

# modernknitting

## **Design Knittings with LibreCAD LESSON 1**

For all knitters, machine or hand

by Harry Guetter

To design knittings professional we can use LibreCAD, which is a free Open Source CAD application for Windows, Apple and Linux. To download and get more general information please use the following link:

<http://librecad.org/cms/home.html>

Download the highest version of the software for your OS and install it. You do not have to donate. But you can of course support this development. You also can donate later. Or not. Just to clear this point: I personally am not involved in LibreCAD. The software is free and not time-limited. And the development of the software is still "living".

The general download space for manuals is: <https://www.box.com/s/i0cv6gvgbwlspqnd3pux>  
I will add all future information to this linked area and inform the group.

Download "Manual INTRODUCTION TO LIBRECAD paged 20130609.pdf"

This is the general LibreCAD-Manual. Use this manual as I gave it a paging. And I will refer to the paging. Do not get frightened. You will not have to learn the complete content of this manual. If you like use it parallel, read it from time to time to get an impression of the content. For our work we need only to know a few commands.

I will explain the most important commands and steps in following lessons.

We should have a discussion how to save and organize created drawings of group members.  
The following is just a first suggestion

## 1. Folder and subfolders for Designs in box.com (or a different space)

Main folder	<b>Design Knittings with LibreCAD</b>
Subfolder	Manuals, general drawings and general information
Subfolder**	Cuts
SubSubfolder**	Men
	Women
	Children
Subfolder**	Pattern

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***We should build up and keep a good reasoned organization in these folders and subfolders, to be able to search structured for distinct cuts. The more members create cuts and save cuts the more use will be for the complete group. The above shown first organization Cuts...Men...Women...Children must be structured deeper with more chapters like eg. Cardigan, scarf, sweater... I would like that the group gives suggestions. The better we organize that now the less chaos will be later. Please suggest structures!!!!***

## 2. Lessons

We will have 6 lessons. I will build up the lessons step by step in the following weeks

**Lesson 1:      Modify an existing drawing (cut) to distinct personal dimensions**

Content:

Learn about the use of zoom, layers and blocks

Modify dimensions, print in scale and use knit-radar

Without patterns

We use the drawing

Cut Sweater Man shaped with V-neck.dxf

**Lesson 2:      Design a new drawing (cut)**

Content:

We design a women's cardigan with double-round shaped neck

We save the drawing as

Cut cardigan woman double\_round neck.dxf

In Lesson 5 we will put pattern into this design

**Lesson 3:      Create a scaled grid for handknittings or machines without knit-radar**

Content:

We create a grid to substitute the complete calculating for all shapings

**Lesson 4:      Create Pattern**

Content:

We create mother-patterns in LibreCAD

**Lesson 5:      Put scaled pattern into a design**

Content:

We use a mother-pattern

copy it into drawing      cut cardigan woman double\_round neck.dxf

We scale the pattern to mesh-size

We make a pattern-block

We orient the pattern-block in the drawing

We fix start-point and end-point of the patterning. Fix start-point of the pattern-block

**Lesson 6:      Create a small cupboard**

Content:

Construct a small cupboard to learn the use of LibreCAD for general items

## Lesson 1 Modify an existing drawing (cut) to distinct personal dimensions

Open the files-section of the knittingmachines-group

Main folder **Design Knittings with LibreCAD**

Subfolder Manuals, general drawings and general information

Download drawing **Cut Sweater Man shaped with V-neck.dxf** from Box.com

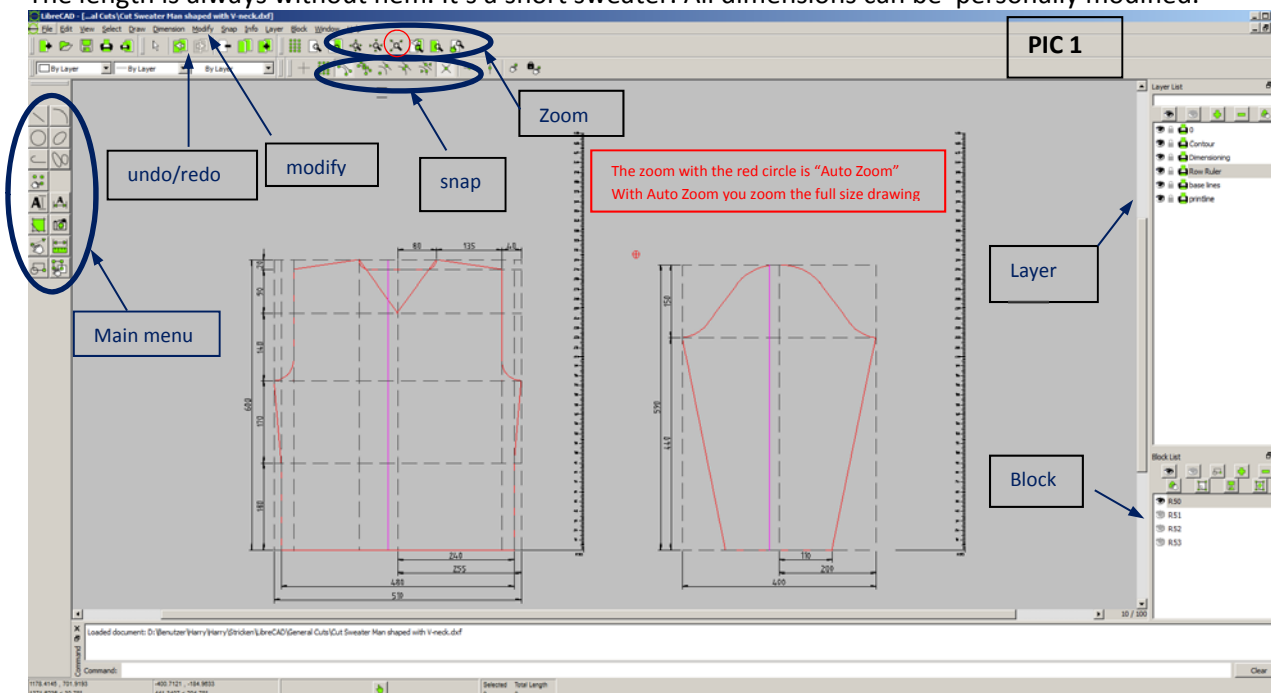
Save the drawing on your computer. I advice for future to keep the same folder-structure as we will build up in box.com (or a different space). So you have one view on two worlds

Start LibreCAD and open file **Cut Sweater Man shaped with V-neck.dxf**

Save the drawing as test.dxf

You will play a little bit with the test.dxf and in worst case you can disturb it. Then you still will have the original.

The length is always without hem. It's a short sweater. All dimensions can be personally modified.



### ZOOM:

Play with your mouse:

Turn the wheel up:

you zoom in

Turn the wheel down:

you zoom out

Turn the wheel down much:

you get a very small drawing

Move your cursor to the zoom-section, over the third icon from left (red circle), leave it there and you get an info:

### Auto-zoom

Click the icon with left. The drawing zooms to the size of your screen

Play with the other zoom-icons, your mouse and read chapter zoom and pan in the manual page20

**You get always back to full view of your drawing with the Auto-zoom icon.**

**LAYER:**

Play with layers (on the right top):

Headline black eye: all layers visible

Headline grey eye: all layers invisible

Same can be done with the single layers. Activate and deactivate single layers and see what happens.

The layer-technology is a mighty tool. Generally if you draw a line or a curve or something else, you first activate the distinct layer. And all you draw will be drawn only in this layer. So later you can visible it or invisible it. Your drawing keeps clearly arranged. We will work with this later.

**BLOCK and ROW-RULERS:**

Elements that belong together as a unit can be created to a BLOCK. This drawing has 4 Blocks. This are 4 distinct row-rulers that I created: R50, R51, R52, R53

For your future planning you use that distinct roll-ruler that matches your knitted and washed gauge.

If your gage has 50rows/100mm you visible BLOCK R50, if it has 52rows/100mm you visible BLOCK R52....

I will construct all row-rulers from R10 – R120 and put the drawings into the files-section. This will last a bit!

The Row Ruler correspondents with the row counter of your knitting machine.

Play with blocks (on the right down):

Headline black eye: all blocks visible

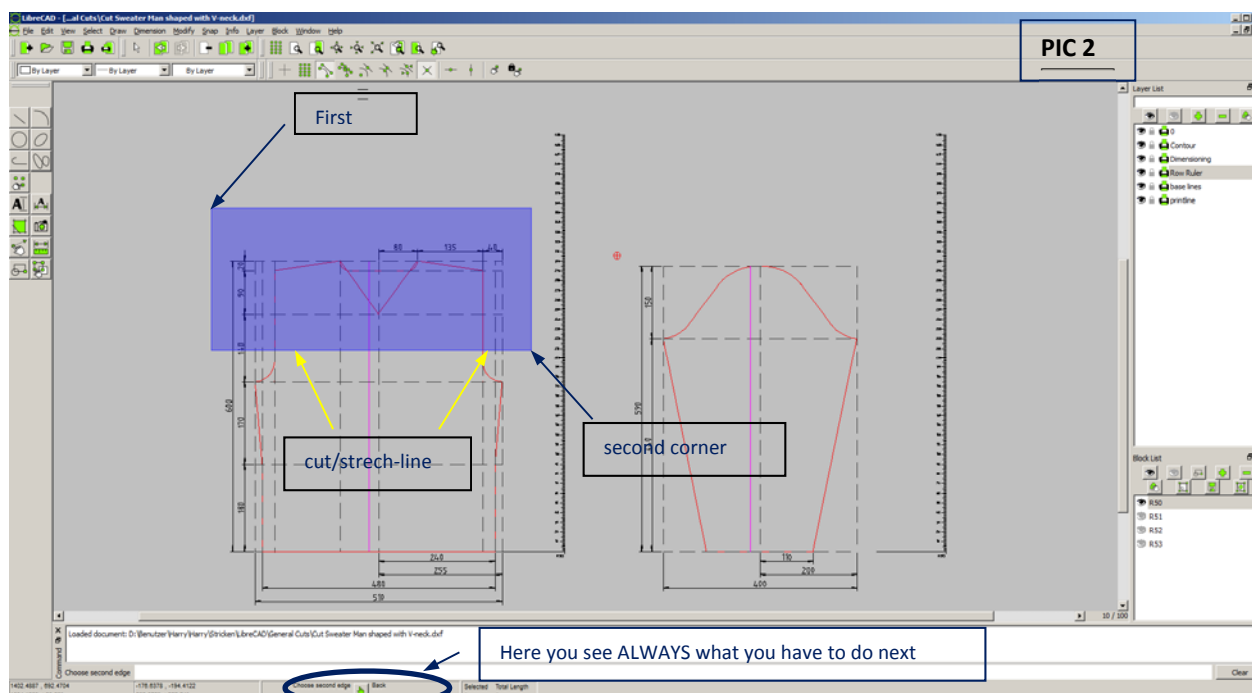
Headline grey eye: all blocks invisible

If you visible all Blocks you see all row-rulers on one place one over each other. You cannot distinguish the single row-ruler. Therefore first invisible all and then visible one distinct.

**Now you know that with one distinct cut you will be able to work with each mesh-size. You just have to select the needed row-ruler.**

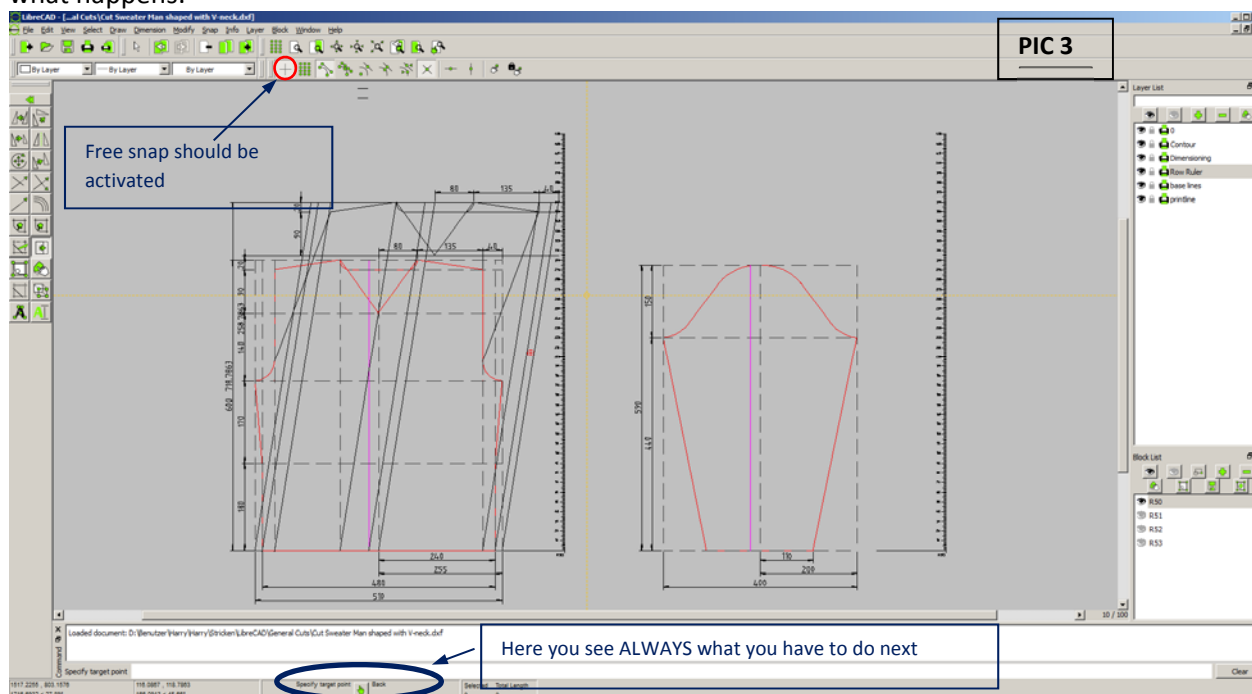
**STRETCH:      Modify dimensions**

Click "Modify", then "Stretch". LibreCAD shows you that now you have to "Specify first corner" of a select window. Activate "Free snap". Place the cursor to left top and with left mouse-click "Specify first corner". Then move the curser right and down like next screen and with left mouse-click "Specify second corner". You do not see the blue rectangle. I added it to show the selected area better.



Now you have fixed a window, that cuts the sweater in height of the sleeve-line. The drawing will be stretched at this line. The other parts of the selected window like V-neck and shoulder-shape are not “cutted”. They will not be stretched, they just move and keep their dimensions.

Now you specify a reference point (a start point) for the DIMENSION of the stretching  
Activate “Free snap”, click the cursor somewhere in the drawing and then move the cursor slowly and look what happens:

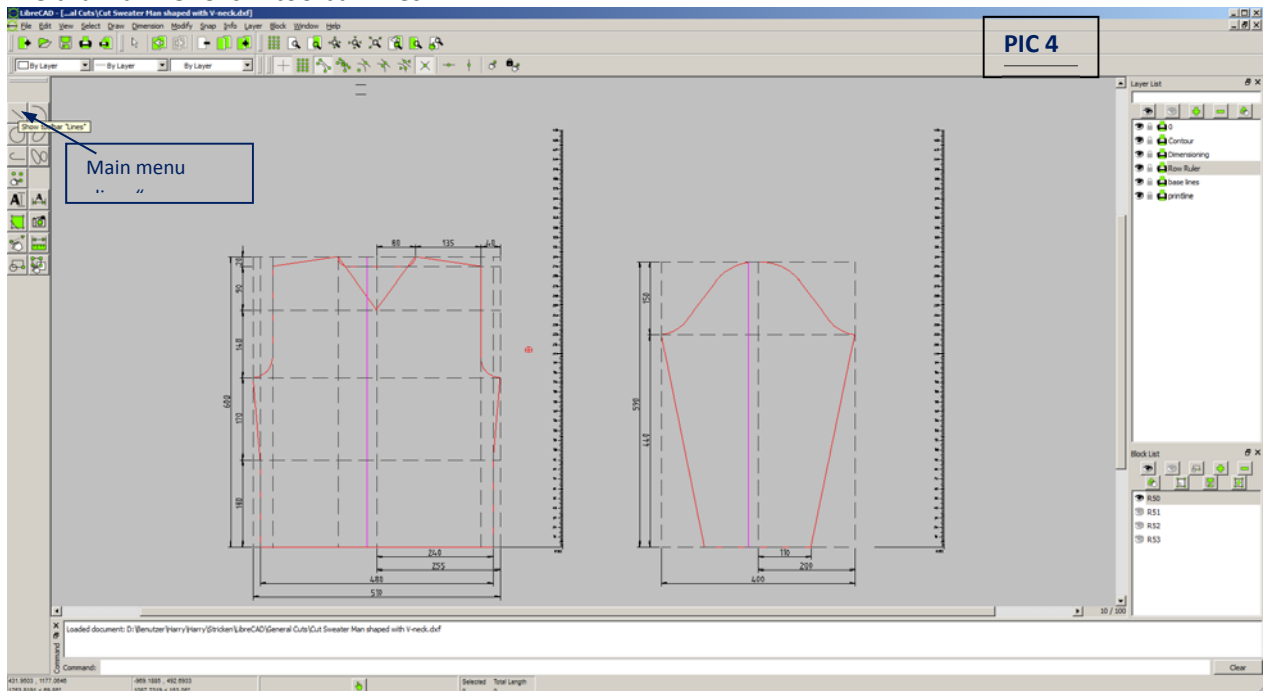


That is just a demonstration. So that you see what happens with generally stretching.  
With two times “Esc” you leave the stretch menu.

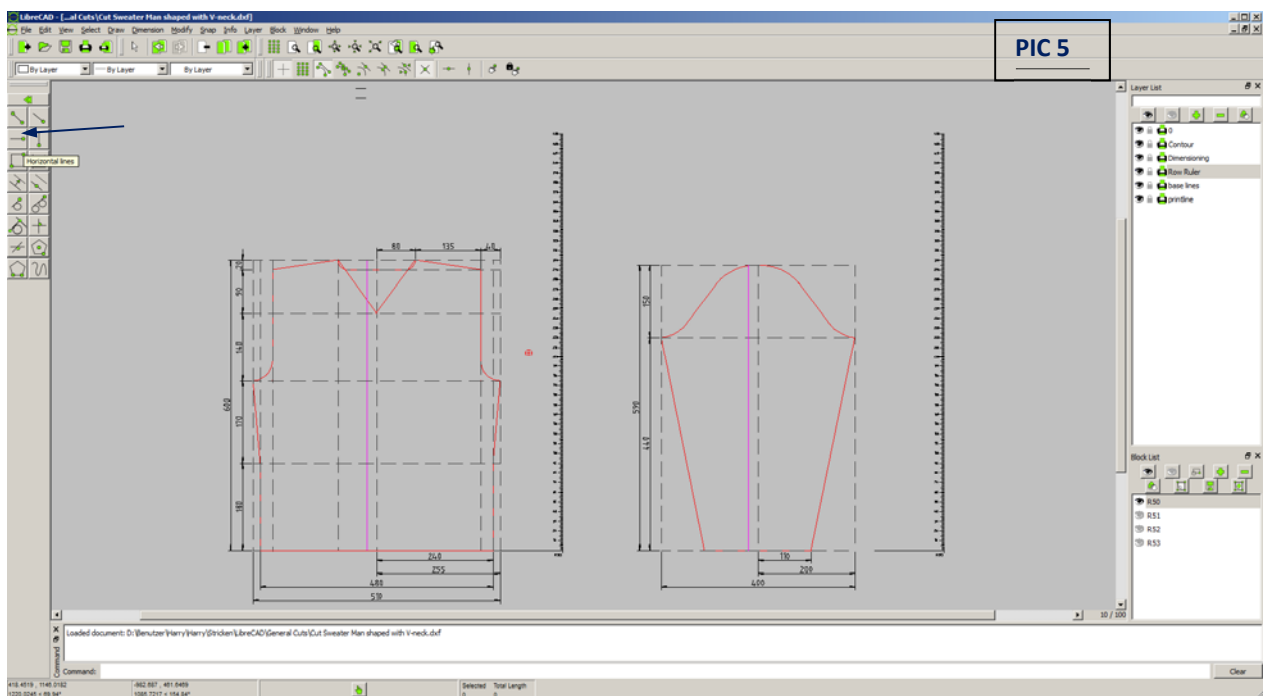
**Remember:** With Esc, Esc, Esc... you always come back to the start menu

**With Undo and Redo you can correct mistakes**

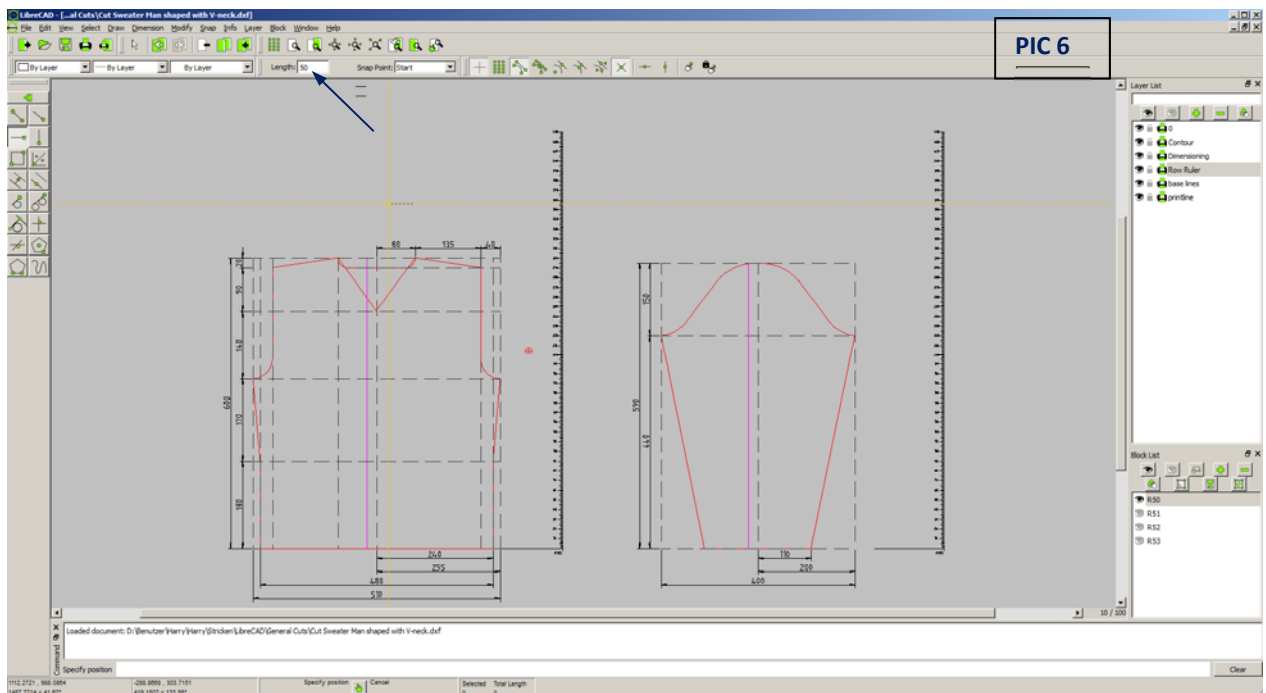
Now we are going to stretch the sleeve-line exact 20mm longer.  
We draw a line: Click “toolbar lines”



Then click “horizontal line”



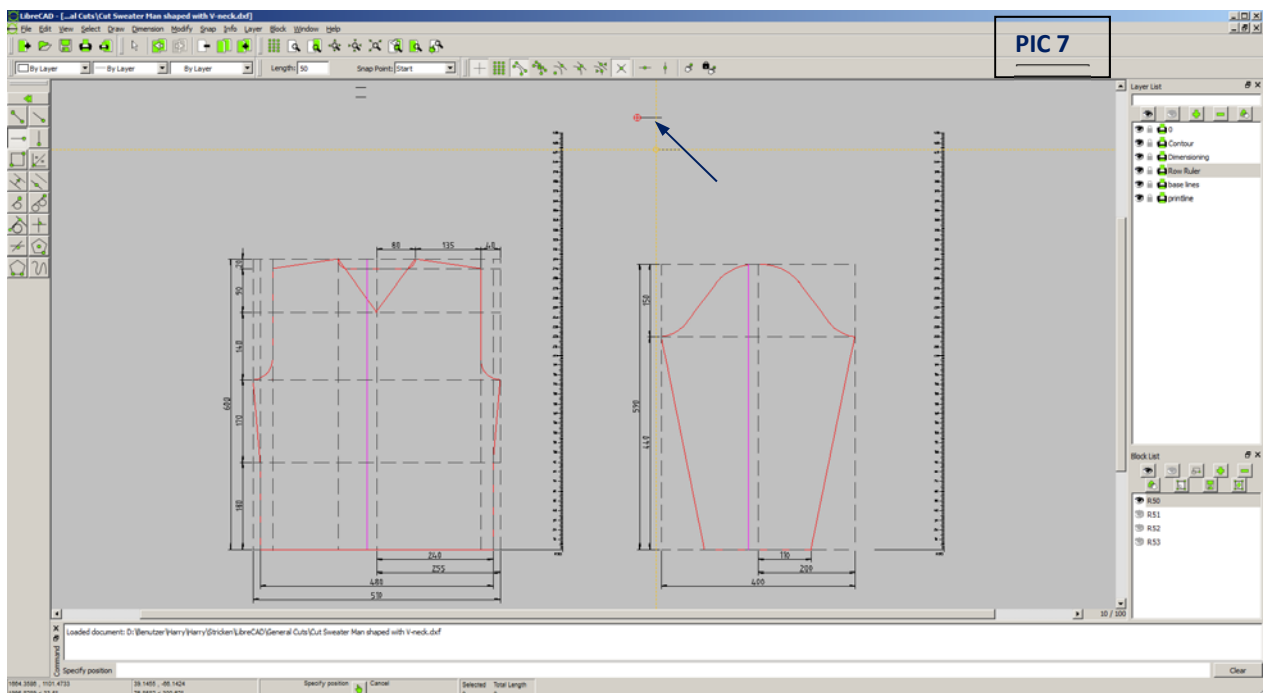
Now type 50 for Length



PIC 6

Move the cursor to a place at the right side top (just a free space) and click once left

You have drawn a 50mm horizontal line.

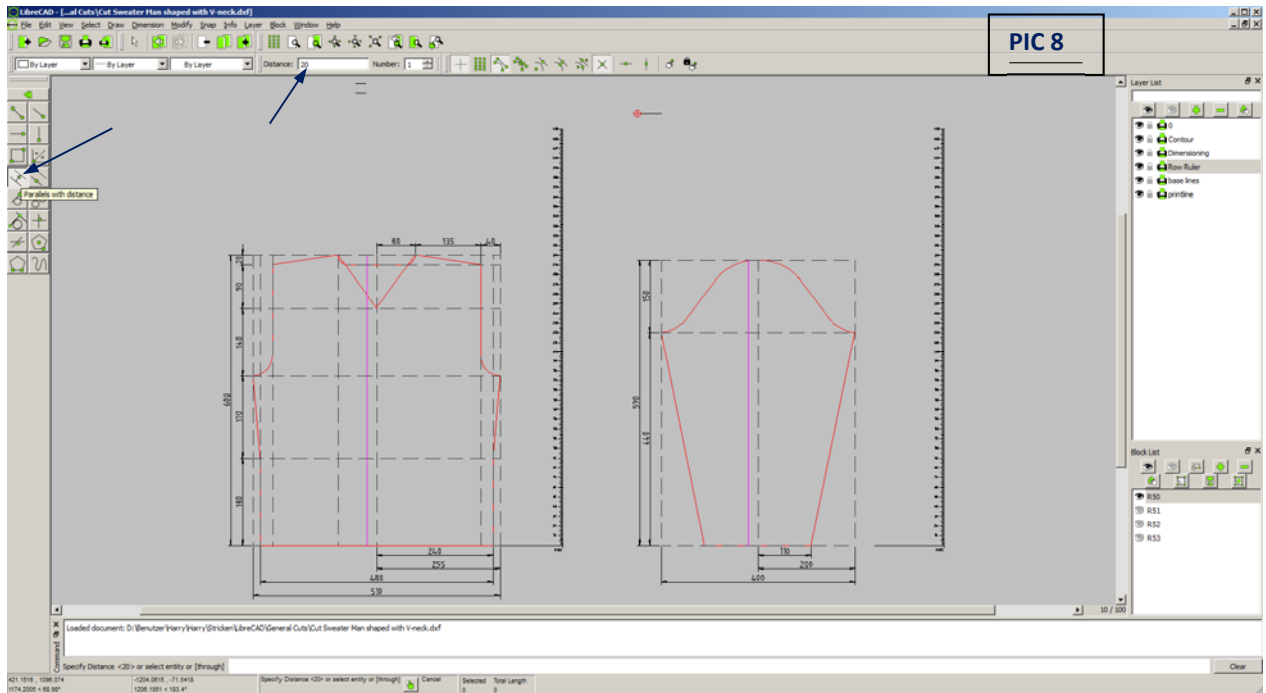


PIC 7

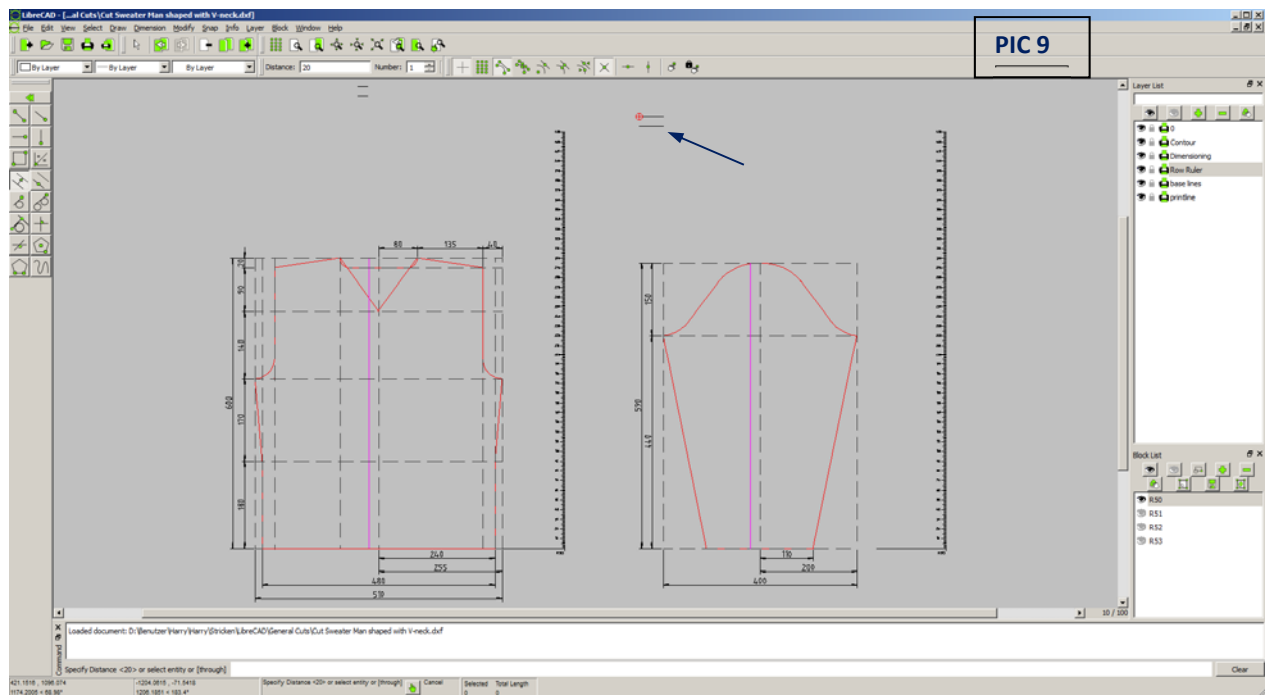


Now we draw a parallel line with distance 20mm (remember: we want to stretch the sleeve-line 20mm)

Move the cursor to “parallel with distance”, click left, type 20 for the distance



Move the cursor near the 50mm line. You see a parallel line. Click left.



You have drawn now a parallel line with distance 20mm. And you have now distinct reference points for the stretching of 20mm. We will stretch the sleeve-line now 20mm longer (or we could also go 20mm smaller)

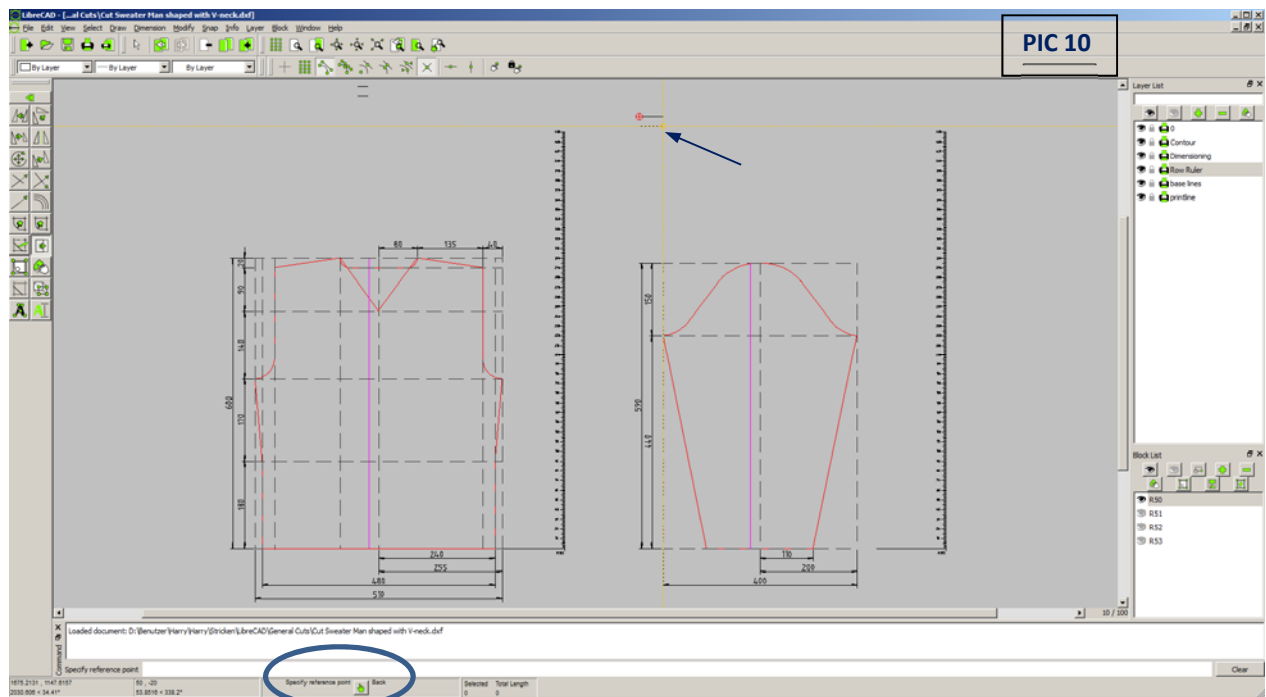
Start again with the process of PIC 2

Modify, Stretch, first corner, second corner (always look what the program tells you to do)

but now take as reference point the right side of the bottom line of the 2 parallel lines.

To be able to snap the end of the line distinct, deactivate “Free Snap” and activate “Snap on Endpoints”

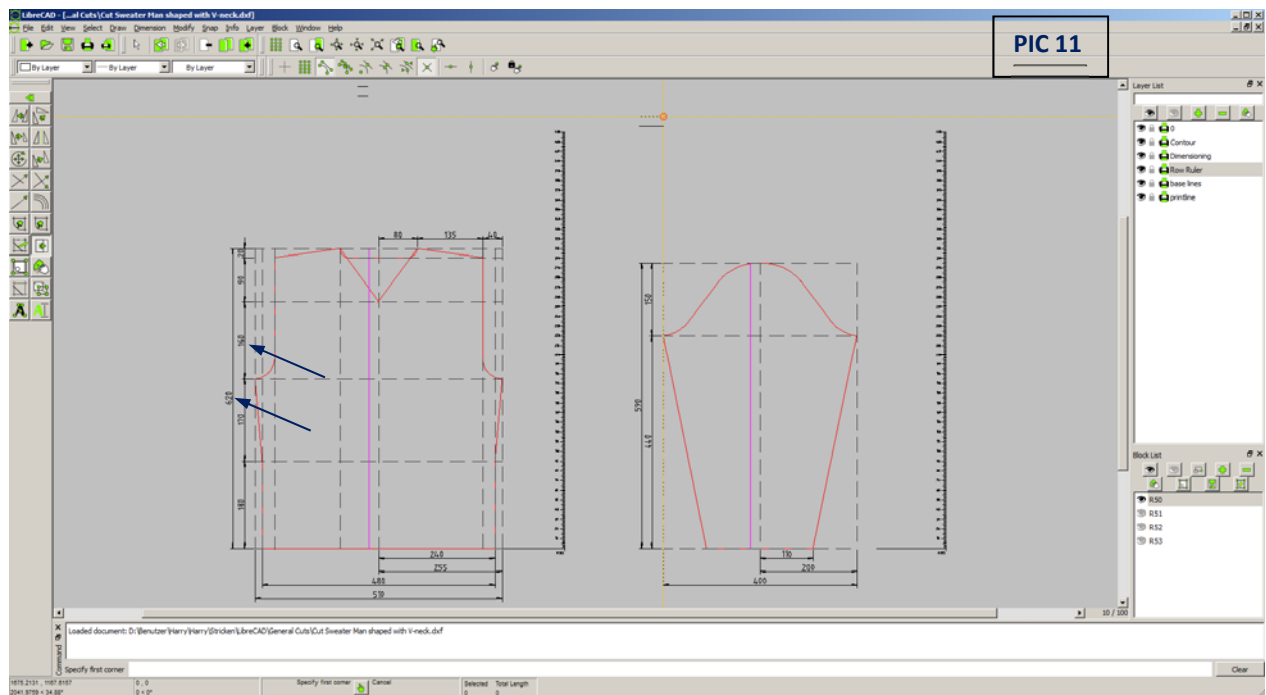
Move the cursor to the right side of the bottom line. You see how the program snaps the endpoint and click left. You have specified the reference point.



Now move the cursor to the right side of the top line of the 2 parallel lines. The program will snap the endpoint again. Click left. You have specified target point. Click left. You have stretched the sleeves 20mm bigger.

To shorten the sleeve-line 20mm you had to use the upper line as reference point and the downer line as target point.

Look at the dimensioning at the left side. The dimension of the sleeve-line is now 160mm (before 140mm) and the total length of the sweater is now 620mm (before 600mm). Congratulations!!!



Esc, Esc back to main menu

In the next step we edit the width. I will show now less PICs as you principally know what has to be done.

And remember: If you should come into a situation where you do not know how to move on, use Esc, Esc... and start new with the command. And use the undo/redo buttons (See PIC 1)

And remember: look always on the downside what the program tells you to do

## SELECT AND DELETE

Move the cursor to one of the two parallel lines and click on it. You now selected this line. Now press DEL on your keyboard. The line is deleted.

You have learned to select an object and to delete it. You could select some objects, one after the other, then Del all together.

With undo (see PIC 1) you will undo the last command. Do that. The line appears again. With redo (PIC 1)

You delete it again.

You have learned to select, delete, undo and redo. Undo and redo is for all commands, not only delete)

Okay – back to what we wanted to do

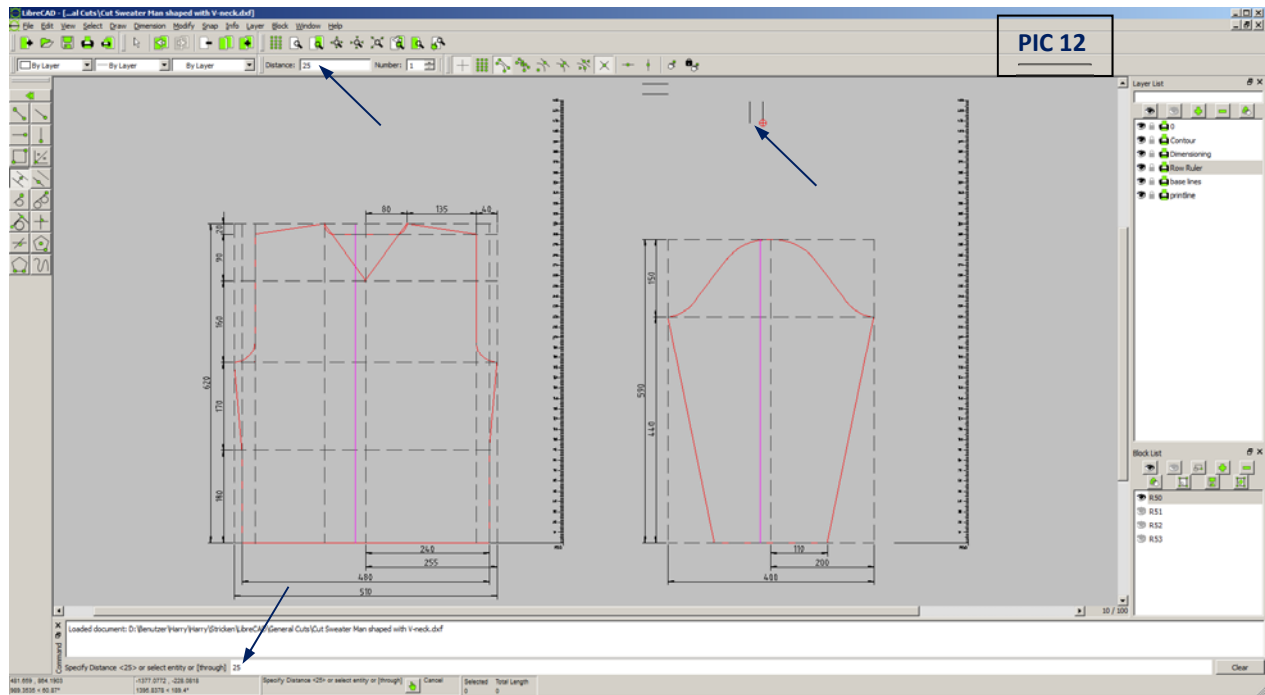
Edit width of the sweater:

To get distinct points we draw a vertical line, draw a parallel line in distinct distance and then stretch. The same way as with the sleeve-lines:

“Toolbar lines”, “vertical lines”, “length (for practice) 40”, “specify position”, “snap free”, Cursor right side top on a free space, “left click”. The line is drawn to top from the specified position.

(INFO: With “length -40” the line would have been drawn to bottom of the specified position)

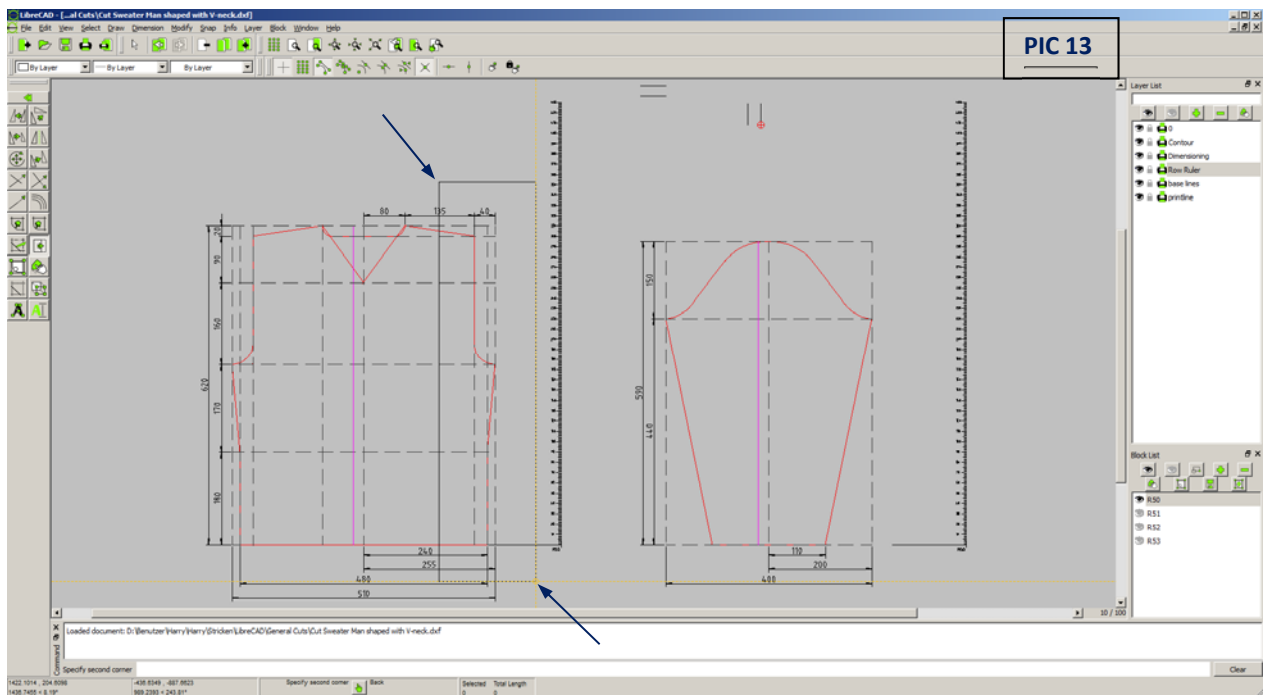
Now left menu “parallel with distance”, “specify distance”25 (either in the field on the top or in the command line on the bottom)



Move the cursor near to the vertical line, the program shows the parallel line, click left.

Now turn the mouse wheel a little to bottom (one raster) . That will minimize the drawing a little bit. We need a little more space on the bottom for the stretching.

“Modify”, “Stretch”, activate “Free snap” if not activated, “Specify first corner”, “Specify second corner” to get a selection window as follows:

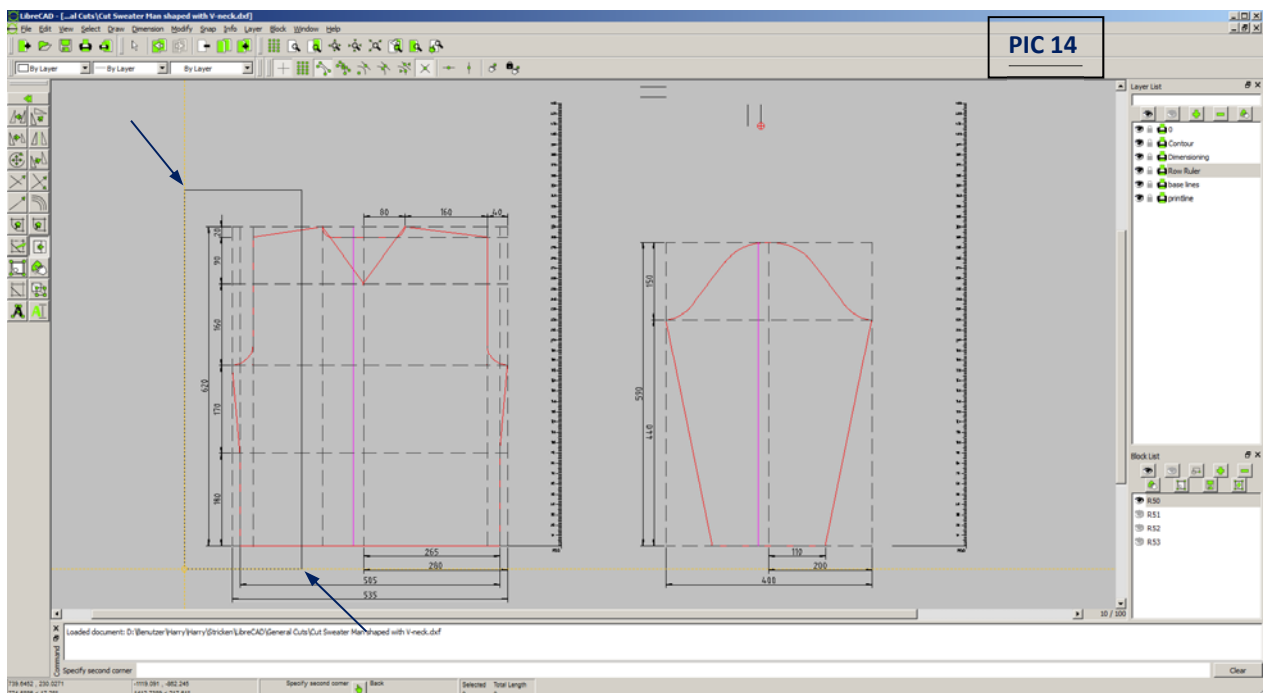


“Specify reference point” , deactivate “free snap”, activate “snap on endpoints” if not activated, move cursor to the left lines bottom endpoint, the programs snaps the point, click left.

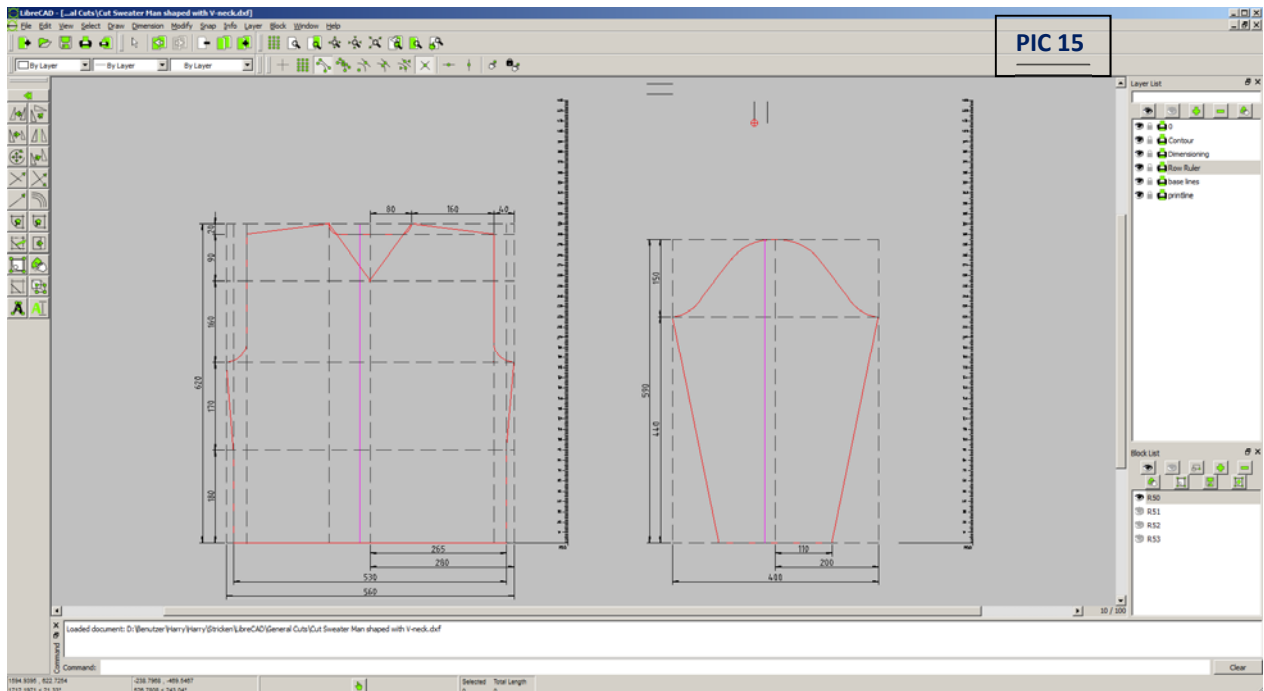
“Specify target point”, move cursor to the right lines bottom endpoint, click left.

The right side of the sweater is 25mm wider. As the cutting line of the window was in the range of the right neck shape this range is stretched now 25mm.

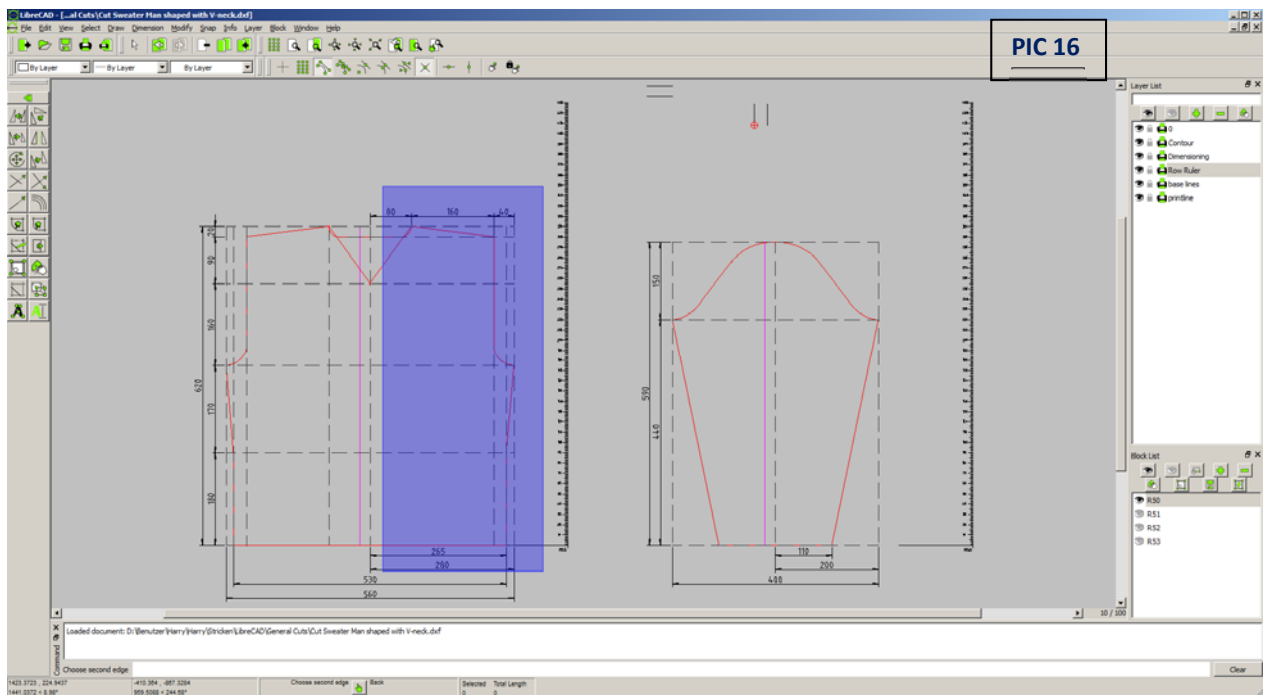
Do the same on the left side.



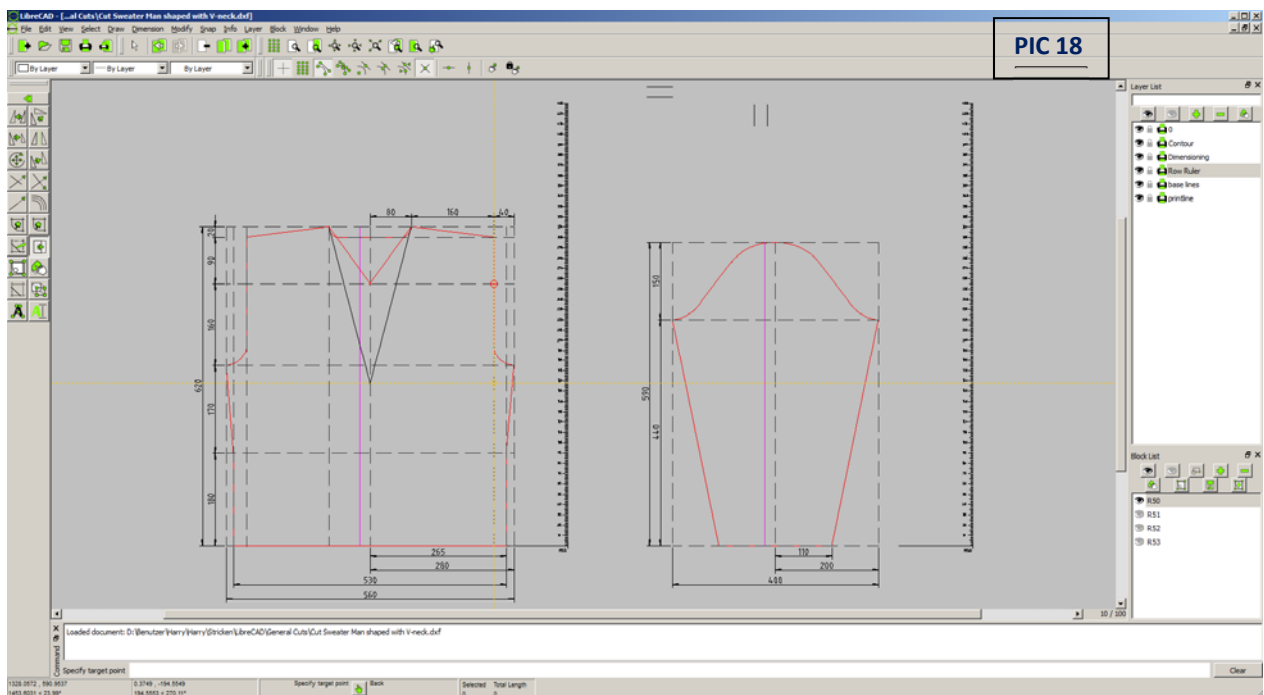
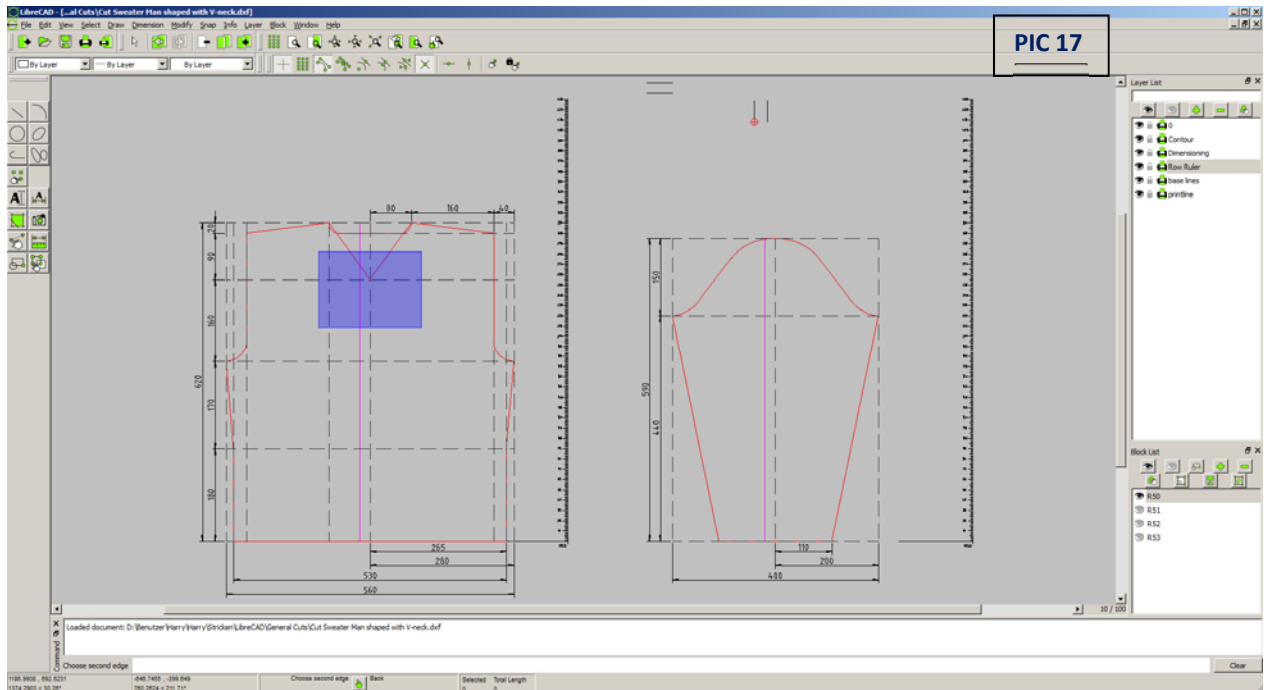
Activate “free snap”, do the selection window as shown, deactivate “free snap”, “specify reference point” (the right line now), “Specify target point” (the left line now). Click left. The left side of the sweater is now 25mm wider. The complete sweater is 50mm wider.



If you want to have a wider V-neck, cut with the selection window in the V-range.



If you want to have a longer V, select the V and stretch it:



Try and train. Try also the different snap-icons

**Remember: For a selection window activate “free snap”. For distinct stretching activate “Snap on endpoints” or “snap intersection”**

You have learned a lot now. I think this is more than 50% of the complete basic-learning.

We go on with stretching the sleeve with the next part of lesson 1

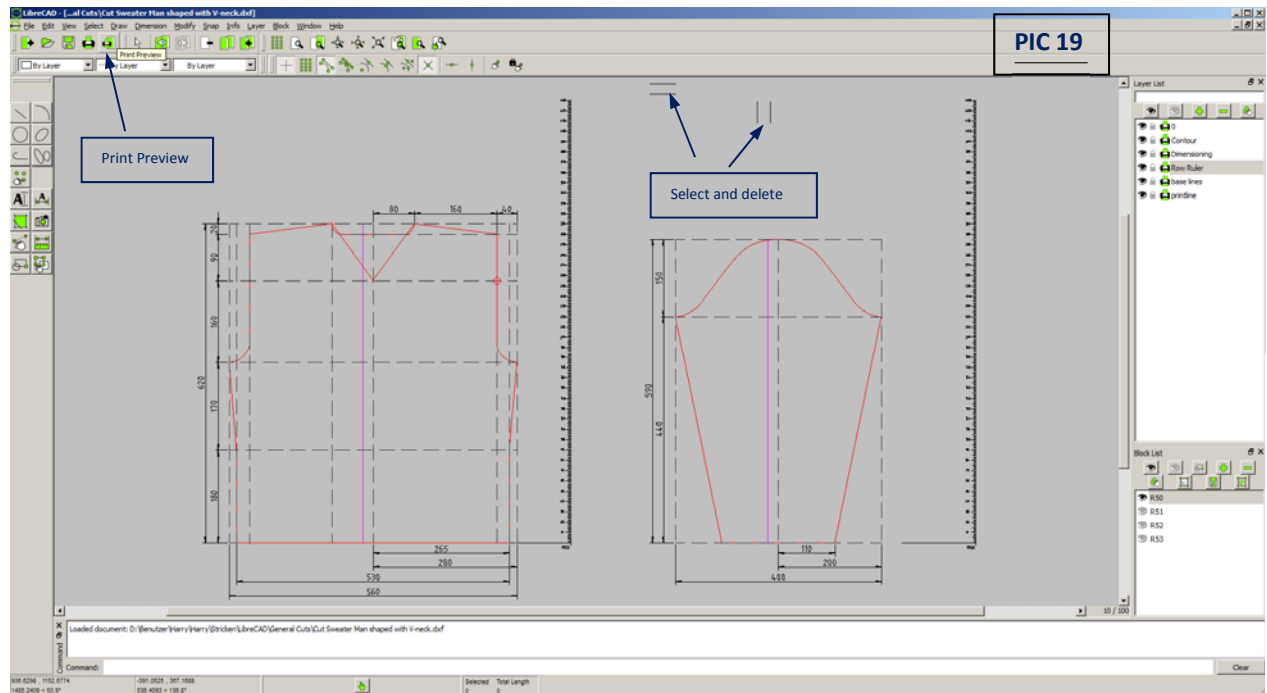


Now we are going to print out the drawing in scale 1:2

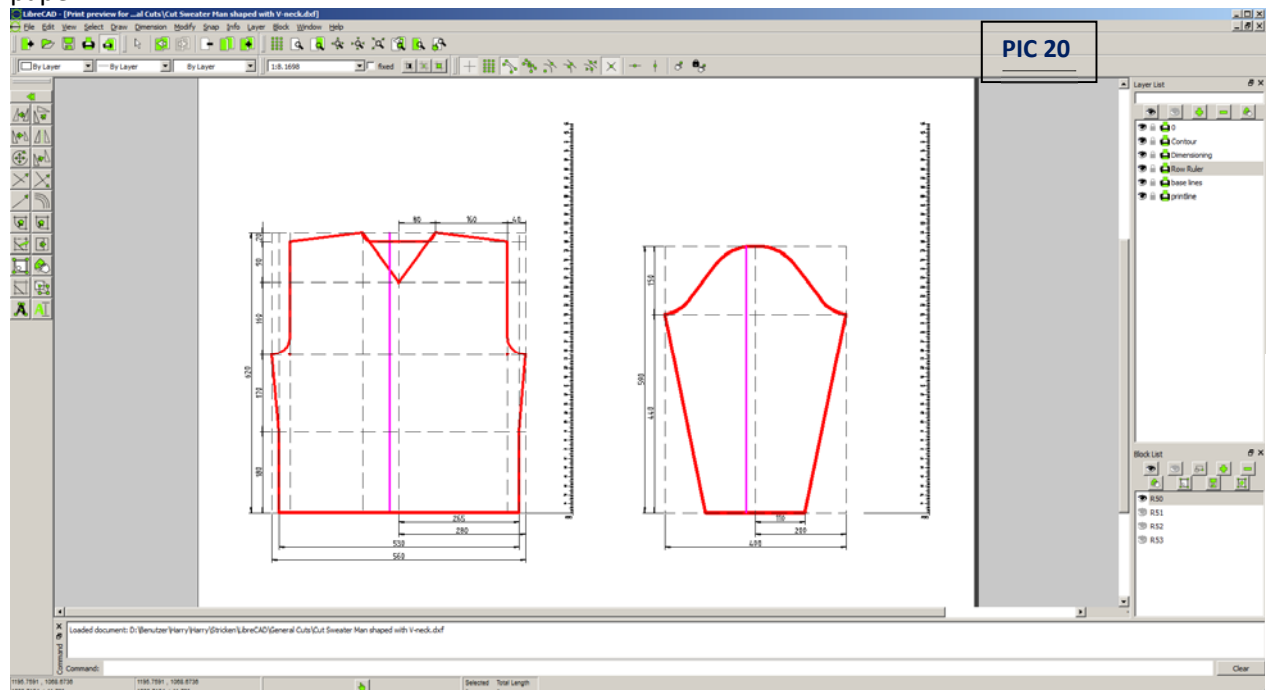
### PRINT:

Check your drawing. If there are still construction lines, select them and delete them.

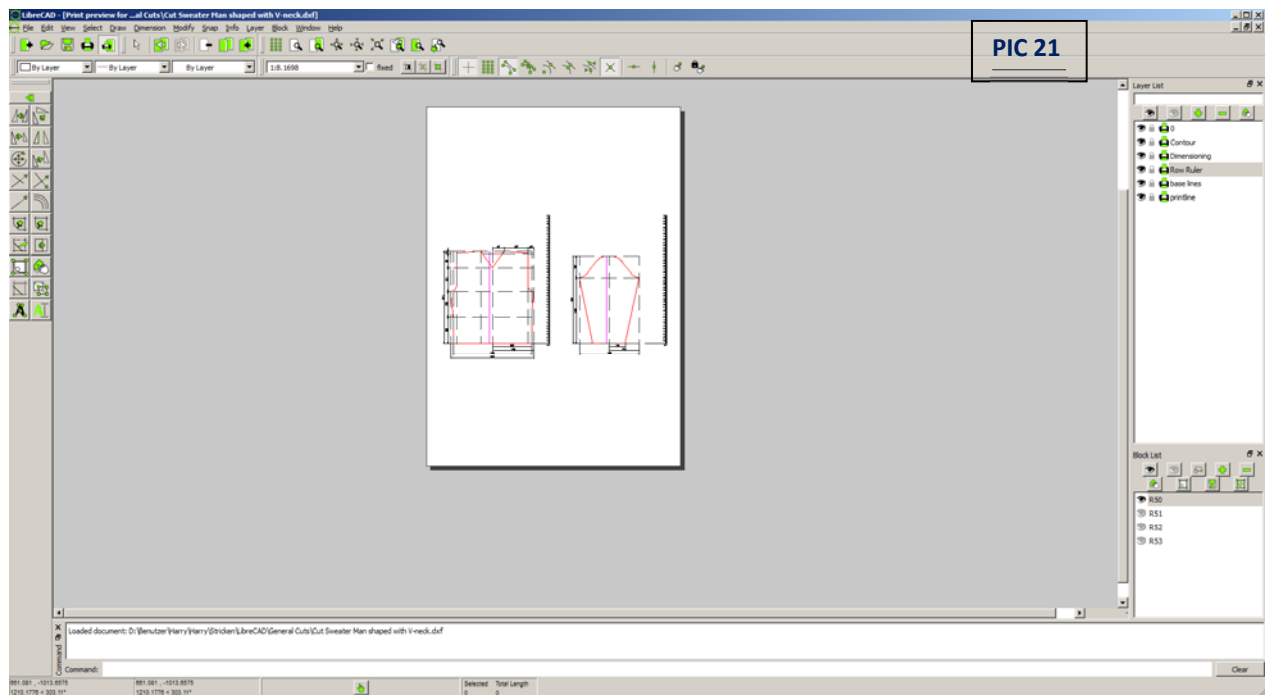
Then click “Print Preview”



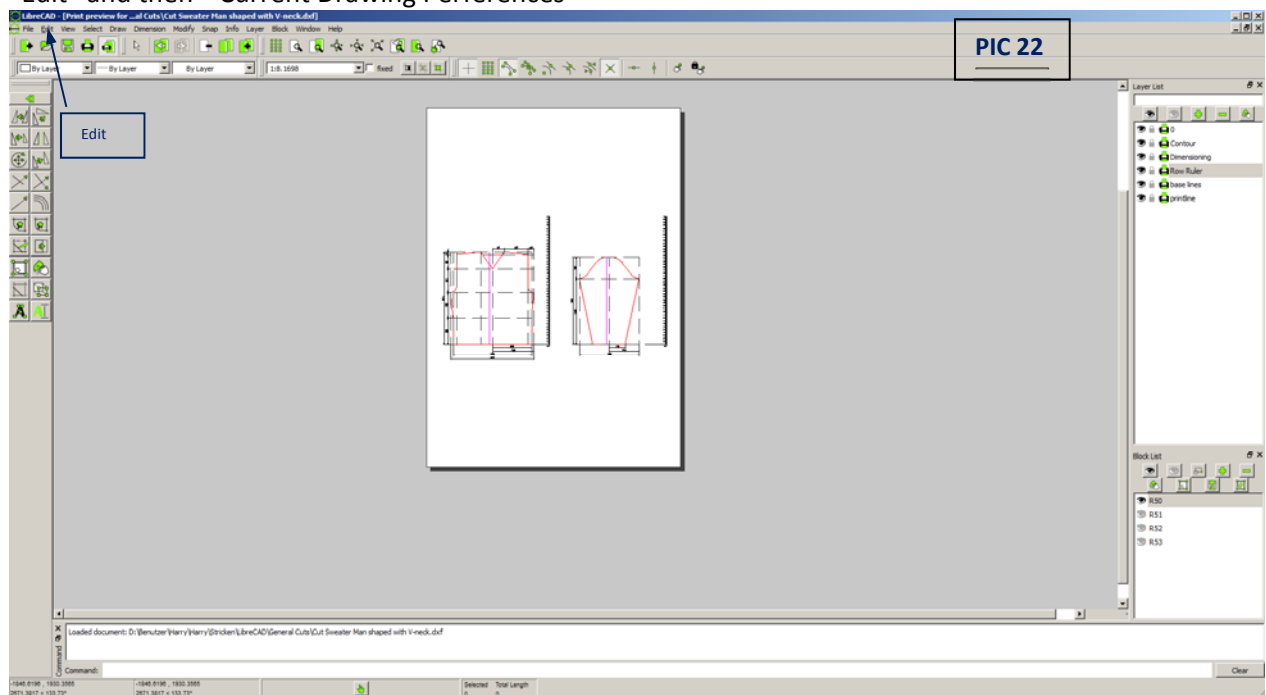
You get the Print Preview with Auto Zoom of the complete drawing. The white background is the selected paper.



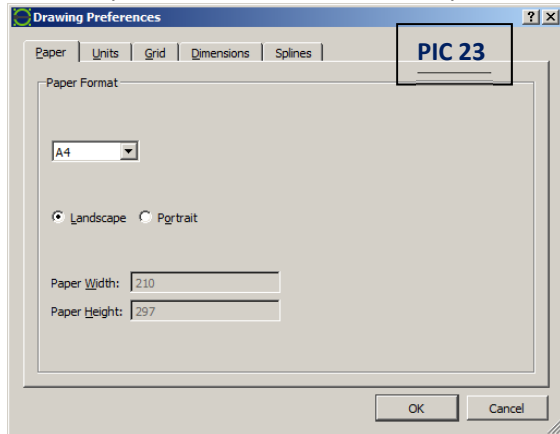
You cannot see if the format is “Portrait” or “Landscape”. Therefore turn the mouse-wheel until you see the complete paper.



If the format is "Portrait", change the settings.  
"Edit" and then "Current Drawing Preferences"



Click “Paper”, select format “Landscape”, “ok”



Click “Auto Zoom”, turn the mouse-wheel until you see the complete paper and then “File”, “Print”

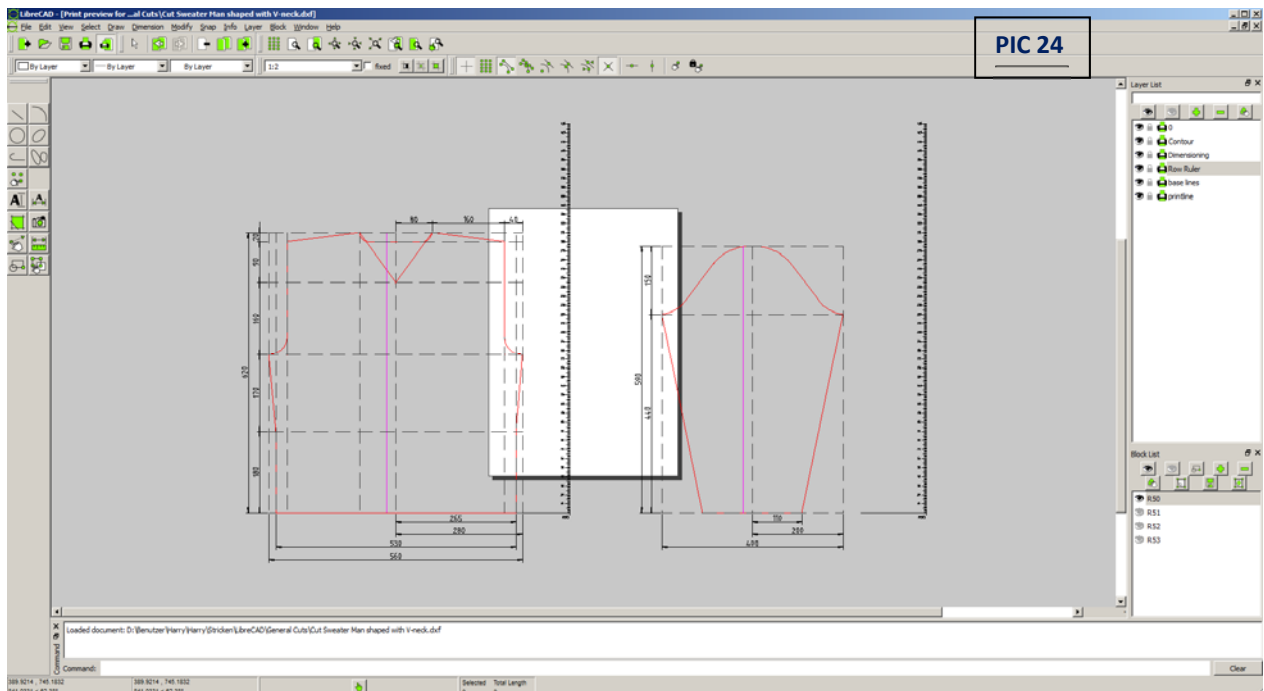
Now you know how to change Paper format, Landscape and Portrait.

## PRINT SCALE

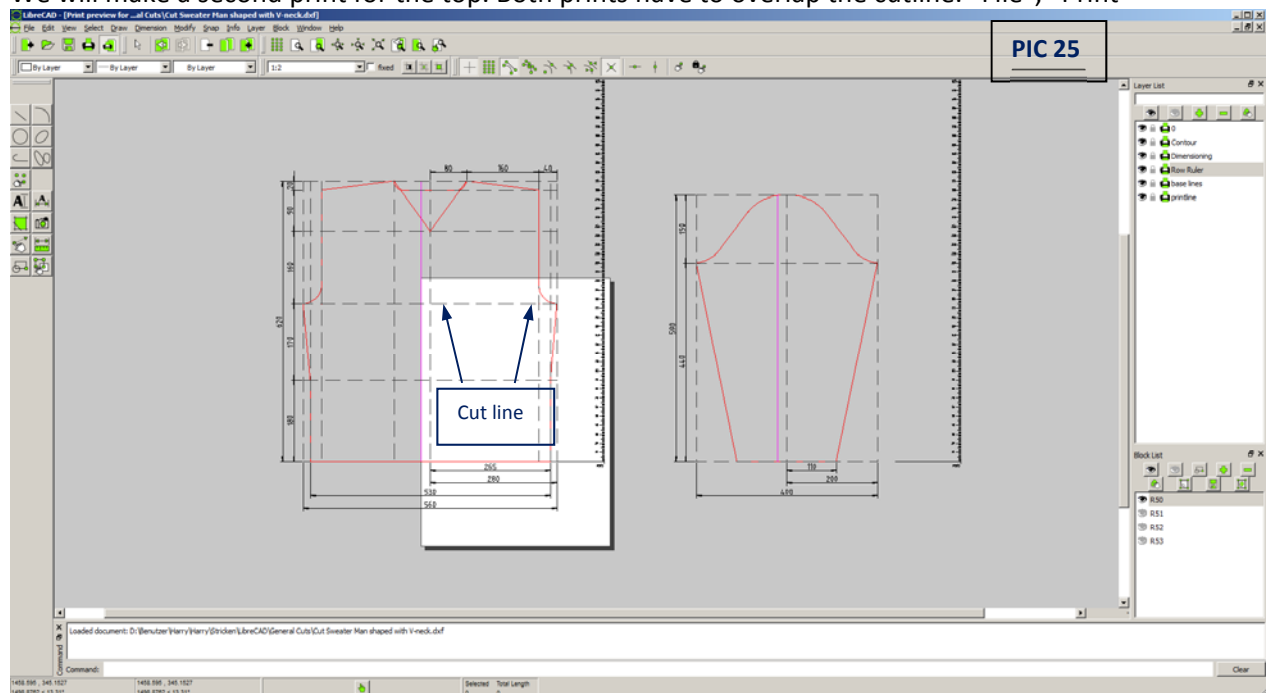
We will print now in scale 1:2 for the knit radar. For this print we need “Portrait”.

“Edit”, “Current Drawing Preferences”, “Portrait”

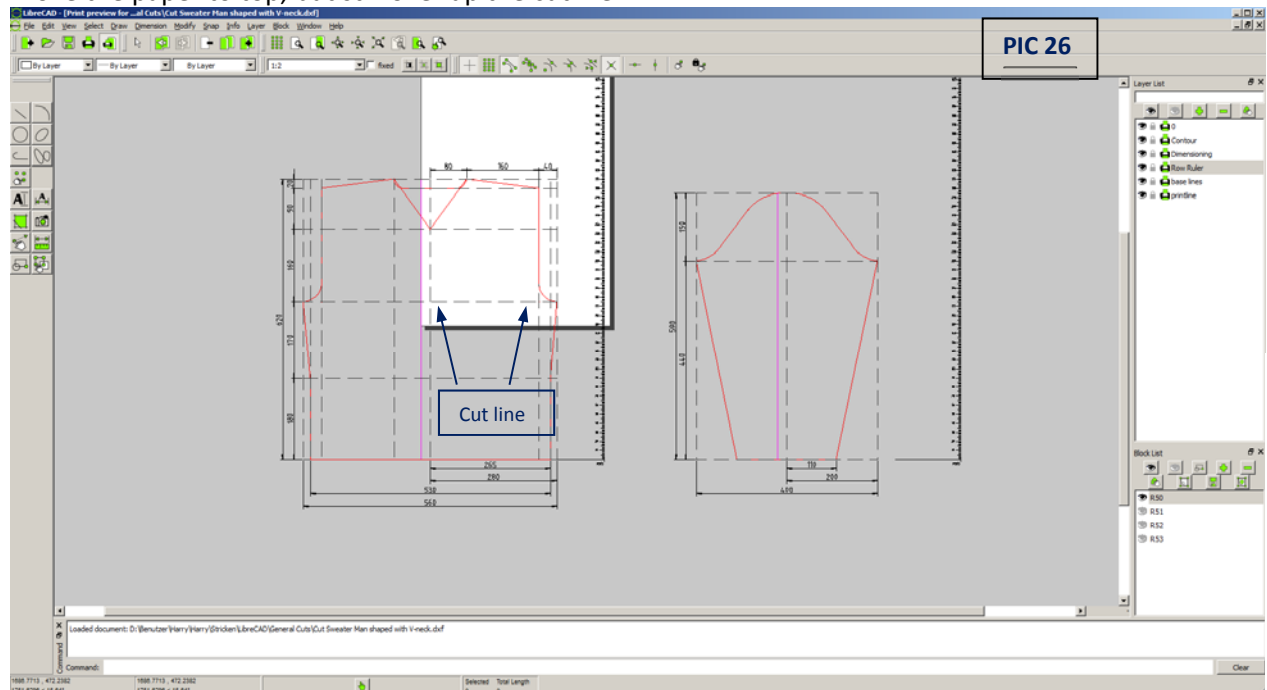
You see the drawing in scale 1:2 and you see the paper in its complete size. Without changing the position of the paper we would print the range that is covered by the paper, the right part of the body and the left part of the sleeve



Now we move the paper to the position we want to print. Move the mouse over the paper, click left, keep clicked and move the paper exact to the magenta printline and a bit over the cut line. This is the first print. We will make a second print for the top. Both prints have to overlap the cutline. “File”, “Print”



Move the paper to top, but still overlap the cutline



“File”, “Print”. You have two prints now with scale 1:2 and with the selected Row Ruler R50.

Either you cut the 2 papers with a fine cutter exact at the cutline and glue them together with transparent film (I do that to have the drawings together, fold them, punch them and put it into a ring file) or you work with 2 single papers.

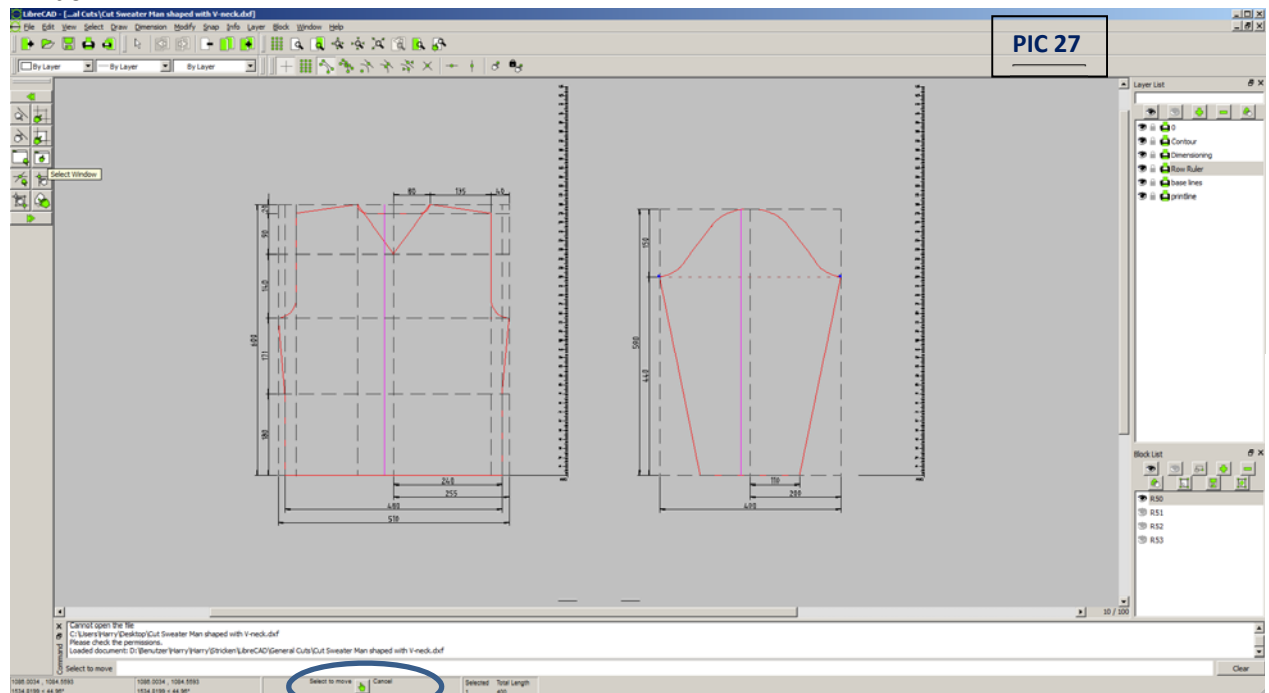
Put the print into the knit-radar, select scale 50 at the knit-radar, turn the print to Row 0 and knit some rows without wool. You see that the printed Row Ruler moves exact together with the row counter of your knitting machine. This is a big advantage if you stop work, have a mistake or... You always can turn the paper in the knit-radar to a distinct row, according to the knitting machines row counter.

## MODIFY A SLEEVE

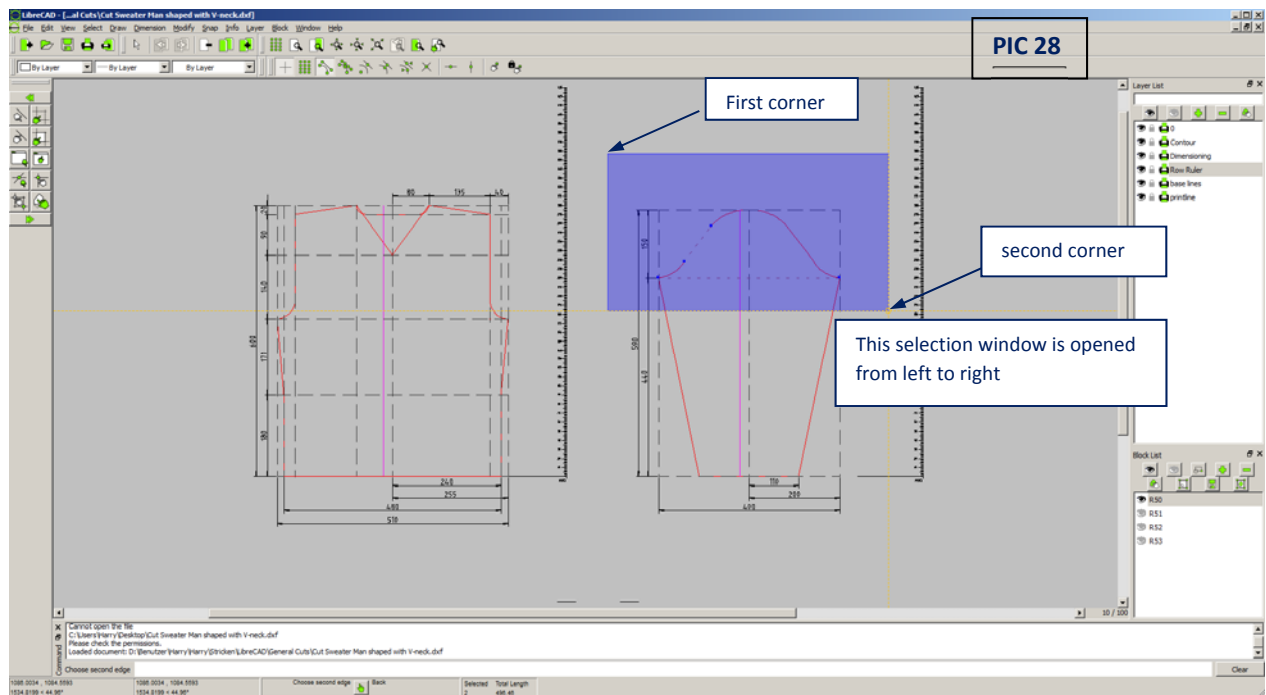
Open drawing Cut Sweater Man shaped with V-neck.dxf

“Invisible” all blocks, “visible” block R50. We will lengthen the sleeve 30mm and broaden it 20mm.

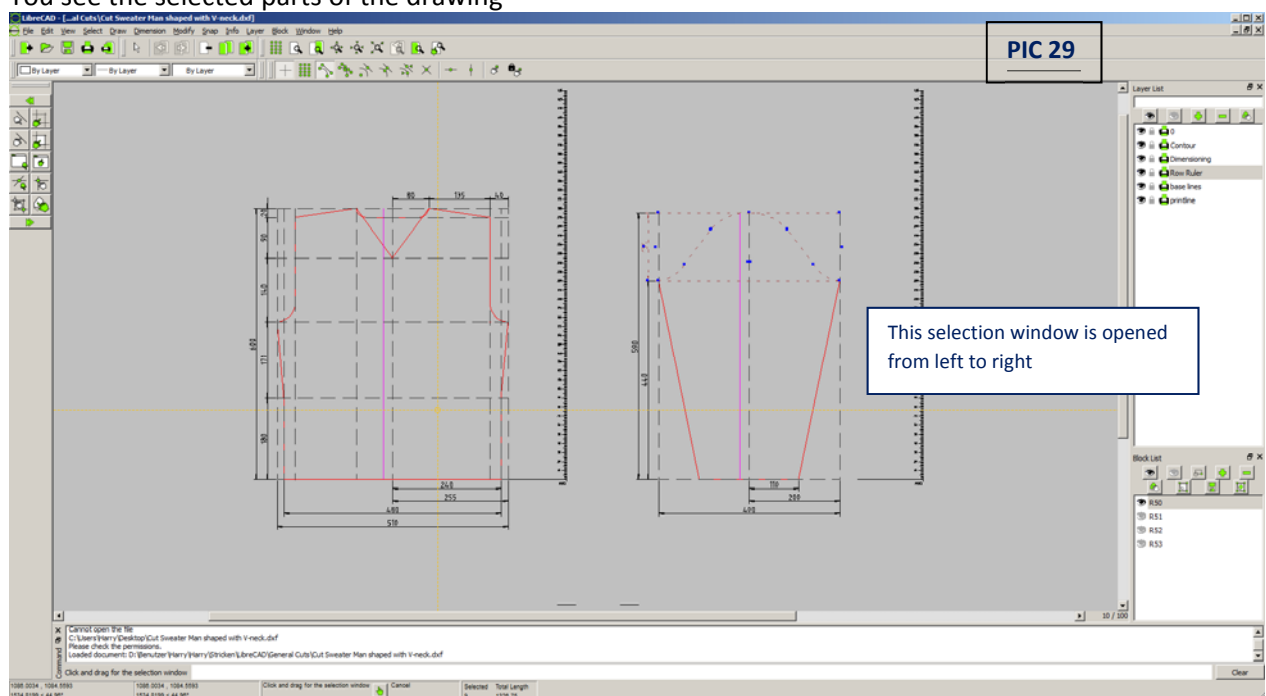
For lengthen the sleeve we use command move/copy. “Modify”, “Move / Copy”, “Free snap”, “Select window”



Left mouse-click for “first corner”, move the mouse to “second corner”, left mouse-click to finish selection



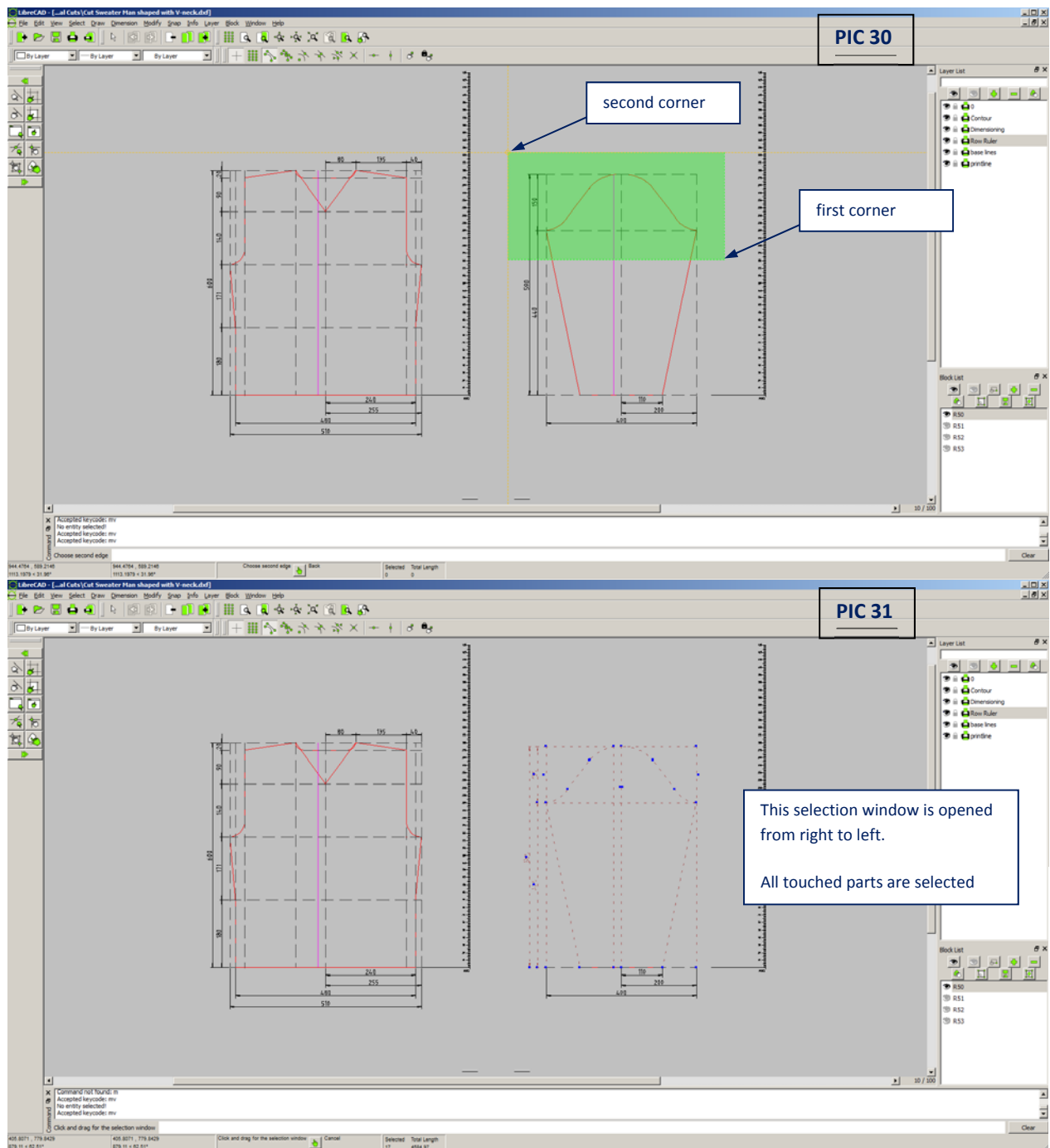
You see the selected parts of the drawing



Remember: A selection window **moved from left to right** snaps **all parts that are with their complete size within the window**.

A selection window **moved from right to left** snaps **all parts that are with their complete size within the window and all touched parts**

See the result of the same selection window but moved from right to left :



Now we are going to lengthen 20mm

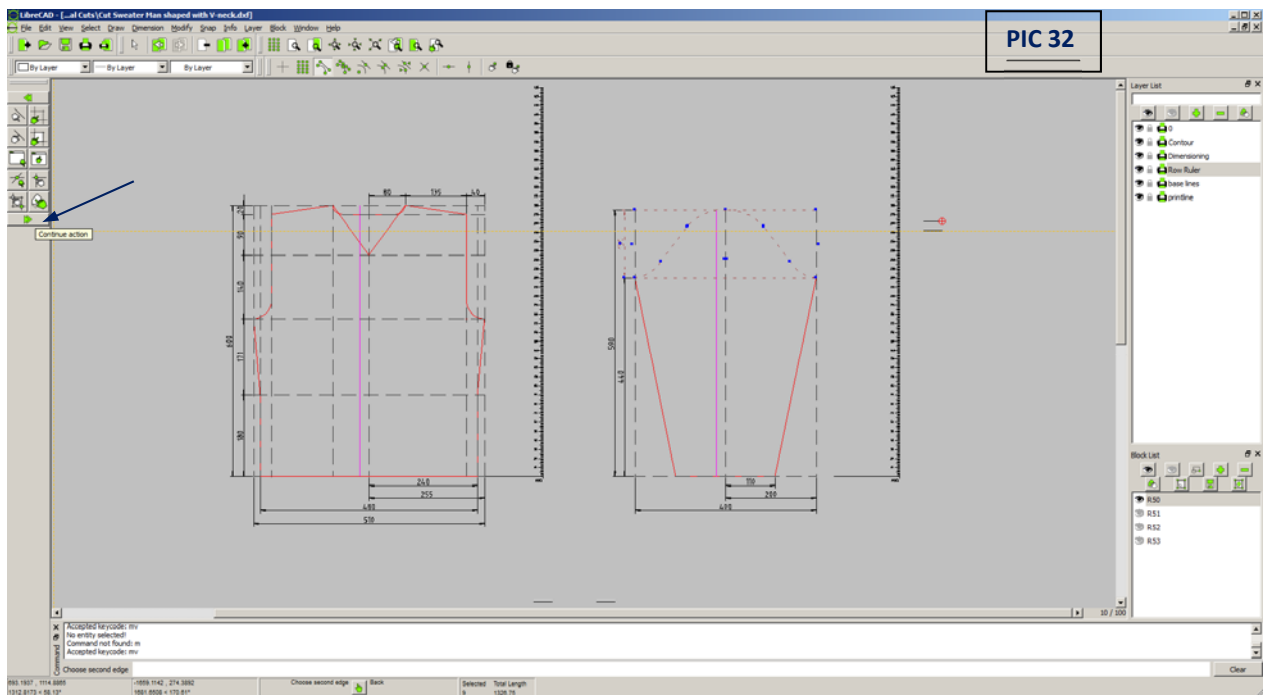
“Toolbar lines”, “Horizontal lines”, “length 40”, snap point “start”, move mouse to a free space on the right side, click left.

“Paralleles with distance”, “distance 20”, “inactive free snap”, mouse near horizontal line, you see the parallel line, “left mouse-click”

“Modify”, “Move / Copy”, “Select window”, from left to right as PIC28

Now look at the green hand at the bottom and the hint “click and drag for the selection window”. That means we could select the next space with the selection window and so on....

But we still have selected all we have to select. Therefore we stop selecting and click “continue action”



“Specify reference point”, deactivate “snap free”, click endpoint downer parallel line, “specify target point”, click endpoint upper parallel line. A window opens

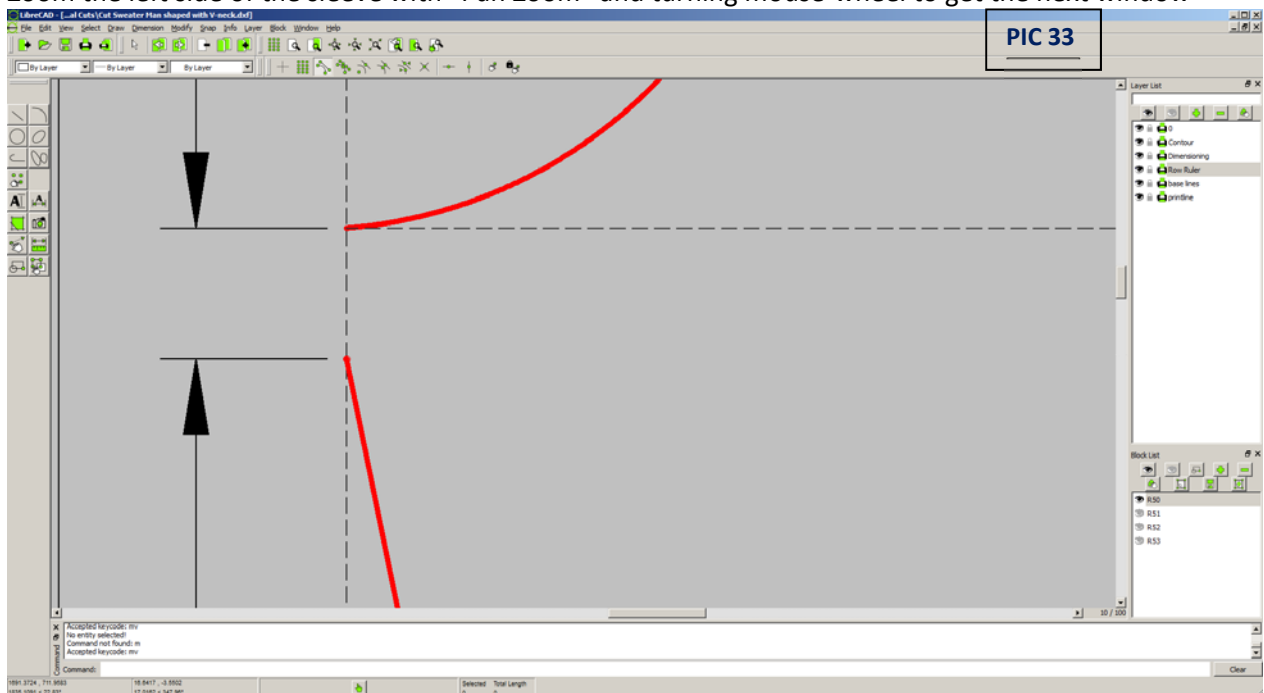
- “Delete original”      You make a copy and the original is deleted. **You move the original**
- “Keep original”      You make a copy and the original is still kept
- “Multiply copies”      You make multiply copies

We delete the original. The upper part of the sleeve moves 20mm to top. To get continuous lines and go on with next commands we press “Esc”, “Esc” on the keyboard.

## PAN ZOOM

Now press the mouse wheel and keep it pressed. So see a hand. Move the mouse, you move the drawing by keeping the scale. This is “Pan Zoom”. Roll the mouse wheel

Zoom the left side of the sleeve with “Pan Zoom” and turning mouse-wheel to get the next window





This is the area of the rounding and the left side. You see that the two lines are connected any more. You will connect it again now.

Select the left line (not the rounding) with mouse-click. Its broken now. So you see its selected.

Click in the center of the red circle at the top of the line, keep pressed and move the end of the line to the end of the rounding. Leave it there by leaving the mouse-click. And now fix it with a mouse-click to the circle in the intersection of line and rounding. Then "Esc", "Esc". Left side is ok. "Auto Zoom"

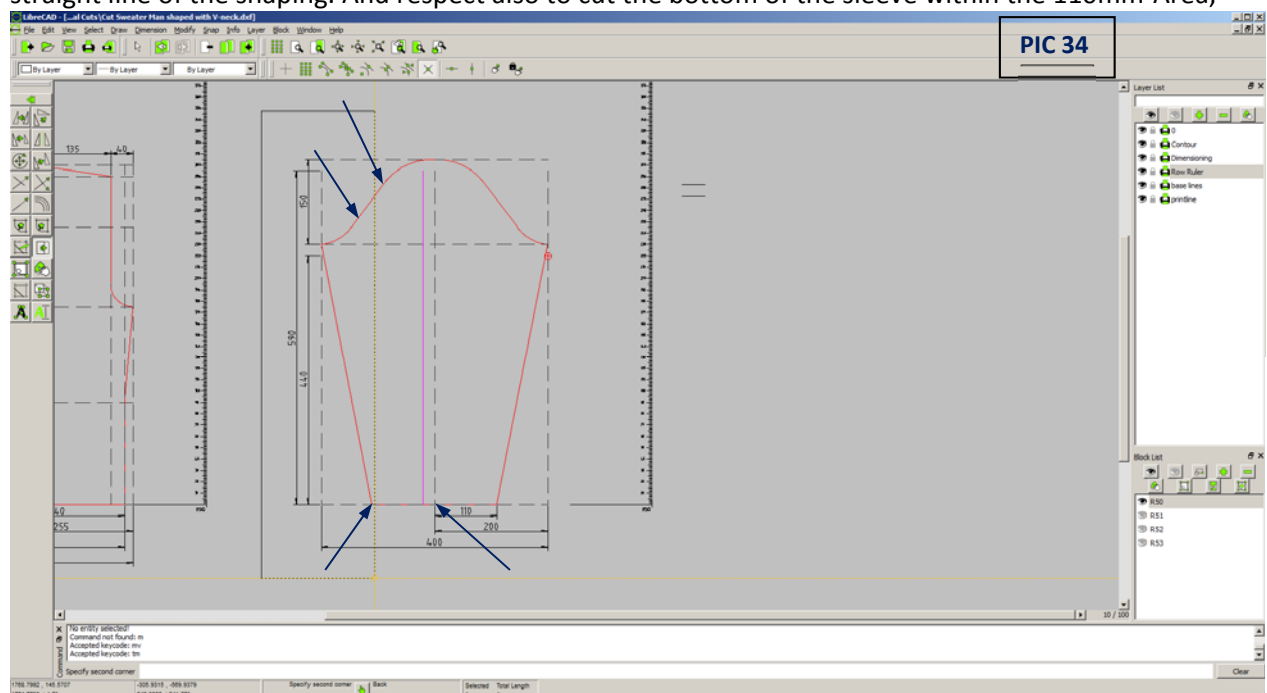
**Do the same on the right side.** You have lengthened the sleeve 20mm. Congratulation!!!

The dimensions on the left side are not ok, we will correct it later.

No you will broaden the sleeve 20mm (10mm each side)

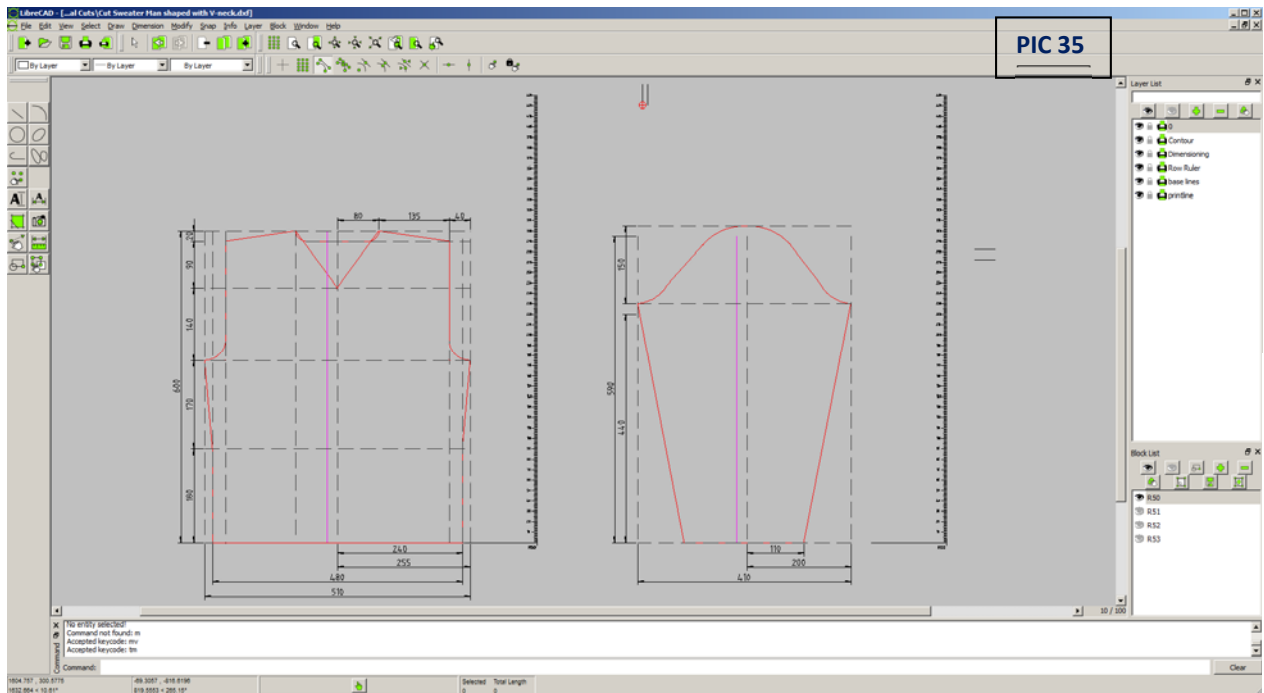
Draw two parallel lines with distance 10mm (you know how to! "Vertical line", "parallel line", "Distance 10mm").

Then "Modify", "Stretch", activate "Free snap", "first corner" top left, "second corner " as shown. Cut the straight line of the shaping. And respect also to cut the bottom of the sleeve within the 110mm-Area,

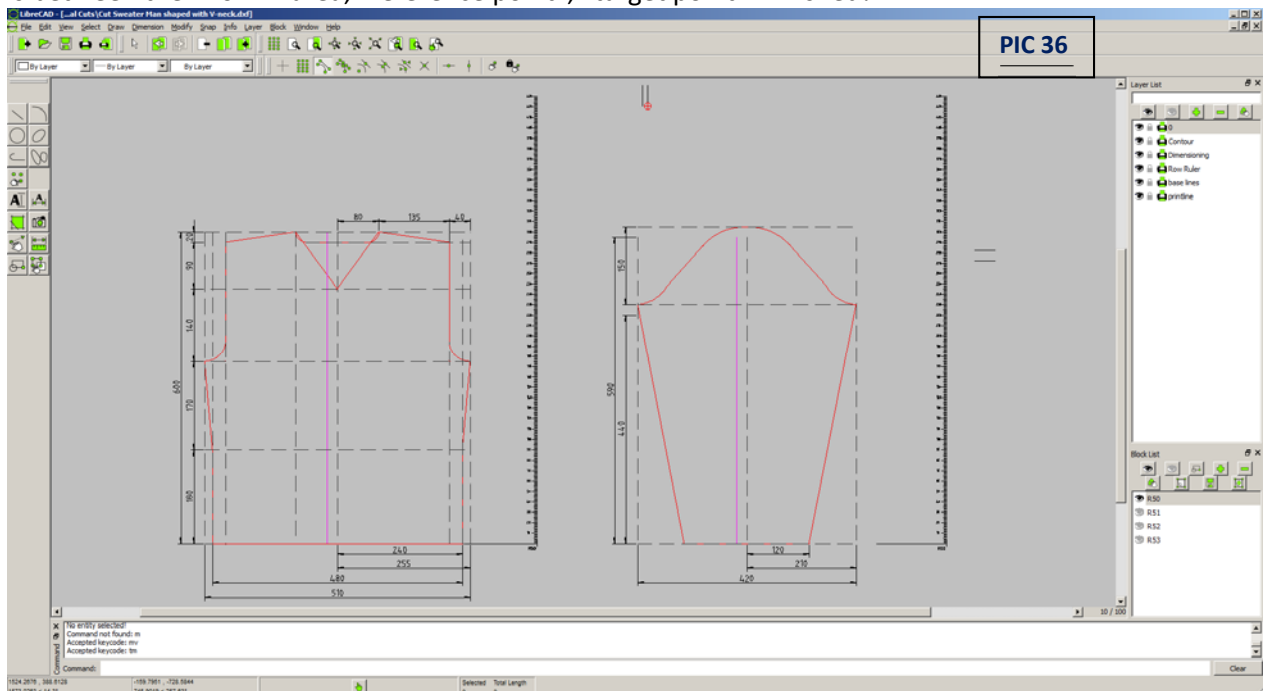


"Specify reference point", endpoint of right parallel line, "Specify target point"

Look at the dimension on bottom. It is 410mm (before 400mm)



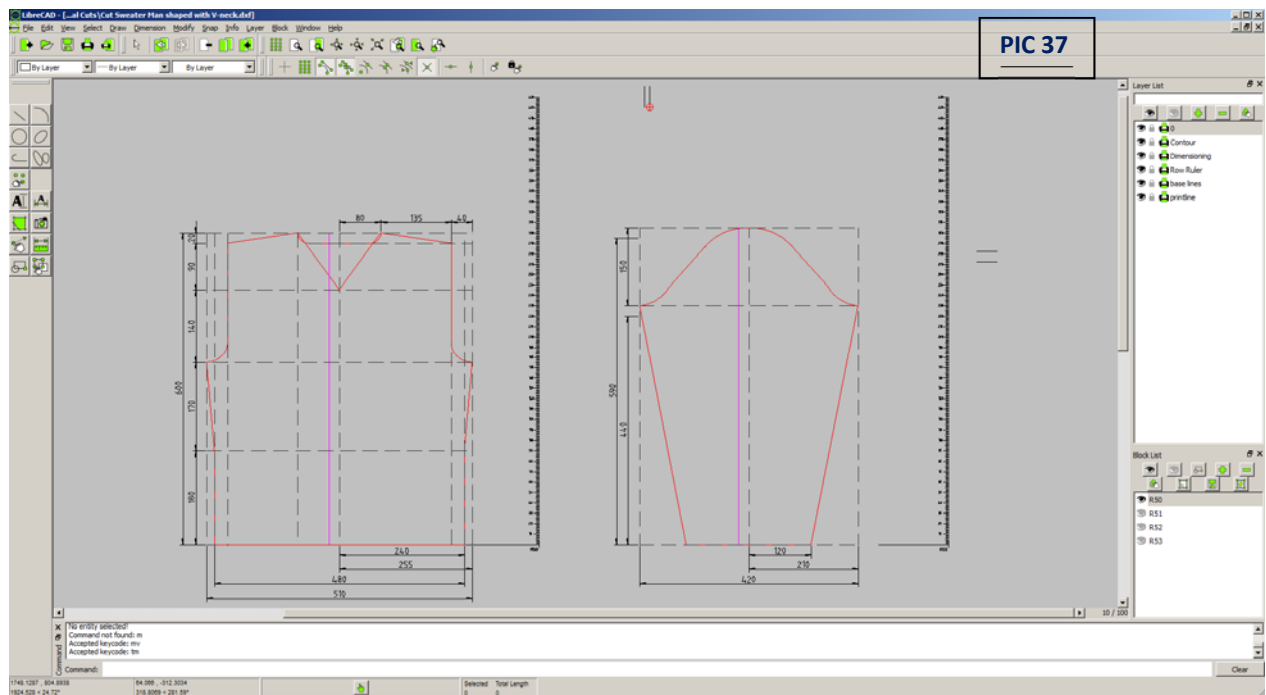
Do the same on the right side. "Modify", "Stretch", select window meets the straight line of the curve and is between the 110mm-area, "reference point", "target point". Finished!



Now you lengthen the vertical-basis-lines and the print-line.

### TRIM

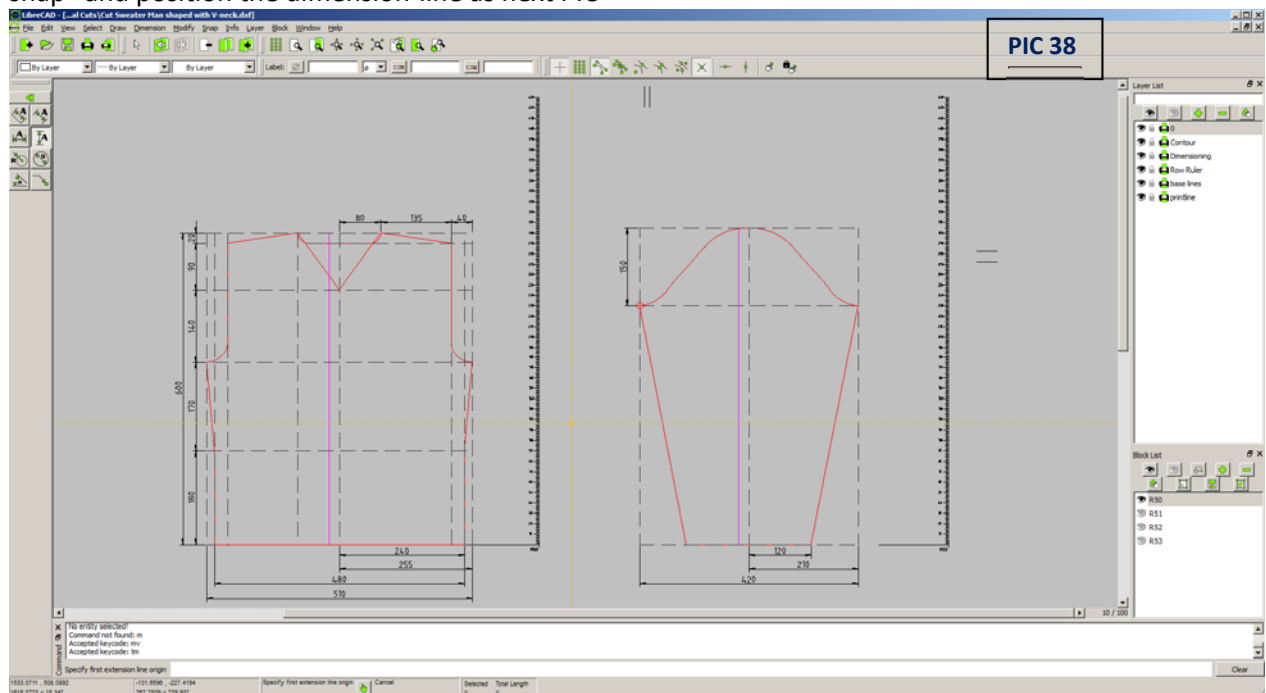
"Modify", "Trim" (NOT: Trim Two), "select limiting entity", click on upper horizontal basis-line, "select entity to trim", click all vertical-basis-lines and the print-line. They expand to the upper basis-line. And watch always the green hand on the bottom of the screen and the instructions to see what you have to do.



At last we have to correct some dimensions. First we delete them. Select all vertical dimensions of the sleeve with mouse-click and press DEL-key.

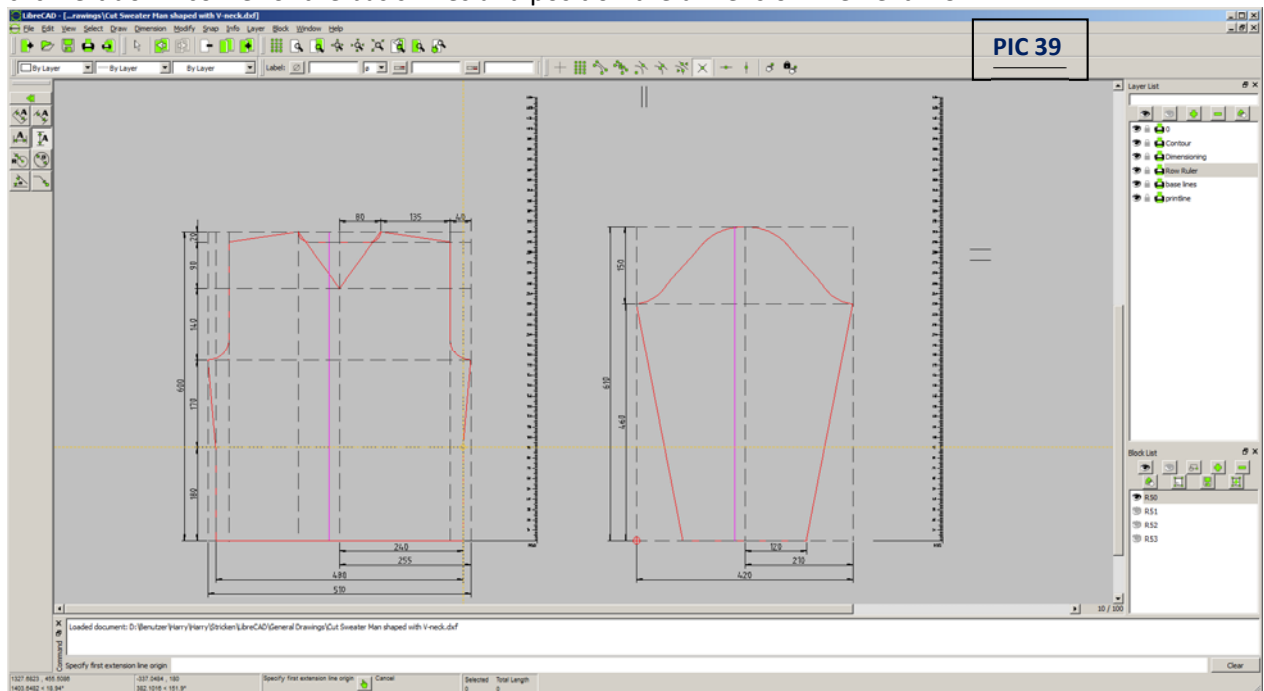
## DIMENSIONING

Deactivate “Free Snap”, “Dimension”, “Vertical”, active snap “endpoint” or “intersection”, click left upper corner of the basis-lines, click intersection of middle horizontal basis-line and left basis-line, activate “free snap” and position the dimension-line as next PIC

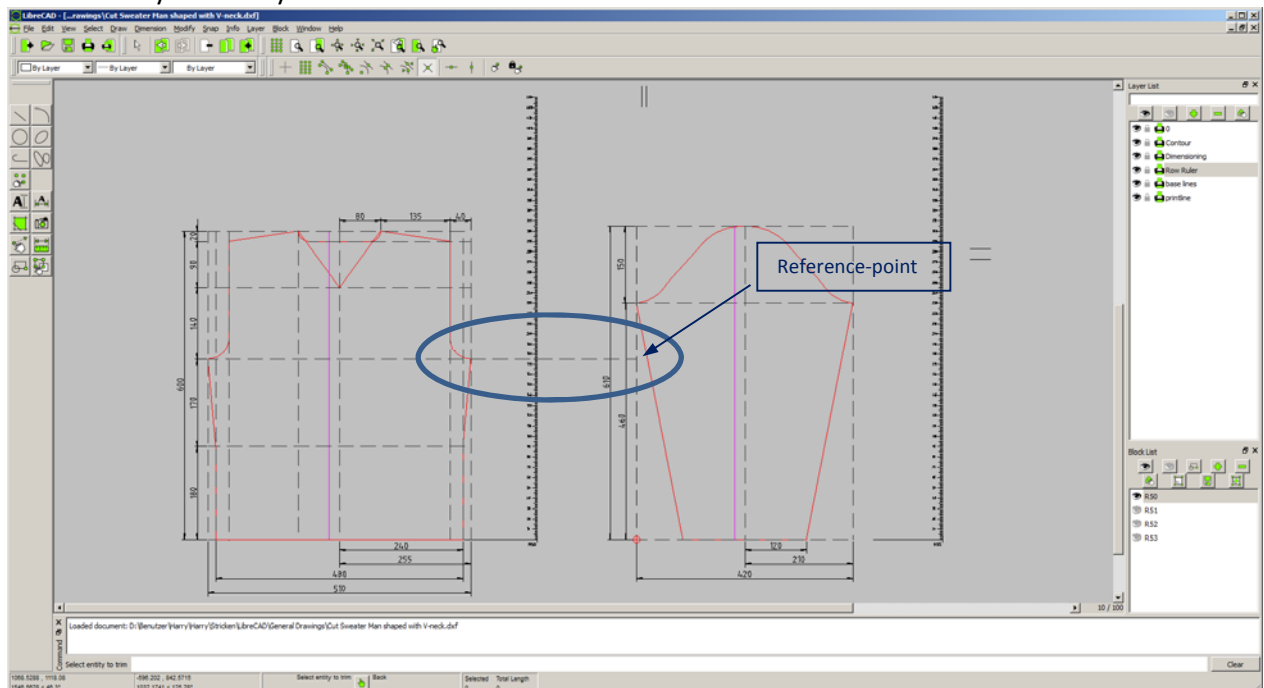


You are still in the vertical-dimension-menu. Look at the green hand or the command line. Click the last intersection-point again, click the bottom end of the vertical basis-line. Activate “Free snap” and position the dimension in line to the upper dimension.

Now we dimension the complete height. Deactivate “Free snap”, click left upper corner of the basis-lines, click left down corner of the basis-lines and position the dimension like next PIC

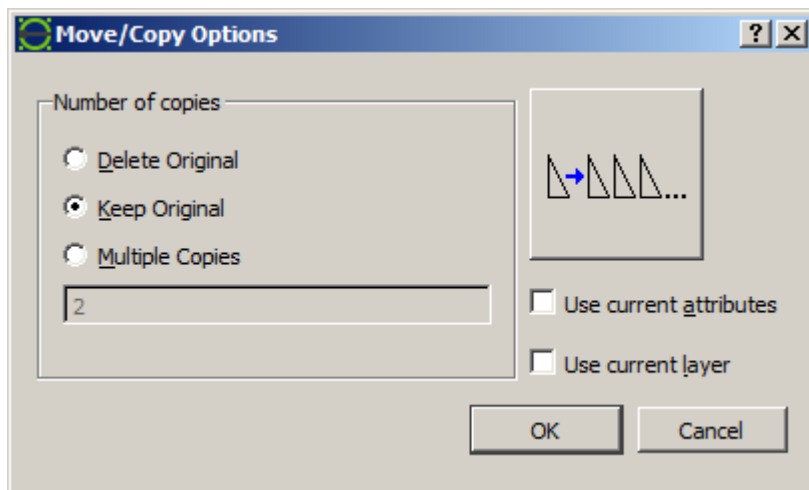
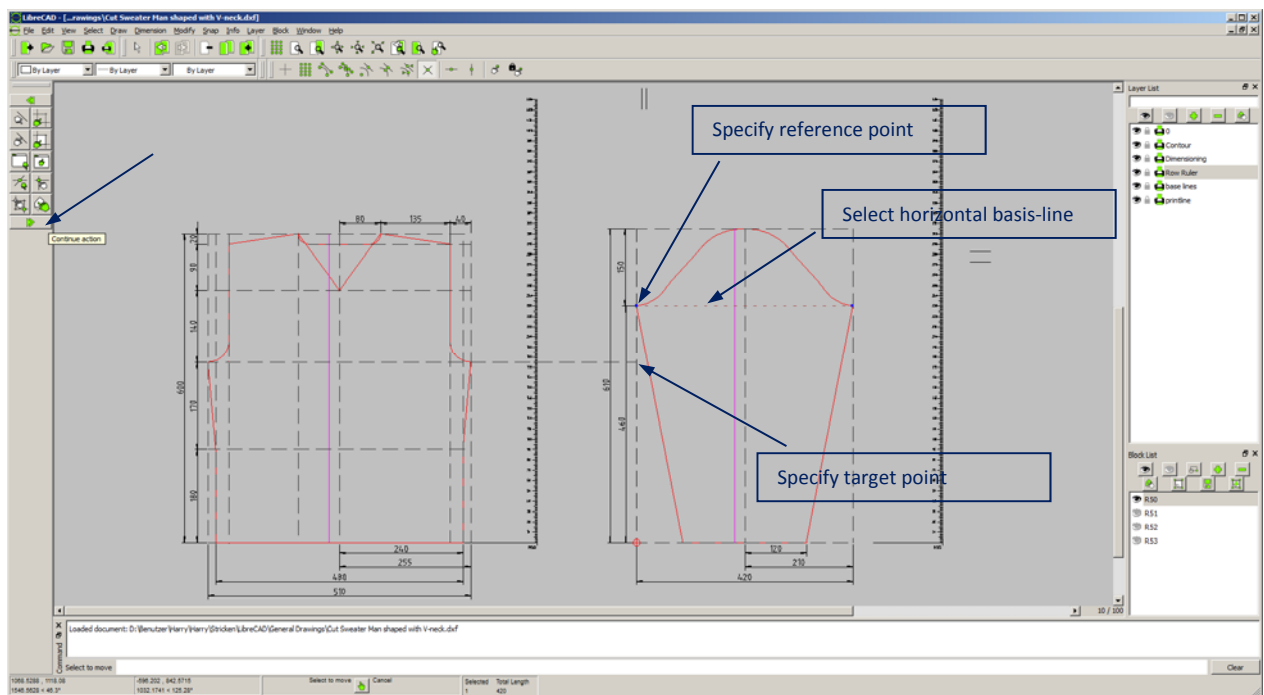


Now you print the sleeve in scale. As you again need two prints for the complete sleeve, we will add a reference line. We use a line of the body as reference line. The same line that was used as cut-line for the print of the body. “Modify”, “Trim”, for “Select limiting entity” you select the left vertical base-line. For “Select entity to trim” you select reference line. See the result next PIC:

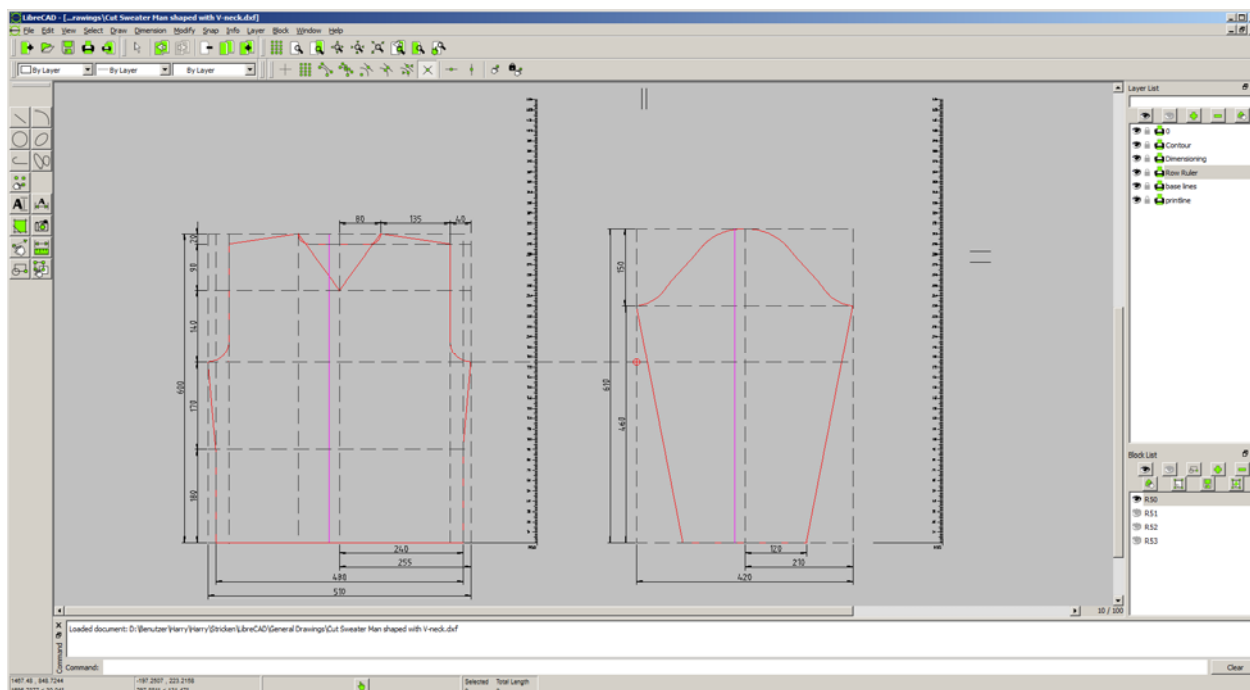


Now we copy the horizontal basis-line of the sleeve to the reference-point.

“Modify”, “Move / Copy”, select the horizontal basis-line, then “Continue action” (we have finished selection). “Specify reference point” (with deactivated “Free Snap”!!), “Specify target point”

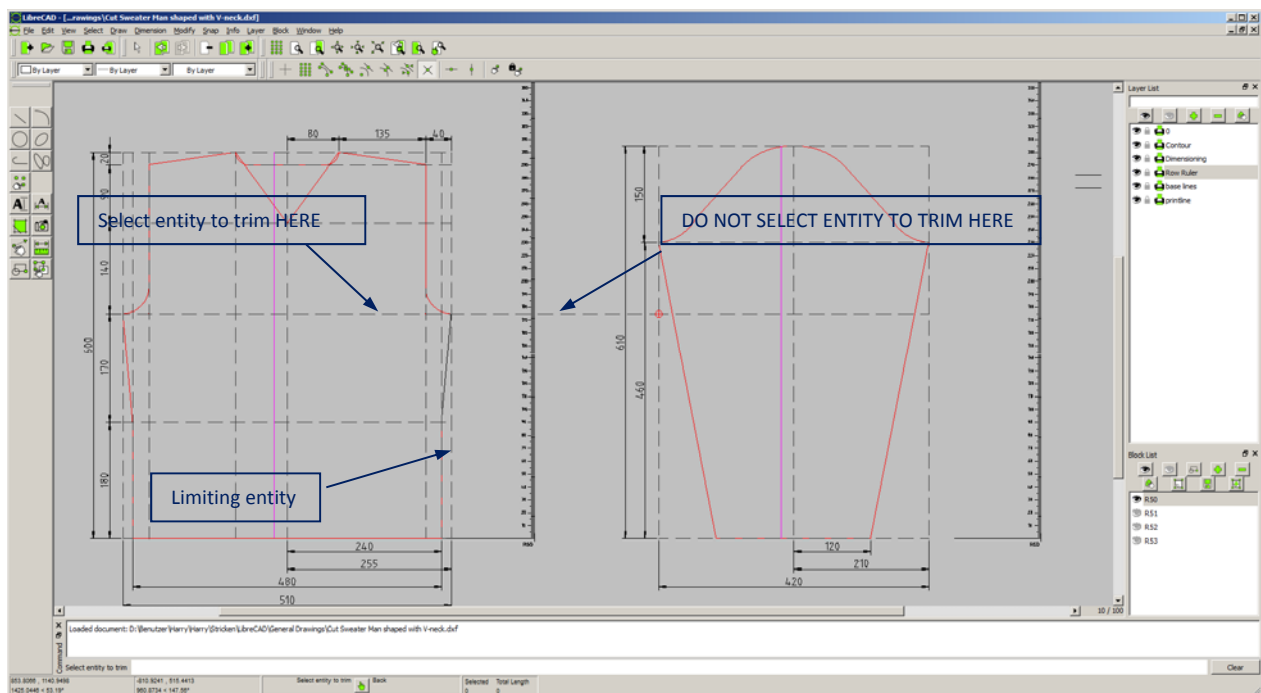


“Keep Original”, “OK”, “ESC”, “ESC”. Result:



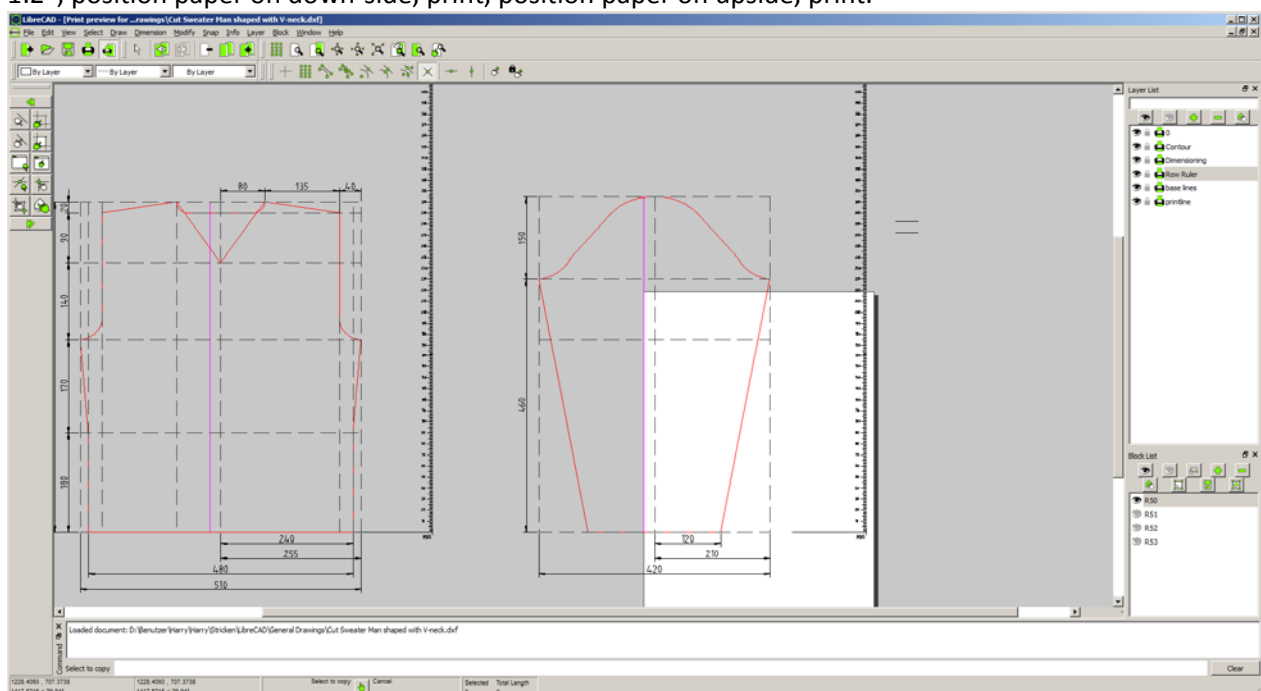
You trim the reference line to its origin size. See next PIC. “Modify”, “Trim”, “Select limiting entity” “Select entity to trim”. Then “ESC”, “ESC” to close the command and get back to main menu.

REMEMBER: If you trim (shorten) a line, the part on which you click will be kept, the other part will be deleted. Therefore see next PIC. DO NOT CLICK ON THE RIGHT SIDE for select. Or the left side will be deleted. But we want to keep the left side. If you like try reverse and then “UNDO”



Now we print. The same procedure as PIC25 and PIC 26. Just select the sleeve.

“Print Preview”, Choice “Portrait” from “Current Drawing Preferences” (you know how to do that!). “Scale 1:2”, position paper on down-side, print, position paper on upside, print.



FINISHED. CONGRATULATION

**YOU HAVE LEARNED NOW 75% of the needed commands**

Do not become desperate and do not give up. For the beginning it seems much, but you will learn very fast. It is only a few commands, I did not count, but I think perhaps 20.

I do all these steps in at most 3 minutes. You will be able to do the same after some exercise. And you will have a mighty tool for more activities. You will learn to use CAD more and more.

You will love your CAD!!!

**Remember: One drawing can be used for all kinds of wool, for all mesh-sizes that your machines allow. Just activate the needed Row Ruler and print out. This needs 1 minute.**

I will add the missed Row Rulers step by step (R10 – R120)

**NOW HAVE FUN!**

**To learn the use of a knitting machine is much more complicate!!!!**

**Finish of Lesson 1**