> ## *"Flexible Line Balancing ™ V. 3 is simply the best software product available to maximize productivity on any assembly line."*

Flexible Line Balancing Version 3 is a new and versatile approach to solution of a classic volume manufacturing problem. It is intended for use by Industrial and Manufacturing Engineers or production supervisors, managers, or planners to allocate labor to progressive assembly lines to achieve the most cost-effective and productive output.

This unique program finds ***the absolute optimum solution*** for balancing work tasks on any progressive assembly line, providing a solution in both text and graphic formats. In ***Flexible Line Balancing,*** you can save entire process descriptions and summary graphs as well as individual work elements. You can build a "library" of work elements and insert or append new elements or groups into your assembly line process at any time.

Unlike some other assembly line balancing products, ***Flexible Line Balancing*** is a standalone product, not an "add-on" module or "plug-in option" to a more complex expensive system. It's easy to learn and use and provides the *single best solution* every time!

Starting with an easy-to-use Windows menu, ***Flexible Line Balancing*** allows you to structure individual elements of work, groups of elements in specific sequences or locations, or operations for an entire complex assembly progressive assembly line.
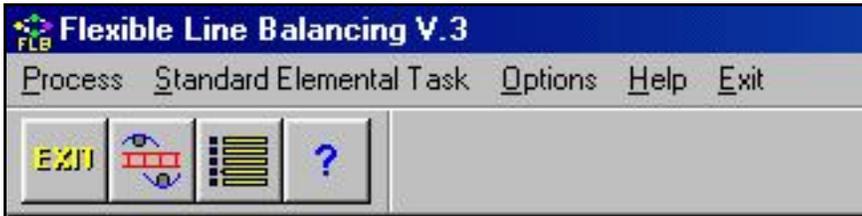
The *Process* menu is the focal point of ***Flexible Line Balancing.***

You may define a work scenario directly on the Process screen, import "library" Standard Elemental Tasks from saved files, or paste data from an external source, such as a Microsoft Excel spreadsheet.


The similar *Standard Elemental Task* menu allows you to enter job data at an individual work element level. Here, an element description, standard time, and process constraints are entered. ***Flexible Line Balancing*** is able to consider any condition or constraint for any work element, including work tasks that are:

- independent of all others
- preceding or following others, or other groups
- done off-line or in a special area
- done as part of another, larger task
- done in a specific work group
- contained as part of the another task;
- done separately
- done by a machine

Flexible Line Balancing uses the *COMSOAL* (*CO*mputer *M*ethod of *S*equencing *O*perations for an *A*ssembly *L*ine) algorithm, a tested and proven way to arrive at optimum assembly line balancing solutions. With the power of the personal computer, this method performs hundreds or thousands of calculations in seconds, until the best solution is found.
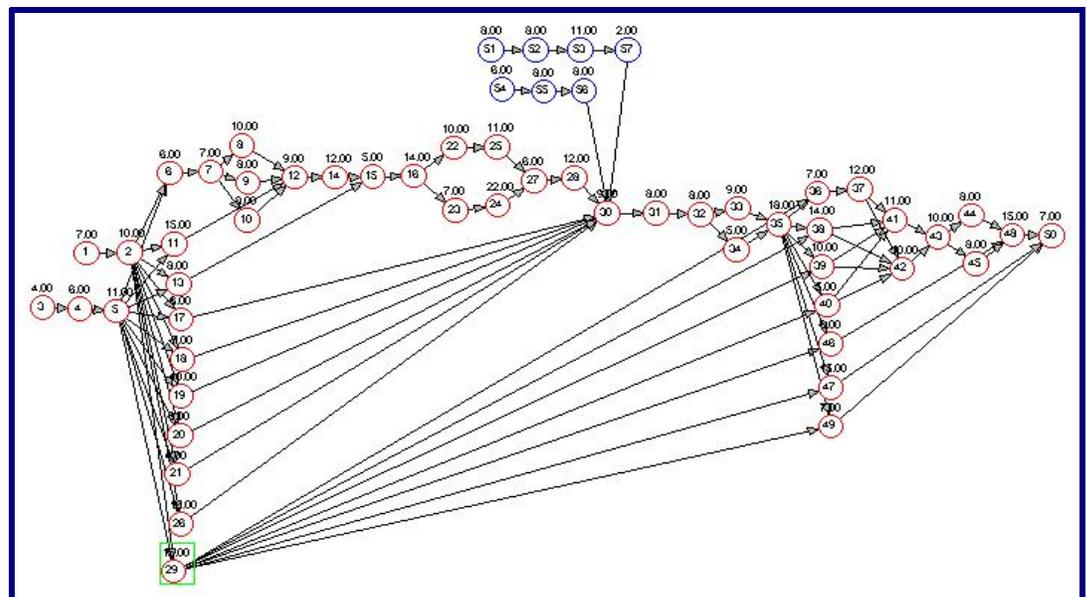

Flexible Line Balancing can define and save work elements in a Standard Elemental Task "library," where you can use them repeatedly as you build other Process scenarios for a progressive assembly line. You can also save the completed Process (all elements in a line) and select, copy and paste all or any part into a new scenario - for example, a different product model with many of the same operations as an older product.

In *Flexible Line Balancing*, both the Standard Elemental Task and Process screens show Text and Graphic Workplaces. The Text Workplace contains a tabulation of task descriptions, standard times, and precedence information, and the Graphic Workplace shows a Precedence Diagram. As each task is added to the upper screen, a corresponding node appears in the Graphic Workplace. Each activity added appears in proper sequence, color and other coded graphics which represent its relationship to all other tasks. Shown below is
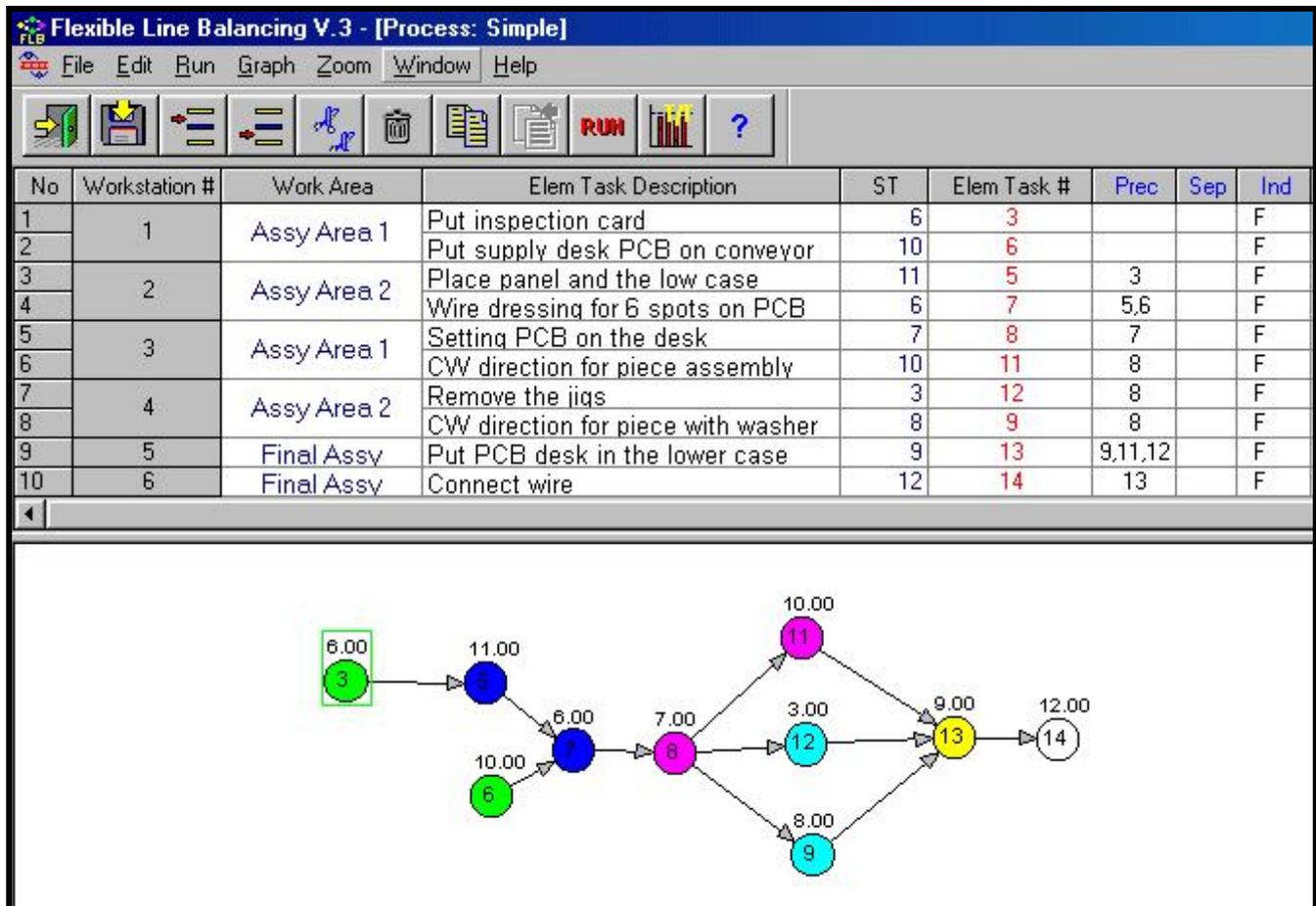
Flexible Line Balancing automatically draws assembly Precedence Diagrams which show relationships between and among all Standard Elemental Tasks. Tasks are color-coded, numbered, and tagged with standard time values.

Diagrams of virtually any complexity are structured automatically as tasks are added to the program. Shown here is a Process involving 57 work elements. The node (circle) for any element can be dragged and repositioned with a mouse. The diagram is shown on the Graphic Workplace portion of the screen.

You can select the criteria to solve any line balancing problem - use either Takt Time (cycle time) or the number of workers desired on the line. *Flexible Line Balancing* will perform hundreds or thousands of computations to arrive at the optimum solution for the conditions you've provided. When done,the program will present a graphic analysis of the balancing solution. The graph example below shows the Takt Time, the longest station time (Neck Time) and how elements are combined at each worker's station. *Flexible Line Balancing* also instantly computes Line Balancing Efficiency, which is a measure of lost time due to imbalance in the Process.

If you don't like the result of an analysis, use the *Flexible Line Balancing* "What If ?" feature to move elements. Click on any work element with the mouse and it becomes yellow. At the same time, other elements will appear in blue. These are in workstations that can accept the selected element. Click on any blue element, and the yellow element will be moved to that station and efficiency recalculated. Click and move elements any number of times and instantly evaluate the balance each time. When satisfied, save the file - this saves the graph and all information in the Text Workplace. When you open a saved *Flexible Line Balancing* file, you can view the text descriptions of work elements, station groupings, and the latest graph. To develop additional scenarios, just save the file by another name, make modifications, and run a new line balancing solution.

Here, Flexible Line Balancing suggests that Task #8 (in yellow) can be moved into stations 2 or 4, adjacent to elements 7or 9 and 12 respectively, appearing in blue. Just click on any blue element, the task is moved, and efficiency automatically recalculated!
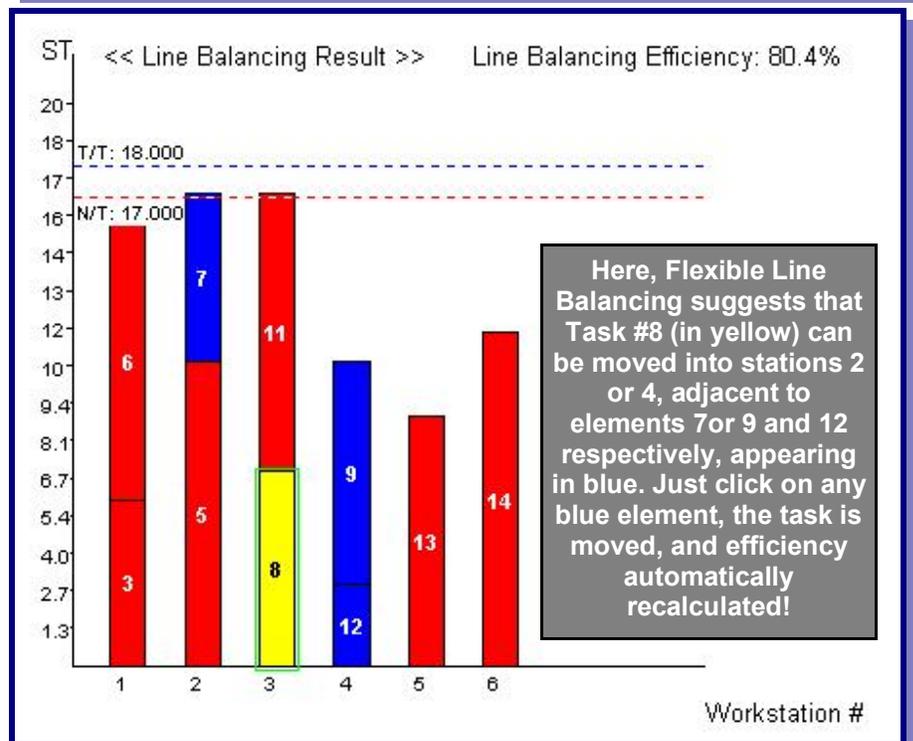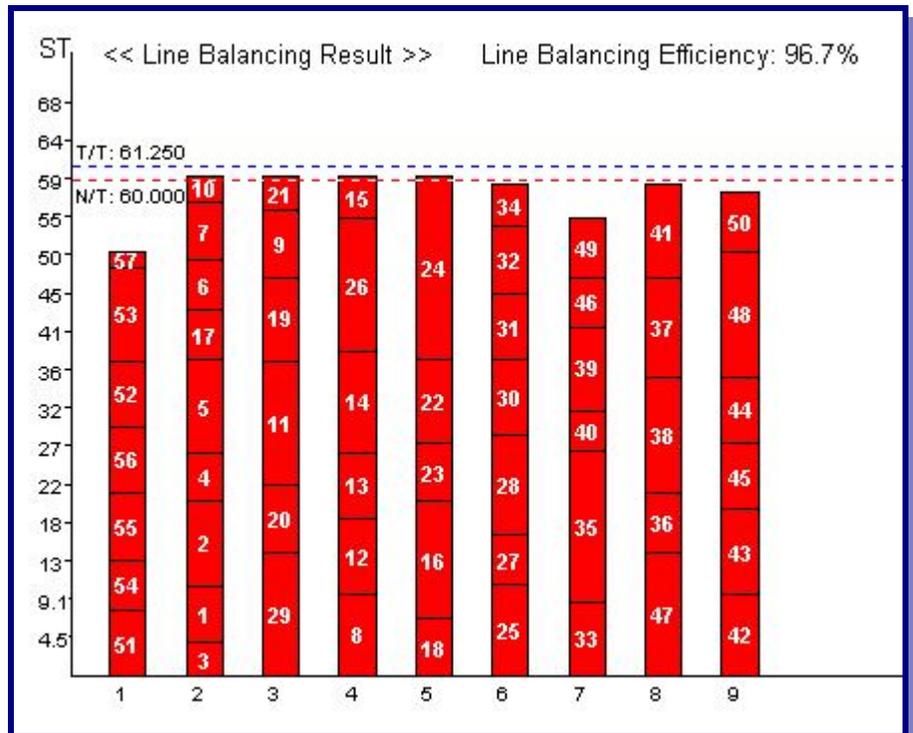
Each time you add a work element to the Process or the Standard Elemental Task screens, the Graphic Workplace instantly updates the precedence diagram in the Graphics Workplace area of the screen. All activities are connected with lines, arrows, and colors which indicate the constraints you have placed on the process scenario being built. As you change sequence of elements or any characteristic of the job, *Flexible Line Balancing* instantly updates the diagram. Additionally, every node (circle) shown in the diagram may be dragged and positioned in the Graphics Workplace. Lines and arrows automatically follow!
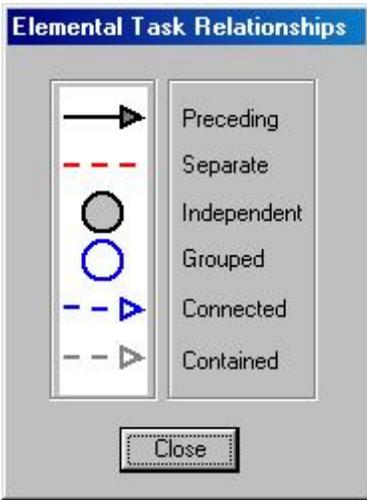
The Graphics Workplace in *Flexible Line Balancing* displays the Graph Legend, a key to the use of colors, lines, and arrows in the precedence diagram. If desired, you may turn the legend display on or off from the Main Menu.

The *Flexible Line Balancing* program gives you superior viewing, printing, and file management capabilities for any Process or Standard Elemental Task you have defined in your problem.

- Zoom In or Out to enlarge or reduce the Text and Graphics areas.
- Print Preview text entries or precedence diagrams (with Zoom).
- Work with multiple open windows and files, cascaded or tiled.
- Save, Save As, and Delete file options.
- A notes entry field for short comments on saved files.
- Full text editing, including Insert, Append, Cut, Copy, and Paste.

Flexible Line Balancing is a joint development of LG Electronics Inc., and Production Technology, which offers exclusive on-site technical training programs in assembly line balancing and other Industrial Engineering techniques.

Production Technology is the exclusive distributor of this product in North America and the UK.

Flexible Line Blancing™ *V.3*

SOFTWARE ORDER FORM

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   Payable to Production Technology, PO Box 24261, Tampa, FL 33623-4261

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