ASPEN LEAFLET

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New Graphical Interface

A much improved user interface is in version 2001 of *ASPEN OneLiner*™, *Power Flow*™, and *DistriView*™. Among the many new features are:

- Bus symbols in the form of a dot, or a horizontal or vertical bar.
- Moveable text blocks for displaying solution quantities and network parameters.
- A drag-and-drop palette for creating new objects.

The bus symbol in previous versions of *OneLiner* and *Power Flow* was a vertical bar. The branch quantities were displayed horizontally near where the branches are attached to a bus. In contrast, the bus symbol in previous versions of *DistriView* was a horizontal bar, and the branch quantities were rotated 90 degrees, in a vertical orientation. In V2001, we unify the two interfaces into a single, more flexible, and easier-to-use interface.

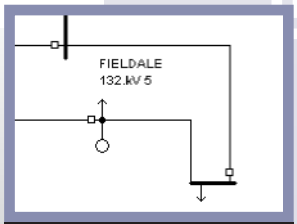

Figure 1

The new *ASPEN* interface lets the user select one of three symbols for each bus. See Figure 1. We also decided to always display the text in a horizontal orientation because we have found the vertical text difficult to read. The possible combination of horizontal bus bars and horizontal text created a new challenge in that the branch quantities of adjacent branches may overlap. We solve this problem by making all the text on the one-line moveable with the mouse. See Figure 2. Once you moved a text block, the new position is stored in the data file.

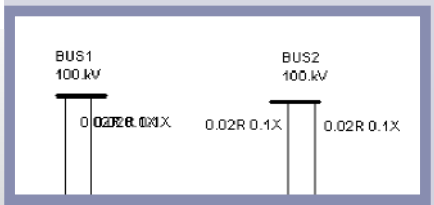

Figure 2

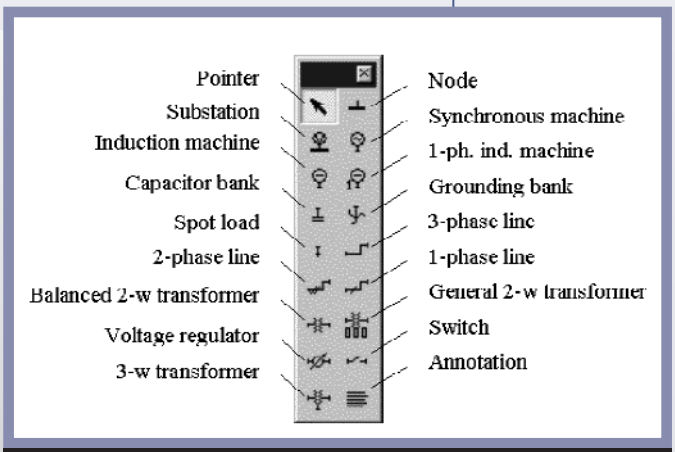

Figure 3

The new drag-and-drop palette should be instantly familiar to *ASPEN* users because such palettes are ubiquitous in Windows programs. Figure 3 shows the palette in *DistriView*. With the exception of the arrow pane, each pane in the palette is for a different object that could be placed on the one-line diagram. The arrow pane is for ending the drag-and-drop mode.

To create a generator using drag-and-drop, you click once on the generator pane in the palette and then click on a bus on the one-line diagram. A new generator will appear on that bus. If you click on an empty spot, instead of on an existing bus, the program will create a new bus along with the new generator. You can create other bus equipment, such as shunts and loads, the same way.

To create a branch, such as a two-winding transformer, between two buses (Bus1 and Bus2), you first click on the transformer pane on the palette. You then click the mouse button on Bus1 and then drag and release the mouse button at Bus2. The same method works for other branches such as lines and phase shifters. We decided to use this method also for the 3-winding transformer. The only difference is that the program will automatically create a new bus for the tertiary terminal at a position between the first two buses. The new merge-bus mechanism comes in handy if you wish to connect the tertiary bus to an existing bus: Simply drag the tertiary bus on top of an existing bus of the same nominal kV, with the <Ctrl> key held down.

With few exceptions, the drag-and-drop method creates new network elements without asking you for their parameters. The reason is that the program always gives to the new object the same parameter as the last object of the same kind. It is your responsibility to review and edit the parameters of new objects.

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Existing users should have no trouble adapting to this new interface because all the old method of creating and editing the one-line diagram still work in the new version.

Improved Series Capacitor Modeling

OneLiner V2001 models series capacitors much more accurately than in V2000, especially for unbalanced faults. *PowerScript*™ was used in V2000 to simulate series capacitors. The script directs the short-circuit engine to solve the fault iteratively, with the sequence impedance of the MOV-protected series capacitors adjusted between iterations. This method of simulating series capacitors produced good results for balanced faults, but it had two shortcomings: First, it was incapable of modeling accurately unbalanced operations of the MOVs by modifying their sequence parameters alone. Second, it was awkward to use because users cannot stack and recall simulation results from *PowerScript* the same way as with classical faults.

In *OneLiner V2001*, we incorporated the iterative logic for MOV-protected series capacitors within the main program using C++. The iterative logic is transparent to the user, and the user can stack and recall the simulation results the same way as other faults – classical or simultaneous.

More importantly, *V2001* simulates the series capacitor in the phase domain, with the MOV on each phase modeled independently based on its phase current and voltage. We were able to do this in *OneLiner* by extending the existing phase-oriented solution algorithm to include the series capacitors' terminal buses within the localized phase admittance matrix (which normally contains only the faulted buses). The result is a much more accurate short circuit solution for unbalanced faults.

The new method is also much faster. The reason is that, instead of refactorizing the large sequence admittance matrices in each iteration, the new logic modifies and refactors a much smaller phase equivalence matrix within the iterative loop. All in all, the accuracy, speed, and ease of use of the new method will make *OneLiner* a much more useful tool for users with series capacitors.

Upcoming Events

OneLiner Users Group Meeting

- Morning of April 30, Atlanta, Georgia.

PowerScript Mini Course

- Afternoon of April 30, Atlanta, Georgia.

Please consult the Events page of our web site for details and signup sheets for these events.

New Users

Breaker Rating Module

- Oklahoma Gas & Electric, Oklahoma City, OK
- PECO Energy, Philadelphia, PA
- PJM Interconnection, LLC, Philadelphia, PA
- Rio Grande Energia, Porto Alegre, Brazil
- Salt River Project, Tempe, AZ
- San Diego Gas & Electric, CA

DistriView

- American Electric Power, Columbus, OH
- Electrical Systems Consultants, Inc., Ft. Collins, CO
- Electricity Co. of Ghana
- Grays Harbor PUD, Aberdeen, WA
- Northeast Utilities, Berlin, CT
- Port of Oakland, CA
- Rasku Services, Rossland, BC, Canada
- Rio Grande Energia, Porto Alegr, Brazil
- TriAxis Engineering, Corvallis, OR

Line Constants Program

- Central Power Electric Coop., Minot, ND
- Chattanooga Electric Power Board, TN
- Electricity Co. of Ghana
- Keyspan Energy, Hicksville, NY
- NorControl, SA, Madrid, Spain
- Public Service Co. of New Mexico
- Rio Grande Energia, Porto Alegr, Brazil

OneLiner

- Amec Simon Ltd., Vancouver, BC, Canada
- COELBA, Salvador, Brazil
- CRE, Santa Cruz de la Sierra, Bolivia
- Chattanooga Electric Power Board, TN
- EPRO, Inc., Augusta, ME
- Electricity Co. of Ghana
- Electricity Generating Authority of Thailand
- GERASUL, Florianopolis, Brazil
- Leonhardt Consulting, Alpheretta, GA
- Luz y Fuerza del Centro, Cuahutemoc, CP, Mexico
- NEI Electric Power Engineering, Inc., Wheat Ridge, CO
- Power & Control Systems, Inc., Baton Rouge, LA
- Power Engineers, Inc., Hailey, ID
- R.W. Beck, Phoenix, AZ
- Sargent & Lundy, Chicago, IL
- URS Corp., New Orleans, LA
- Ulteig Engineers, Inc., Minneapolis, MN
- W.S. Nelson & Co., New Orleans, LA

Power Flow

- American Electric Power, Columbus, OH
- Chattanooga Electric Power Board, TN

Relay Database C/S

- Alabama Electric Coop., Andalusia, AL
- BC Hydro, Burnaby, BC, Canada
- GERASUL, Florianopolis, Brazil
- Pacific Gas & Electric, San Francisco, CA

Relay Database Unlimited

- Electricity Co. of Ghana
- Electricity Generating Authority of Thailand

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