

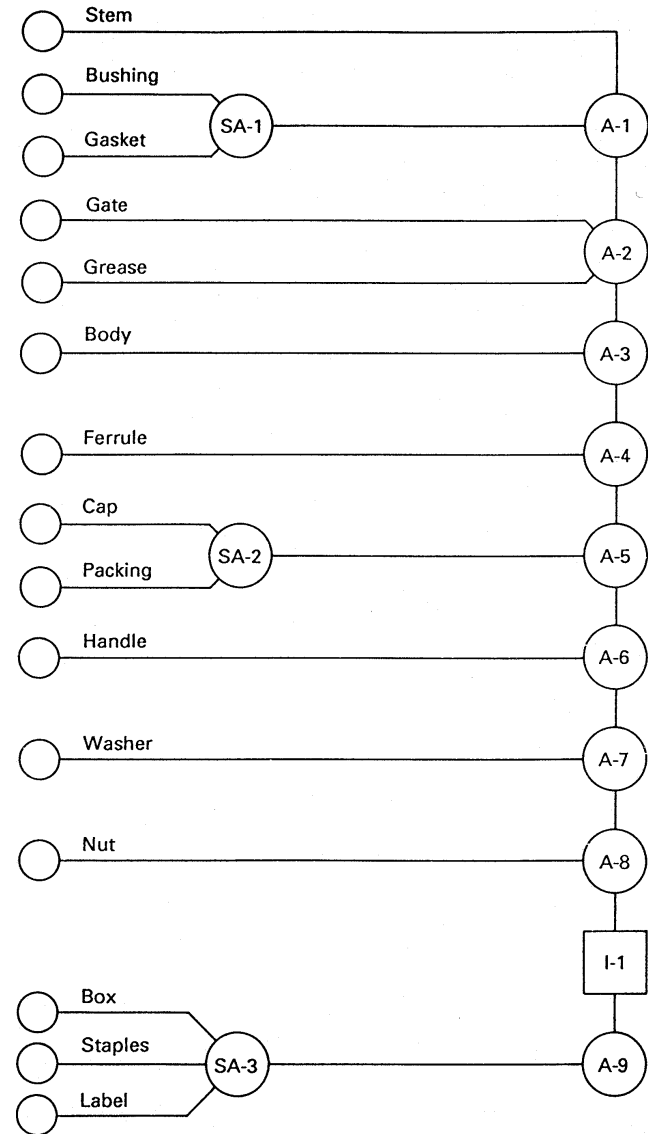
Flow Analysis Charts

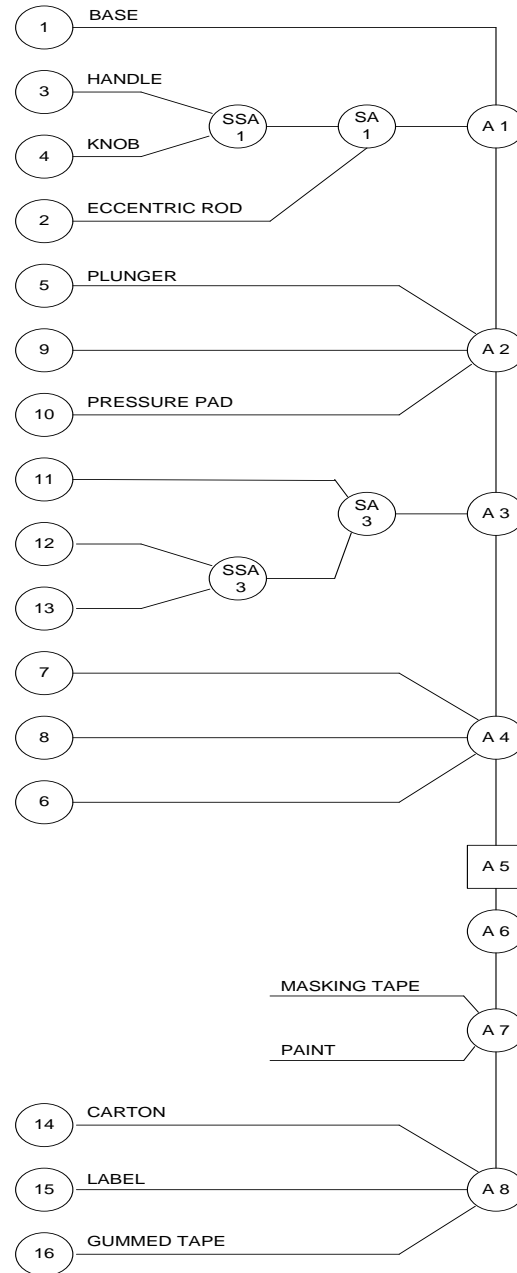
Flow Analysis Information

- **Assembly Chart**
- **Operations Process Chart**
- **Flow Process Chart**
- **Multi-Product Process Chart**
- **Flow Diagram**
- **From-To Chart**

Assembly Chart

It is an analog model of the assembly process. Circles with a single link denote basic components, circles with several links denote assembly operations/subassemblies, and squares represent inspection operations. The easiest method to constructing an assembly chart is to begin with the original product and to trace the product disassembly back to its basic components.



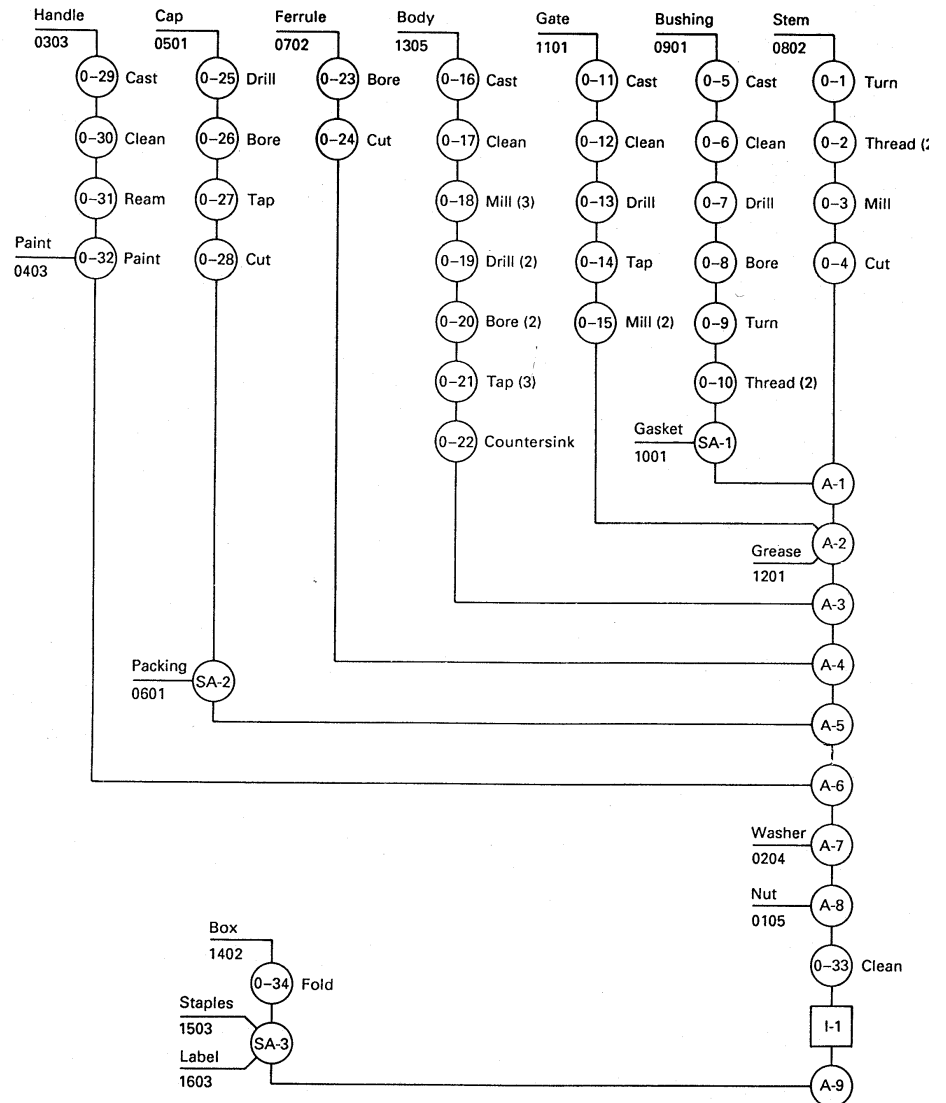


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- A = ASSEMBLY
- SA = SUB ASSEMBLY
- SSA = SUB SUB ASSEMBLY
- = INSPEKSI

Operations Process Chart

By superimposing the route sheets and the assembly chart, a chart results that gives an overview of the flow within the facility. This chart is operations process chart.



Process Chart

This chart uses **circles** for operations, **arrows** for transports, **squares** for inspections, **triangles** for storage, and the **letter D** for delays. Vertical lines connect these symbols in the sequence they are performed.

Job Assemble Slab – wooden pencil		Summary								
Follow the <input type="checkbox"/> Product <input type="checkbox"/> Main <input type="checkbox"/> Material <input type="checkbox"/> Form	Chart begins <u>Slabs in storeroom</u> Chart ends <u>Assembled and clamped</u> Charted by <u>P.O.E.</u> Date <u>9/29</u>	600 Assemblies		Present		Proposed		Difference		No. <u> </u> Page <u> </u> of <u> </u>
		No.	Time	No.	Time	No.	Time	No.	Time	
<input type="radio"/> Operations		7	30.5	7	30.0	-	0.5	-	0.5	
<input type="radio"/> Transportations		10	4.2	4	0.5	6	3.7			
<input type="checkbox"/> Inspections		-	-	1	-	+1	-			
<input type="checkbox"/> Delays		-	-	2	-	+2	-			
<input type="checkbox"/> Storages		3	v	1	v	-2				
Totals		20	39.7	15	30.5	-5	9.2			
Distance travelled		417	ft	30	ft	337	ft			




















































Details of Present Proposed Method	Operation Transport Inspection Delay Storage	Distance (ft)	Quantity	Est. time (min.)	Notes
1. Stored in storeroom	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
2. To slotter-groover by hand truck	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	15	1,200	0.25	Finished stock thinner one box contains 1,200 four-stock slabs (2,400)
3. Slot cut in bottom and four grooves in top	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1,200	30.00	One pass thru tandem set machines
4. To lead-laying machine (one-half lot – see 9)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	15	600	0.13	Hand truck
5. Wait for lead layer	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	v	Stock delay between lots all four-grove run before starting next size
6. Loaded in machine magazine	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	-	Loaded during machine operation
7. Lead layed in slab	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	20.00	Push-bar mach. pushes slabs from bottom of mag. under lead hopper.
8. Inspected for full leads. Moved to topper (see 12)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				Inspected by machine tender on steel bench slide on way to topper.
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				During machine time
9. To glue topper (one-half lot – see 4)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	30	600	0.15	Hand truck
10. Wait for glue topper	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	v	Refer to 5
11. Loaded in glue machine magazine	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	2.40	Glue topper loads 25 slabs at time into mag. = 24 loads @ 10 min/load
12. Glued	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	-	Push-bar mach. pushes slab over glue wheel into topping position
13. Topped and turned	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	11.60	Topper places glued slab on leaded slab and turns on edge
14. Assembled slabs Clamped by topper	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		600	6.00	Topper clamps unit of 25 assem. slabs = 24 units (topper paced by layer)
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

Date: 9-30-00						Location: Graves Mountain		
Analyst: TLR						Process: Apple Sauce		
Step	Operation	Transport	Inspect	Delay	Storage	Description of process	Time (min)	Distance (feet)
1	●	→	□	D	▽	Unload apples from truck	20	
2	○	→	□	D	▽	Move to inspection station		100 ft
3	○	→	■	D	▽	Weigh, inspect, sort	30	
4	○	→	□	D	▽	Move to storage		50 ft
5	○	→	□	D	▽	Wait until needed	360	
6	○	→	□	D	▽	Move to peeler		20 ft
7	●	→	□	D	▽	Apples peeled and cored	15	
8	○	→	□	D	▽	Soak in water until needed	20	
9	●	→	□	D	▽	Place in conveyor	5	
10	○	→	□	D	▽	Move to mixing area		20 ft
11	○	→	■	D	▽	Weigh, inspect, sort	30	
Page 1 Of 3						Total	480	190 ft

Multi-Product Process Chart

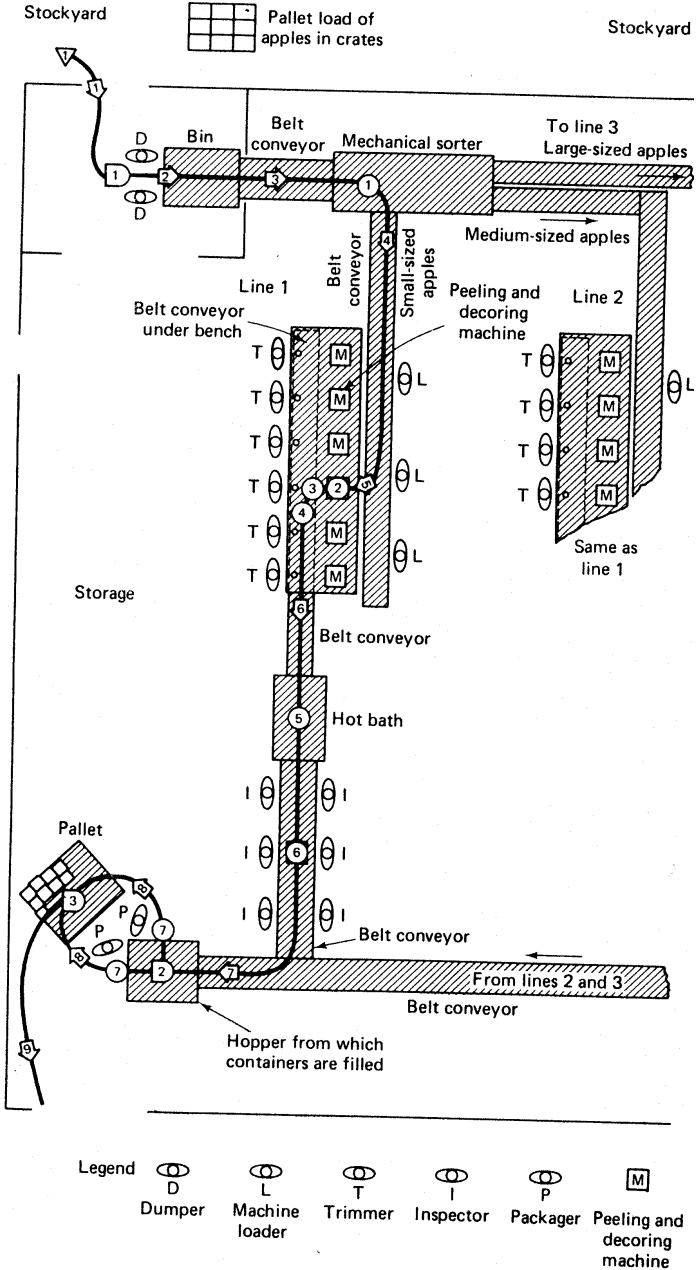
This chart is a flow/operation process chart containing several products.

Operations	A Tin-base etched items	B Alum-base etched items	C Alum-base printed items	D Alum-base anodized items I	E Alum-base anodized items II	Business vol. each oper. %
1. Cut to size	①	①	①	③		A - 18 B - 32 C - 28 D - 14
2. Polish	②					18
3. Wash out	③					18
4. Nickel-silver plate	④					18
5. Weld				①	①	D - 14 E - 8
6. Anodize				②	②	22
7. Colour					③	22
8. Print	⑤	②	②	④	④	100
9. Color etch					⑤	8
10. Dry spray	⑥	③				A - 18 B - 32
11. Retouch	⑦	④				50
12. Deep etch	⑧	⑤				50
13. Pickle	⑨					18
14. Rinse	⑩	⑦			⑥	72
15. Lacquer	⑪	⑧	③		⑥	78
16. Spray paint		⑥				32
17. Imbed colors (future consideration)	⑨ Alternate	⑦ Alternate				Future potential 50
Business vol. (%)	18	32	28	14	8	100

PART NO. OPERASI	1	2	3	4	5	6	16	17
1. ROUGH STORAGE								
2. MILL	  				 			
3. LATHE		 		  	 			
4. DRILL	  	  	  		  			
5. BARE								
6. GRIND					 			
7. PRESS	 				 			 
8. HONE								
9. SAW								
10. FINAL INSPECTION								

Flow Diagram

It depicts the probable movement of materials in the floor plant. The movement is represented by a line in the plant drawing.



From-To Chart

This chart is a matrix that contains numbers representing a measure (units, unit loads, etc.) of the material flow between machines, departments, buildings, etc.

To From	Stores	Saw	Grind	Weld	Lathe	Mill	Drill	Paint	Assemble	W'house	Total
Stores		500	100	200							800
Saw					300	200					500
Grind					200	100					300
Weld			200								200
Lathe						300	200				500
Mill							600				600
Drill								300	500		800
Paint									300		300
Assemble										800	800
W'house											-
Total	-	500	300	200	500	600	800	300	800	800	