

**JD GRAY ASSOCIATES  
MANUFACTURING PRODUCTIVITY CONSULTANTS**

**THINKING ABOUT RETURNING YOUR ASSEMBLY WORK FROM CHINA?**

**KEEP IT IN THE USA!!!**

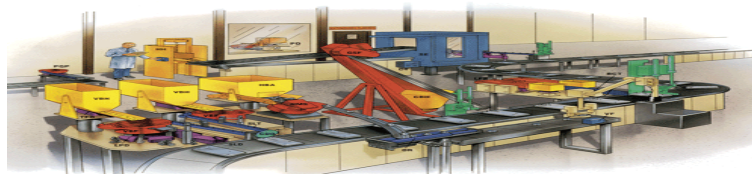
**ALLOW US TO MODERNIZE YOUR OPERATION AND WE WILL OFFER**

**GUARANTEED SAVINGS!**

**SEMI-AUTOMATION PROPOSAL**

**IN**

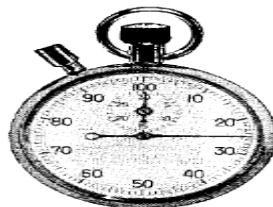
**PRODUCT AUTOMATION**



**MATERIALS HANDLING**

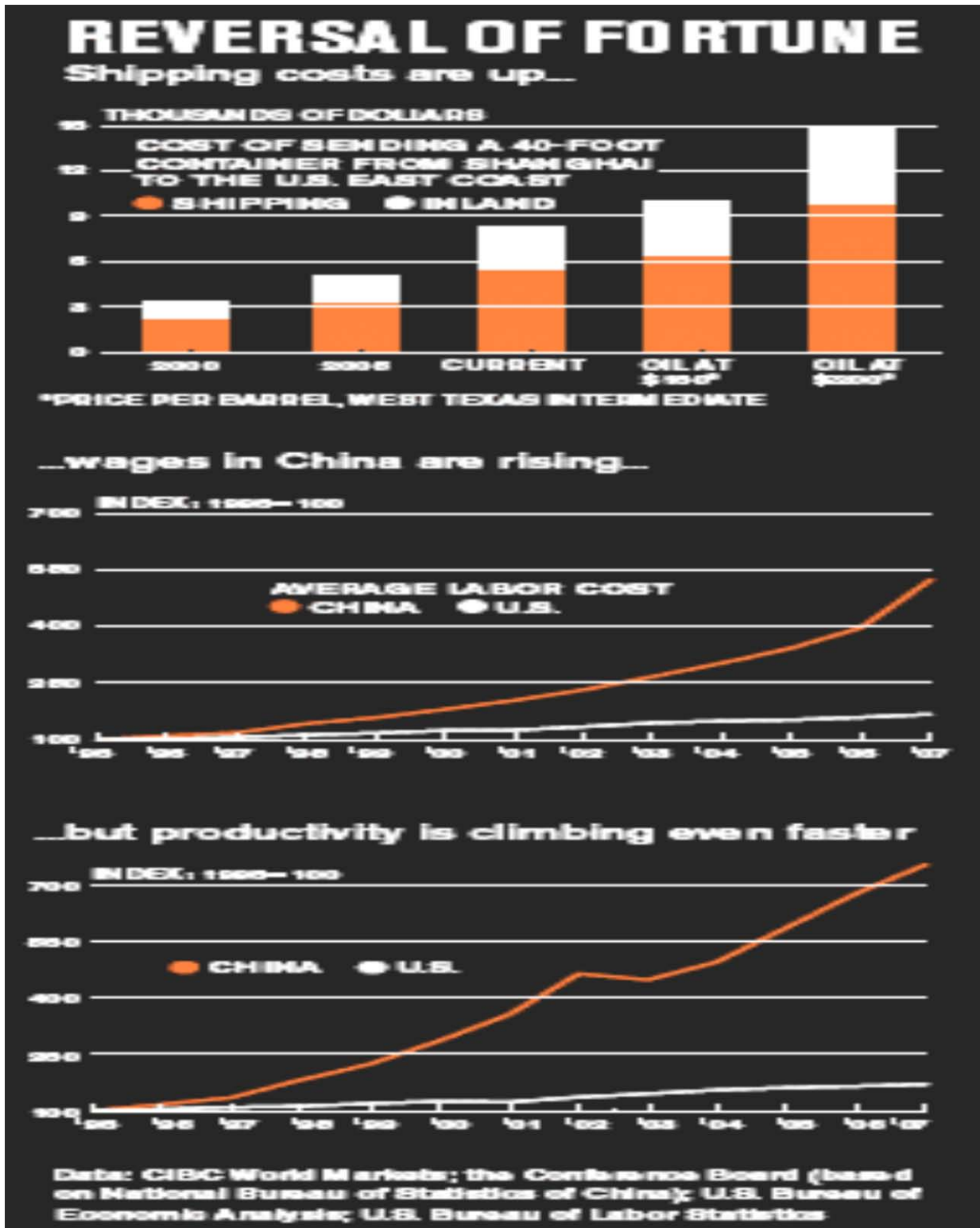


**DIRECT LABOR CONTROLS**



**PO BOX 63 SUMMIT HILL, PENNSYLVANIA 18250 USA  
P (484) 274-2851 F (484) 294-2333  
[jdgrayassociates@yahoo.com](mailto:jdgrayassociates@yahoo.com) [www.jdgray-associates.com](http://www.jdgray-associates.com)**

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**WE WILL INCREASE YOUR USA PRODUCTIVITY  
BETWEEN 55% TO 75%**

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CONSULTING ACTIVITY	COST	APPROXIMATE TIME FRAME
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- WORK MEASUREMENT OF FAMILY WORK TASKS
- LINE BALANCE OF FAMILY WORK TASKS
- FINAL ASSEMBLY CONVEYOR SPECIFICATION/RFQ
- PURCHASE ORDER OF ASSEMBLY CONVEYOR
- COMPONENT PART CONTAINERIZATION
- WORK STATION LAYOUT
- WORK STATION VISUAL AIDS
- WORK STATION FIXTURES/TOOLING
- WORK STATION BILL OF MATERIAL
- WORK STATION INSTRUCTIONS
- GROUP LEADER TRAINING
- PACED SYSTEM SET-UP
- PACED SYSTEM INSTALLATION
- PACED SYSTEM FOLLOW-UP

**\$60,000  
FOR  
4 FAMILIES  
+  
\$6,000  
EXPENSES**

  
**FOUR  
MONTHS**

**SEMI-AUTOMATION SPECIFICATION/RFQ OF BULK HOPPER FEED, VIBRATORY BOWL PART POSITIONING AND ROBOTIC PICK AND PLACEMENT**

**\$15,600  
FOR  
4 FAMILIES  
+  
\$3,000  
EXPENSES**

**ONE  
MONTH**

PURCHASE ORDER OF SEMI-AUTOMATION EQUIPMENT.

CUSTOM ROBOT DESIGN, FABRICATION, PROGRAMMING, ELECTRICAL INSTALLATION AND MECHANICAL INSTALLATION

SEMI-AUTOMATION SYSTEM IMPLEMENTATION

**\$84,600  
FOR  
4 FAMILIES**

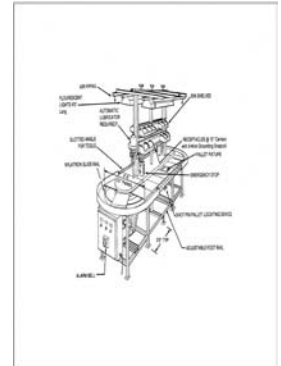
**FIVE  
MONTHS**

**TOTAL**

**JD GRAY ASSOCIATES  
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<b>EQUIPMENT - PRECISION INDEXING EXPANDABLE ASSEMBLY CONVEYOR FOR 4 FAMILIES</b>	<b>COST</b>	<b>APPROXIMATE TIME FRAME</b>
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- Standard Rotary Assembly Conveyor Model 2424, 22' 6" OL, 18 pallets, 6 pallets/side (3 pallets on each end), Variable Dwell time, 3 operator/side with 4 supports.....\$34,139
  - Standard Rotary Options. Variable speed indexing, fluorescent lighting fixtures, electrical outlets beneath pallet for six operators, upper supports to support lighting fixtures, pneumatic quick disconnect with air piping for six operators, tool tray railing, overhead rail with trolleys for six operators.....\$10,201
  - Standard Rotary Precision Pallet Locating System for One Work Cell. 1 shot pin locating device and 18 pallet shot pin blocks..... \$8,815
- NOTE: ADD'L COST REQUIRED FOR ROTARY CONVEYOR OVER 6 STATIONS



**FOUR MONTHS**

<b>EQUIPMENT- TYPICAL ROBOTIC WORK CELLS FOR 4 FAMILIES</b>	<b>COST</b>	<b>APPROXIMATE TIME FRAME</b>
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- LOAD/INSERT COMMON COMPONENTS (i.e. Screws) INTO ASSEMBLY IN FIXTURE ON ROTARY PALLET.....\$150,000**
- Vibratory Feed Bowl and Inline Track (BUDGET)
  - Multi-Axis-Servo
  - Multi-End-Effector
  - Rotary Conveyor Pallet Synchronous Loader
  - PLC Controlled
- UNLOAD ASSEMBLY FROM FIXTURE INTO CARTON.....\$100,000**
- Multi-Axis-Servo (BUDGET)
  - Multi-End-Effector
  - Rotary Conveyor Pallet Synchronous Unloader
  - PLC Controlled
- (BUDGET)
- CARTON SIDE FORMING, SEAL AND TAPE.....\$150,000**
- Fully Automatic Case Former with Hot Melt Glue Bottom Case Sealer
  - Hot Melt Glue Top Case Sealer
  - Top and Bottom Pressure Sensitive Case Taper
  - Intermediate Case-Transport Powered Conveyor



**FOUR MONTHS**

**TOTAL**

**\$453,155  
FOR 4  
FAMILIES**

**EIGHT MONTHS**

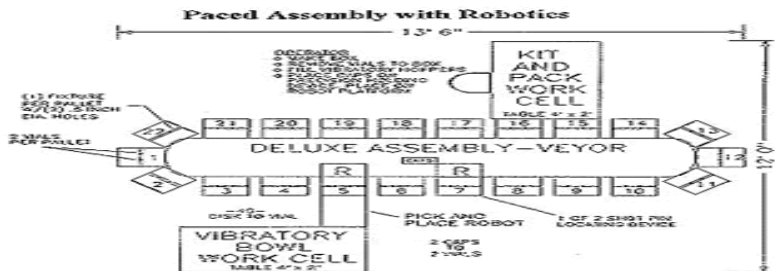
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**SEMI-AUTOMATION SAVINGS MILESTONES**

<b>PACED ASSEMBLY ONLY</b>	<b>ROBOTIC WORK CELLS</b>
<b>PHASE ONE</b>	<b>PHASE TWO</b>
<b>(4 MONTHS)</b>	<b>(1 MONTH)</b>
<b>4 MONTHS</b>	<b>4 MONTHS</b>
<b>25% to 40%</b>	<b>30% to 35%</b>
<b>GRAND TOTAL SAVINGS</b>	
<b>55% TO 75%</b>	

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<b>\$66,000</b>	-	<b>CONSULTING FEE WITH</b>	-	<b>\$18,600</b>
		<b>USA EXPENSES ON 4 FAMILIES</b>		
<b>\$53,155</b>	-	<b>ROTARY ASSEMBLY CONVEYOR</b>		
		<b>TYPICAL ROBOTIC WORK CELLS</b>	-	<b>\$400,000</b>
<b>\$119,155</b>	-	<b>SUB TOTAL COST</b>	-	<b>\$418,600</b>
		<b>GRAND TOTAL COST WITH</b>	-	<b>\$537,755</b>
		<b>PACED ASSEMBLY AND</b>		
		<b>ROBOTIC WORK CELLS</b>		



SEMI-AUTOMATION OF ROUND DISK VIAL FILLING AND PACKAGING SYSTEM

**8.9 MONTHS - TYPICAL USA PAYBACK BASED ON - 21.5 MONTHS**  
**20 EXISTING OPERATORS**  
**@ \$10 PER HOUR**