

Chapter 2

User Interface Features

netWorks Window

When you invoke the netWorks application, the netWorks window appears. This window consists of three main components: a large drawing panel, a command panel, and a menu bar. (See Figure 2.1.)

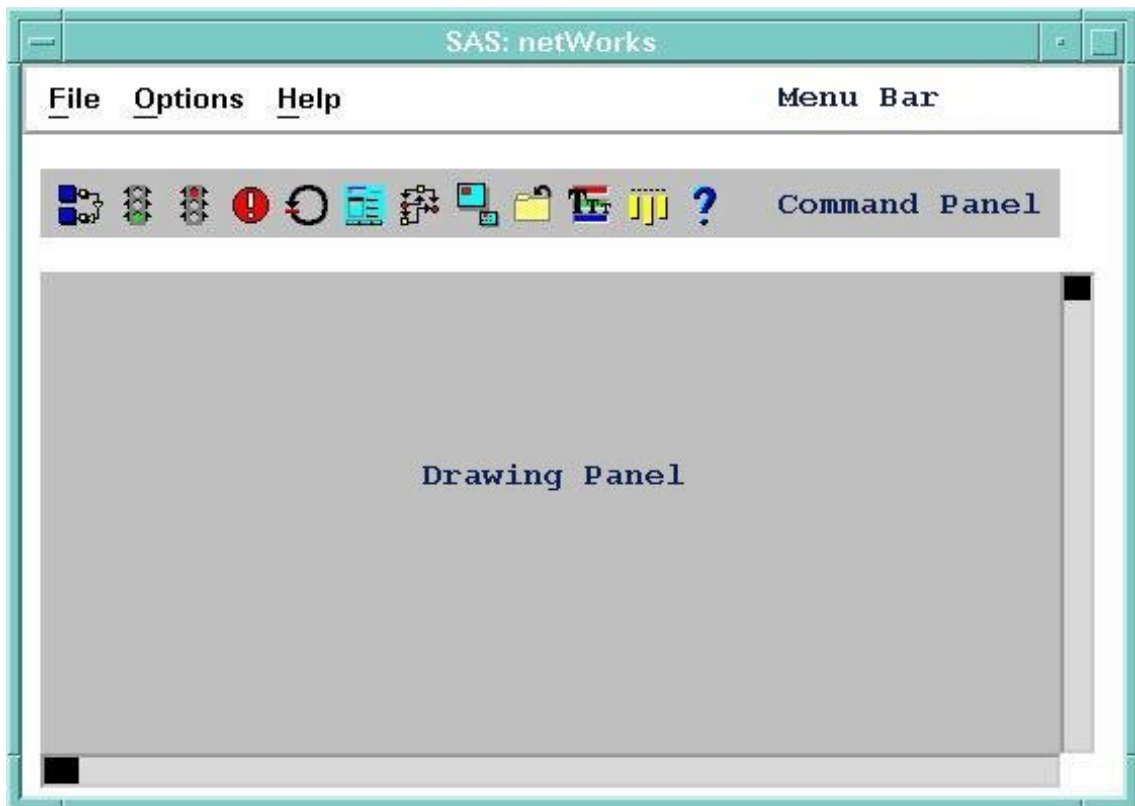


Figure 2.1. netWorks Window

Drawing Panel

You create the model or picture of your network in the drawing panel. Only a small portion of the drawing panel is visible through the netWorks window at any given time; therefore, scroll bars are provided at the bottom and on the right side of the window for moving about the entire drawing panel. A pop-up menu (Figure 2.2) on the drawing panel is accessed by clicking the right mouse button while the cursor is over the drawing panel background. This menu provides easy access to all equipment










models and various application options. The details of the individual menu items are provided in later sections of this document.



Figure 2.2. Drawing Panel Pop-up Menu

Command Panel

The command panel holds icons representing commonly used netWorks commands. By positioning the cursor over a command icon and then clicking the left mouse button, you can invoke the corresponding netWorks command. The commands are as follows:

-  toggle animation controls
-  start simulation routine
-  stop simulation routine
-  pause simulation routine
-  reset
-  display simulation control panel
-  display paths control panel
-  create viewport
-  save current network model

 edit models control panel

 display alignment control panel

 help

Again, the details for these commands are interspersed in appropriate sections throughout this document.

Menu Bar

The menu bar and associated pull-down menus (Figure 2.3) at the top of the netWorks window provide access to additional netWorks functionality including saving a network model to disk, opening a saved model, opening palettes of equipment models, and other features.



Figure 2.3. Pull-down Menu

The details of the commands available in the menu bar pull-down menus are provided in other sections of this document.

Palettes

Palettes are small, independent windows populated with icons providing shortcuts to various application features. You can add items or delete items from a palette, and you can create a totally new palette. A sample palette is displayed in Figure 2.4.

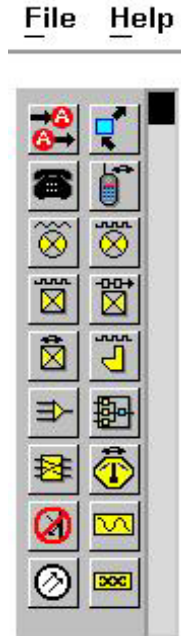


Figure 2.4. Telecom Equipment Model Palette

The netWorks application provides four default palettes: Telecom, LAN, Attribute, and Plot. You display a palette using the **Palettes** option from the **File** pull-down menu. The Telecom and LAN palettes contain icons representing common equipment models used for building model networks. The Attribute palette displays icons for the family of performance attributes associated with telecom equipment models. The use of these palettes is discussed in detail in later sections of this document. Finally, the Plot palette contains icons representing the various plot graphics available for displaying data values collected during a netWorks simulation.

Building a Network Model

You build a model of a network by placing equipment models in the netWorks drawing panel and then connecting the models with lines or arcs. There are three ways of placing equipment models onto the drawing panel.

- Use the mouse to drag an equipment model icon from one of the equipment palettes and drop it on the drawing panel.
- Select an equipment model menu item from the drawing panel pop-up menu and then use the cursor and mouse to select the position for the equipment model in the drawing panel.
- Copy (or clone) an equipment model already in the drawing panel.

Equipment Models

Equipment models typically represent physical components found in a real telecommunication or LAN network, and they are the building blocks of a network model. For example, in the netWorks telecom environment there are equipment models for telephone sets and digital switching systems, and the LAN subsystem has models of routers, workstations, and so forth.

There are two broad categories of equipment models: simple models and compound models. Simple models have attributes associated with them (for example, delay and capacity), and you can modify or edit the values of these attributes for your particular simulation. These attributes are typically accessible through a pop-up menu on the equipment model and an associated attributes dialog box. (See Figure 2.5.)

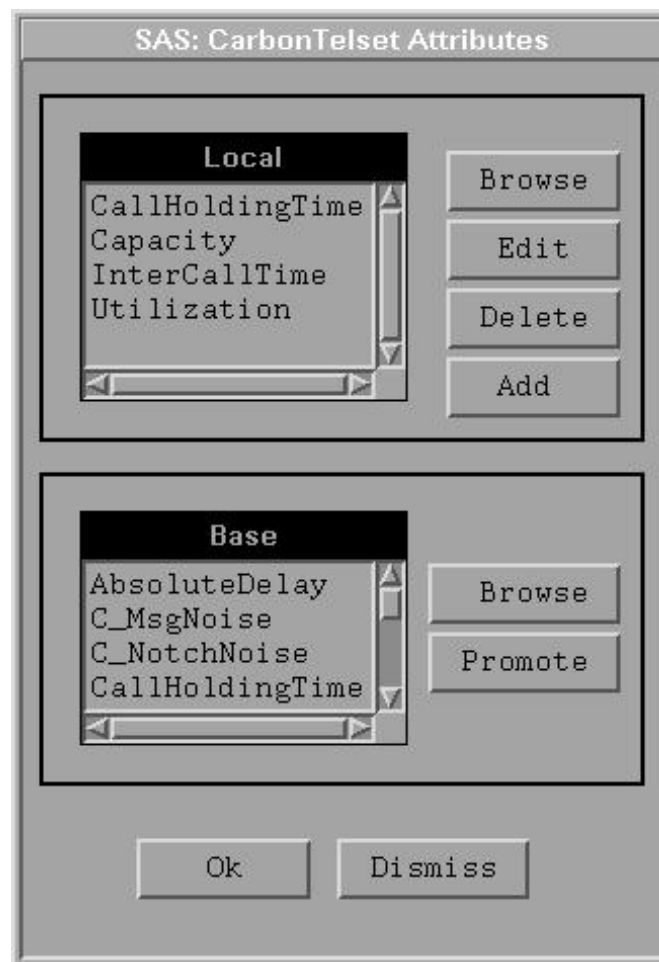


Figure 2.5. Sample Attributes Dialog Box

Compound models are used to group or wrap a collection of other models—both simple and compound—into a single unit. Functions to expose, hide, or edit the details of a compound model can be invoked using the pop-up menu for that model. The application provides many default compound equipment models, but you can

also create your own by selecting **Assemble Components** from the drawing panel pop-up menu. This function prompts you to sweep an area in the drawing panel (using a rubberband rectangle) to identify the equipment models you want to combine into a new compound model. A rectangle appears around the selected models indicating that they are now part of a new compound model. Appendix ??, “??,” contains more details on assembling components.

Both simple and compound models have hotspots associated with their drawings. By placing the cursor over the hotspot and clicking the left mouse button, you can invoke a specific function on the equipment model. The hotspot positions and their corresponding functionality are shown in Figure 2.6.

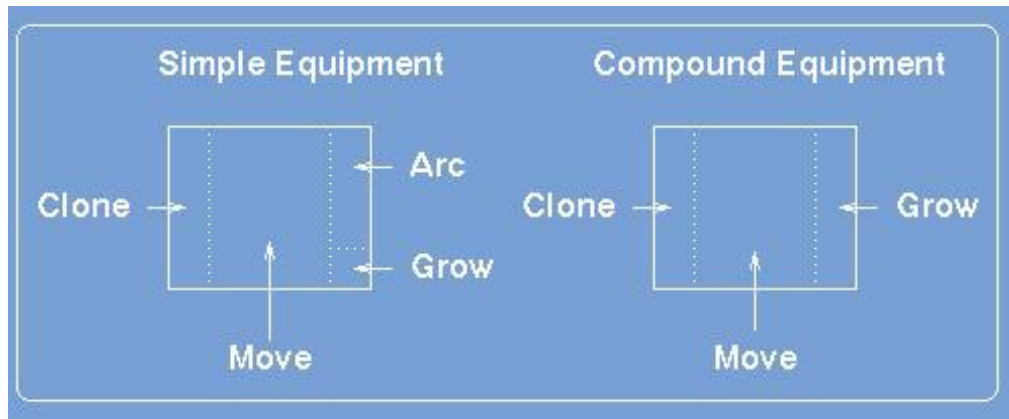


Figure 2.6. Hotspots

Arcs and Connectors

Arcs are used to connect simple equipment models logically, and their purpose is to represent paths or links between pieces of equipment. Arcs do not have any impact on the actual simulation of a network model other than their use in determining paths through the network. No arcs start or end on a compound model; however, there may be arcs between simple equipment models nested within compound models.

There are two ways to create an arc. One way is with a hotspot. Move the cursor over the right edge of a simple model in the netWorks drawing panel, and the cursor changes to a crosshair ("+"). If you click the left mouse button, the cursor has a rubberband line connected to it and to the equipment model. If you click the mouse while the crosshair cursor is over the drawing panel background, you put a bend in the arc. If you click the mouse while the crosshair cursor is over another simple model, an arc is created between the two models and the cursor reverts to its original state. Some of the simple models have a fairly small region associated with them, and it can be difficult to find the hotspot to change the cursor to a crosshair.

The other way to invoke the arc drawing process is through the equipment model's pop-up menu. If you position the cursor over a simple model and click the right mouse button, a pop-up menu appears. Selecting **Arc** from this menu invokes the arc drawing process.

You may want to have an arc between two simple models that are far apart on the drawing panel. You can do this using the process that is described in the preceding paragraph, but the resulting arc may cross over other models and be visually distracting to your network model. *Connector* models are designed to alleviate this problem. A connector can be created either from a palette or from the drawing panel pop-up menu. You create a connector close to one of the models you want to link on the drawing panel and then duplicate (not copy) the connector using its pop-up menu. Move the duplicate connector close to the other equipment model and create an arc between the two. Remember to keep the direction for the arcs to and from the connector models consistent. (See Figure 2.7)

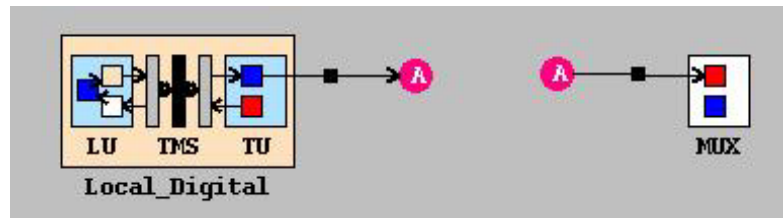


Figure 2.7. Connector Example

Pop-up Menus

Every object in a netWorks model network has an associated pop-up menu that can be exposed by positioning the cursor over the object and clicking the right mouse button. Sample pop-up menus for various equipment models are displayed in Figure 2.8, Figure 2.9, and Figure 2.10.



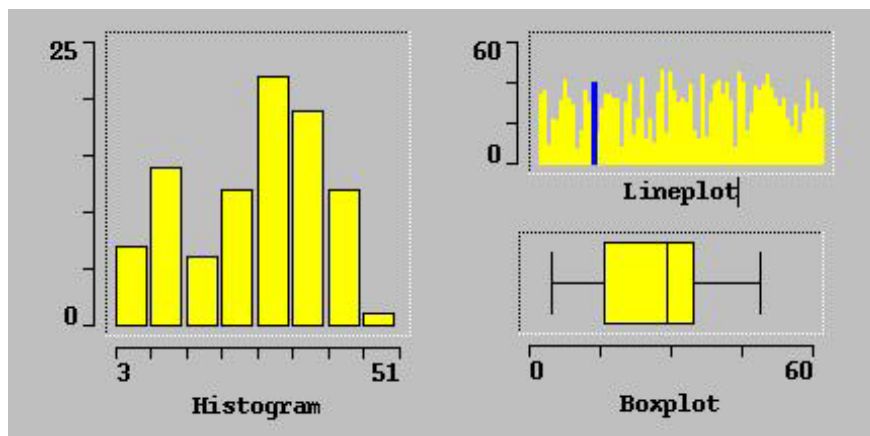
Figure 2.8. Sample Telecom Model Pop-up Menu



Figure 2.9. Sample Compound Model Pop-up Menu**Figure 2.10.** Sample LAN Model Pop-up Menu

Plots

Box plots, histograms, and line plots are available in netWORKs for displaying data collected while the simulation is running. (See Figure 2.11.)

**Figure 2.11.** Plot Examples

A line plot uses an individual line or bar to represent each data value displayed. The height of the line indicates the value's magnitude. Values are displayed in the order in which they are received. A histogram divides the range of the data values it is displaying into bins and then counts how many values fall into each of those bins. The bars on a histogram represent either the counts or the percentages of the data values in each bin. A box plot calculates order statistics (quartiles, median, and so forth) from the data values it is to display and then creates a graphic representation of them. The details of a box plot can be found in [Tukey 1977].

You can create a plot using the Plot Palette or the pop-up menu on the drawing panel. The basic idea is to drag an object that contains data that you want to display and drop

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