves. Here too, you might want to add  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches based on style and preference.

4 — Length of Sleeve



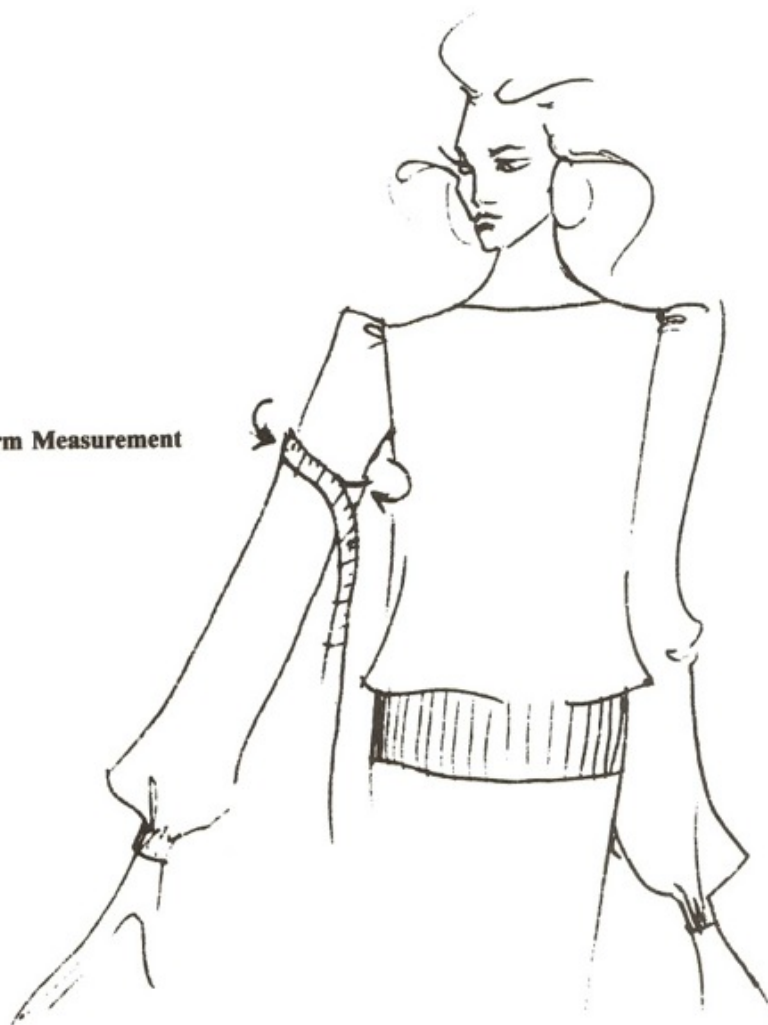
5. **Wrist Measurement:** This measurement is very important. It must be pointed out that it is never taken precisely at the wrist and for very good reason. The cuff of sweater sleeves are generally knitted up in ribbing on small needles. If the measurement was to be taken precisely at the wrist and the number of stitches based on that measurement, the result would be a very tight, almost impossible fit. The wrist measurement must be taken 2½ inches above the wrist and to that measurement must be added one or more inches to allow for a comfortable fit.

5 — Wrist Measurement



6. **Upper Arm Measurement:** This measurement is taken around the bicep, somewhere around the middle of the upper arm. To this actual measure must be added at least the same amount of ease that was added onto the actual wrist measurement.

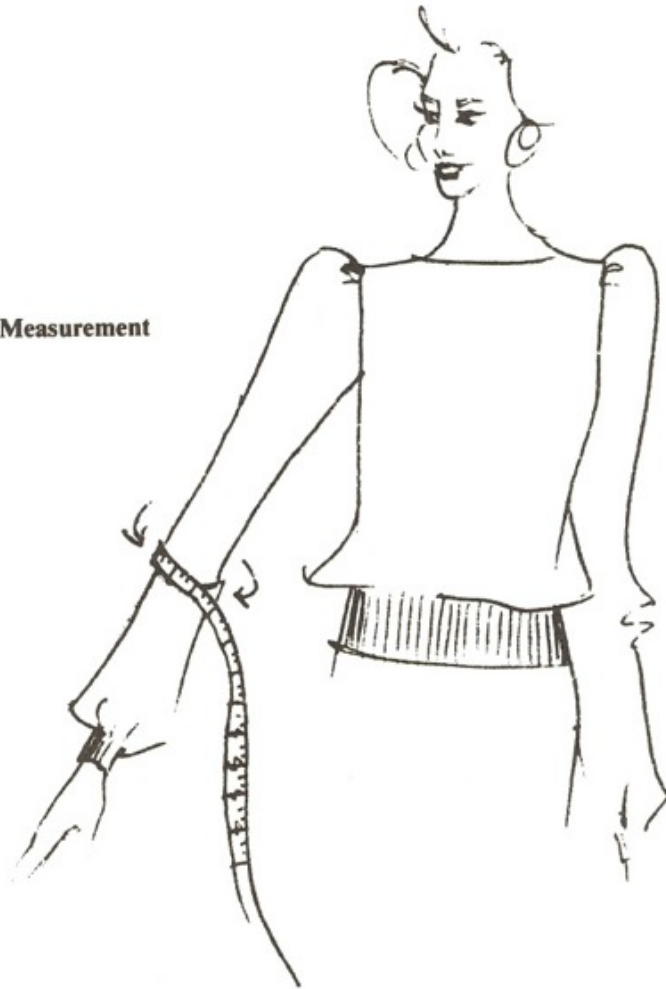
6 — Upper Arm Measurement





**7. Forearm Measurement:** This is only needed for very special styles. The sleeve around the forearm must be measured below the elbow and the same amount of ease added to the wrist must also be added to it.

**7. Forearm Measurement**



Now please remember that everyone does not like to be fit the same way. Some people like looser fits, others, tighter. Be sure to know beforehand how the garment you are charting is to fit!

## STITCH & ROW GAUGES

Now that we are done with sweater measurements, we need to know the size of the bricks (stitches) to be used. Since we are working on a much smaller scale than a building, and since the stitches are much smaller than bricks, we do not measure each stitch individually, but rather we work with the inch as a unit and we figure how many stitches it takes to fill that inch. What we refer to here is called the **stitch gauge**.

The stitch gauge is based on the thickness of the yarn. The thicker the yarn, the larger the gauge. The inverse is also true. A large gauge for a very bulky yarn may be 2 stitches per inch while a small gauge for a very thin yarn may be 9 stitches per inch. Please notice a large gauge implies small numbers (2 in this case) while a small gauge implies larger numbers (9 in this case).

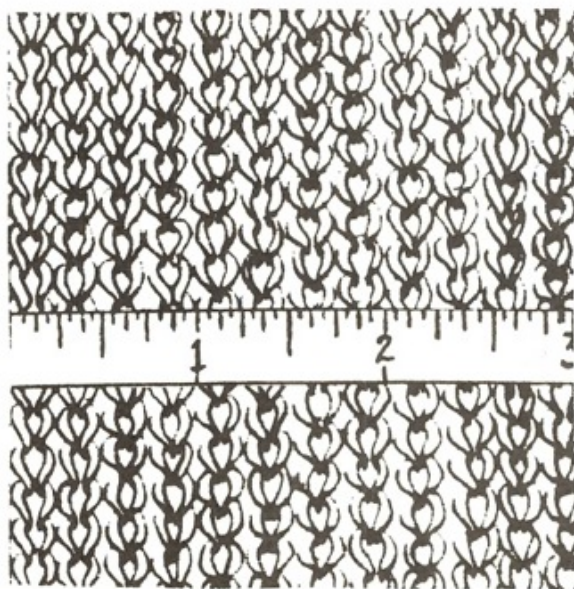
The stitch gauge refers only to the horizontal measure of the stitch. We must also know the vertical measure of the stitch (the thickness of the brick). This vertical measure is called the **row gauge**.

Just as the stitch gauge is based on the thickness of the yarn, so is the row gauge. And again, since the thickness of each row is quite small, we work with the inch as a unit and determine the number of rows **within** the inch.

To obtain an accurate pair of gauges there are several prerequisites:

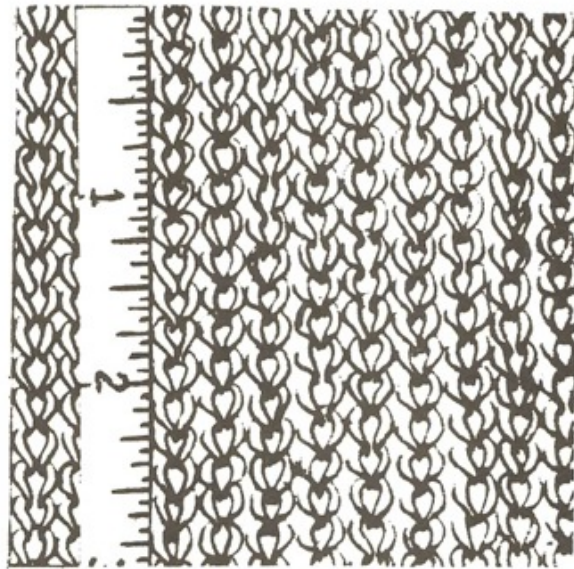
1. The person who is to knit the sweater must work up a sample square with the yarn and needles to be used. Since everyone knits differently, it is imperative to obtain this sample from the knitter.
2. This sample square must be made in the very stitch to be used in the sweater. There is a multitude of various stitches and they all measure differently. Be sure to make the sample out of the stitch to be used.
3. The sample square must be made large enough to get an accurate measure. This is very important with all yarns but it is most significant when working with novelty yarns and especially yarns with large nubs or thick and thin parts. We recommend a square at least 3 to 4 inches by 3 to 4 inches.

**To measure a stitch gauge** lay the sample on the table. Be sure to lay it flat without stretching it. Lay across it a ruler or tape measure defining precisely a 3 inch length. Count the number of stitches included within this 3 inch area. Then divide the number of stitches by the number of inches (3). The resulting number is the stitch gauge. It can be a whole number or it can have a decimal. This is the number we will use as a stitch gauge to chart the sweater.



8 — Stitch Gauge

The **row gauge** is measured precisely in the same manner, but this time you count the number of rows in the 3 inches instead of the number of stitches. Again, the number of rows is divided by the number of inches (3). The resulting number is the row gauge used to chart the sweater.



9 — Row Gauge

To work on a sample square of less than 3 to 4 inches is extremely risky. You will have great difficulty obtaining an accurate gauge. Understand that the few minutes spent on the sample square represent the single most valuable effort to assure a proper fit. It is really a small price to pay. If you wish the sweater to fit, knit the sample square.

Both the row gauge and the stitch gauge can be rounded off to a number and a single decimal. For example, 3.666 can be rounded off to 3.7, but 3.7 **must not** be rounded off to 4.



## SHAPE

At this point we have obtained sweater measurements and both stitch and row gauges. All we need to speak of now is shape.

In order to chart, it is necessary to have a certain understanding of the human body — its shape that is. In spite of all the variations we will encounter in width, in length, in girth, etc., we still work with basically the same shape — that is one head, one torso, and two arms. The head must be exposed, even if not completely. The arms must have freedom of movement and perhaps be covered if we are making a garment that has sleeves. The hands should be exposed. The torso must be covered. This is a shape we have lived with for a while. This is the body we have dressed every day of the week — a body that has experienced discomfort when armholes are too small or garments too tight or too long. This is a body we are familiar with. Imagine for a moment designing clothes for a spider when you have no understanding of the way spiders move. How could you know what is comfortable and what is not? Luckily, we are going to become knitting architects for bodies such as our own; bodies we are familiar with. We will leave spiders for someone else.

Let's look now at some of the possibilities for designing. The first consideration is the **pullover**. This type of sweater, as the name implies is pulled over the head and body to go on. The only openings left are for the head and arms. Pullovers can have any length sleeves or even no sleeves at all. In the last instance, they are called **pullover vests**.



10 — Pullover

The next consideration is the **cardigan**. This is a sweater that generally has a zipper, or buttons, or even no closure at all down the front so that it can be slipped on like a jacket and closed in the front afterwards. Sleeveless vests can also be made in this style.



11 — Cardigan

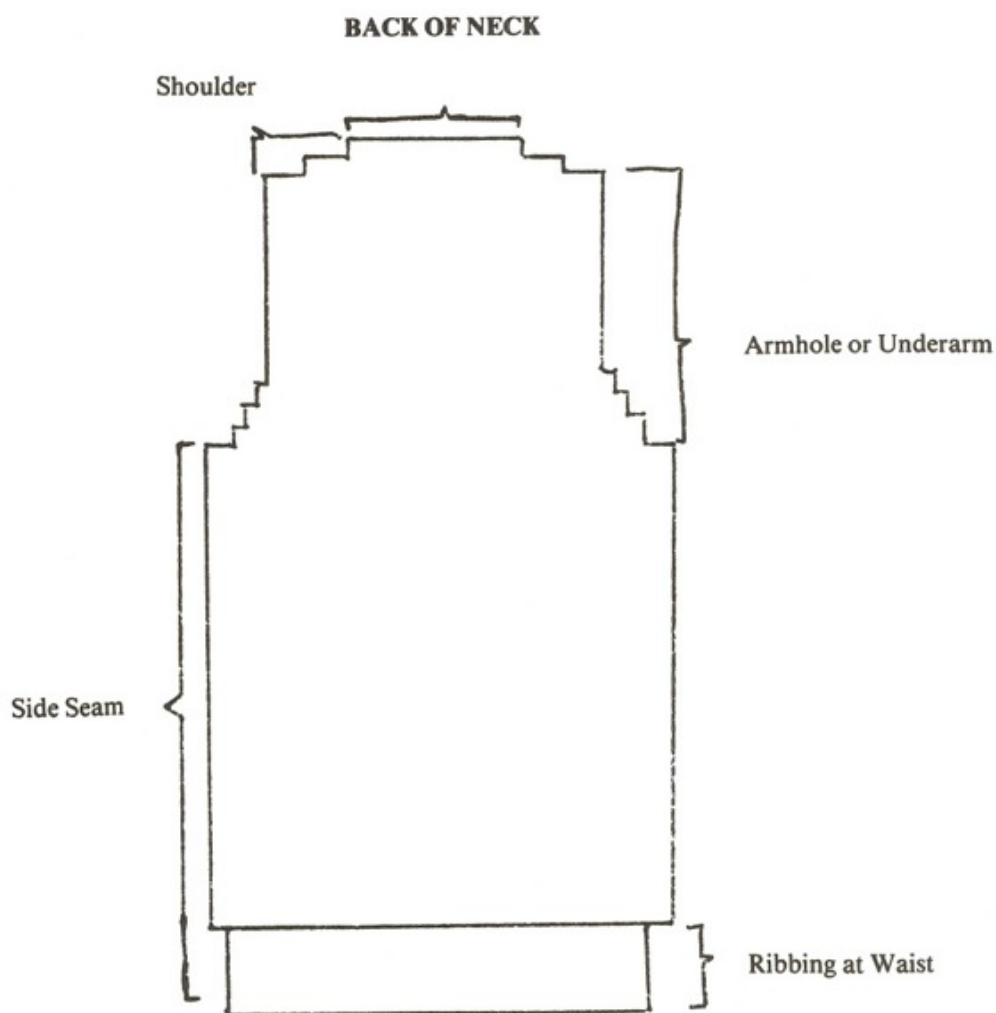
From these two basic types, we can turn out a multitude of styles, coats, tunics, dresses, etc. Vary the sleeve, the neck, the length; close it in the middle or on the side, long rib, no rib. There is no end. And all these possibilities are easy to achieve when we are familiar with the two basic types above and with the principles of charting.

So what it all boils down to is that in spite of all the possibilities, when it comes to style and fashion, we are still basically dealing at this time with two types of design that will fit over one body shape. Nothing overwhelming.



## CONSTANTS

Before we start with the basics of charting, it is important to list what we will refer to as constants. These constants can be changed, in spite of their name, whenever your judgment calls for it. They are to serve as a general base from which to start. Remember these are not absolute.



12 — Sketch of Back

The first constant we will consider is the **underarm constant**.

Children — chest size	20 - 23	5½ inches
	24 - 27	6 inches
	28 - 31	6½ inches
Female adults — chest size	32 - 35	7 inches
	36 - 39	7½ inches
	40 - 43	8 inches
	44 - 47	9 inches
	48 up	9½ inches
Male adults — chest size	32 - 35	8 inches
	36 - 39	9 inches
	40 - 43	9½ inches
	44 - 47	10 inches
	48 up	10½ inches

When making larger and heavier garments that are to be worn over other clothes, all the measurements one works with must be increased to allow for the added bulk. This applies to the underarm constants. They must be increased as follows:

All children's sizes	add ½ inch to underarm constant	
Adult female sizes	32 - 39	add 1 inch
	40 - 47	add 1¼ inches
	48 up	add 1½ inches
Adult male sizes	32 - 39	add 1 inch
	40 - 47	add 1½ inches
	48 up	add 2 inches

When making a larger and heavier garment such as a coat, the actual chest measurements should be increased as follows:

Children's sizes	add 3 inches	
All adult sizes	32 - 39	add 4 inches
	40 - 47	add 5 inches
	48 up	add 6 inches

The next constant is for the back of neck. This constant does not need to vary from females to males. We will be working at this time with relatively small numbers and the differences that could exist between the male and female back of neck constants would be so small that they will be compensated for in the finishing. We can always rib an extra quarter inch of ribbing around the neck to make it fit properly or vice versa. This is where a little judgment comes in. Work up the whole sweater first. Then decide how much ribbing will be needed. This is called playing it safe — and that's fine. Please remember that in the finishing you will generally rib around the neck for ¾ inch or more. This takes off 1½ inches from the back of neck measurement. For this reason, do not be alarmed if these new constants seem excessive.

### BACK OF NECK CONSTANTS

Chest size	20 - 23	4½ inches
	24 - 27	5 inches
	28 - 31	5½ inches
	32 - 35	6 inches
	36 - 39	6½ inches
	40 - 43	7 inches
	44 - 47	7½ inches
	48 - 52	8 inches
	52 up	8½ inches

When it comes to constants, you must use judgment if variation is called for. These constants can be changed to suit the individual's specific needs. For example, the armhole constant for a female with a 38 inch chest is 7½ inches, but depending on your knowledge of the yarn and its qualities or style, or the unusually heavy arm of the person, you may decide to change the 7½ inch armhole to 8 inches or even 8½ inches. The opposite could also be true if the arm were very skinny; you could reduce the underarm constant to 7 inches or even less.

Even though these constants cover us in 98 percent of all cases without alterations, we are not limited exclusively to them. The constants provide us with a base from which to work. There are other constants which will be established later. And as you become more expert, you will establish some of your own constants. At this time, they are a good place to start.

## **BASIC CHARTING PRINCIPLES**

Now we begin. We will learn to chart a basic ladies pullover with long set-in sleeves and a round neck. Please understand that if three qualified instructors chart the same sweater for the same person, the three charts may read differently. There may be slight differences between them, but these will not be important. What will matter is the fit. All three sweaters should fit properly. The fit is the key.

The best approach and the easiest approach to charting and knitting a pullover calls for the work to be done in four pieces; the back, the front, and the two sleeves.

We will work with the following sweater measurements:

Chest — 40 inches  
Shoulders — 16 inches  
Length of sweater — 17 inches  
Length of sleeve — 18 inches  
Sleeve around upper arm — 15 inches  
Sleeve around wrist — 10 inches  
Stitch gauge — 3 sts = 1 inch  
Row gauge — 4 rows = 1 inch  
Pattern — stockinette and K1, P1 rib  
Needles — 8 and 10½

The back and the front of the pullover are generally made the same width. Since the whole sweater will measure 40 inches around, then the back must be 40/2 or 20 inches and so must the front (20 + 20 © 40). To obtain the number of stitches to cast on for the back, we simply multiply the stitch gauge by the width of the back.

Stitch gauge x Back  
3 x 20 = 60 stitches

So we start as follows:

**Cast on 60 stitches.**

Since ribbing must be tight, we work it on needles 2 or 3 sizes smaller than needles used for the sweater.

**On size 8 needles, rib K1, P1 for 2½ inches. Change to size 10½ needles and stockinette stitch.**

We determined that the sweater should be 17 inches long to the underarm.

**Work even until piece measures 17 inches.**

“Work even” implies working straight up — no increases or decreases.



At this point we are going to shape the underarm. What we need to do is to reduce the back to the size of the shoulders. The shoulders are 16 inches. That represents 48 stitches (3 times 16). We need to reduce 60 stitches which is what we started with, to 48 stitches which is the size of the shoulders. 60 stitches less 48 stitches leaves 12 stitches to be eliminated. This reduction must be arranged half on one side, half on the other side. We must have symmetry. That means we must eliminate 6 stitches on the right and 6 stitches on the left. But these stitches are not eliminated all at once. We start first with a bind off of several stitches at each side. This first underarm bind off is usually equal to the stitch gauge.

**Bind off 3 stitches at beginning of next 2 rows.**

Remember that a bind off is always done at the beginning of a row. The other stitches left to eliminate will be reduced one at a time in an effort to create a slope instead of a right angle.

**Decrease 1 stitch each end every other row 3 times.**

We now refer to our constants. A 40 inch chest has an 8 inch armhole.

**Work even until armhole is 8 inches.**

The back of the sweater is now finished. We have reduced it to 48 stitches, the size of the shoulders (60 sts. less 2 bind off of 3 sts. each = 54 sts. less 2 sets of decreases of 3 sts. each = 48 sts). We must now shape the shoulders and the back of neck.

We know that the back of neck is 7 inches which is the constant for size 40. 7 inches times gauge (3) = 21 stitches. The total number of stitches left on the needle is 48 sts. The difference between the total number of stitches left on the needle and the number of stitches needed for the back of neck represents the number of stitches to be worked in the shaping of the shoulders. 48 stitches less 21 stitches = 27 stitches. This number must be divisible by 2,  $\frac{1}{2}$  for the right shoulder and  $\frac{1}{2}$  for the left shoulder. Since each shoulder must be identical to the other, remember symmetry, and since 27 does not divide equally by two, we are forced to add or to eliminate 1 stitch from the number of stitches needed the the shoulder shapings. Whether you add or subtract is entirely your choice. In most cases it will make no difference. But to be safe, look at your customer and determine if she or he has a wide or narrow neck. For a wide neck, add a stitch to the back of neck and subtract from shoulders. A narrow neck, subtract from neck and add to shoulders.

In this instance, we are working with a narrow neck. We will subtract 1 stitch from the 21 stitches of back of neck to make it 20 stitches. We will add this one stitch to the 27 stitches of shoulders making them 28 stitches. Remember that no matter what you do, the original 48 stitches you were left with does not change.  $21 + 27 = 48$  and  $20 + 28 = 48$ .

To shape the shoulders, we must bind off the 28 stitches we allocated to them. We must bind off  $\frac{1}{2}$  or 14 stitches for the right side and 14 stitches for the left side leaving 20 stitches for the back of neck in the middle. But we do not wish to bind off all 14 stitches at one time. We want to create a slope to match the natural shape of our shoulders. In order to do this, we break the bind off into several steps.

At this point we introduce another constant. It applies to the number of steps in which one will bind off at the shoulders.

- Stitch gauge under 4 stitches, bind off each shoulder in 2 steps.
- Stitch gauge of 4-6 stitches, bind off each shoulder in 3 steps.
- Stitch gauge of more than 6 stitches, bind off each shoulder in 4 steps.

Our stitch gauge is 3. We fall into the first category so:

**Bind off 7 stitches at beginning of next 4 rows.**

This represents two rows at the right and two rows at the left. This is two bind off on each side.

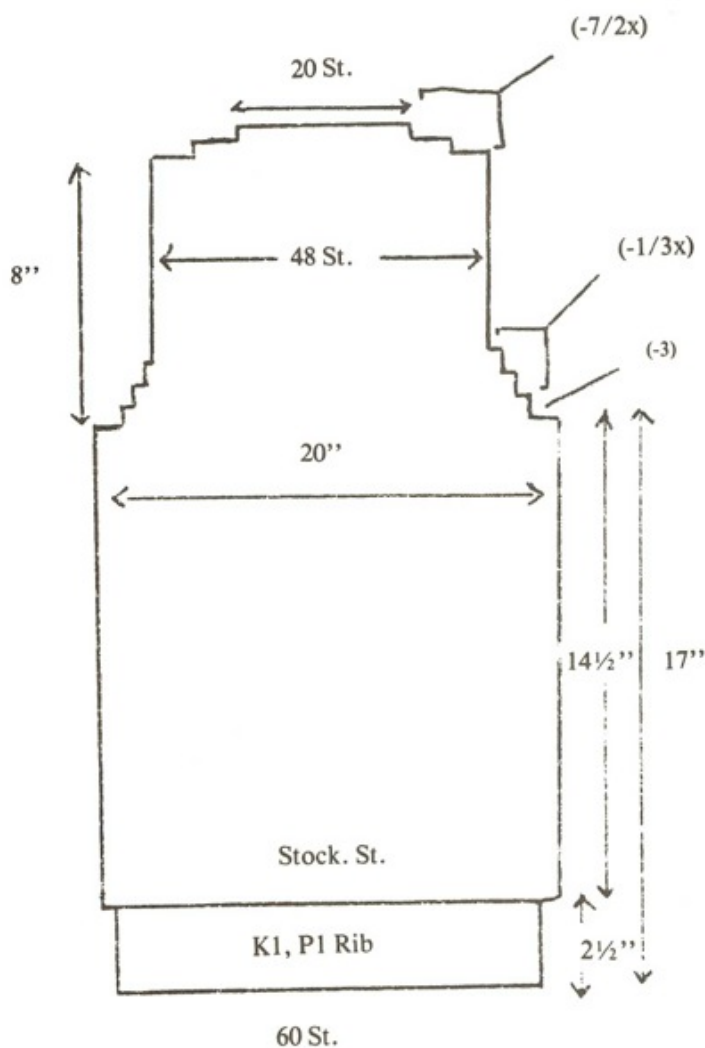
The shoulders are now done. We are left with 20 stitches for the back of neck. Here we have a choice.

1. We can bind off these 20 stitches
2. We can place them on a holder

My preference is to bind off. This will create a firmer frame that will prevent the shoulders and back from stretching.

**Bind off 20 stitches for back of neck.**

The back is now all done.



13 — Sketch of Back With Data



## FRONT

We are now ready to begin the front. The front is identical to the back up to the point where the neck starts (for a pullover) so:

**Cast on 60 stitches on size 8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles and stockinette stitch. Work even until piece measures 17 inches. Bind off 3 stitches at the beginning of the next 2 rows. Decrease 1 stitch each end every other row 3 times.**

At this point, we must establish another new constant. This one is for the round neck shaping on the front of sweaters.

Size 20-25, neck starts 1" short of top of armhole.

Size 26-30, neck starts 1½" short of top of armhole.

Size 31-42, neck starts 2" short of top of armhole.

Size 43-52, neck starts 2½" short of top of armhole.

The armhole constant is 8 inches for size 40. The neck starts 2 inches below that.  $8 \text{ less } 2 = 6 \text{ inches}$ . So we continue.

**Work even until armhole is 6 inches.**

We have allowed 20 stitches for the back of neck. We must allow the same number for the front of neck in the sweater. These 20 stitches for the front must be rounded off. We will bind off a center portion of these 20 stitches in one step and then we will round off the corners by decreasing a stitch at each end every other row until the balance of the 20 stitches of neck is used up. The question is how many stitches do we first bind off in the center?

The one rule we use is to take the number of stitches for the back of neck and deduct from it two times the gauge. Should the gauge not be a whole number, it must first be rounded to its next whole number. So we take 20 stitches less  $(2 \times 3) = 14$  stitches to be bound off in the center of row.

At this point, we have 48 stitches, 14 of which we must bind off in the center. To determine where the bind off should start, we use the following formula.

Total number of stitches (48) — Stitches to be bound off (14) divided by 2.

$$\frac{48 - 14}{2} = 17 \text{ stitches}$$

This number (17) tells me that there will be 17 stitches on either side of the 14 stitches to be bound off in center of row. So we continue:

**Work 17 stitches.**

Now we want to bind off 14 center stitches and create the separation in the front for each side to be worked up. To create this separation and work both sides up simultaneously we must introduce a second ball of yarn, one for each side. By working both sides simultaneously we make sure to work the same number of rows on both sides. We continue:

**With a second ball of yarn, bind off 14 stitches and work remaining 17 stitches.**

The 17 stitches represent 14 stitches of the shoulder plus the 3 stitches of gauge taken from the center of neck on each side. To round off the front of the neck, it is these 3 stitches that we must eliminate gradually and on each side. It follows:

**Decrease 1 stitch each neck edge every other row 3 times.**

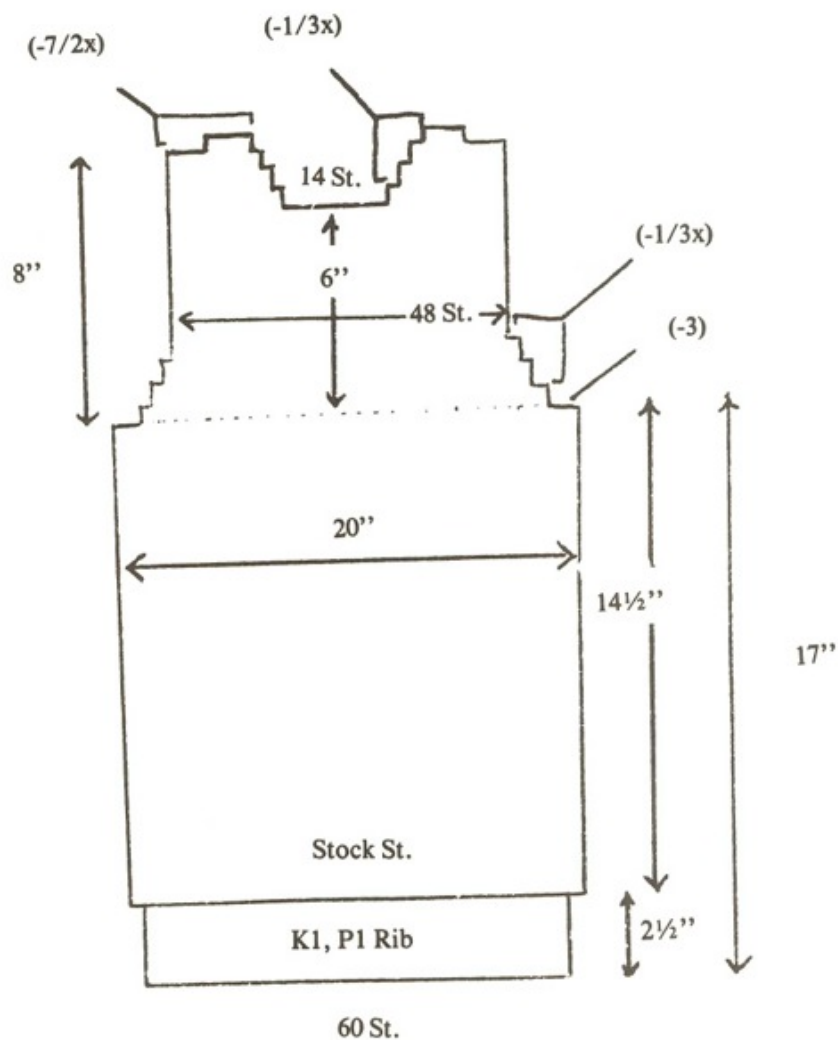
These 6 stitches plus the 14 stitches bound off represent the same opening in front as we have in back. We now have 14 stitches remaining on each side for the shoulders. The shoulder bind off in the front must match the shoulder bind off in the back. So we continue:

**Work even until armhole measures 8 inches.**

Armhole for back and front must match.

**Bind off 7 stitches at the beginning of next 4 rows.**

This is the same thing we did for back. Now the front is finished.



14 — Sketch of Front With Data

## SLEEVE

Since both sleeves are the same, we only need to chart one. We multiply the wrist measurement by the gauge to obtain the cast on number of stitches. Wrist is 10 inches, gauge is 3, so  $10 \times 3 = 30$  stitches. It follows:

**Cast on 30 stitches on size 8 needles. Rib K1, P1 for  $2\frac{1}{2}$  inches.**

From this point we must progressively increase the width of the sleeve. We must go from 10 inches around the wrist to 15 inches around the upper arm. 15 inches represents 45 stitches. We must add  $45 - 30 = 15$  stitches to the width of the sleeve. These increases must be made equally on both sides. The sleeve must be symmetrical. Since 15 is not divisible by 2, we must even up or even down this number in order to be able to divide by 2. We must use our judgment. A thin arm, even down. A heavy arm, even up. In this instance, we will even down. We will increase 14 stitches, 7 on each side, progressively.

The sleeve length is 18 inches. We already used  $2\frac{1}{2}$  inches for the ribbed cuff.  $18 - 2\frac{1}{2} = 15\frac{1}{2}$  inches left. As a rule, all the increases on a long sleeve must be finished at least 3 inches before the armhole bind off on adults and 2 inches before the armhole bind off on children.

For our sweater sleeve, we started with an 18 inch sleeve. We reduced that by  $2\frac{1}{2}$  inches for the cuff, and we now reduce it by 3 inches (see above rule).  $18 - 2\frac{1}{2} = 15\frac{1}{2}$  less 3 =  $12\frac{1}{2}$ . We have  $12\frac{1}{2}$  inches in which to make our 7 increases on each side.  $12\frac{1}{2}$  inches times the row gauge represents  $12\frac{1}{2} \times 4 = 50$  rows. We must increase 14 stitches, that is, 2 stitches, one at each end 7 times. These increases must be spaced equally in the  $12\frac{1}{2}$  inches of sleeve immediately above the cuff. Every so many rows we must increase. The question is how many rows?

To figure this, we take the number of rows in the  $12\frac{1}{2}$  inches (50) and divide it by the number of times we must increase (7).  $50/7 = 7.14$ . We round it down to the nearest whole number which is 7. We must increase every 7 rows. It follows:

**Change to  $10\frac{1}{2}$  needles and stockinette stitch. Increase 1 stitch each end, every 7 rows, 7 times. Continue to work even until sleeve measures 18 inches.**

In order to successfully shape and fit the parts of the sweater together, the bind offs and decreases of the front and back must match those of the sleeves. For a set in sleeve, the cap is shaped by binding off gauge on each side and decreasing 1 stitch each and every other row until cap is (refer to following constant):

### CONSTANT

Size 20-26 2 inches less than armhole.  
Size 27-31  $2\frac{1}{2}$  inches less than armhole.  
Size 32-40 3 inches less than armhole.  
Size 41-48  $3\frac{1}{2}$  inches less than armhole.  
Above 48 4 inches less than armhole.

All caps are not shaped the same way. Since the bind offs and decreases of back and front must match that of sleeves, we start as follows.

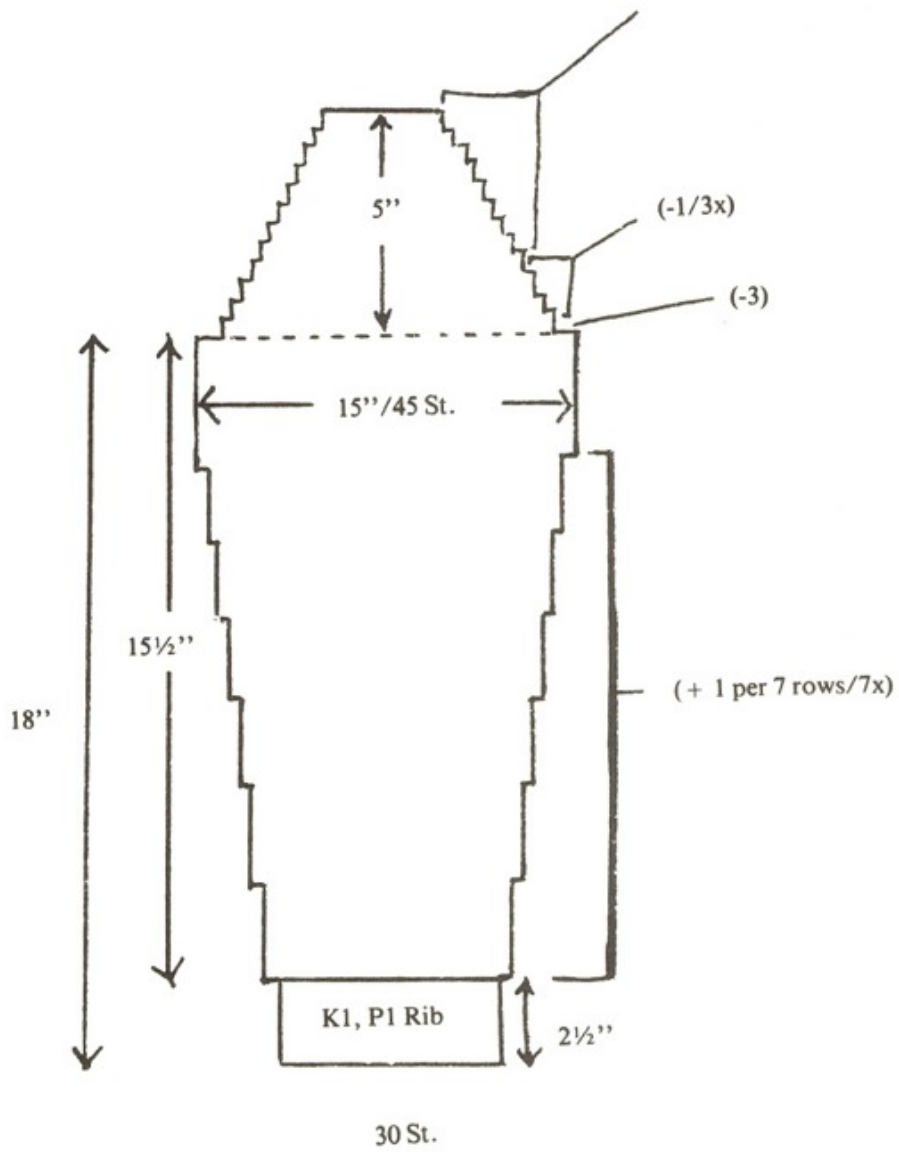
**Bind off 3 stitches at beginning of next 2 rows. Decrease 1 stitch each end every other row 3 times.**

Since this is a set in sleeve cap, we continue as follows.

**Decrease 1 stitch each end, every other row, until cap is 5 inches (3 inches less than armhole). Bind off all remaining stitches.**

Start over for second sleeve.





15 — Sketch of Sleeve With Data

## FINISHING

The main work is finished. The four pieces are done. They must be put together as follows.

**Back stitch the front and back together at the shoulders and at the sides. Fit in the sleeves by matching the bind offs and back stitch all around armhole.**

To finish the neck, we will rib  $\frac{3}{4}$  inch all around. To determine the number of stitches to be picked up, we measure around the neck, we measure around the neck of the sweater. We multiply this number by gauge. 18 inches times 3 = 54 stitches. It follows:

**Pick up 54 stitches evenly around the neck on circular or double pointed needles and rib K1, P1 for  $\frac{3}{4}$  inch or desired length. Bind off loosely or sweater won't go on.**



## APPLICATION OF CHARTING PRINCIPLES

### NECKS

At first sight it will appear that all we have learned so far is to chart a round neck pullover. Right? Wrong!

Let's see why. The best way to approach it is to chart a different sweater. Let's say a **V neck pullover with long, set in sleeves**. The back of the V neck pullover is identical to the back of the round neck pullover. We already know how to do the back. The sleeves of the V neck pullover are identical to the sleeves of the round neck. We already know how to do the sleeves. The front of the V neck sweater is identical to that of the round neck up to the point where the neck starts. The V neck usually starts at the height of the armhole. I say normally because it could also start at the belly button or anywhere you choose. To make sure we understand, we are going to chart the whole front.

**Cast on 60 stitches on #8 needles and Rib K1, P1 for 2½".** Change to 10½ needles and stockinette stitch. Work even until piece measures 17 inches.

Everything is the same up to this point. We now must make our underarm bind offs and at the same time we must begin to shape our V neck. The V shaping is started at precisely the middle of the row. 30 stitches on one side and 30 stitches on the other. The division is made on the same row as the first bind off and it is made as follows:

**Bind off 3 stitches at beginning of row and work 27 stitches.** ( $27 + 3 = 30$  sts. of first side). With a second ball of yarn work remaining 30 stitches. Bind off 3 stitches at beginning of row.

We have done our bind offs. We have created our division. We must now make our decreases on the armsides and shape our neck.

**Decrease 1 stitch each arm edge every other row 3 times.**

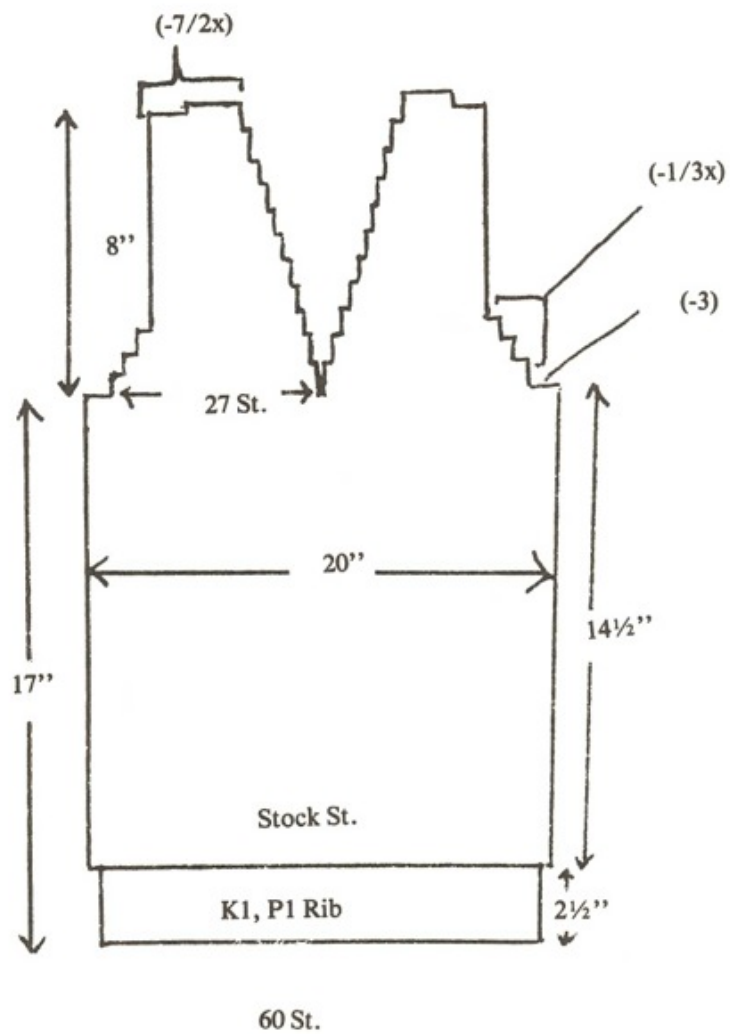
**AT THE SAME TIME: Shape neck.**

The question is how. Let's see what we know. The back of neck is 20 stitches. The armhole is 8 inches.  $8 \times 4$  (row gauge = 32 rows. What this indicated to me is that we have 32 rows in which to eliminate 20 stitches. These 20 stitches must be eliminated  $\frac{1}{2}$  on the right side and  $\frac{1}{2}$  on the left side of neck. For the sake of symmetry we decrease on both sides of the neck at the same time. So we must eliminate the 20 stitches in  $20/2 = 10$  steps.

The next question is how often must we make these decreases. We take the number of rows, 32, and divide it by the number of decreases.  $32/10 = 3.2$ . Always round the number down. In this case it is 3 rows. It follows:

**Decrease 1 stitch on each neck edge every third row 10 times. Work even until armhole is 8 inches. Bind off 7 stitches at beginning of the next 4 rows.**

We are done. To figure out the number of stitches to be picked up around the neck, use the formula used for the round neck. If you notice that we are not spending much time on finishing it is so because we are concerned here with principles general enough to apply to all charting. The fact that we use very specific examples to demonstrate these principles does not limit in anyway their broad applications.

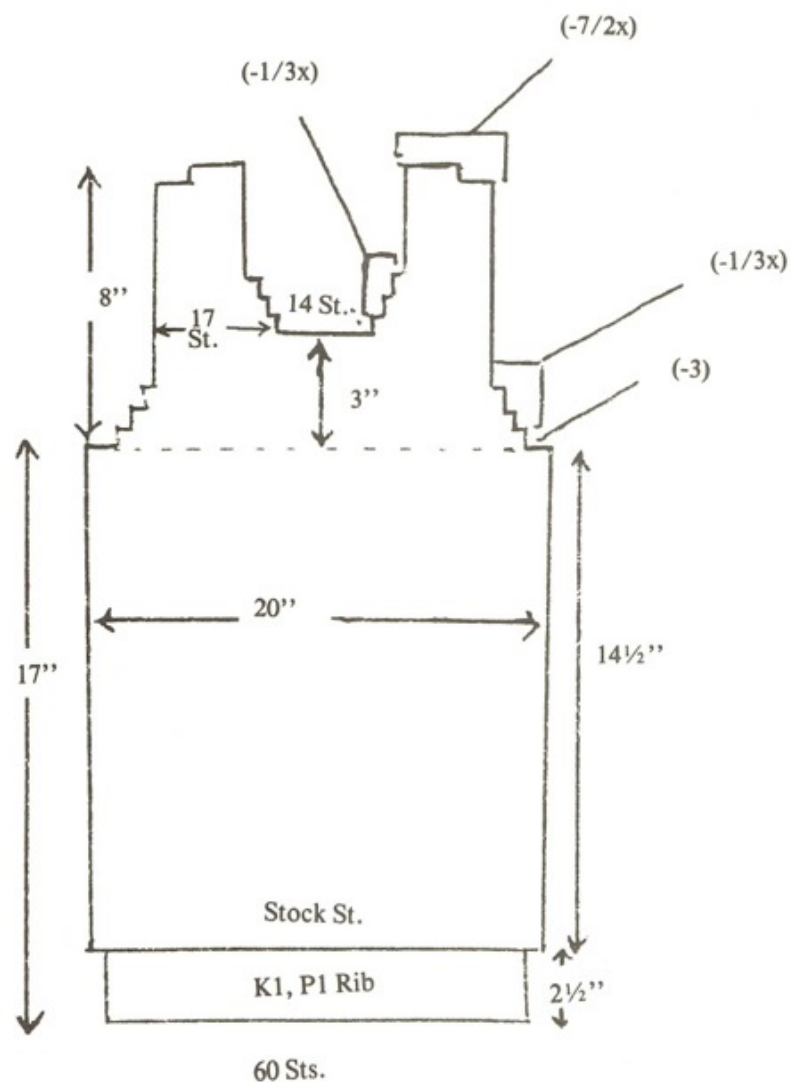


16 — V Neck Front Sketch With Data

**A scoop neck pullover** is even easier. Not only are the back and sleeves identical to those of a round neck pullover, but so is the front with one exception only: The scoop neck shapings start usually 3 inches above the armhole. Everything else is identical. It reads as follows:

**Neck shaping:** When armhole measures 3 inches, work 17 stitches. With second ball of yarn, bind off center 14 stitches and work other 17 stitches. Decrease 1 stitch on each neck edge every other row 3 times.

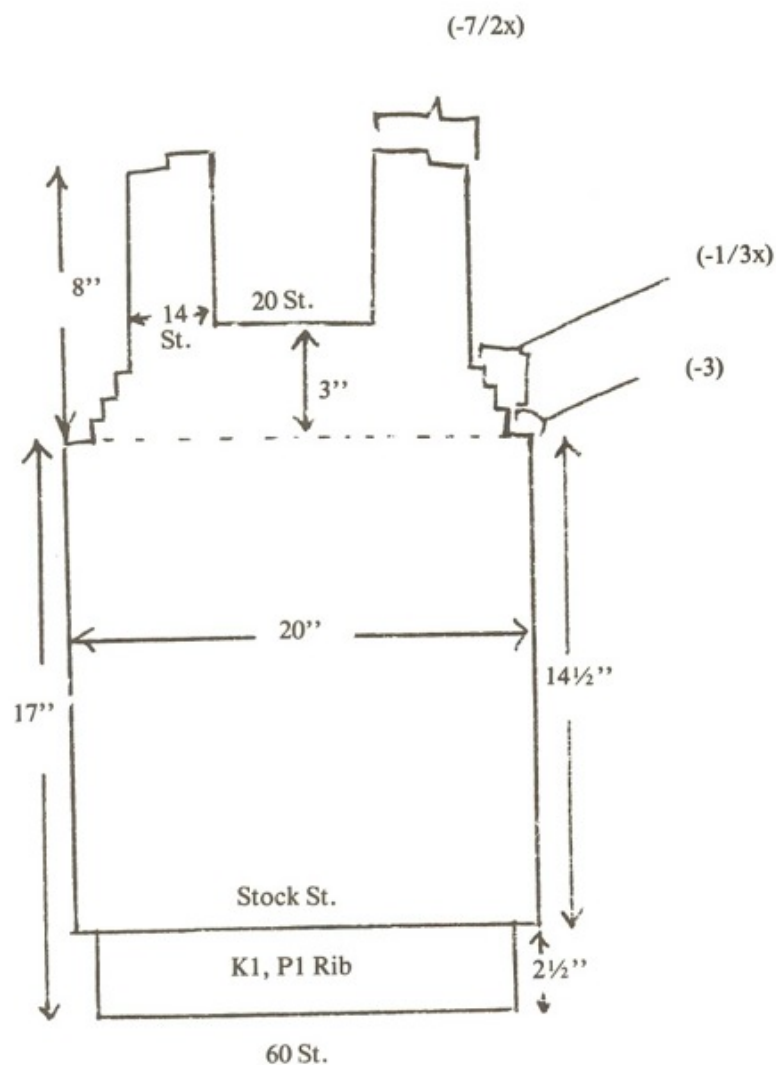
Everything is identical to the round neck pullover. The only thing that changed was the height at which the neck shaping started.



17 — Scoop Neck Front Sketch With Data

The **square neck pullover** is identical to the scoop neck except for one little difference. The neck shaping across the front is done in one step. There are no decreases done on the neck edges, just one bind off equal to the number of stitches left for back of neck. It reads as follows:

**Neck shaping:** When armhole measures 3 inches, work 14 stitches. With second ball of yarn bind off center 20 stitches and work other 14 stitches. Work even until armhole measures 8 inches, etc.



18 — Square Neck Front Sketch With Data

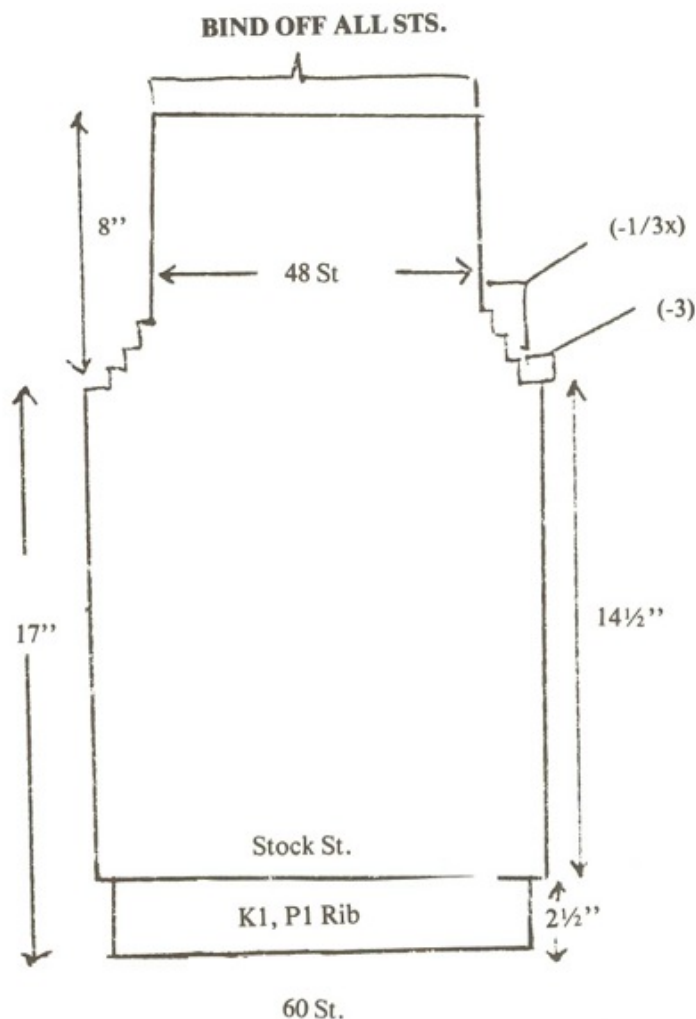
A **boat neck pullover** is the easiest to do of all the necks because it requires no shaping at all. The front and the back of the sweater are knitted up in two identical pieces. These two pieces are identical to the back of the pullovers we have done thus far. The only difference is that up to now we shaped the shoulders of the pullover we learned to chart. The boat neck has no shoulder shapings. It would be written as follows:

**Back:** Cast on 60 sts. on #8 needle and rib K1, P1 for 2½". Change to 10½ needle and stockinette stitch. Work even until piece is 17 inches. Bind off 3 sts. at beginning of next 2 rows. Decrease 1 stitch each end every other row 3 times. Work even until armhole measures 8 inches. Bind off all stitches straight across the row.

**Front:** Identical to back. Repeat from start.

Sleeves are the same as for the other pullovers we learned to chart.

The thing to remember is that for a boat neck we do not rib around the neck. We leave an opening 8 to 10 inches wide and crochet around it.



19 — Boat Neck Front or Back Sketch With Data



## SLEEVES

We have covered the five most common types of necks. And we can chart instructions for a set in, long sleeve pullover with any of the above necks. That makes five styles. To double the number of styles that we can chart, all we need is one new element. Apply this element to all five styles above and that gives you five new styles. For example let's change the sleeve. Instead of a long set in sleeve, we will make a **long pleated sleeve**.

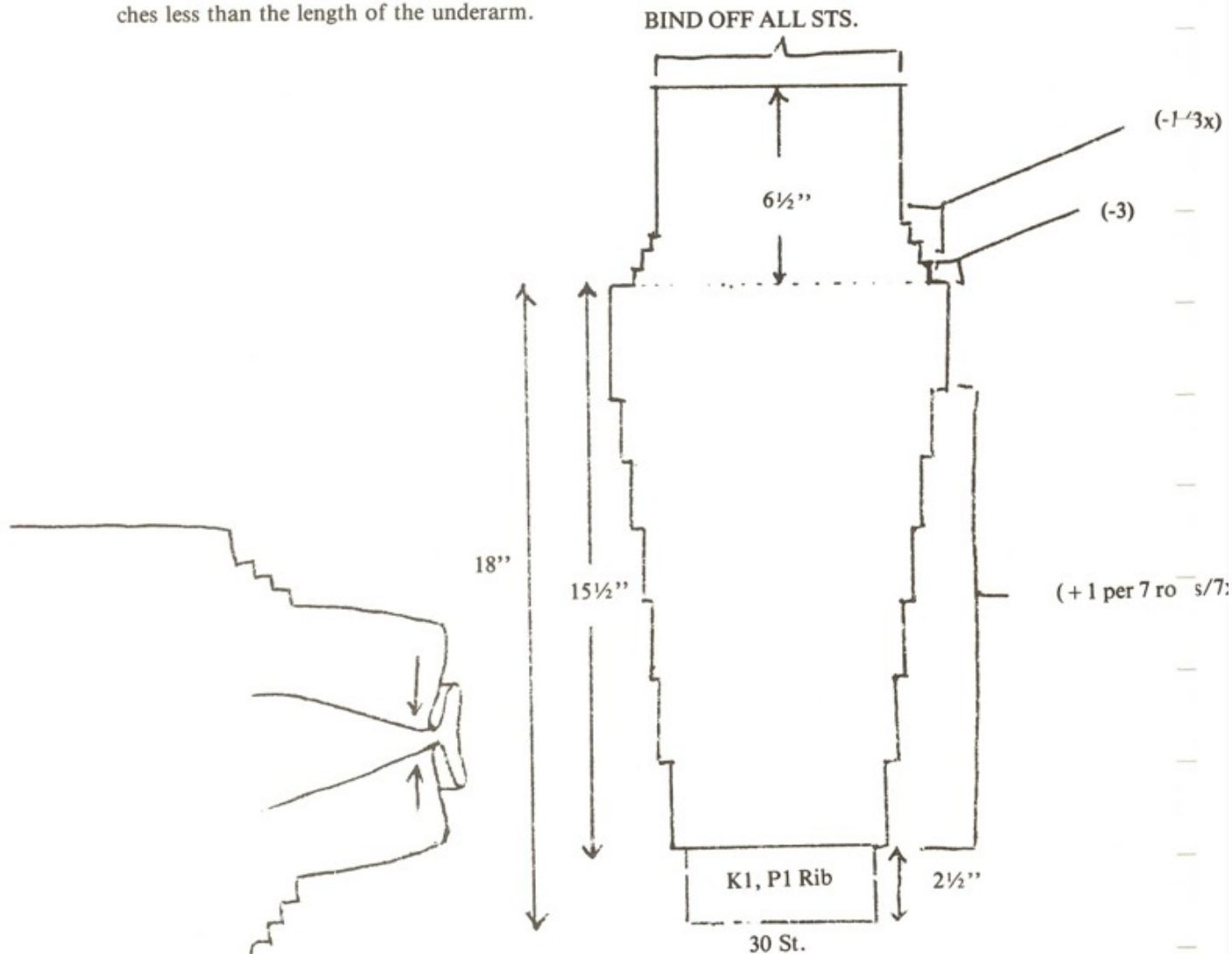
The only difference between a long pleated sleeve and a long, set in sleeve is in the sleeve cap. The sleeve is identical up to the bind off for the underarm. So we take it from there. (Turn back to the set in sleeve to refresh your memory.)

**Bind off 3 stitches at the beginning of the next 2 rows. Decrease 1 stitch each end every other row 3 times.**

Up to now everything is still identical to the set in cap. The bind off and decreases match the front and back of sweaters. The difference is here:

**Work even until cap measures 6½ inches. Bind off all stitches straight across.**

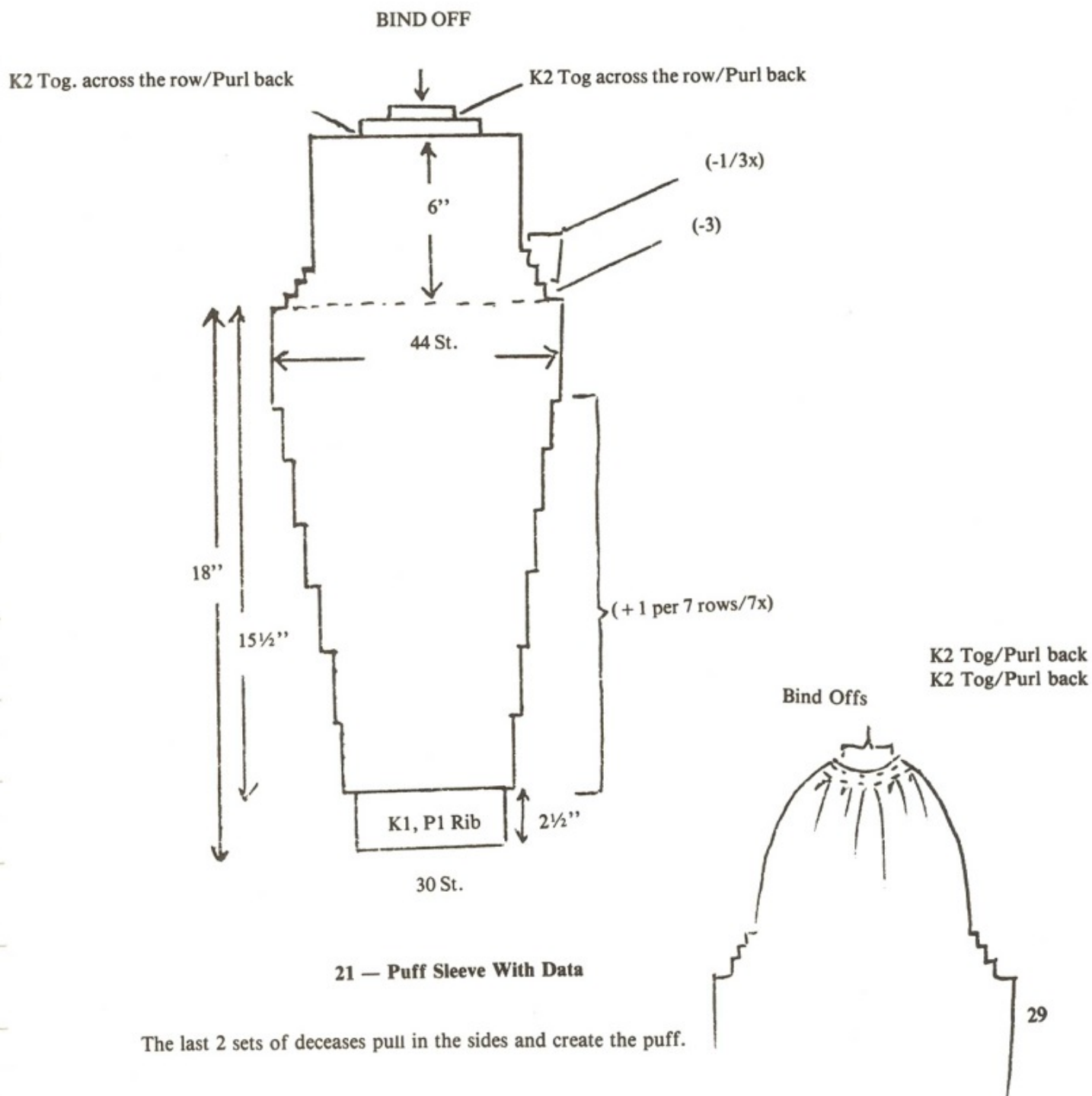
At this point we will introduce a constant that applies to the pleated cap. The cap must measure 1½ inches less than the length of the underarm.



From here we go to the **puff sleeve**. This sleeve is practically identical to the pleated sleeve with the following exceptions.

1. The cap must measure 2 inches less than the length of the underarm.
2. When cap does measure 2 inches less, it is finished as follows:

**When cap measures 6 inches, knit 2 stitches together across the row. Purl back. Knit 2 stitches together across the row. Purl back. Bind off all remaining stitches.**



## SHORT SLEEVES

This makes 15 styles we have learned to chart. By learning to chart one new element that will apply to the above 15 styles we will double the library of styles from which to pick. For example, we will learn to chart a short sleeve. This same short sleeve will apply to the 15 styles we can now chart. The caps for a short, set in sleeve, short pleated sleeve, and short puff sleeve are identical to those of the corresponding long sleeves. The only difference is in the body of the sleeve.

To chart a short sleeve, we need the measurement around the upper arm and the length of the sleeve. We also need to know how wide a sleeve we want. The principle is similar to that of the long sleeve.

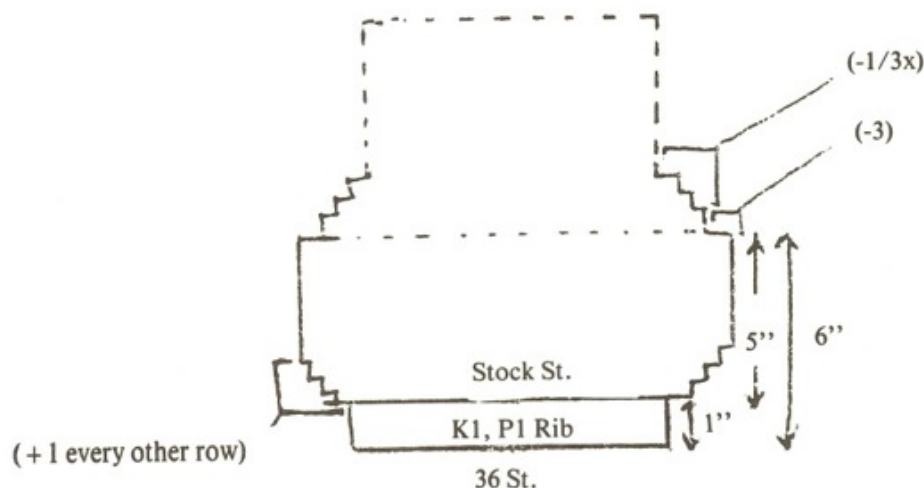
To start, we take the gauge and the actual upper arm measurement (allowing for a small amount of ease) and multiply them. Gauge = 3 sts. Upper arm = 12 inches.  $3 \times 12 = 36$  stitches. Length is 6 inches. It follows:

**Cast on 36 stitches on #8 needles and rib K1, P1 for 1 inch (or desired length).**

At this point we wish to increase to 15 inches, the desired width for the sleeve.  $15 \times 3 = 45$  stitches. We even out this number just as we did for the long sleeve to 44 stitches. We must now increase from 36 to 44 or 8 stitches. That is 4 on each side. We recommend that these increases be done every other row as follows:

**Change to  $10\frac{1}{2}$  needles and stockinette stitch. Increase 1 stitch each end, every other row 4 times. Work even until sleeve measures 6 inches.**

From here on the cap shapings are identical to those of the corresponding long sleeve. So now we can chart 30 different styles.



22 — Short Sleeve With Data

## LANTERN SLEEVE

A variation on all these sleeves calls for all the increases to be done on one row immediately after the ribbing. It is the **lantern sleeve**. This sleeve applies to all the styles we learned to chart. The caps are identical. The body of the sleeve changes.

The principal for arriving at the number of stitches needed is always the same. The sleeve is 10 inches around the wrist. We multiply the gauge by the wrist measurement to arrive at the number of stitches.  $3 \times 10 = 30$  stitches.

**Cast on 30 stitches on #8 needles and rib K1, P1 for  $2\frac{1}{2}$  inches. Change to  $10\frac{1}{2}$  needles and stockinette.**

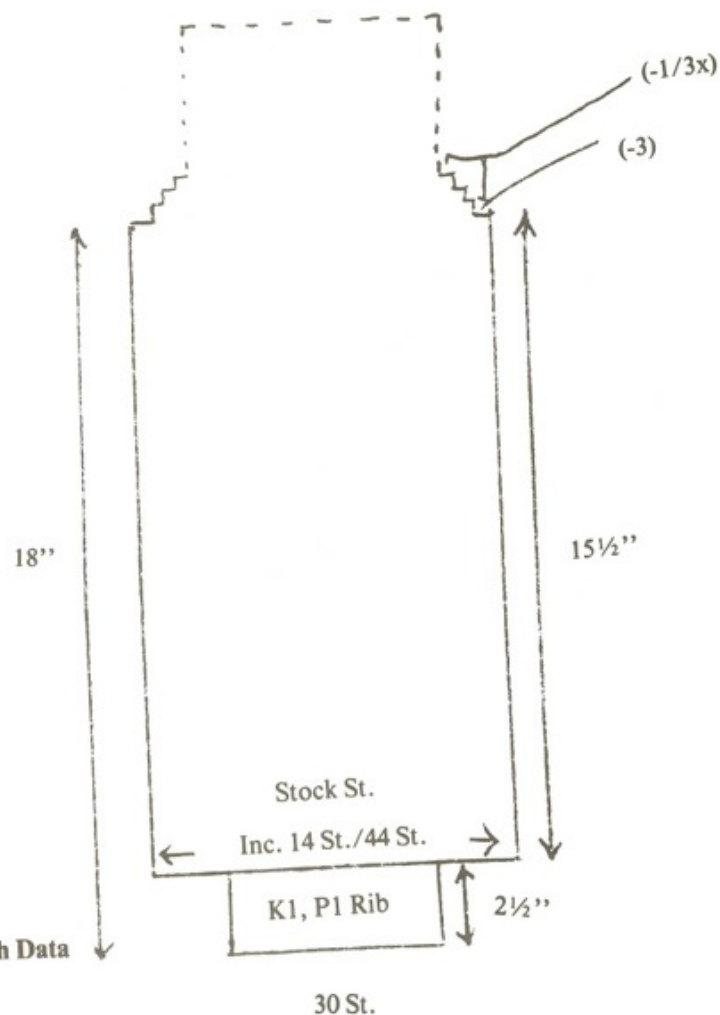
Now we want to place all our increases evenly across the row. Our sleeve is to be 15" at the upper arm. That represents 44 stitches for our purposes (evened down). We need to increase 44 stitches less 30 stitches or 14 stitches. It follows:

**Increase 14 stitches evenly across the row. Work even until sleeve is 18 inches.**

From here on it is all the same as before. You can now chart 60 different styles. The lantern sleeve can be long or short. For that matter any of the sleeves described can be made to any length. You decide. For example, for a  $\frac{3}{4}$  length sleeve start with the measurement of that part of the arm where the sleeve begins. The principle is the same as for a long sleeve. The only differences are:

1. The sleeve is shorter and so the increases will be made closer to each other.
2. The ribbing may be made shorter or even eliminated based on style.

So now we have added even more possibilities to our library. Before we are done, we will be able to chart a multitude of patterns and truly become independent knitters — knitting architects!





## LEG O'MUTTON

The leg o'mutton sleeve is a very interesting sleeve. It is also a very popular one today. This sleeve represents a little mix of our other sleeves. For this particular sleeve we need the wrist measurement, the forearm measurement (below the elbow), and the upper arm measurement. Wrist 10, forearm 12, upper arm 15, gauge 3. So wrist is 30 stitches, forearm is 36 stitches, and upper arm is 44 stitches. The ribbing in this sleeve is done up to the forearm. We must increase while ribbing from 30 to 36 stitches. From wrist to forearm, in this particular instance, measures 7 inches. The row gauge is 4 so the ribbing represents 28 rows. We must increase 6 stitches, 3 on each side in 28 rows. So we divide 28 by 3 and we learn that we must increase every 9 rows. It follows:

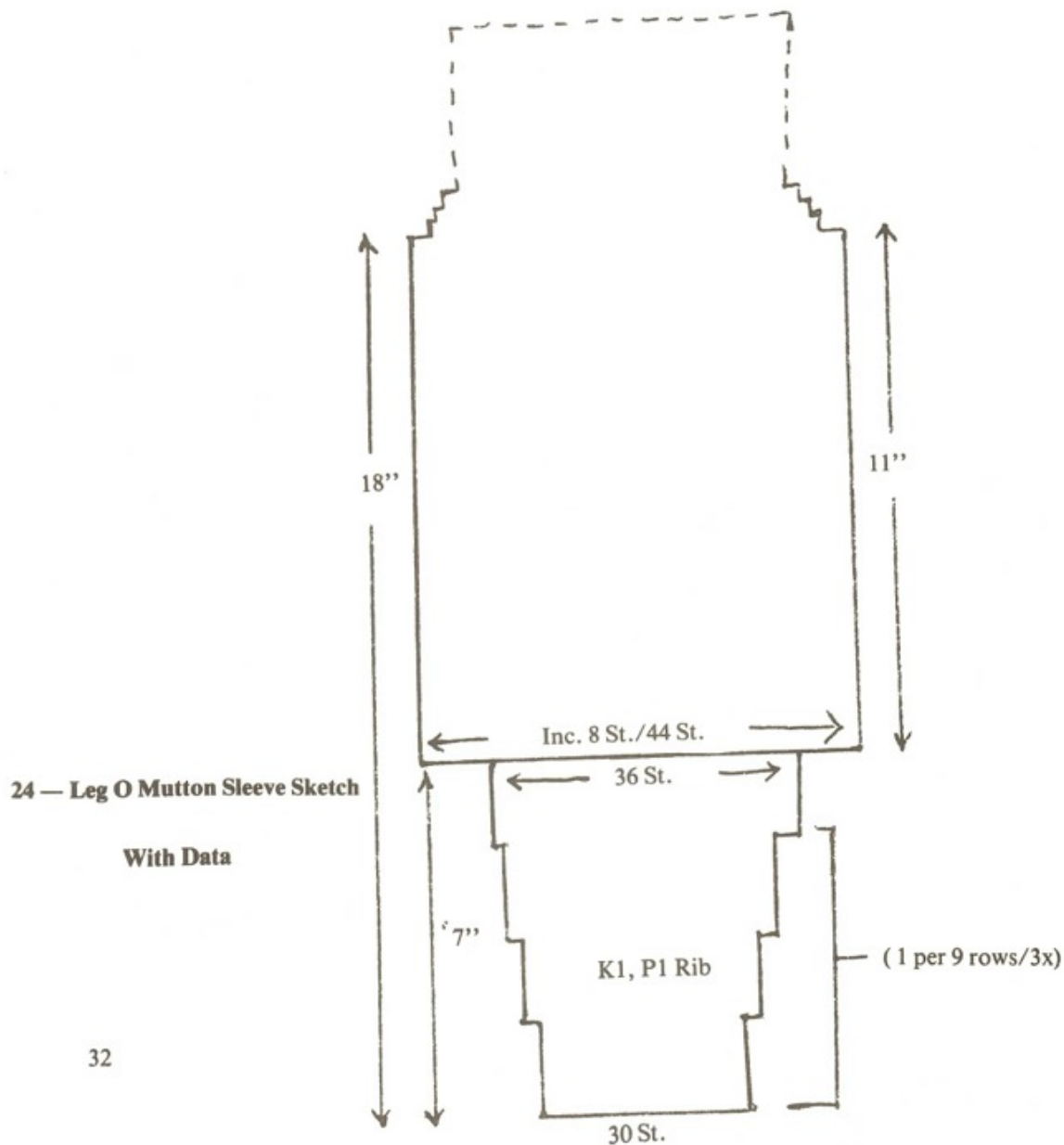
**Cast on 30 stitches on #8 needles and rib K1, P1 for 7 inches. At the same time increase 1 stitch each end every 9 rows 3 times. When ribbing measures 7 inches, change to 10½ needles and stockinette stitch.**

Now we want to increase from 36 to 44 stitches. That is 8 stitches. We want the increase here to be along one row, like the lantern sleeve.

**Increase 8 stitches evenly across the row. Work even until sleeve measures 18 inches and...**

From here on, pick any of the caps we learned to chart up to now. We recommend the puff cap. We find it to be the most appropriate for this style.

Also, the Leg O'Mutton sleeve looks best when made very wide.

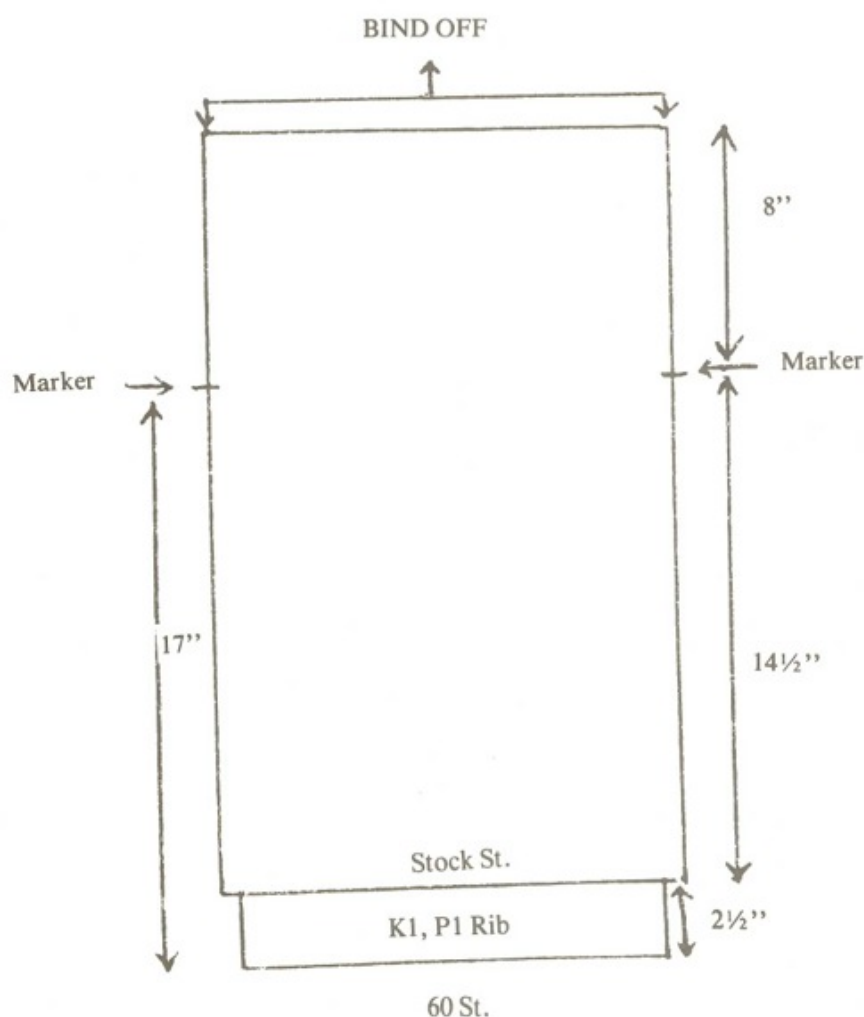


## DROP SHOULDER

There are two other sleeve styles that I wish to cover here. The drop shoulder, which is the easiest and the raglan, which is the hardest.

For a drop shoulder sweater, like the others, we start with half the chest measurement multiplied by the gauge. We are still working with the same measurements. Chest  $40/2 \times 3 = 60$  stitches. The main difference is that for a drop shoulder there are no bind offs for underarm and no decreases. The front and the back both are worked up evenly on both sides.

**Back:** Cast on 60 stitches on #8 needles. Rib K1, P1 for  $2\frac{1}{2}$  inches. Change to  $10\frac{1}{2}$  needles and stockinette stitch. Work even until piece is 17 inches. Place a marker on arm sides to indicate start of armhole and work even for another 8 inches. Bind off all stitches across the row.



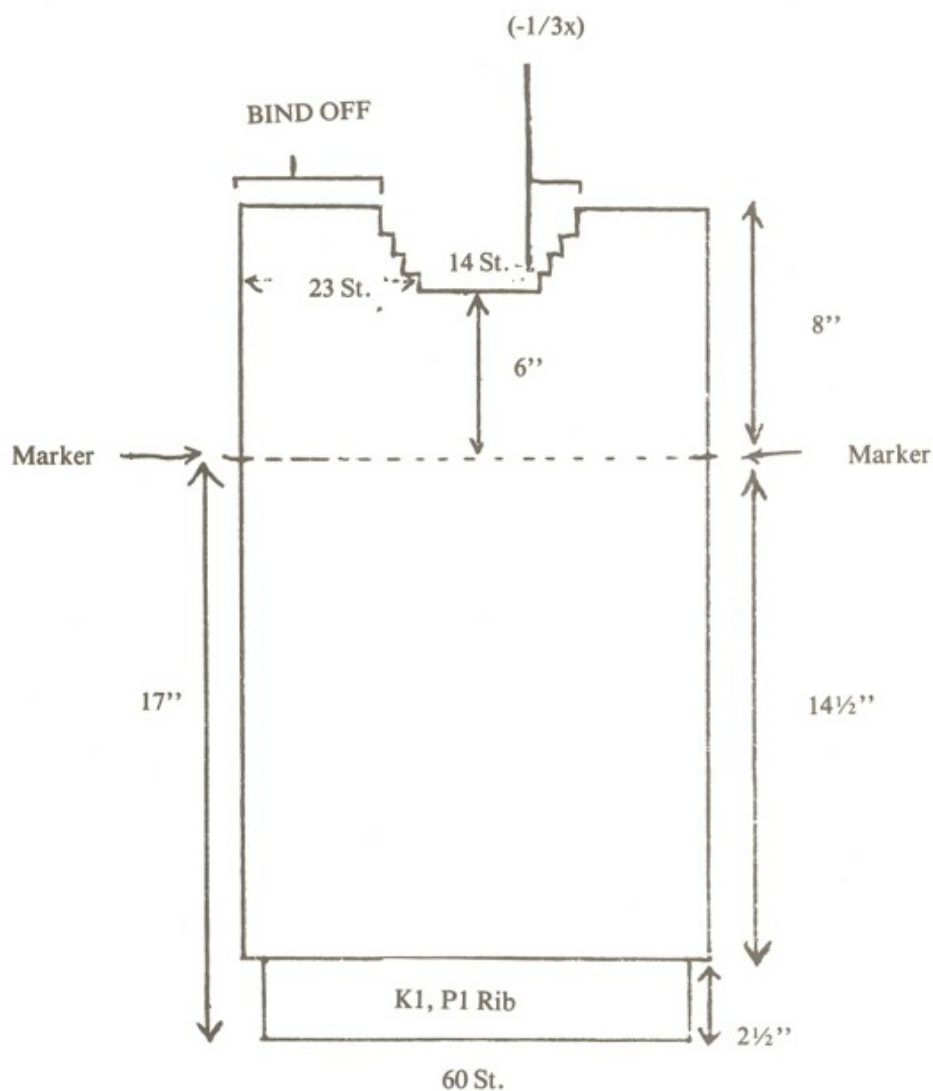
The front is worked up the same way as the back. The only thing to remember is that because we did not eliminate stitches on either side we will end up with different numbers from those obtained for the set in sleeve pullover. This the way it will read.

**Round neck:** Cast on 60 stitches on #8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles and stockinette stitch. Work even until piece is 16 inches. Mark start of armhole with marker. Continue to work even until armhole measures 6 inches.

Here we will start neck shaping. Remember we are working here with 60 stitches (not 48). We know that the back of neck measures 20 stitches. 60 less 20 = 40 stitches or 20 on each side. We apply here the very same principle we used in the set in sleeve (shoulder + gauge).

**Work 23 stitches (20 + 3).** With second ball of yarn bind off center 14 stitches and work 23 stitches. Decrease 1 stitch each neck edge every other row 3 times. Work even until armhole is 8 inches. Bind off all remaining stitches.

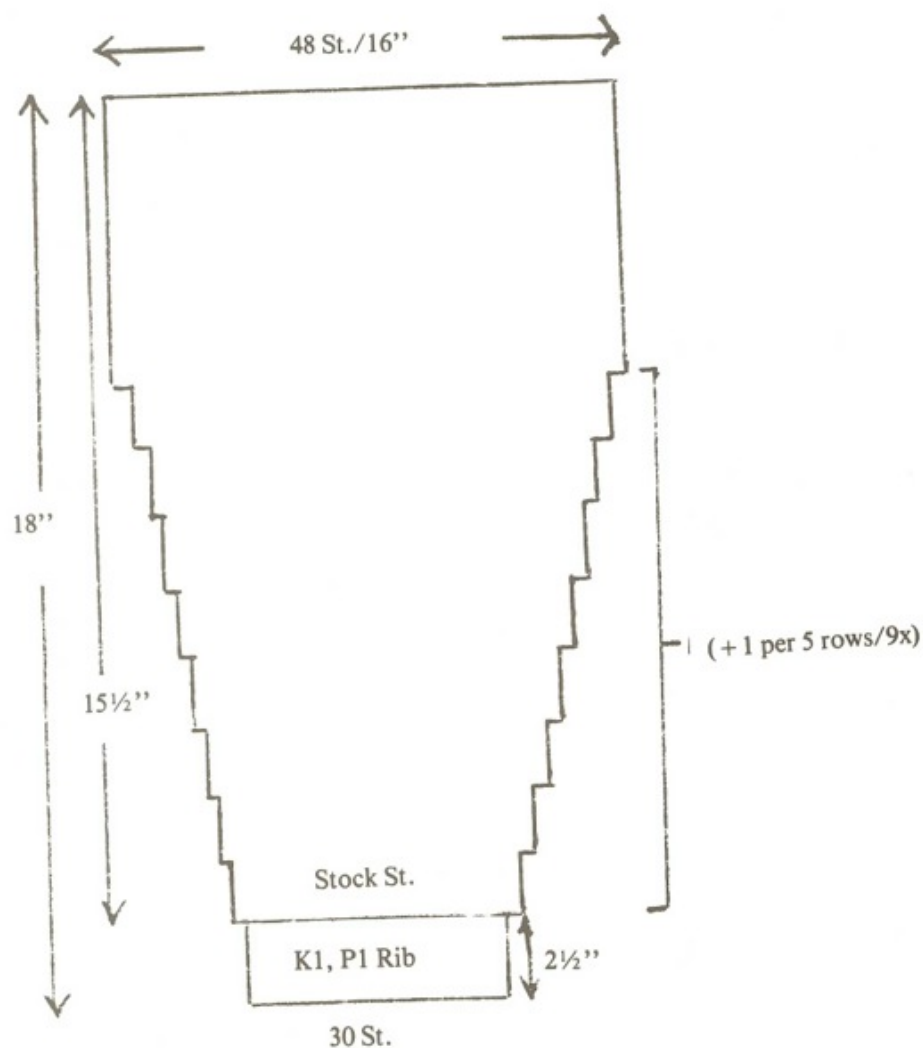
The very same principle applies to all the necks.



The sleeves are worked up differently. The upper arm measurement must be equal to twice the armhole. The armhole is 8 inches so the sleeve at its widest point must be 16 inches.  $16 \times 3$  (gauge) = 48 stitches so we must increase from the 30 stitches we started with to 48 stitches. From here the principle is the same.  $48 \text{ less } 30 = 18$ . That means we must increase 9 stitches on each side. We have 50 rows to fit them (refer to set in style).  $50/9 = 5.6$ . We round down to 5.

**Cast on 30 stitches on #8 needles and rib K1, P1 for  $2\frac{1}{2}$  inches. Change to  $10\frac{1}{2}$  needles and stockinette stitch. Increase 1 stitch each end every 5 rows 9 times. Work even until sleeve is 18 inches. Bind off all stitches across row.**

The one thing you must notice is that there is no cap. Not at all. A drop shoulder sleeve has no cap.



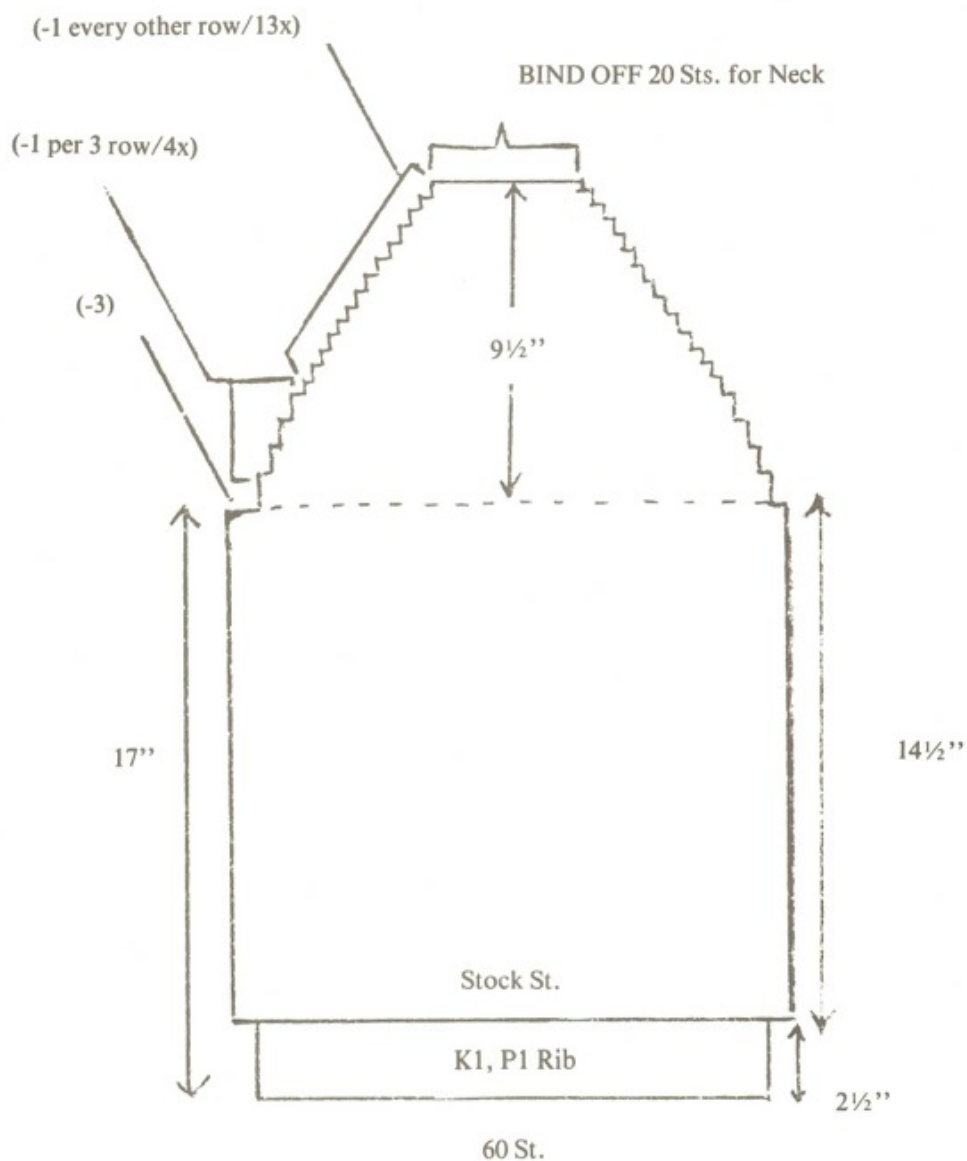


## RAGLAN SHAPING

All the pullovers we have learned to chart are worked up the same way up to the underarm. For the raglan, we add one inch to the underarm constant of sizes under 40 and 1½ inch to the underarm constant of sizes 40 or over.

Let's take the same pullover we have been working on; size 40, round neck, etc. We begin as before.

**Back:** Cast on 60 stitches on #8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles and stockinette. Work even until piece measures 17 inches. Bind off 3 stitches at the beginning of the next 2 rows.



28 — Raglan Back Sketch With Data

Up to now everything is identical to the first sweater we charted. Let us see what we know up to now.

1. We started with 60 stitches.
2. We eliminated 6 leaving 54 stitches.
3. Back of neck constant calls for 20 stitches.
4. 54 less 20 divided by 2 = 17 stitches. That's the number of stitches for each shoulder.
5. Armhole constant is  $9\frac{1}{2}$  inches or 9.5 times 4 = 38 rows.

To create a raglan shaping we must eliminate all the shoulder stitches and we have here 38 rows in which to do it. How often must we decrease? We know that — 17 times on each side. But we don't know how many rows apart these decreases must be made. Here is how we figure it out. We take the number of rows and divide it by the number of decreases. In very few cases will we get a whole number as an answer. For example, if we had 34 rows and 17 decreases, that would be perfect since  $34/17$  equals 2.

In this case where we have 38 rows and 17 decreases we end up with 2 as an answer and 4 rows left over. This indicates that 4 decreases will have to be made every (2 + 1) or 3 rows and (17 - 4) or 13 decreases will have to be made every 2 rows. To double check, 4 times 3 = 12 and 13 times 2 = 26. 26 + 12 equals 38 rows. That checks so it follows:

**Decrease 1 stitch each end every 3 rows 4 times. Decrease 1 stitch each end every other row 13 times.  
Bind off remaining 20 stitches for back of neck.**

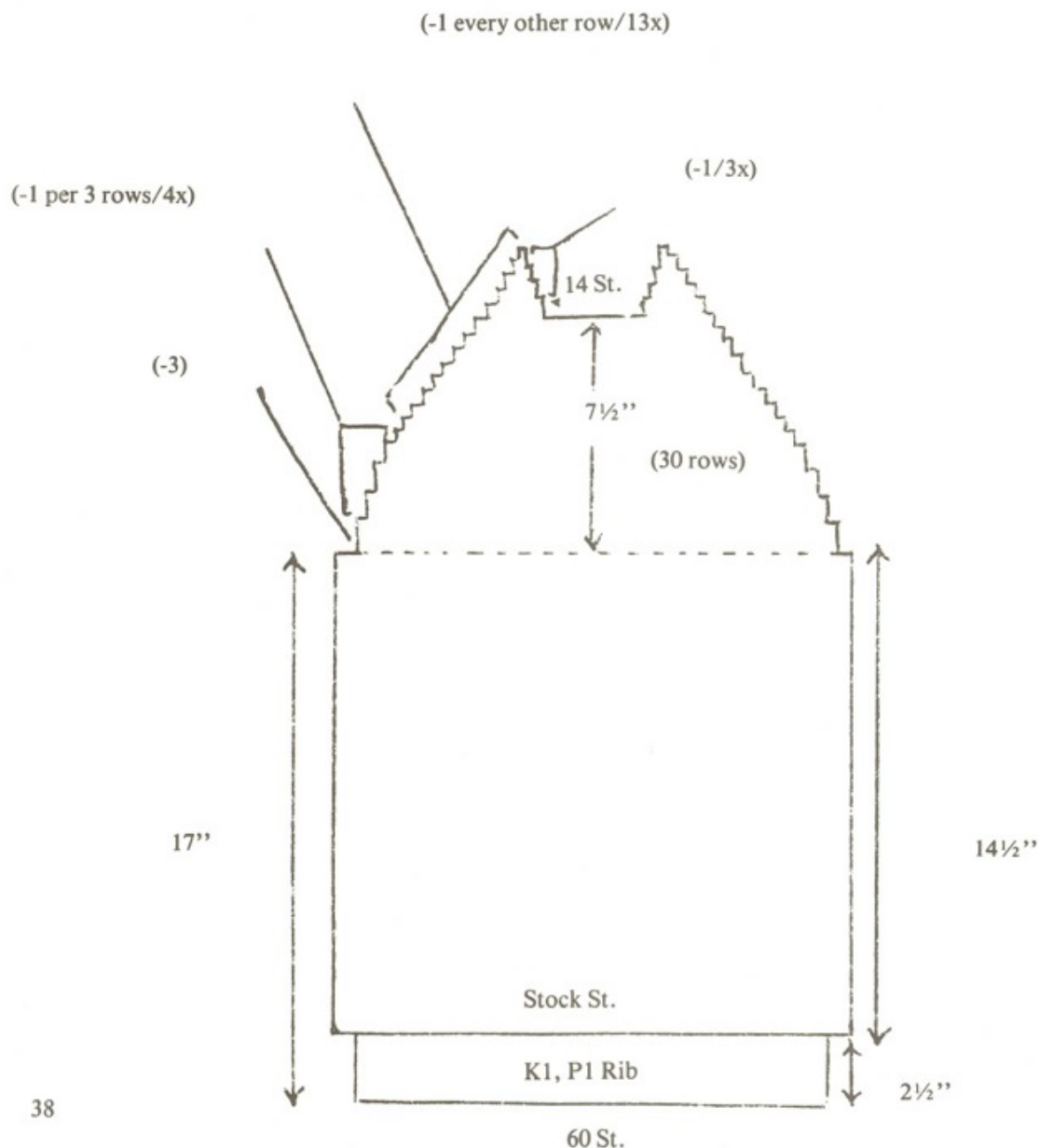
This takes care of the back.

The front is identical to the back up to the point where the neck starts. We know that the round neck shaping starts at  $7\frac{1}{2}$  inches or 30 rows. (2 inches below the end of the  $9\frac{1}{2}$  inch armhole). We need to know how many stitches are left at this point.

We decreased 1 stitch every 3 rows 4 times. This means that we used up 12 rows and 8 stitches (4 on each side). 30 rows less 12 rows = 18 rows.

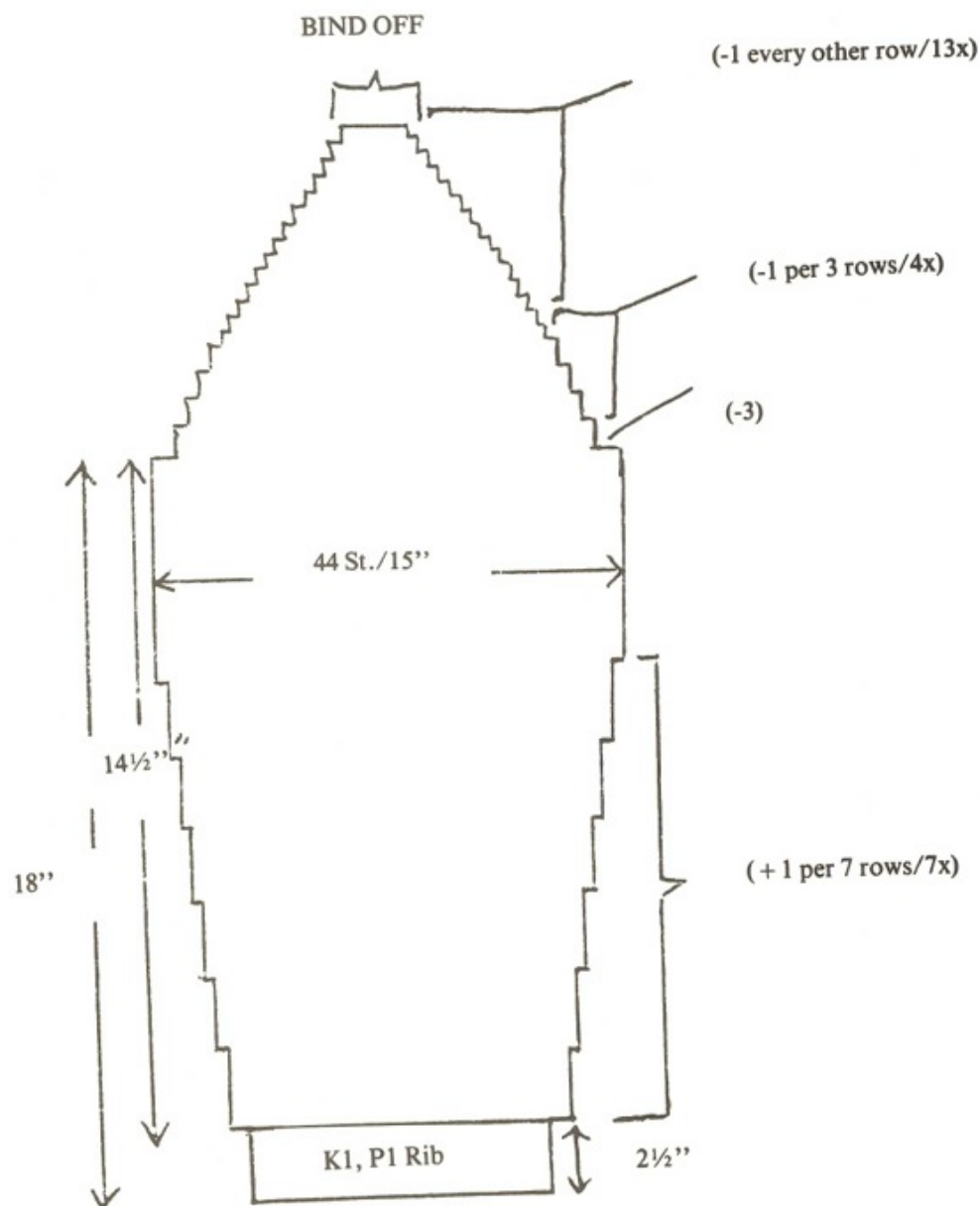
We are decreasing 1 stitch each end every other row for the next 18 rows. That represents 18 stitches (9 on each side). 18 stitches + 8 stitches = 26 stitches eliminated by the thirtieth row. That represents 13 decreases. We had 54 stitches left after the underarm bind off. We eliminated 26 stitches. That leaves 28 stitches. This is a round neck with 20 stitches for back of neck. The central bind off we know is 14 stitches, that leaves 28 less 14 or 14 stitches to be worked  $\frac{1}{2}$  on one side and  $\frac{1}{2}$  on the other. That is 7 stitches. It follows:

**AT THE SAME TIME:** Shape neck starting on row 31 of armhole (that is after your 13th decrease). Work 7 stitches. With second ball of yarn bind off 14 stitches and work 7 stitches. Decrease one stitch on each neck edge every other row 3 times.



Now we come to the sleeves. The body of the sleeve is identical to that of any other style we pick. That is it is identical up to the underarm bind off. From here on the bind off and decreases must match those of the body of the sweater. At first glance this seems easy, but there is an important question to ask.

Is the sleeve going to have enough stitches on it to allow for all the decreases? Will it be wide enough? Remember that the cap of the sleeve must match the underarm. For this sweater, we know that we need 17 decreases on each side. That represents 34 stitches, the minimum width possible. The sleeve we are making must measure 15 inches around or as we figured out before, 44 stitches. We will then work with the largest of these two numbers when charting the sleeve.



The very same principle applies to all the other necks. 30 St.



## CARDIGANS

We will now cover a new idea. We have learned to chart pullovers. We will now learn to chart cardigans.

You may be surprised to hear that you already know how to chart the backs and sleeves of cardigans in a multitude of styles. These parts of cardigans are identical to those of pullovers. The differences are in the front.

There are basically 2 types of fronts.

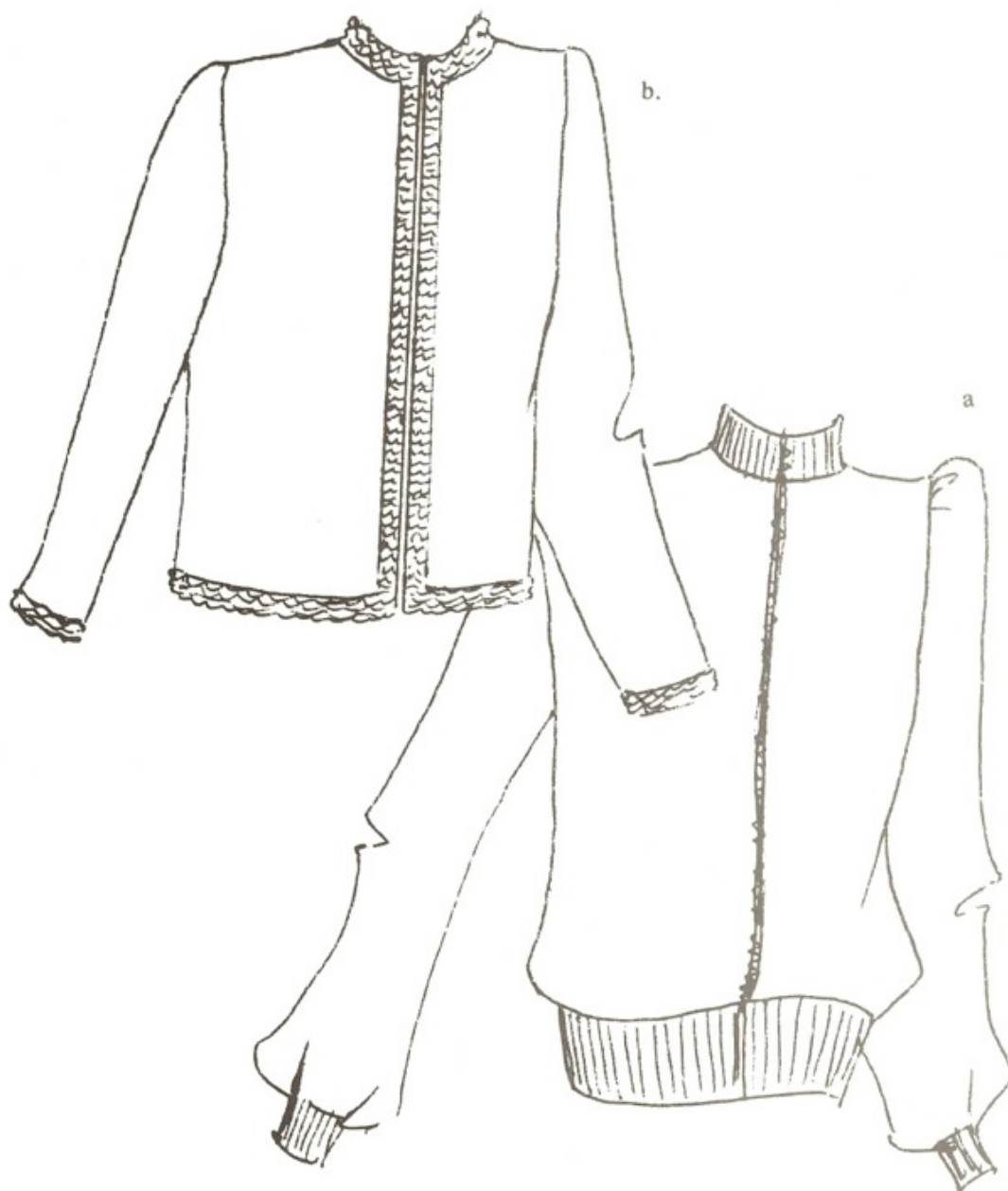
1. Regular or buttoned cardigans. This means that the front panels overlap.



31 — Closed Cardigan

2. Open cardigans. The edges of front panels fit flush. Here we have 2 groups:

- a. Closed with a zipper.
- b. No closure — usually done without rib.

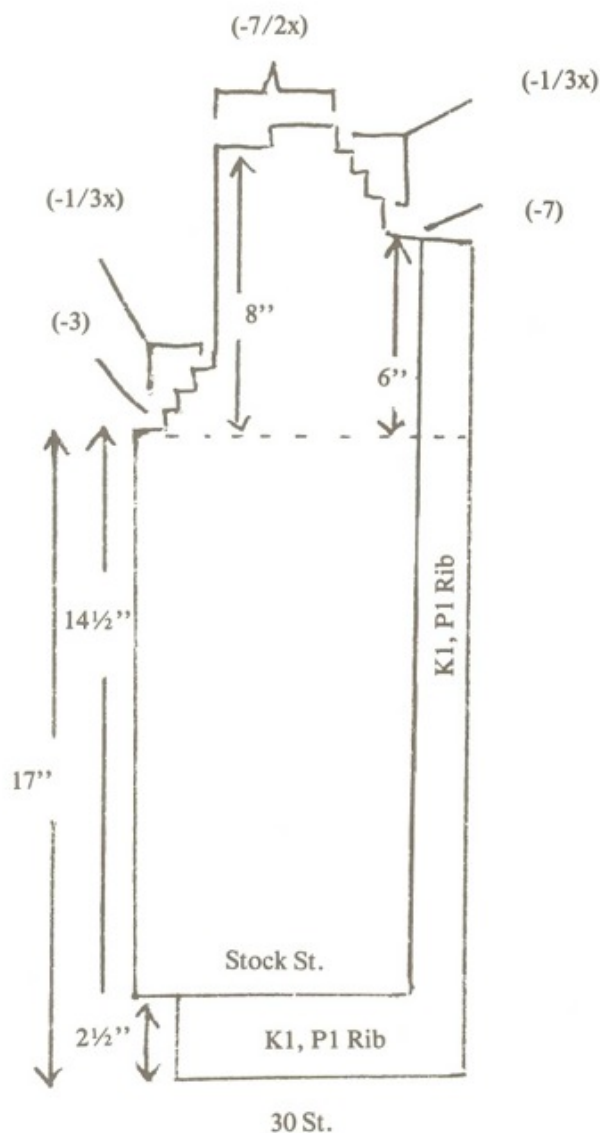


Let's start with the open cardigans. The basic difference between the two types of open cardigans is in the finishing and in the fact that one has ribbing and not the other. All the numbers and calculations are identical. The only thing to remember is that we are taking the same number of stitches used in the back and breaking it in two;  $\frac{1}{2}$  for front right panel and  $\frac{1}{2}$  for front left panel. So for a round neck open cardigan (with zipper) it follows:

**Front: Cast on 30 stitches on #8 needle. Rib K1, P1 for  $2\frac{1}{2}$  inches. Change to  $10\frac{1}{2}$  needle.**

In order for the front edges of sweater to lay flat, we will rib between 1 and 2 inches on the center edge, your choice.

**Work 26 stitches in stockinette and rib K1, P1 for 4 stitches on center edge. Work this way until piece is 17 inches.**



33 — Round Neck Open Cardigan Sketch With Data

Remember that now we shape an armhole on one side only.

**Bind off 3 stitches at beginning of row on armhole. Decrease 1 stitch every other row on armhole 3 times. Work even until armhole measures 6 inches.**

At this point we shape the neck. Remember that the back of neck is 20 stitches. This means that on the front, half or 10 stitches are on the right panel and 10 stitches are on the left panel of the cardigan. On a pullover we bound off center 14 stitches and decreased 3 stitches on each neck edge for a total of 20. For the cardigan we must bind off  $\frac{1}{2}$  of 14 or 7 stitches on each panel at neck edge and decrease the other 3 stitches. This will make the panels symmetrical. It follows:

**Bind off 7 stitches on neck edge and decrease on neck edge 1 stitch every other row 3 times. Work even until armhole is 8 inches. Bind off 7 stitches at armhole every other row 2 times. Reverse all shapings for second panel.**

The cardigan is now done. Just back stitch it together.

**Pick up on straight needles 52 stitches evenly around the neck and rib K1, P1 for  $\frac{3}{4}$  inch. Bind off.**

Had you wanted this open cardigan to be without a zipper, to have it hang straight, all you would have to do is change your instructions to say the following:

**All ribbing is done in garter stitch (or any other stitch that won't pull or curl) on large ( $10\frac{1}{2}$ ) needles.**

This cardigan can be made with all the various sleeves we studied by applying the very same principles.

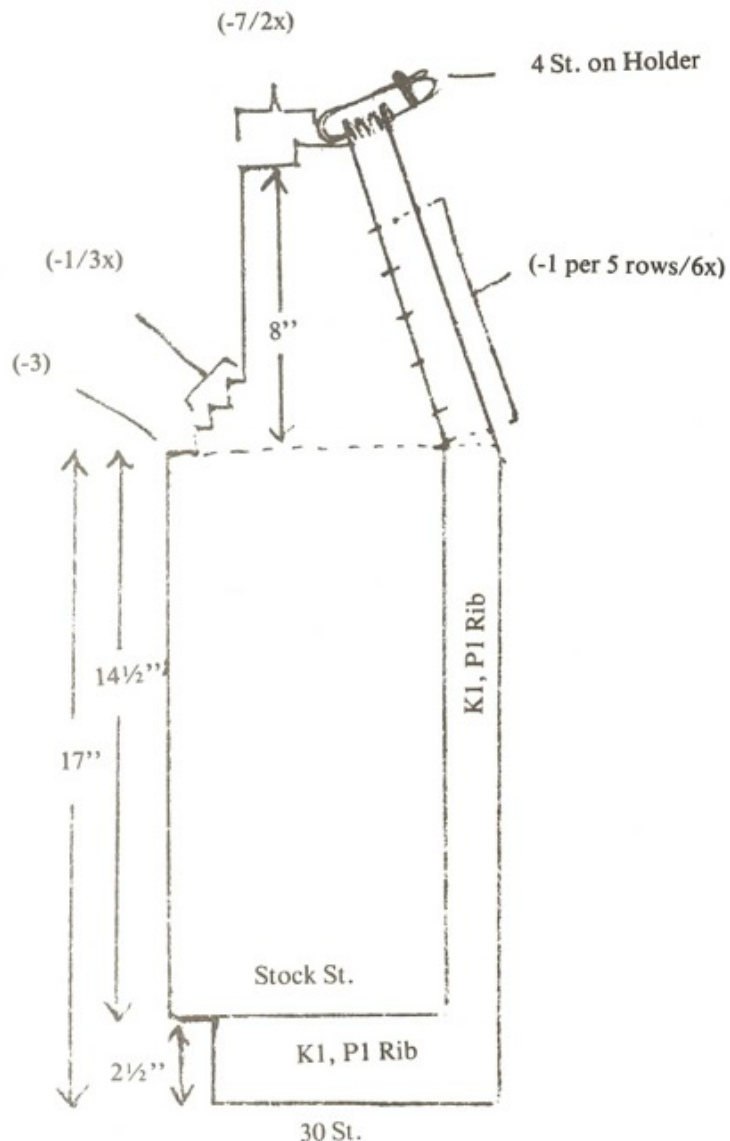


## OPEN V NECK CARDIGAN

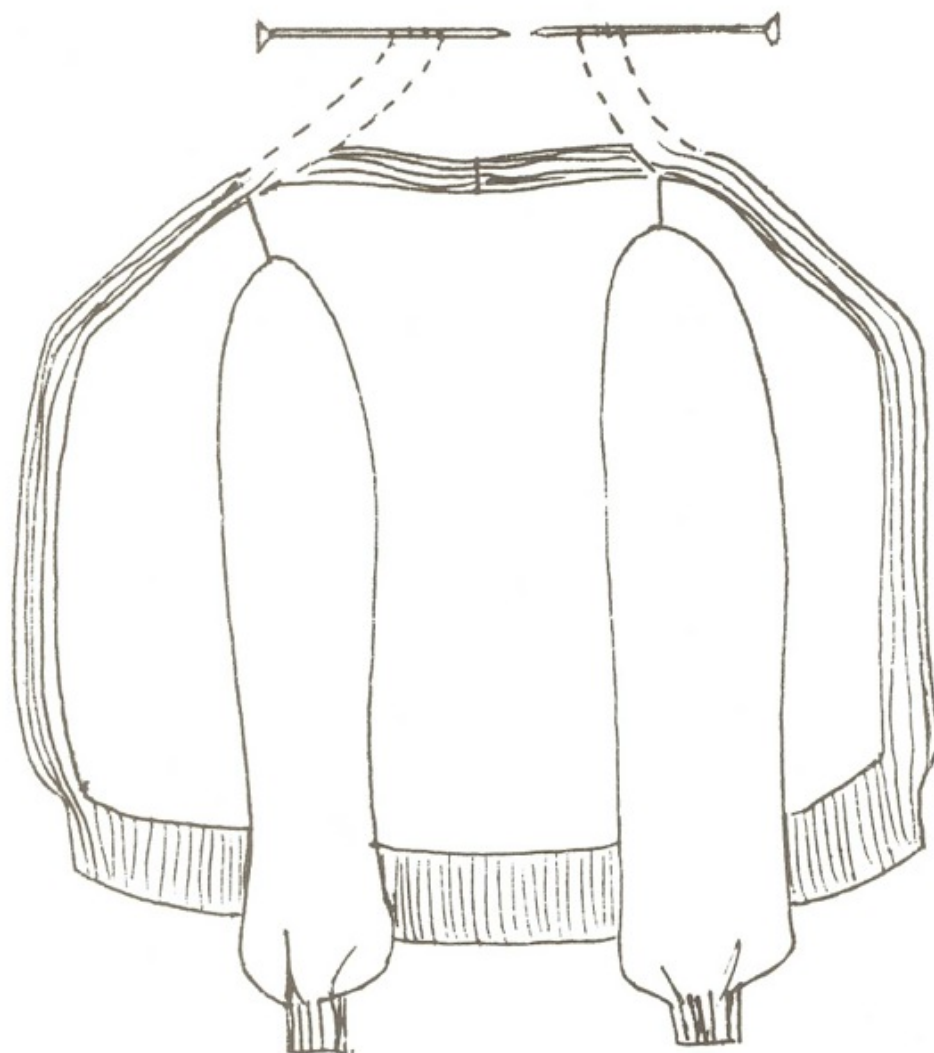
The same applies to the necks we learned to chart with the exception of the V neck. The main difference is that we do the ribbing around the neck at the same time as we work the front. We are going to bring the 4 ribbed

stitches all the way to the back. The decreases will be made on the inside of the ribbing and we will decrease  $\frac{1}{2}$  of the back of neck minus 4 ribbed stitches. When the shoulders will be bound off these 4 stitches will be extended on both front panels until they meet in the middle of the back of neck. Then they will be sewn down. It works as follows:

**Cast on 30 stitches on #8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles. Work 26 stitches in stockinette and rib 4 stitches on center edge. Work even until the piece measures 17 inches. Bind off 3 stitches on armhole and decrease 1 stitch every other row on armhole 3 times. AT THE SAME TIME: On neck edge decrease 1 stitch inside of ribbing every 5 rows 6 times. (back of neck divided by 2 less rib =  $20/2$  less 4 = 6 times) When armhole is 8 inches, bind off 7 stitches on armhole 2 times. Place remaining 4 stitches on holder.**



Reverse shapings for second panel. Back stitch pieces together. Continue 4 stitches of ribbing on each panel until both strips of ribbing are long enough to meet in the middle of the back of the neck. Sew strips together and sew down to back of neck.

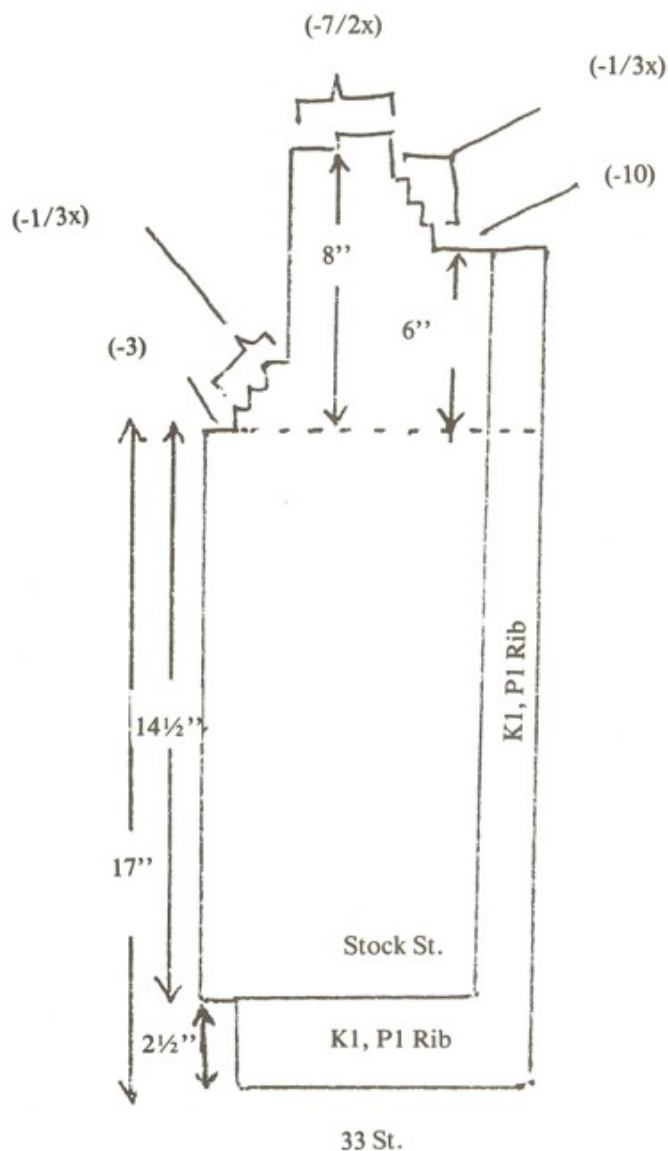


35 — V Neck Cardigan Finishing

## CLOSED ROUND NECK CARDIGAN

The main difference between an open cardigan and a closed cardigan is that when charting we add about 1 inch to the measurements of each of the front panels. An inch is equal to the gauge. Instead of casting on 30 stitches, for our closed cardigan front panel we will cast on 33 stitches. All this means is that when shaping the neck, we will have 3 more stitches to eliminate. It follows for a round neck:

**Cast on 33 stitches on #8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles. Stockinette for 29 stitches and rib remaining 4 stitches on center edge. When piece measures 17 inches, bind off 3 stitches on arm edge. Decrease 1 stitch on arm edge every other row 3 times. When armhole is 6 inches bind off 10 stitches on center edge (7 + 3). Decrease one stitch every other row on neck edge 3 times. When armhole is 8 inches, bind off 7 stitches on armside every other row 2 times.**



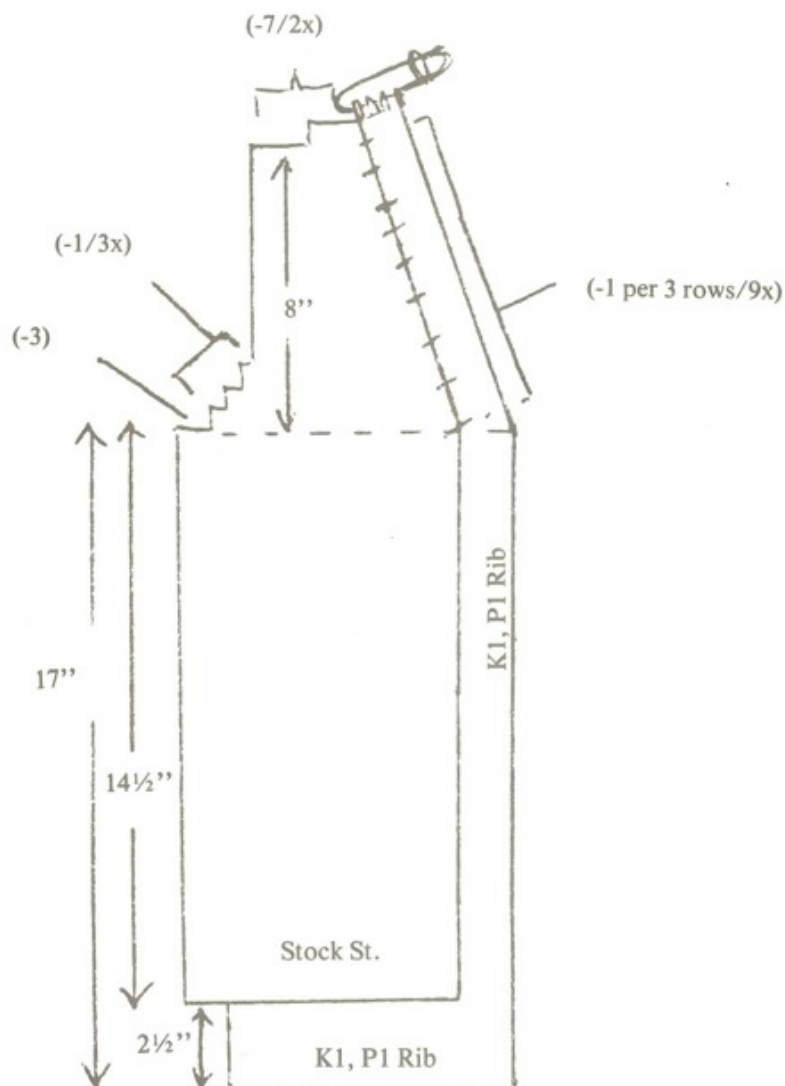
36 — Closed Round Neck Cardigan Sketch With Data

## V NECK CLOSED CARDIGAN

The only other style cardigan warranting an explanation here is the V neck closed cardigan. We have 3 more stitches to eliminate and so it will read as follows:

**Cast on 33 stitches on #8 needles and rib K1, P1 for 2½ inches. Change to 10½ needles. Stockinette for 29 stitches and rib 4 stitches on center edge. When piece measures 17 inches, bind off 3 stitches on arm edge. Decrease 1 stitch every other row on arm edge 3 times. AT THE SAME TIME: Decrease on neck edge, on inside of ribbing, one stitch every 3 rows 9 times (6 + 3). Everything else is the same as the open v-neck cardigan.**

No explanations are given here on how we arrived at making our decreases every third row. But I am sure you understand the principle by now.

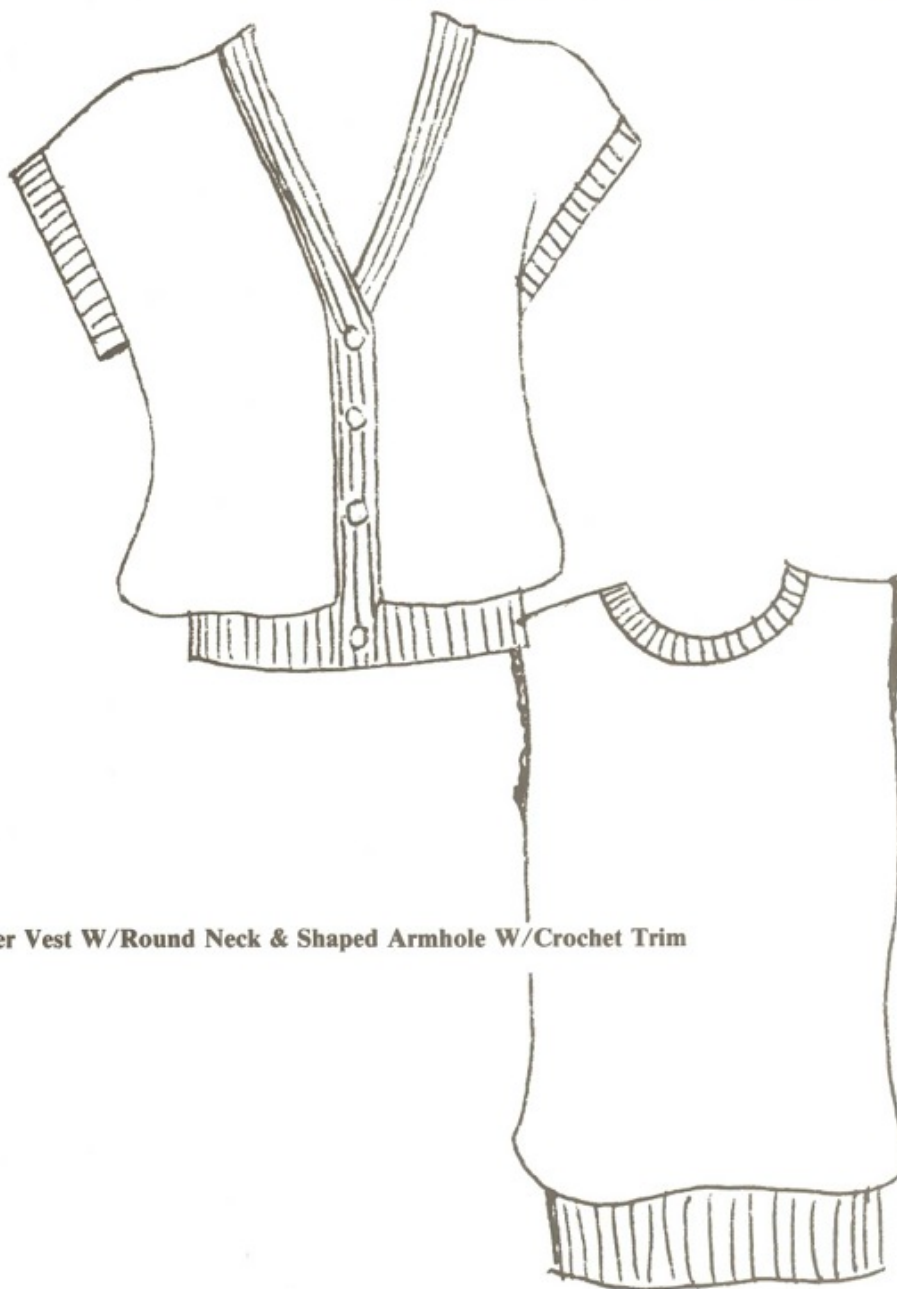




Vests are sleeveless. They can be charted as pullovers or cardigans with regular shoulders or drop shoulders. Regular shoulders imply an underarm bind off and decreases just like for a set in sleeve. A drop shoulder implies no bind offs and no decreases. They are charted exactly the same way as the sweaters with sleeves. The only difference is that we pick up stitches around the armhole and create a short rib instead of attaching a sleeve. Sometimes we may just crochet a row or two around the armhole.

So you see, you already know how to make vests.

**38 — Drop Shoulder V-Neck Cardigan Style Vest W/Rib Around Armhole**



**39 — Pullover Vest W/Round Neck & Shaped Armhole W/Crochet Trim**

At this point, I would recommend that you go back to the beginning and start again. After a careful second reading of this book, I believe that you should have a clear understanding of its content. What is most important is that the principles demonstrated here be understood and remembered. For the details, you can always refer to notes or books. But the principles go beyond that. Armed with these principles you can tackle any charting job. You can break down any style into simple shapes that can be achieved by simply adding or decreasing. It all boils down to making use of these principles outside the confines of the styles we covered here.

You can chart sweaters sideways, or in one piece. You can chart long tunics or coats. You can chart any shape at all. Analyze the shape and then chart it. You can do it now!

## HAPPY CHARTING