Using Graphical VOS   **5**

This chapter provides an overview of Graphical VOS FlowCharter and two tutorials in which you create applications using FlowCharter. It contains the following sections:

- FlowCharter Overview
- Tutorial 1: Creating a Basic Telephony Application
- Tutorial 2: Creating an IVR Application

FlowCharter Overview

The Graphical VOS FlowCharter is a graphical tool that lets you build CT applications using a flow chart layout. This kind of layout lets you easily see the organization and flow of your application.

To see the Graphical VOS IDE main window, display the Inbound sample application from the Start menu by choosing Programs | Parity Software | Graphical VOS | Samples | FlowCharter Samples | Inbound. Then double-click on the Main.flw file in the Project window.
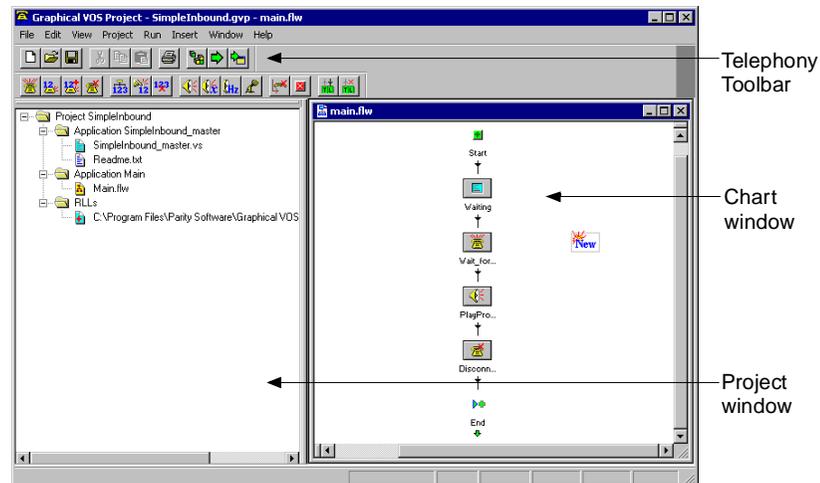

Figure 5-1 Graphical VOS IDE—main window

On the left side of the main window, the Project window displays a tree of files that make up the Inbound sample application. The Chart window on the right displays a flow chart view of the Inbound application.

When you develop a new application, you must create a new project first. A new project tree displays on the left side of the Graphical VOS main window. Within this project you can create telephony applications using FlowCharter to create flow charts or VOS source code. Applications display in the project tree on the left side of the main window and as flow charts or source code on the right side.

Flow charts consist of linked icons called cells. Cells are modules of code that perform specific telephony functions. Your application executes cells in the order they are linked in the flow chart. You can make changes directly to the chart by moving the cells, or by changing the flow of the links connecting them.

Each cell has properties that include its name, what it does, and any parameters you need to define. Although every cell has default properties that you can use, you can also modify them to suit your needs. You add cells to your chart by dragging them from one of the telephony function toolbars.

Using Toolbars

There are seven toolbars that you can use to build, edit, and debug your applications.

Standard—Use the three rightmost cells on this toolbar to compile, run, and debug your project. This toolbar displays by default when you open Graphical VOS.

Chart—Use the Chart cells to manage the cells on your flow chart.

Telephony—Use the Telephony cells to add functions such as waiting for a call, dialing digits, receive digits dialed

Mailbox Functions—Use the Mailbox Functions cells to access and manage voicemail.

Fax Functions—Use the Fax Functions cells to send and receive faxes.

Conferencing Functions—Use the Conferencing Functions cells to set up and administer conference calls.

MSI Station Functions—Use the MSI Station Functions cells to control MSI stations.

NetHub Plus—Use the NetHub Plus cells to add and edit messaging functions.

View the Telephony toolbar by choosing View | Toolbars | Telephony from the Graphical VOS main window.

Drag your cursor over each button to view a description of its function

Figure 5-2 Telephony Toolbar in Graphical VOS

Flow Charts

When you're developing your application, your flow chart has a New cell that acts like a cursor, showing where the next cell will be inserted by default. Each time you insert a cell, the New cell moves to the next place that you're most likely to insert a cell. This saves you from having to drag individual cells to your chart and significantly reduces the number of mouse clicks and keystrokes required to create an application. If you want, you can also drag the New cell anywhere on the screen.

When you run your application, execution begins at the Start cell and then continues to subsequent cells in the order they are arranged on the chart.

Connecting Cells

The cells on your chart are connected by links containing arrows that show the flow of your application. A stub is a link that is connected to only one cell instead of two and appears as a red X below a cell.
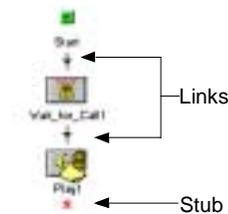

Figure 5-3 Flowcharter cells showing links and stubs

When you insert a new cell directly below a stub, FlowCharter automatically links the two cells. You can check a link's properties by right-clicking the link and selecting Properties, or by double-clicking the link. From the Properties dialog, you can hide a link (it appears as a green arrow, but won't change the flow of your application) or connect it to any other cell on the chart. You can also drag links to other cells on the chart.

Links enter a cell at any one of three sockets on the top or sides and leave from its outlet at the bottom of the cell.
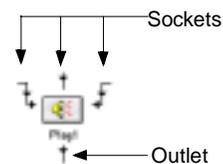

Figure 5-4 Flowcharter cell showing sockets and an outlet

Cell Properties

Open the properties for a cell by double-clicking the cell or clicking it once and pressing the Enter key. You can also view the properties by right-clicking the cell and selecting Properties or by pressing Ctrl+Enter.

The Cell Properties dialog appears with tabs, and each tab defines a property for the cell. For example, the Cell Name tab displays the name of the cell. The What Am I? tab displays a detailed description of the code's function. (This tab is read only, but you can modify the information on most tabs.) Just as cells have functions that differ, they may also have more or fewer tabs on which you can specify properties that apply to that particular cell.

If a cell has properties that still need to be set, it appears with a little yellow note tacked to it. This is called a *To Do note*. In this case, the Cell Properties dialog has a Things To Do tab that outlines which properties you need to set.
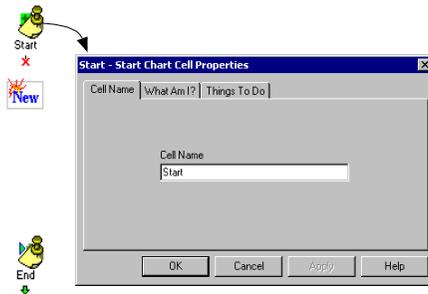

Figure 5-5 Start Chart Cell Properties dialog

In the next two sections we've provided tutorials to give you a chance to create applications using FlowCharter.

Tutorial 1: Creating a Basic Telephony Application

In this tutorial you'll create a very simple application that answers an incoming call, plays a message to the caller, and then hangs up.

Before you Begin

Make sure Graphical VOS has been installed correctly. If you have questions or want more information on any of the FlowCharter cells or VOS code you see during this tutorial, see the Graphical VOS online help.

Step 1: Creating a Graphical VOS Project

1. Start SimPhone and Graphical VOS from the Windows Start menu.

2. In the Welcome to Graphical VOS dialog, select Create a new project and click OK.
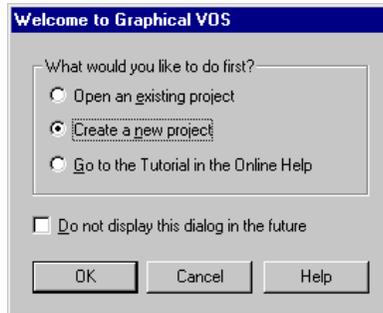

Figure 5-6 Welcome to Graphical VOS dialog

3. In the New dialog:

   a. Make sure that Project is the selected File Type.

   b. In the File name field, type **Tutorial**.

   c. In the Location field, type this path for the project:
   ```
   C:\Program Files\Parity Software\Graphical VOS\Tutorial\Flo
   wCharter
   ```
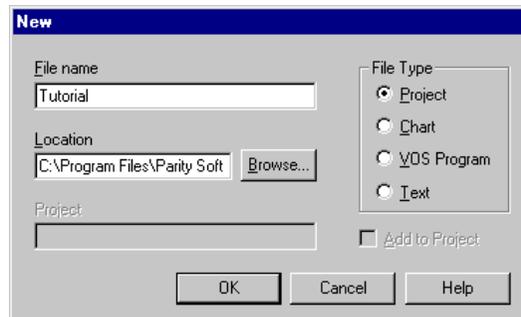
   d. Click OK.

Figure 5-7 New dialog—displays when you choose Create a new project button

Graphical VOS creates your project. In the Project window, you see a tree on the left side that shows the project's files: a master application and an RLL. To find out more about RLLs (Runtime Link Libraries) see the Graphical VOS online help.

Step 2: Adding a Flow Chart to the Project

1. From the main menu in Graphical VOS, click File | New.

2. In the New dialog:

a. Make sure that Chart is the selected File Type.

b. In the File name field, name the chart **MyFirst**.

c. Select the Add to Project checkbox, and then click OK to create the new chart.

The chart you created contains a Start cell, a New cell, and an End Chart cell.

Step 3: Making the Telephony Toolbar Visible

1. From the main menu in Graphical VOS, choose View | Toolbars | Telephony.

   The Telephony Toolbar displays.

2. Click the Wait for Call cell icon on the Telephony Toolbar.

   The Wait for Call cell appears on your chart and automatically links itself to the Start cell. When you run your application, the Wait for Call cell waits for an incoming call. When a call arrives, the cell answers the call and passes control to the next cell.

   Notice that the New cell has moved below the Wait for Call cell.

3. Click the Play cell icon on the Telephony Toolbar.

   The Play cell appears on your chart and automatically links itself to the Wait for Call cell. When you run your application, the Play cell plays a prompt over the phone line and passes control to the next cell.

   You can also insert cells by dragging them from the toolbar.

4. Click the Disconnect cell on the Telephony Toolbar.

   The Disconnect cell appears on your chart and automatically links itself to the Play cell. At the end of a phone call, the Disconnect cell hangs up the phone line.

5. To complete your application, drag the existing End Chart cell up one space and drop it where the New cell sits.

The New cell is bumped down one spot on the chart and the End Chart cell automatically links itself to the Disconnect Call cell. When you run your application, the End Chart cell restarts the application and execution resumes with the Start cell.

Now you're ready to run your application!

Step 4: Running Your First Application

1. From the Run menu in Graphical VOS, choose Run MyFirst.flw.

   Graphical VOS compiles your application and starts VOS. If you have trouble, click View | Runtime Log and consult the online help for troubleshooting information.

2. In SimPhone, click Ring to simulate a call to the voice card. If you didn't start SimPhone at the beginning of this tutorial, launch it from the Windows Start menu now.

   Your application answers the call and plays a prompt before hanging up. You can make another call if you want, and your application will answer and play the message again.

3. From the Graphical VOS Run menu, choose Stop Running to stop the application.

Step 5: Setting Play Cell Properties

There is a little yellow To Do note tacked to the Play cell so you still need to set properties for the Play cell. Because you didn't set them before running the application, the cell used its default behavior.

The Properties dialog shows all the properties associated with the cell. On the Things To Do tab, you see that *Select a prompt* is a To Do item. This means that the Play cell is defined, but the prompt to play has not been specified. As you saw, the Play cell still runs, but because no prompt has been defined it plays the default prompt.

To specify a new prompt:

1. Right-click the Play cell and select Properties from the drop-down menu.

2. On the Play Cell Properties dialog, click the Prompt tab.

If prompts had already been defined, you could select one from the Prompt Name list.

3. No prompts have been defined in this project so click Prompts to display the Prompts dialog.

4. Click New to display the New Prompt - Properties dialog, then complete these steps:

   a. In the Prompt Name field, type **Hello**.

   b. Click Browse and locate the following audio file that has been recorded for this tutorial:
   ```
   C:\Program Files\Parity Software\Graphical VOS\Tutorial\Pro
   mpts
   ```

   c. Select Hello.vox, and then click Open.

   d. Select 24 kbps 4-bit 6 kHz ADPCM VOX for the File Type.

   e. For the script, type: **Hello and thank you for calling Parity Software**.

   f. Click OK to close the Prompt Properties dialog, then click OK again to close the Prompts dialog.

   Now you can see the Play cell properties. Note that the prompt you just defined has been selected for this cell.

5. Click OK to close the Play Cell Properties dialog.

   Notice that the note is gone from the cell.

6. Run your application again to hear the new prompt.

7. When you're done, choose Stop Running from the Graphical VOS Run menu to stop the application.

Tutorial 2: Creating an IVR Telephony Application

In this tutorial you are going to create an IVR (Interactive Voice Response) telephony application that:

- Answers an incoming call

- Plays a menu that gives the caller three options:

  — Leave a message

  — Enter a phone number

  — Hear the company's stock price

- Performs the action the caller requested, or plays a goodbye message if the caller didn't make a valid choice.

- Hangs up the phone line

Before You Begin

This tutorial extends Tutorial 1: Creating Your First Telephony Application. If you haven't completed all of the steps in Tutorial 1, go back and finish them before beginning Tutorial 2.

Step 1: Adding a New Flow Chart to Your Project

1. If you haven't already done so, start Graphical VOS and open the Tutorial project you created in Your First Telephony Application.

2. From the main menu, click File | New.

3. In the New dialog:

    a. Make sure that Chart is the selected File Type.

    b. In the File name field, name the chart: **AutoAttendant**.

    c. Make sure the Add to Project checkbox is checked.

    d. Click OK to create the new chart.

FlowCharter adds the new chart to your project. In the Project window, you can see three applications listed:
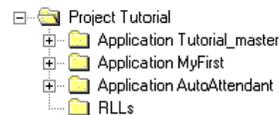
Tutorial_master—The master application controls which files are launched when you run your project. Graphical VOS creates and maintains the master application. You shouldn't delete this file, and in most cases you won't need to modify it.

MyFirst—This is the application you created in Getting Started: Your First Telephony Application.

AutoAttendant—This is your new application.

Step 2: Configuring the Trunk 0

To specify which application to run:

1. From the main menu, choose Project | Configure Trunks.

2. In the Trunk Configuration dialog, click Add to open the Configure Trunks dialog.

3. Set both Trunk Range fields to 0.

4. Set the Program Type to Fixed, and then select AutoAttendant from the Program drop list.
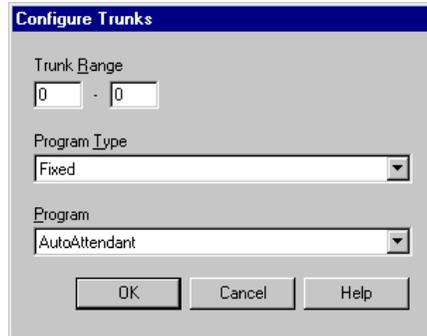

Figure 5-8 Configure Trunks dialog

5. Click OK to close the Configure Trunks dialog.

In the VOS Trunk Configuration dialog, you can see that Trunk 0 has been set.
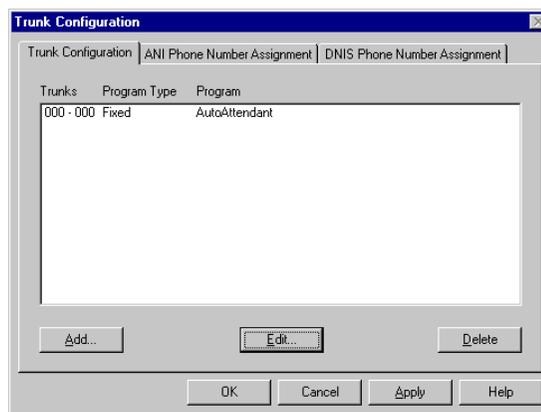

Figure 5-9 Trunk Configuration dialog

Each time a call comes in on Trunk 0, that call is sent to the AutoAttendant program.

6. Click OK to close the Configure Trunks dialog.

Step 3: Waiting for an Incoming Call

When the application starts, we want it to wait for and answer an incoming call.

Click the Wait for Call cell icon on the Telephony toolbar to insert a Wait for Call cell.

Now the application waits for an incoming call, and takes the phone off hook when a call comes in. The New cell moves below the Wait for Call cell, where we'll insert the next cell.

Step 4: Adding a Menu

Next, let's add a menu to our application. Most call processing applications begin with a main menu similar to this one:

"Hello and thank you for calling our company. For this option, press 1, for that option, press 2..."

1. Click the Menu cell icon on the Telephony toolbar to insert a menu.

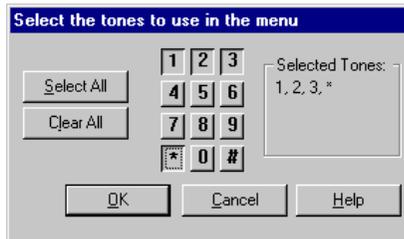   A dialog box displays, and now you can select the tones to use in the menu.

Figure 5-10 Select the tones to use in the menu dialog

We want our application to let the caller leave a message, enter a phone number, or hear the current stock price, so we need to create a menu that has three options. We also want the caller to be able to press the star key to exit the call.

2. Select the 1, 2, 3, and * buttons—the tones you select display in the Selected Tones list—then click OK.

   The note attached to the Menu1 cell means that there are properties you need to set for the cell.

3. Double-click the Menu1 cell to see its properties.

4. Click the Things To Do tab, and you'll see that you need to select a prompt for the menu that lets callers know how to access the different menu options.

5. Click the Prompt tab.

   In the Prompt Name list box, you'll see that the flow chart doesn't have any prompts available so you need to set up a prompt for the menu.

6. Click Prompts, and then click New to open the New Prompt - Properties dialog:

   a. In the Prompt Name field, type **MainMenu**.

Next, you need to specify which sound file to play—main_men.vox has been provided for this tutorial:

b. Click the Browse button to locate and select the Main_men.vox sound file.

By default, you'll find it in the following directory:

```
C:\Program Files\Parity Software\Graphical VOS\Tutorial\Pro
mpts
```

c. Click Open to return to the New Prompt - Properties dialog and then from the File Type list, select 24 kbps 4-bit 6 kHz ADPCM VOX.

d. In the Script field, type:

To leave a message, press 1. To enter your phone number for a return call, press 2. To hear today's stock price, press 3. To end this call, press star.
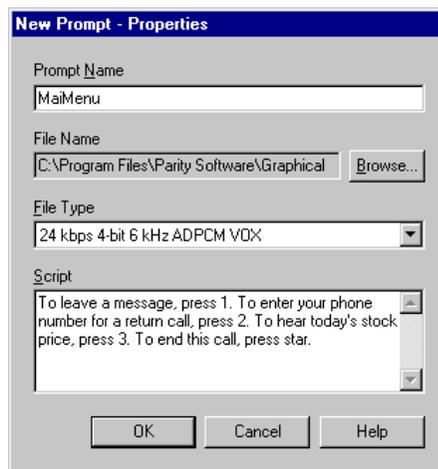

Figure 5-11 New Prompt - Properties dialog

e. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Menu Cell Properties dialog.

The MainMenu prompt is now listed in the Prompt Name field.

7. Click the Cell Name tab. In the Cell Name field, name the cell **MainMenu**.

8. Click OK to return to your flow chart.

The MainMenu cell no longer has a note attached.

Depending on what the caller dials after hearing the menu prompt, the application flows to one of the Case cells below the Menu cell. Each Case cell shows the number that the caller must press to choose that option. Next we'll give these Case cells more descriptive names.

9. Double-click the first cell's name, Choice1_1. The cell name is highlighted, and you can type another name in its place. Name this cell **LeaveMsg**.

10. When you are done typing, click anywhere in your chart and the cell is renamed. Repeat this process and rename the other Case cells **LeavePhoneNum**, **HearStock**, **EndCall**, and **CallerError**.
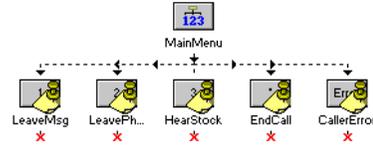
Next, you need to add cells to let the caller leave a message, enter his or her phone number, hear the stock price, or end the call.

Step 5: Adding a Record Cell

If the caller presses 1 from the main menu, the application records a message. After the caller finishes recording a message, we want the application to hang up and end the call.

1. Drag the Record cell icon from the Telephony toolbar to below the LeaveMsg Case cell.

2. Drag the Disconnect cell icon from the Telephony toolbar to below the Record1 cell, and then drag the link at the bottom of the Disconnect1 cell to the End Chart cell.

3. Double-click the Record1 cell to see the cell's properties.

   The Things To Do tab tells you that you need to enter a file name and a file type and select a prompt for the cell.

4. Click the File to Record tab and type **Message.vox** in the File Name field.

5. From the File Type drop-down list, select 24 kbps 4-bit 6 kHz ADPCM VOX.

   To set up a prompt for the Record cell, follow the same procedure that you did for the Menu.

6. Click the Prompt tab, then click the Prompts button to open the Prompts dialog.

   a. Click New, and in the Prompt Name field, type: **LeaveAMessage**.

   b. Click Browse and select Leave_a_.vox in the Select a Sound File dialog.

   c. Click Open to return to the New Prompt - Properties dialog. From the File Type list, select 24 kbps 4-bit 6 kHz ADPCM VOX.

   d. In the Script field, type:
      Please leave a message at the tone. When you are finished, press pound.

    e. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Record Cell Properties dialog.

7. Click the Cell Name tab. In the Cell <u>N</u>ame field, type **RecordMessage**.

8. Click OK a final time to return to your flow chart.

Step 6: Adding a Get Digits Cell

If the caller presses 2 from the main menu, we want to let him or her enter a phone number. After the caller has entered a phone number, we want to end the call.

1. Drag the Get Digits button on the Telephony toolbar to below the LeavePhoneNum Case cell.

2. Drag the link at the bottom of the Get_Digits1 cell to the Disconnect cell.

3. Double-click the Get_Digits1 cell to see its properties.

The Things To Do tab says that you need to select a prompt for the cell.
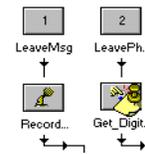
4. Click the Prompt tab, then click the Prompts button to open the Prompts dialog.

    a. Click New and then in the Prompt Name field, type: **EnterYourPhoneNumber**.

    b. Click Browse and select Enter_yo.vox in the Select a Sound File dialog. Click Open to return to the New Prompt - Properties dialog.

    c. From the File Type list, select 24 kbps 4-bit 6 kHz ADPCM VOX.

    d. In the Script field, type:

        Enter your phone number. Press pound when you are finished.

    e. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Get Digits Cell Properties dialog.

We also need to set up the number of digits to get from the caller, which you specify on the Digit Limits tab. To have a valid phone number, we need between seven and ten digits from the caller. We'll give the caller 30 seconds to enter all of the digits.

5. Click on the Digit Limits tab:

    a. Type **7** in the Get at least __ digit[s] field.

    b. Type **10** in the Get at most __ digit[s] field.

    c. Type **30** in the Allow up to __ seconds to get all digit[s] field.

Figure 5-12 Get Digits Cell Properties dialog

6. Click the Cell Name tab. In the Cell Name field, type **EnterPhoneNumber**.

7. Click OK to return to your flow chart.

Step 7: Adding a Phrase

If the caller presses 3 from the main menu, we want to play a message that tells the current stock price. In order to play a message that contains variable data, like dates or dollar amounts, you need to create a phrase. If the caller chooses the stock price option, he or she hears a sentence like this:

"Our company's stock price is $216.84."

This phrase is made up of one Play cell that says *Our company's stock price is*, plus one Phrase cell that is a Money variable. After the caller has heard the stock price, we want to end the call.

1. Drag the Play cell icon from the Telephony toolbar to below the HearStock Case cell.

   Now you need a Phrase:

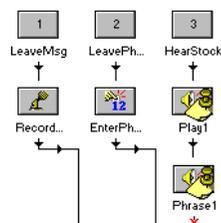2. Next, drag the Phrase cell from the Telephony toolbar to just below the Play1 cell.

Figure 5-13 Flowcharter—adding a Phrase cell

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3. Drag the link at the bottom of the Phrase1 cell to the Disconnect cell. Then double-click the Play1 cell to see the cell's properties.

The Things To Do tab tells you that you need to select a prompt for the cell.

4. Click the Prompt tab, then click the Prompts button to open the Prompts dialog:

   a. Click New and in the Prompt Name field, type **StockPrice**.

   b. Click Browse and select Stock_pr.vox in the Select a Sound File dialog, then click Open to return to the New Prompt - Properties dialog.

   c. From the File Type list, select 24 kbps 4-bit 6 kHz ADPCM VOX.

   d. In the Script field, type **Our company's stock price is**.

   e. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Play Cell Properties dialog.

5. Click the Cell Name tab and in the Cell Name field, type **CompanyStockIs**. Click OK to return to your flow chart.

6. Double-click the Phrase1 cell to see that cell's properties.

The Things To Do tab tells you that you need to enter a value to speak and specify how that value should be spoken.

7. Click the Type tab and select Money from the Speak as field.

8. Next, click the Value to Speak tab:

In most applications, you would read this value from a variable or database, but to keep this tutorial simple, we'll just assign a dollar amount to read.

   a. In the Type field select Expression and then type **"216.84"** in this field.
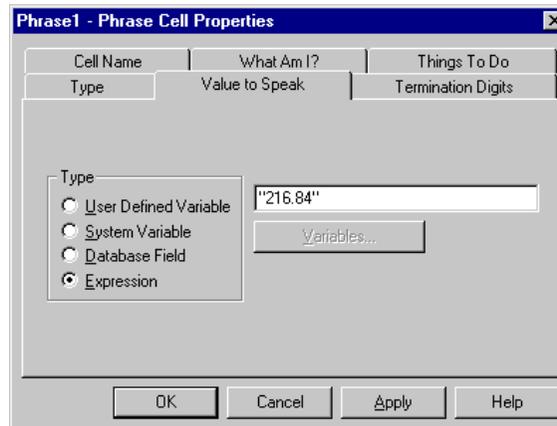

Figure 5-14 Phrase Cell Properties dialog

9. Click the Cell Name tab and in the Cell Name field, type **Price**. Click OK to return to your flow chart.

Step 8: Placing the Phrase in a Group

A Group helps you organize your flow charts by representing a set of related cells using a single cell. This shrinks the overall size of the flow chart, making it easier to see it as a whole. You can expand the set of cells in a Group cell by clicking on it.

1. Select the CompanyStockIs and Price cells by clicking one and then holding down the Ctrl key while you click the other.

2. From the main menu, choose Edit | Create Group.

   The Group1 cell appears in place of the cells you selected.

3. To rename the Group1 cell, right-click it and choose Properties from the right-click menu, then click the Cell Name tab and type **StockPrice** in the Cell Name field. Click OK.

4. Double-click the StockPrice cell, and you'll see the CompanyStockIs and Price cells between a Group Start cell and a Group End cell.

   Similar to the Start cell and End Chart cells, the Group Start and Group End cells mark the beginning and end of the Group.

5. Click the Close button in the upper right corner of the AutoAttendant1:StockPrice window to close the Group and return to the flow chart.

Step 9: Adding a Thank-You Message

If the caller presses * from the main menu, we want to thank him or her for calling, and hang up.

1. Drag the Play cell icon from the Telephony toolbar to below the EndCall Case cell.
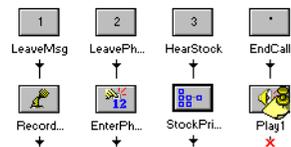
Figure 5-15 FlowCharter—adding a Play cell

2. Drag the link at the bottom of the Play1 cell to the Disconnect cell, then double-click the Play1 cell to see the cell's properties.

   The Things To Do tab says that you need to select a prompt for the cell.

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3. Set up a prompt for this Play cell:

    a. Name the prompt **ThankYou**.

    b. Select Goodbye.vox as the sound file.

    c. Select 24 kbps 4-bit 6 kHz ADPCM VOX for the <u>F</u>ile Type.

    d. In the <u>S</u>cript field type **Thank you for calling. Goodbye.**

4. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Play Cell Properties dialog.

5. Click the Cell Name tab. In the Cell <u>N</u>ame field, type **ThankYou**. Click OK to return to your flow chart.

Step 10: Adding an Error Message

In the main menu, if the caller fails to enter a valid choice after three tries, the application flows to the CallerError Case cell. We want to play a special message in this case and then end the call.

1. Move the New cell below the CallerError Case cell, and click the Play cell icon on the Telephony toolbar.

2. Drag the link at the bottom of the Play cell to the Disconnect cell.

3. Double-click the Play cell to see the cell's properties.

    The Things To Do tab tells you that you need to select a prompt for the cell.

4. Set up a prompt for this Play cell:

    a. Name the prompt **Invalid**.

    b. Select Bad_good.vox as the sound file.

    c. Select 24 kbps 4-bit 6 kHz ADPCM VOX for the <u>F</u>ile Type.

    d. In the <u>S</u>cript field type **Your choices were invalid. Goodbye.**

5. Click OK to create your new prompt and return to the Prompts dialog. Click OK again to return to the Play Cell Properties dialog.

6. Click the Cell Name tab. In the Cell <u>N</u>ame field, type **Sorry**. Click OK to return to your flow chart.
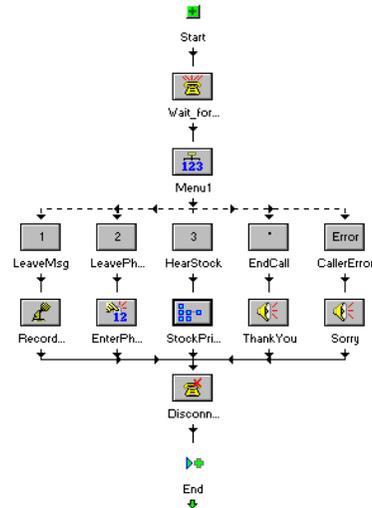
Figure 5-16 FlowCharter—your finished flowchart

7. From the Graphical VOS menu, choose File | Save.

Step 11: Running the Application

1. Select Run | Run autoattendant.flw from the main menu.

    Graphical VOS saves and compiles your application, then starts VOS.

2. In SimPhone, click Ring to simulate a call to the voice card.

    Your application answers and plays this prompt:

    "To leave a message, press 1. To enter your phone number for a return call, press 2. To hear today's stock price, press 3. To end this call, press star."

3. Enter a number between 1 and 3.

    — If you press 1, you will be prompted to leave a message.

    — If you press 2, you will be asked to enter a seven-digit number.

    — If you press 3, you will hear a phrase that says:

        "Our company's stock price is two hundred sixteen dollars and eighty-four cents."

    After the application completes the task that accompanies the option you chose, it hangs up. If you press the star key (*), the application plays a closing message and hangs up. You can repeat this as many times as you wish by making another call to the voice card.

4. When you are finished, exit the application by choosing Run | End from the Graphical VOS main menu.