SEWING ROOM ENGINEERING MANUAL

(Incomplete)

DUBLIN GARMENT COMPANY

OXFORD SHIRT DIVISION

OXFORD INDUSTRIES, INC.

by

KURT SALMON ASSOCIATES, INC.

ATLANTA, GEORGIA

September, 1970

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES:	SUMMARY NO.: 1 SHEET 1 OF:
DEPARTMENT: Collar	PRODUCT: Dress Shirt	PART: Quarter Patch & Stay	FROM STUDY NOS.:	OPERATOR: Joyce Fordham
OPERATION NO.: 1	OPERATION: Stay Sew to Quarter Patch			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 9 inch	THREADS USED: DSP 100/2	ASL: 3 3/4"
MACHINE MAKE: Pfaff	MACHINE TYPE: 463-34/3 -900AS	GAUGE: SEAM TYPE:	NEEDLES: Schmetz 80	R.P.M.: 4500
THROAT PLATE: 48664 (1.2)	FEED DOG: 47298	PRESSER FOOT: P3613	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Shop made stay guide			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: 9 EFI
AVG. BUNDLE SIZE: 250	AVG. NO. OF THREAD CHGS.:	INFORMATION BY:	MOTION ANALYST:	TIME STUDIES BY: GM
CALCULATIONS BY: GM	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: GM	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: RW	DATE INSTALLED

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions Quarter patches and stays are brought to operator by service personnel. Quarter patches are tied in stacks of 500. The stays are sewn to the quarter patches and the completed assemblies are sent to Collar Run.						
1.	Pick up, position, sew stay to Quarter Patch	20	.0603	1.075	.0647	200	12.9
A.	Dispose completed box, get and open new box of 500				.380	.40	.15
B.	Get stays				.200	.40	.08
C.	Stack completed quarter patches				1.060	.40	.42
D.	Coupon				.250	.40	.10

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	12.95	12½	14.56	7½	12½	20	17.48	DOZ.				218				158
A-D	.76	-	.76	7½	12½	20	.91	BDLE.								
						TOTAL →		100	18.39			2615				1900

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar / PRODUCT: Dress shirt	CONTINUATION OF SUMMARY NO.: 1	SHEET NO.: 2 OF SHEETS:
DATE:	MOTION ANALYST GM	OPERATION NO.: 1	OPERATION NAME: (Describe In Full) Stay Sew to Quarter Patch	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Secure quarter patches and stays from work table at left. Place quarter patches to right of machine and stays in tray above needle. Completed assemblies are kept separate as to lefts and rights. Service personnel take completed work to Collar Run.

Operation Sequence

1. A. Pick up, position, sew stay to quarter patch.

B. RH picks up quarter patch and moves to needle as LH disposes previous assembly. RH then feeds stay between thumb and index finger into stay guide on presser foot. (Approximately 20-30 stays are held in RH and fed one by one onto quarter patches.) LH guides Q.P. while sewing. LH disposes assembly against stop block as RH reaches for next Q.P.

C. RH picks up Q.P. as LH disposes previous assembly. 20-30 stays should be kept in RH.

D. Stay must be positioned on quarter patch according to templates for various style collars.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 1970	SUMMARY NO.: 2 SHE 1 OF: 2
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: R. Coley
OPERATION NO.: 2	OPERATION: Collar Run			OPERATOR'S NO. OR POSITION:
SIZE: 15½	MATERIAL: 65/35	STITCHES PER 11 inch	THREADS USED: DSP	
MACHINE MAKE: US	MACHINE TYPE: 61900	GAUGE: SEAM TYPE:	NEEDLES: 180-036	R.P.M.: 4700
THROAT PLATE: 61928B	FEED DOG: 61926D	PRESSER FOOT: 61920M	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Three-Sided Gauge			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: AMK	MOTION ANALYST: AMK	TIME STUDIES BY: AMK
CALCULATIONS BY: AMK	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: AMK	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: AMK	DATE INSTALLED June 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: M
	Conditions Linings are tied together in bundles according to size and make. Quarter patches are in boxes to side of machine. Collars are in two sections - top and bottom tied together with one string. The three plies are aligned with the quarter patch and stitched together. Collars are disposed into a box for the next operation of clip collars.						
	Operation Sequence						
1.	Pick Up and position lining, collar and first quarter patch	20	20.5	105	.215	100	21.5
2.	Sew around collar inserting second quarter patches	20	.107	105	.112	100	11.2
	Bundle Handling						
A.	Get and prepare bundle, lining, and quarter patches	20	.405	100	.405	2.1	.85
B.	Position collar lining and quarter patches	20	.238	100	.238	2.1	.50
C.	Coupon						.25

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1-2	32.7	12½	36.8	7½	12½	20	44.1	DOZ.				87.5				87.5
A-C	1.33			7½	12½	20	1.6	BDLE.								
						TOTAL →		100	45.7			1050	45.7			1050

FORM 33CP

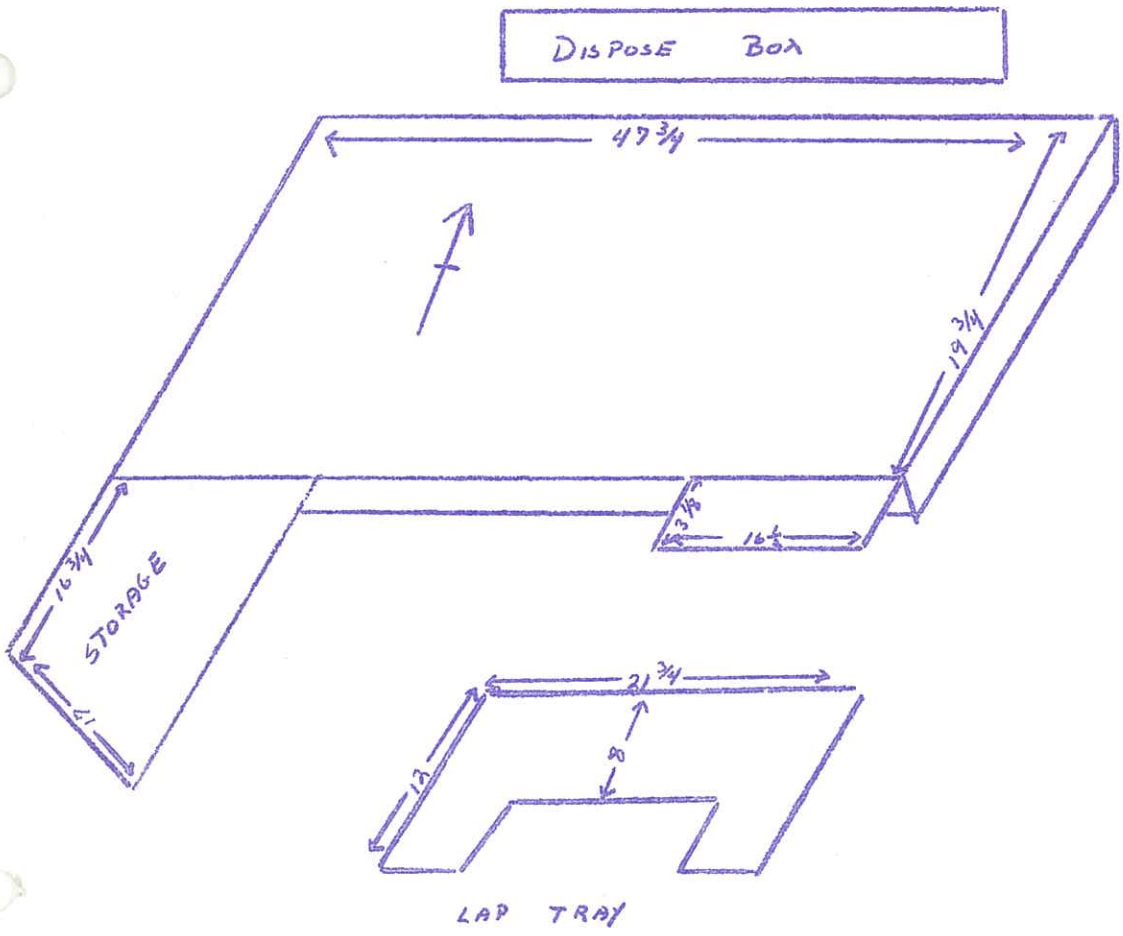
KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 2	SHEET NO.: 2 OF 2 SHEETS:
DATE: June 1970	MOTION ANALYST AMK	OPERATION NO.: 2	OPERATION NAME: (Describe in Full) Collar Run	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
	Bundle Handling Secure bundles of lining and quarter patches for corresponding collars from storage area. Untie lining and place on lining shelf on machine. Place two stacks(left and right)quarter patches directly under machine. Open bundle of collars and place bottom collars to rear of lap tray, top collars to the front of the lap tray. Clip and attach coupon to gum sheet, sign ticket, and sew ticket in chain.	.016
	Operation Sequence	
1.	A. Pick up and position lining, top and bottom collar and first quarter patch.	
	B. Right hand moves lining into position from the lining shelf attached to the machine as left hand sews off previous collar. Right and left hand simultaneously pick up top and bottom collar from lap tray. As both hands lift both plies to the table, the right hand turns the bottom ply forward 180°, aligns and holds with both hands. Align the two plys with the lining on the machine stand. Right hand grasps quarter patch and align, with right edge of collar.	
	C. Use both hands simultaneously.	
2.	A. Sew around collar inserting second quarter patch.	11.2
	B. Using both hands, move collar to machine point. As both hands hold sew first side of collar. Without stopping, chain off approximately 2 inches. Left hand pivots collar 90° and guides as machine sews back of collar. Right hand grasps center of collar on right side with finger underneath and thumb on top and guides as left hand releases forward of collar, and grasps center on left side and holds in same manner as right side. Sew approximately 3/4 down back of collar and stop. Right hand reaches across collar grasp second quarter patch and aligns collar at second edge. Sew remainder at back of collar chaining off approximately 2 inches. Left hand pivots 90° and enters into machine guiding the collar as remaining side is sewn, right hand reaches for next lining.	
	C. Sew collar with one stop to apply quarter patch. Align edges as collar slides through hands. Guide off last point with left hand as right hand reaches for next lining.	

Operation 3

COLLAR RUN



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: May 70	SUMMARY NO.: 3 SHEET 1 OF: 2
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Joyce Tanner
OPERATION NO.: 3	OPERATION: Clip Collar			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE: Schrieber-Goldberg	MACHINE TYPE: 124 A	GAUGE: SEAM TYPE: Collar Clipper	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Air Operated Knee Press and Counter			TYPE POWER TRANSMISSION: Treadle	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JC	MOTION ANALYST: JC	TIME STUDIES BY: BL
CALCULATIONS BY: BL	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JC	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: BL	DATE INSTALLED 5-21-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Collars arrive in mobile box in chain from run operation. Dispose is in chain into mobile box and pushed toward Turn-Form operation.						
	Operation Sequence						
1.	Position, Clip, Reposition, and Clip.		.0376	105	.0396	100	3.96
	Bundle Handling						
	A. Get new bundle		.11	100	.11	2.1	.23
	B. Get new mobile box		.12	100	.12	.7	.08
	C. Dispose mobile box		.08	100	.08	.7	.06

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	% ALLOWANCES Inc. F	% ALLOWANCES Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1	3.96	2½	4.06	7½	12½	20	4.86	DOZ.				750				750
A-C	37			7½	12½	20	.45	BDLE.								
						TOTAL →		100	5.31	.089		9000	5.31	.089		9000

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar PRODUCT:	CONTINUATION OF SUMMARY NO.: 3	SHEET NO.: 2 OF SHEETS: 2
DATE: June 70	MOTION ANALYST JC	OPERATION NO.: 3	OPERATION NAME: (Describe in Full) Clip Collar Points	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Mobile box of 150 collars in chain is pulled into position at right. Collars flow from right to left into another mobile box. Lining side of collar is up. When 150 collars are completed, the full box is pushed toward Turn-Form operation.

Operation Sequence

1. A. Position, Clip, Reposition, & Clip

B. Clipping has just been completed on the previous collar. Right hand moves to next collar (left hand) and grasps bottom edge of collar. The fingers twist the collar open to separate the top ply and lining from the bottom ply (and Quarter Patch). Left hand assists in guiding left end of collar point on holder.

Both hands move blade down holding collar point firmly on holder; Clip collar point by activating machine with left knee. Left hand raises blade quickly and moves to left while holding collar, removing point from blade and sliding collar to left with blade still in collar until next point (right) is on blade. Right hand slides down collar to last end.

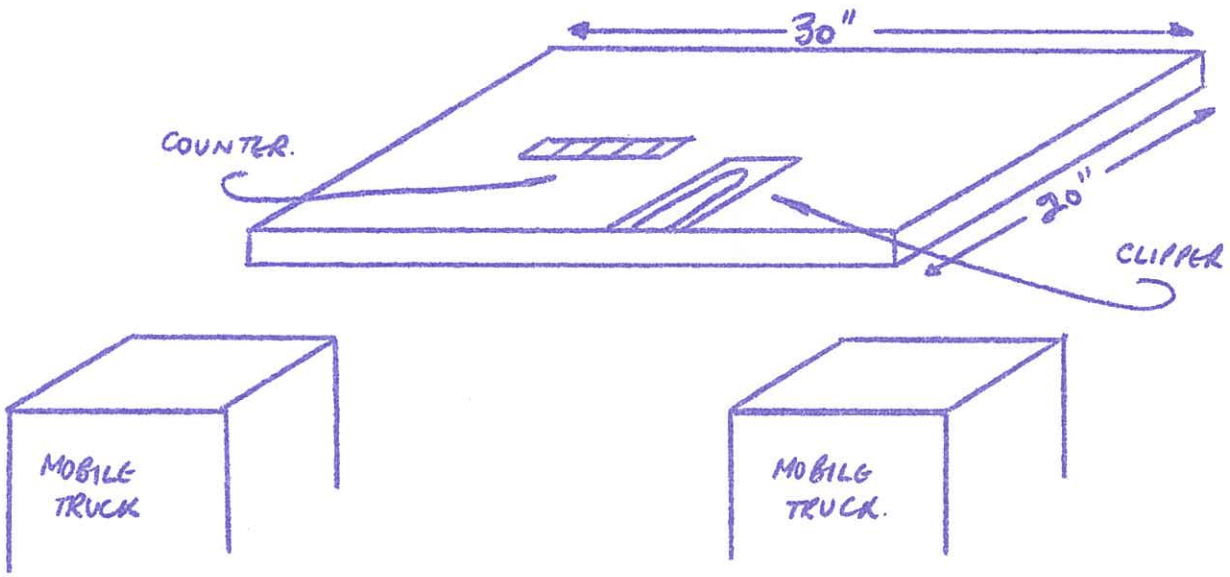
Both hands move to right point and pull tight as before and clip.

C. Clipper should take only one stroke per point. Separate top and bottom ply as previous point is trimmed. Keep blade between plies when moving from 1st to 2nd point.

D. Points should be evenly and cleanly trimmed.

OPERATION 3

CLIP COLLAR



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 70	SUMMARY NO.: 5-A SHEET 1 OF:
DEPARTMENT: Collar	PRODUCT: Ivy Button Down	PART: Collar	FROM STUDY NOS.:	OPERATOR: Syn.
OPERATION NO.: 5	OPERATION: Topstitch Collars			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 14	THREADS USED: 100/2	ASL: 22 3/4"
MACHINE MAKE: Un S	MACHINE TYPE: 61900 B	GAUGE: SEAM TYPE:	NEEDLES: 036	R.P.M.: 5000
THROAT PLATE: 61928 B	FEED DOG: 61926 D	PRESSER FOOT: 61320AA	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Needle Positioner shop made Knife	Edge guide 61 203 G		TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE:
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: GM	MOTION ANALYST: GM	TIME STUDIES BY: GM
CALCULATIONS BY: GM	CALCULATIONS CHECKED BY: GM	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY: GM	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: GM	DATE INSTALLED 6-18-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Collars come from Turn & Form tied in bundles. Bundles are placed on storage shelf to left by service personnel. Collars are topstitched, tied, and placed on storage shelf to right.						
	Operation Sequence						
1.	Pick up, position, topstitch, cut, dispose				.1730	100	17.30
	Bundle Handling						
	A. Coupon				.2500	2.1	.53
	B. Get & position				.2500	2.1	.53
	C. Tie & Dispose				.2140	2.1	.45

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	17.30	12½	19.50	7½	12½	20	23.49	DOZ.				158				158
A-C	1.51	-	1.51	7½	12½	20	1.81	BDLE.								
						TOTAL →	100		25.30			1900				1900

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar PRODUCT Ivy Dress	CONTINUATION OF SUMMARY NO.: 5-A	SHEET NO.: 2 OF 2 SHEETS:
DATE: 6/18/70	MOTION ANALYST GM	OPERATION NO.: 5	OPERATION NAME: (Describe in Full) Topstitch Collar	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Secure tied bundle from left storage shelf and untie. Place collars in lap with collar points away from operator and bottom side of collar face up. Place tie string across disposed well. At end of bundle tie and dispose bundle to right storage shelf.

Operation Sequence

1. A. Pick up, position, topstitch, cut, dispose

B. RH grasps right edge of collar in lap as LH controls sew off of previous collar. RH flips collar and brings collar up to needle. LH & RH guide collar into machine. Sew to collar point tolerance. Stop with needle down. RH pivots collar counter clockwise for top edge stitching as LH pulls previous collar against knife to cut chain. Start stitching across top of collar with RH holding against gauge. During first stitching LH disposed previous collar to disposal well at left. LH & RH guide while sewing down top of collar. Sew to second collar point tolerance. Stop with needle down LH & RH pivot collar counter clockwise to finishing edge. LH controls sew off as RH begins pick up of next collar from lap.

C. RH picks up collar from lap as LH controls sew off of previous collar. RH pivots collar at first collar point as LH cuts chain from previous collar. LH disposes previous collar during stitching across top of collar.

D. Seam margin ¼".
No cross stitches or rounding at corners.
No gutter in points.
Gutter on top edge not to exceed 1/16".
No beading to front side of collar.
Beading to underside not to exceed 1/16".

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

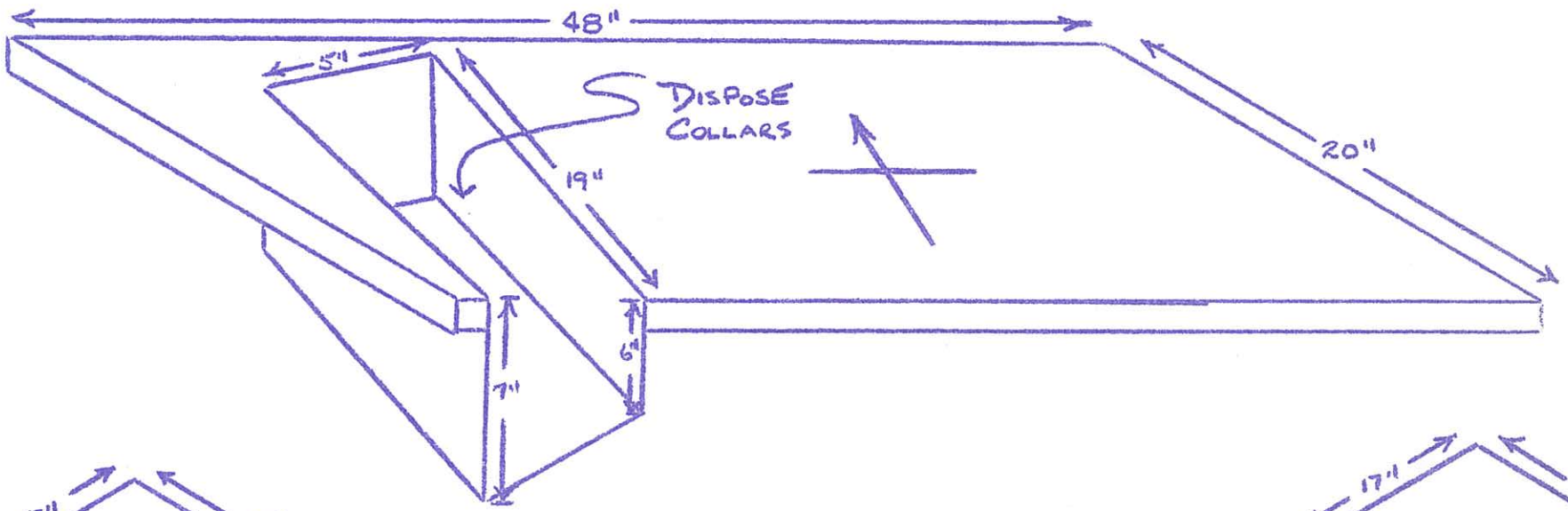
CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: June 70	SUMMARY NO.: 5-B SHE 1 OF: 1
DEPARTMENT: Collar	PRODUCT: Stay Collars	PART: Collar	FROM STUDY NOS.:	OPERATOR: Syn.
OPERATION NO.: 5	OPERATION: Topstitch Collars			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch 14	THREADS USED: 100/2	ASL: 243/4"
MACHINE MAKE: Un S	MACHINE TYPE: 61900 B	GAUGE: SEAM TYPE: B	NEEDLES: 036	R.P.M.: 5000
THROAT PLATE: 61928 B	FEED DOG: 61926 D	PRESSER FOOT: 61320 AA	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Needle Positioner shop made Knife	Edge guide 61 203 B		TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: GM	MOTION ANALYST: GM	TIME STUDIES BY: GM
CALCULATIONS BY: GM	CALCULATIONS CHECKED BY: GM	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY: GM	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: GM	DATE INSTALLED 6-18-70

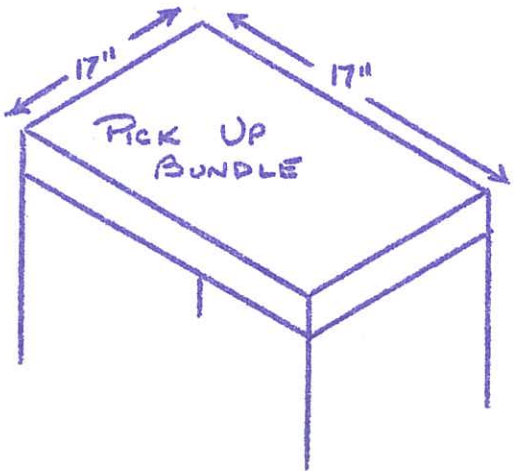
ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Same as Summary						
	Operation Sequence						
	Same as Summary						19.75
	Bundle Handling						
	Same as Summary						1.51

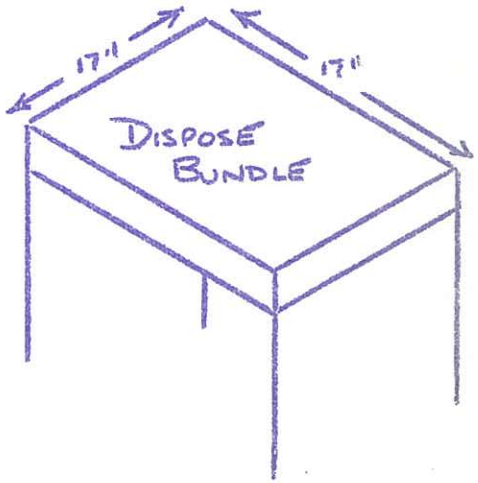
ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1	19.75	12½	21.20	7½	12½	20	26.69	DOZ.				140				140
A-C	1.51	-	1.51	7½	12½	20	1.81	BDLE.								
						TOTAL →	100	28.50				1685				1685

Operation 5

Topstitch Collars







Note: Not To Scale

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 70	SUMMARY NO.: 7 — SHE 1 OF 2
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Band	FROM STUDY NOS.:	OPERATOR: Syn.
OPERATION NO.: 7	OPERATION: Hem Band			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 10 inch	THREADS USED: Cotton	ASL: 18"
MACHINE MAKE: Singer	MACHINE TYPE: 281	GAUGE: SEAM TYPE: ⊣⊢	NEEDLES: 1955-14	R.P.M.: 5400
THROAT PLATE: 142060	FEED DOG: 14-9057	PRESSER FOOT: Flat/with guide 127233	FOLDER: Single Turn	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JC	MOTION ANALYST: JC	TIME STUDIES BY: JC
CALCULATIONS BY: JC	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JC	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JC	DATE INSTALLED 6-9-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Hem Band and Quilt Band are tied together in one bundle. Operator hems band with ¼" single turn Hem in chain, breaks, stacks, and reties bundle.						
	Operation Sequence						
1.	Pick up, load folder, sew				.0473	100	4.73
2.	Stack out				.0156	100	1.56
	A. Process coupon				.25	2.0	.50
	B. Tie and dispose				.23	2.0	.46
	C. Get new bundle				.30	2.0	.60

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1-2	6.29	12½	7.10	7½	12½	20	8.53	DOZ.				385				363
A-C	1.56			7½	12½	20	1.87	BDLE.								
						TOTAL →		100	10.40			4620	11.02			4350

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar PRODUCT:	CONTINUATION OF SUMMARY NO.: 7	SHEET NO.: 2 OF 2 SHEETS:

DATE: 6/9/70	MOTION ANALYST JC	OPERATION NO.: 7	OPERATION NAME: (Describe in Full) Hem Band

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Bands are placed in tray to the left of operator by Service personnel. Operator gets one bundle, places on machine table top. Unties string and places hem band in tray protruding to the right from needle. Face side down. When bundle is complete, right hand pulls band to left hand and move hands placing band in lap and break apart simultaneously. Coupon is attached to last band hemmed before stacking. Tie bundle along with unhemmed band with string and dispose in tray to the right.

1. Operation Sequence

A. Pick up, load folder, sew, stack out

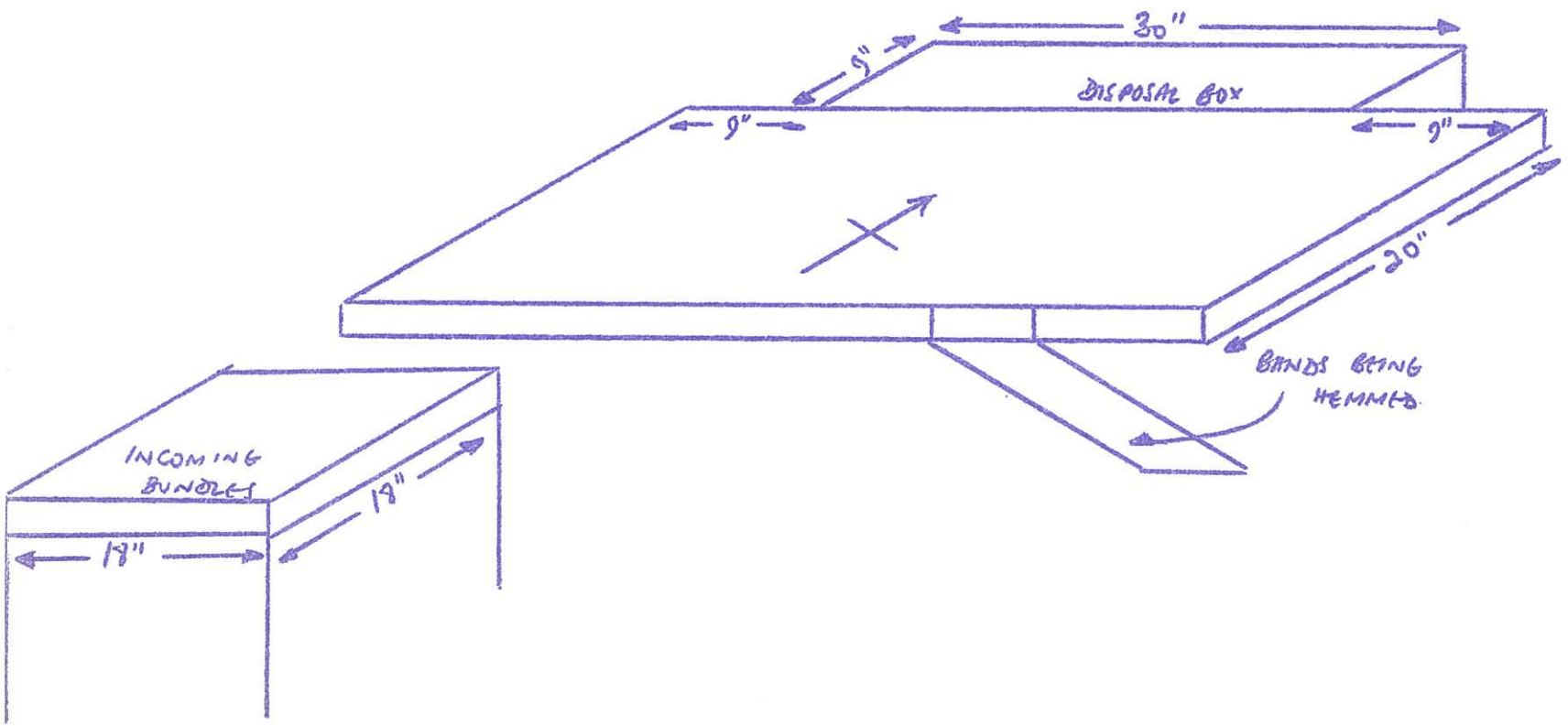
B. Right hand guides band ½ way thru folder. Left hand guides band all the way thru folder. While left hand is completing previous band, right hand reaches next band and positions to front of folder. Left hand assists right hand in loading the folder.

C. Have next band ready to load in folder when previous band is completed.

D. Hem should be uniform in width.

OPERATION 7

HEM BANDS



FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 34A	SHEET NO.: 4 OF 4 SHEETS:
DATE: May 1970	MOTION ANALYST JW	OPERATION NO.: 34	OPERATION NAME: (Describe in Full) Combination	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
8.	A. Seam Right Side B. Same as 4B except as follows: (Last sentence)As the sewing approaches the bottom, take left hand to tail and follow out the last few inches as the right hand moves to lap. After finishing sewing, the left hand pushes the shirt into the trough as the right hand grasps the left front. C. Same as 4C D. Same as 4D	

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 1970	SUMMARY NO.: 8 SHEET 1 OF 2
DEPARTMENT: Parts	PRODUCT: Dress Shirt	PART: Collar	FROM STUDY NOS.:	OPERATOR: Joyce Walker
OPERATION NO.: 8	OPERATION: Band Collar			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 13	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 63900A 63900	GAUGE: SEAM TYPE:	NEEDLES: 183-036	R.P.M.: 5000
THROAT PLATE: 61924B	FEED DOG: 61905B	PRESSER FOOT: 61320AA	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Three Corner Gauge			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JC	MOTION ANALYST: JC	TIME STUDIES BY: JC
CALCULATIONS BY: JC	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: IB	TYPING CHECKED BY: JCR	INSTALLED BY: JC	DATE INSTALLED: June 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% PER: 100
	Conditions Collars, bands, and lining are in separate bundles located on a work aid at operator's left. The collars are complete, one band is hemmed with a ¼" raw edge hem. After matching a bundle of collars, bands, and lining, the operator opens the bundles and places the lining on left of table top, hemmed bands and collars on right of table top - partially under the machine head, and the inner bands in lap. Operator matches the parts and sews together leaving in chain and pushing into chute of back of machine.						
	Operation Sequence						
1.	Pick Up and position parts	20	.1369	100	.1369	100	13.69
2.	Sew together	20	.1479	85	.1257	100	12.57
	A. Untie and position collars		.210	100	.210	2.1	.42
	B. Untie and position lining, tie and dispose excess lining		.325	100	.325	2.1	.65
	C. Untie and position bands		.295	100	.295	2.1	.59
	D. Clip and sign coupon		.25	100	.250	2.1	.50

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1-2	26.26	12.5	29.54	7½	12½	20	35.45	DOZ.				105				105
A-D	2.16			7½	12½	20	2.59	BDLE.								
						TOTAL →		100	38.04			1260	38.04	.634		1260

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT (CODE): 169	PLANT: (CODE)	DEPT.: Parts PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 8	SHEET NO. 2 OF 2 SHEETS:

DATE: June 1970	MOTION ANALYST: JCR	OPERATION NO.: 8	OPERATION NAME: (Describe in Full) Band Collar

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Tie up excess lining from previous bundle, if another size, and dispose left. Match collar and band bundles and get lining from work aid at left. Open bundles and place lining on left of table top, collars and hemmed bands on right table top partially under machine head, and inner bands in lap. Clip and sign coupon.

Operation Sequence

1. A. Pick Up and Position Parts.

B. LH picks up and positions lining to left and front of foot as RH picks up inner band from lap. Position inner band to lining, matching first notch, and hold ends and first notches together as RH slides back aligning notches. LH positions in front of foot as RH reaches for and picks up collar. Match collar end to first notch. LH positions in collar and holds in place until L1 and L2 grasp. Pick up and position hemmed band with RH, match 1st notch then L1 holds in place while RH slides back aligning notches. Position to foot while LH, RH helps hold.

C. LH holds each part in place as RH matches notches.

D. Center notches should always be the same. Distance should be split on first and last notches.

2. A. Sew together.

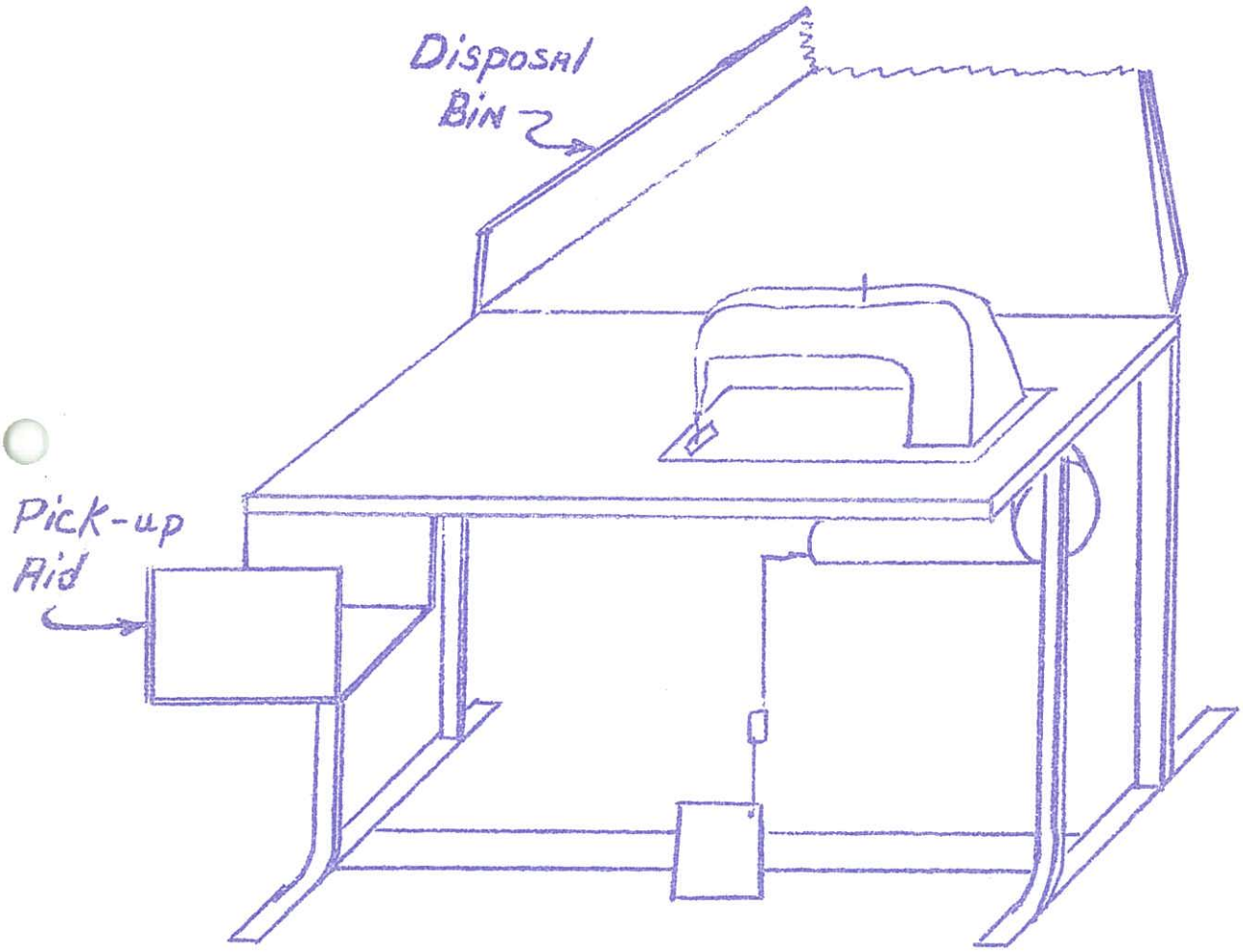
B. Entry sew to about 1" beyond first notch. Stop & realign. Grasp hemmed band between L1 and L2 and collar between LT and L1. RH guides inner band lining.
Sew without stops to about 3" beyond center notch. Stop and realign. RH positions collar to notch on inner band and L1 and LT positions hemmed band to collar. RH releases and LH holds ends together and sews off.

C. LH guides hemmed band and collar. RH guides inner band and lining.

D. Band extensions must be even and notches matched, keep edges against guide.

Operation # 8

Band Collar



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 70	SUMMARY NO.: 9-A SHEET 1 OF 3
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Syn.
OPERATION NO.: 9	OPERATION: Close Band Ends - Wide Bands			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 20 inch	THREADS USED: 200/2 DSP	ASL - 3"
MACHINE MAKE: Singer	MACHINE TYPE: 241-1	GAUGE: SEAM TYPE:	NEEDLES: 88X9 - 14	R.P.M. 4000
THROAT PLATE: Fowler	FEED DOG: 14-9057	PRESSER FOOT: Fowler	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Guide on bobbin cover plate - Fowler edge cutter T2001 stock no. Sunbrand			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JC	MOTION ANALYSIS: JC	TIME STUDIES BY: JC
CALCULATIONS BY: JC	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JC	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JC	DATE INSTALLED 6-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Collars arrive from band operation in chain - slides in 4 chutes to Close Band Ends and dispose in chain in chute. Tickets are attached to first collar and remain in tack.						
	Operation Sequence						
1.	Sew one collar				.087	100	8.70
	Bundle Handling						
	A. Process coupon				.25	2.0	.50
	B. Get new bundle				.10	1.0	.10
	C. Change gauge				.20	.5	.10

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	8.70	12½	9.80	7½	12½	20	11.78	DOZ.				317				317
A-C	.70			7½	12½	20	.84	BDLE.								
						TOTAL →		100	12.62			3800				3800

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar / PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 9-A	SHEET NO.: 2 OF SHEETS: 3
DATE: 6/17/70	MOTION ANALYST JC	OPERATION NO.: 9	OPERATION NAME: (Describe in Full) Close Band Ends - Wide Bands	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Collars arrive in chain from band operation - 4 chutes from band operation are attached to Close Band machine (right side). Ticket is attached to first collar and remains in tact. Bundle is disposed in chain in chute to next operation.

Operation Sequence

1. A. Sew one collar

B. Previous collar is being completed with left hand. Right hand reaches 1st end of next collar, and positions to needle. Left hand assists in positioning to needle and guides band - 1st end thru needle. While left hand is completing the sewing cycle, right hand readhes for 2nd end, breaks 2nd end from next collar and positions to needle. Left hand assists in positioning to needle and guides band 2nd end thru needle. While left hand is completing this sewing cycle, right hand reaches for 1st end of next collar.

C. Right hand prepositions band end during sewing cycle of previous end.

D. Collar must be against gauge correctly so that both band ends will be some length and proper shape.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

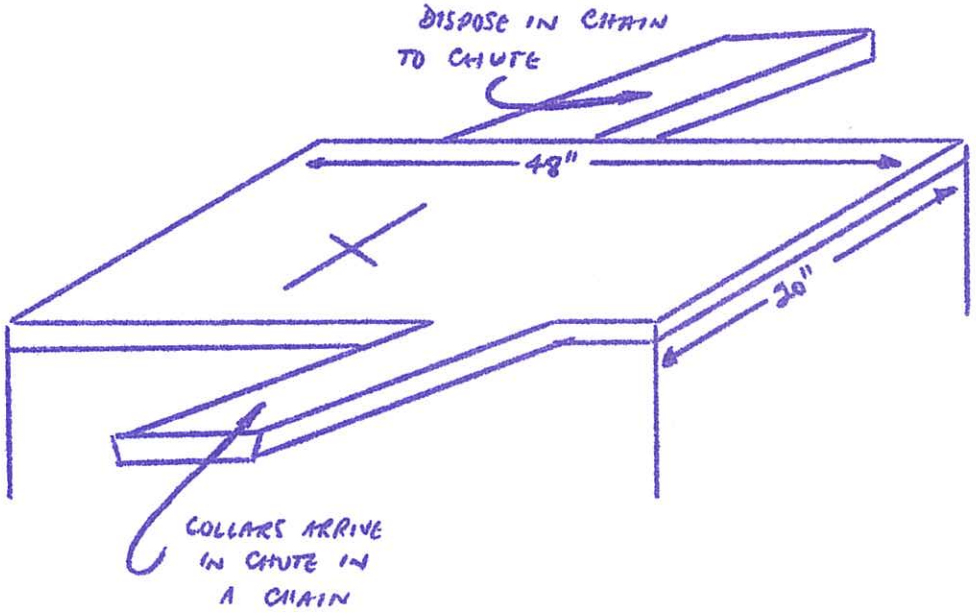
CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: June 70	SUMMARY NO.: 9-B 3 SHE OF: 3
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Syn.
OPERATION NO.: 9	OPERATION: Close Band Ends - DRBR			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch 20	THREADS USED: DSP	
MACHINE MAKE: Singer	MACHINE TYPE: 241-1	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.: 4000
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Guide on Bobbin Cover Plate - Fowler Edge Cutter			TYPE POWER TRANSMISSION IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JC	MOTION ANALYST: JC	TIME STUDIES BY: JC
CALCULATIONS BY: JC	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JC	DATE INSTALLED 6-17-70

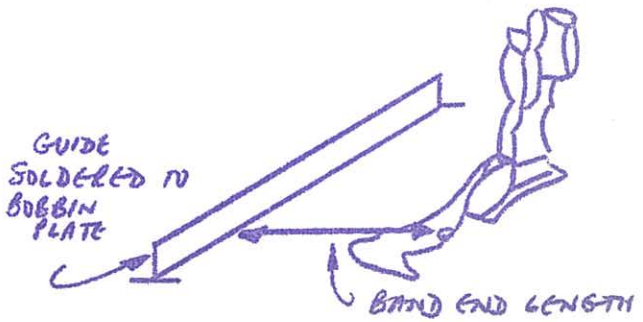
ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Same as Summary						
1.	Operation Sequence						7.50
	Same as Summary						
	Bundle Handling						.70
	Same as Summary						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	7.50	12½	8.45	7½	12½	20	10.15	DOZ.				364				364
A-C	.70			7½	12½	20	.84	BDLE.								
						TOTAL →	100		10.99			4375				4375

OPERATION 9

CLOSE BAND ENDS.





FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 8/26/70	SUMMARY NO.: 12 SHEET 1 OF: 3
DEPARTMENT: Collars (02)	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Helen Register
OPERATION NO.: 12	OPERATION: Trim & Baste Collar Bands			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER In. 6	THREADS USED: 100/2	
MACHINE MAKE: Union Special	MACHINE TYPE: 63400 D	GAUGE: SEAM TYPE:	NEEDLES: Standard	R.P.M.: 4500
THROAT PLATE 63428	FEED DOG: 64139	PRESSER FOOT: 63420	FOLDER: NA	GEARS: CAMS:
ATTACHMENTS: Edge Guide on Foot			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 50	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: REN	MOTION ANALYST: REN	TIME STUDIES BY: REN
CALCULATIONS BY: REN	CALCULATIONS CHECKED BY: REN	SKETCHES BY: REN	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY: REN	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: GM	DATE INSTALLED

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Bonded collars come from Cord Down in tied bundles. Bundles are placed on machine storage box. Collars are stacked back after several bundles are sewn. Bundles are disposed to the left.						
	Operation Sequence						
1.	Pick up, position, sew	20	.0596	90	.0536	100	5.36
2.	Stack out	20	.0150	100	.0150	100	1.50
	Bundle Handling Time						
A.	Get, untie, position bundle				.25	2.0	.50
B.	Clerical				.25	2.0	.50
C.	Tie & dispose				.20	2.0	.40

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	6.86	12½	7.71	7½	12½	20	9.25	DOZ.				366				370
A-C	1.40		1.40	7½	12½	20	1.68	BDLE.								
						TOTAL →		100	10.93			4390				4445

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collars PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.:	SHEET NO.: 2 OF 3 SHEETS:

DATE: 8/26/70	MOTION ANALYST REW	OPERATION NO.: 12	OPERATION NAME: (Describe in Full) Trim & Baste Collars

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Collars are secured from operators right on storage table. Bundle is untied and placed under machine arm with hemmed band on top. After several bundles are sewn, operator stacks out and ties bundles, clips coupon and disposes to her left.

Operation Sequence

A. Pick up, position and sew one collar.

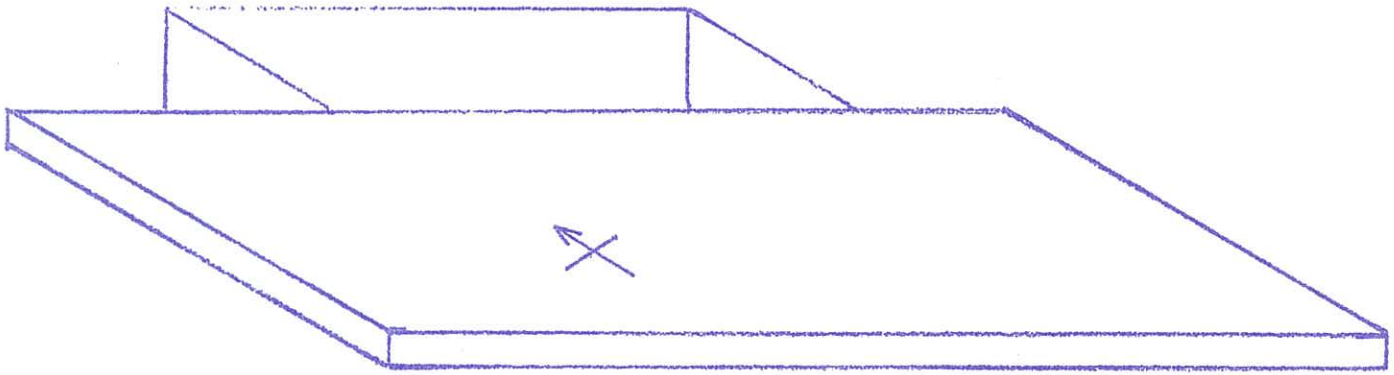
B. Machine has stopped as previous collar is completed. LH & RH position next band to sewing foot and machine starts. LH guides collar as machine sews across band. RH moves to collar placed under machine arm and gets next collar and pre-positions for the next sew cycle.

C. Use both hands simultaneously.

A. Stack out.

B. LH pulls collar to RH. RH places collar in lap as LH moves to next collar. LH grasps next collar and snaps connecting thread. Operation is repeated.

C. Bands must be sewn by guide.



STORAGE

STORAGE

FORM 33B

KURT SALMON ASSOCIATES — CONSULTING ENGINEERS

MOTION AND TIME ANALYSIS SUMMARY

CLIENT: (CODE) 169	PLANT: (CODE)		DATES OF STUDIES: 9/16/70	SUMMARY NO.: 13 SHEET 1 OF: 3
DEPARTMENT: Collars (02)	PRODUCT: Shirt	PART: Collar & Band	FROM STUDY NOS.:	OPERATOR: Frances Sharp
OPERATION NO.:	DESCRIPTION: Notch Collar Band			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER NA	THREADS USED: NA	
MACHINE MAKE: Shop	MACHINE TYPE: Heatdre Burner	GAUGE: NA SEAM TYPE:	NEEDLES: NA	R.P.M.: NA
THROAT PLATE: NA	FEED DOG: NA	PRESSER FOOT: NA	FOLDER: NA	GEARS: CAMS:
ATTACHMENTS: See Drawing			TYPE POWER TRANSMISSION: NA	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 50	AVG. NO. OF THREAD CHGS.: NA	INFORMATION BY: REN	MOTION ANALYST: REN	TIME STUDIES BY: REN
CALCULATIONS BY: REN	CALCULATIONS CHECKED BY: REN	SKETCHES BY: REN	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY: REN	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: REN	DATE INSTALLED 9.21.70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Collars arrive in tied bundles from Trim and Baste. Collar bands are notched and retied in bundles for BH & BS neck.						
	Operation Sequence						
1.	Pick up, position, notch and dispose	40	.0587	105	.0616	100	6.16
	Bundle Handling Time						
A.	Get, untie, position in lap				.20	2	.40
B.	Clerical				.25	2	.50
C.	Tie and dispose				.20	2	.40
							1.30

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	6.16	5	6.47	7½	12½	20	7.76	DOZ.				439				416
A-C	1.30		1.30	7½	12½	20	1.56	BDLE.								
						TOTAL →		100	9.32			5150				5000

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collars / PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 13	SHEET NO.: 2 OF 3 SHEETS:

DATE: 9/21/70	MOTION ANALYST RBN	OPERATION NO.: 13	OPERATION NAME: (Describe in Full) Notch Collar

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Tied bundles are secured from left of machine. They are placed in operator's lap and untied. Collars are placed in lap with point toward operator and hemmed band on bottom. After notching collars are placed in hanger in the table front. At the completion of the bundle, the bundle is tied, coupon clipped and bundle disposed to the operator's left on storage table.

Operation Sequence

A. Pick up, position collar, notch, and dispose

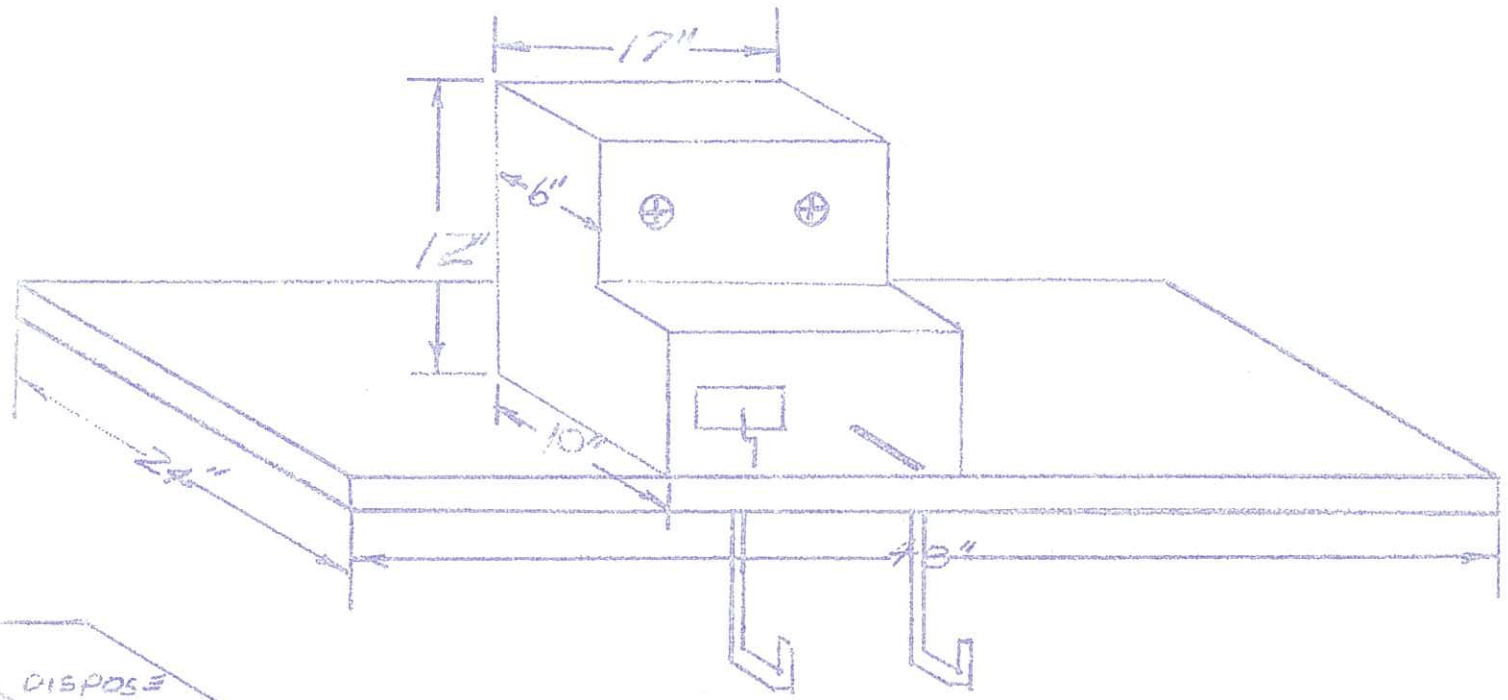
B. Previous collar has just been dropped into the dispose hanger. RH moves to the center of the next collar. LH grasps the left end of the same collar. Index and middle fingers of the RH turn the hemmed band back toward the collar points as little finger flips right end of collar down and around so that LH grasps band right end. Collar is now folded around index finger of RH. LH is grasping both band ends. LH aligns "V" formed by the collar and band so that band is centered around index finger of RH. Collar is moved to peg on machine as center of collar is positioned around peg by RH - LH places band to quarter notch wire. RH thumb flips top portion of the folded collar upward and to the right and both bands drop collar into the dispose hanger.

C. Ends of collars are flipped with fingers and thumb for quickest results.

D. Notches must be according to band notch template.

NOTCH COLLAR

SUMMARY 13



DISPOSE

PICK-UP

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 8-30-70	SUMMARY NO.: 14 SHE 1 OF: 2
DEPARTMENT: Collar	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Sadie Tyson
OPERATION NO.: 14	OPERATION: Buttonhole-Button Sew Band in a Part			OPERATOR'S NO. OR POSITION:
SIZE: 15½	MATERIAL: All	STITCHES PER ~~BH 90~~ ~~BS 16~~	THREADS USED: BH-40/6 BS-50/3	
MACHINE MAKE: Singer	MACHINE TYPE: BH-271-K1 BS-114-54	GAUGE: SEAM TYPE: Shop	NEEDLES: BH-71x1 BS-108	R.P.M.: BS-1500 BH-2500
THROAT PLATE: Standard	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: 271642 CAMS: 271638
ATTACHMENTS: See Attached			TYPE POWER TRANSMISSION: I M2	MACH. TIME PER PIECE: BH-.04 BS-.01
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: REN	MOTION ANALYST: REN	TIME STUDIES BY: REN
CALCULATIONS BY: REN	CALCULATIONS CHECKED BY: REN	SKETCHES BY: REN	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY: REN	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: REN	DATE INSTALLED 9-14-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions Collars arrive from notch collar tied in bundles. Operator places collars in work aid and button holes - button sews and places collars on left - they are tied and disposed to the left.						
	Operation Sequence						
1.	Pick Up, Position, Button Hole, Reposition Button Sew, Dispose	3.0	.077	0112½	.0867	100	8.67
	Bundle Handling						
A.	Pick Up, Position, Untie				.25	2	.50
B.	Clerical				.25	2	.50
C.	Tie and Dispose - String prepositioned				.15	2	.30
							1.30

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	8.67	12	9.71	7½	12½	20	11.67	DOZ.								300
A-C	1.30	-	1.30	7½	12½	20	1.56	BDLE.								
						TOTAL →		100	13.23			3625				3600

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Collar -02 PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 14	SHEET NO.: 2 OF 2 SHEETS:
DATE: 9-16-70	MOTION ANALYST: REN	OPERATION NO.:	OPERATION NAME: (Describe in Full) HH-BS Band (In a Part)	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Operator gets bundle from her right - places it in work aid on the right of machine.

Bundle is placed with the hemmed band up high ply number on top. String is placed in the slot in the disposal work aid at operator's left. Completed work is placed to the left - hemmed band down high ply number on bottom. Tie bundle - clip coupon and dispose to the left.

Operation Sequence

1. A. Pick up, Position to buttonhole machine, sew, reposition to button sew, sew, dispose.

B. As the left hand disposes the previous collar, the right hand positions the next collar to the buttonhole gauge. The left foot lowers the clamp and left knee starts the buttonhole machine. The left hand moves to grasp the collar at the button end approximately 2" from collar point. Collar is grasped with a thumb and index finger on top. Left hand moves collar to button sew gauge as right hand gets button from tray at right and loads button clamp. Right foot lowers clamp and left hand starts the button sew machine. Once the button clamp is loaded, the right hand moves to get next collar at right. Button Sew completes cycle - Left hand pulls button sew end from button clamp. Left hand moves to other end of collar - unloades button hole machine and disposes to left.

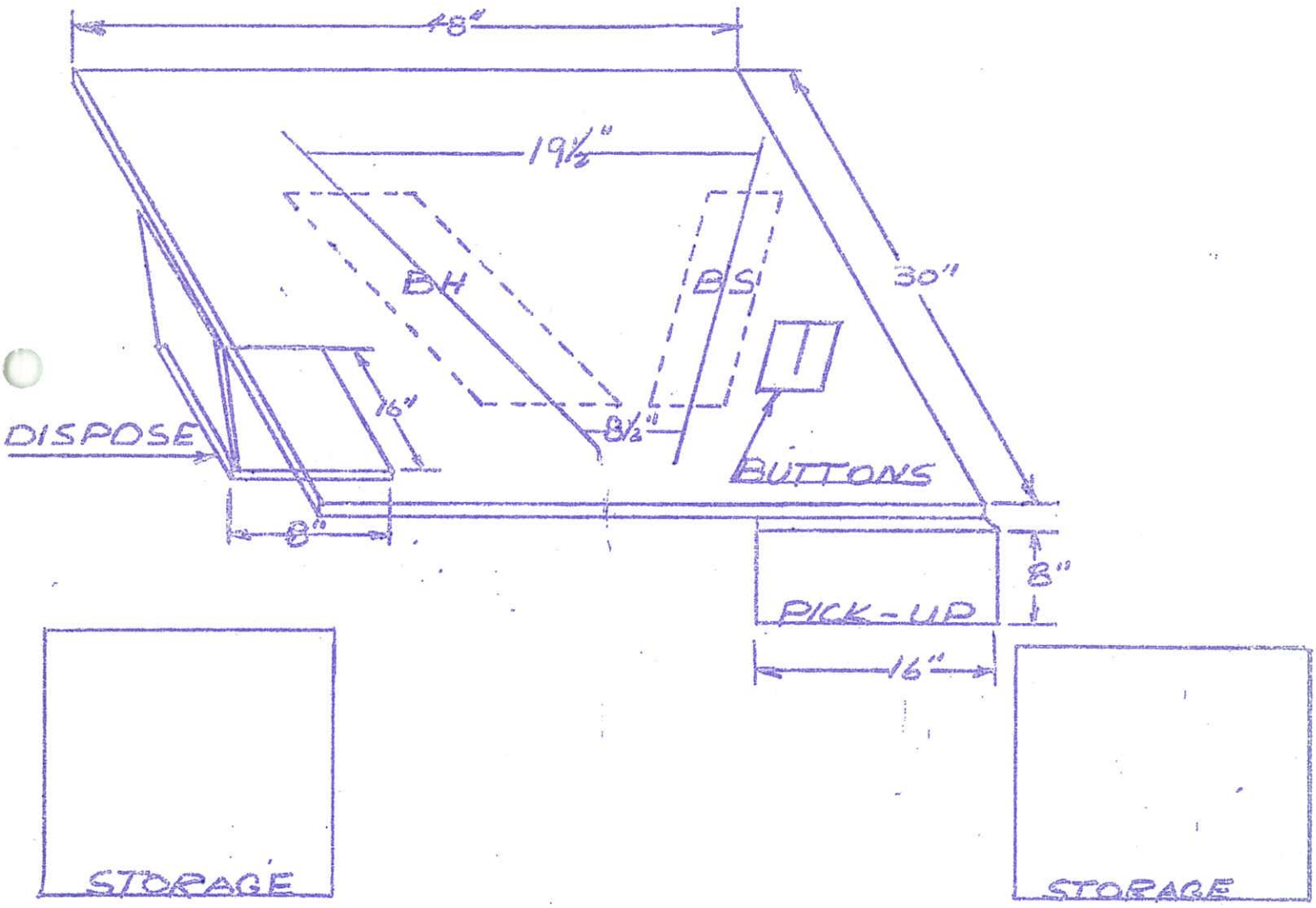
C. Simultaneous use of both hands is a must.

D. The lead edge of the collar must be flush with the edge of the gauge with the "V" formed by the band and collar snug with the end of gauge.

E. Each collar style must have a different button hole and button sew gauge.

#14

BUTTON-HOLE - BUTTON-SEW BAND



FORM 33B **KURT SALMON ASSOCIATES** — **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: 7-24-70	SUMMARY NO.: 15 SHEET 1 OF: 2
DEPARTMENT: Frt & Bk Prep	PRODUCT: Shirts	PART: Front	FROM STUDY NOS.: 15-1	OPERATOR: Jaqueta Gruber
OPERATION NO.: 15	OPERATION: Hem Right Fronts			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 13	THREADS USED: 4	
MACHINE MAKE: US	MACHINE TYPE: 56300	GAUGE: SEAM TYPE:	NEEDLES: 100/2	R.P.M.: 5100
THROAT PLATE: 51224	FEED DOG: 51205	PRESSER FOOT: 51720	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Stacker			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 8-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions Work is brought in bundles by a service operator. In this operation, the right fronts are hemmed. The machine has an automatic stacker arm. At the end of each bundle, it is tied with ribbon and placed on a trolley. The next operation is centerplait.						
	Operation						
1.	Position front in folder, push starter and sew through.	20	6.45	130	8.37	100	8.37
	Bundle Handling						
A.	Coupon disposal	3	26.0	100	26.0	2.1	56.0
B.	Untie bundle and sort into left and right fronts-dispose left fronts.	3	40.0	100	40.0	2.1	84.0
C.	At end of bundle, tie both left and right fronts in bundle and dispose.	3	22.0	100	22.0	2.1	46.0

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1	8.37	7½	9.01	7½	12½	20	10.80	DOZ.				313				313
A-C	1.70	-	1.70	7½	12½	20	2.00	BDLE.								
						TOTAL →		100	12.80			3700	12.80			3700

FORM 33CP

KURT SALMON ASSOCIATES

MOTION AND TIME ANALYSIS SUMMARY

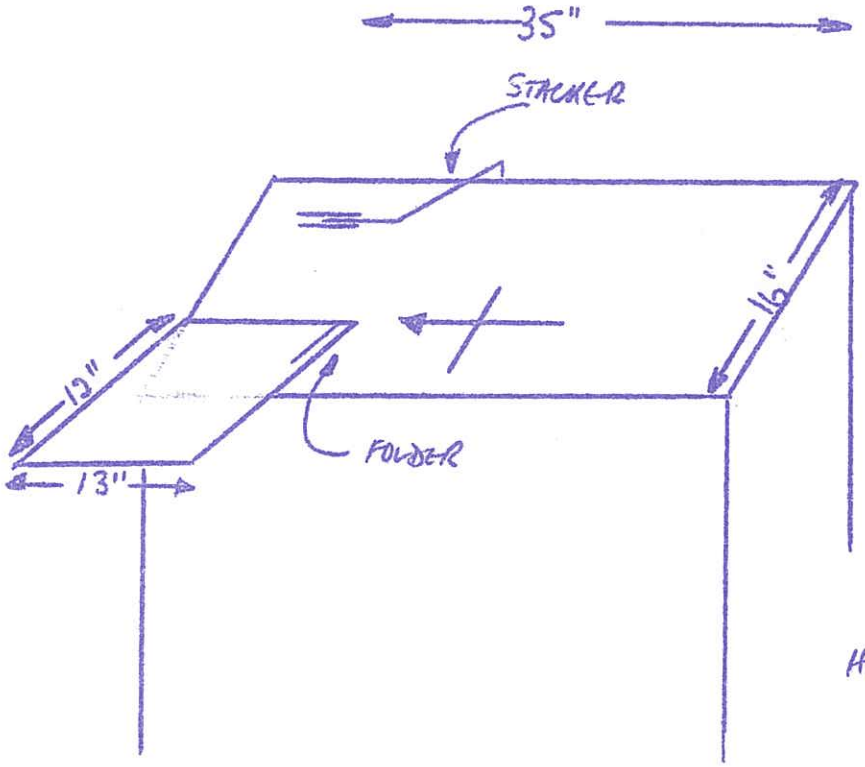
CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Frt & Bk Prep PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 15	SHEET NO.: 2 OF 2 SHEETS:
DATE 7-24-70	MOTION ANALYST JCR	OPERATION NO.: 15	OPERATION NAME: (Describe in Full) Hem Right Front	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME P UNIT
1.	A. Position Front in Folder, push starter and sew through. B. While previous front is going through the machine, the left hand grasps the next front. This is placed in the folder approximately 2-3 inches behind the preceding front. Both hands are used to guide the front initially. C. The motion of fronts through the machine should be virtually continuous. The needle should not be stopped between shirts. D. The hem must be made on the notch previously inserted. Both ends of the hem must be flush with the bottom of the front. <u>Bundle Handling</u> Bundle is picked up from bench beside the operator. This is untied and sorted. The left fronts are placed to one side and the right fronts placed at the left of the operator. At the end of the bundle, the right fronts are collected from the stacker and reunited with the left fronts, both are tied and disposed. The coupon is dealt with.	

OPERATION 15

HEM RIGHT FRONT



HEIGHT 36"

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-28-70	SUMMARY NO.: 16A SHE 1 OF: 2
DEPARTMENT: Frt & Bk Prep.	PRODUCT: Shirts	PART: Fronts	FROM STUDY NOS.: 1-3	OPERATOR: Composite
OPERATION NO.: 16	OPERATION: Centerplait - Narrow Lining			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch 13	THREADS USED:	
MACHINE MAKE: US	MACHINE TYPE: 54400	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.: 5100
THROAT PLATE: 54228	FEED DOG: 54224	PRESSER FOOT: 54220	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: IB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-30-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions Bundles are put at left side of operators by service personnel. Lining comes in rolls. Bundle of fronts is delivered with bundle of centers. In this operation, a centerplait with lining is sewn on in a chain into a parts box.						
	Operation Sequence						
1.	Pick Up and Position center strip in folder, pick up and position front.				11.0	100	11.0
2.	Sew centerplait to front.				8.3	100	8.3
	Bundle Handling						
A.	Process Ticket				27.7	2.1	0.58
B.	Bundle Handle.				27.7	2.1	0.58

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	19.3	7	21.0	7½	12½	20	25.20	DOZ.				150.0				150.0
A-B	1.16	-	1.16	7½	12½	20	1.40	BDLE.								
						TOTAL →		100	26.6			1800	26.6			1800

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Fronts PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 16A	SHEET NO.: 2 OF 2 SHEETS:
DATE: 7-28-70	MOTION ANALYST JCR	OPERATION NO.: 16	OPERATION NAME: (Describe in Full) Sew Centerplait	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Bundles are brought by service operators and placed on left side of operator. On taking up a bundle, the operator removes the right fronts, folds them in two, and positions them at the back of the bench with the remaining shirts of the coupon. The left fronts are placed on the left of the operator face down and the centerplaits are placed on top of these.

Two to four bundles are worked at a time depending on their size.

As each bundle is sewn, the centerplaits are placed on the operator's lap at the bundle commencement.

The bundle is sewn in a chain into a disposal bin behind the machine.

Operation Sequence

1. A. Pick up and Position. Center pleat in folder, Pick up and position front.

   B. As machine stops sewing previous front, both hands reach down, collect centerplait and position in folder. This is then aligned at the needle.

   C. Positioning of the centerplait into the folder should be one fluid movement.

   D. Edge of centerplait should be parallel to vertical stripes.

2. A. Sew centerplait to front.

   B. Left hand feeds bulk of material past the needle while the right hand insures that the folder is filled correctly.

   C. Sew should be continuous from one end to the other.

   D. There must be no raw edges.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

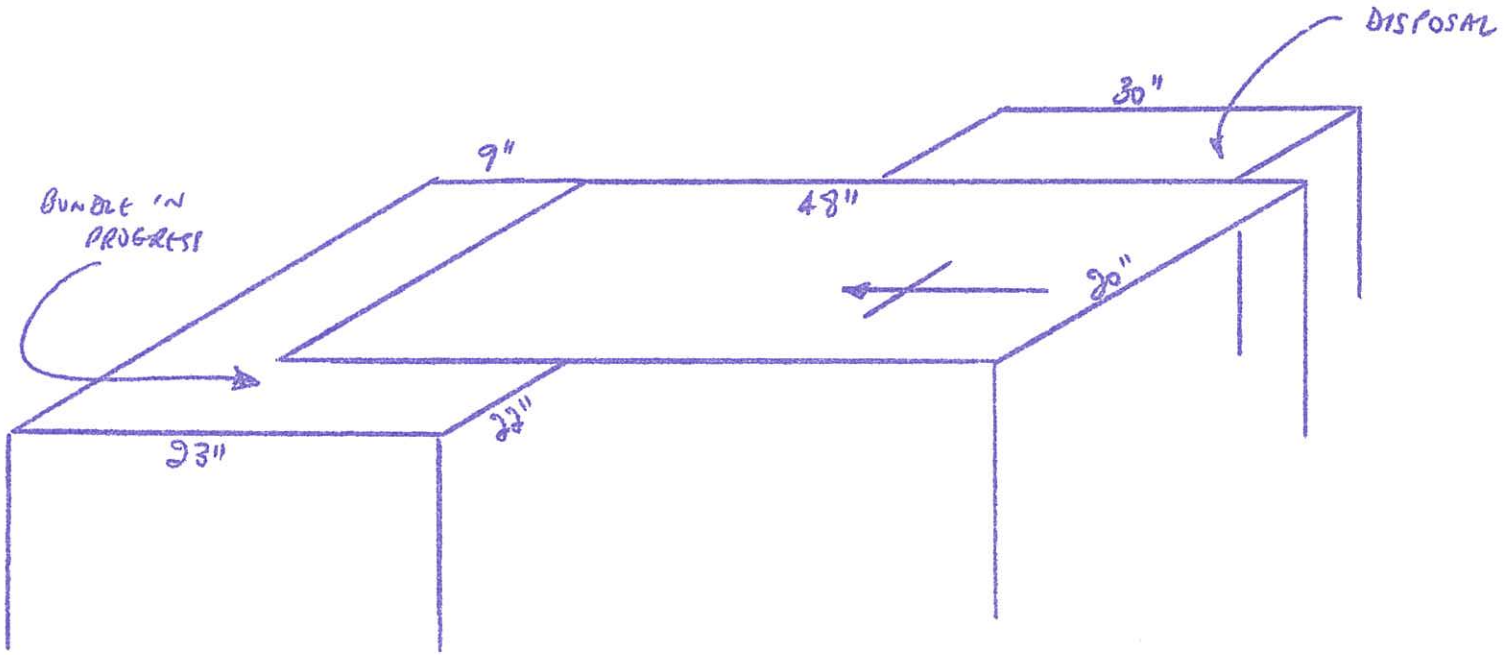
CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-28-70	SUMMARY NO.: 16B SHEET NO.: 1 OF: 1
DEPARTMENT: Fronts	PRODUCT: Dress Shirts	PART: Front	FROM STUDY NOS.: 1-3	OPERATOR: Composite
OPERATION NO.: 16	OPERATION: Sew Centerplait - Wide Lining			OPERATOR'S NO. OR POSITION:
All	MATERIAL: All	STITCHES PER: 13 inch	THREADS USED:	
MACHINE MAKE: US	MACHINE TYPE: 54400	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.: 5100
THROAT PLATE: 54228	FEED DOG: 54224	PRESSER FOOT: 54220	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTRUCTED BY: JCR	DATE INSTALLED 7-30-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As in Summary A.						
	Operation Sequence						
1.	Pick Up and Position center strip in fold, pick up and position front.				12.80	100	12.80
2.	Sew centerplait to front.				8.40	100	8.40
	Bundle Handling As in Summary A.						1.16

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	21.20	7	22.75	7½	12½	20	27.22					140.5				140.5
A-B	1.16	-	1.16	7½	12½	20	1.40	DOZ.								
								BDLE.								
						TOTAL →		100	28.62			1685	28.62			1685

OPERATION 16

SEW CENTER PLEAT



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-29-70	SUMMARY NO.: 17 SHE 1 OF: 2
DEPARTMENT: Front & Back Preparation	PRODUCT: Dress Shirts	PART: Front	FROM STUDY NOS.:	OPERATOR: M. McNair
OPERATION NO.: 17	OPERATION: Clip and Stack after Centerplait			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE: Scissors	MACHINE TYPE:	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED August 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions Fronts are moved into a disposal bin in a chain from centerplaiting. In this operation, the fronts are pulled out in the chain and both ends are clipped evenly. They are then stacked. The next operation is Buttonhole Front.						
	Operation						
1.	Pick up front, clip both ends, and stack.	20	5.48	130	7.12	100	7.12
A.	A. Put fronts with backs of the bundle and tie together. Dispose.	3	0.29	100	0.29	2.1	0.61
B.	Clip Coupon	3	0.28	100	0.28	2.1	0.59

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	7.12	2½	7.30	7½	12½	20	8.76	DOZ.				392				392
A-B	1.20	—	1.20	7½	12½	20	1.44	BDLE.								
						TOTAL	→	100	10.2			4700	10.2			4700

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Preparation PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 17	SHEET NO.: 2 OF 2 SHEETS:
DATE: 7-29-70	MOTION ANALYST JCR	OPERATION NO.: 17	OPERATION NAME: (Describe in Full) Clip and Stack after Centerplait	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
1.	A. Pick up front, clip both ends and stack. B. Left hand pulls front out of bin and scissors in right hand clip off leading edge. Front rests on bundle while following edge is trimmed. C. Left hand is responsible for motion of front - in right-handed person. D. Trimming must be exactly flush with the edges of the front. No lining should remain showing. <u>Bundle Handling</u> The bundle is formed underneath the clipping operation so that no realignment is necessary to stack. At the end of each bundle, the coupon is clipped and the fronts and backs put together in one bundle.	

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES:	SUMMARY NO.: 18A SHEET 1 OF: 2
DEPARTMENT: Front & Back Prep.	PRODUCT: Sport Shirts	PART: Front	FROM STUDY NOS.: 18A 1-A	OPERATOR: W. Waites
OPERATION NO.: 18	OPERATION: Button Hole Front - 6 Button Hole			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch Hole 120	THREADS USED:	
MACHINE MAKE: Reece (4)	MACHINE TYPE: S 2	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE: Standard	FEED DOG: Standard	PRESSER FOOT: Standard	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Indexer Stacker Arm			TYPE POWER TRANSMISSION: IM 6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED: Sept. 70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Fronts come from Centerplait and are stacked outside machine circle by the service operator.	60	0.0805	1100	.0885	100	8.85
	In this operation 4 machines are progressively loaded and started. Disposal is by a stacker arm. 4 separate bundles are worked on.						
	Next operation is button sew front.						
	Operation Sequence						
1.	Move to machine, pick up front, position on indexer and start machine.						
	Bundle Handling						
A.	Get bundle, separate and hang on rack		.30	100	.30	2.1	.63
B.	Tie up completed bundles dispose		.20	100	.20	2.1	.42
C.	Clerical		.25	100	.25	2.1	.53

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	8.85	20	11.6	7½	12½	20	12.7	DOZ.			34.6	275				
A-C	1.58	-	1.58	7½	12½	20	1.9	BDLE.								
						TOTAL →		100	14.6	1.244		3300				

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Front & Back Prep. PRODUCT:	CONTINUATION OF SUMMARY NO.: 18A	SHEET NO.: 2 OF 2 SHEETS:

DATE: Sept. 70	MOTION ANALYST JCR	OPERATION NO.: 18	OPERATION NAME: (Describe in Full) Button Hole Front - 6 Button Hole

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

1.

A) Move to machine, pick up front, position on indexer and start machine.

B) Previous machine has been started, operator moves to next machine picking up a front from the rack on her way. With one hand grasping each end of the front it is fixed under two clamps at each end. The machine is started using a foot pedal.

C) Pick up should be on motion between machines as should the about motion.

D) Front must be accurately placed in clamps at each end otherwise holes will be cut of alignment.

Bundle Handling

Bundles are left outside machine circle by service operator. Bundles are picked up, sorted into left and right fronts. The left fronts are placed on the rack and the right fronts placed aside. At the end of the bundle they are joined, tied together and disposed outside the machine circle.

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Sept. 70	SUMMARY NO.: 18B SHEET 1 OF: 1
DEPARTMENT: Front & Back Prep.	PRODUCT: Sport Shirts	PART: Front	FROM STUDY NOS.: 18A 1-3	OPERATOR: G. Kitchens
OPERATION NO.: 18	OPERATION: Button Hole Front - 5 Button Hole			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 120 inch	THREADS USED:	
MACHINE MAKE: Reece (4)	MACHINE TYPE: S 2	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE: STD	FEED DOG: STD	PRESSER FOOT: STD	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Indexer, stacker arm			TYPE POWER TRANSMISSION: M6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED: Sept. 70

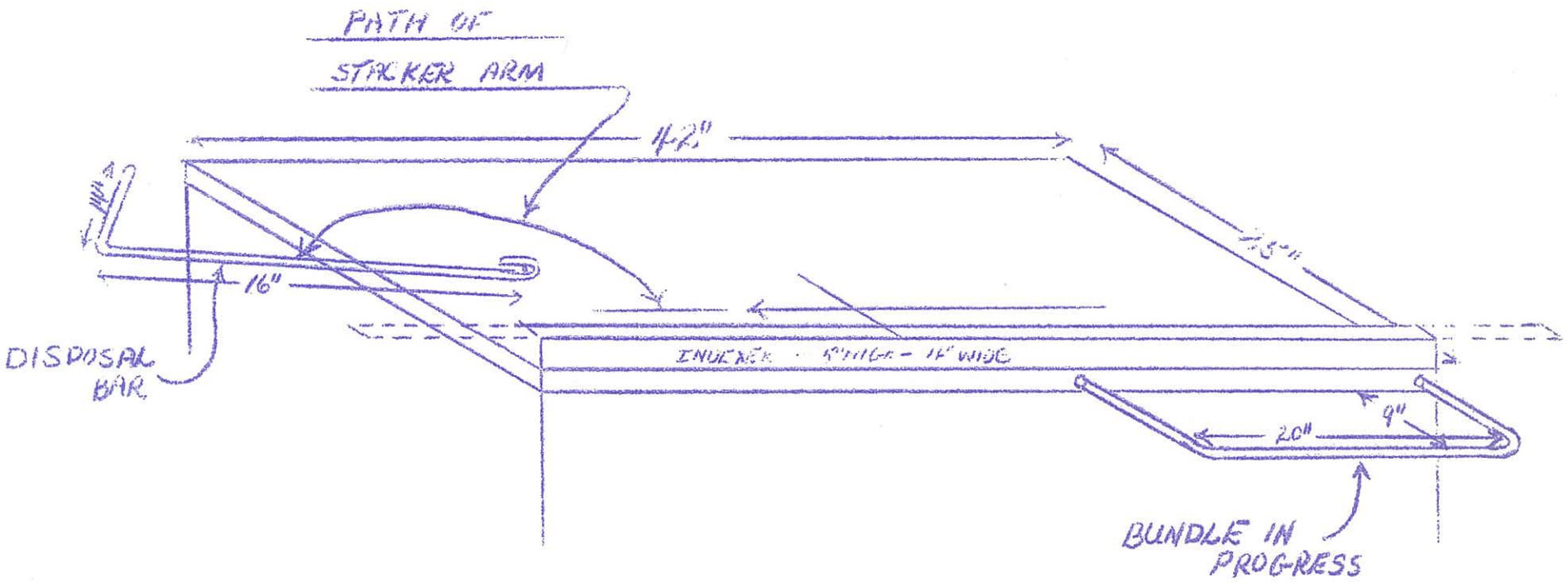
ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: JCC
	Conditions	30	.077	100	0.077	100	7.70
	As in summary 18A						
	Operation Sequence						
1.	Move to machine, pick up front, position on indexer and start machine.						
	Bundle Handling						
	As in summary 18A						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1	7.7	20	9.25	7½	12½	20	11.1	DOZ.			38.4	308				
A-C	1.58	-	1.58	7½	12½	20	1.9	BDLE.								
						TOTAL →		100	13.0	.217		3700				

Operation #18 Button Hole Front

5 & 6 Button Hole

4 Reece Indexers Placed in Circle



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 8-11-70	SUMMARY NO.: 19A SHE 1 OF: 3
DEPARTMENT: Front & Back Preparation	PRODUCT: Shirts	PART: Front	FROM STUDY NOS.: 1-8	OPERATOR: Composite
OPERATION NO.: 19	OPERATION: Button Sew Front - 6 Button Hemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Button: 16	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES: 108	R.P.M.:
THROAT PLATE: Standard	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot, Spacer Gauge			TYPE POWER TRANSMISSION: 1M2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE:
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY JCR	DATE INSTALLED 8-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions Work comes to this operation from Buttonhole Fronts. Bundles are placed on table to right of operator by service operator. In this operation, buttons are sewn on the front utilizing a robot button feeder. The location of the first button is indicated by a stop on the gauge. Finished bundles are tied and disposed to table at left.						
	Operation Sequence						
1.	Dispose, pick up, and position.				4.60	100	4.60
2.	Sew 6 buttons.				15.0	100	15.00
	Bundle Handling						
A.	Tie and Dispose				0.19	2.1	0.40
B.	Untie and Sort				0.34	2.1	0.72
C.	Process Coupon				0.29	2.1	0.60

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	19.60	7	20.92	7½	12½	20	25.14	DOZ.				146.0				146.0
A-C	1.72	-	1.72	7½	12½	20	2.06	BDLE.								
						TOTAL →		100	27.2			1764.	27.2			1764

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Frt & Bk Prep PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 19A	SHEET NO.: 2 OF 2 SHEETS:
DATE: 8-14-70	MOTION ANALYST JCR	OPERATION NO.: 19	OPERATION NAME: (Describe in Full) Button Sew Fronts - 6 Button Unhemme	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME P UNIT

Bundle Handling

Get bundle from work table at right, untie it, and lay the fronts face up on table in front.

Pull coupon, sign and stick to gum sheet. Place Ribbon on disposal shelf at left. When bundle is completed, tie, and dispose to trolley at left.

1. A. Dispose, Pick Up, Fold and Position

B. When sewing is completed, with left hand at neck opening and right hand on front edge below last button, dispose front face up on disposal shelf at left. Both hands reach for next front with left hand grasping top and right hand bottom. Both hands fold simultaneously at the notches, then position front under gauge against the stop.

C. Pick Up and Fold simultaneously.

D. i) Fold on notches
ii) Front must be held taut.

2. A. Sew 6 Buttons

B. Foot depresses pedal and when machine stops, left hand pulls front so that button is aligned in notch of gauge. Right hand keeps front flush with the edge of the gauge. Machine clamp descends and button is sewn when foot depresses pedal.

C. Foot must be depressed through entire button sew cycle.

D. Buttons must be evenly spaced and be a uniform distance from the front edge.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: 8-11-70	SUMMARY NO.: 19B SHE 1 OF: 1
DEPARTMENT: Frt & Back Preparation	PRODUCT: Shirts	PART: Front	FROM STUDY NOS.: 1-8	OPERATOR: Composite
OPERATION NO.: 19	OPERATION: Button Sew Front - 6 Button Unhemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER button: 16	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES: 108	R.P.M.:
THROAT PLATE: Standard	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot-Spacer Gauge			TYPE POWER TRANSMISSION: 1M2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 8-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As in Summary A.						
	Operation Sequence						
1.	Dispose, Pick Up, Fold and Position.				8.30	100	8.30
2.	Sew 6 Buttons				15.0	100	15.0
	Bundle Handling As in Summary A.				82.0	2.1	1.72

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	23.3	7	24.90	7½	12½	20	29.94	DOZ.				125.0				125.0
A-C	1.72	-	1.72	7½	12½	20	2.06	BDLE.								
						TOTAL	→	100	32.00			1500	32.00			1500

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 8-14-70	SUMMARY NO.: 19C SHE OF: 1
DEPARTMENT: Front & Back Preparation	PRODUCT: Shirts	PART: Front	FROM STUDY NOS.: 8-12	OPERATOR: Composite
OPERATION NO.: 19	OPERATION: Button Sew Front - 5 Button Unhemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 16 button	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES: 108	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot-Spacer Gauge			TYPE POWER TRANSMISSION: 1M2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 8-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As In Summary A.						
	Operation Sequence						
1.	Dispose, Pick Up, Fold and Position				8.30	100	8.30
2.	Sew Five Buttons				12.0	100	12.0
	Bundle Handling						
A-C	As In Summary A.				82.0	2.1	1.72

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	20.3	7	21.80	7½	12½	20	2i.14	DOZ.				142				142
A-C	17.2	-	1.72	7½	12½	20	2.06	BDLE.								
						TOTAL →		100	28.2			1700	28.2			1700

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

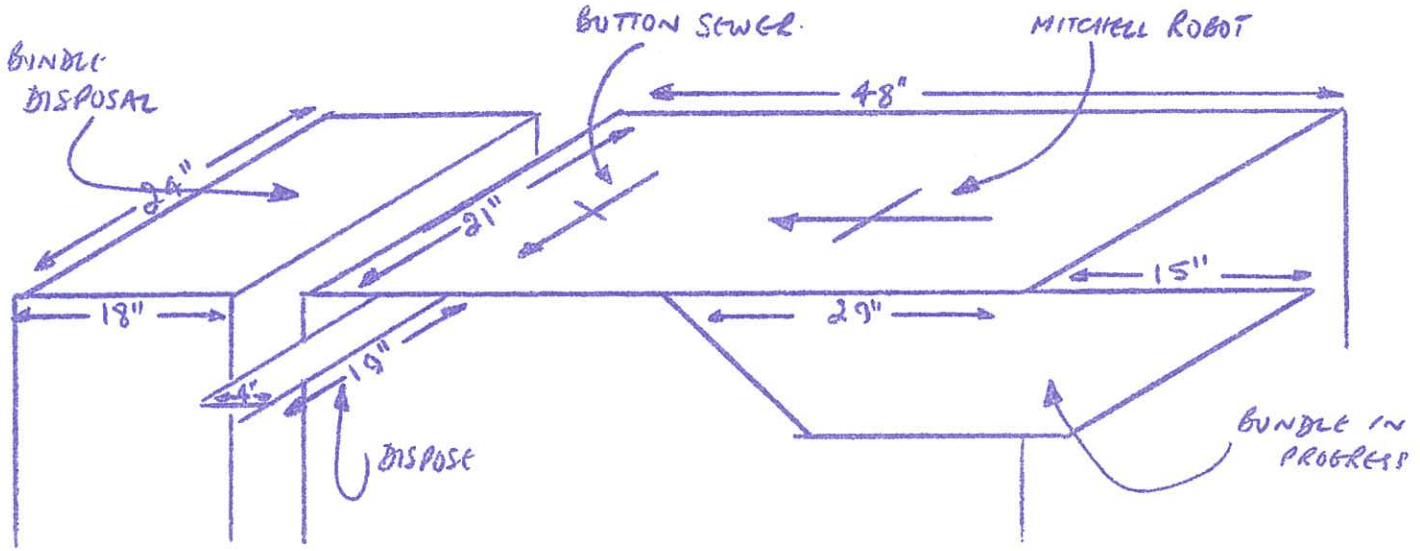
CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: 8-14-70	SUMMARY NO.: 19D SHEET 1 OF: 1
DEPARTMENT: Front & Back Preparation	PRODUCT: Shirts	PART: Front	FROM STUDY NOS.: 8-12	OPERATOR: Composite
OPERATION NO.: 19	OPERATION: Button Sew Front - 5 Button Hemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER button: 16	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES: 108	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot-Spaced Gauge			TYPE POWER TRANSMISSION: 1M2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED: 8-17-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	As In Summary A.						
	Operation Sequence						
1.	Dispose, Pick Up, Fold and Position				5.00	90	5.00
2.	Sew Five Buttons				12.00	100	12.00
	Bundle Handling						
A-C	As In Summary A.				82.0	2.1	1.72

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	17.00	7	17.3	7½	12½	20	21.94	DOZ.				167.0				167.0
A-C	1.72	-	1.72	7½	12½	20	2.06	BDLE.								
						TOTAL →		100	24.00			2000	2400			2000

OPERATION 19

BUTTON - SEW FRONT



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Oct 1970	SUMMARY NO.: 1 SHEET OF: 2
DEPARTMENT: Front & Back Prep.	PRODUCT: Shirts	PART: Fronts	FROM STUDY NOS.:	OPERATOR: Doris Nix
OPERATION NO.: 19	OPERATION: Button Sew Fronts 5-Button 1 - Tanden			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE: STD	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot	Reece Indexer S 2		TYPE POWER TRANSMISSION: IM#2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED Oct. 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	As in Summary 19A						
	Operation Sequence						
1.	Start machine, walk to 2nd machine, pick up front, position.	40	.0843	105	.0885	100	8.85
	Bundle Handling						
A.	Get bundle, separate and hang on rack.		.30	100	.30	2.1	.63
B.	Tie completed bundle & dispose		.20	100	.20	2.1	.42
C.	Clerical		.25	100	.25	2.1	.53

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	8.85		11.60	7½	12½	20	12.7	DOZ.			34.6	275				
A-C	158		1.58	7½	12½	20	1.9	BDLE.								
						TOTAL →		100	14.6	.244		3300				3300

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

2

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.: 19E	SHEET NO.: 2 OF SHEETS:
DATE: Oct. 70	MOTION ANALYST JCR	OPERATION NO.: 19	OPERATION NAME: (Describe in Full)	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
1	A) Start machine, walk to second machine, pick up front and position. B) Having started the button-sewer with the right foot as a pedal, the operator turns and walks one pace to the second machine. As she turns she picks up a front from the rack, turns the hem if necessary and positions this on the indexer table. Each end is held by a clamp. C) The distance between needles is 39". By the time the operator has turned to the second machine she should have the front ready (hemmed) to position. D) The clamps on the indexer holds the front straight allowing striped to be sewn on this equipment.	

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Oct. 1970	SUMMARY 19F SHEET NO.: 1 OF: 1
DEPARTMENT: F & F Prep.	PRODUCT: Shirts	PART: Fronts	FROM STUDY NOS.:	OPERATOR: Doris Nix
OPERATION NO.: 19	OPERATION: Button Sew Fronts 6 Button Tandem			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Mitchell Robot	Reece Indexer S 2		TYPE POWER TRANSMISSION: IM#2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDY BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED: Oct. 70

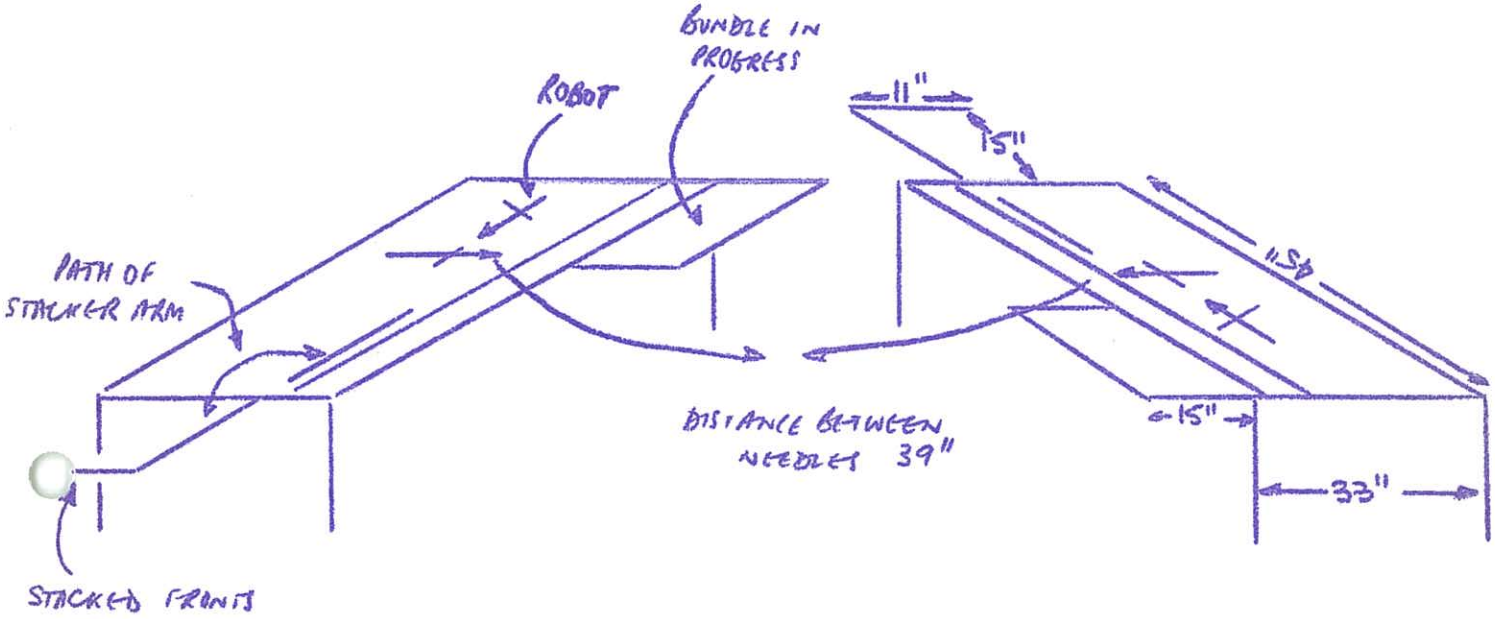
ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions						
	As in Summary 19A						
	Operation Sequence						
	As in Summary 19E	30	.1065	100	.1065	100	10.65
	Bundle Handling						
	As in Summary 19E						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	10.65	10	11.7	7½	12½	20	14.1	DOZ.				250				250
A-C	1.58	-	1.58	7½	12½	20	1.9	BDLE.								
						TOTAL →		100	16.0			3000	16.0			3000

OPERATION 19

BUTTON SEW FRONT

TANDEM



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 6-22-70	SUMMARY NO.: 21A SHEET 1 OF: 3
DEPARTMENT: Front & Back Rep	PRODUCT: Dress/Sport Shirts	PART: Back	FROM STUDY NOS.: 1-14	OPERATOR: Composite
OPERATION NO.: 21	OPERATION: Set Yokes with Center Box Pleat - Straight Back			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 12	THREADS USED: 100/2	
MACHINE MAKE: Union Special	MACHINE TYPE: 51200	GAUGE: SEAM TYPE:	NEEDLES: 108GS-036	R.P.M.: 5100
THROAT PLATE: 51224R	FEED DOG: 51205R	PRESSER FOOT: 51220R	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION: 1M6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-14-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 26
	Conditions						
	Backs come to this operation from cutting in bundles. Distribution of these bundles is by service operators. The yokes come from label sew and are distributed with the appropriate back bundles. Initially, the bundles are placed at the back of the workplace.						
	Operation Sequence						
1.	Pick up back and two yokes, position at needle and sew to pleat				12.6	100	12.6
2.	Make pleat and sew through to end of back				14.4	100	14.4
3.	At end of bundle remove from disposal bin, clip and stack on side of bench.				1.9	100	1.9
	Bundle Handling						
A.	Untie bundle, sort back and yokes, position to left and right. Attend to coupon.		94		0.94	2.1	1.96
B.	Reposition semi-bundle at end of each lay		11		0.11	2.1	0.24

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	28.90	7½	31.10	7½	12½	20	37.36	DOZ.				100				100
A-B	2.20	-	2.20	7½	12½	20	2.64	BDLE.								
						TOTAL →		100	40.00			1200	40.00			1200

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Frt & Bk Prep PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 21A	SHEET NO.: 2 OF 3 SHEETS:
DATE: 7-14-70	MOTION ANALYST JCR	OPERATION NO.: 21	OPERATION NAME: (Describe in Full) Set Yokes with Center Box Pleat	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Operator pulls bundle from rear of work place to front, unties bundle and divides yokes into outside yoke and label yoke. These are placed in separate piles on the operator's right side with the seam edges facing away from the operator. The Back bundle is placed at the left of the operator with the seam edge towards her, approximately 18 inches from the needle. Operator clips coupon, signs it and places it on her gum sheet.

As the intermediate lay in the bundle is reached, the operator, pulls this semi-bundle towards her to a position approximately 6 inches from the needle.

At the end of clipping and stacking, the bundle is tied with ribbon and disposed to a central buggy.

Operation Sequence

1. A. Pick up back and two yokes and position at needle.

B. Left hand is completing previous sequence. Right hand grasps label and outside yoke from position at right. Meanwhile, left hand grasps leading edge of back and moves it towards the needle.

Righthand drops label yoke on face plate, then left hand places back on top of this followed by right hand placing outside yoke. These parts are aligned at the needle point and sewed approximately two inches before pleat formation starts.

C. Both label and outside yokes are picked up in the same sweep of the right hand. Label yoke between thumb and index finger, outside yoke between the index and middle finger.

D. Bottom fold of pleat should meet. Tolerance of 1/16" overlap and 1/8" gap.
Ends of plys should be even. Tolerance ¼"
Margin should be 5/16". Tolerance ± 1/16"

2. A. Make pleat and sew through to end of yoke.

B. Left hand flicks back outside yoke then pinch grasps back at marking notch. Forms box pleat by laying away pleat and then folding back. Right hand reaches over, grasps outside yoke and repositions in alignment with label yoke and back. All three plys are then sewn through. Left hand guides progress of material by the needle. The thread is not cut and the garment falls into a disposal bin at the rear of the table.

C. Sew yoke in two distinct parts. Only one stop at pleat formation.

D. Key Quality points as above.

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Frt & Back Prep PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 21A	SHEET NO.: 3 OF 3 SHEETS:

DATE: 7-14-70	MOTION ANALYST JCR	OPERATION NO.: 21	OPERATION NAME: (Describe in Full) Set Yokes with Center Box Pleat

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
3.	A. Clip and Stack. B. At end of bundle, operator stands and puts finger knife on. Operator reaches into the disposal bin and pulls out the first shirt. In one motion, the shirt is clipped from the line and is stacked flat on the workplace surface. Operator continues to pull shirts out of disposal bin in one length until the bundle is completed.	

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 6-22-70	SUMMARY NO.: 21B SHE 1 OF: 1
DEPARTMENT: Frt & Bk Prep	PRODUCT: Dress/Sport Shirt	PART: Back	FROM STUDY NOS.: 1-14	OPERATOR: Composite
OPERATION NO.: 21	OPERATION: Set Yokes - No Pleat - Straight Back			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Inch 12	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 51200	GAUGE: SEAM TYPE:	NEEDLES: 108GS-036	R.P.M.: 5100
THROAT PLATE: 51224R	FEED DOG: 51205R	PRESSER FOOT: 51220R	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION: 1M6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY JCR	DATE INSTALLED 7-14-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	Same as Summary 1.						
	Operation Sequence						
1.	Pick up back and two yokes, position at needle and sew to approximately 4 inches.				12.2	100	12.2
2.	Reposition alignment at lower edge and complete sewing operation.				8.0	100	8.0
3.	At end of bundle, remove from disposal bin, clip and stack to side.				1.9	100	1.9
	Bundle Handling						
	As in Summary 1.						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	22.10	7½	23.80	7½	12½	20	28.56	DOZ.				128.5				128.5
A-B	2.20	-	2.20	7½	12½	20	2.64	BDLE.								
						TOTAL	→	100	31.20			1540	31.20			1540

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 6-22-70	SUMMARY NO.: 21C SHE 1 OF: 1
DEPARTMENT: Frt & Bk Prep	PRODUCT:	PART: Back	FROM STUDY NOS.: 1-14	OPERATOR: Composite
OPERATION NO.: 21	OPERATION: Set Yokes - No Pleat - Curved Back			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Inch 12	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 51200	GAUGE: SEAM TYPE:	NEEDLES: 108GS-036	R.P.M.: 5100
THROAT PLATE: 51224R	FEED DOG: 51205R	PRESSER FOOT: 51220R	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION: 1M6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-14-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As in Summary 1.						
	Operation Sequence						
1.	Pick up, position, and sew 4 inches				13.0	100	13.0
2.	Reposition and complete sew.				9.8	100	9.8
3.	Clip - Stack				1.9	100	1.9
	Bundle Handling As in Summary 1.						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	24.70	7½	26.60	7½	12½	20	31.9	DOZ.				117				117
A-B	2.20	-	2.20	7½	12½	20	2.64	BDLE.								
						TOTAL →		100	34.5			1400				1400

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

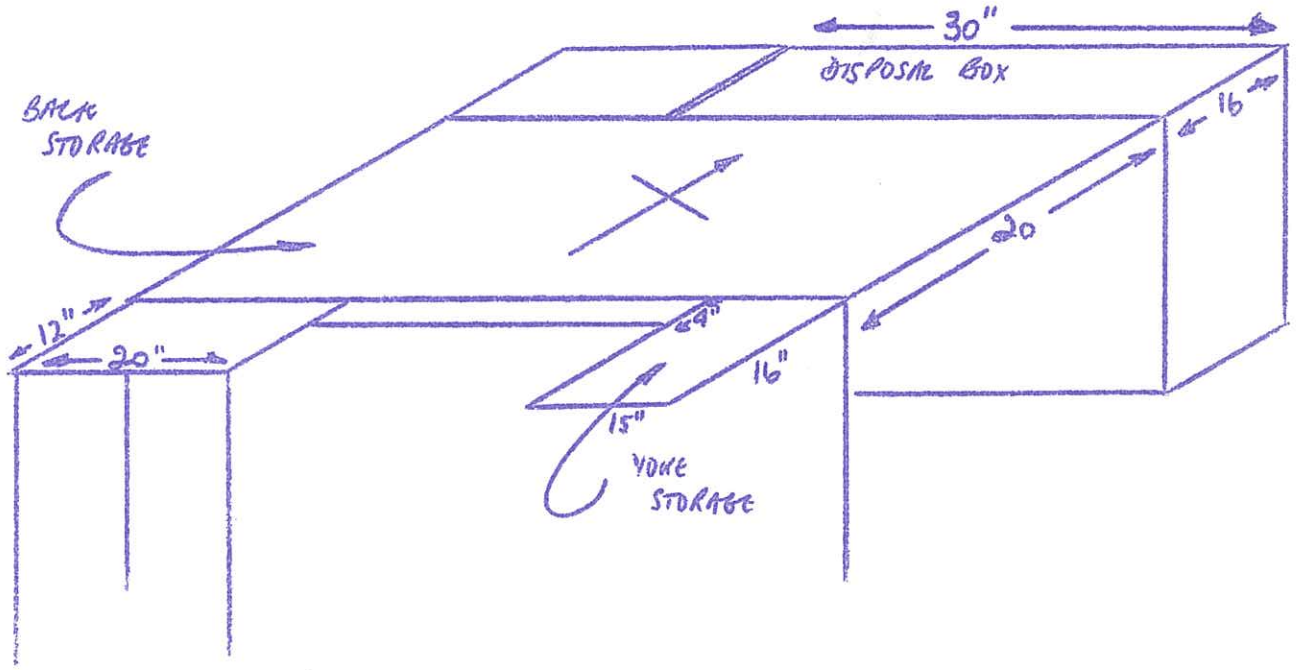
CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 6-22-70	SUMMARY NO.: 21D SHE 1 OF: 1
DEPARTMENT: Frt & Bk Prep	PRODUCT: Dress/Sport shirts	PART: Back	FROM STUDY NOS.: 1-14	OPERATOR: Composite
OPERATION NO.: 21	OPERATION: Set Yoke - Box Pleat - Curved Back			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Inch 12	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 51200	GAUGE: SEAM TYPE:	NEEDLES: 108GS-036	R.P.M.: 5100
THROAT PLATE: 51224R	FEED DOG: 51205R	PRESSER FOOT: 51220R	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE:
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCH BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-14-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As in Summary 1.						
	Operation Sequence						
1.	Pick up, position, sew to pleat				13.0	100	13.0
2.	Make pleat - sew to end				16.3	100	16.3
3.	Clip - Stack				1.9	100	1.9
	Bundle Handling As in Summary 1.						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	31.2	7½	33.50	7½	12½	20	40.16	DOZ.				93.5				93.5
A-B	2.20	-	2.20	7½	12½	20	2.64	BDLE.								
						TOTAL →		100	42.8			1120				1120

OPERATION 21

SET YOKES



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Oct. 70	SUMMARY NO.: 24 SHEET 1 OF:
DEPARTMENT: Assembly	PRODUCT: SS Shirts	PART: Sleeve	FROM STUDY NOS.:	OPERATOR: Sara Chambers
OPERATION NO.: 24	OPERATION: Pre-hem sleeves			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 12 inch	THREADS USED:	
MACHINE MAKE: Unsp.	MACHINE TYPE: 61900	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE: STD	FEED DOG: STD	PRESSER FOOT: STD	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Stacker			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED Oct. 24. 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	A bundle of sleeves is obtained from the side of the machine. They are separated into left and right. After sewing each sleeve is automatically stacked.						
	Operation Sequence						
1.	Pick up, position and hem sleeve	72	.0595	110	.0655	200	13.1
	Bundle Handling						
A.	Pick up bundle and separate		.30	100	.30	2.1	.63
B.	Dispose		.24	100	.24	2.1	.51
C.	Clerical		.25	100	.25	2.1	.53

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
	13.1	12½	14.7	7½	12½	20	17.7	DOZ.								
	1.67	-	1.67	7½	12½	20	2.0	BDLE.								
						TOTAL →		100	19.7			2440	19.7			2440

FORM 33CP

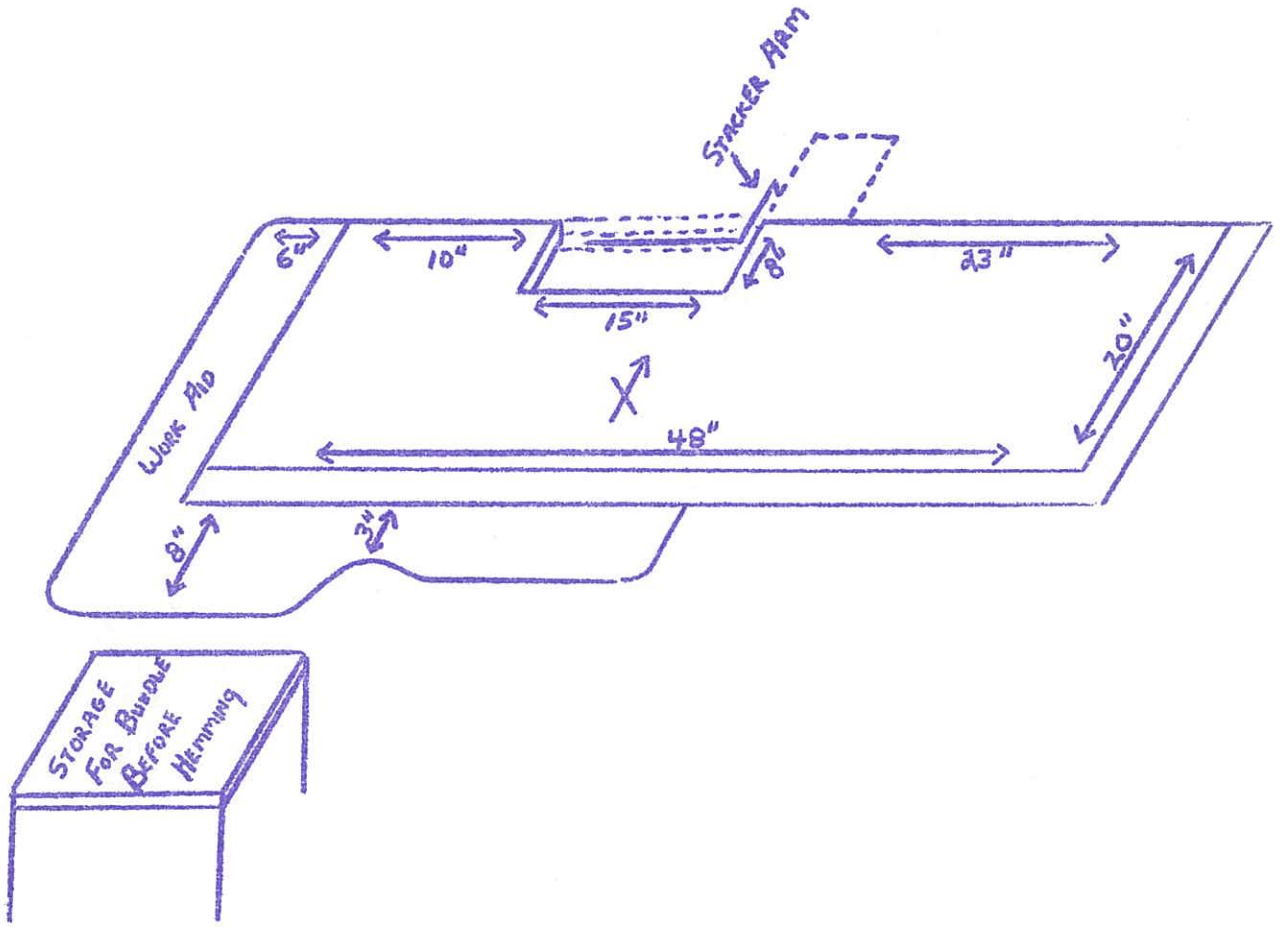
KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly / PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 24	SHEET NO.: 2 OF SHEETS: 2

DATE: Oct. 70	MOTION ANALYST JCR	OPERATION NO.: 24	OPERATION NAME: (Describe in Full) Pre-hem Sleeves

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT
1	A) Pick up, position and hem sleeve. B) Left hand picks up sleeve and both hands then position this in folder. Disposal is by an automatic arm at the rear. C) Left hand should be grasping and moving sleeve towards needle as previous sleeve is being seam. Operation should be virtually continuous. D) There must be no raw edges.	

PRE-HEM
SUMMARY 24



FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Oct. 1970	SUMMARY NO.: 25A SHEET 1 OF: 4
DEPARTMENT: Sleeve Prep. & Cuff Make	PRODUCT: Shirts	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 25	OPERATION: Line Cuff - Two Button, Square corner			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 13	THREADS USED: 100/2 DSP	
MACHINE MAKE: Union Special	MACHINE TYPE: 51-300 BP 51-400 BV	GAUGE: SEAM TYPE:	NEEDLES: 108 GS 36	R.P.M.: 4600
THROAT PLATE: 6428L	FEED DOG: 6405U	PRESSER FOOT: 7420AG	FOLDER: Campbell Folder	GEARS: CAMS:
ATTACHMENTS: Campbell Cuff Line	Unit - See BDC/CJS		TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY: JM	SKETCHES BY: JM	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: BDL	INSTALLED BY: JM	DATE INSTALLED 10-29-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Cuffs come from the cutting room tied in bundles. Bundles are placed on storage table to the right of operator by service personnel. Cuffs are lined into a roll to the left of the machine heads. Rolls are removed when finished and disposed to the left.						
	Operation Sequence						
1.	Pick up top and bottom ply, position and sew				.0510	200	10.20
	Bundle Handling						
	A. Get, untie, & arrange				.667	2.10	1.400
	B. Process coupon				.250	2.10	.525
	C. Unload & dispose				.510	1.04	.5300
	D. Get and attach roll of lining				.390	.03	.1170

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1	10.20	10	11.21	7½	12½	20	13.47	DOZ.				242				242
A-D	2.57	-	2.57	7½	12½	20	3.08	BDLE.								
						TOTAL →	100 16.55					2900				2900

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Slv. Prep. & PRODUCT: Cuff Make Cuff	CONTINUATION OF SUMMARY NO.: 25A	SHEET NO.: 2 OF SHEETS:
DATE: Oct. 1970	MOTION ANALYST JM	OPERATION NO.: 25	OPERATION NAME: (Describe in Full) Line 325S Cuff - Campbell Unit	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

A. Secure bundle from table on right and untie. Split off bottom & top plies. Place top plies in the tray and bottom plies on the table beside the tray next to the operator.

B. Process Line Cuff coupon and sew master coupon on to the lining behind the last cuff in the bundle.

C. Cut the lining at a point next to the coupon, remove finished bundle from the wheel, and dispose to the left. (Note: Line between 100 and 125 pair of cuffs before unloading the wheel.)

D. Get & attach new roll of lining when the roll of lining is finished, get a new roll from lower shelf of storage table to the right. Put the new roll on the lining peg and pin the starting end to the finishing of previous roll. Sew splice through both needles.

Operation Sequence

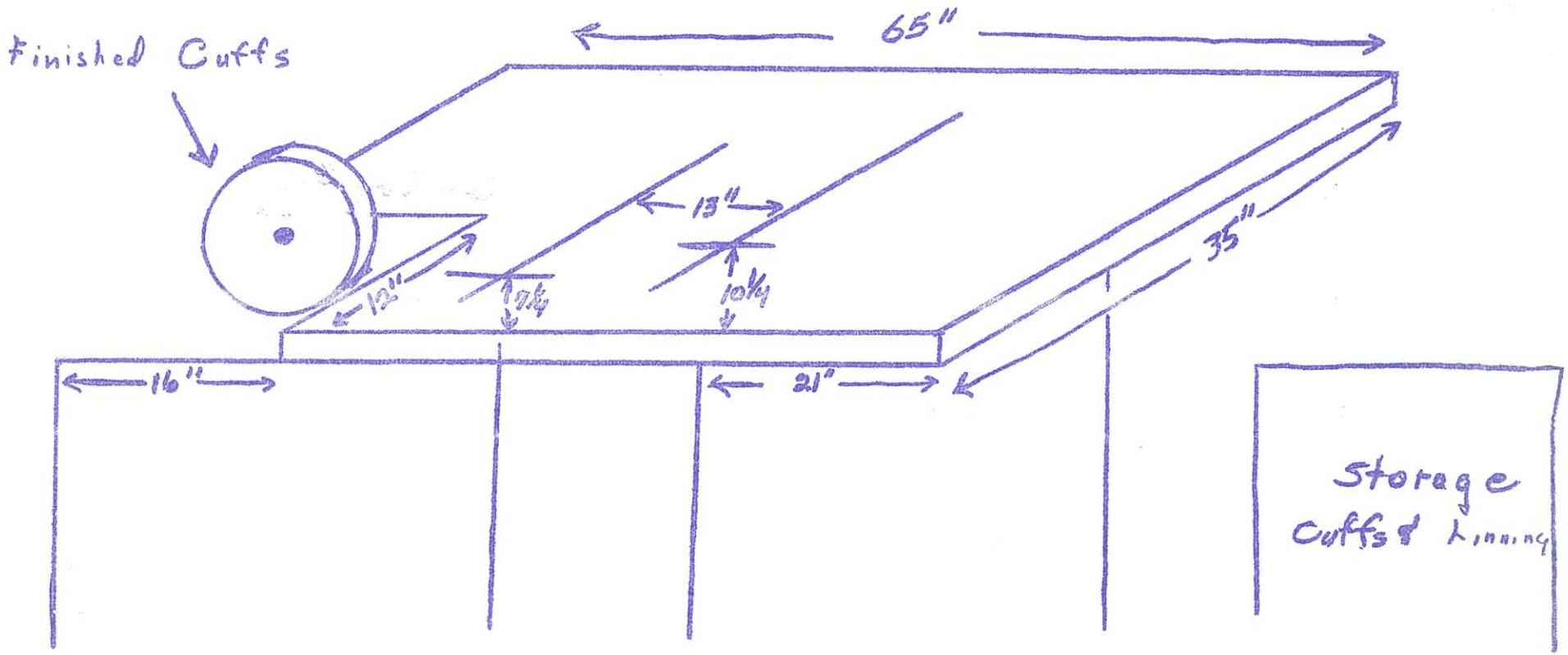
A. Pick up top & bottom ply, position in the tray, and sew.

B. RH picks up top ply and positions it in the tray, while LH is picking up bottom ply. When RH has top ply positioned, RH assists, LH with bottom ply. Both LH & RH aligne bottom ply to top ply. LH guides both plies when the needle of the first machine catches them. RH moves back to pick up next top ply while LH moves back to pick up next bottom ply.

C. RH picks up & positions top ply while LH is picking up bottom ply. LH & RH aligne both plies. LH guides both plies into needle. RH moves back to pick up next top ply.

D. No skipped or broken stitches.
Margin in in $\frac{1}{4}$" plus or minus 1/16".

Operation # 25 A — Line Cuff - Campbell Unit



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169 Slv. Prep.	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Nov. 1970	SUMMARY NO.: 26A SHEET 1 OF: 3
DEPARTMENT: and Cuff Make	PRODUCT: Shirts	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Zell Heath
OPERATION NO.: 26	OPERATION: Run Cuff - Two Button, Square Corner			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 13	THREADS USED: 100/2 DSP	
MACHINE MAKE: Union Special	MACHINE TYPE: 56-400Z	GAUGE: SEAM TYPE:	NEEDLES: 108GS-040	R.P.M.: 3700
THROAT PLATE: 514 24 C40	FEED DOG: 51405 C40	PRESSER FOOT: 514302-40	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Campbell Cuff Unit - See BDL/CJS Scissors, knife, on foot, two air jets (see sketch)			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY: JM	SKETCH NOS.: 26A	ON SHEET NOS.: 3
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY: BDL	INSTALLED BY: JM	DATE INSTALLED: Nov. 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100 TIME PER:
	Conditions						
	Cuffs come from Campbell Line Cuff Unit in rolls of two bundles. Rolls are located on a storage table to the left of Run Cuff operator. Cuffs are run and cut apart by Run operator. Finished bundles are placed on storage table to the right.						
	Operation Sequence						
1.	Pull to needle, sew, cut, dispose		.0562	95	.0534	200	10.68
	Bundle Handling						
A.	Get and put on wheel				.304	1.04	.316
B.	Process coupon				.250	2.10	.525
C.	Tie & dispose				.300	2.10	.630

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1	10.68	9	11.63	7½	12½	20	13.98	DOZ.				254				254
A-C	1.47	-	1.47	7½	12½	20	1.77	BDLE.								
						TOTAL →		100	15.75			3050				3050

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 26A	SHEET NO.: 2 OF 3 SHEETS:
DATE: Nov. 1970	MOTION ANALYST JM	OPERATION NO.: 26	OPERATION NAME: (Describe in Full) Run 3258 Cuff - Campbell Unit	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PI UNIT

Bundle Handling

A. Get and put on wheel - rolls of lined cuffs are picked up and put on wheel. First cuff is pulled under bracket on table top.

B. Process coupon and attach master coupon to bundle string.

C. Tie & dispose bundle to the left.

Operation Sequence

1. A. Pull to needle, sew, cut, dispose

B. LH pulls cuff into position in front of needles while RH disposes finished cuff into box on the right. RH grasps bottom ply of the cuff to the right of the needles and folds it over toward the operator. Simultaneously LH grasps the bottom ply of the cuff to the left of the needles and folds it over. (Notes Bottom ply of the cuff to the left is blown out straight by the first air jet. Bottom ply is also blown up by an air jet in the table top to the left of the needles) Both hands guide cuffs into the needles. Cuff ends are sewn and cut by air operated scissors. Operator chains off and chains are cut by knives located on the back of the presser foot. RH disposes finished cuff while LH pulls next cuff into position.

C. LH pulls cuff into position, while RH disposes finished cuff. LH & RH sew cuffs and cut chain offs.

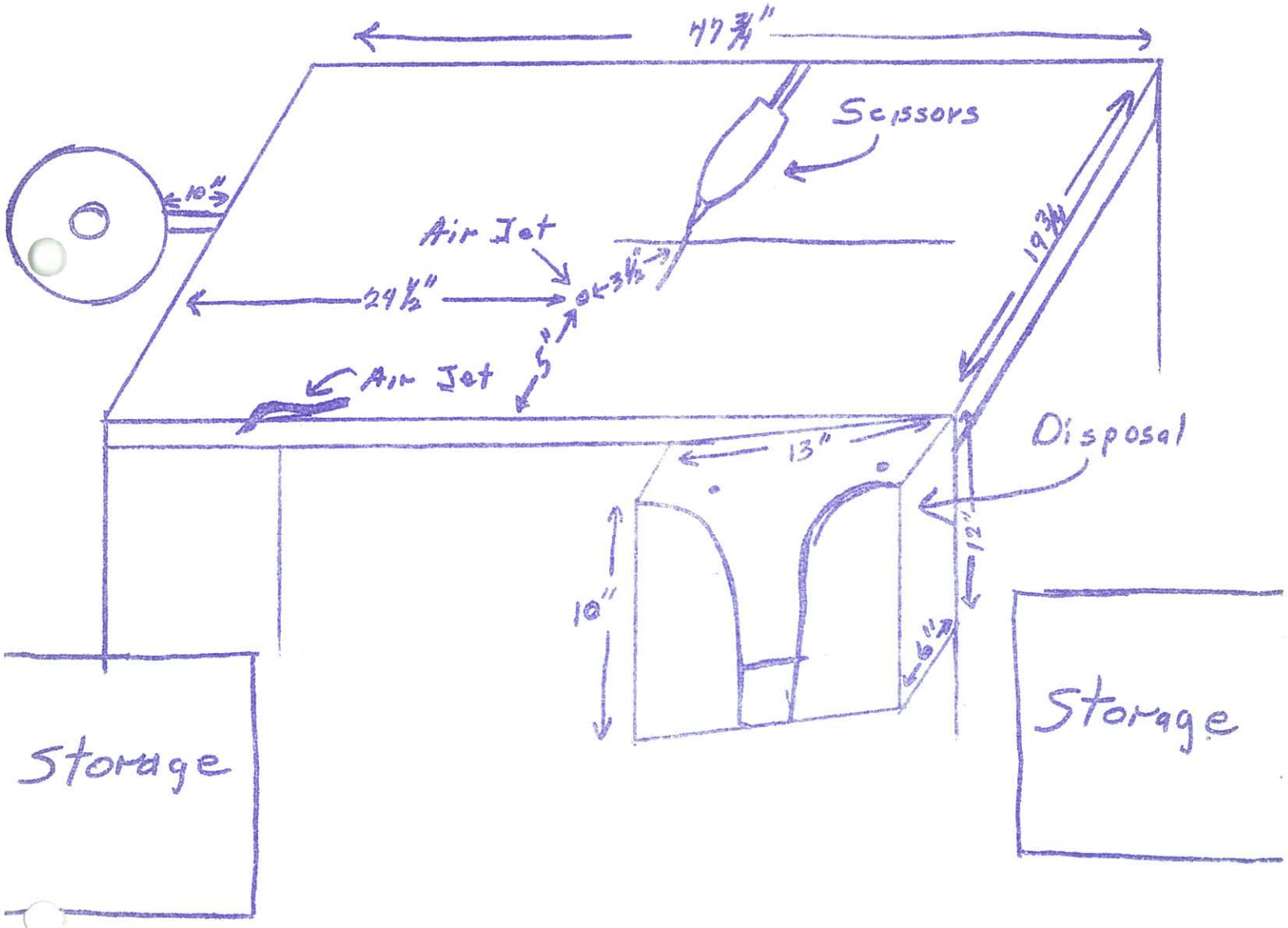
D. No rip backs.
No skipped or broken stitches.

Operation # 26 — Summary 26A

Run Cuff -

Campbell Unit

(not to scale)



FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS 26B

MOTION AND TIME ANALYSIS SUMMARY

CLIENT: (CODE) 169 Slv. Prep. & Cuff Make	PLANT: (CODE) Shirts	Cuff	DATES OF STUDIES: Nov. 1970	SUMMARY NO. 1 OF 2 SHE
DEPARTMENT: 26	PRODUCT: Run Cuff - 250R	PART:	FROM STUDY NOS.:	OPERATOR: Larue Braddy
OPERATION NO.: All	OPERATION: All	13 in. Three Corner	100/2 Smallstitch	OPERATOR'S NO. OR POSITION:
SIZE: Union Special	MATERIAL: 51400 BP	STITCHES PER	THREADS USED: 108 GS 036	4100
MACHINE MAKE: 1724F	MACHINE TYPE: 22D	GAUGE: SEAM TYPE: 51320G	NEEDLES: N/A	R.P.M.:
THROAT PLATE: Three Corner Guage	FEED DOG:	PRESSER FOOT:	FOLDER: IM-6	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED: 48	STUDY FINISHED:	ELAPSED TIME: JM	NO. OF PIECES: JM	AVG. TIME PER PIECE: JM EI
AVG. BUNDLE SIZE: JM	AVG. NO. OF THREAD CHGS.: JM	INFORMATION BY: JM	MOTION ANALYST:	TIME STUDIES BY:
CALCULATIONS BY:	CALCULATIONS CHECKED BY:	SKETCHES BY:	SKETCH NOS.: JM	ON SHEET NOS.: 11/24/70
STUDY TRANSFER CHECKED BY:	TYPED BY:	TYPING CHECKED BY:	INSTALLED BY:	DATE INSTALLED 10

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions Bundles come from line operation in a chain down a chute. Cuffs are run into chain down a chute.						
	Operation Sequence						
1.	Pick up, position, break, reposition	20	.0725	95	.0688	200	13.79
2.	Sew one cuff	20	.0571	95	.0543	200	10.85
	Bundle Handling						
A.	Get & arrange				.400	2.1	.840
B.	Process coupon				.250	2.1	.525
C.	Push off				.055	2.1	.155

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	24.64	7½	26.55	7½	12½	20	31.85					119				117
A-C	1.52	–	1.52	7½	12½	20	1.83	DOZ.								
								BDLE.	33.68			1420				1400
						TOTAL	→	100								

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Cuff Make / PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 26B	SHEET NO.: 2 OF 3 SHEETS:
DATE: Nov. 1970	MOTION ANALYST JM	OPERATION NO.: 26	OPERATION NAME: (Describe in Full) Run 25OR Cuff	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Bundles come from line cuff operation down a chute to the right of run cuff operator. Get bundle from the chute and untie. Arrange bottom plies of cuff on table top to the right of the needle and in front of the machine head. Process run cuff coupon and sew master coupon into the chain at the beginning of the bundle. Push finished cuff cuffs off the table top down the chute to the left.

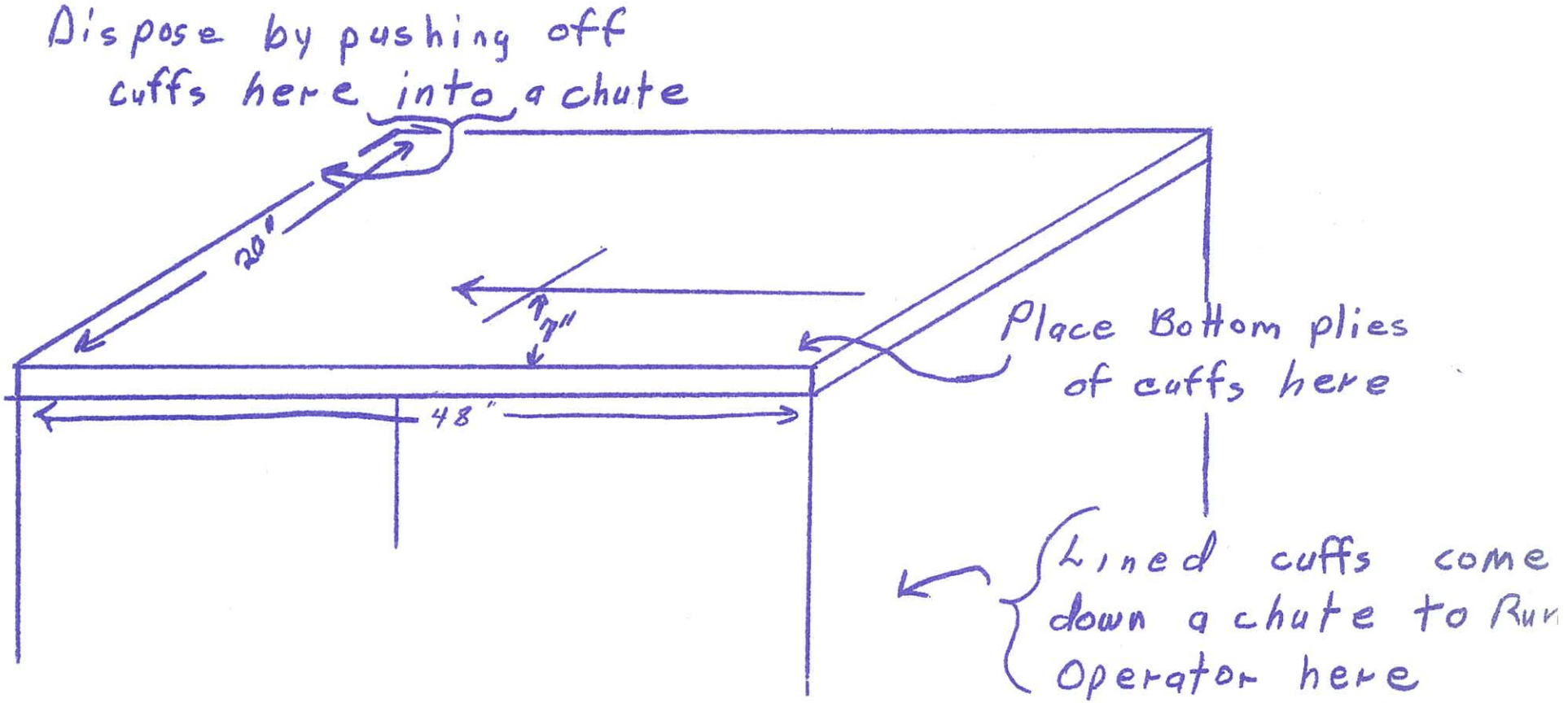
Operation Sequence

1. A. Pick up, position, break, reposition
   B. Pick up bottom ply with RH and place in front of the needle. LH & RH position top ply over bottom ply. RH breaks the chain simultaneously. LH folds over the bottom ply on beginning end of cuff. RH & LH guide the cuff into the needle.
   C. Pick up bottom ply and position. Place top ply over bottom ply and break. Fold over bottom ply, reposition, and guide into needle.

2. A. Sew one cuff
   B. Sew around cuff. Stop approximately 3/4" from finishing edge. Fold over bottom ply and finish sewing. Chain off while RH picks up next bottom ply.
   C. Sew around cuff, stop, fold over bottom ply, and finish cuff.
   D. No skipped or broken stitches. Margin is $\frac{1}{4}$". Top and bottom cuff should be evenly aligned at starting end and unhemmed edge. Top edge of bottom cuff should be folded directly over hemmed edge of top cuff.

Operation #26 – Summary 26B

Run 250R Cuff



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Nov. 1970	SUMMARY NO.: 1 SHEET 27 OF: 3
DEPARTMENT: Slv. Prep. and Cuff Make	PRODUCT: Shirts	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Ollie Wright
OPERATION NO.: 27	OPERATION: Turn and Crease Cuff (250R & 225R)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Reece	MACHINE TYPE: Cuff Crease	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Shop blades and knife on table			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY:	DATE INSTALLED

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Cuffs come from run operation in a chain. Cuffs are run into a chute. Cuffs are turned & creased and disposed into a tray. Bundles are tied & disposed.						
	Operation Sequence						
1.	Cut chain, turn, crease, dispose	40	.072	105	.0755	200	15.1(
	Bundle Handling						
A.	Get first cuff from tray				.153	2.1	.32
B.	Clerical				.250	2.1	.52
C.	Dispose to tray				.060	4.0	.24(
D.	Tie & dispose bundle				.355	2.1	.74

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	15.10	2½	15.48	7½	12½	.20	18.57	DOZ.				193				192
	1.84						2.20	BDLE.								
						TOTAL →		100	20.77			2310				2300

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Slv. Prep. & Cuff PRODUCT: Make Cuff	CONTINUATION OF SUMMARY NO.: 27	SHEET NO.: 2 OF 2 SHEETS:

DATE: Nov. 1970	MOTION ANALYST JM	OPERATION NO.: 27	OPERATION NAME: (Describe in Full) Turn & Crease 250R & 225R

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Bundles come from run cuff operation in chain. Turn & Crease operator gets first cuff and processes coupon. Master coupon is then attached to a bundle string and the string is placed in cuff disposal tray. After approximately 40 cuffs are creased, the turn & crease operator disposes the cuff to the right into the disposal tray. At the halfway point in the bundle, the first half is tied. When the bundle is finished, it is tied & disposed to the right.

Operation Sequence

A. Cut cuff out of chain, turn, crease, dispose
B. Chain is cut on knife located on the left side of the table on cuff crease machine. Cuff is turned with RH & LH and placed on cuff creaser blades. Knee pedal enables operator to collapse creaser blades and foot pedal initiates mechanism to drive cuff into creaser head. While first cuff is creasing, LH & RH pull, cut, and load next cuff on the other set of blades. Foot pedal drives this cuff into the head, while the first cuff is brought out of the creaser head. RH disposes creased cuff onto table top. LH & RH cut next cuff.
C. Cuffs are cut apart, turned, and placed on creaser blades. Cuff is creased and disposed to table top.
D. Cuffs must be turned out completely. Cuffs must be creased on seam.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Oct. 70	SUMMARY NO.: 27 SHEET 1 OF: 2
DEPARTMENT: Cuff Make and Sleeve Prep.	PRODUCT: Shirts	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 27	OPERATION: Turn 3255 Cuff (Square Tom Jones)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE: Marco	MACHINE TYPE: Collar Turner	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY: JM	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: JM	DATE INSTALLED Oct. 70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Cuffs come in bundles from Run Cuff operation. Cuffs are placed on work aid to the left of Turn operator. Cuffs are turned and placed on work aid to the right.						
	Operation Sequence						
	Pick up, turn, dispose				.0613	200	12.25
	Bundle Handling						
	A. Tie & dispose				.2758	2.1	.55
	B. Get, untie & arrange				.2822	2.1	.56
	C. Process coupon				.2500	2.1	.52

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	12.25	2½	12.55	7½	12½	20	15.07	DOZ.								
A-C	1.641			7½	12½	20	1.97	BDLE.								
						TOTAL →		100	17.04			2820				2800

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE)	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.:	SHEET NO.: OF SHEETS:
169		Cuff Make 3255 Cuff	27	2 2

DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)
Oct. 70	JH	27	Turn 3255 Cuff (Square Tom Jones)

ELEMENT NO.: | LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS. | 100% TIME PE UNIT

Bundle Handling

Get bundle from left work aid. Untie and arrange to left of Turner. Process coupon and lay string across disposal tray to the right. When half the bundle is done, tie half knot in string. When the entire bundle is finished, tie and dispose.

Operation Sequence

1. A. Pick up, turn, dispose

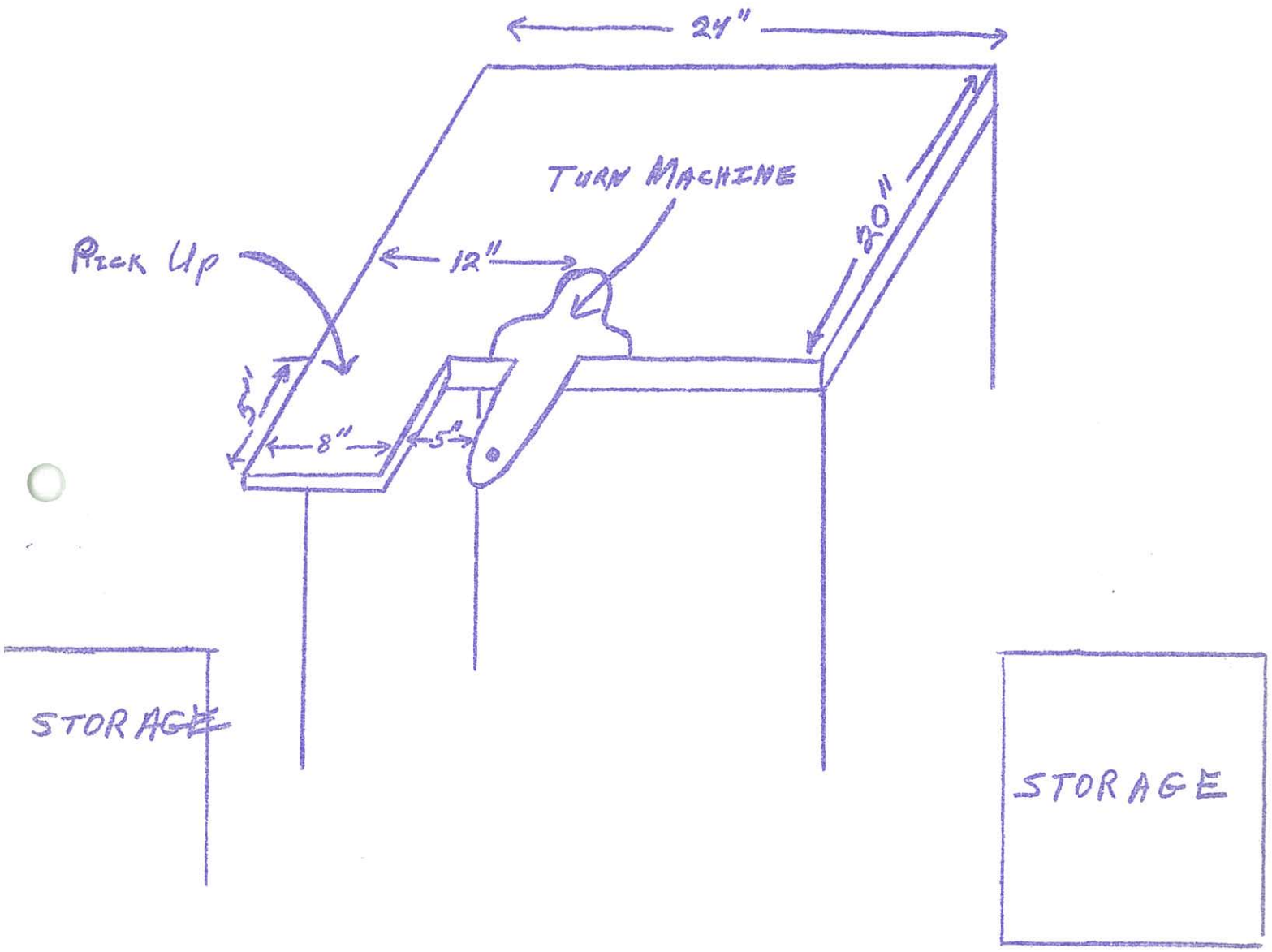
B. Cuffs are arranged on extention of table on the left of the Turn Machine. LH picks up cuff. Cuff is turned with RH & LH. RH disposes cuff in lap while LH picks up next cuff.

Note: When 10 to 20 cuffs are disposed in the lap, they are transferred to tray on the right work aid.

C. LH picks up cuff. LH & RH turn cuff. RH disposes while LH reaches for next cuff.

D. Points must be turned out completely.

Turn 3255 Cuff - Operation #27



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Sept. 70	SUMMARY NO.: 28 A 1 SHE OF: 3
DEPARTMENT: Sleeve and Cuff Prep.	PRODUCT: 350S Tom Jones	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 28	OPERATION: Topstitch Tom Jones Cuff (3255)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 14 inch	THREADS USED: DSP 100/2	
MACHINE MAKE: Singer	MACHINE TYPE: 281-141	GAUGE: SEAM TYPE:	NEEDLES: 1955 Size-14	R.P.M.: 4600
THROAT PLATE: #149051	FEED DOG: 149054	PRESSER FOOT: 161066	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Needle Positioner with trimmer. Three corner guage.			TYPE POWER TRANSMISSION: IM-6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY: JM	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: JM	DATE INSTALLED 10/8/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER 100
	Conditions						
	Cuffs come from Turn tied in bundles. Bundles are placed at topstitch cuff station by service personnel. Cuffs are topstitched, tied, and disposed by topstitch operator.						
	Operation sequence						
1.	Pick up, position, topstitch, cut, dispose				.136	200	2.72
	Bundle Handling						
A.	Tie & dispose				.5000	2.1	1.05
B.	Get, untie, & arrange				.3200	2.1	.67
C.	Process coupon				.2500	2.1	.52

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	27.20	12½	30.60	7½	12½	20	36.75	DOZ.				101				100
A-C	2.25	-	2.25	7½	12½	20	2.71	BDLE.								
						TOTAL	→	100	39.64			1215				1200

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Slv. & Cuff Prep PRODUCT: Cuff-350 S	CONTINUATION OF SUMMARY NO.: 28A	SHEET NO.: 2 OF 3 SHEETS:

DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)
Sept. 70	JM	28	Topstitch Cuff - 350 S or French

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Pick up tied bundle from storage table beside machine and untie. Place one half of the bundle on table extention to the right of machine head. Place the other half to the right of the needle with the top side of cuff face up. Process coupon and place string in work aid on the left end of sewing table.

1 Operation Sequence

A. Pick up, position, topstitch, cut, dispose

B. RH picks up top cuff to the right of needle as LH disposes previous topstitched cuff in box to the left. L & RH guide cuff into machine. Topstitch beginning end of cuff to corner tolerance. With needle positioned down turn and topstitch long side of cuff to corner tolerance. With needle positioned down, turn and topstitch end of cuff within tolerance of finishing edge. Position needle up. Raise presser foot. LH disposed finished cuff to box on the left of machine table while RH. Picks up next cuff.

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.: 28A	SHEET NO.: 3 OF 3 SHEETS:
DATE: 10-8-70	MOTION ANALYST JM	OPERATION NO.: 28	OPERATION NAME: (Describe in Full) Topstitch Cuff	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

C. 1. Pick up cuff with RH & position under needle.

2. Sew to corner, turn, sew down long side, turn, sew to finishing edge.

3. Dispose into box to left with LH, while picking up next cuff with RH.

D. 1. Begin & finish 3/4" from edge of cuff

2. ¼" margin 1/16".

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Sept. 70	SUMMARY NO.: 28B 1 SHE OF: 1
DEPARTMENT: Sleeve & Cuff Preparation	PRODUCT: French Cuff	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 28	OPERATION: Topstitch French Cuff			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch 14	THREADS USED: DSP 100/2	
MACHINE MAKE: Singer	MACHINE TYPE: 281-141	GAUGE: SEAM TYPE:	NEEDLES: 1955 Size-14.	R.P.M.: 4600
THROAT PLATE: 149051	FEED DOG: 149057	PRESSER FOOT: 161066	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Needle Positioner with Trimmer Three Corner Guage			TYPE POWER TRANSMISSION: IM-6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: E
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY: JM	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY:	DATE INSTALLED 10-8-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions						
	Same as Summary 28A						
	Operation Sequence						
	Same as Summary 28A				.1753	200	35.0
	Bundle Handling						
	Same as Summary 28A						2.2

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1	35.05	12½	39.50	7½	12½	20	47.40	DOZ.			10	80			10	80
A-C	2.25	-	2.25	7½	12½	20	2.71	BDLE.								
						TOTAL →		100	50.11	.834		960				960

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Sept. 70	SUMMARY NO.: 28C SHE 1 OF: 2
DEPARTMENT: Sleeve & Cuff Preparation	PRODUCT: 225R or 250R	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 28	OPERATION: Topstitch Round Cuff (225R or 250R)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 14	THREADS USED: DSP 100/2	
MACHINE MAKE: Singer	MACHINE TYPE: 281-141	GAUGE: SEAM TYPE:	NEEDLES: 1955 size 14	R.P.M.: 4600
THROAT PLATE: 14905I	FEED DOG: 161066	PRESSER FOOT: 161066	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Needle Positioner with Trimmer Three Corner Guage			TYPE POWER TRANSMISSION: IM-6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: JM	DATE INSTALLED 10-8-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions						
	Same as Summary 28A						
	Operation Sequence						
1	Pick up, position, topstitch, cut, dispose				.077	200	15.1
	Bundle Handling						
	Same as Summary 28A						2.2

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1	15.40	12½	17.10	7½	12½	20	20.55	DOZ.				174				167
A-C	2.25	-	2.25	7½	12½	20	2.71	BDLE.								
						TOTAL →		100	23.26			2060				2000

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Slv. & Cuff Prep. PRODUCT: Cuff	CONTINUATION OF SUMMARY NO.: 28C	SHEET NO.: 2 OF 2 SHEETS:

DATE: Sept. 70	MOTION ANALYST JM	OPERATION NO.: 28	OPERATION NAME: (Describe in Full) Topstitch Cuff - 250R or 225R

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Same as in Summary 28A

1 Operation Sequence

A. Pick up, position, topstitch, cut, dispose

B. RH picks up top cuff to the right of needle, as LH disposes previous topstitched cuff in box to the left. LH & RH guides cuff into machine. Topstitch around edge of cuff from beginning point on starting end to ending point on finishing end. Topstitch complete cuff without stopping the machine. (Note: On 225R cuff, starting and stopping point is Brighton Row.) At stopping point on finishing edge of cuff, position needle up and raise presser foot. LH disposes finished cuff to the left while RH picks up from the right the next cuff to be topstitched.

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE)	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.: 28C	SHEET NO.: OF SHEETS:
DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

C. 1. Pick up cuff with RH and position under needle.

2. Sew around cuff to finishing edge.

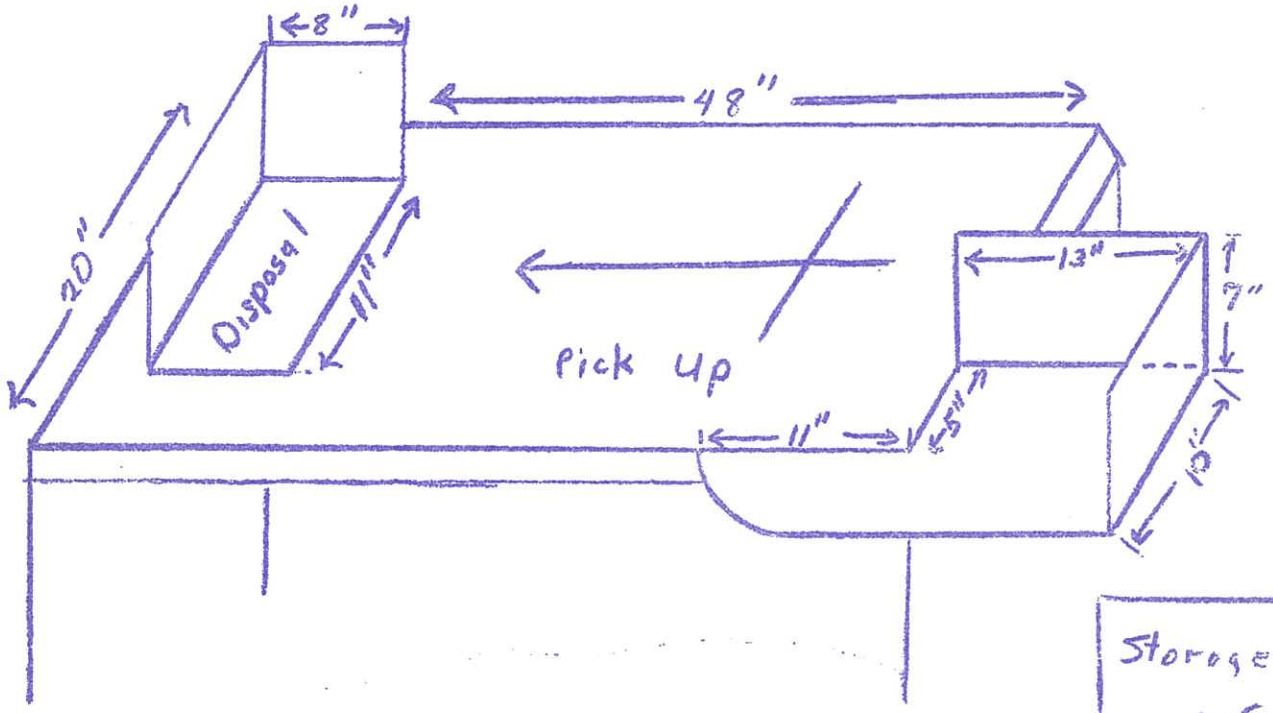
3. Dispose into box on the left with the LH, while RH is picking up next cuff.

D. 1. ¼" inch margin on topstitching 1/16".

2. On 250R begin & finish 3/4" from edge of cuff.

3. On 225R, begin & finish on Brighton Row.

Top stitch Cuff - Operation # 28



Storage — Before Top stitch

Storage — After Top-stitch

Note! Disposal Box is attached to table top with a metal Bracket. The Box is also elevated approx. 1" above table Top.

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 1970	SUMMARY NO.: 1 SHEET OF: 4
DEPARTMENT: Cuff Make & Sleeve Prep.	PRODUCT: Shirts	PART: Cuff	FROM STUDY NOS.:	OPERATOR: Wonnie Oliver
OPERATION NO.: 30	OPERATION: Button Sew 325S Cuff - Robot			OPERATOR'S NO. OR POSITION: 1079
SIZE: All	MATERIAL: All	STITCHES PER 16 button	THREADS USED: 40/6	
MACHINE MAKE: Singer	MACHINE TYPE: 114-37	GAUGE: SEAM TYPE: Shop made	NEEDLES: 108 X 1 - 16	R.P.M.: 1500
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Shop made guage, pick up tray, disposal tray, robot			TYPE POWER TRANSMISSION: IM-2	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JM	MOTION ANALYST: JM	TIME STUDIES BY: JM
CALCULATIONS BY: JM	CALCULATIONS CHECKED BY:	SKETCHES BY: JM	SKETCH NOS.: 1	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: JM	DATE INSTALLED 12/3/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Cuffs arrive tied in bundles placed to the left of Button Sew operator. Cuffs are button sewn, tied, and disposed to the right.						
	Operation Sequence						
1.	Position, sew, reposition, sew	20	.0508	110	.056	200	11.20
	Bundle Handling						
A.	Get and arrange				.280	2.1	.587
B.	Clerical				.250	2.1	.525
C.	Tie & dispose				.312	2.1	.655
D.	Get & dispose hand full				.134	2.9	.388
E.	Get buttons and fill hopper				.248	.14	.034

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	11.20	7	11.98	7½	12½	120	14.39	DOZ.				235				235
A-E	2.19	-		7½	12½	120	2.63	BDLE.								
						TOTAL →		100	17.02			2820				2820

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Cuff Make PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 30	SHEET NO.: 2 OF 4 SHEETS:

DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)
Nov. 1970	JM	30	Button Sew 325S Cuff

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (C) KEY POINTS IN MOTION PATH. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Secure tied bundle from storage table to the left. Untie and arrange cuffs top side down in the tray on the left end of table top. Process button sew cuff ticket and lay bundle string across disposal tray on the right. Get approximately 35 ply of cuff from the tray on the left, button sew, and dispose to tray on the right. At the half way point in the bundle tie a half knot in the string. When the bundle is finished, tie & dispose to the right.

Operation Sequence

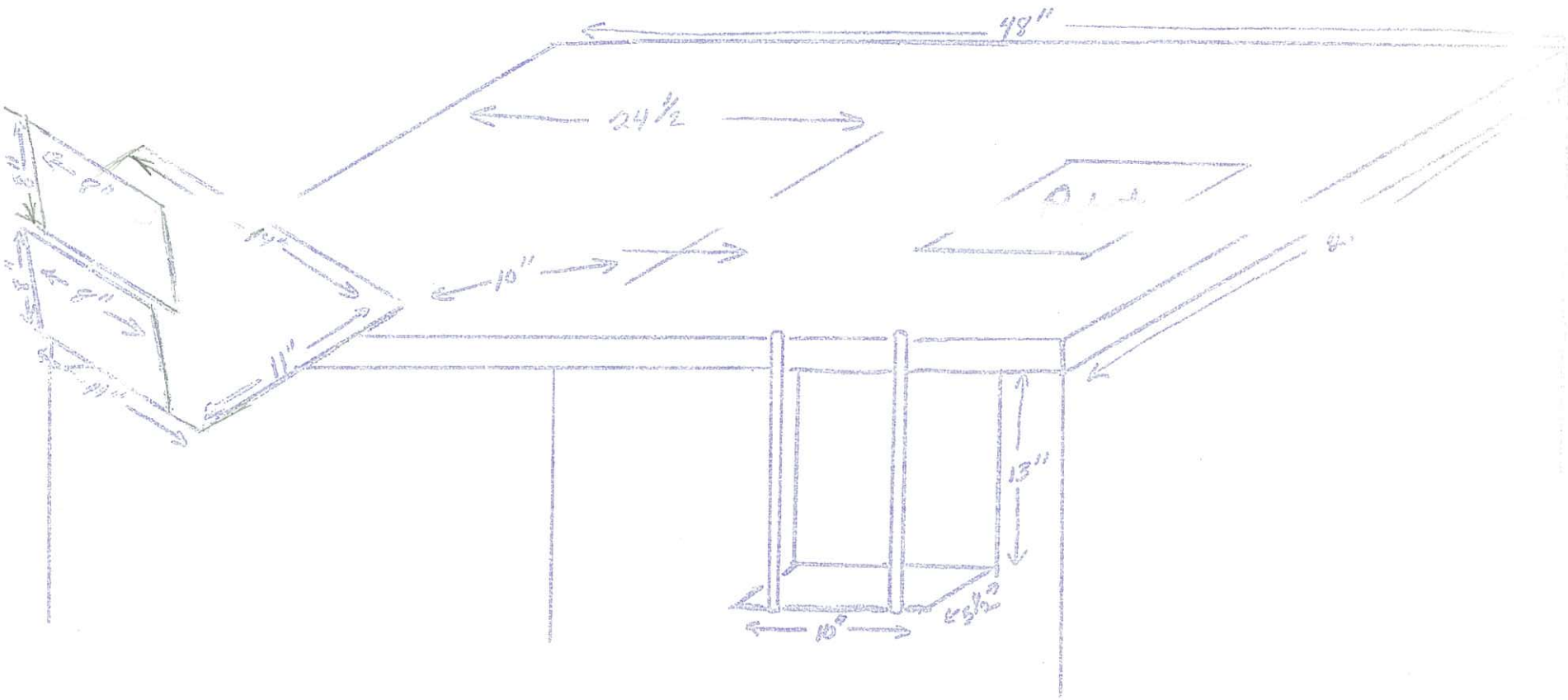
1. A. Position, sew, reposition, sew

B. Cuffs are held in the RH in front of the needle. LH flips bottom cuff down and positions it in the gauge along the right guide of the gauge. Foot depresses pedal and the machine sews the first button. LH & RH repositions the cuff along the left guide of the gauge. Foot depressed the pedal and machine sews second button. Simultaneously flips next cuff down toward the needle and pushes the finished cuff out from under the needle. Next, cuff is positioned along right guide of guage.

C. LH flips cuff down toward the needle and pushes finished cuff out from under the needle simultaneously. LH & RH position cuff on the right guide of the gauge; sew first button. Reposition cuff along left guide and sew second button.

D. Buttons must be ½" from end off cuff.
Buttons must be 1 ¼" apart.
Buttons must be 1" from side of cutt.
Buttons must be sewn on proper end.
No attached threads.
Cross stitch button sew

Operation # 30
Button Sew Cuff - Robot



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-13-70	SUMMARY NO.: 31 SHEET 1 OF: 3
DEPARTMENT: Assembly	PRODUCT: Shirts	PART: Fronts & Yokes	FROM STUDY NOS.:	OPERATOR: Craig
OPERATION NO.: 31	OPERATION: Shoulder Join			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Inch 14	THREADS USED: 100/2 DSP	ASL 14
MACHINE MAKE: U S	MACHINE TYPE: 51200 BH	GAUGE: SEAM TYPE: ≡≡≡	NEEDLES: 108GS-036	R.P.M.: 5000
THROAT PLATE: 51-324V	FEED DOG: 51305V	PRESSER FOOT: 56330H	FOLDER:	GEARS: CAMS:
ATTACHMENTS: ACCA-Table Shelves			TYPE POWER TRANSMISSION: AMCO	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY:	MOTION ANALYST:	TIME STUDIES BY:
CALCULATIONS BY: RW	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: RW	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: RW	DATE INSTALLED 7-15-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions One bundle of matched fronts, backs, and collars is placed on work-aid to the left of the machine. Backs and fronts are then positioned, the completed shirt is disposed on mobile truck with collars on top and forwarded to collar join.						
1.	**Operation Sequence**						
1.	Dispose, pick up and position	20	.151	100%	.1510	100	15.10
2.	Sew	20	.057	95%	.0542	100	5.42
3.	Reposition	20	.131	100%	.1310	100	13.10
4.	Sew	20	.059	90%	.0544	100	5.44
	Bundle Handling						
A.	Clerical				.250	2.08	.523
B.	Untie and Position Parts				.440	2.08	.915
C.	Exchange trucks				.350	2.88	.726

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-4	39.06	7½%	42.0	7½	12½	20%	50.4	DOZ.				75.5				75.5
A-C	2.16			7½	12½	20%	2.5	BDLE.								
						TOTAL →		100	53.0			90.6				90.6

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Fronts	CONTINUATION OF SUMMARY NO.: 31	SHEET NO.: 2 OF 3 SHEETS:

DATE: 7-13-70	MOTION ANALYST RW	OPERATION NO.: 31	OPERATION NAME: (Describe in Full) Fronts & Yokes

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Operator secures one bundle of matched fronts, backs, and collars from work-aid to left of machine. Service Boy places work on work-aid. Backs are untied and placed on undershelf to left with inside up. Fronts are untied and left fronts positioned on upper shelf on the right side of the shelf, right fronts are positioned on the upper shelf on the left side of the shelf. Neck portion of shirt is toward operator on both back and fronts.

Operation Sequence

1. A. Dispose, Pick Up and Position

B. As machine finishes sewing last join seam, the thread is cut by ACCA, the right hand grasp the front and the left hand grasp the back. The hands are then pulled apart, causing the seam to be turned right side out. Left hand gives shirt to right hand. Right hand grasps shirt in middle of yoke causing shirt to be folded. Right hand flips tail of shirt away from her laying shirt on mobile truck to her right - Right Side Up - Left hand already started to grasp yoke and pull toward needle. As shirt is pulled, right hand reached for top of yoke and with left hand flips yoke causing it to fold under. Left hand reaches for left fronts and as it brings it to the needle, it is flipped over so that face is down. Right hand grasp bottom part of raw edge and along with left hand align the front and yoke. Right hand holds the two plys together and left hand pulls front toward operator. Left hand then reaches under back and pulls bottom part of yoke over so that the face side of both top and bottom yoke faces each other. Move to needle with left hand guiding and right hand still inside hold plys together.

C. Turn join seam with simple pull. Align front to inside yoke all around and hold firm with right hand so that no additional alignment is necessary. Bulk of front is toward operator.

2. A. Sew-

B. Sew approximately one inch and stop. Grasp top yoke with left hand and position to other two ply moving right hand out from between the plys. Align plys and grasp with both hands. Sew off yoke. ACCA cuts threads.

C. One stop is allowed for the seam because the bottom two plys are in alignment and you only have to align the top yoke to these two.

D. Seam width 5/16" ± 1/16". Ends at neck should be aligned within 1/8".

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Fronts	CONTINUATION OF SUMMARY NO.: 3	SHEET NO.: 3 OF 3 SHEETS:

DATE: 7-13-70	MOTION ANALYST RW	OPERATION NO.: 31	OPERATION NAME: (Describe in Full) Fronts & Yokes

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT
3.	A. Reposition.	
	B. Right hand grasp front, left hand back and pull apart causing join seam to be turned. Flip left wrist toward machine, at the same time, causing back to fall on table with top yoke up. Grasp top yoke with right hand and position to needle. Grasp right front with left hand and bring to machine and with right hand align the front with the top yoke. Hold alignment with right hand reach under shirt and bring bottom yoke up and align with the back and top yoke. Pull bulk of shirt toward operator and move the aligned three plys to needle.	
	C. Turn with quick pull. Align front to outside yoke all around and hold firm with right hand so that additional positioning is unnecessary.	
4.	A. Sew-	
	B. Same as 2B	
	C. Same as 2C	
	D. Same as 2D	

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: July 1970	SUMMARY NO.: 32 SHEET 1 OF: 3
DEPARTMENT: Assembly	PRODUCT: Dress Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: W. Foskey
OPERATION NO.: 32	OPERATION: Collar Join - Banded (Right Front-Hemmed)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 12 inch	THREADS USED: 100/2 DSP	ASL 12
MACHINE MAKE: Singer	MACHINE TYPE: 241-11	GAUGE: SEAM TYPE: ═╪═	NEEDLES: 1361-14/90	R.P.M.: 4700
THROAT PLATE: 147158	FEED DOG: 149057	PRESSER FOOT: 161-085	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Three-Corner Gauge #25873			TYPE POWER TRANSMISSION: AMCO	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE:
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY:	MOTION ANALYST:	TIME STUDIES BY:
CALCULATIONS BY: RW	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: RW	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: RW	DATE INSTALLED: 7-15-1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100 TIME PER: 100
	Conditions Collars and shirts are placed to left of the machine on a mobile truck, by service personnel. Collars are joined, placed on mobile truck and forwarded onto collar finish.						
	Operation Sequence						
1.	Pick Up, Position, Sew onto Collar	20	.110	105	.116	100	11.60
2.	Break chain-dispose of previous shirt to right onto truck.	20	.005	100	.055	100	5.00
3.	Finish seam started on collar.	20	.184	110	.212	100	21.2
	Bundle Handling						
A.	Clerical Work				.250	208	.523
B.	Get, untie, and Position Collar				.264	208	.550
C.	Exchange trucks				.350	208	.726

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	38.62	12½	43.5	7½	12½	20%	52.1	DOZ.				75.0				75.0
A-C	11.50			7½	12½	20%	1.8	BDLE.								
						TOTAL →		100	53.4			900				900

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Collars	CONTINUATION OF SUMMARY NO.: 32	SHEET NO.: 2 OF 3 SHEETS:

DATE: July 1970	MOTION ANALYST RW	OPERATION NO.: 32	OPERATION NAME: (Describe in Full) Collar Join - Banded

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PEI UNIT

Bundle Handling

One bundle of shirts with matched collars are placed to the left of the operator, in mobile truck, by service personnel. Collars are untied and placed on a table extension to the right of the operator and at an angle toward the needle.

Dispose completed shirt folded in half to mobile truck to right of operator, left side up. Completed shirt removed by service personnel.

Operation Sequence

1. A. Pick Up, position both parts and sew one inch.

   B. Previous shirt has just been completed, left hand grasp next shirt, from lap, at neck opening. Simultaneously, right hand moves to stack of collars and grasp next collar. Right hand position shirt, face down, at needle as left hand position collars to shirt, unhemmed side down, matching end of collar to end of neck hole. Left hand holds hem band back and right hand aligns shirt and collar. Sew onto collar approximately one inch and back tack.

2. A. Dispose previous shirt to right

   B. As the back tack is completed, right hand release and move to middle of collar, of previously completed shirt, grasp and with a sharp motion away from the machine breaking the connecting thread. Fold shirt in half so that the shirt is left side up- and bring it around end of the machine. Flip wrist causing tail of shirt to be away from operator and lay on mobile truck. Right hand thenreturns to shirt and collar and grasp shirt at shoulder seam. Left hand moves down collar to first notch of collar and align to shoulder seam keeping hem bands pulled back.

3. A. Set Collar-

   B. Sew from end of collar to shoulder seam. Right hand find center notch of shirt, left hand finds center notch of collar. Align notches and sew to this point. Likewise, align next shoulder seam on shirt and third notch on collar and sew to this point. Align end of collar and shirt and sew to end, back tacking approximately one inch. Sew off.

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Collars	CONTINUATION OF SUMMARY NO.: 32	SHEET NO.: 3 OF 3 SHEETS:
DATE: July 1970	MOTION ANALYST RW	OPERATION NO.: 32	OPERATION NAME: (Describe in Full) Collar Join - Banded	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PEI UNIT

C. Seam width should be 1/16" ± 1/16"

End of collar bands should be set even with the fronts. No tolerance at front ± 1/8" at back. Knotches on bands and yoke should match, (± 1/8" tolerance). Quarter notches should align with shoulder seams.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: May 1970	SUMMARY NO: 34A SHE 1 OF: 4
DEPARTMENT: Assembly	PRODUCT: Sports & Dress Shirt	PART: Body	FROM STUDY NOS.:	OPERATOR:
OPERATION NO.: 34	OPERATION: Combination- Set Sleeves and Seam Sides L. Slv.			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER Inch: 12	THREADS USED: 100/2	ASL:
MACHINE MAKE: Rimoldi	MACHINE TYPE: Rim 27	GAUGE: SEAM TYPE:	NEEDLES: System Rim 27 Size 80	R.P.M.: 5200
THROAT PLATE: 290 B 114 P	FEED DOG: 290 B - 050	PRESSER FOOT: 297-18|1|1 G 290 B |81|	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Cut Vac			TYPE POWER TRANSMISSION: 1M6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JW	MOTION ANALYST: JW	TIME STUDIES BY: JW
CALCULATIONS BY: JW	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: BL	DATE INSTALLED May 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% PER: 100
	Conditions The garment has been yoked, shoulder joined, collar and band attached. The bundle supply is in a buggy to the right of the operator, sleeves to left on a table extension of machine. Left sleeves are on back and right sleeves on front beside operator. Operator gets left sleeve and sews to garment, then seams the left side. The operator then gets right sleeve and sews to garment, then seams the right side.						
	Operation Sequence						
1.	Dispose, Pick Up, and Position Left	74	.1019	95	.0967	100	9.67
2.	Sew Left Sleeve	81	.1158	94	.1087	100	10.87
3.	Reposition Left	78	.1073	93	.1000	100	10.00
4.	Seam Left Side	78	.1205	96	.1155	100	11.55
5.	Pick Up & Position Right	79	.0970	100	.0970	100	9.70
6.	Sew Right Sleeve	79	.1080	94	.1012	100	10.12
7.	Reposition Right	76	.1040	100	.1040	100	10.40
8.	Seam Right Side	79	.1218	96	.1171	100	11.71
							84.02
	Bundle Handling						
A.	Get Bundle & Ck Number Sequence	16	.430	100	.430	*	.90
B.	Clip Coupon *100/48	16	.430	100	.430	*	.90
C.	Pick Up Shirts to Lap	24	.065	110	.072	100/8	.90 2.70

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-8	84.02	10	92.42	7½	12½	20%	110.93	DOZ.								35
A-3	2.90		2.90	7½	12½	20%	3.24	BDLE.								
						TOTAL →		100	114.17		52.5	420	114.17			420

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 34A	SHEET NO.: 2 OF 4 SHEETS:
DATE: May 1970	MOTION ANALYST JW	OPERATION NO.: 34	OPERATION NAME: (Describe in Full) Combination	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT
1.	A. Dispose, Pick Up & Position Left Sleeve	
	B. The garment has just cleared the Cut Vac. Left hand pushes garment into trough at rear of machine while right hand reaches for left front of shirt in lap. While the left hand reaches for and grasps the left sleeve, the right hand grasps the left front. Slide the sleeve on to table top in front of presser foot while right hand flips the left front across left forearm. Open left hand and place face down on sleeve while right hand reaches for and grasps front arm opening point. Match the armhole point to the sleeve with right hand while left hand steadies the sleeve. Both hands position garment to the presser foot and guide.	.09
	C. Covered above	
	D. Sleeve and Armhole opening must be even	
2.	A. Sew left sleeve	
	B. Start machine and as right hand remains open (face down) to guide sleeve, - Guide the armhole by letting it slide between 1st two fingers of the right hand. After sewing across yoking seam, stop to let right hand throw the back toward back of machine out of way. Regrasp opening and finish sewing.	
	C. Sew with one stop. Operator must develop skill to exert correct tension to make sleeve and back come out even. Skill must also be developed to sew with one stop. No stop sewing can be achieved, but requires an extremely high degree of skill.	
	D. No raw edges. Check SQC Requirements.	
3.	A. Reposition Left (for Seaming Side)	
	B. Left hand grasps collar while right hand grasps sleeve. Left hand pulls shirt to lap(back over front)as right hand flips sleeve across table top. Simultaneously, move left hand to end of sleeve and insert 1st finger of the right hand between the sleeve plys. With the left hand, match the sleeve ends, while the right moves down the side straightening. Move sleeve to needle with left hand and match sleeve seams with right.	
	C. Covered above	
	D. All plys should be even. Check SQC for other specifications.	

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly / PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 34A	SHEET NO.: 3 OF 4 SHEETS:
DATE: May 1970	MOTION ANALYST JW	OPERATION NO.: 34	OPERATION NAME: (Describe in Full) Combination	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT
4.	A. Seam left side.	
	B. Start machine and guide the side with the right hand, using the left to keep garment from gathering under the foot. After the garment is seamed to sleeve seam, let the garment plys slide through the fingers and thumb of right hand. As the sewing approaches the bottom, take left hand to tail and follow out the last few inches as the right hand moves under left arm and grasps right front.	
	C. Two stops acceptable - High degree of skill can achieve one or none.	
	D. Sleeve ends and bottom front and back must match evenly as well as the sleeve seams.	
5.	A. Reposition Garment, Pick Up and position Right Sleeve.	
	B. Simultaneously, pull right front toward lap with right hand and flip left side out of way with left hand. While left hand reaches for and grasps sleeve, the right hand gets the collar. Right hand lifts the collar up while the left hand slides the sleeve under toward armhole. Open left hand and place face down on sleeve while right hand reaches for and grasps arm opening point. Match to sleeve with right hand while left hand steadies sleeve. Both hands position garment to the presser foot and guide.	
	C. Same as 1C	
	D. Same as 1D	
6.	A. Sew Right Sleeve	
	B. Same as 2B	
	C. Same as 2C	
	D. Same as 2D	
7.	A. Reposition Right	
	B. Same as 3B	
	C. Same as 3C	
	D. Same as 3D	

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: May 70	SUMMARY NO.: 348 SHEET 1 OF: 2
DEPARTMENT: Assembly	PRODUCT: Sport & Dress Shirt	PART: Body	FROM STUDY NOS.:	OPERATOR:
OPERATION NO.:	OPERATION: Combination - Set Sleeves and Seam Sides S. Slv.			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER inch: 12	THREADS USED: 100/2	
MACHINE MAKE: Rimoldi	MACHINE TYPE: Rim 27	GAUGE: SEAM TYPE:	NEEDLES: Size 80 System Rim 27	R.P.M.: 5200
THROAT PLATE: 290B114 P	FEED DOG: 290B - 050	PRESSER FOOT: 297-1811/1 G290 B 1811	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Cut Vac			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JW	MOTION ANALYST: JW	TIME STUDIES BY: JW
CALCULATIONS BY: JW	CALCULATIONS CHECKED BY:	SKETCHES BY: JW	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: BL	DATE INSTALLED: May 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions:						
	Same as for long sleeve						
	Operation Sequence						
1.	Dispose, PV & position left sleeve	15	.1165	80.0	.0932	100	9.32
2.	Sew left sleeve	19	.1013	95.0	.0964	100	9.64
3.	Reposition left	19	.0868	102.5	.0890	100	8.90
4.	Seam left side	18	.1020	102.5	.1045	100	10.45
5.	PV & position right	18	.0735	105	.0771	100	7.71
6.	Sew right sleeve	19	.0935	95	.0889	100	8.89
7.	Reposition right	20	.0855	95	.0811	100	8.11
8.	Seam right side	19	.1035	97.5	.1010	100	10.10
	Bundle Handling						
A.	Get bundle & check number sequence	16	.430	100	.430	*	.90
B.	Clip coupon	16	.430	100	.430	*	.90
C.	Pick up shirts to lap	24	.065	110	.072	100/8	.90
	*100/48						

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-8	73.12	90	80.43	7½	12½	20	96.52	DOZ.							5	40
A-C	2.70		2.70	7½	12½	20	3.24	BDLE.								
						TOTAL →	100		99.76			481	100		60	480

FORM 33CP

KURT SALMON ASSOCIATES

MOTION AND TIME ANALYSIS SUMMARY

CONSULTING ENGINEERS

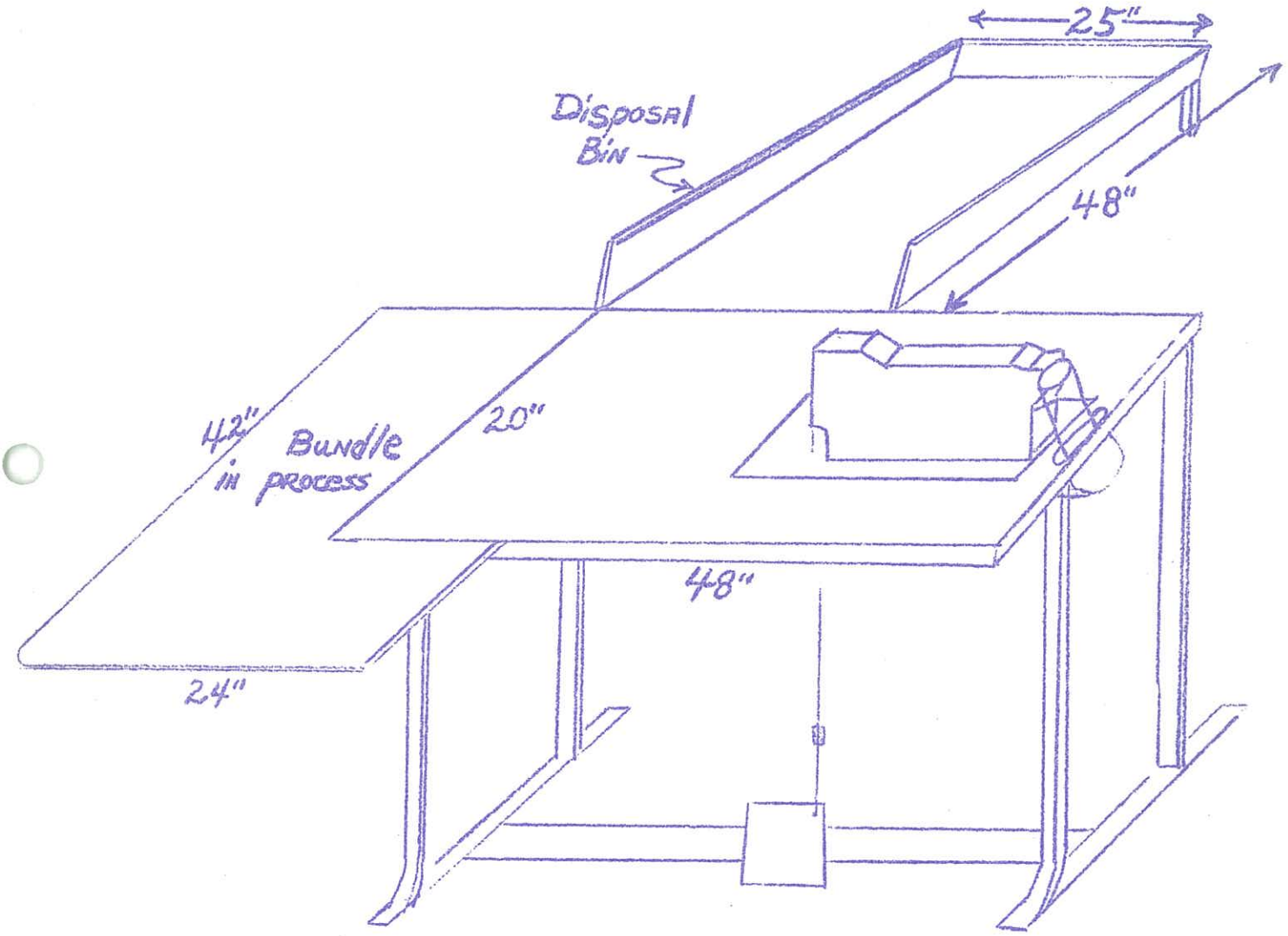
CLIENT: (CODE)	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.:	SHEET NO.: OF SHEETS:
DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Motion analysis is the same as for long sleeves.

Operation # 34

Combination



FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

MOTION AND TIME ANALYSIS SUMMARY

CLIENT: (CODE) 169	PLANT: (CODE)		DATES OF STUDIES: June 1970	SUMMARY NO.: 35 SHEET 1 OF: 2
DEPARTMENT: Assembly	PRODUCT: Sport & Dress Shirt	PART: Body	FROM STUDY NOS.:	OPERATOR: Mable Pittman
OPERATION NO.: 35	OPERATION: Turn & Stack Long Sleeves for Cuff Set(After Slv & Fell)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER	THREADS USED:	
MACHINE MAKE:	MACHINE TYPE:	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EL
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JW	MOTION ANALYST: JW	TIME STUDIES BY: JW
CALCULATIONS BY: JW	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: BL	DATE INSTALLED July 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions Shirts have sleeved and felled, disposed into a chute behind sleeve and fell operators. Operator turns sleeves and stacks shirts on trucks for cuff set, highest ply number on top.						
	Operation Sequence						
1.	Turn & Stack	20	.0935	100	.0935	100	9.350
	Bundle Handling						
A.	Add up Production from Sleeve-Fell operators and turn in	4	2.90	100	2.90	.028	.080
B.	Walk from one stack out station to next	17	.072	100	.072	8.3	.600
C.	Get truck	5	.368	95	.350	2	.700
D.	Measure dress shirt sleeve length	9	.150	100	.150	1.33	.200

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1	9.35	2½	9.58	7½	12½	20	11.50					298				298
A-D	1.58					20	1.90	DOZ.								
								BDLE.	13.40			3580				3580
						TOTAL	→	100								

FORM 33CP

KURT SALMON ASSOCIATES | **MOTION AND TIME ANALYSIS SUMMARY** | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 35	SHEET NO.: 1 OF 2 SHEETS:

DATE: June 1970	MOTION ANALYST JW	OPERATION NO.: 35	OPERATION NAME: (Describe in Full) Stack for Cuff Set

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Push truck with completed bundle out of way into cuff set department. Bring back empty truck. After clearing one operator's chute, move to next. This should average turning 12 to 15 shirts per move. Check sleeve length of every 1st shirt of every dress shirt bundle. Get the production of every operator worked for, add up, and turn in.

Operation Sequence

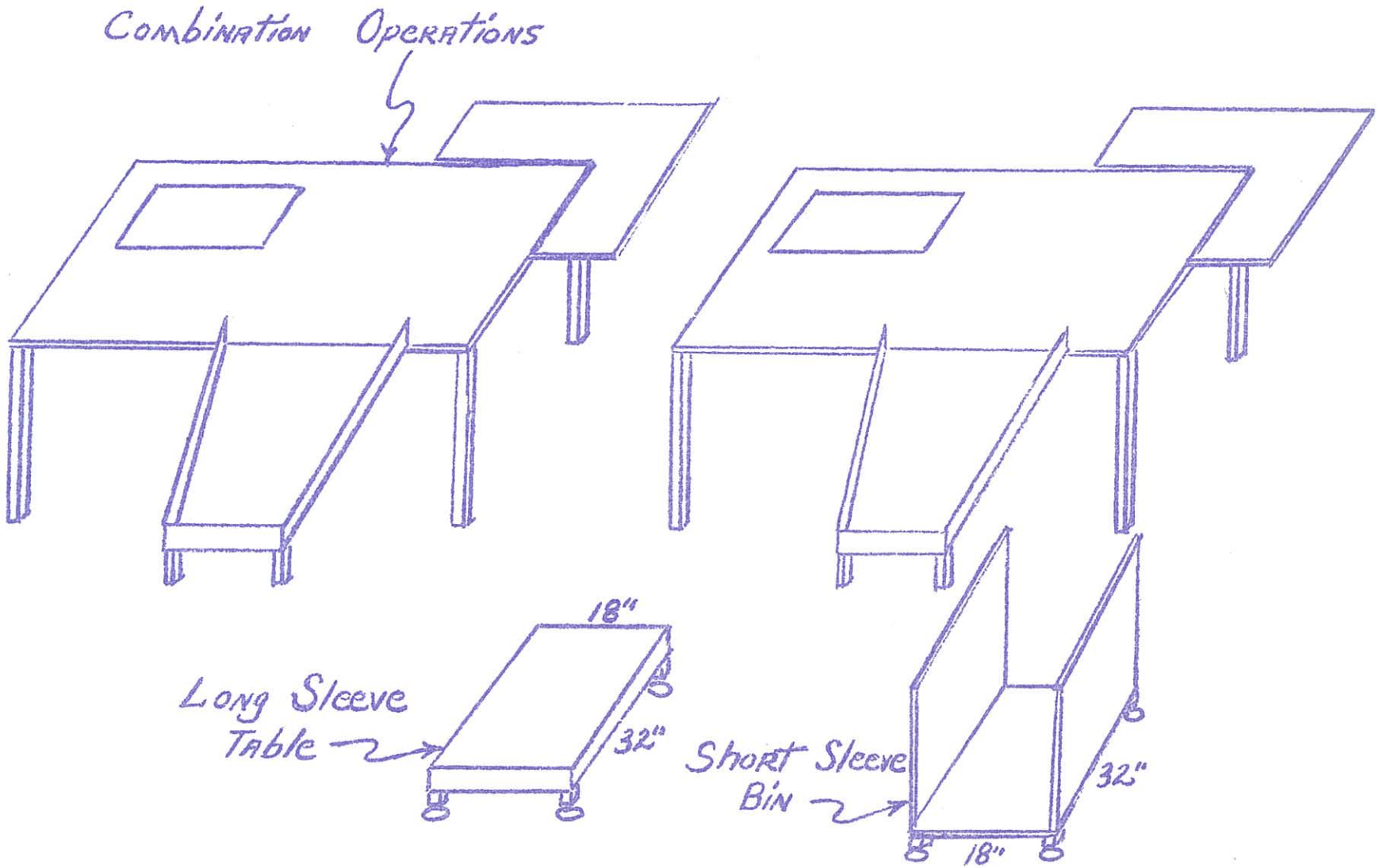
1. A. Turn & Stack

B. Pick up shirt with either hand and insert the other into sleeve. Hold shirt with hand that is in sleeve and insert the other arm and hand into the other sleeve. Turn one sleeve right side out with one hand while the other holds shirt. Grasp the shirt at the shoulder with the hand that turned the first sleeve and hold while the other hand turns the other sleeve right side out. Grasp shirt at the other shoulder, with both hands, flip shirt on to truck.

C. Right hand must work on right sleeve and left hand on left sleeve.

D. Stack neatly with label facing up and highest ply number on top. Use shoulders as quide for stacking.

Operation # 35
Turn & Stack



FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 1970	SUMMARY NO.: 36 SHE 1 OF: 4
DEPARTMENT: Assembly	PRODUCT: Shirts	PART:	FROM STUDY NOS.:	OPERATOR: B. Stanley
OPERATION NO.: 36	OPERATION: Cuff Set			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: 65/35	STITCHES PER inch 14	THREADS USED:	
MACHINE MAKE: Pfaff	MACHINE TYPE: 463	GAUGE: SEAM TYPE:	NEEDLES: 134-80	R.P.M.: 4900
THROAT PLATE: 486643	FEED DOG: A47298	PRESSER FOOT: 22 Sunbrand	FOLDER:	GEARS: CAMS:
ATTACHMENTS: underbed trimmer			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: AMK	MOTION ANALYST: AMK	TIME STUDIES BY: AMK
CALCULATIONS BY: AMK	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: AMK	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: IB	TYPING CHECKED BY: JCR	INSTALLED BY: AMK	DATE INSTALLED June 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions One bundle of matched shirts and cuffs on a mobile truck is secured from sleeve-fell combination and pulled into position. The cuff is attached to the sleeve and completed shirt is forwarded to bottom hem.						
	Operation Sequence						
1.	Pick Up and position for right cuff	20	.0795	110	.0875	100	8.75
2.	Sew Right Cuff	20	.140	115	.161	100	16.10
3.	Pick Up and Position for left cuff	20	.0795	110	.0875	100	8.75
4.	Sew Left Cuff	20	.140	115	.161	100	16.10
	Bundle Handling						
A.	Clerical	20			.250	2.1	.525
B.	Pull truck into position	20			.047	2.1	.100
C.	Untie cuffs	20			.750	2.1	1.525

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-4	49.7	12½	56.0	7½	12½	20	67.0	DOZ.				57.1				57.1
A-E	2.5		2.5	7½	12½	20	3.1	BDLE.								
						TOTAL →		100	70.1			685	70.1			685

FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 1970	SUMMARY NO.: 36 SHEET 2 OF: 4
DEPARTMENT: Assembly	PRODUCT: Shirts	PART:	FROM STUDY NOS.:	OPERATOR: B. Stanley
OPERATION NO.: 36	OPERATION: Cuff Set			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: 65/35	STITCHES PER inch: 14	THREADS USED:	
MACHINE MAKE: Pfaff	MACHINE TYPE: 463	GAUGE: SEAM TYPE:	NEEDLES: 134-80	R.P.M.: 4900
THROAT PLATE: 486643	FEED DOG: A 47298	PRESSER FOOT: 22 Sunbrand	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Underbed Trimmer			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: E
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: AMK	MOTION ANALYST: AMK	TIME STUDIES BY: AMK
CALCULATIONS BY: AMK	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: AMK	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: EB	TYPING CHECKED BY: JCR	INSTALLED BY: AMK	DATE INSTALLED: June 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	D. Revolve truck	20			.017	2.1	.035
	E. Dispose	20			.15	2.1	.315

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
								DOZ.								
								BDLE.								
						TOTAL →		100								

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 36	SHEET NO.: 3 OF 4 SHEETS:

DATE: June 1970	MOTION ANALYST AMK	OPERATION NO.: 36	OPERATION NAME: (Describe in Full) Cuff Set

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Bundle Handling

Operator gets bundle truck with shirts and cuffs and puts to the left of the machine, removes cuffs from bundle truck, clips string and places cuffs on machine stand. Operator flips sleeves over top of the shirts and sews from bottom to top in sequence. Operator pulls coupon, signs ticket, and attaches to gum sheet.

1. A. Pick up 1st(right)sleeve and cuff.

B. Pick up right sleeve with left hand at facing with vent down and moves to front of machine, holding sleeve at facing with thumb on top. With right hand, grasp right cuff with first finger and thumb on top, remaining fingers on bottom. Opening of cuff is to the left. Move cuff to sleeve, operator then takes her thumb and first finger of the left hand, still holding sleeve, and grasps the bottom ply of the cuff, letting the sleeve facing rest on the top ply. With an upward motion of the left hand and a twisting motion of the of the right hand she opens the cuff and inserts the thumb of the right hand to keep the cuff open. With the thumb of the left hand, she pushes sleeve downward and into cuff opening, 3/8", she then removes right thumb and positions cuff and sleeve to needle.

C. Simultaneously, pick up right sleeve and cuff.

D. Sleeve should not be inserted more than 3/8" ± 1/8".

2. A. Sew right cuff (with one pleat).

B. With both hands, back tack 4-5 stitches and stop. Insert thumb of right hand inside cuff and sew about 5 inches, stop. Grasp end of sleeve at facing and with thumb of right hand open cuff and insert sleeve with facing turned under. Holding cuff and sleeve at end with right hand, the left hand then grasps excess material with thumb and first finger and forms a pleat about 1½" from end of cuff. Folding pleat toward the operator, sew to end of cuff and back tack.

C. Only 2 stops including end of back tack.

D. Maintain ¼" insert of sleeve. Tolerance 3/8" ± 1/8"

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

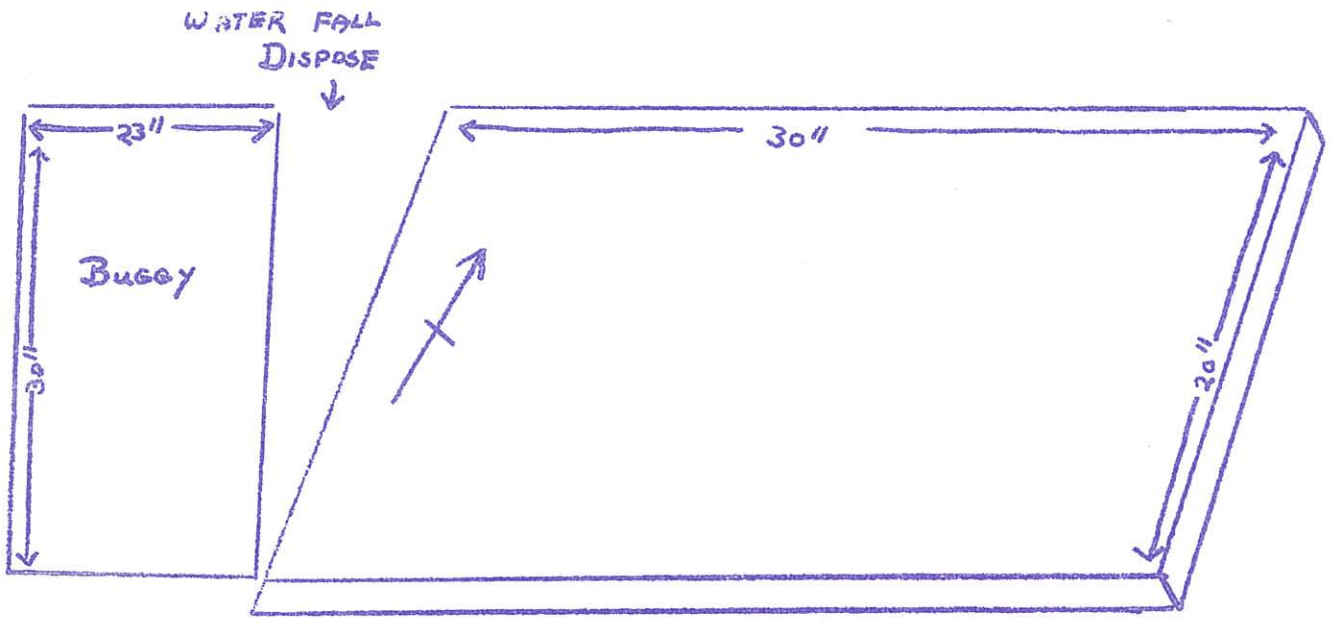
CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 36	SHEET NO.: 4 OF 4 SHEETS:

DATE: June 1970	MOTION ANALYST AMK	OPERATION NO.: 36	OPERATION NAME: (Describe in Full) Cuff Set

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT
3.	A. Pick Up and position 2nd (left) sleeve and cuff	
	B. Same as 1B except with left sleeve and cuff	
	C. Same as 1C	
4.	A. Sew left cuff (with one Float)	
	B. Same as 2B	
	C. Same as 2C	

OPERATION NO. 36

CUFF SET



CUT-OFF TABLE

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-16-70	SUMMARY NO.: 37A SHEET 1 OF: 3
DEPARTMENT: Assembly	PRODUCT: Dress & Sport Shirts	PART: Back	FROM STUDY NOS.:	OPERATOR: Composite
OPERATION NO.: 37	OPERATION: Bottom Hem - Right Front Unhemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 12 inch	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 63400	GAUGE: SEAM TYPE:	NEEDLES: 180GXS-036	R.P.M.: 5100
THROAT PLATE: 613240-063	FEED DOG: 61305D	PRESSER FOOT: Adapted 121805	FOLDER: included in p. foot	GEARS: CAMS:
ATTACHMENTS: knife attached to rear of presser foot			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY: JCR	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-22-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Shirt comes to this operation on trolleys from the cuff section. Distribution is by service operator. After sewing, work is stacked on trolley at rear of bench for removal by service operator.						
	Operation Sequence						
1.	Reach for shirt, pick up, and position in folder at needle.				9.6	100	9.6
2.	Sew through bottom hem while cutting and disposing previous shirt. At end of hem, fold over right front and sew through.				25.4	100	25.4
	Bundle Handling						
A.	Put tagged shirt aside at commencement of bundle and place on top of bundle at completion.				0.18	2.1	0.38
B.	Clip coupon, sign, and stick to gum sheet.				0.19	2.1	0.38
C.	Move full trolley to side and remove previous trolley.				0.38	2	0.80

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	35.0	12½	39.4	7½	12½	20	47.3	DOZ.				81.2				81.2
A-C	1.56	-	1.56	7½	12½	20	1.87	BDLE.								
						TOTAL →		100	49.2			975	49.2			975

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 37A	SHEET NO.: 2 OF 2 SHEETS:

DATE: 7-16-70	MOTION ANALYST JCR	OPERATION NO.: 37	OPERATION NAME: (Describe in Full) Bottom Hem

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PER UNIT

Operation Sequence

1. A. Reach for shirt, pick up and position in folder.

   B. Right hand reaches back to grasp top shirt in bundle while left hand completes previous sequence. Both hands are required to place hem into folder.

   C. Hem with 3/16" ± 1/16". The hem should be even with the front and ends.

2. A. Sew through bottom hem. Fold over right front hem at end of cycle and sew through. After the first stitches, the cut thread attached to previous shirt.

   B. As hem comes by the needle, the left hand picks up the previous shirt and pulls the connecting thread over the the knife situated on the back of the presser foot - Left hand disposes shirt to rear.

   C. Right hand controls bulk of material until sewing is nearly complete.

Bundle Handling

After the shirt to which the ticket is attached is sewn, it is placed on top of bundle. When this is done, the coupon is signed, clipped, and placed on the gum sheet.

At the end of each bundle, the empty trolley is pushed away and the full one pulled in.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

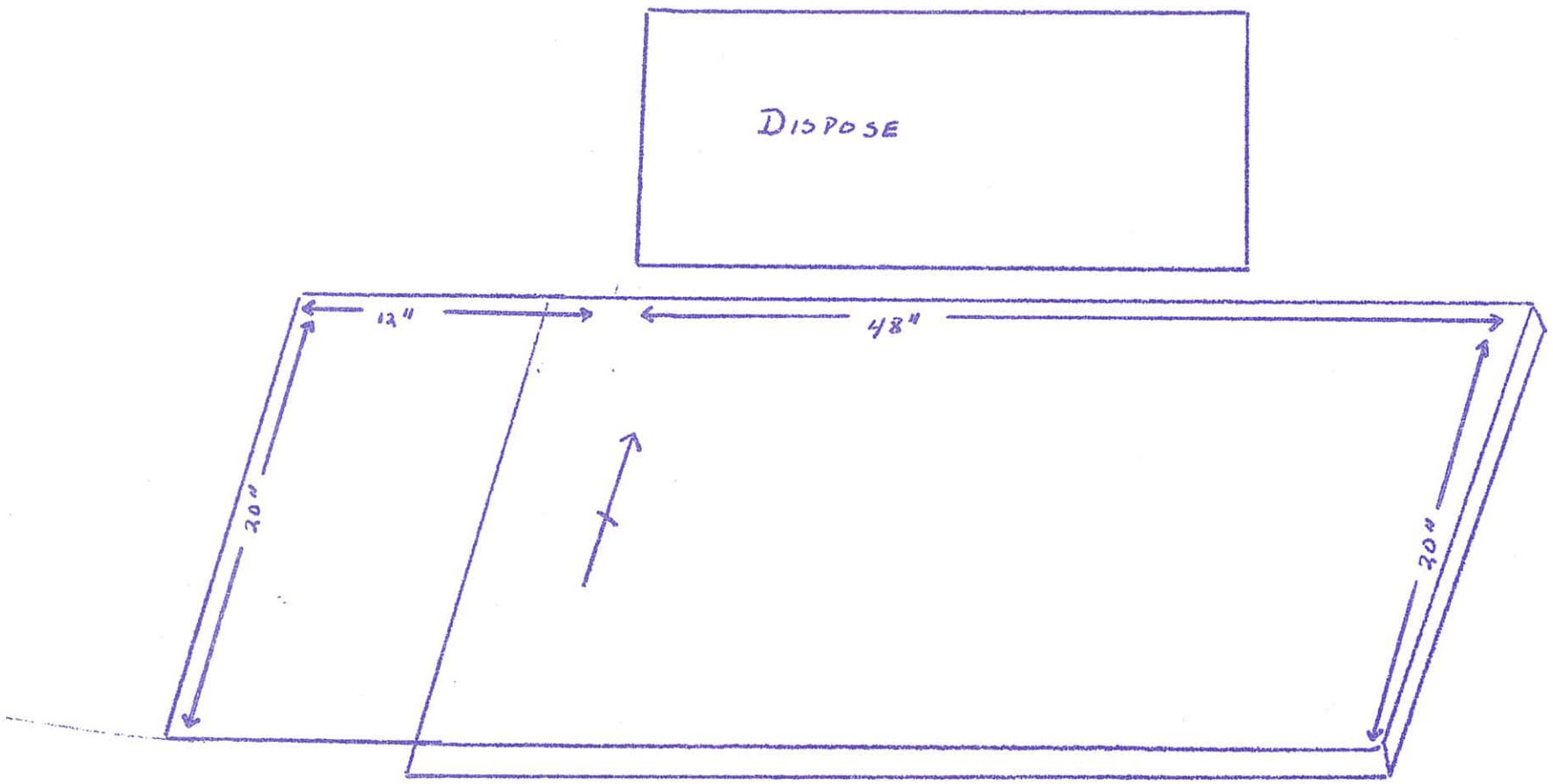
CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: 7-16-70	SUMMARY NO.: 37B 1 OF: 1 SHE
DEPARTMENT: Assembly	PRODUCT: Dress/Sport Shirt	PART: Back	FROM STUDY NOS.:	OPERATOR: Composite
OPERATION NO.: 37	OPERATION: Bottom Hem - Right Front Hemmed			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 12 inch	THREADS USED: 100/2	
MACHINE MAKE: US	MACHINE TYPE: 63400	GAUGE: SEAM TYPE:	NEEDLES: 108GXS-036	R.P.M.: 5100
THROAT PLATE: 61324D-063	FEED DOG: 61305D	PRESSER FOOT: adapted 121805	FOLDER: included in PF	GEARS: CAMS:
ATTACHMENTS: knife attached to rear of presser foot			TYPE POWER TRANSMISSION: IM6	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: E
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JCR	MOTION ANALYST: JCR	TIME STUDIES BY: JCR
CALCULATIONS BY: JCR	CALCULATIONS CHECKED BY:	SKETCHES BY: JCR	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JCR	DATE INSTALLED 7-22-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions As in previous Summary.						
1.	Operation Sequence Reach for shirt, pick up, and position in folder at needle.				9.6	100	9.6
2.	Sew through bottom hem while cutting and disposing previous shirt.				24.6	100	24.6
	Bundle Handling As in previous Summary.						1.56

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1-2	34.2	12½	38.4	7½	12½	20	46.13	DOZ.				83.5				83.5
A-B	1.56	-	1.56	7½	12½	20	1.87	BDLE.								
						TOTAL →		100	48.00			1000	48.00			1000

OPERATION NO. 37

BOTTOM HEM



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 1970	SUMMARY NO.: 1 SHE OF:
DEPARTMENT:	PRODUCT: Shirts	PART: Ivy Button	FROM STUDY NOS.:	OPERATOR: Billie Warren
OPERATION NO.:	OPERATION: Button Sew Ivy			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER 16 button	THREADS USED: 50/3	
MACHINE MAKE: Singer	MACHINE TYPE: 114-54	GAUGE: SEAM TYPE: Shop Made	NEEDLES: 108 X 1-16	R.P.M.: 1600
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Robot Button Feed Unit	FAD Unit		TYPE POWER TRANSMISSION: IMZ	MACH. TIME PER PIECE: .02
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: KWA	MOTION ANALYST: KWA	TIME STUDIES BY: KWA
CALCULATIONS BY: KWA	CALCULATIONS CHECKED BY: REN	SKETCHES BY: KWA	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: KWA	DATE INSTALLED Nov. 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	Shirts arrive at operation in buggies from BH/BS neck. Shirts are located on operator's right with collar toward operator. Buttons are sewn into proper position. After operation, shirt is placed to operator's left in buggies. Completed buggy is forwarded to Final Trim by service personnel.						
	Operation Sequence						
1.	Dispose, pick up, sew button on right front				.0620	100/1	6.20
2.	Reposition, sew button on left front				.0605	100/1	6.05
	Bundle Handling						
A.	Coupon				.25	100/48	.52
B.	Remove completed buggy, get and position new buggy				.40	100/100	.40
C.	Refill robot unit with buttons				.15	200/2880	.01
D.	Dispose of ticketed shirt and reposition				.08	100/48	.17

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1 &	212.25	7%	13.10	7½	12½	20	15.71	DOZ.				233.3				233.3
A-D	1.20	-	1.20	7½	12½	20	1.44	BDLE.								
						TOTAL →	100		17.15			2800				2800

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE)	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES:	SUMMARY SHE NO.: OF:
DEPARTMENT:	PRODUCT:	PART:	FROM STUDY NOS.:	OPERATOR:
OPERATION NO.:	OPERATION:			OPERATOR'S NO. OR POSITION:
SIZE:	MATERIAL:	STITCHES PER	THREADS USED:	
MACHINE MAKE:	MACHINE TYPE:	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS:			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY:	MOTION ANALYST:	TIME STUDIES BY:
CALCULATIONS BY:	CALCULATIONS CHECKED BY:	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY:	TYPING CHECKED BY:	INSTALLED BY:	DATE INSTALLED

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
E.	Refill tape of TAD Unit				1.050	200/3000	.10

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
								DOZ.								
								BDLE.								
						TOTAL →		100								

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Shirts / PRODUCT:	CONTINUATION OF SUMMARY NO.:	SHEET NO.: 3 OF SHEETS:

DATE Nov. 1, 1970	MOTION ANALYST KWA	OPERATION NO.:	OPERATION NAME: (Describe in Full) Button Sew Ivy

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Operation Sequence

1. A. Dispose, pick up, sew button on right front. B. Previous left front button has just been sewn. Operator disposes shirt to left with left hand - collar is away from operator. Simultaneously, RH picks up top shirt in buggy at center of collar and moves to left side of guide on machine. LH has released previous shirt and moves to position right front by placing index finger of LH at outermost point on left side of guage while thumb at LH places edge of bottom of band flush against projecting portion of gauge. * RH, meanwhile, releases collar and outer edge of centerplait even with edge-guide portion of gauge. Machine is then started by depressing foot pedal with right foot - button sew cycle of machine begins.

2. A. Reposition, sew button on left front. B. Immediately, upon completion of button sew cycle of previous, shirt is removed from position with LH. RH then grasps collar once shirt is cleared from machine. Index finger on RH positions outermost point of collar band junction of left front at vertex of triangle on right side of gauge, while thumb of RH alignes bottom of band flush against projecting portion of gauge. * Meanwhile, LH has released collar and repositions on hemmed front where it places outer edge of centerplait flush with edge-guide portion of gauge. Machine is then started by depressing foot pedal with right foot - button sew cycle begins again. Sequence is now completed.
* Remaining fingers of hand grasp collar portion to hold shirt in position.
C. Buttons must be sewn such that they are equidistant from bottom of band directly above button. Must also be a distance of at least $3\frac{1}{4}$" from center to center of button once shirt has been folded but not more than $3\frac{1}{2}$". Button stays must be secured on under side of all buttons. No attached threads are allowed on button.

Bundle Handling

A. Coupon - Upon completing previous bundle of shirts, operator removes coupon, initials and sticks on gum sheet.

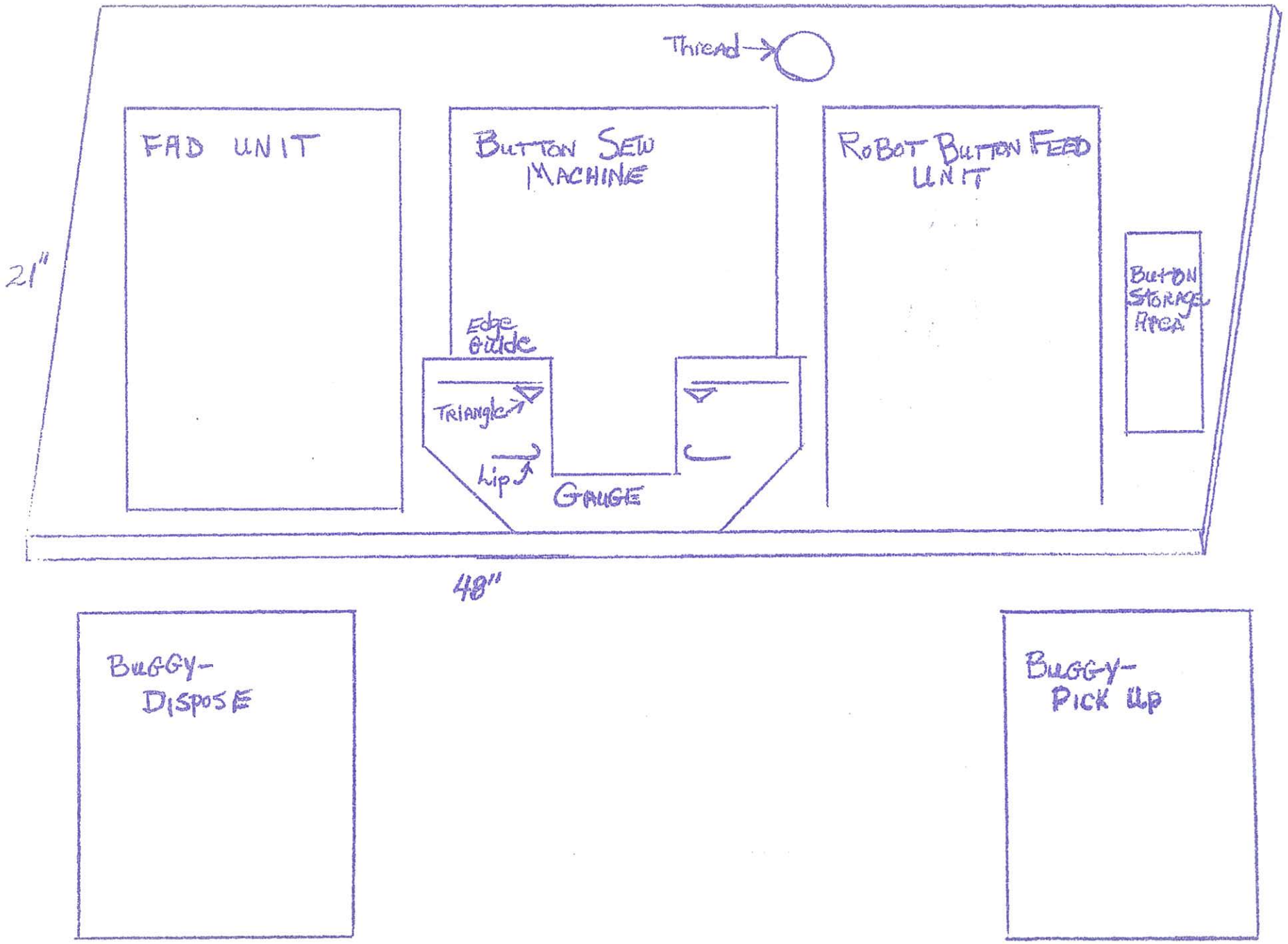
B. Remove completed buggy, get and position new buggy - When last shirt in a buggy has been completed, filled buggy to left is pushed towards Final Trim area. Empty buggy then is placed where filled buggy was located. Buggy of shirts to be sewn are then placed where empty buggy was, with collars toward operator.

C. Refill robot with buttons - Operator retrieves filled box of buttons and fills robot feed unit completely with contents of box.

D. Dispose of ticketed shirt and reposition - When shirt with coupon on it has been sewn, shirt is placed across edge of buggy, instead of being placed lengthwise. When last shirt of bundle has been sewn, operator replaces ticketed shirt in same fashion as remaining shirts from bundle, but is placed on top of others.

E. Refill on FAD unit - operator obtains new roll of tape from beneath machine. Replcases roll on unit and threads through unit. Recyles FAD unit several times to cut and advance stays to needle position.

Button Sew Ivy



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: June 1970	SUMMARY NO.: 38 SHEET 1 OF: 2
DEPARTMENT: Assembly	PRODUCT: Dress & Sport Shirt	PART: Complete Shirt	FROM STUDY NOS.:	OPERATOR: Nell Jernigan
OPERATION NO.: 38	OPERATION: Button and Final Trim			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER ____	THREADS USED:	
MACHINE MAKE:	MACHINE TYPE:	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE:	FEED DOG:	PRESSER FOOT:	FOLDER:	GEARS: CAMS:
ATTACHMENTS: Special Board & Clamps			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: ____ E
AVG. BUNDLE SIZE 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: JW	MOTION ANALYST: JW	TIME STUDIES BY: JW
CALCULATIONS BY: JW	CALCULATIONS CHECKED BY: JCR	SKETCHES BY:	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: LB	TYPING CHECKED BY: JCR	INSTALLED BY: JW	DATE INSTALLED June 1970

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions All sewing operations are complete and shirts are ready for finishing preparation.						
B	Bundles of shirts are located in trucks from which the operator works. Operator secures shirt from cart, cleans all strings from the collar, and buttons front buttons.						
	Operation Sequence						
1.	Dispose, Pick Up, and Position next shirt. Remove strings from collar.	20	.144	105	.151	100	15.10
2.	Button front buttons.	20	.110	110	.121	100	12.10
	Bundle Handling						
A.	Get Work.		.236	100	.236	2.1	.60
B.	Clip and Sign coupon.		.238	100	.238	2.1	.50
C.	Dispose Bundle.		.095	100	.095	2.1	.20
D.	Pull work to top of cart		.050	100	.050	6.0	.30

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.	INSTALLED STANDARD TIMES MTS.	HRS.	PRODUCTION 1 HR.	8 HRS.
1-2	27.20	2.5	27.90	7½	12½	20	33.48	DOZ.	33.48			113.0				113.0
A-D	1.60			7½	12½	20	1.92	BDLE.	1.92							
						TOTAL	→	100	35.40			1356				1356

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: Assembly PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 38	SHEET NO.: 2 OF 2 SHEETS:

DATE: June 1970	MOTION ANALYST JW	OPERATION NO.: 38	OPERATION NAME: (Describe in Full) Button and Final Trim

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Push completed bundle through hole in wall. Get work from trucks located on sewing room side of work stations. Check bundle against work sheet chart, clip, and sign coupon. Pull from truck about 15 shirts at a time, rest on trucks raised side (used as a work aid).

Operation Sequence

1. A. Dispose, Pick Up, and remove strings from collar.

   B. Both hands pull shirt from under clamp and dispose on shelf with label up. Fold sleeves across shirt. Both hands grasp next shirt on collar and position under clamp with label out. Both hands remove all strings from collar.

   C. Use both hands.

   D. Stack neatly.

2. A. Button front buttons.

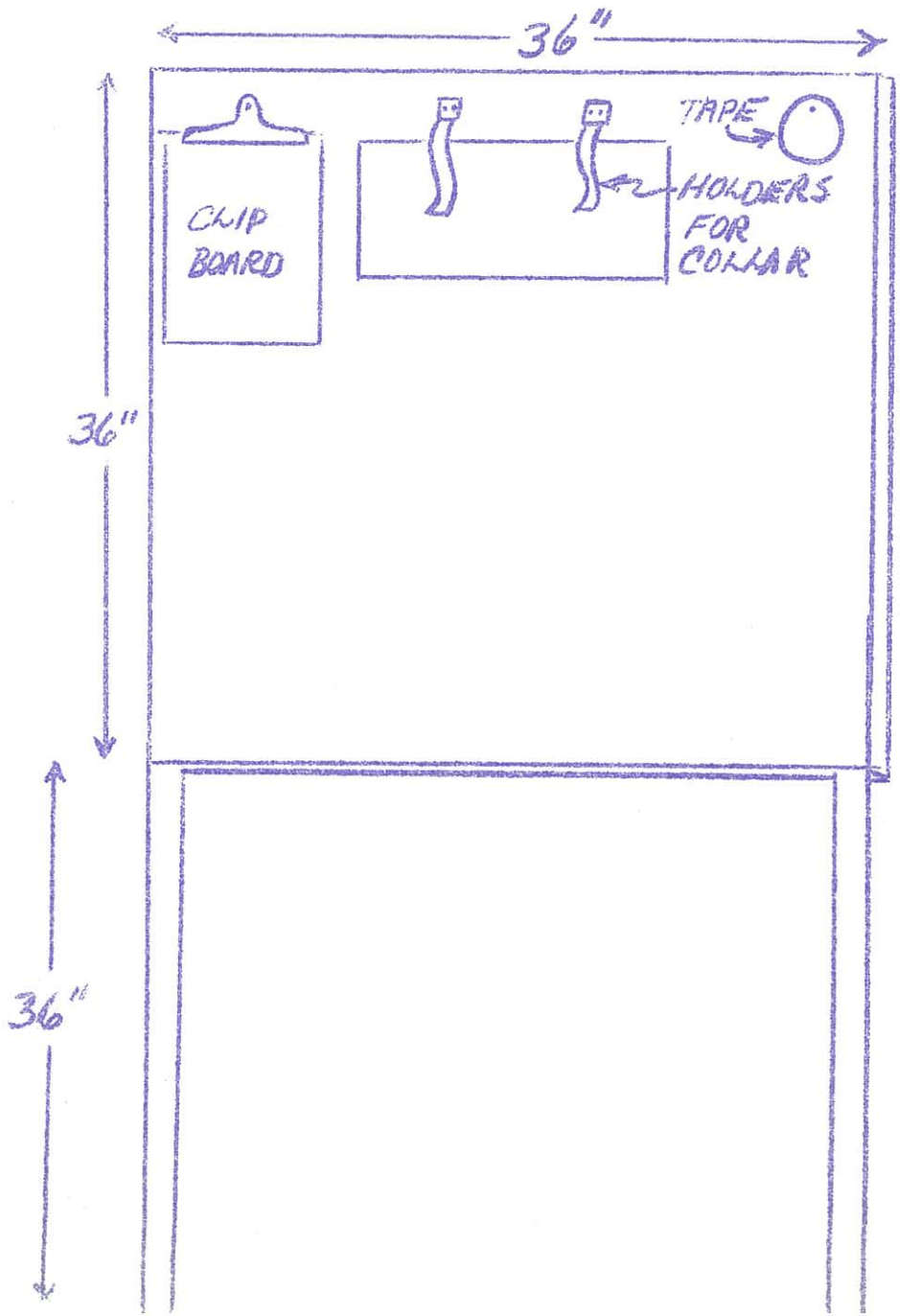
   B. Take both from collar to fronts and button bottom 4 buttons.

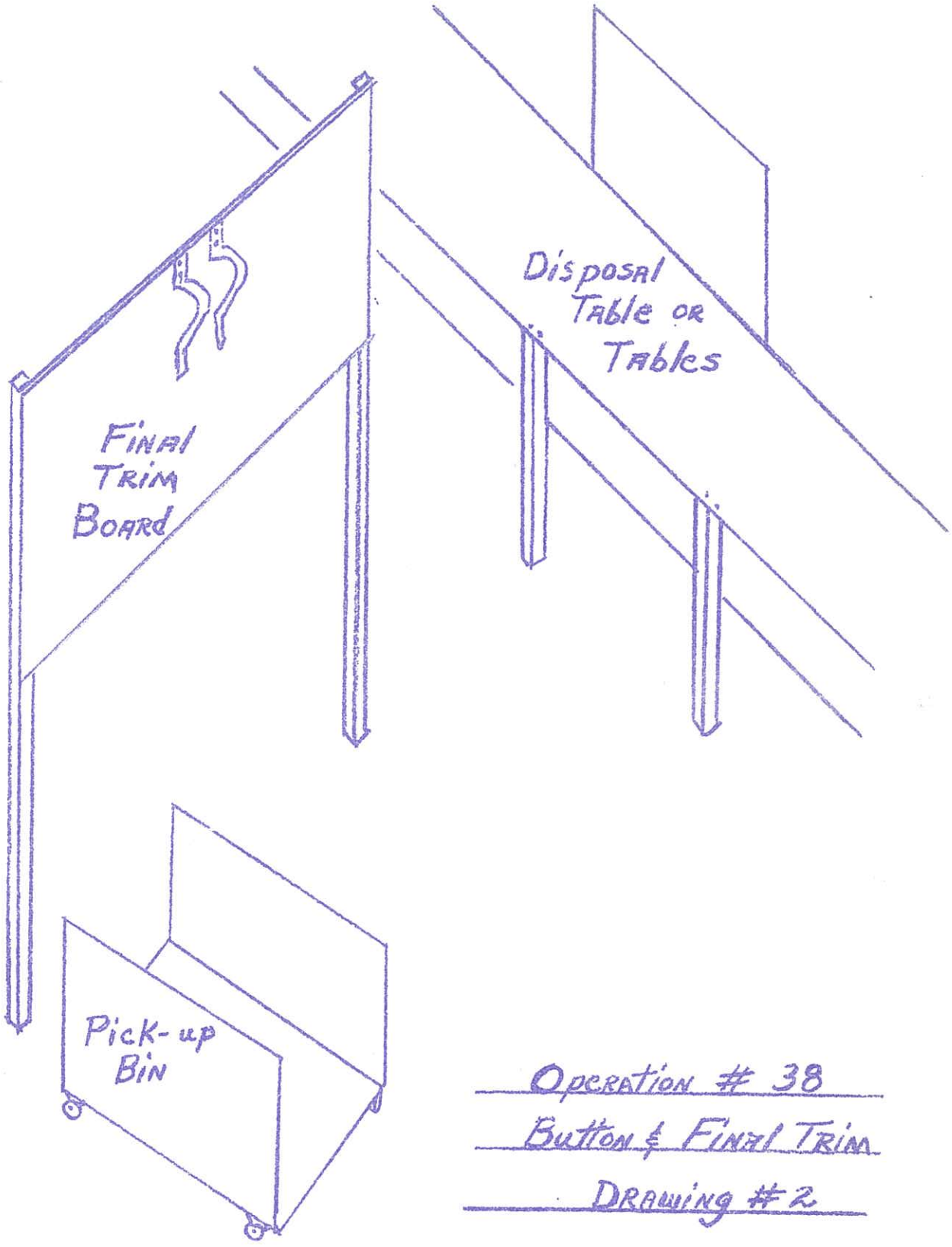
   C. LH pushes button through buttonhole which RH is holding.

   D. Buttons must pass completely through button holes.

NOTE: GOOD LIGHTING NEEDED DIRECTLY OVERHEAD.

BUTTON & FINAL TRIM
OPERATION #38





Operation # 38

Button & Final Trim

Drawing #2

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE)	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 1970	SUMMARY NO.: 39 SHEET 1 OF: 2
DEPARTMENT: Pressing	PRODUCT: Shirts	PART: Collar	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.: 39	OPERATION: Collar Buck - Tandem			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Sunbrand	MACHINE TYPE:	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS:
ATTACHMENTS: Counter, Bar Aid for pressing collars			TYPE POWER TRANSMISSION: Air	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.: N/A	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.: 1	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY:	TYPING CHECKED BY: DRS	INSTALLED BY: DRS	DATE INSTALLED 11/4/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	Shirts come to Cuck Press from Final Trim on mobile tables in bundles. Collars are bucked and disposed on storage table beside bucks.						
	Operation Sequence						
1.	Pick up, position, buck #1 machine (2 shirts)				.1472	100	14.72
2.	Pick up, position, buck #2 machine (2 shirts)				.1472	100	14.72
	Bundle Handling						
A.	Exchange trucks				.16	10/100	1.60
B.	Dispose				.225	2/100	.45

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-2	7.36	2½	7.45	7½	12½	20	8.94	DOZ.				350				
A-B	2.05	-	2.05	7½	12½	20	2.46	BDLE.								
						TOTAL →		100	11.40			4200				

FORM 33CP

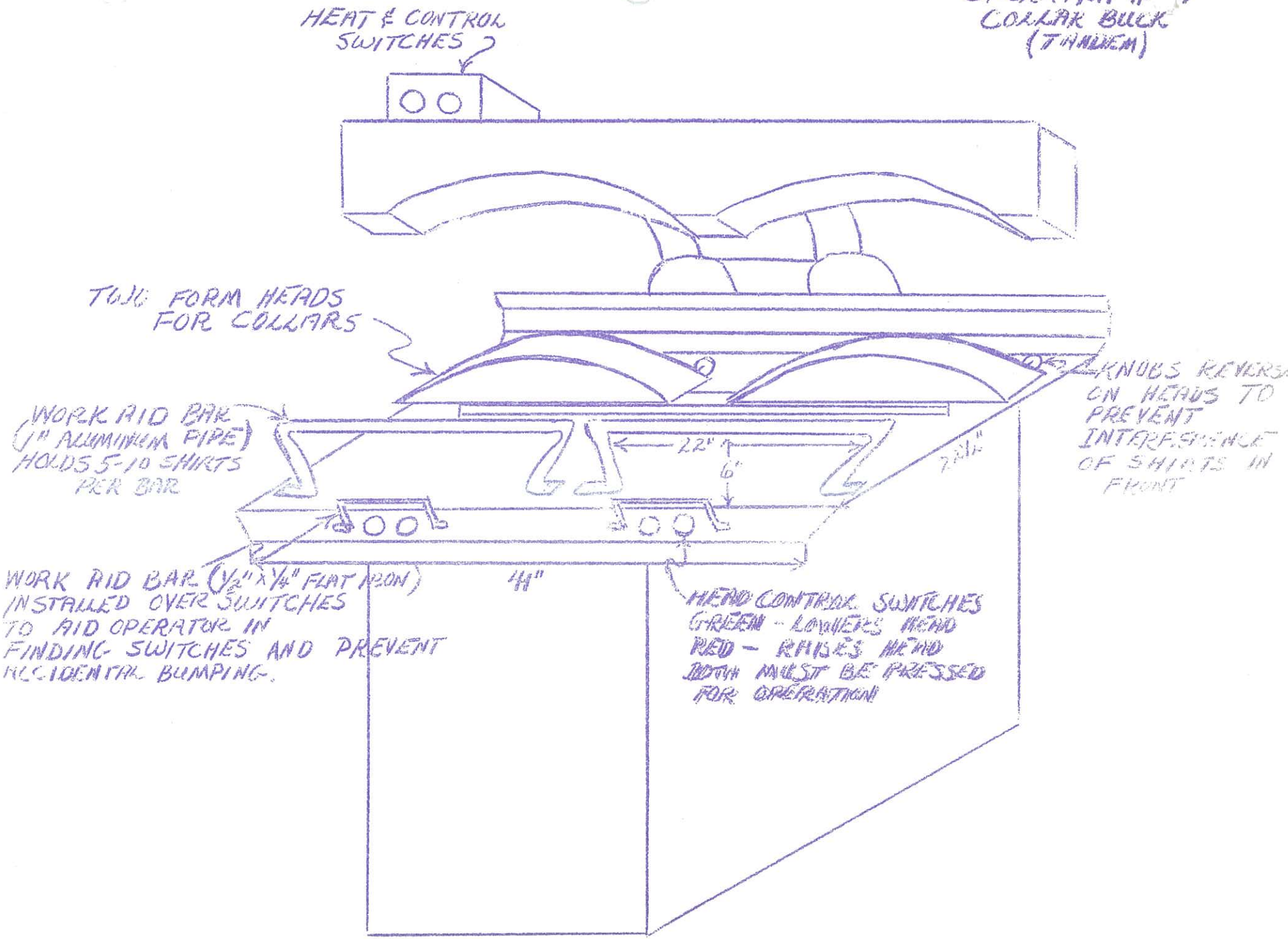
KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE)	DEPT.: PRODUCT:	CONTINUATION OF SUMMARY NO.: 39	SHEET NO.: 2 OF 2 SHEETS:

DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)
Nov. 1970	DRS	39	Collar Buck - Tandem

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT
	Bundle Handling	
	Exchange trucks - Upon completion of a bundle the operator disposes of the empty truck and gets a new bundle on a truck from Final Trim.	.024
	Dispose - When the operator completes bucking from 10 to 12 collars on one machine, she then disposes of the collars on the disposal table.	
	Operation Sequence	
1.	A. Pick up and position 2 collars on buck #1.	.147
	B. Right hand grasps one collar while left hand grasps second collar simultaneously. Left hand holding collar flips shirt under left arm to free hand. Using both hands now places the collar in right hand on form head #1 of machine #1 and then simultaneously places #2 collar under left arm on form head #2 of machine #1. Now both hands apply pressure to buttons to lower form heads.	
	C. Keep palms of both hands facing each other when grasping collars from tables and use both hands simultaneoudly while placing collars on form.	
	D. No wrinkles in collars.	
2.	A. Pick up and position 2 collars on buck #2.	.147
	B. Same as above except facing in opposite direction.	
	C. Same as 1C.	
	D. Same as 1D.	

OPERATION # 9
COLLAR BUCK
(TANDEM)



FORM 33B KURT SALMON ASSOCIATES CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 40 SHEET 1 OF:
DEPARTMENT: Pressing	PRODUCT: Shirt	PART:	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.:	OPERATION: Prepare (Long Sleve, S.U., Press Cuff)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Cissel	MACHINE TYPE: Model X	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER:	GEARS: CAMS: N/A
ATTACHMENTS: N/A			TYPE POWER TRANSMISSION: 220W	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE: 48	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: DRS	DATE INSTALLED 12-1-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 100
	Conditions						
	Shirts come to operator by conveyor. Top shirt is picked up by collar, prepared with collar band and positioned for pressing both collar and cuff. Collar and cuff are pressed, then collar is rolled, buttoned & pinned. Shirt is then disposed to mobile table on left.						
	Operation Sequence						
1.	Pick up, prepare & position collar & cuff				.126	100	12.6
2.	Press cuff & collar				.059	100	5.9
3.	Button & pin collar & dispose shirt				.102	100	10.2
	Bundle Handling						
A.	Clerical				.25	8.35/100	2.08
B.	Exchange trucks				.20	4.2/100	.84
C.	Get supplies				.11	1/100	.11
D.	Get bands from under table				.10	2.100	.20

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-3	28.7	2½	29.44	7½	12½	35.33		DOZ.								
A-O	3.23	-	3.23	7½	12½	3.87		BDLE.				102 Doz.				
						TOTAL →	100		39.20			1224				

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE)	PLANT: (CODE)	**MOTION AND TIME ANALYSIS SUMMARY**	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 40A SHEET NO.: 1 OF: 1
DEPARTMENT: 169	PRODUCT: Dublin	PART:	FROM STUDY NOS.:	OPERATOR:
OPERATION NO.: Pressing	OPERATION: Shirts			OPERATOR'S NO. OR POSITION: Synthesis
SIZE:	MATERIAL: Prepare (Short Sleeve - S.U.)	STITCHES PER: N/A	THREADS USED:	
MACHINE MAKE: All	MACHINE TYPE: All	GAUGE: SEAM TYPE:	NEEDLES:	R.P.M.:
THROAT PLATE: Cissel	FEED DOG: Model X	PRESSER FOOT: N/A	FOLDER:	GEARS: CAMS: N/A
ATTACHMENTS: N/A		N/A	TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE: N/A
STUDY STARTED: N/A	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES: 220W	AVG. TIME PER PIECE: EI
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY:	MOTION ANALYST:	TIME STUDIES BY:
CALCULATIONS BY: 48	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.: DRS	ON SHEET NOS.: DRS
STUDY TRANSFER CHECKED BY: DRS	TYPED BY: BG	TYPING CHECKED BY: DRS	INSTALLED BY: DRS	DATE INSTALLED 12-1-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions						
	Conditions aressame as for long-sleeve (40)						
	Operation Sequence						
1.	Dispose, get & position collar				.602	100	6.0
2.	Get & position strip & press band				.894	100	8.9
3.	Button & pin collar				.893	100	8.9
	Bundle Handling						
A.	Clerical				.25	8.35/100	2.0
B.	Exchange trucks				.20	4.2/100	.8
C.	Get supplies				.11	1/100	.11
D.	Get hnads from under table				.10	2/100	.20

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1-3	23.89	2½	24.50	7½	12½	20	29.40	DOZ.				120				
A-D	3.23	-	3.23	7½	12½	20	3.87	BDLE.								
						TOTAL →		100	33.27			1440				

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	DEPT.: Pressing PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 40	SHEET NO.: 2 OF 4 SHEETS:

DATE:	MOTION ANALYST	OPERATION NO.:	OPERATION NAME: (Describe in Full)
Nov. 70	DRS	40	Prepare

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Operator receives shirts on 5' conveyor in front of her table. Conveyor holds two stacks of shirts on boards. When one stack is completed, the board is pushed off conveyor to allow next stack to roll down to table. When shirt is finished it is disposed to left on mobile table face down. Coupon is taken and attached to gum sheet and ticket is pinned between second and third button on first shirt disposed. If possible, it is recommended to dispose 2 dozen shirts to each table. The table is then pushed out toward steam and an empty table secured. .0387

Operation Sequence

1. A. Pick up, prepare, & position collar & cuff .126

B. Operator picks up collar band with left hand while simultaneously picking up shirt with right hand. Shirt is then positioned about 4" from edge of table and collar folded over. The collar band is then inserted and collar position. The cuff is then positioned also with right hand with buttons face up. Both cuff and collar are now ready to press.

C. If possible, right hand alone should position cuff.

D. Band should be inserted properly and cuff positioned with buttons centered before pressing.

2. A. Press cuff and collar. .059

B. While the left holds right side of collar, the right hand picks up the iron and presses the cuff first and then the collar while the left hand rolls collar behind pressing it. The right then replaces the iron.

C. Left and right hands are crossed over while right hand presses below left hand rolling collar.

D. Both cuff & collar should be pressed without wrinkles.

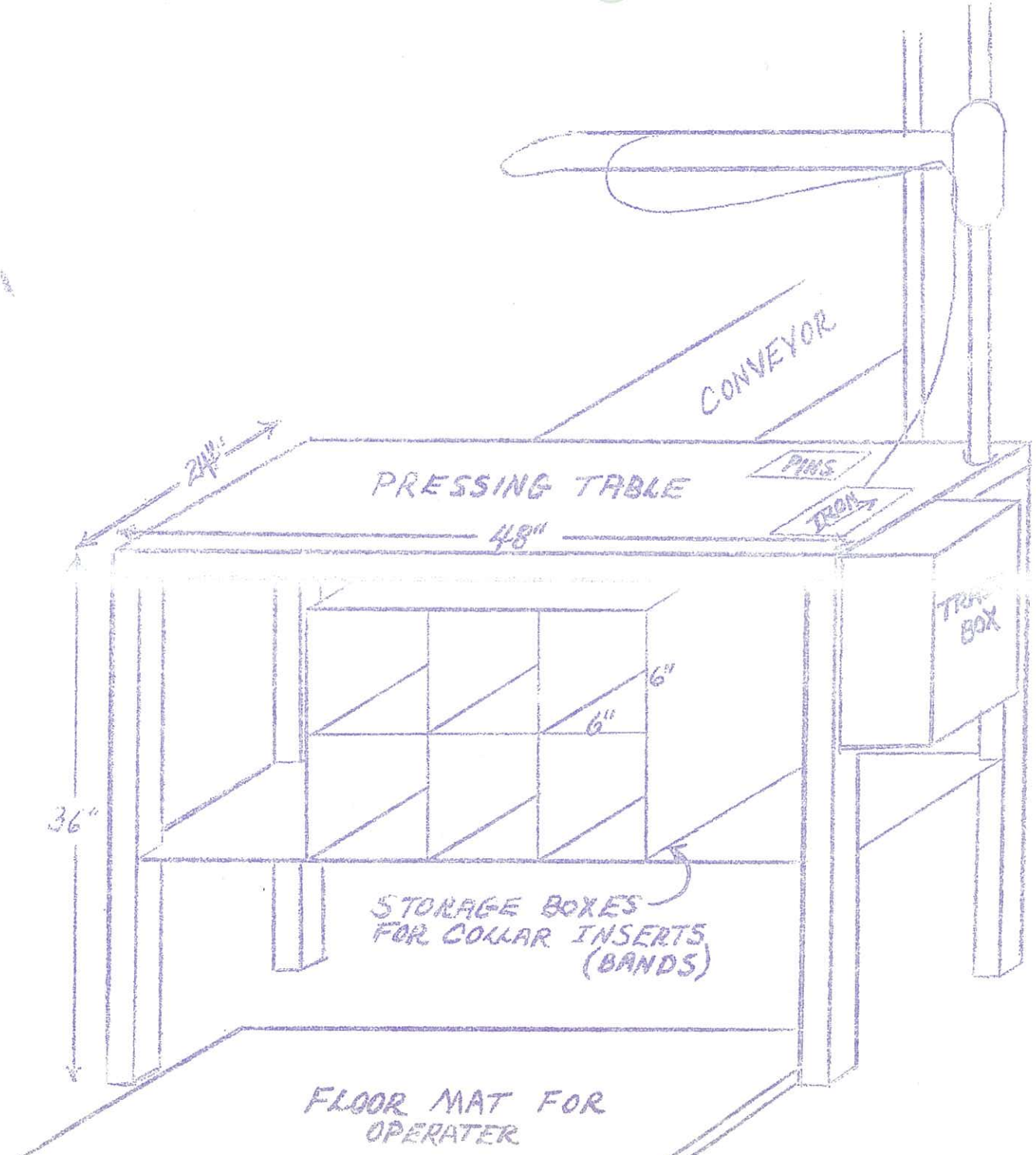
3. A. Button & pin collar & dispose shirt. .102

B. Shirt is then buttoned with right and left hand, then right hand secures a pin and pins collar below collar button. After pinning the collar, shirt is disposed with both hands face down to mobile table on left.

C. Left hand should hold right front of collar palm out while right hand replaces iron and grasps left front of collar, brings over, and both hands button collar button.

D. Collar & cuff should be ready for package with no wrinkles.

Operation # 4c
Prepare



FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 41 SHEET OF:
DEPARTMENT: Pressing	PRODUCT: Shirt	PART:	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.:	OPERATION: Steam (Long Sleeve - S.U. - B.F. - Pin Tail)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Paris	MACHINE TYPE: Garment Finisher	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS: N/A
ATTACHMENTS: Collar Forms			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: DRS	DATE INSTALLED 11/30/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER:
	Conditions						
	Shirts come (by dozen) from prepare on mobile tables. Tails are pinned on tables and then placed on cissel. Butterfly is installed and two front buttons are pinned. Shirt in then steamed while shirt on 2nd cissel is disposed on mobile table on operator's right.						
	Operation Sequence						
1.	Pin tail				.0535	100	5.35
2.	Pick up & position				.0620	100	6.20
3.	Position Butterfly and button 2 front buttons & steam				.1105	100	11.05
4.	Dispose of 2nd shirt				.0600	100	6.00
	Bundle Handling						
A.	Clerical				.25	8.35/100	2.08
B.	Exchange trucks				.20	4.2/100	.84
C.	Supplies				.20	2/100	.40

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-4	28.6	2½	29.35	7½	12½	20	35.22	DOZ.								
A-C	3.32	-	3.32	7½	12½	20	3.98	BDLE.				102 Doz.				
						TOTAL →	100		39.2			1224				

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 41A — SHEET 1 OF: 1
DEPARTMENT: Pressing	PRODUCT: Shirt	PART:	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.:	OPERATION: Steam (Short sleeve - S.U. - B.F. - P.I.)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Paris	MACHINE TYPE: Garment Finisher	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG:	PRESSER FOOT: N/A	FOLDER: N/A	GEARS: CAMS: N/A
ATTACHMENTS: Collar Forms			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: DRS	DATE INSTALLED 11-30-70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READ-INGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 10
	Conditions						
	Same as long-sleeve (40)						
	Operation Sequence						
1.	Pin tail				.0535	100	5.3
2.	Pick up & position				.0590	100	5.9
3.	Position butterfly and button 2 front buttons & steam				.1105	100	11.0
4.	Dispose of 2nd shirt				.0577	100	5.7
	Bundle Handling						
A.	Clerical				.25	8.35/100	2.0
B.	Exchange Trucks				.20	4.2/100	.8
C.	Supplies				.20	2/100	.4

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1-4	28.07	2½	28.77	7½	12½	20	34.52	DOZ.				104				
A-C	3.32	-	3.32	7½	12½	20	3.98	BDLE.								
						TOTAL →		100	38.50			12.48				

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	DEPT.: Pressing PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 41	SHEET NO.: 2 OF 4 SHEETS:

DATE: Nov. 70	MOTION ANALYST DRS	OPERATION NO.: 41	OPERATION NAME: (Describe in Full) Steam

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

c

Bundle Handling

Operator secures a mobile table from prepare with either 1 or 2 dozen shirts on it depending on in-process. When last shirt is completed, the operator tears her coupon off ticket while still on cissel and attaches to gum sheet. Note: (Ticket is not removed from shirt.) With completed dozen the operator pushes table toward folder and secures empty table and then gets another table from prepare. .039

Operation Sequence

1. A. Pin tail .053

B. Operator secures pin with right hand and picks up the tails of both fronts on table and pins the tails inside the shirt approximately 1" from bottom.

C. Left hand can be positioning tails while right hand secures pin.

D. Tails should be even when pinned.

2. A. Pick up and position. .062

B. Using both hands, operator picks up shirt from table by the tail of the back and positions over cissel and straightens collar over collar form.

3. A. Position butterfly and button 2 fronts buttons & steam. .110

B. With collar positioned, operator secures butterfly from apron and positions it under collar and band. Both hands are then used to button 2 front buttons and then the cissel is started by pressing the starter button.

4. A. Dispose of 2nd shirt. .060

B. After 1st shirt has began to steam, operator removes 2nd shirt from 2nd cissel with both hands on both shoulders and disposed on table face up. Shirts are stacked either 1 or 2 dozen per table depending on in-process.

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 42 SHEET 1 OF: ___
DEPARTMENT: Pressing	PRODUCT: Shirt	PART:	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.:	OPERATION: Fold (L.S. - S.U. - Pin-Tail - Fold-Outside)			OPERATOR'S NO. OR POSITION:
SIZE:	MATERIAL:	STITCHES PER N/A	THREADS USED:	
MACHINE MAKE:	MACHINE TYPE:	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER:	GEARS: CAMS: N/A
ATTACHMENTS: Collar blocks			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: ___ EF
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: DRS	DATE INSTALLED 11/30/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 1
	Conditions						
	Shirts arrive on mobile tables from cissel. Shirt is picked up, positioned on folder and prepared for folding with board and tissue. Shirt is then folded, sleeves and tail pinned and then removed from folder. The cuff is folded and pinned outside and the shirt pressed if necessary. Shirt is then disposed on top of folder.						
	Operation Sequence						
1.	Pick up, position, place board & tissue				.174	100	17.4
2.	Fold and pin sleeves				.271	100	27.1
3.	Fold and pin tail				.131	100	13.1
4.	Press, pin cuff, and dispose				.166	100	16.6
	Bundle Handling						
A.	Clerical				.25	8.35/100	2.08
B.	Exchange trucks				.20	4.2/100	.84
C.	Get supplies				.20	2.100	.40

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIME STUDY STANDARD TIMES HRS.	TIME STUDY STANDARD PRODUCTION 1 HR.	TIME STUDY STANDARD PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	INSTALLED STANDARD TIMES HRS.	INSTALLED STANDARD PRODUCTION 1 HR.	INSTALLED STANDARD PRODUCTION 8 HRS.
1-4	74.2	2½	76.05	7½	12½	20	91.26	DOZ.								
A-C	3.32	-	3.32	7½	12½	20	3.98	BDLE.				42 Doz.				
						TOTAL →	100		95.24			504				

FORM 33B **KURT SALMON ASSOCIATES** **CONSULTING ENGINEERS**

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	MOTION AND TIME ANALYSIS SUMMARY	DATES OF STUDIES: Nov. 70	SUMMARY NO.: 42A SHE 1 OF: 1
DEPARTMENT: Pressing	PRODUCT: Shirt	PART:	FROM STUDY NOS.:	OPERATOR: Synthesis
OPERATION NO.:	OPERATION: Fold (Short Sleeve - S.U. - P.T.)			OPERATOR'S NO. OR POSITION:
SIZE: All	MATERIAL: All	STITCHES PER N/A	THREADS USED: N/A	
MACHINE MAKE: Bishop	MACHINE TYPE:	GAUGE: SEAM TYPE: N/A	NEEDLES: N/A	R.P.M.: N/A
THROAT PLATE: N/A	FEED DOG: N/A	PRESSER FOOT: N/A	FOLDER:	GEARS: CAMS: N/A
ATTACHMENTS: Collar forms			TYPE POWER TRANSMISSION:	MACH. TIME PER PIECE:
STUDY STARTED:	STUDY FINISHED:	ELAPSED TIME:	NO. OF PIECES:	AVG. TIME PER PIECE: EF
AVG. BUNDLE SIZE:	AVG. NO. OF THREAD CHGS.:	INFORMATION BY: DRS	MOTION ANALYST: DRS	TIME STUDIES BY: DRS
CALCULATIONS BY: DRS	CALCULATIONS CHECKED BY:	SKETCHES BY: DRS	SKETCH NOS.:	ON SHEET NOS.:
STUDY TRANSFER CHECKED BY:	TYPED BY: BG	TYPING CHECKED BY:	INSTALLED BY: DRS	DATE INSTALLED 11/30/70

ELEMENT NO.	OPERATION SEQUENCE AND JOB DESCRIPTION	NO. OF READINGS	AVG. TIME	G. F.	100% TIME	OCC.	100% TIME PER: 1
	Conditions						
	Same as long-sleeve (40)						
	Operation Sequence						
1.	Pick up, position, place board & tissue				.1595	100	15.9
2.	Fold and pin sleeves				.1340	100	13.4
3.	Fold and pin tail				.1224	100	12.2
4.	Press and dispose				.0940	100	9.4
	Bundling Handling						
A.	Clerical				.25	8.35/100	2.5
B.	Exchange trucks				.20	4.2/100	.8
C.	Get supplies				.20	2/100	.4

ELEMENT NOS.	100% TIME MTS/100	% Delay	ADJUSTED BASE MTS/100	% ALLOWANCES Pers. & Fat.	Inc. F	Total	S.A.M. PER 100	UNIT	TIME STUDY STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.	INSTALLED STANDARD TIMES MTS.	TIMES HRS.	PRODUCTION 1 HR.	PRODUCTION 8 HRS.
1-4	50.99	2½	52.26	7½	12½	20	62.72	DOZ.				60				
A-C	3.32	-	3.32	7½	12½	20	3.98	BDLE.								
						TOTAL →		100	66.70			720				

FORM 33CP

KURT SALMON ASSOCIATES | MOTION AND TIME ANALYSIS SUMMARY | CONSULTING ENGINEERS

CLIENT: (CODE) 169	PLANT: (CODE) Dublin	DEPT.: Pressing PRODUCT: Shirts	CONTINUATION OF SUMMARY NO.: 42	SHEET NO.: 2 OF 4 SHEETS:
DATE: Nov. 70	MOTION ANALYST DRS	OPERATION NO.: 42	OPERATION NAME: (Describe in Full) Fold	

ELEMENT NO.:	LIST THE FOLLOWING INFORMATION BELOW FOR EVERY ELEMENT NO.: (A) ELEMENT TITLE, CORRESPONDING WITH TITLE USED ON FORM 33. (B) COMPLETE AND DETAILED JOB BREAKDOWN AND MOTION PATH. (C) KEY POINTS IN MOTION PATH. (D) KEY QUALITY POINTS.	100% TIME PE UNIT

Bundle Handling

Operator secures a mobile table from steam with either 1 or 2 dozen shirts on it, depending on in-process. After operator has completed first shirt, she takes off the ticket, tears off her coupon, sticks it on her gun sheet, and disposes of the shirt on top of her folding machine. When the operator has completed the last shirt of the dozen, she replaces the ticket with a pin on front of the shirt. When the dozen shirts are completed the empty table is pushed back toward the steam operation and a full one obtained. .039

Operation Sequence

1. A. Pick up, position, place board & tissue .174

   B. Both hands are used to pick up shirt from table by the shoulders. The collar of the shirt is positioned in the folding collar form and the shirt is straightened for folding face down. The folding board is picked up with the right hand and positioned in back of the collar. Then one or two sheets of tissue are picked up also with right hand and placed on top of board.

2. A. Fold and pin sleeves. .271

   B. The folding form is first dropped on board and tissue. Now the left sleeve is folded over left sleeve bar and position. The left sleeve bar is folded in and next the right sleeve is folded over right sleeve bar and the bar folded in. The top of the sleeves are then pinned and then the right sleeve is folded back over the shirt and pinned leaving the right cuff protruding from the right side of the shirt.

3. A. Fold and pin tail. .131

   B. The tail is then folded back over the form and turned under enough to lay even with fold. The tail is then pinned on each side.

4. A. Press, pin cuff, and dispose .166

   B. The shirt is now removed from folder and flipped over to face-up. The cuff is now folded over the front of the shirt and pinned inside with the buttons showing. The shirt is now pressed and disposed on top of folder.

   C. Cuff is opened with right & left hand, held open left hand and pinned with right hand.

   D. Shirt should not have wrinkles, spots, flaws, or any other abnormalty showing.