

EMP
27

Empisal COMPUTAMATIC



INSTRUCTION BOOK MODEL: KH91

BASIC TUITION SYLLABUS

Your attention is invited to the introduction on page 3 and to the sections on the care of your knitter on pages 10 – 11.

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Owner's name: Mrs Campion

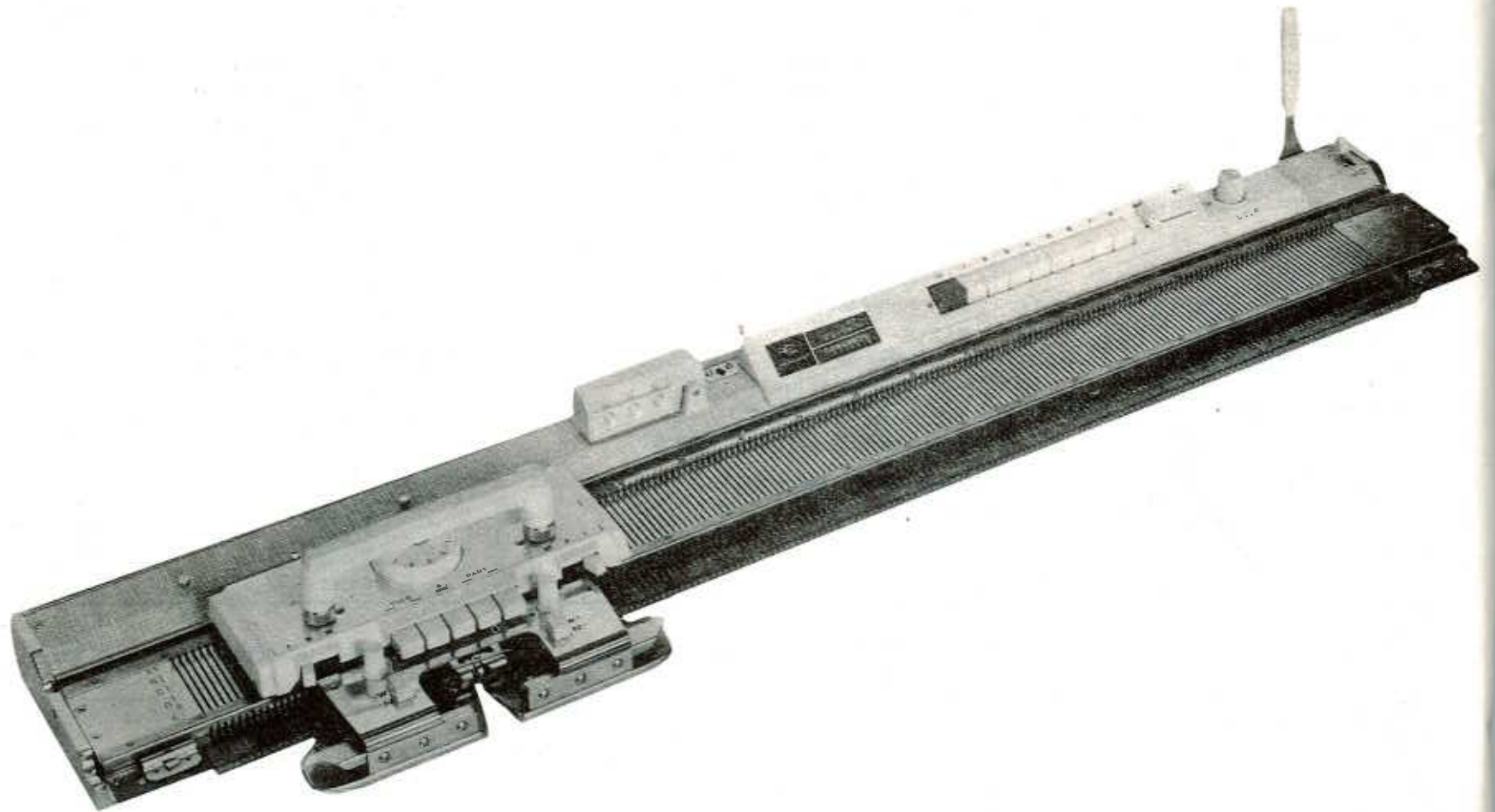
Name of Dealer: Waltons Store

Address: 13 Greenwood Ave
Bankstown 2200

Address: Campion Way
Bankstown 2200

Machine No: K.R. 90

Date: 12-2-72





LET'S BECOME FRIENDS

There is nothing more exciting than receiving a parcel—however, it becomes more exciting when that parcel contains an EMPISAL KNITTER.

You have no doubt already opened your parcel, taken out the knitter and had a look at the various accessories; in a moment we will sort them out and quickly discover their uses.

CONSULTANTS AND EXPERTS AT YOUR SERVICE

The lessons have been designed by a team of Empisal Knitting advisors, drawing on their years of experience in conducting the Empisal Knitting Correspondence School, and advising people who have never previously operated a knitter.

WE ARE ALWAYS INTERESTED IN YOU

By following the simple, progressive steps they have devised for you, you will find it easy and exciting to teach yourself at home to operate the Empisal Knitter. Many of our prize-winners and finest knitters have done so. We shall be delighted to learn of your success with your Empisal Knitter—please write to us—your letters will be most welcome.

LEARN TO WALK FIRST

As the first step, learn the names of all the parts given in the opening chapter, and then

continue step by step, lesson by lesson along this Course of Home Instruction. In this way you will gain speed and confidence so that you will soon master this most willing of servants.

BE THE ENVY OF YOUR FRIENDS

There is nothing more delightful than success and achievement. If you will patiently follow these instructions, in a few short evenings you will make new garments, accomplish that sense of achievement and assuredly become the envy of your friends.

RELAX AND HAVE FUN

Always remain relaxed—you will work quicker and better relaxed, and your Knitter will respond most efficiently to gentle handling.

MORE HASTE — LESS SPEED!

If you have a restless nature, remember that you learned to walk before you could run, so don't be tempted to jump chapters. Work through the manual systematically—it has been designed to be progressive.

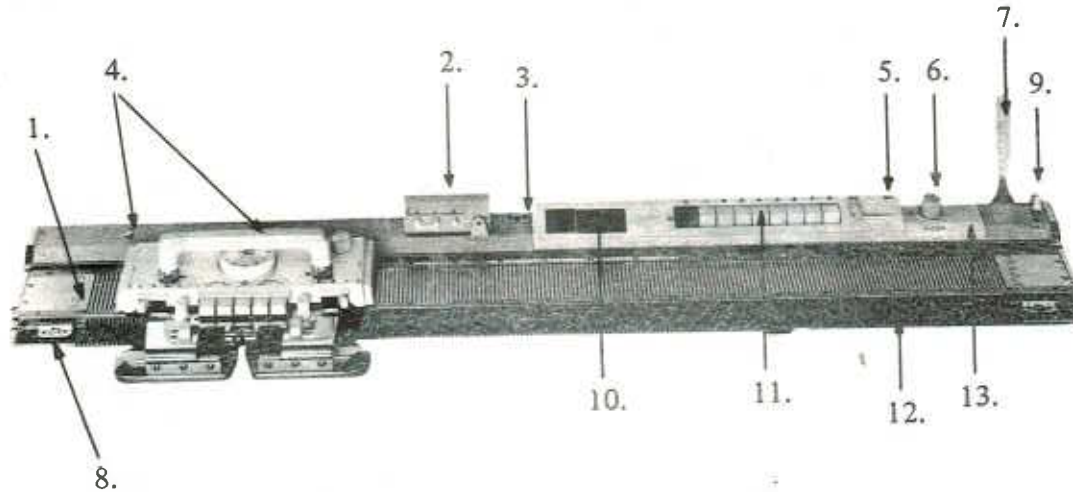
A WORD TO THE EXPERIENCED

Finally, if you already have some experience with a knitting machine, we advise a quick revision of this manual, to acquaint yourself with the many improvements incorporated into this exciting, new Empisal Knitter.

Now, lets get acquainted with our EMPISAL.



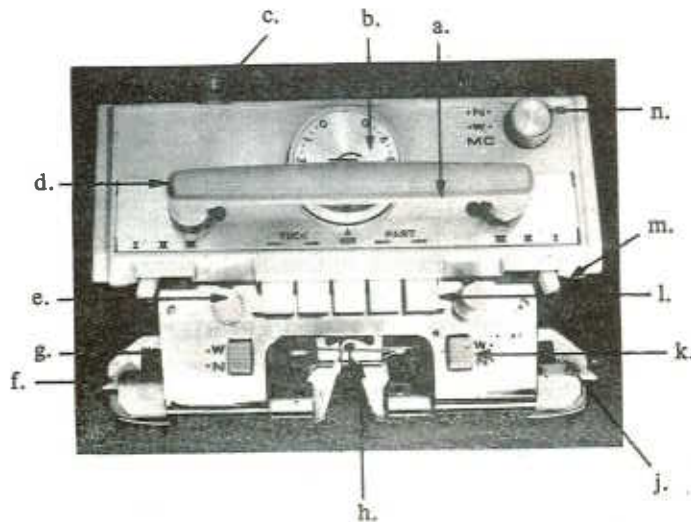
THE KNITTER BED



1. Needle Bed Upper Plate
2. Row Counter
3. Setting Hole for Yarn Tension Unit
4. Accessory Tray Studs
5. Reverse Switch
6. Slide Dial
7. Set Lever
8. Setting Hole for Ribbing Attachment
9. Needle Position Selector (N.P.S.)
10. Slide Indicator
11. Needle Selector Buttons (N.S.B.)
12. Gate Pegs
13. Slide Rail for Carriage

See Cleaning and Oiling instructions on page 10.

THE CARRIAGE



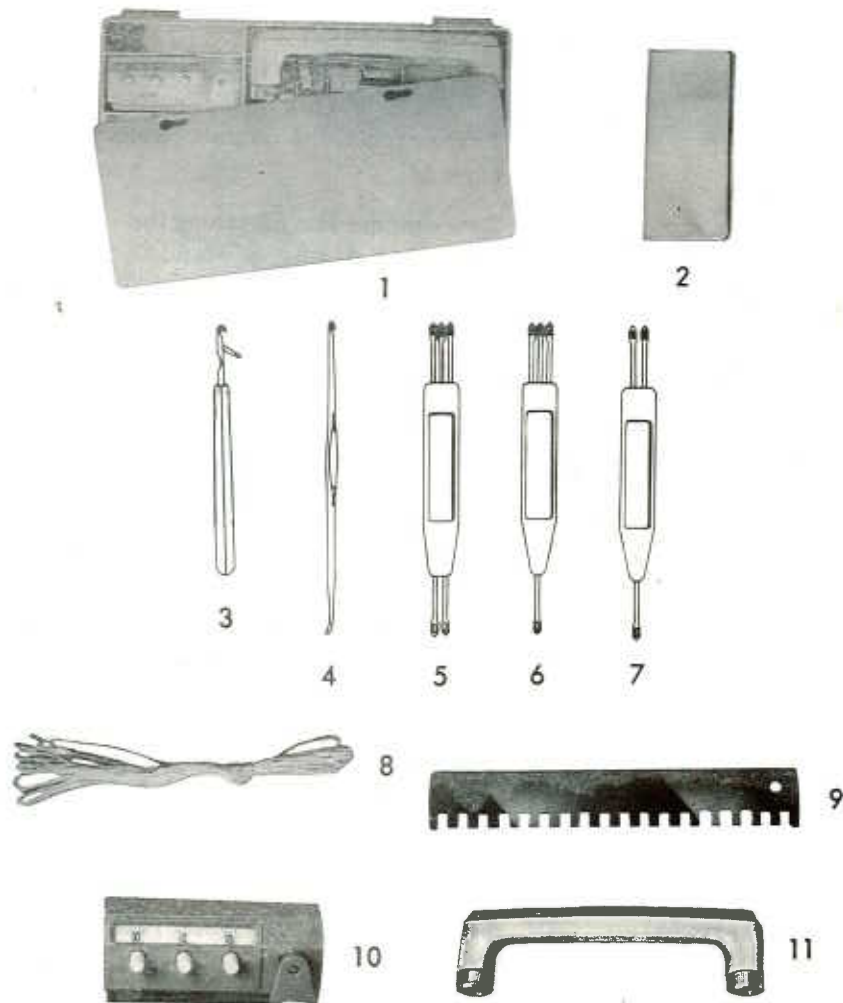
- a. Carriage handle
- b. Tension Dial
- c. Row Counter Tripper
- d. Carriage Cover
- e. Plastic Thumb Screw
- f. Sinkers
- g. Latch Brush
- h. Yarn Feeder
- i. Weaving-in Pattern Brush
- j. Knob for Weaving-in Pattern Brush
- k. Pattern Selector Buttons
- l. Holding Cam Lever
- m. Holding Cam Lever
- n. Stitch Selector Knob (S.S.K.)

THE ACCESSORIES

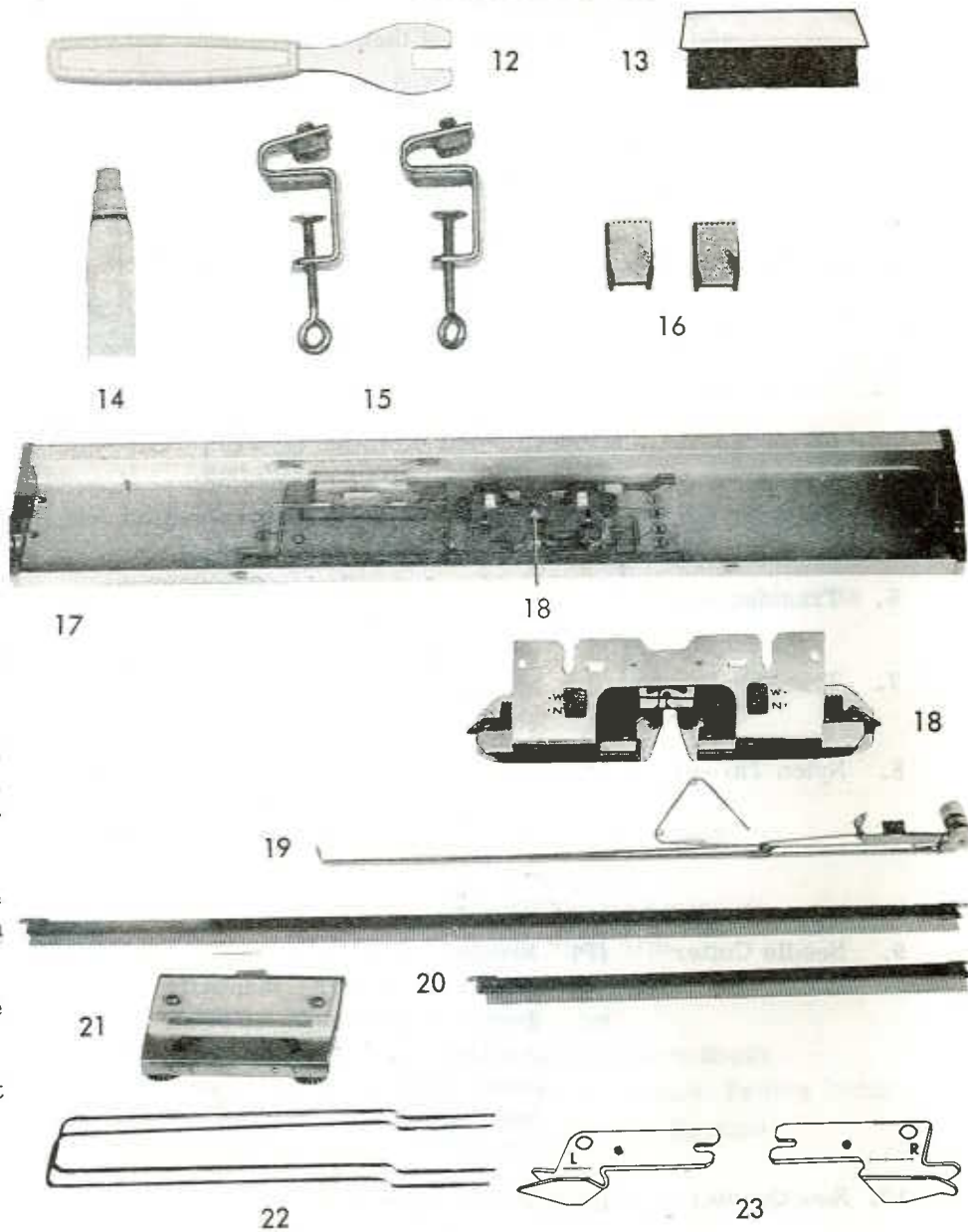
and a brief description of their use

1. Accessory Box A box fitted and spaced to hold the accessories when the knitter is packed away. Items marked 'B' below fit into this box.
2. Accessory Pouch (B) A fitted pouch to hold small accessories. Items marked 'P' fit into this pouch.
3. Latchet Hook (P) Used to pick up dropped stitches and casting off.
4. Work Hook (P) To catch dropped stitches.
5. Transfer Handle (P) These combinations give you 3 x 2 two 3-needle, two 2-needle and two 1-needle handles.
6. Transfer Handle (P) These are used for transferring stitches, cross over 3 x 1 stitches when cabling, and
7. Transfer Handle (P) 2 x 1 shaping.
8. Nylon Thread (P) Used to hold together 2 pieces of knitted fabric to enable a continuation of knitting without removing the first panel from the knitter.
9. Needle Cutter (P) Needle cutters are used to raise or lower manually groups of needles to different positions. Only one is supplied, others in various combinations are available as spares.
10. Row Counter (B) Used to count the rows.

11. Carriage Handles (B) Detachable for convenience of packing. One is for the Main Carriage; the other for the Lace Carriage.



12. Needle Selector Lever (B) This is attached to the needle selector lug on the outer case of the Knitter and is used to set selected needles.
13. Brush (B) For cleaning fluff from the Knitter.
14. Oil Bottle (B) Should be kept filled with EMPISAL Oil for best results. For instructions on use, see page 16.
15. Clamps (B) Two clamps for attaching the Knitter to a table or stand.
16. Claw Weights (B) May be hung on sides of fabric or cast-on comb for extra gravity.
17. Case Cover The cover to protect the Knitter when packed. Articles packed therein are marked 'C'
18. Roller Plate Assembly (C) Part of the carriage to hold the work against the Knitter. Also contains the yarn feeder and lay-in mechanism.
19. Branch Tension Arm (C) Used to guide and maintain an even tension on the yarn being fed to the knitter.
20. Combs (C) Combs are used to hold the yarns when casting on.
21. L-Carriage (C) For lace and crochet-craft patterning.
22. Auxiliary Rail (C) To rest the L-Carriage.
23. Weave-in Guide (C) To simplify your weaving.

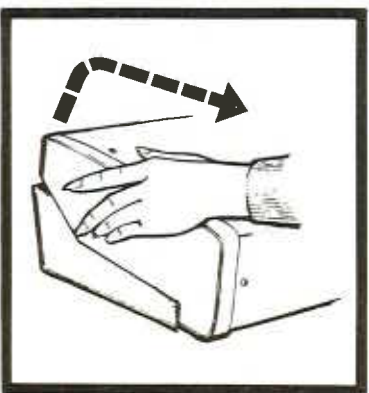
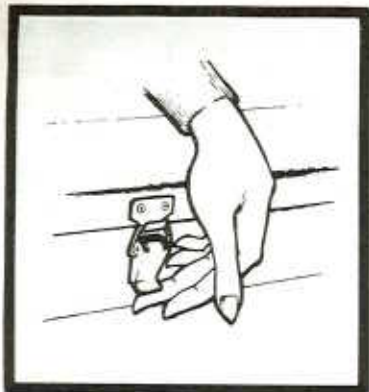


SETTING UP YOUR KNITTER

Place your knitter on the edge of a firm table, with the handle of the carrying case away from you.

Release the catches on both sides of the handle

Lift the upper case about 1" and pull towards you. This will release the upper case which should be placed on the table beyond the knitter, inside up.



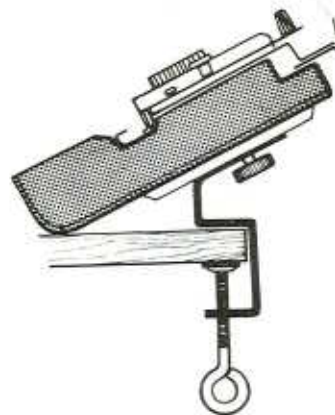
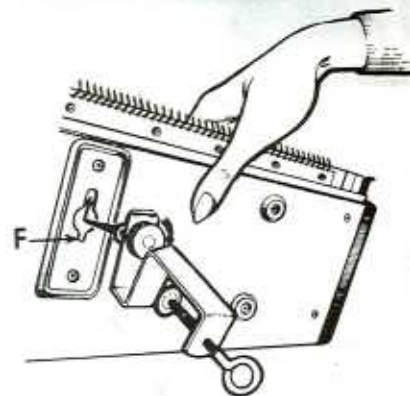
Remove the accessory box.

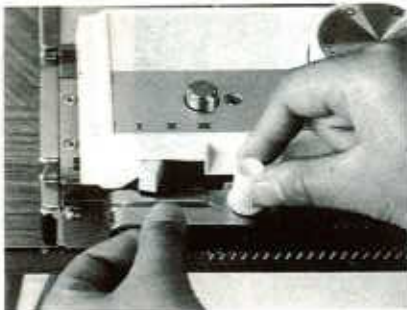
The carriage is on the left and the accessory box on the right. Lift the front of the accessory box and slide off towards the right.

Fasten the knitter to the table.

Raise the front of the knitter and insert the table clamp and screw B into the keyhole aperture, press upwards and fasten knob A. It is essential that boss E fits snugly into aperture F.

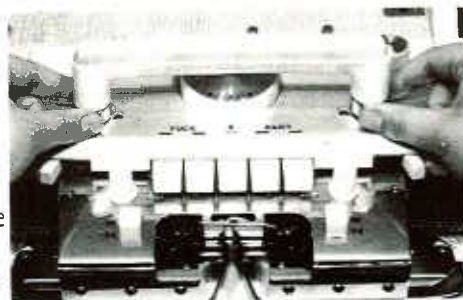
Fasten the knitter to the table by tightening the table clamp screws.



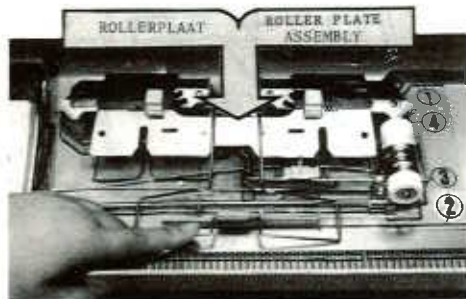


ASSEMBLE THE CARRIAGE

Loosen the plastic thumb screw of the carriage and remove the carriage lock. This will free the carriage, which can then be made to slide along or off the needle bed. (Keep the carriage lock in the accessory box).

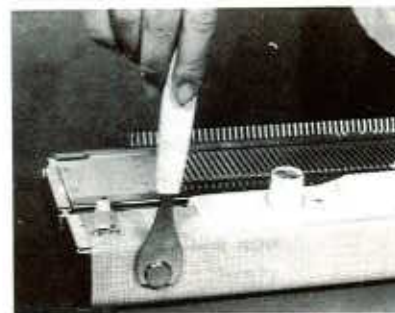


Fasten the handle on to the two threaded studs on the carriage. Both sides should be screwed down at the same time to avoid stripping the thread.



Release the spring in the upper case (above the parts marked 1, 2, 3, 4) and remove the roller plate assembly.

② Loosen the plastic thumb screws of the carriage, and place the roller plate assembly in position over the holding lugs then fasten the thumb screws securely.

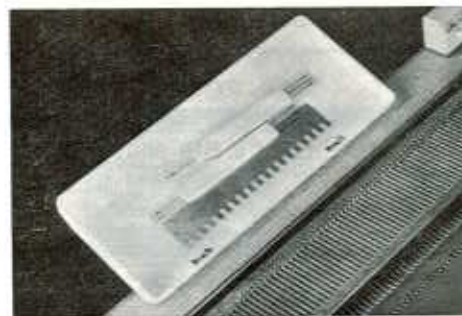


Set up the set lever.

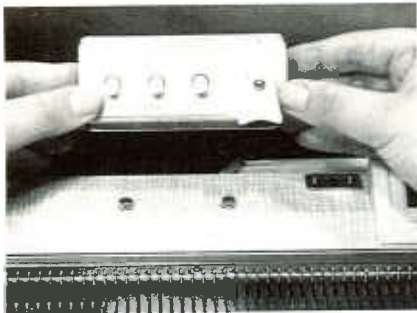
Fit the set lever onto the setting key shaft at the rear of the needle bed as illustrated.

Set up the accessory tray.

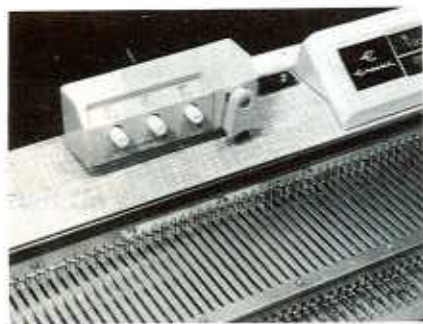
Set up the accessory tray by placing the keyholes over the studs on the needle bed casing and push sideways to lock into position.



THE ROW COUNTER



Lock the row counter onto the studs at the back of the needle bed. (Place the apertures over the studs then slide the row counter away from you.)

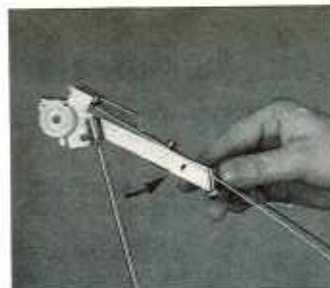


There are three setting knobs on the front of the row counter which turn in either direction, except when the numeral is 9 or 0.



The row counter is operated by the tripper at the back of the carriage.

To bring it into operation move the tripper into the horizontal position.

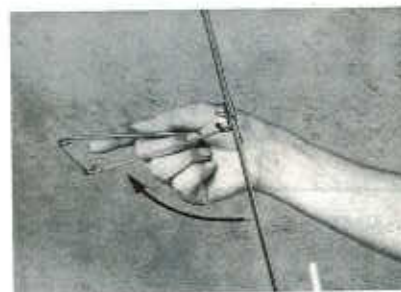


Set up the yarn tension unit.

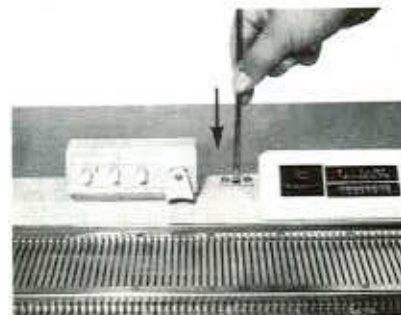
- a. Remove the automatic tension unit from the upper carrying case.
- b. Raise the front yarn guide arm as indicated by the arrow.



- c. Raise the take-up springs as far as they will go.



- d. Raise the rear yarn guide as far as it will go.



- e. Fit the base of the rod into the hole at the centre



... for your greater
knitting pleasure

EMPISAL KNITTING TABLE AND PATTERN STAND

Designed to the correct height for your working comfort. Durable Laminex top and chromelegs which fold away for compact storage. Enquire at your Empisal dealer or any Empisal sewing and knitting centre.

In all communications with EMPISAL or your Dealer
OR when ordering additional accessories or spares for
your EMPISAL Knitter, always quote:

e.g.
Model
Number

KH 91

and factory
number.

(The factory number will be found on the right of the
needle bed.)

The policy of Empisal International is one of continuous progress and improvement. All specifications are therefore subject to change without notice.

CLEANING AND OILING

Before and during use.

For best results your knitter must be kept clean and the carriage regularly oiled.

The Carriage.

1. Remove the roller assembly (to avoid getting oil onto the brushes and wheels from where it would be transferred to the knitting).
2. Remove the carriage from the needlebed.
3. With a lightly oiled lint free cloth wipe away all fluff that has gathered underneath the carriage.
4. Leave a film of oil over all the moving parts as well as all rails.

The Needlebed.

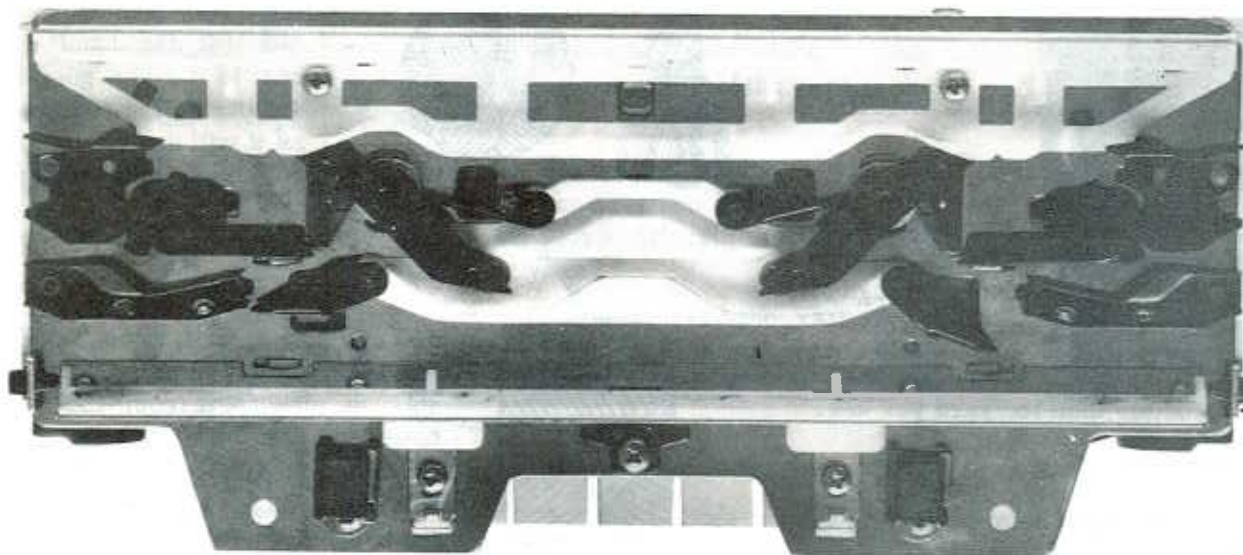
1. With a soft brush clean out the needlebed grooves.
2. With a lightly oiled lint free cloth wipe away all fluff that has gathered along slide rails.

After use.

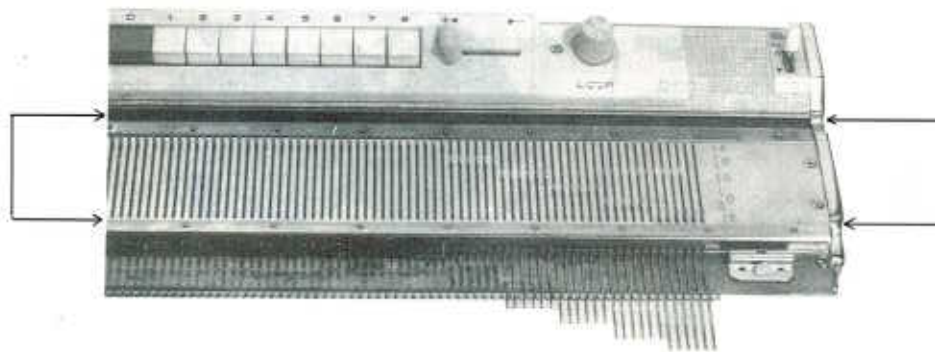
3. Keep your knitter covered in a dry place when not in use.

Avoid:

4. Avoid getting oil onto the needle hooks and latches as this will transmit itself to the knitting.



Lightly oil the parts pictured between these arrows.



Keep these slide rails clean



... YARNS AND YOUR KNITTING MACHINE

Your knitting machine has been designed to give you perfect results using the widest possible range of yarns from cottons and two ply knitting yarns right through to double crepes, and when weaving even thicker yarns.

Always use the best quality yarns, and remember - your garment can never be better than the yarn you use.

Preparation of yarn.

Correct preparation of your yarn before starting to knit is most important to make your knitting faster, and the quality of your work so much better.

Joining yarns (Knots).

When joining yarns make sure the joins come in the selvedges and not in the centre of a row where knots can be unsightly with the added risk of them unravelling and spoiling an otherwise perfect garment.

Stitch sizes.

In hand knitting your fingers are adjusting the "tension" of the yarn to keep the knitting even and the thickness of the needles control the stitch size. Your knitting machine can be set to do both automatically. The tension is set by the spring disc on the tension arm assembly, and the stitch size by the gauge on the carriage.

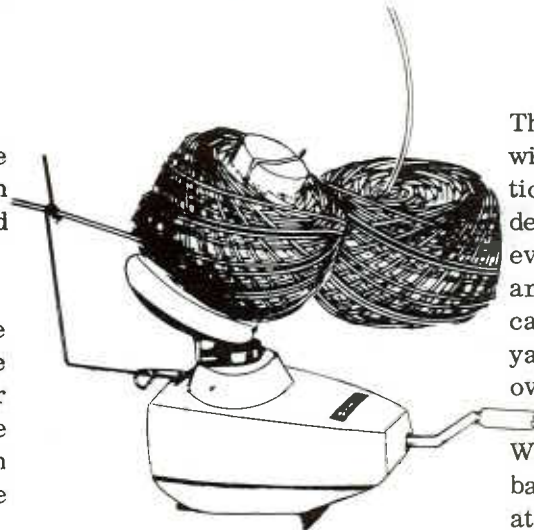


PREPARATION OF YARNS

It is quite impossible to knit from a hank such as this, and although the hand wound ball next to it looks good it is quite unsuitable for machine knitting as it will just dance around and get entangled everywhere.



You can knit directly from a ball such as you get from the shops, ONLY if you are able to unwind it from the centre. If however, the ball is crushed through handling, then you must be careful to pull out enough yarn from the centre of the ball before knitting each row.



The EMPISAL Wisk Wool-winder (obtainable as an additional accessory from your dealer), is a great time saver even a yarn saver - when you are practising your knitting it can be used to rewind your yarns so that you can use them over and over again.

When you use a Wisk-wound ball always work from the end at the centre of the ball.

THREADING THE YARN TENSION UNIT

The yarn tension unit is devised to guide and ensure an even feed of the yarn to the carriage.

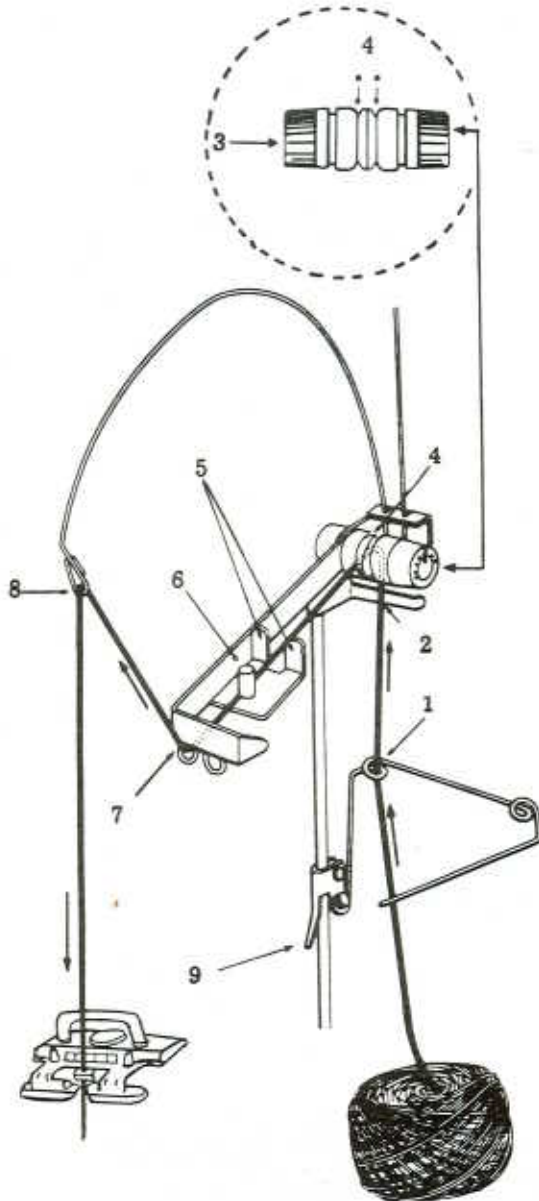
There are two sets of tension guides, for multicolour and pattern knitting and each can be fed with a different colour or even quality of yarn.

To thread the unit, lead the yarn from the ball first through the rear yarn guide, then through the yarn tension unit as illustrated.

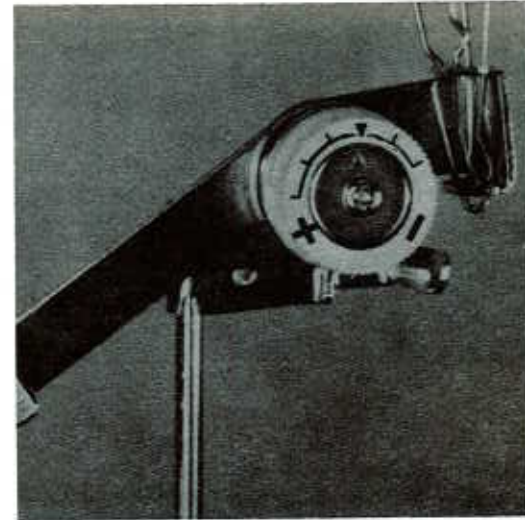
Be sure that the yarn is on the correct side of the central discs.

Lead the yarn to the carriage.

(As the take-up spring will draw the yarn upwards, pull sufficient yarn through so that it hangs about 8 inches below the carriage when the take-up spring is in the upright position).



1. Rear yarn guide
2. Upper yarn guide
3. Adjusting knob
4. Yarn discs
5. Yarn gates
6. Dividing stud
7. Front yarn guide
8. Eyelet of take-up spring
9. Yarn clip

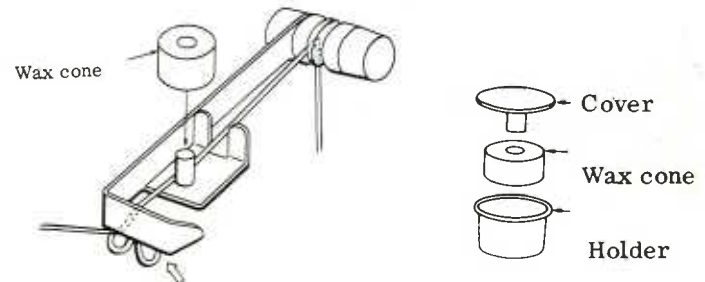


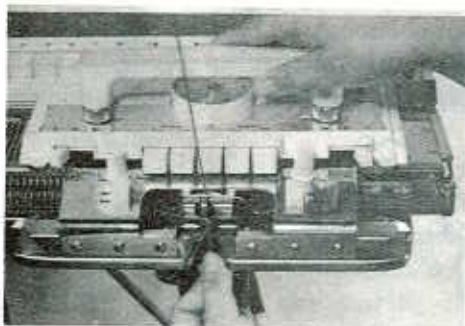
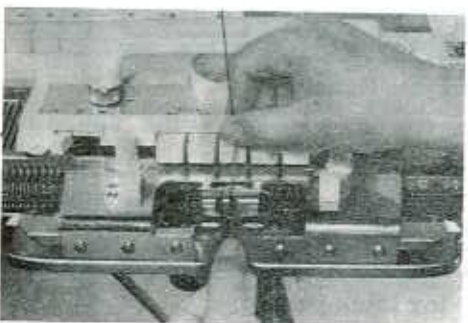
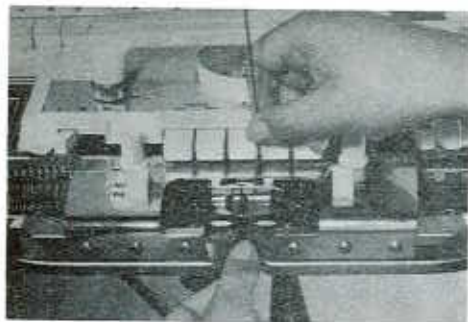
Adjusting yarn tension.

The yarn tension is set by the adjusting knob marked + and - .

- + denotes a tighter tension suitable for thin yarns
- denotes a looser tension suitable for thick yarns

The tension is correct if the take-up spring remains curved when threading the carriage. If it tends to return to the upright position, the tension is loose; if the eyelet (8) approaches the front yarn guide (7), the tension is too tight.

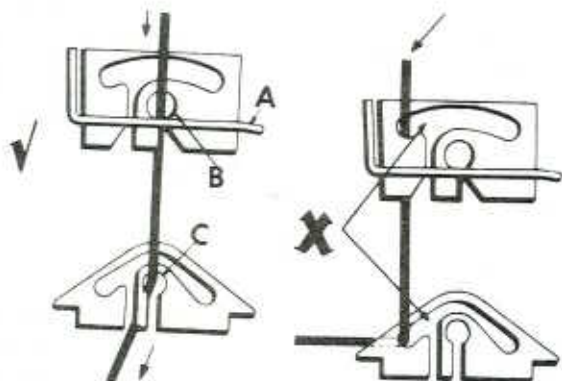




THREADING THE CARRIAGE YARN FEEDER

The carriage may be at either side of the needle bed clear of the needles to be knitted.

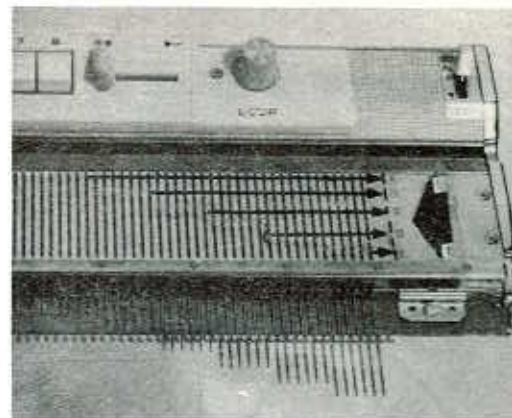
- a. Thread the yarn under the top spring A, into slit B of the yarn feeder; hold it taut with both hands and press it back into the slit until you hear the click of the yarn retaining spring. The yarn should then be in apertures B and C.



Right

Wrong

- b. Pull enough yarn down from the automatic take-up spring to extend about 8 inches below the carriage.



SELECTION OF NEEDLES

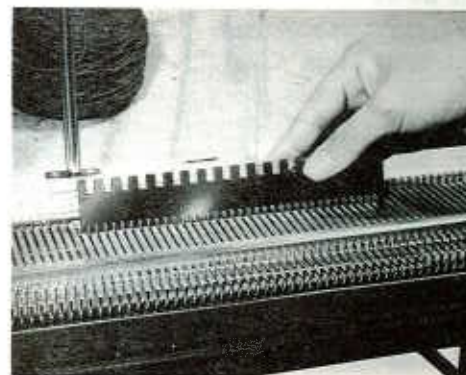
The position of the needle butts is indicated by the marks A to E at the sides of the needlebed.

A Position.

When the needles are out of action the needle butts correspond with the Mark A. (The needles are then said to be in Position A).

B Position.

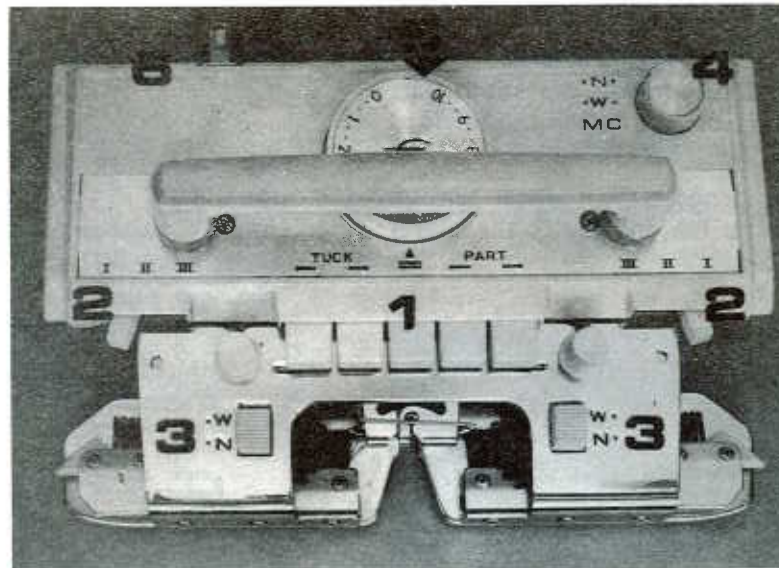
For plain knitting the needles must be in Position B.



SELECTION OF NEEDLES (continued from previous page)

As the needles are numbered from the centre "0" outwards to 100 on each side, (in red in front of the needlebed), it is convenient always to work in the centre of the needlebed.

Move as many needles forward from Position A to Position B as there are to be stitches.



SETTING THE CARRIAGE CONTROLS for plain knitting

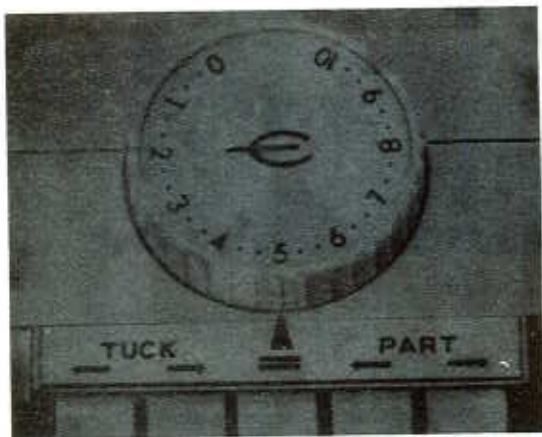
The carriage may be at either side of the needlebed away from the in action needles.

1. **Pattern Selector Buttons**
Press the central button – although it will return in line with the others this will ensure that the other buttons are released.
2. **Holding Cam Levers**
Set both these levers opposite the mark I (termed HCL in Position 1).
3. **Weaving Brush Knobs**
If pressed in release them by drawing them forward (they will rise upwards).
4. **Stitch Selector Knob**
Set this knob on N (Normal knitting).
5. **Tension Dial**
The Tension Dial is below the handle – see next page
6. **Row Counter Tripper**
Set this forward if you wish to use the row counter. (See also page 14).

STITCH SIZE.

The Tension Dial controls the stitch size. It is graduated from 0 to 10 and subdivided into thirds.

The figure 0 denotes the tightest tension i.e. the smallest stitch, and the 10 the largest stitch.



In this illustration the tension gauge is set on 5 (the 5 being opposite the indicator mark).

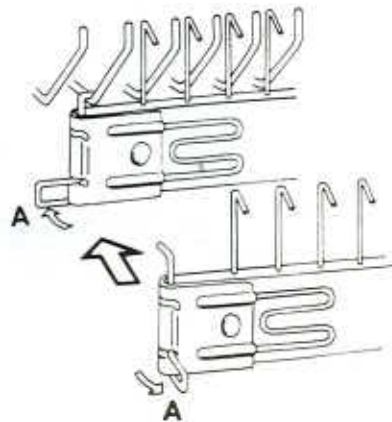
The tension used will depend upon the thickness of the yarn used.

If you are practicing with –
3 ply fingering – set your tension on 5.
4 ply fingering – set your tension on 6.
Confine yourself to these thicknesses of yarn until you are familiar with your knitter.

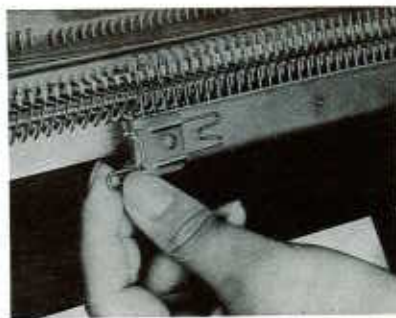
CASTING ON AND PLAIN KNITTING

You are now ready to knit.

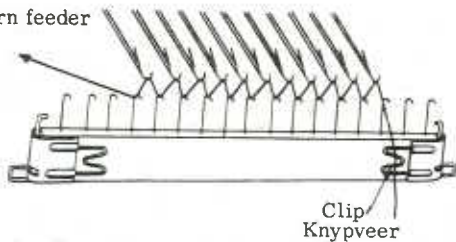
The open edge cast-on which is formed with the assistance of the cast-on comb does not have a sealed edge and can therefore unravel. However, it is a quick way of starting for practice knitting.



1. Set into action 20 needles on each side of the central "0". (Position B)
2. Hold the cast-on comb with the wire hooks facing you and turn the securing levers A at both ends to face you.
3. Place the hooks between the pegs of needlebed as far up as possible then turn the two securing levers A outwards and the cast-on comb will hang correctly on the knitter. The comb should be set in front of the needles to be knitted so that the central needle is central to the comb.
4. Check that the needles pass freely between the cast-on comb teeth.
5. Move the threaded carriage slowly across the needles. The yarn will be picked up in the needle hooks and form loops around the gate pegs and the hooks of the cast-on comb. Continue the carriage movement until the carriage clears the last B-position needles.



To yarn feeder



If the end needles on the side near the carriage come up out of line*, push them back, commencing with the inner needle; to make this easier draw the yarn from the yarn feeder on the carriage towards the needles with the other hand.

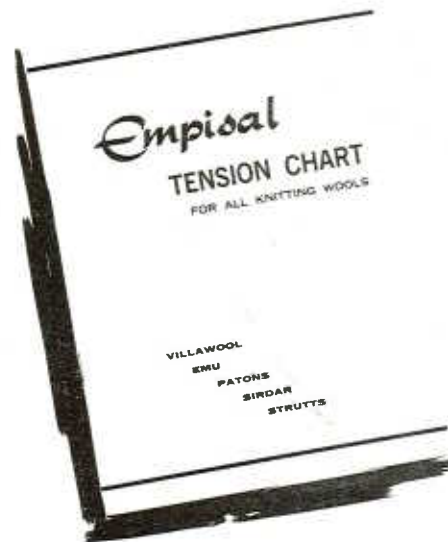
*This is usually an indication that the yarn tension is too tight. (See page 21).



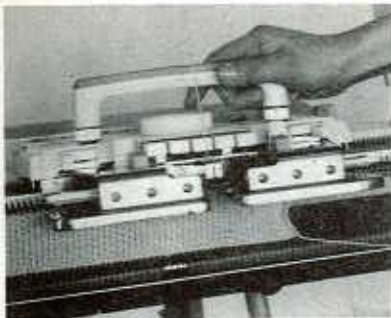
6. Carefully unhook the comb from the pegs by turning the securing levers A of the cast-on comb and let the comb hang in the loops of wool.
7. Catch the loose end of the wool round the cast-on comb spring to keep it out of the way and to secure the first stitch.



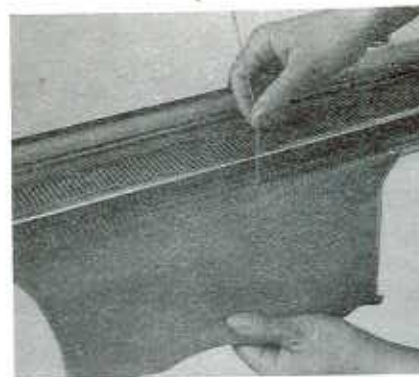
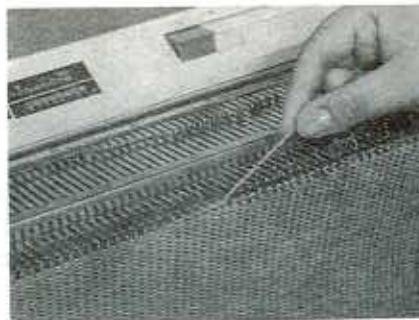
EMPISAL BOOK OF TENSIONS



Published following requests from customers everywhere! We had to test every ply of **knitting wool** on the Australian market to produce this book. It will save you many hours of trial and error and will give you the correct tension for all wools made by Patons, Emu, Villawool and Sirdar.



At the beginning knit slowly speed comes with practice.



- a. Move the threaded carriage from side to side at an even speed across the B position needles.
- b. Do not reverse the movement of the carriage in the middle of a row as this may cause it to jam, or stitches may be dropped.
- c. Move the carriage at an even speed and listen for a "click" before changing direction at the end of each row.

Important:

If you should miss the "click", a long unknitted thread will show in front of the needles in action.

To correct this press both buttons marked "PART" and return the carriage across the needles to the opposite edge, away from the needles in action.

Press the "KNIT" button (centre button) and continue knitting.

(It is unlikely that any stitches will have dropped, but if they have pick them up before continuing to knit).

For neat side selvages do not move the carriage too far beyond the needles in action.

UNDOING ROWS (Unravelling)

If you have knitted more rows than necessary, do not remove work from the knitter. Simply unravel one or several rows, by doing the following:

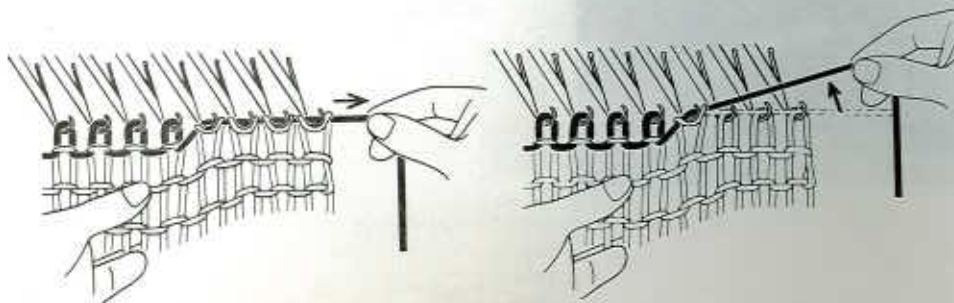
Pull the yarn sideways, upwards and away from you while holding the fabric down. The stitches of the previous rows will slip into the needle hooks automatically.

To continue knitting.

To move the carriage in either direction without knitting, press in both "Part" Pattern Selector Buttons and the carriage can then slide over the needles without knitting. (This is also useful for multi-colour knitting).

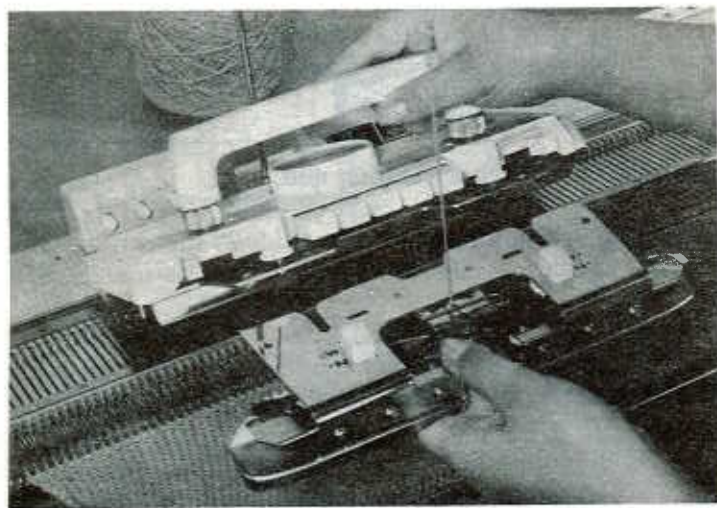
Pull the ripped yarn down through the back of the yarn guide until the yarn tension spring is brought back into operation.

Deduct the number of rows unravelled from the row counter and reset the central Pattern Selector Button to knit.



To unlock the carriage.

Should the carriage lock in the course of normal knitting, the following steps will quickly free it:



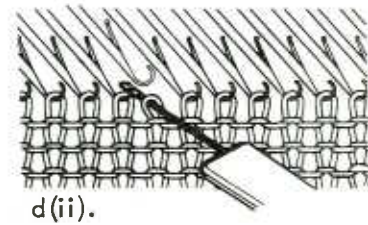
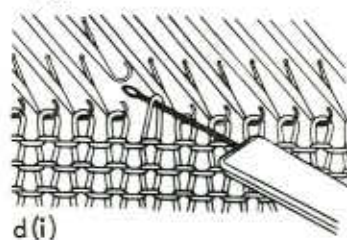
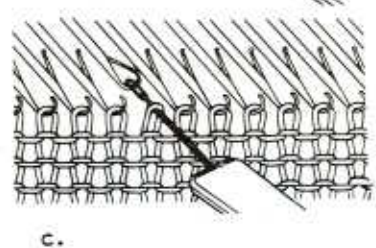
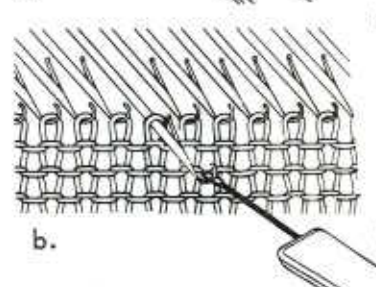
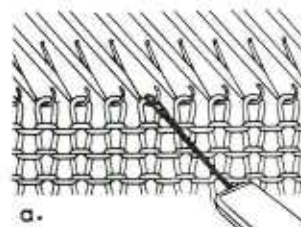
- a. Loosen the thumb screws and remove the roller plate from the carriage.
- b. Raise the front of the carriage.
- c. Slide the carriage to the side where the row commenced and when free of the needles lower the front on to the needlebed.
- d. Attach the roller plate to the carriage and fasten the thumb screws securely.
- e. Unravel last row of knitting and, if necessary, rethread the carriage feeder.
- f. Adjust the numbers on the row counter.

SHAPING

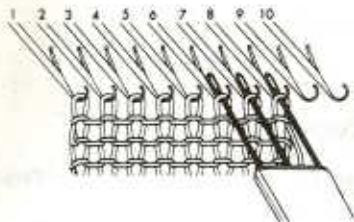
HOW TO USE THE TRANSFER TOOL

The transfer tools are used for increasing, decreasing, and repairing dropped stitches.

To transfer a stitch.



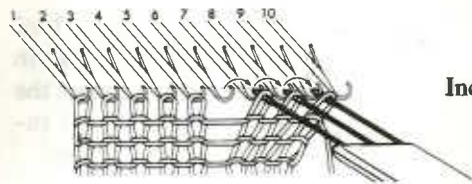
- a. Hold the transfer tool parallel with the needles in the needlebed. Place the eye of the transfer tool into the hook of the needle.
- b. With the transfer tool, bring the needle forward. The stitch in the hook of the needle will slide behind the latch and onto the stem of the needle.
- c. Without releasing the transfer tool, push the needle all the way back until the stitch is transferred onto the transfer tool.
- d. Raise the transfer tool with the stitch on it and transfer it to the adjacent needle, right or left as desired.



Note:

If the latches of the needles are opened before transferring, this will speed the transfer of stitches. (Use hand brush for opening the latches.)

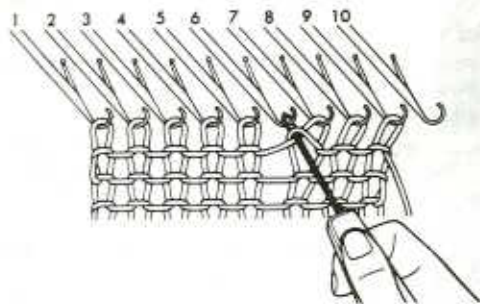
INCREASING



Increasing one stitch at either edge.

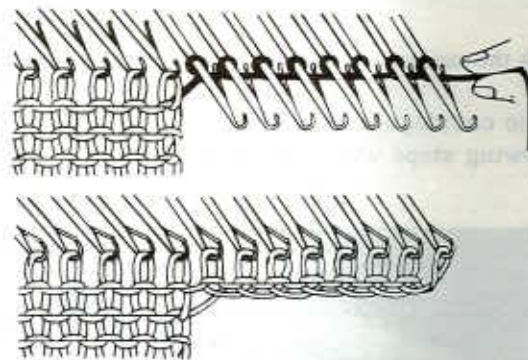
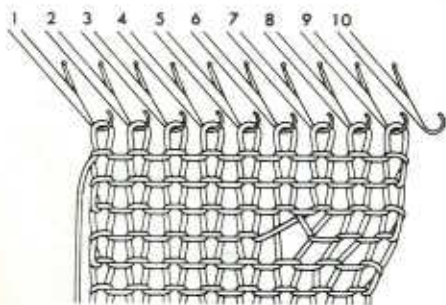
(i) Simple method.

- a. Bring into action one extra needle on the side nearest the carriage and the empty needle will pick up the yarn to form a stitch in the next row.



(ii) Fully fashioned method.

- a. Use the 3-needle transfer tool and move three selvedge stitches outwards to adjacent empty needles
- b. To fill in empty needle pick up a loop from lower row.



Increasing several stitches at either end.

1. Raise to Position E on the same side as the carriage as many needles as there are stitches to be increased.
2. Loosely wind yarn around stem of each needle as illustrated and ensure that the loops are beyond the latches on the stem of the needle.
3. Set Holding Cam Levers on Position 1.
4. Knit across.

Note:

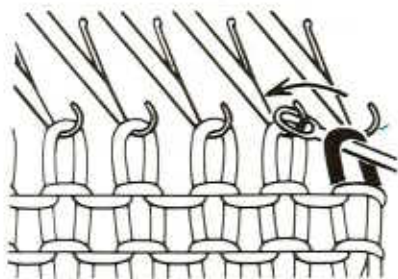
To ensure perfect knitting on the increased stitches raise these needles to position E, manually each time before knitting across for the first 4 or 5 rows.

Increasing in the centre of a row.

1. Determine the position at which you have to increase a stitch or stitches.
2. Use the 3-needle transfer tool and starting from the edge nearest the required needle, transfer all the stitches outwards until the needle is free.
3. Pick up the neighbouring lower half stitch onto the empty needle.

DECREASING

Simple method.



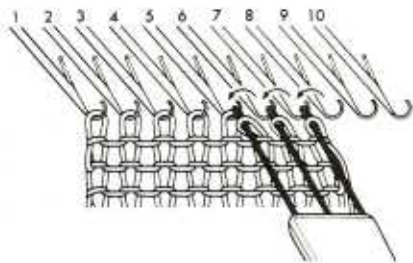
(i) Simple method.

Use single needle transfer tool and transfer the end stitch to the adjacent needle. Place empty needle out of action.

(ii) Fully fashioned method.

Use the three needle transfer tool and raise the 3 selvedge stitches. Move the stitches inwards by one needle, then place the empty end needle out of action.

Fully fashioned method.

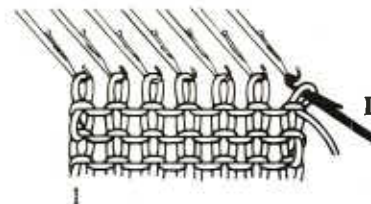


Decreasing several stitches within a row.

(i) Knit 4 or 5 rows using contrast colour yarn, then remove from the needles.

(ii) Reset only the decreased number of needles into action then replace the last row of main colour loops onto the needles, placing 2 loops on to one needle at regular intervals according to the number of decreases required.

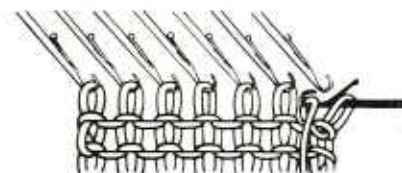
(iii) Unravel the contrast colour yarn then continue knitting.



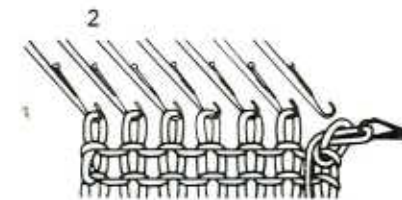
CASTING OFF OR
Decreasing several stitches at the side

Important:

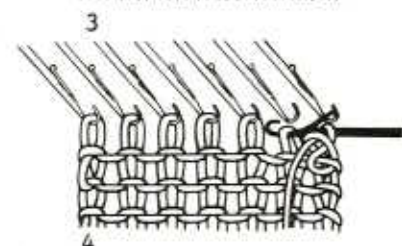
Always start on the side nearest the carriage.



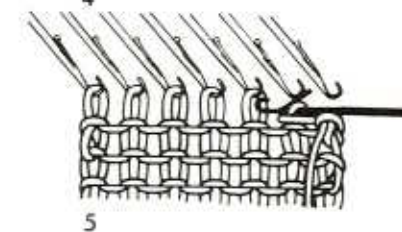
1. Transfer the first stitch off the needle onto latchet hook.



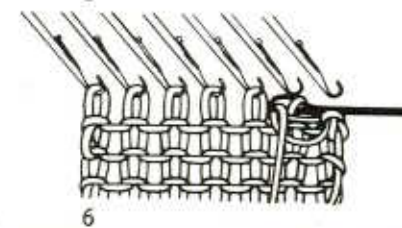
2. Push latchet hook forward until stitch is behind latch and place yarn into latchet hook.



3. Pull latchet hook backwards and a new stitch is formed.



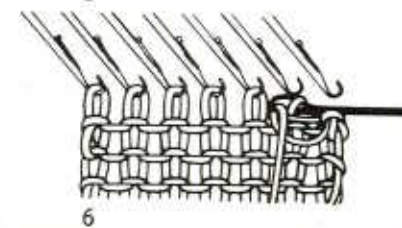
4a. Push latchet hook forward until stitch is behind latch and remove stitch from next needle onto latchet hook.



b. Pull latchet hook backwards and a new stitch is formed.



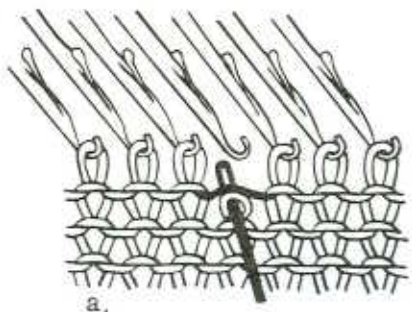
5. Repeat steps 2 to 4b until you have cast off the required number of stitches.



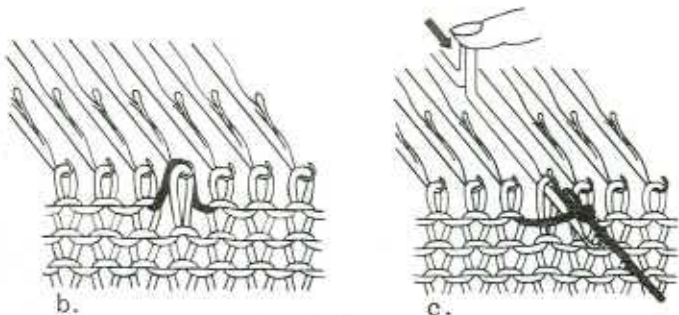
6. Transfer the last stitch off the latchet hook onto the adjacent needle.



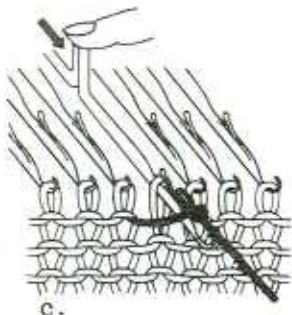
7. Place empty needles out of action.



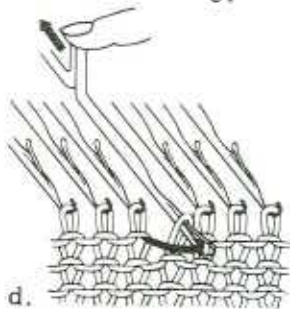
a.



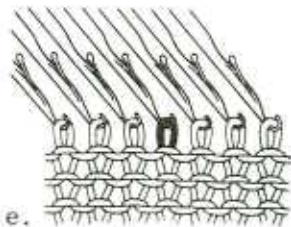
b.



c.



d.



e.

How to pick up dropped stitches.

How to pick up one dropped stitch.

- a. With the single transfer tool, pick up the stitch and the "unknitted" thread and put them both onto the empty needle.
- b. Raise the thread of the unknitted stitch then push the empty needle forward until the lower stitch is behind the latch of the needle, and lower the unknitted strand into the hook of the needle.
- c. Draw the needle back. The stitch will slide over the closed hook of the needle and re-knit the upper loop.

How to pick up a run of stitches

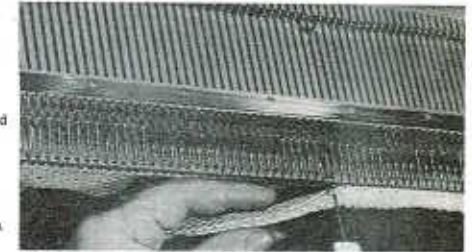
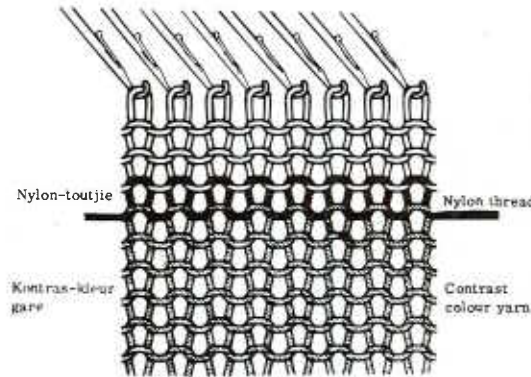
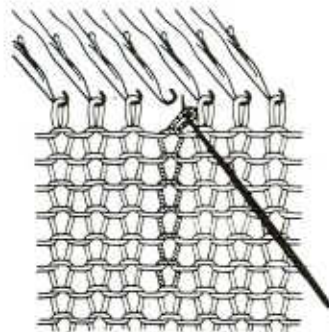
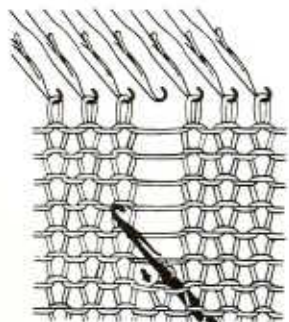
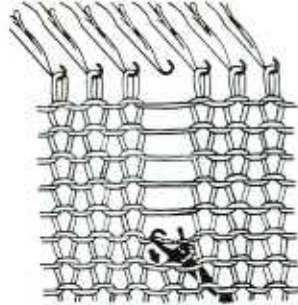
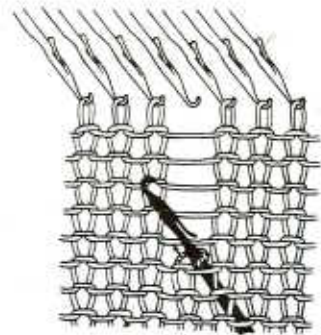
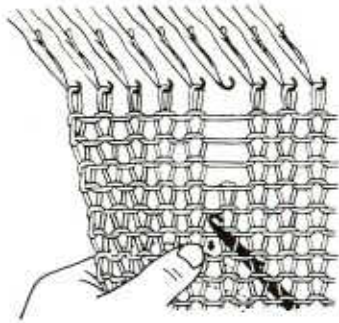
(Plain knitting).

Work from behind the knitting with the latchet tool and crochet upwards to reform the lines of stitches as follows:

- a. Catch the lowest loop of the dropped stitch with the latchet hook from behind the fabric.
- b. With an upward movement place the stitch behind the latch and catch the next horizontal thread into the hook of the needle.
- c. Draw the latchet tool downwards to reform the stitch then catch the horizontal threads one by one to form new stitches until you have knitted back to the top of your work.

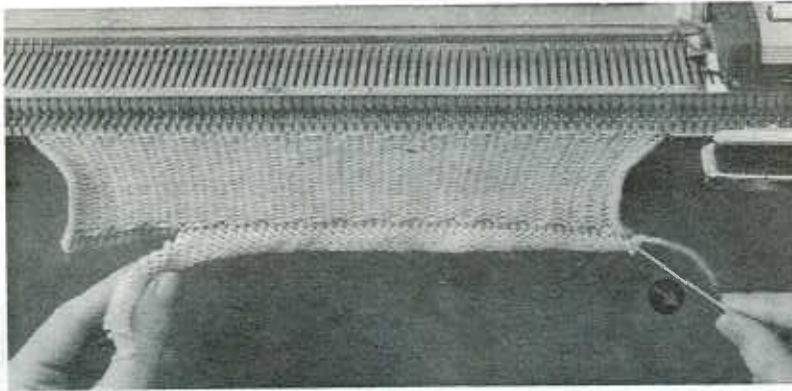
HOW TO MAKE HEMS

The hem is a very popular border trim for both the start and finish of smart knitted garments. All hems should be cast on with an open edge on No. 10 tension for the first row regardless of the weight of the yarn.



HEM

1. Using contrast colour yarn at tension setting 10 cast on the necessary number of stitches with the cast-on comb then knit 5 rows.
2. Rethread with the nylon yarn supplied in your accessory kit and knit one row.
3. Reset the tension to one number smaller than selected for the garment and rethread with the correct yarn.
4. Knit twice the depth of the hem (about 20 rows).
5. Remove the cast-on comb and fold the fabric double.
6. Using the transfer tool pick up the first row of loops of the Main colour yarn and raise them on to their corresponding needle.



REVISION – KNITTING A GARMENT

So far we have been trying out our machine.

Now lets start a garment and put into practical use what has been explained up to this point.

7. Raise the working needles to E position; check that Holding Cam Levers are on I and knit across. This will close the hem.
8. Reset tension dial to the correct number and continue knitting.

THE NYLON THREAD

When the panel is completed draw out the nylon thread. This will separate the contrast colour yarn and leave a clean hem.

TO REMOVE THE KNITTING FROM THE KNITTER

Unbound (unfinished) method.

- a. Take the yarn out of the yarn feeder on the carriage, and rethread with any contrast colour yarn (waste yarn).
- b. Knit 5 rows using the waste yarn, then remove the yarn from the yarn feeder.
- c. Press the work against the needle bed and slide the carriage twice across the needles in action.

The work will be released.



QUICK PATTERN FOR CHILD'S CARDIGAN V-NECK OPEN FRONT

For Age group 4 to 6 years
About 7 ozs. of 4 ply Crepe Wool
Tension set to $7\frac{1}{2}$ stitches to 1" -
BACK 10¼ rows to 1"

Row Counter on 0.

Cast on open edge 102 sts. Knit 36 rows.

Close the hem.

Row Counter on 0.

Knit 88 rows.

Shape Raglan edge

Row Counter on 0.

At the beginning of the next 2 rows cast off 3 sts, then decrease 1 st. at each end of every 2nd row until there are 70 rows and 28 stitches.

Place onto stitch holders.



SLEEVES

Row Counter on 0.

Cast on open edge 52 sts. Knit 32 rows.

Close the hem.

Row Counter on 0.

Knit in stocking stitch increasing 1 st. at each end of every 8th row until there are 78 sts. and 104 rows.

Shape raglan edge

Row Counter on 0.

At the beginning of the next 2 rows cast off 3 sts. then decrease 1 st. at each end of every 4th row until there are 22 rows and 62 sts; then decrease 1 st. at each end of every 2nd row until there are 70 rows and 14 sts.

Place onto stitch holders.

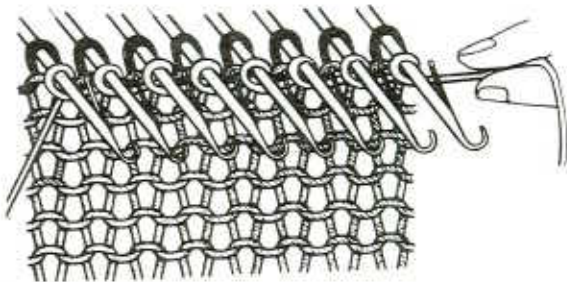
The directions for the fronts and bands and make up are continued on pages 34 to 36.

SELVEDGES

Plain cast on selvages are not often required in knitting, but it is as well to know about them.

Here you have a choice of the Automatic and Manual selv-edges, which enable you to start a panel that will not unravel.

The Automatic method is quicker, but you may prefer the finish of the manual method.



MANUAL METHOD

1. Set up your cast-on-comb and knit several rows using contrast colour yarn, then remove the yarn from the feeder, and knit 1 row with the nylon thread.
2. Raise all B-position needles to position E.
3. Starting on the side furthest from the carriage, wind the Main Colour yarn around the needles.
4. Thread the yarn into the Carriage feeder and continue knitting.

Withdraw the nylon thread to separate the contrast colour yarn.

Automatic method

To cast on while forming a selvage automatically proceed as follows:

Carriage controls

1. Press in both "PART" buttons.
2. Place both HCL on I.
3. Turn the Tension 3 full points lower than average setting for the yarn used.

Needles

4. Place into action (Position B) the required number of needles.
5. Reverse Switch on + and press NSB 1, 3, 5, 7.

Note:

When the word "set" is within inverted commas, the set lever must be swivelled to raise the needles.

To knit the selvage

6. "Set" the needles and knit 1 row.
7. Change Reverse Switch to - (negative), "set" the needles and knit the 2nd row.
8. With the hooks facing towards the machine, hang the cast-on comb onto the loops.
9. Change the Tension to Main Setting and Row Counter to 0, move the reverse switch to + (positive) then press in the "KNIT" button. (This will release both "PART" buttons) and you are ready to continue knitting.

SHORT ROW KNITTING

Use of H.C.L.

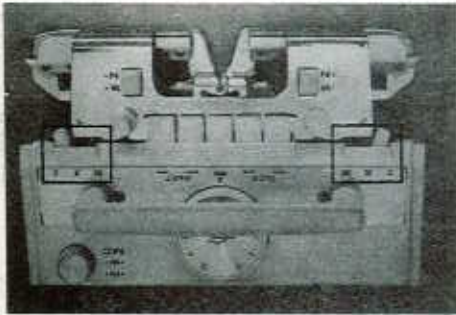
A short row is a method of shaping by knitting only part of a row.

Short rows are principally used for turning the heels of socks, for pockets, horizontal darts etc. By the same process diagonal coloured stripe effects are possible because inasmuch as it is possible to narrow one edge, it is also possible to widen that or the opposite edge. The principle of coloured diagonal striping is therefore first to decrease the width of a row and then to re-instate that row to its original width using a different colour yarn.

Short rows are knitted with the help of the Holding Cams.

SHAPING WITH HOLDING CAMS

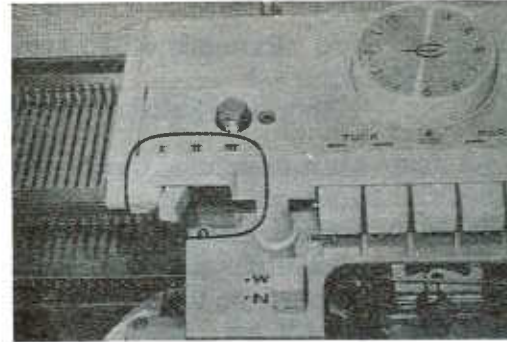
The holding cams are operated by the plastic levers on side of the carriage.



Setting of Holding
Cam Levers
(Abbreviated to
H.C.L.)

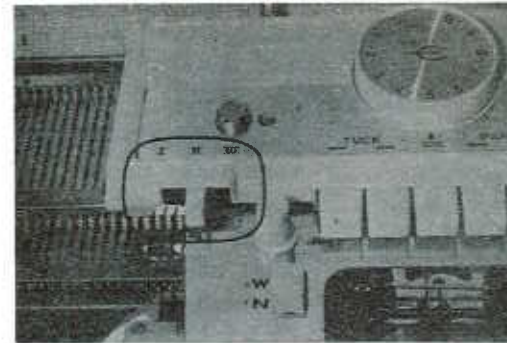
For all normal knitting the H.C.L. must be on 1.

They should only be moved to Position II or III when specifically required for patterning purposes.



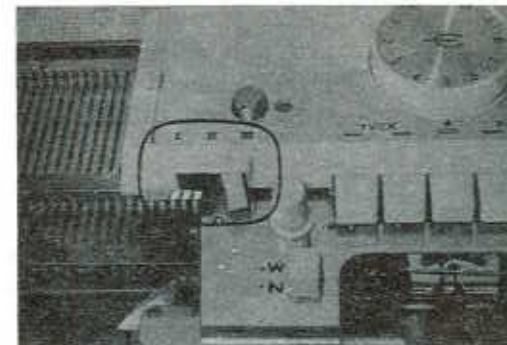
Position I

The holding cam levers are on I for normal knitting and to bring any needles from the raised (E) position back into normal knitting position.



Position II

The levers are on II to operate on C and D position needles for special patterning, often in conjunction with the tucking cams and especially when patterning whilst knitting on only part of the fabric (e.g. one side of a placket or a V-neck) when the other part of the fabric remains on the Knitter.



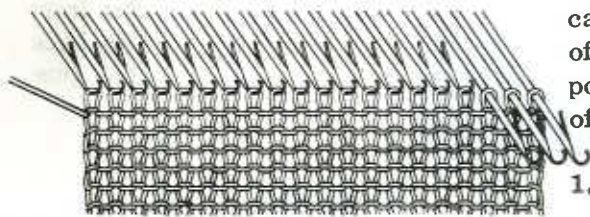
Position III

The levers are on III to knit only B (normal knitting position) and C position needles thus leaving needles in other positions to perform different functions.

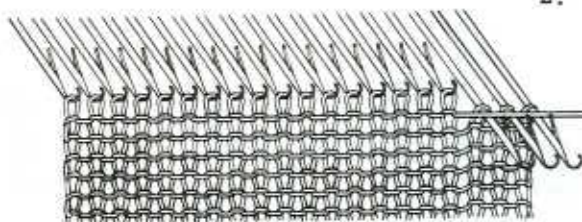
Examples of short row knitting

Short row knitting for a Horizontal dart

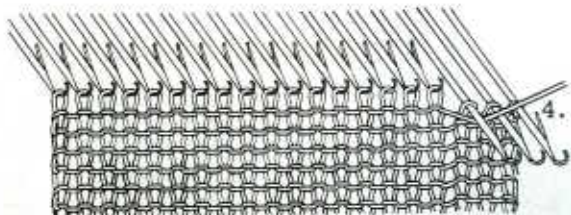
Set both Holding Cam Levers on II and the carriage (which may be set on either side of the needlebed) should be set for the purpose of this practice on the left of a piece of fabric on the needles.



1. Raise the 3 in action needles at the extrême right of the fabric to position E, where they will remain until manually moved down to C position, or until the Holding Cams are moved to I.



2. Knit 1 row (to the right) then pass the yarn under the stem of the E position needle nearest those in B position to avoid the formation of a hole at the point where the short row ends (i.e. adjacent to the E position needles - such a hole would only become apparent later).



3. Knit 1 row (to the left). (The E position needles have not knitted, and the one nearest the B position needles holds two stitches).

4. Continue raising 3 needles and knitting 2 rows until the required number of needles are in position E, remembering always to pass the yarn under the E position needle nearest the B position needles.

To close the dart

5. Set Holding Cam Levers on I.
6. Knit across. Notice how all stitches are now knitted and the fabric is drawn up on one side.

Note:

- a. If the yarn is not passed under the stem of the needles as explained in Step 2 (b) a row of holes will be formed. This could be effectively used for patterning.
- b. For a normal "horizontal" dart reducing the length of the rows by 3 needles at a time makes the dart somewhat sharp, usually 4 or more needles are "held" every second row.

Short row knitting for a contrast colour diagonal stripe

- a. Work steps 1 to 4 as stated in the previous column, and continue until all needles are in E position then set HCL on I and knit one row.
- b. Change colour of yarn, and knit 1 row.
- c. Reset HCL on II and place all needles into E position.

POCKETS using the H.C.L.

- d. On the side nearest the carriage push 3 needles down to C position and knit 1 row. Take the yarn around the nearest E position needle, then knit another row – repeat until all required needles are back in B position.

These are basic instructions, some changes have to be made for differences in sizes of pockets, thickness of yarns etc.

This method in which the pocket is knitted into the fabric saves binding off or picking up stitches after completion of the garment and should be worked at the position required:

1. Set the carriage for Knit with both Holding Cam Levers on II.

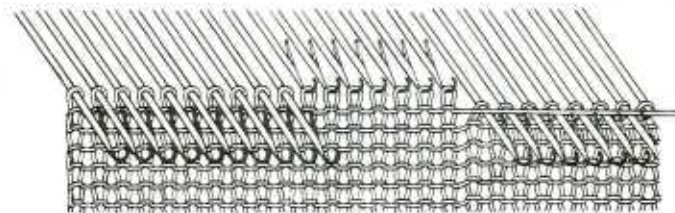
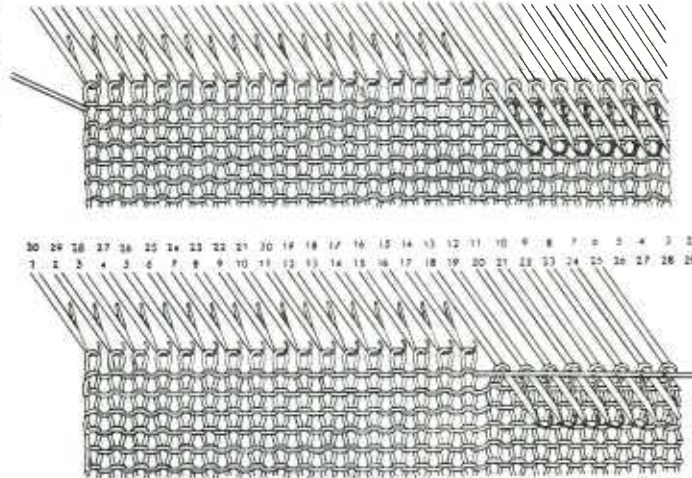
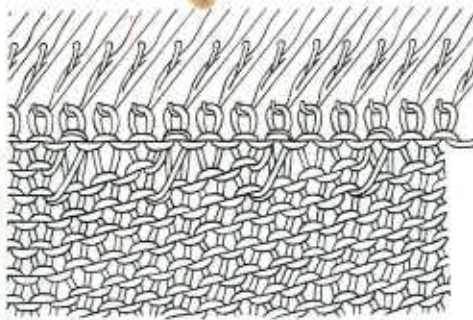
2. On the side furthest from the carriage raise to E position all needles not to be used in knitting the pocket.

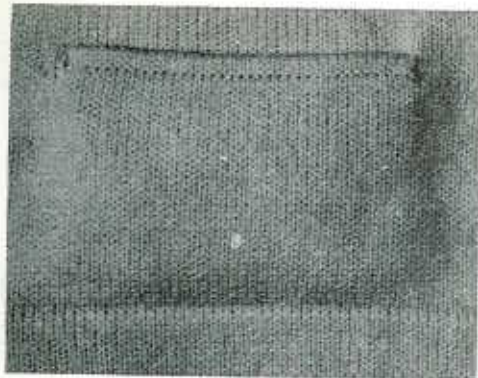
3. Knit 1 row.

4. On the other side of the pocket raise to E position the needles not to be used in knitting the pocket.

5. Feed into the yarn feeder, together with the yarn already there, a length of contrast colour sewing thread. This will be used as a marker to facilitate Step 8.

6. Knit 1 row (using the yarn and marking thread).





The pocket can now be knitted on the intermediate B position needles, and can be plain (without a hem) or with a straight, plain or fancy hem or picot edged hem.

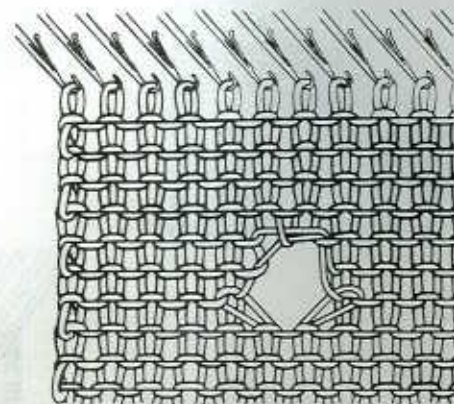
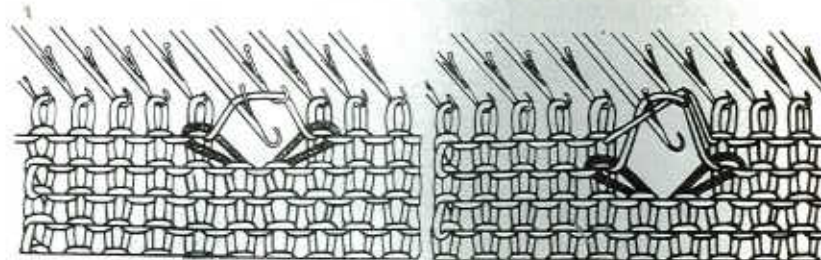
7. Form the Hem - knit 7 rows.
8. Close the Hem - onto the B position needles pick up the lower loop of the stitches outlined by the marking thread. (Pick up both yarn and marking thread).



9. Form the pocket lining:

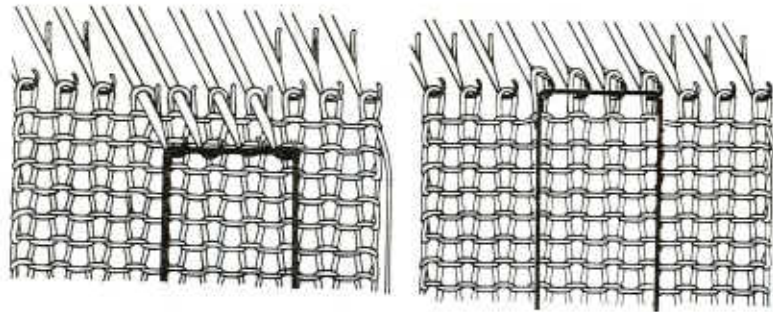
Knit a number of rows equivalent to twice the depth of the pocket lining; whilst knitting this it is advisable to use claw weights which should be periodically raised to prevent the extra fabric jumping off the needles.

10. To continue knitting the full width of the panel:
 - a. Return to C position those E position needles furthest away from the carriage.
 - b. Knit 1 row. (The C position needles are returned to position B).
 - c. Raise the Holding Cam Lever nearest the fabric to Position I.
 - d. Knit 1 row bringing the remaining E position needles back into operation.
 - e. Reset the carriage for the fabric pattern and continue knitting.



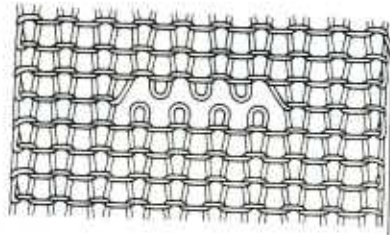
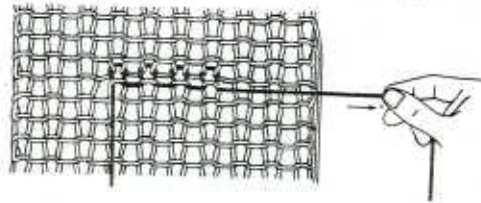
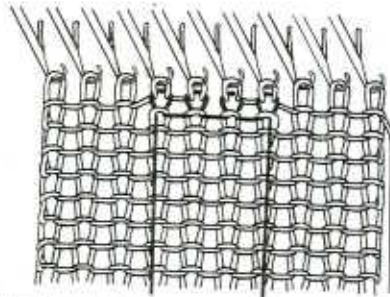
The pocket will appear as a length of fabric in the centre of the panel. To finish off it will require to be sewn down along the inner side selvages; outside, the hem will be sewn down at the side edges.

BUTTONHOLES



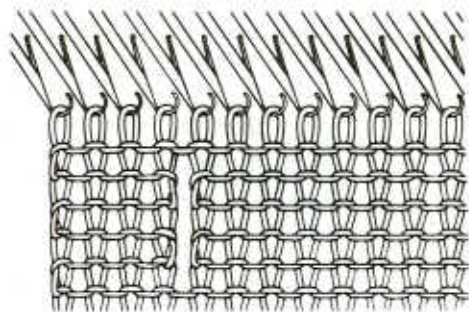
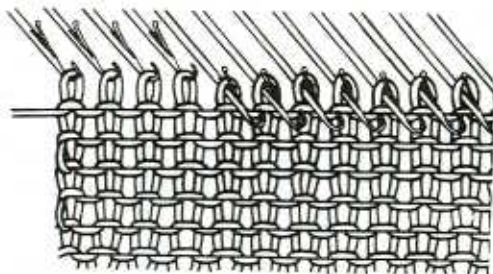
Simple buttonhole

1. At the position of the buttonhole transfer one stitch to the left and the other to the right.
2. Place one empty needle in position B and the other in position E, and both Holding Cam Levers on III. (HCL on III).
3. Knit 2 rows.
4. Place both HCL on I and continue knitting.



Making horizontal buttonholes.

1. Determine position of the buttonholes.
2. Place a length of contrast yarn over the required number of needles for the width of the buttonhole.
3. Over the same needles take the loops behind the latches ...
4. ... and allow the latches to close over the contrast colour yarn.
5. Draw the loops off the latchet hooks thus forming stitches on the contrast colour yarn.
6. Continue Knitting.
7. After the fabric is removed from the knitter, steam it at the position of the buttonhole.
8. Carefully draw the contrast yarn out of the fabric.
9. This will leave a number of open loops which must now be sealed off in a buttonhole stitch.



Making a vertical buttonhole.

1. Divide the fabric at the buttonhole position, so as to knit first the side of the fabric nearest the carriage, by placing into E position all needles on the side of the buttonhole furthest away from the carriage.
2. Set both HCL on II.
3. Knit on the B position needles at the side nearest the carriage as many rows as are required for the buttonhole, the carriage to rest at the same side as it started.
4. Break the thread.
5. Raise to E position all remaining B position needles.
6. Transfer the carriage to the opposite side of the needlebed. (The carriage may be passed across the needles as they are in E position with the Holding Cams in Position II).
7. Place into C position those needles raised to E position in Step 1.
8. Knit the same number of rows as knitted in Step 4 to complete the fabric on the opposite side of the buttonhole.
9. Place the HCL nearest the fabric into Position I.
10. Continue knitting. The raised HCL will close the buttonhole by bringing the E position needles back into action (B position).

ANOTHER EMPISAL ACCESSORY FOR YOUR GREATER KNITTING PLEASURE



3 BOWL YARN FEEDER

Each bowl holds 2 oz. of wool which unwinds from the centre of spool. A must when knitting Fair Isle and other multi-coloured work. Available from your Empisal Dealer or your nearest Empisal Sewing and Knitting Centre.

SHAPING A NECKLINE

The method of shaping a neck opening is similar whether it is V-shaped, rounded, square, etc.

In each case, each side of the panel is knitted separately.

There are two methods. In one of them, one side of the panel can be knitted while the other remains on the needles unknitted. This is not generally recommended and we explain the second method in which one side of the work is removed from the needles while the other is being knitted.

To Shape a V-neck

Step 1 Transfer the central stitch to an adjacent needle (if working with an even number of stitches transfer two central stitches to adjacent needles outwards), and place the empty needle (or needles) out of action.

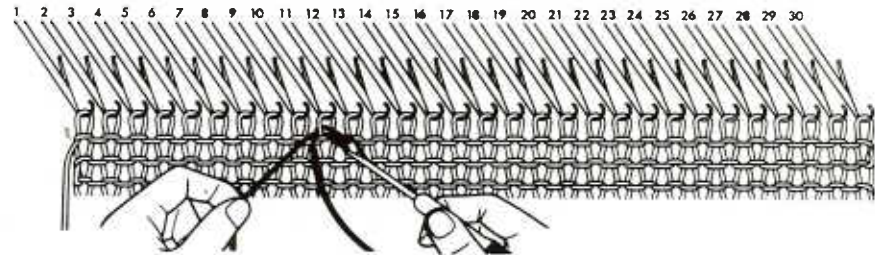
Step 2 Place the needles on the side furthest from the carriage into E position, set both Holding Cam Levers on position II, then break off the yarn and rethread with a contrast colour yarn, after which knit in stocking stitch 5 rows on the needles nearest the carriage.

Step 3 Remove the contrast colour yarn from the feeder, and remove that part of the panel knitted in contrast yarn from the needles, then place those needles out of action.

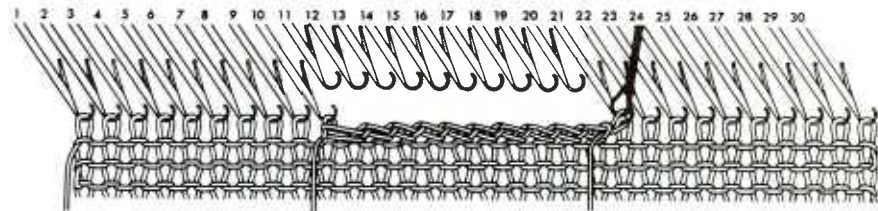
Step 4 Transfer the carriage across the needles to the opposite outer selvedge; rethread with the yarn for the garment then set Holding Cam Levers on I and continue knitting, decreasing at the neck edge as required whilst shaping at the outer selvedge if necessary, until the panel is completed according to the pattern directions.

Step 5 Replace the stitches knitted in contrast yarn onto the needles then unravel the contrast yarn until all main colour stitches are back on the needles, after which rethread in Main Colour yarn and knit the panel.

To shape a round or square neck



Step 1 Using a separate thread of the Main Colour yarn cast off as many of the central stitches as required in the knitting directions, leaving an equal number of stitches on each side hanging from the needles - place the empty needles out of action.



Steps 2 to 5 are then worked exactly as explained for the V-neck, shaping according to the directions in the knitting pattern.

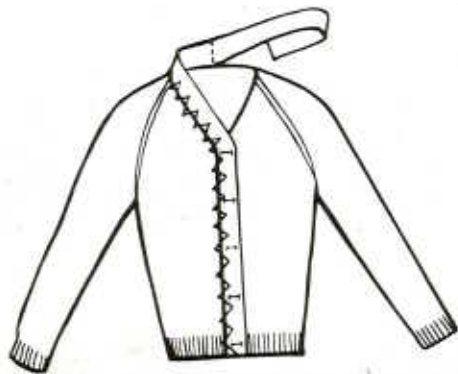
BANDS FOR CARDIGANS

Separate bands (double).

For V-neck cardigans the separate band can be knitted in one piece. Measure from the welt, along the front, around the neckline, and down to the opposite welt.

For round-neck cardigans, first knit the neckband, then knit the front bands, measuring from the top of the neckband to the base of the welt.

Join fronts to back before measuring for band.



Tacking the band in to position.

1. Cast on twice the number of stitches required for the width of the band.
2. Knit required length for opening and, where necessary make buttonholes (in pairs to correspond when the band is folded double).
3. Fold and tack the band lengthwise.
4. Tack along opening and stitch down.
5. Finish off buttonholes.

KNITTED-ON NECK BANDS

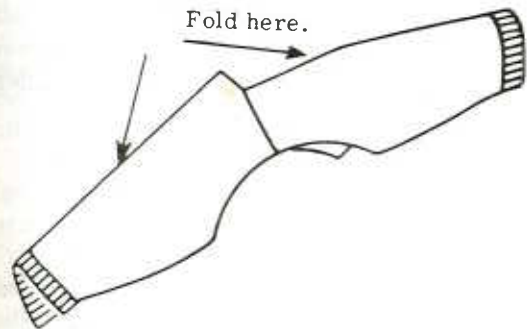
When neck bands are to be knitted directly on to garment it is usual to work on the joined front and panels.

For V-neck fronts, the neckline is joined all round, for round fronts the neckline is left open at one edge.

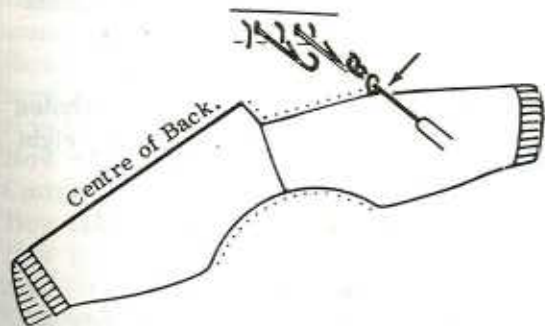
V-neck band.

1. With the wrong side of the fabric facing you pick up evenly spaced, the selvedge loops from point of V-neck to centre back, onto adjacent needles.
2. Knit 2 rows, commencing from centre back.
3. Decrease 1 stitch at V-point.
4. Repeat steps 2 and 3 for width of band (approximately 14 rows for adults and 10 to 12 rows for children).
5. Knit 2 rows.
6. Increase 1 stitch at V-point.
7. Repeat steps 5 and 6 for the same number of rows as in step 4.
8. Cast off loosely.
9. Repeat steps 1 to 8 for opposite side.

10. Join the bands at V-point and centre back.
11. Fold the band inwards, lengthwise, and tack down, then stitch down on the inside.



Join shoulder seams then fold the garment in half, wrong side outwards.



Pick up selvedge stitches on one half from point of V-neck to centre back.

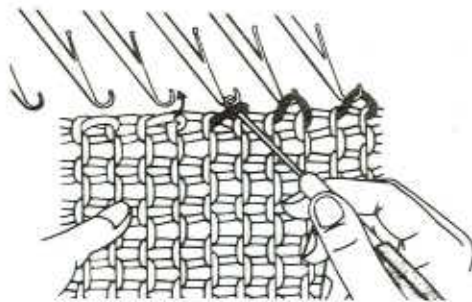


Illustration showing how to pick up long loops.

Knitted on bands (double)

For V-neck cardigans pick up the stitches from the base of the welt to the centre back.

For round-neck cardigans work first the neckband then the centre front band.

1. Pick up evenly spaced onto adjacent needles the selvedge loops.
2. Knit double the width of the band and where necessary make buttonholes (in pairs to correspond when the band is folded).
3. Cast off loosely.
4. Fold inwards and stitch down.
5. Finish off buttonholes.

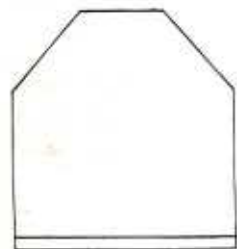
Round neck-band.

1. Starting at one open edge pick up evenly spaced, the loops all around the neckline onto adjacent needles, ending at the opposite open edge.
2. Knit double the width of the required band.
3. Cast off loosely.
4. Join the second shoulder seam and continue along band then fold inwards and tack down after which stitch down on the inside.

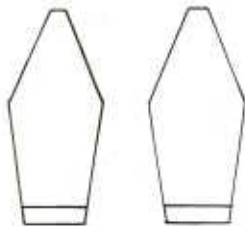
REVISION – KNITTING A GARMENT

We now know how to complete our child's cardigan (started on Page 24) and for revision we will knit the fronts and bands then sew the garment together.

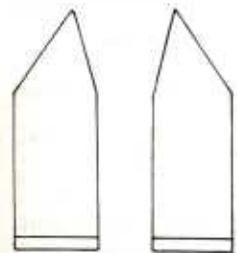
Quick pattern for a child's V-neck cardigan.



The Back



The Sleeve



The Fronts

One front

Row Counter on 0.

Cast on open edge 51 sts.

Knit 36 rows.

Close the hem.

Row Counter on 0.

Knit 88 rows.

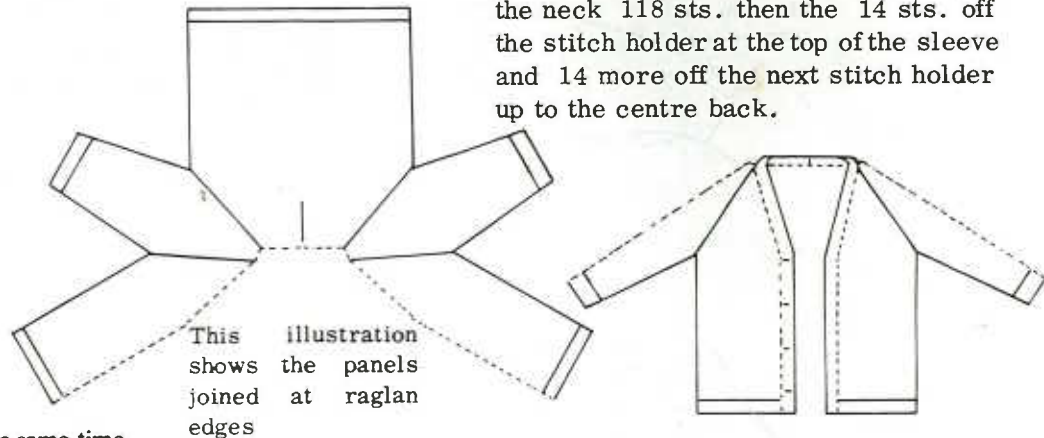
Shaping raglan and neck edges at the same time

At raglan edge - cast off 3 sts. then decrease 1 stitch at this edge every 2nd row.

At neck edge - decrease 1 st. every following 4th row, altogether 12 times.

While still decreasing at Raglan edge knit straight at neck edge until there are 70 rows and 1 stitch. Bind through.

Knit the opposite front reversing all shapings.



TO MAKE UP

1. Press blocked panels on the wrong side under a damp cloth.
2. Join sleeves to front and back at raglan edge.

Commencing at the hem of one front, pick up along centre front edge up to the neck 118 sts. then the 14 sts. off the stitch holder at the top of the sleeve and 14 more off the next stitch holder up to the centre back.

For V-neck cardigans pick up the stitches from the base of the welt to the centre back.

Knit 36 rows, allowing for buttonholes on the left for a boy and on the right for a girl.

Turn the hem and cast off loosely.

Repeat on opposite front.

4. Join sleeve and underarm seams.
5. Press the bands and seams.
6. Sew on buttons, and finish off buttonholes.



THE EMPISAL COMPANION FOR HOME KNITTERS

No machine knitter can afford to be without this book. Its 60 pages contain a wealth of information – it answers all problems that you may have found. A brief outline of the chapters is:—

How to take your measurements for knitted garments.

Complete chart of children's measurements, chest, length, shoulders and sleeves for both boys and girls in sizes from 18 to 34 chest.

Make fit to measure knitteds from your own brown paper patterns.

How to knit test pieces for correct tension.

How to knit darts for bustline shaping.

How to professionally finish with invisible seams.

How to attach buttons so that buttonholes never stretch.

How to attach neck and armbands correctly.

How to insert zips so they are invisible.

Correct pressing for perfect fit.

How to create extra elasticity in the basques.

How to adapt hand knitting patterns to the machine.

Casting on, casting off, picking up and joining panels and bands.

Available from your Empisal Dealer or any Empisal Sewing & Knitting Centre.

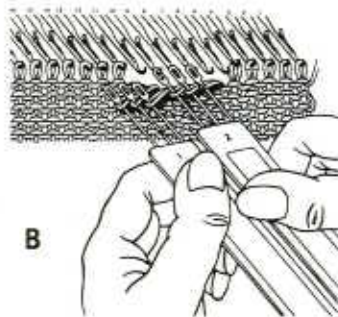
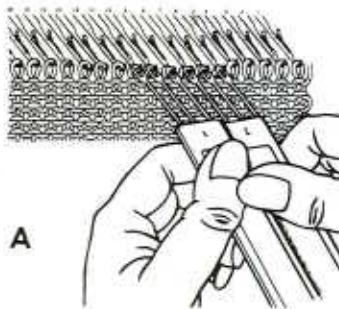
PATTERNING using the transfer handles

The most common use of the transfer handles for patterning is to form cables or plaits, the latter being only a different kind of cable.



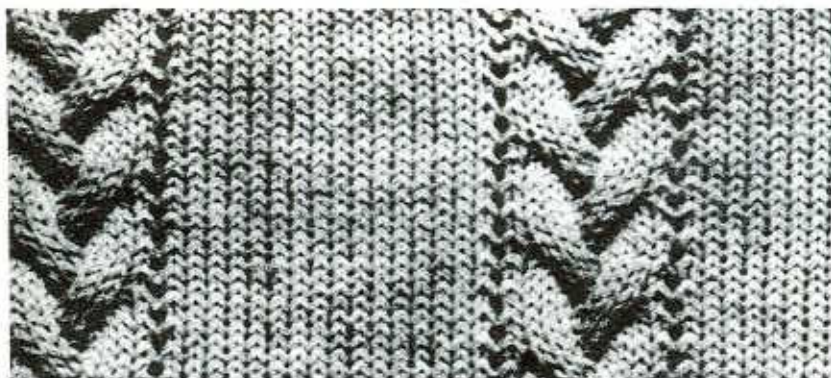
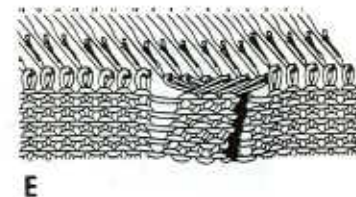
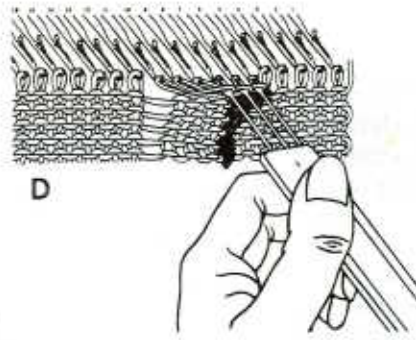
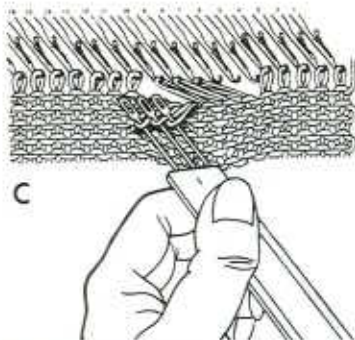
CABLES

1. Using two three needle transfer handles over six adjacent stitches, form a cable as follows:
 - a. Lift 3 stitches on to one transfer handle;
 - b. Lift the next 3 stitches on to the other transfer handle;
 - c. Cross the transfer handles, so that -
 - (i) those stitches from the left-hand needles are transferred to the right-hand needles, and
 - (ii) those stitches from the right-hand needles are transferred to the left-hand needles: over the previously transferred stitches.
2. Push the needles with the twist into E position, together with a few needles on each side of them.
3. Raise H.C.L.'s to Position I.
4. Knit six or as many rows as required between cables.
5. Repeat from Step 1.



To accentuate a cable either purl one stitch on each side, or leave a needle on each side out of action.

Plaited cable.



Carriage at either side, set at knit.

Using two 3-needle transfer handles work as follows over 9 adjacent stitches:

1. Lift the first 3 stitches on the side nearest the carriage on to one transfer handle.
2. Lift the adjacent 3 stitches on to the other transfer handle.
3. Cross the transfer handles over so that
 - (i) those stitches from the 3 needles furthest away from the carriage are transferred to the vacant needles nearer the carriage
 - (ii) those stitches that were nearest the carriage are transferred to the other vacant needles.

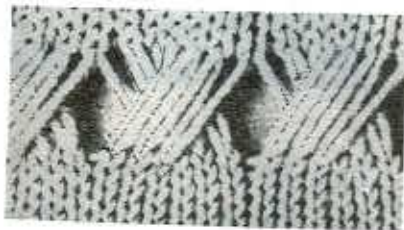
4. Knit 3 rows (the carriage will now be on the opposite side).
5. Lift the first 3 stitches on the side nearest the carriage on to one transfer handle. (These will be the 3 stitches not previously picked up).
6. Lift the centre 3 stitches on to the other transfer handle.
7. Cross the transfer handles over so that
 - (i) the 3 stitches from the centre are transferred to the vacant needles nearer the carriage
 - (ii) those stitches that were nearest the carriage are transferred to the vacant needles
8. Knit three rows.
9. Repeat from Step 1 for length of the plait.

Briefly:

The centre 3 stitches are always transferred outwards, either to the left or to the right, on to the outer needles before the outer stitches are transferred inwards. If an odd number of rows is knitted between "cables" always work towards the side on which the carriage is resting.

Lace cable.

Knit one row by feeding the yarn into each needle by hand to form a stitch then pull the individual needle as far back as possible to Position A to form a long stitch. When the row is completed insert cast-on comb into the knitting and with the comb



carefully pull knitting forward until the needles are in Position B, the stitches hanging on the hooks. Using the three-needle transfer tools proceed to cross the loops as you would to make cables. Transfer the carriage to the opposite side of the needlebed, re-thread it and proceed with your knitting.

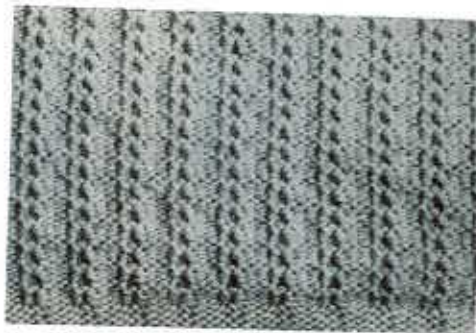
AUTOMATIC PATTERNING

Various combinations of the carriage and needlebed controls will give you multitudes of automatic patterns.

In the next few pages we will show you how to knit a few basic patterns, each one of which introduces the use of a different control.

By experimenting with these basic patterns on your own you will often be fascinated by the new and interesting patterns you can create yourself simply by changing a control or even a sequence of movements.

To practice these patterns start each one after knitting several rows of stocking stitch and repeat each set of instructions a number of times.



The Holding Cam Levers (HCL) and Needle Selector Buttons (NSB)

(To release the buttons press 0).

1. Press NSB 1 and 5.
2. "Set".
3. Place HCL on III.
4. Knit 3 rows.
5. Move HCL to I.
6. Knit 1 row.

Repeat steps 2 to 6 inclusive for the length of the pattern.



The HCL and Slide Dial

1. Press NSB 1 and 5.
2. Place Slide Dial on 1.
3. Place HCL on III.
4. "Set" and knit 3 rows.
5. Move HCL to I.
6. Knit 1 row.
7. Change Slide Dial to next number.

Repeat the pattern from Step 2 after the Slide Dial has reached 8 commence again at 1.

The "Part" Buttons (on the carriage)

1. Press NSB 1, 2, 5 and 6.
2. Press in both "Part" buttons.
3. Place HCL on I.
4. Place Slide Dial on 1.
5. "Set" and knit 1 row.
6. Change Slide Dial to next number.

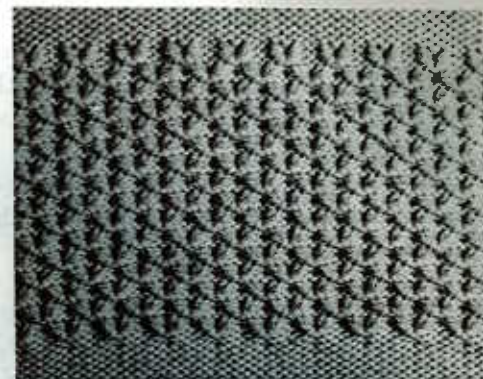
Repeat steps 5 and 6 for the length of the pattern, but before each repeat move the Slide Dial in the sequence 2, 3, 4, 5, 6, 7, 8, 7, 6, 5, 4, 3, 2, 1.

Tuck (in one direction)

Start with the carriage at the right side.

1. Press in the left TUCK button.
2. Place HCL on I.
3. Slide Dial on 1.
4. Press NSB 1, 3, 5 and 7.
5. "Set" and knit 2 rows.
6. Move Slide Dial to 2.
7. "Set" and knit 2 rows.
8. Move Slide Dial to I.

Repeat steps 5 to 8 for length of the pattern.



Tuck (in both directions)

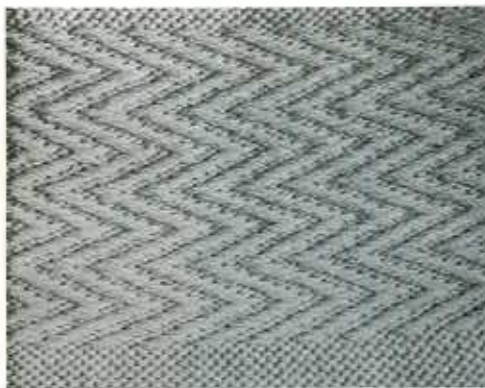
Start with the carriage on the right.

1. Press in both TUCK buttons.
2. Place HCL on I.
3. Place Slide Dial on 1.
4. Press NSB 1, 2, 3, 5, 6 and 7.
5. "Set" and knit 1 row.
6. Repeat step 5 a further 2 times. *
7. Move Slide Dial to 3.
8. "Set" and knit 1 row.
9. Repeat step 8 a further 2 times.
10. Move Slide Dial to 1.

Repeat from Step 5 for the length of the pattern.

* Each repeat requires the "set" movement before knitting.

If you "set" and knit 2 rows the 2nd row will not form stitches.



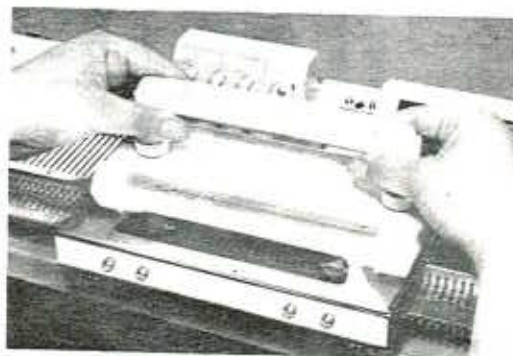
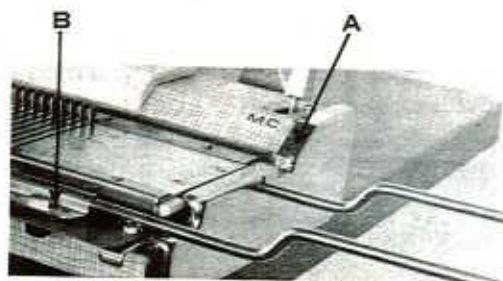
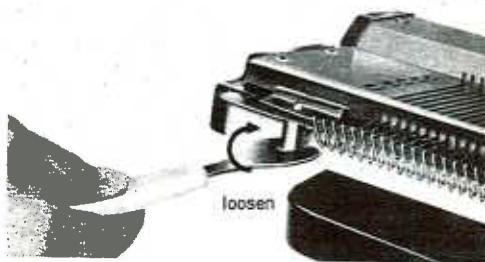
This pattern is reversible.



THE LACE AND CROCHET CARRIAGE

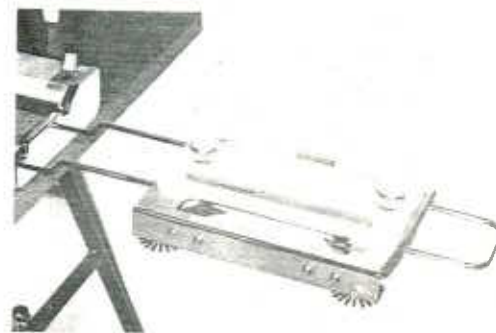
This attachment is an optional extra for your KH91 knitting machine.

It gives an unlimited range of lace and hand crochet look patterns automatically.



Setting up the Lace carriage.

1. Loosen the auxiliary rail nut with the set lever.
2. Remove the auxiliary rails from the carrying case and insert one on each side of the needlebed into aperture 'A' and under the rail clip 'B' then tighten the rail nut.
3. Set the wax cone onto the stud on the front of the yarn guide.
4. Fasten the handle on the L-carriage.
5. Place the L-carriage onto the auxiliary rail and slide it towards and onto the needlebed. It will move into position with the back rail in the rear carriage groove on the needlebed.



The lace carriage

The Lace Carriage works from left to right and right to left across the knitting.

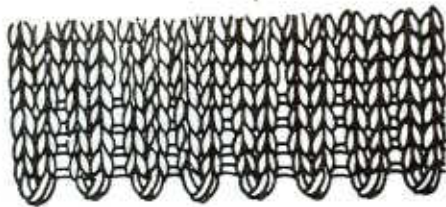
Its function is to transfer stitches off D position needles onto adjacent B position needles.

After the stitches have been transferred it draws the empty D position needles back to the B position.

To knit a picot-edge hem

Hems are usually knitted slightly tighter than the rest of the garment, so adjust the tension to the yarn you are using.

1. Place into action the required needles and, using contrast colour yarn and cast-on comb, cast on, open edge then after a few rows knit one row with the nylon thread and change to Main yarn.
2. Knit (in main yarn) the depth of the hem (for practice say 10 rows).
3. Press N.S.B. 1, 3, 5 and 7 and "set".
4. Pass the L-carriage once across the fabric (every second stitch will be transferred to adjacent needle).
5. Leave empty needles in position B, and knit the same number of rows as in Step 2.
6. Fold the work and raise the loops of the first row of main yarn onto corresponding needles (to close the hem) reset the tension for the garment and continue knitting.



Using the Lace carriage for patterning

When the L-carriage is operated to the left
the stitches are transferred towards the left.

When the L-carriage is operated to the right
the stitches are transferred towards the right.

Therefore when selecting the needles for transferring there must be a B position needle on the correct side adjacent to the D position needle to receive the stitch.

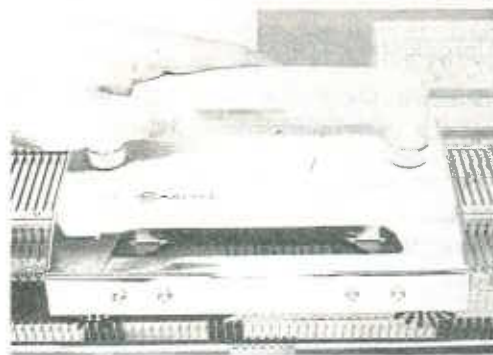
When all the in action needles are in B position the Lace Carriage can be moved across the knitting without it affecting the work - this is frequently necessary.

The L-carriage and needle positions

The selection of needles for lace patterns is effected principally by use of the needle selector buttons.

All needles may be in operation (Position B) or some may be out of action (Position A) but those raised to the D position for transferring stitches, thus forming the pattern, must never be next to each other.

This illustration shows a bad needle arrangement because two or more consecutive needles have been raised to the D-position.

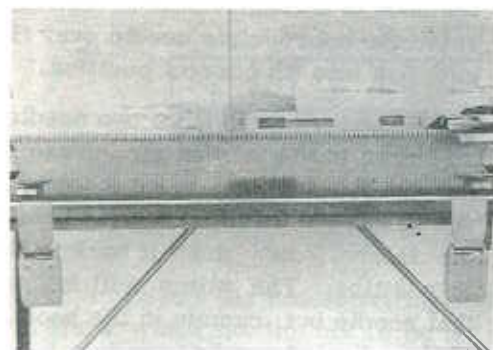


A few brief rules

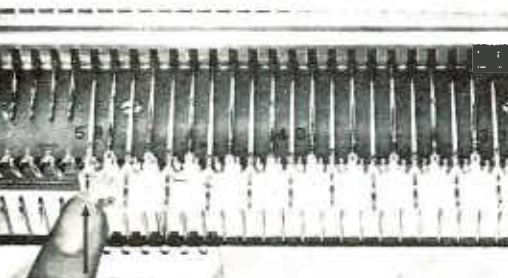
The Lace carriage Always move the L-carriage evenly and with care and never too fast.

Tensions for patterning: Set the tension looser than usual for the yarn used to achieve a more open effect on the fabric.

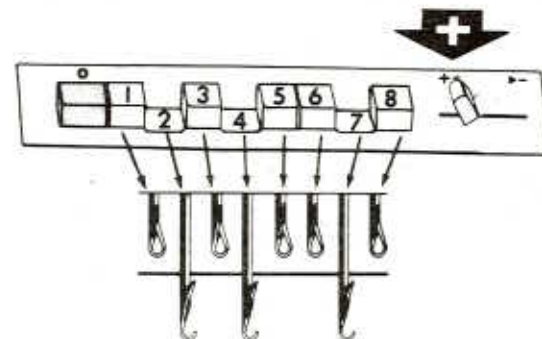
Weights The cast-on comb is usually sufficient weight, but if you are using a very springy yarn (certain rayons or cottons) or a very open pattern extra weights will prevent dropped stitches. (Hang them on the cast-on comb as illustrated).



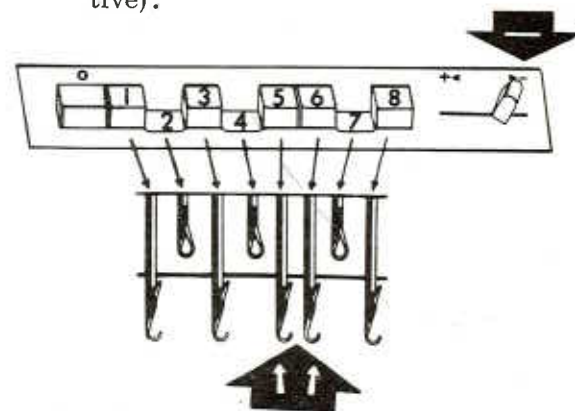
Set lever The lever must be "set" to raise the needles indicated by the buttons pressed in.



Finally an essential rule - if the selvage needle is raised it must be pushed back to the 'B' position, otherwise it will drop the stitch.



This illustration shows a good needle arrangement when the reverse switch is on + (positive).



However, should the reverse switch be moved to - (negative) the needle setting will not be suitable.

Note that in this arrangement Button 1 and Button 8 are not depressed - a good rule to observe is that if either button 1 or 8 is depressed the other must not be pressed in.

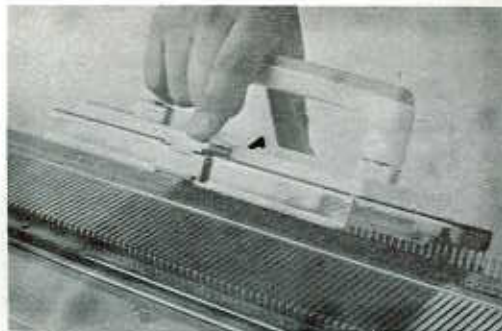
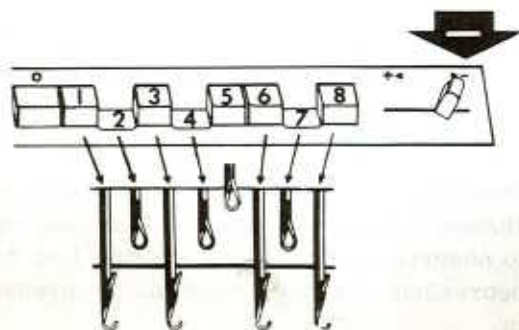
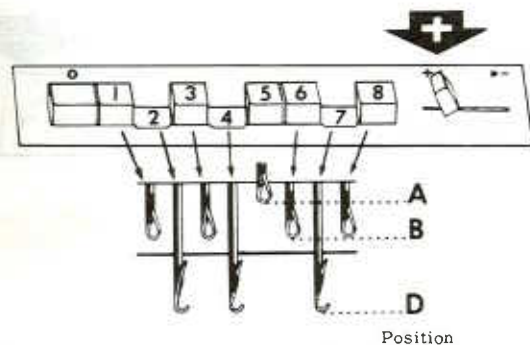
After the needles have been selected by depressing the needle selector buttons the pattern can be varied by the use of the Slide Dial and Reverse Switch.

If it is intended to use the Slide Dial or Reverse Switch and there are needles out of action ensure that there will be a B position needle on the correct side of the D position needle to receive the transferred stitch, remembering that when the Lace Carriage is moved from right to left stitches are transferred to the left and vice versa; and be specially careful on the point of needle setting when using the Reverse Switch.

With this needle setting the Lace Carriage will work from right to left.

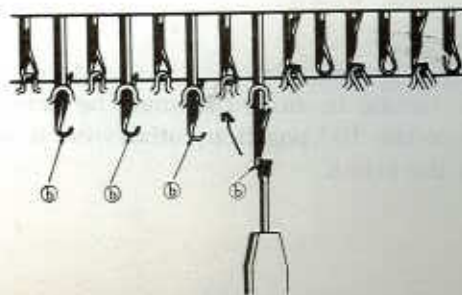
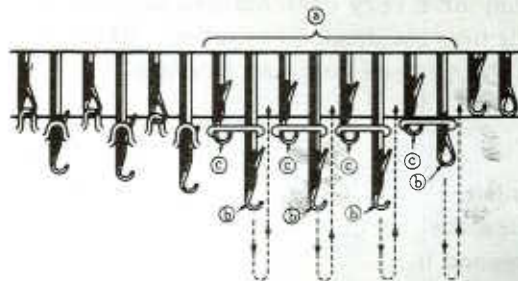
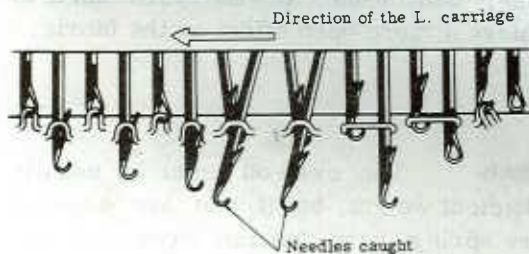
In the opposite direction needle '4' will drop the stitch.

BUT if the reverse switch is changed the setting will be corrected for transferring stitches to the right.



If the carriage is jammed:—

1. Unlock the carriage:
 - a. Push in the release button at the back of the carriage.
 - b. Raise the rear of the carriage and draw it towards you; if needles are caught in it exercise extra care as you pull it away from the needlebed.
2. After removing the carriage, reset the needles
 - a. If the needles are caught in each other, separate them by lifting back the hook of the uppermost needle then raise the appropriate needle over the gate peg into its correct position.
 - b. If stitches are caught on two needles as shown in the section ②, press on the needle butt and move it towards you to ensure that the stitch is behind the latchet, then draw it back to the B position. The stitch will fall off that needle but remain in the hook ③ of the adjacent needle.
 - c. If any stitches along the row remain untransferred use the transfer tool to transfer them to the appropriate needle for the pattern.
 - d. Reset the L-carriage in position on the auxiliary rail and continue knitting according to the pattern.



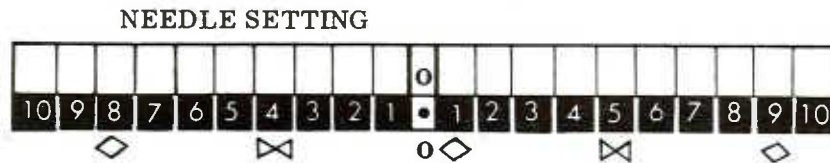
How to follow Pattern Charts

Read the chart from the lowest line upwards and from left to right. The reason for reading the chart upwards is that the knitting works upwards and the knitted article will then correspond with the chart.

The first step is to set all controls on the needlebed and the carriage as defined in the captions to the chart.

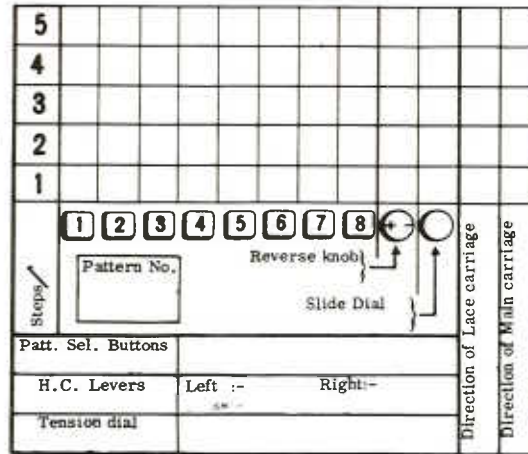
Needle setting.

Unless there is a needle setting section under the chart it is to be understood that all required needles are to be set in B position.



Where it appears the needle setting section will show which needles are to be set into operation, these are indicated by the letter B in the appropriate square; those left out of action are indicated by the letter A to correspond with the needle positions marked on the side of the needlebed.

Note that the needles are set working outwards from the central '0' on the needlebed. To achieve the correct pattern be sure to set the needles according to the chart and repeat the needle sequence working outwards from the central '0'.



Needle Selector Buttons

Needle Selector Buttons

The lowest shaded square in an upward column means that the corresponding button must be depressed on that row. In some cases this shaded square is numbered with the button number.

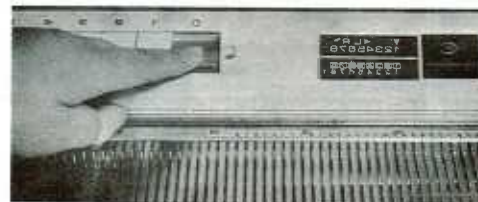
If after one or more rows the square above a shaded one appears unshaded that particular button must be released.

Depressing the 0 button will release all the buttons so that other buttons indicated in the next row of squares must be depressed again.

The Reverse Knob must be on the + position unless the appropriate column reads -

The Slide Dial must be set on the appropriate position as stated in the column reserved for it.

In the Reverse Switch and Slide Dial columns only the changes are indicated by different symbols or numbers. Thus if no symbol or number appears in this column for any step, the symbol or number below that space applies.



The Set Lever Having set all the controls, buttons and dials as indicated, the Set Lever must be swivelled down to raise the appropriate needles before operating the L-carriage or the Main carriage.

Direction of Carriage Columns

The L-carriage will always be operated first when there are arrows in both carriage columns.

A single arrow \leftarrow or \rightarrow . If the arrow points to the left the carriage must be operated from right to left and vice versa.

A curved arrow thus \curvearrowright means two rows commencing on the right for the first row and returning to the right for the second row. A curve in the opposite direction thus \curvearrowleft means the carriage starts on the left.

Three arrows thus \rightleftarrows are to be read upwards: the first row knitted in the direction indicated by the lowest arrowhead.

More than three rows are indicated by an arrow and a number above. The arrow shows the direction of the first row of that number of rows to be knitted.

In most cases a single arrow will appear in the L-carriage column whereas in the Main carriage column the arrows may indicate more than one row. When this is shown in the chart operate the L-carriage in the direction indicated and allow it to rest on the auxiliary rail, then knit the number of rows indicated for the Main carriage.

If in the next step the L-carriage is shown as operating in the same direction as in the previous row, the L-carriage can be returned across the knitting to its starting position without affecting the knitting provided all needles are in the A or B position.

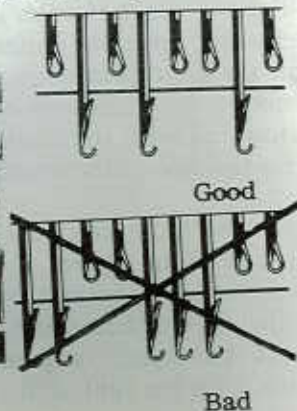
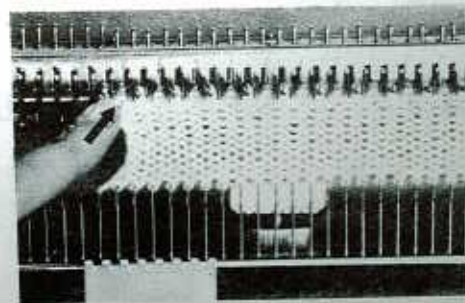
Repeat of pattern

Each chart represents 1 pattern unit, in rows. After the uppermost step on the chart has been knitted, return to step 1, and if necessary reset the controls accordingly.

Note:

- Work the pattern in the sequence indicated by the steps column.
- Always operate the L-carriage before the Main knitting carriage if there are arrows in both carriage columns.
- Place the carriages in the correct position as indicated by the arrow heads before starting the pattern, the Main Carriage on the outer position.
- Reverse knob always on + unless the pattern indicates otherwise.
- All needles in position B unless otherwise indicated (some are sometimes out of action for a more open-work effect).
- Always check that the selvedge needles are in B position before moving the L-carriage.
- In every step where there are one or more shaded squares the Set Lever must be swivelled down to reset the needles before operating the carriages.

Important: Always check your needle setting and if the selvedge needle is raised return it to B position.





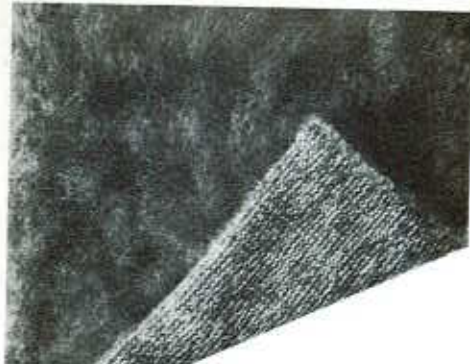
12				5						←	↻																									
11			3							→	↻																									
10						6				←	↻																									
9		2								→	↻																									
8							7			←	↻																									
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5							7			→	↻																									
4			2							←	↻																									
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2				3						←	↻																									
1						5				→	↻																									
Steps	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td colspan="8">Pattern No.</td></tr> <tr><td colspan="8">5</td></tr> </table>								1	2	3	4	5	6	7	8	Pattern No.								5								Reverse knob Slide Dial		Direction of Lace carriage	Direction of Main carriage
	1	2	3	4	5	6	7	8																												
Pattern No.																																				
5																																				
Patt. Sel. Buttons	Press in both "Tuck" Buttons																																			
H.C. Levers	Left :-					Right:-																														
Tension dial	6					4-Ply Yarn																														

10										-		←																								
9										-		→																								
8										-		←																								
7										-		→																								
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4										-		→																								
3										-		→																								
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Steps	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td colspan="8">Pattern No.</td></tr> <tr><td colspan="8">5</td></tr> </table>								1	2	3	4	5	6	7	8	Pattern No.								5								Reverse knob Slide Dial		Direction of Lace carriage	Direction of Main carriage
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Pattern No.																																				
5																																				
Patt. Sel. Buttons	Press in both "Tuck" Buttons																																			
H.C. Levers	Left :-					Right:-																														
Tension dial	6					4-Ply Yarn																														

This pattern uses both "Tuck" Needle Selector Buttons.

Notice that when the Reverse Knob is on the Lace Carriage is not used in that row.

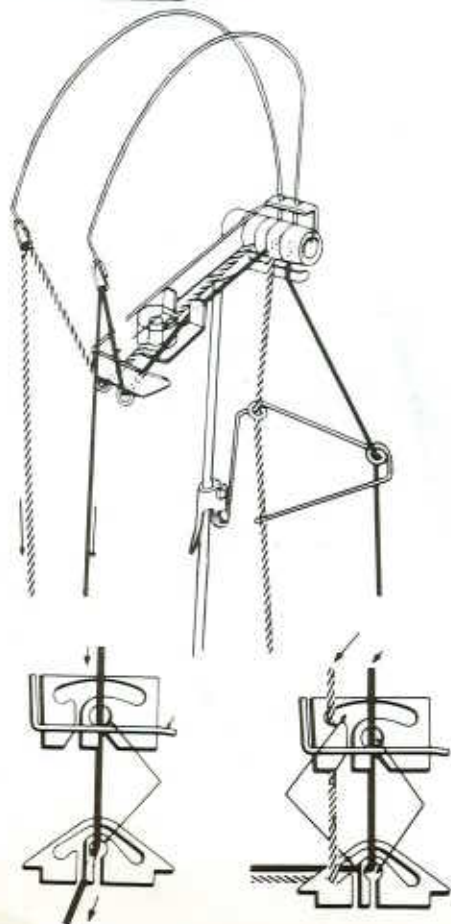




PLATING FEEDER AND FAIR-ISLE

In addition to all its other features the KH91 has a feature in the yarn feeder which makes plating easy.

A combination of new yarn outside and reclaimed yarn inside is possible; and different yarns could be used to produce fluffy fabrics backed with smooth contrast colour yarn.



Carriage setting

For normal plain knitting the carriage should be set on "Plain" with both Holding Cam Levers on I.

Threading the yarn

Thread the two yarns through the yarn tension unit. The main colour on the right as for ordinary knitting, and the second colour on the left. In the carriage feeder the main yarn should be threaded as usual and the other through the slots on the left.

Knitting with the yarn feeder threaded in this manner will produce a plated fabric i.e. one in which the main colour yarn appears on the front of the fabric.

Patterning.

To knit each row in the opposite colour catch the second colour thread in the yarn hanger on the left. (The yarn hangers are situated between the upper and lower sections of the yarn feeder, one on each side).

Sk. 123

Catching the second thread on the yarn hanger.

Tension dial settings for various yarns.

The following experimental guide will be useful when plating:

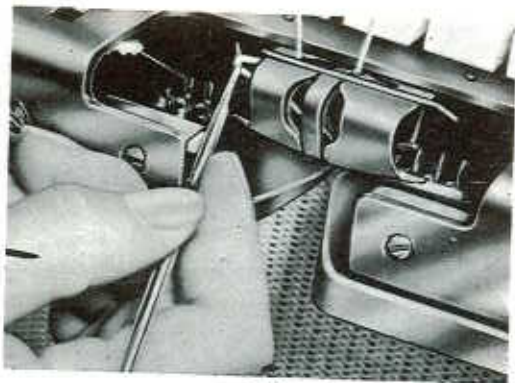
2 medium yarns: Tension about 9

1 medium and 1 thin yarn: Tension about 8

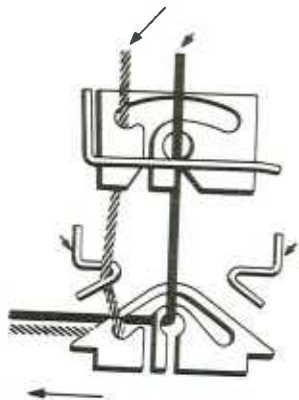
2 thin yarns: Tension about 6

Note:

When plating with two medium thickness yarns a little help must be given by pulling down the fabric to ease the movement of the needles and consequently the carriage. To do this use weights or pull down evenly on the cast-on comb after each row. Waxing the yarn will also help.



Sk. 123



FAIR ISLE PATTERNING

For two colour patterns the yarns can be threaded as for weaving, but if a pattern involves more than two colours in a row each colour must be knitted in separately. This of course requires the carriage to pass across the needles once for each colour to be knitted in.



Two colour patterns

AUTOMATIC:

After several rows of plain knitting stop the carriage on the left side then turn the Stitch Selector Knob to the MC (multi-colour) position and knit 1 row to the right for the needles to remain in the D-position.

Thread the second colour through the Branch Tension Unit and allow it to hang at the side of the fabric to be caught into weaving guides.

To knit the pattern illustrated -

Carriage: PSB - Press in both "part"
 buttons
 SSK - on MC
 HCL - both on I
 Brushes - on W

Needlebed: NPS - on MC
 NSB - as directed

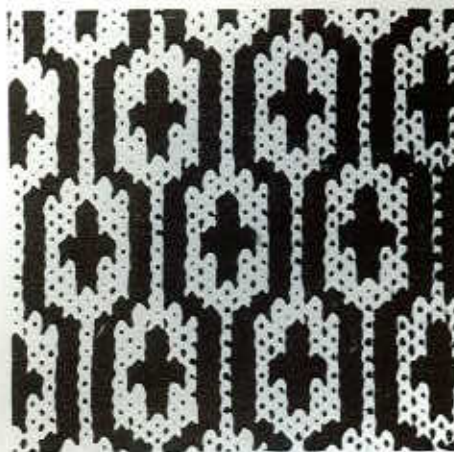
Before each row press the Needle Selector Buttons indicated below and "set", then knit the row.

After each row release the NSB (press 0), and disengage the second colour yarn from the weaving guide to allow it to return to the side of the fabric, ready for the next row.

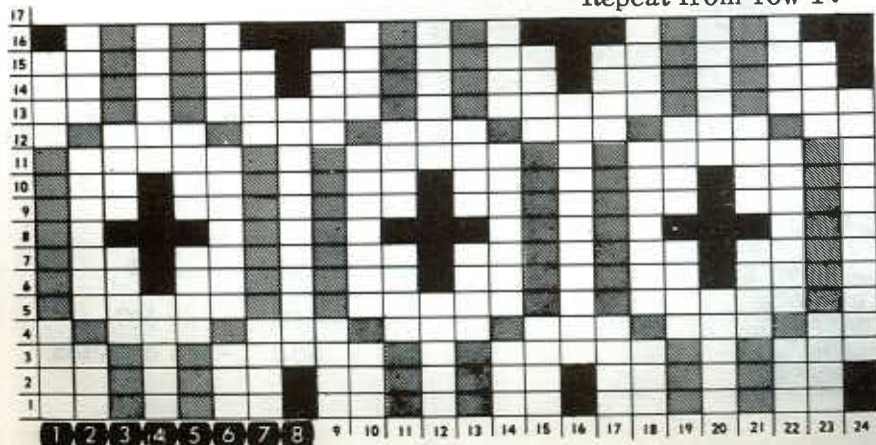
- 1st Row: NSB 1 and 5
- 2nd Row: NSB 4, 5 and 6
- 3rd Row: NSB 3, 4, 6 and 7
- 4th Row: NSB 2, 3, 5, 7 and 8
- 5th Row: NSB 1, 2, 4, 5, 6 and 8
- 6th Row: NSB 2, 3, 5, 7 and 8
- 7th Row: NSB 3, 4, 6 and 7
- 8th Row: NSB 4, 5 and 6

The pattern starts again at row 1.

Now work this pattern out for yourself.



Repeat from row 1.



Checker board pattern

Set the controls for multicolour knitting and thread one colour into the carriage, the other to hang down at the side of the fabric.

Press in both "Part" buttons; and with the Slide Dial on 1 press NSB 1, 2, 3 and 4.

Before each row "set" and check that the second colour is hanging next to the fabric to be caught up by the weaving guide and after every 4th row change the Reverse Switch.

The slide dial and reverse switch

A lot of time can be saved if you become thoroughly acquainted with the use of the Reverse Switch and Slide Dial in Fair-Isling.

In certain geometric designs the Slide Dial can save changing buttons - see how effective this is to change from the checker board pattern to the zig-zag pattern pictured at the side as follows:

Start exactly as for the checker board pattern, but after each of the first 4 rows move the Slide Dial once to the right then for the next 4 rows, move it to the left.



NON AUTOMATIC PATTERNS

In this category we place numerous designs in which the Needle Selector Buttons cannot be used, such as monogrammes, pictures and other patterns in which a different and irregular number of stitches is worked on each row.

A "picker" will simplify the work and insure against dropped stitches.

For these designs the patterning yarn is laid across the needles by hand and the background colour knitted in.

Press in both "Part" buttons, but keep the SSK and NPS on N; place both Holding Cam Levers on I.

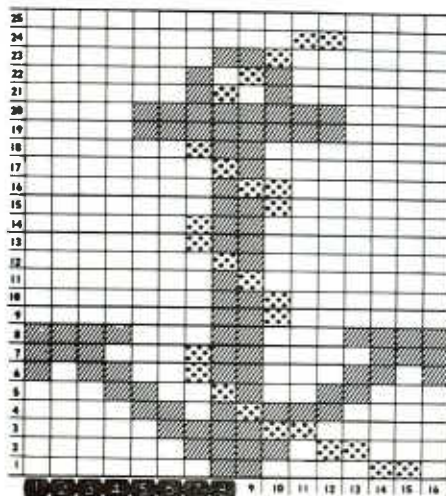
To work the Anchor Pattern:

Place a marker on each side of the 16 needles over which the pattern is to be worked then using separate short strands of yarn for each contrast colour, proceed as follows:

1st Row:

- a. By hand move needles 14 and 15 forward to C position, and pass the picker from right to left across them, lay the 3rd contrast colour yarn across these needles then return the picker from left to right; the latches will close over the yarn, to keep it in position until knitted in.
- b. Raise needles 8 and 9 and using the 2nd contrast colour yarn repeat (a) above.
- c. Raise all other needles to E position and operate the carriage threaded with the background colour; all stitches will be knitted in.

(continued overleaf)



Anchor pattern (continued)

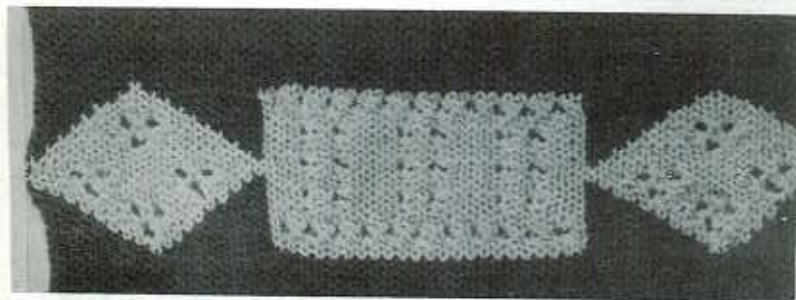
Following Rows:

Repeat these steps for each contrast colour in each row, placing the yarns over the needles indicated by the different shading in the graph.

As soon as the pattern has been worked you can revert to the usual method of knitting.

In this method, it is not necessary to have long strands of yarn stretched across the back of the work, because each design can use separate strands of yarn, the ends of which can be neatly sewn into the back of the work, after knitting.

When working in this method, cross the yarns around each other to prevent gaps where the colours change.



These pictures show the front and back of a Fair-isle pattern in which the yarns are laid across the needles.

WEAVING PATTERNS

With the KH67 Model, EMPISAL introduced a new form of knitting to produce firm, elastic fabrics often indistinguishable from woven fabrics.

There is practically no limit to the types or thicknesses of thread that can be used as weaving yarns; raffias, fine silks, blanket wools, embroidery threads, ribbon-leather thongs, even elastic has been used, to create countless numbers of articles from table mats to curtains, from baby blankets to high fashion fabrics for costumes and top-coats.

The artistry comes in the choice and blending not only of colours but also of materials. Warp threads may be of one kind - weft threads of an absolutely opposite kind giving such combinations as wool with raffia, fine yarn with blanket wool, etc. The general rule will be the thinner yarns for background (warp) and thicker yarns for weft (or weave-in).

Remember that frequently the knitted background is scarcely seen; nevertheless the yarn for this must be chosen with special care because threads do have to come forward over the weaving threads to bind them to the background fabric and help to form the fabric pattern.

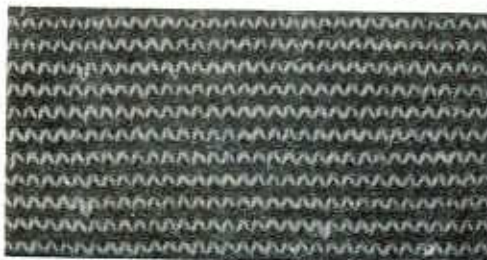
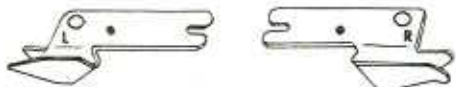
There are three weaving controls. The first at the back of the carriage, i.e. the stitch selector button, the other two on the front of the sinker plate. Each must be set on 'W' (for weaving).

The warp, or background yarn, which forms the length of the fabric is knitted. For this, the yarn is threaded in the usual manner through one set of yarn guides into the carriage feeder.

The weft, or cross thread is threaded through the other set of yarn guides and, depending on the direction of the carriage, one of the weave-in guides.

The tension adjusting knob () must then be adjusted on each side for the respective thicknesses of the two yarns.

The fact that there are only two yarn guides does not limit you to two colour weaving. Other colours can be hand fed into the fabric. The weaving yarn is worked into the fabric by D-position needles which must be set before each row of weaving; thus to weave an extra colour into the fabric place the first weaving yarn away from the weaving yarn guides, and lay the second colour over the D-position needles by hand to be worked into the fabric.



Weave-in guides

Set both guides into position beneath the thumb screws on the carriage, above the sinker plate assembly.

Weaving controls

Set the stitch selector button and both Weaving-in brush knobs on W, and both Holding Cam Levers on I.

When the brushes are set on W they ensure that the weave-in yarn is kept down on the supporting needles and against the gate pegs so that it may be caught into the background fabric.

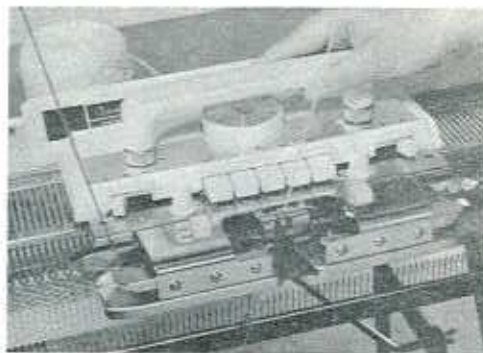
The pattern selector buttons

Use only the "Plain" or "Partial" buttons when weaving. Do not use the "Tuck" buttons, as a tuck stitch not being properly formed will not gather the weave-in thread into the fabric.

The needle position selector

On the needle bed set the needle position selector on N.

The background fabric is knitted mainly on the B-position needles although needles in other positions also perform this function.



The weave-in (patterning) thread

is worked into the background fabric through the weave-in guide, and additional colours worked in by hand.

Occasionally, when the pattern demands, the weaving thread can be worked into the fabric in the opposite direction to the carriage, but then it must be laid over the D-position needles and kept away from the weave-in guide when moving the carriage to prevent it being caught in the brushes beneath the sinker plates.

METHOD:

1. Thread Weaving Yarn through 2nd guide of Tension Unit.
2. Loosen Thumb Screws (e) on carriage.
3. Attach metal Weave Guides () and re-tighten Thumb Screws.
4. Press down Weaving Brush Knobs (k).
5. Set S.S.K. (Stitch Selector Knob) (n) on "W".
6. Push down N.S.B. (Needle Selector Buttons) (11) for Pattern.
7. Set Dial for pattern.
8. Set Lever.
9. Bring Weaving Yarn down through Weave Guide on carriage, nearest the knitting.
10. Knit 1-row.

Repeat Steps 6 to 10 for each row of weaving.

NOTE: Weaving yarn must be changed to Weaving Guide nearest the knitting, at the beginning of every Weaving row.



BEADWORK

Before you can start beading, the beads must be threaded on to the knitting yarn.

Choose a strong yarn over which the beads will slide smoothly and whilst threading them discard any with irregularities which could hamper their smooth flow along the yarn.

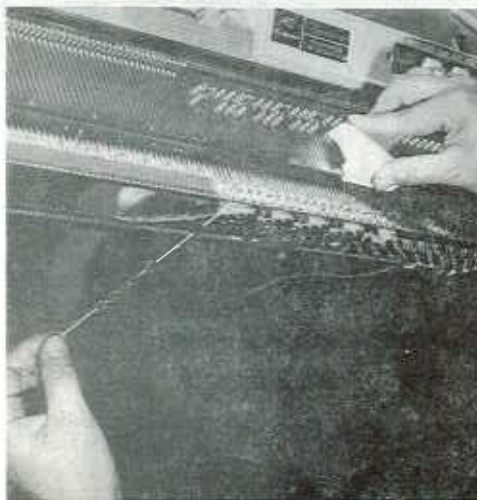
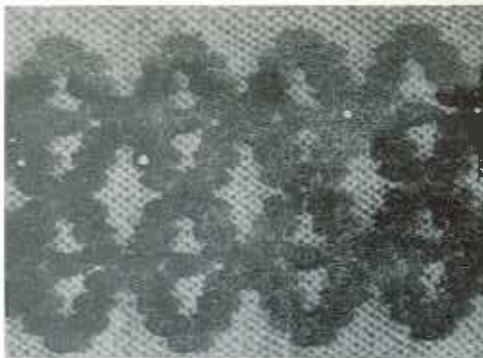
As the yarn used will form the background it must be chosen with a view to the effect one wishes to achieve – for instance an interesting effect is obtained using variegated yarn and transparent beads.

Single colour beading requires no pre-planning, but if a design is required it must first be planned on squared paper and the beads threaded following the plan starting from the lowest row. It will be found more convenient to thread and work a limited number of rows at a time (depending upon the number of beads in the row).

The beads must be threaded in the same order as on the plan and in the same direction as the carriage will operate for each row.

Start with the required number of needles in action, and several rows already knitted in stocking stitch; these can be turned back and hemmed down later if they are not to be seen.

As the beads will not pass through the carriage feeder remove the roller plate from the carriage. You will then feed the beaded yarn to the needles manually. For this reason it is advisable to suspend a cast-on comb on to the fabric.



Carriage setting

Place the stitch selector knob at N and HCL on 1. Press in both "PART" buttons and set the Tension at least 3 full points looser than is usual for the type of yarn being used.

Needle bed controls

Needle Position selector on N; reverse switch on +; press in NSB 1, 3, 5 and 7.

To Bead a Row

1. "Set" the needles, (to raise every alternate needle to Position D).
2. Pass the "Picker" across the needles from right to left to ensure that the stitches on the raised needles are behind the latches.
3. Lay the beaded yarn across the needles, so that the beads fall between the raised needles.
4. Hold the yarn lightly below the needles at the sides so that the beads remain between the needles and pass the picker across from left to right to close the latches over the yarn.
5. Pass the carriage across the needles and the beads are knitted in.

Following row unbeaded

6. Change the Reverse Switch and "set".
7. Pass the picker across the needles from right to left.
8. Lay the yarn across the needles from left to right.
9. Pass picker across from left to right.
10. Pass the carriage across the needles to knit the row.

Repeat from Step 1.

ABBREVIATIONS
(in alphabetical order)

BTA	- Branch Tension Assembly
HCL	- Holding Cam Lever/s
L-carriage	- Lace carriage
MB	- Main Bed
MC	- Main Carriage
NPS	- Needle Position Selector
NSB	- Needle Selector Buttons
PSB	- Pattern Selector Buttons
RS +	- Reverse Switch on + (positive)
RS -	- Reverse Switch on - (negative)
SSK	- Stitch Selector Knob
"Set"	- Operate the Set-lever

The Knitting Course:

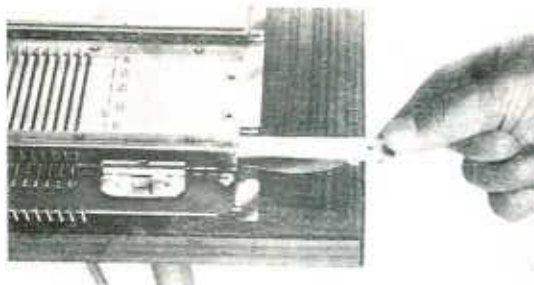
The movement of the carriages across the needles is known as its course.

Right Course means carriage movement from left to right.

Left Course means carriage movement from right to left.

The Knitting Side:

In either course the side which leads is termed the "knitting side", the opposite side being the "trailing side" - therefore the knitting side changes each time the direction of the carriage changes. The reason for this is that only the cams on the knitting side operate according to their setting.

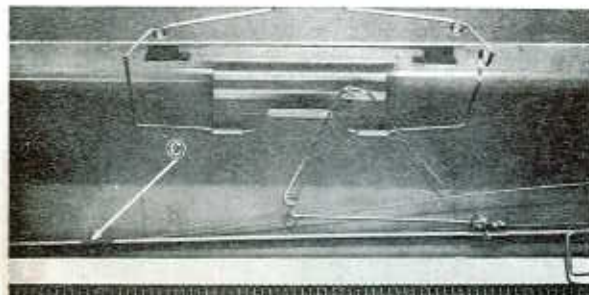
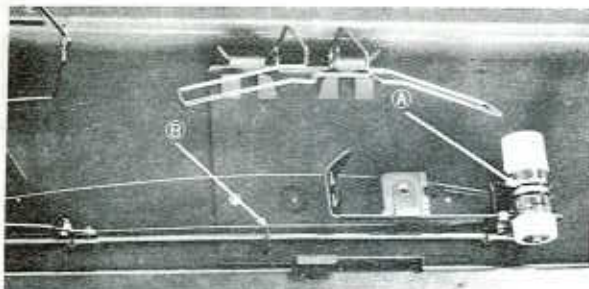
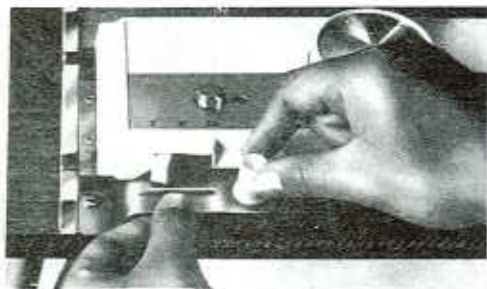
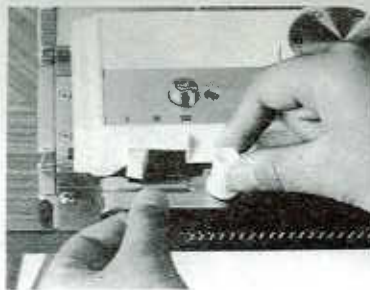
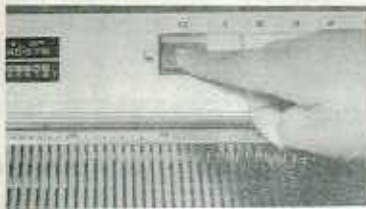


TO REPLACE A NEEDLE

1. Push either end piece of the foam bar with the end of a latchet tool.

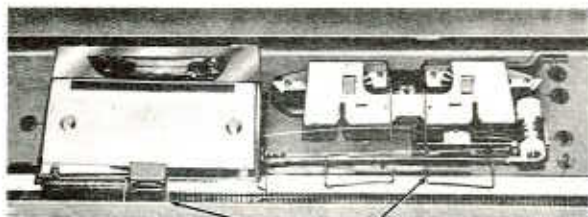
The other end of the foam bar will then appear at the opposite end of the needle-bed.

2. Withdraw it from the knitter until the needle you wish to change is freed.
3. Bring forward the needle as far as it will go.
4. Push down the hook until shank end rises free of needlebed.
5. Grasp shank end and draw it out backwards.
6. Replace with new needle by holding it with the latch opened.
7. Push in the foam bar, making sure that the foam is face downwards.



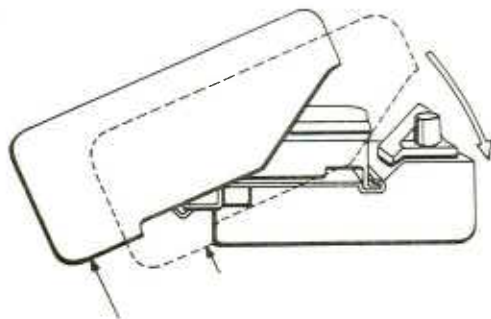
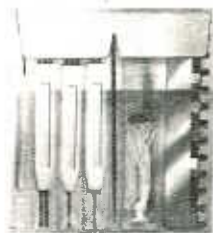
HOW TO FOLD UP THE KNITTER

1. Release all needle selector buttons by pushing down the "0" button, and push back all needles to Position A. (Resting Position)
2. Remove the sinker plate and handle from the carriage.
3. Lock the carriage on the left end of the needlebed.
Note: The row counter tripper must be horizontal.
4. Replace the auxiliary rail in the upper case.
5. Open the springs in the case.
6. Replace the cast on combs in the case with the hooks downwards.
7. Fold up and replace the automatic yarn tension unit as illustrated. (Fit the head (a) under the clasp (b).)
8. Place the yarn tension rod and take up spring next to the cast on combs and inside the hook (c)



- Springs

9. Remove sinker plate from carriage and replace it as illustrated.
10. Remove handle from L-carriage and replace the carriage as illustrated.
11. Close the springs.
12. Remove the Set Lever, Row Counter and accessory tray from the needlebed.
13. Undo the table clamps and separate them from the knitter.



14.
 - a) Replace large accessories in the box ...
 - b) ... and small accessories in the pouch as illustrated ...
 - c) ... then place the pouch over the handles and close the box.
15.
 - a) Hold the box with the front up.
 - b) Insert the rear foot into the rear carriage groove.
 - c) Place the left edge of the box in line with needle No. 40.
 - d) Allow the box to rest on the needlebed.
16.
 - a) Hold the upper case with the front (locks) upwards.
 - b) Slide it towards the front of the needlebed.
 - c) Lower the upper case over the lower case.
 - d) Close the locks.

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* = and following pages

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