Chapter 9. Testing Speech Vocabularies

After you define your vocabulary, compile the grammar (if necessary), and create a dictionary of pronunciations for your vocabulary, you need to test it and the pronunciations to verify that all the words and phrases can be recognized by VoiceType. The Grammar Test utility allows you to do this before you've written or modified your own application. If VoiceType cannot recognize selected words or phrases, you might need to modify your vocabulary or the pronunciation(s) of the words or phrases to resolve the problems.

The Grammar Test utility takes compiled grammar (FSG) files as input. It also supports command vocabularies; that is, you can specify word list (WDL) files as input, too. In addition, you can define dynamic command vocabularies and external lists from within the Grammar Test Utility.

When testing your vocabulary, you should test both in-vocabulary and out-of-vocabulary words and phrases. If you have more than one vocabulary for your application, you should test each of the vocabularies separately, and then test them together.

The Grammar Test utility is also provided as sample source code (ERECO). Refer to Chapter 16, “Sample Programs” on page 151 for more information.

Accessing the Grammar Test Utility

From the VoiceType Developers Toolkit start menu, click **Test a Speech Grammar**. The Grammar Test utility (Extended Reco Sample) main window appears. You can also start the Grammar Test utility from the command line by typing:

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ereco
```

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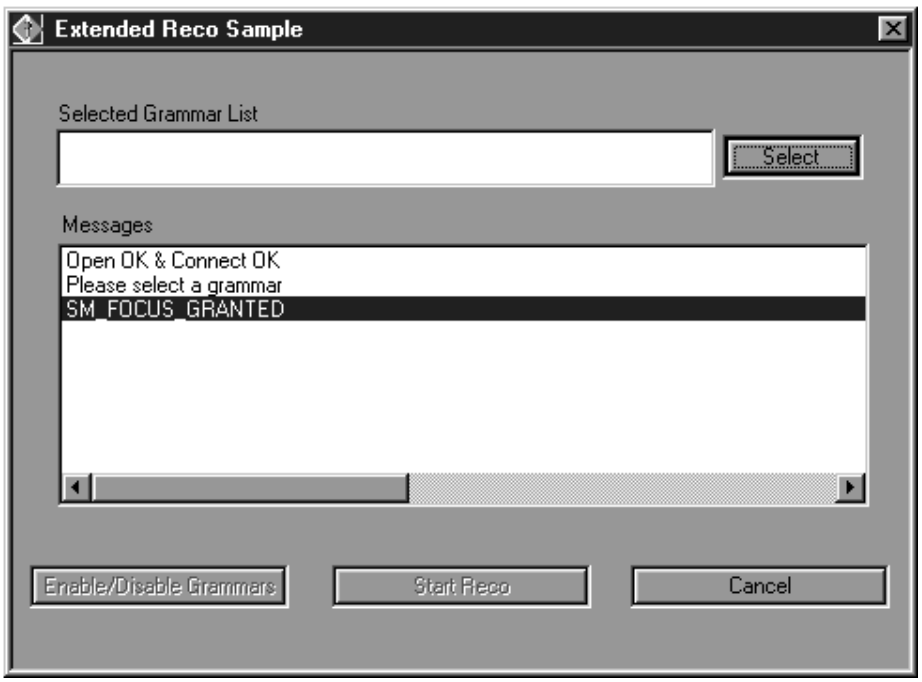

Figure 7. Grammar Test Utility (ERECO)

This window shows the grammars you have selected to test. From this window, you can enable and disable the selected grammars and start recognition to test them. In the messages area, you see messages from the speech engine, including messages confirming that a grammar has been enabled or disabled, when the recognition has started and the microphone is on, and whether the engine recognized what you said.

Testing a Vocabulary

Follow these steps to test a speech vocabulary:

1. Select a vocabulary to test. To do this, click the **Select** button. The Grammar Selection Choices window is displayed:

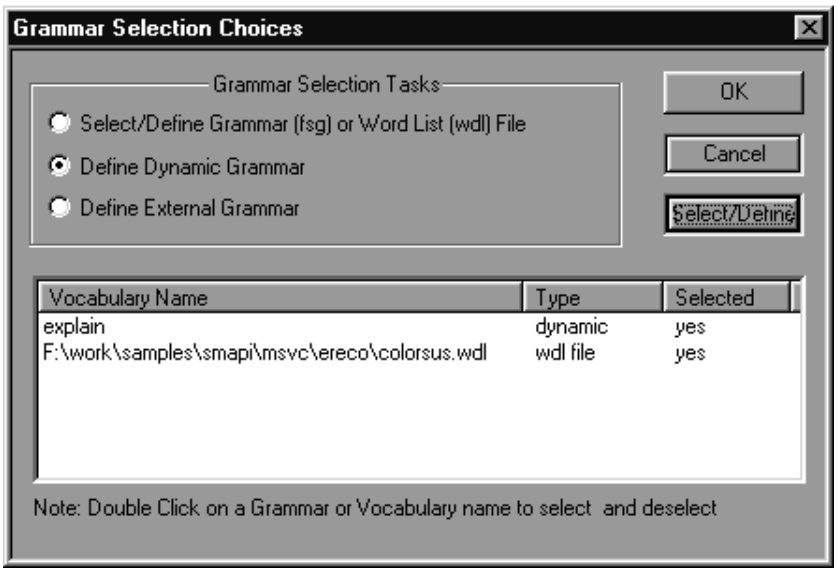

Figure 8. Grammar Selection Choices

From this window, you can choose the type of vocabulary you want to test. To select a compiled grammar (FSG) file or a word list (WDL) file, click the **Select/Define Grammar (fsg) or Word List (wdl) File** button. To define a dynamic command vocabulary, click the **Define Dynamic Grammars** button. To define an external list, click **Define External Grammar** When you've chosen the type of vocabulary, click **Select/Define**.

As an example, let's work with FSG and WDL files. Click **Select/Define Grammar (fsg) or Word List (wdl) File**. and then click **Select/Define**. This brings up a window from which you can choose FSG and WDL files. Select the vocabulary you want to test and click **OK**.

You will see the name of the vocabularies you selected in the Vocabulary Name list. (Hint: If you want to de-select a vocabulary from the list, simply double-click the vocabulary name). Click **OK**.

Note: If any of the words or phrases in any of the vocabularies does not have an associated pronunciation, the Grammar Test utility cannot continue. You must exit the Grammar Test utility and use the Dictionary Builder to create a dictionary (pronunciation) file for that vocabulary.

2. Next, you need to enable your vocabulary. Do this by clicking the **Enable/Disable Grammars** button. An appropriate message appears in the Messages list, indicating that the selected vocabularies have been enabled.
3. Now you are ready to test your vocabulary. Click the **Start Recognizing** button. Speak every word and phrase in your vocabulary, one at a time. (Hint: If you need to find out what words and phrases are valid, open up the corresponding BNF or WDL files).

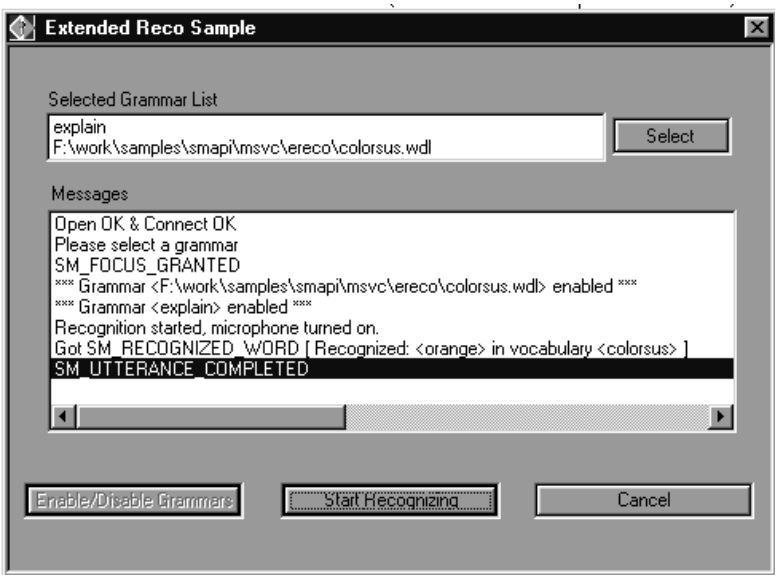

Figure 9. Testing Your Vocabulary

As you say a word or phrase, a message appears in the Messages list, telling you whether the word or phrase was recognized by the engine. When you are working with a dynamic command vocabulary or WDL file, the message is preceded with "SM_RECOGNIZED_WORD." When you are working with a grammar vocabulary or an external list, the message is preceded with "SM_RECOGNIZED_PHRASE." The following types of messages are returned by the engine:

You can get a correct recognition message. In the example shown, "orange" is in the word list. When the word "orange" is spoken, the engine should return:

```
Got SM_RECOGNIZED_WORD [Recognized: <orange> in vocabulary <colorsus> ]
```

You can get a rejection. For example, if you say a word which is in one of the vocabularies, but it is not recognized by the engine, you get the following message:

```
Got SM_RECOGNIZED_WORD [Recognized: ?? <word> in vocabulary <vocab-name> ]

or

Got SM_RECOGNIZED_PHRASE [Recognized: ?? <word> in vocabulary <vocab-name> ]
```

The "??" indicate that the engine rejected the utterance, with the word in brackets being the engine's closest guess.

You can also encounter substitution errors. Substitution occurs if the engine recognizes a word, but it is not the word you said (the engine substitutes another word for the word you said), you should see a message like:

```
Got SM_RECOGNIZED_WORD [Recognized: <other word> in vocabulary <vocab-name> ]

or

Got SM_RECOGNIZED_PHRASE [Recognized: <other word> in vocabulary <vocab-name> ]
```

Finally, you can encounter out-of-vocabulary messages. This happens if the engine does not recognize a word as being in any of the vocabularies, you get the following message:

```
Got SM_RECOGNIZED_WORD [ ?? Unrecognized word ]

or

Got SM_RECOGNIZED_PHRASE [ ?? Unrecognized word ]
```

For tips on interpreting and handling these types of messages, see “Interpreting and Handling the Results” on page 63.

Defining a Dynamic Vocabulary

With the Grammar Test utility, you can define a vocabulary "on the fly" as you're testing it. This is one way you can input a dynamic command vocabulary. It is also a useful way of testing alternative words and phrases for your current vocabulary. The Grammar Test utility refers to dynamic vocabularies as "dynamic grammars." To define a dynamic vocabulary, follow these steps:

1. From the main window, click **Select/Define Grammars**.
2. From the Grammar Select Choices window, click **Define Dynamic Grammar** and then **Select/Define**.

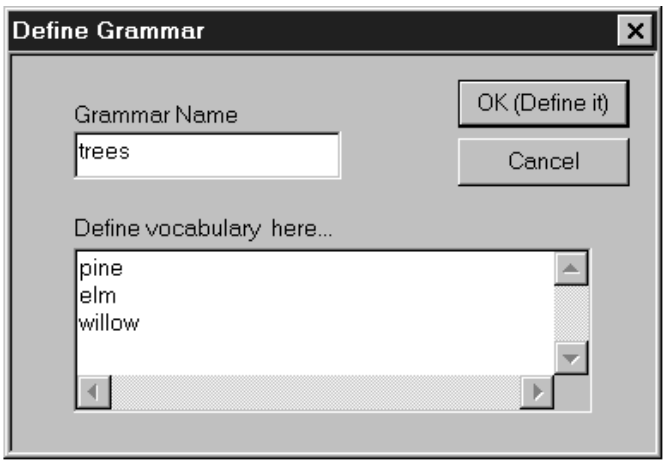

Figure 10. Define Dynamic Vocabulary

3. The Define Grammar window appears. Type a name for your dynamic vocabulary in the Grammar Name field. Enter all of the words and phrases for this vocabulary in the Define vocabulary here... field. When you're done, click **OK (Define it)**.

Note: Be sure you've entered all of the words and phrases correctly before you click **OK (Define it)**. Once you've defined a dynamic vocabulary, you cannot go back and change it. If your vocabulary is substantial, you might consider using a word list file (WDL) instead, which you can edit.

4. Click **OK**.
5. Click **Enable/Disable Grammars**.
6. Click **Start Recognizing** to begin testing your dynamic vocabulary.

Working with External Lists

With the Grammar Test utility, you can work with external lists. An external list is referenced by a compiled grammar (FSG).

The Grammar Test utility refers to external lists as "external grammars." To define an external list, follow these steps:

1. From the main window, click **Select/Define Grammars**.
2. From the Grammar Select Choices window, click **Define External Grammar** and then **Select/Define**.

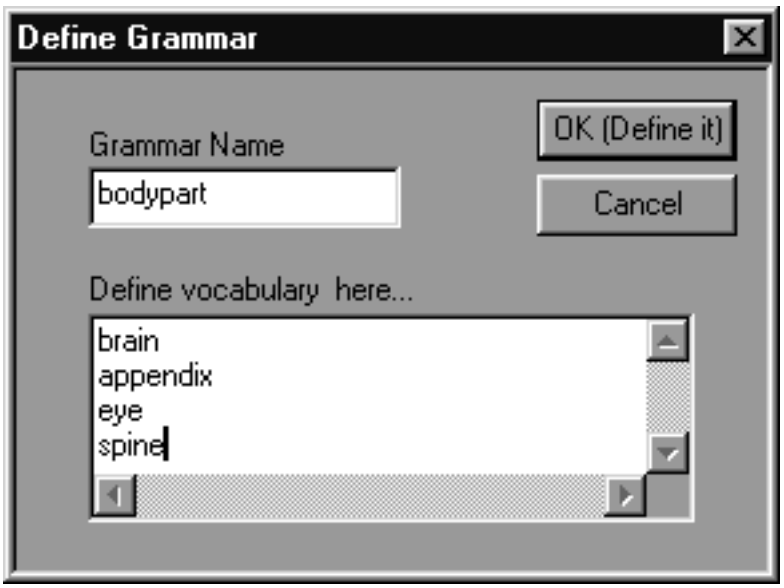

Figure 11. Define External List

3. The Define Grammar window appears. Type a name for your external list in the Grammar Name field. (Remember: The name you type must be the same name as one that is referenced in an FSG file). Enter all of the words and phrases for this list in the Define vocabulary here... field. When you're done, click **OK (Define it)**.

   Note: Be sure you've entered all of the words and phrases correctly before you click **OK (Define it)**. Once you've defined an external list, you cannot go back and change it.

4. You will be reminded that you need to select the FSG file which references the external list. Click **OK**.
5. Select the FSG file which references the external list. Click **Open**.

6. Click **OK**.
7. Click **Enable/Disable Grammars**.
8. Click **Start Recognizing** to begin testing your external list.

Interpreting and Handling the Results

The following examples illustrate how you might interpret and handle some of the more common results that you may encounter when testing your vocabulary. This is not a complete list, nor is there a prescribed approach to testing and verifying your vocabulary and its associated pronunciations. However, this section is meant to provide some insight into the testing process, and it should guide you in determining when you need to change your vocabulary and when you need to change or add a pronunciation to fix a problem.

- You experience frequent misrecognitions of a short phrase. For example, you defined the word "blue" in your vocabulary to select the color blue. When you test it using the Grammar Test utility, it is consistently misrecognized as "new." You probably need to provide a longer alternative; for example, you may want to define "choose blue" or "new color blue."
- You defined the phrases "Add gray pen" and "Add green pen" in your vocabulary. You find that "Add gray pen" is consistently misrecognized as "Add green pen" ("green" is substituted for "gray"). Look at the pronunciations for "gray" and "green." You might need to provide an alternative pronunciation for "gray" using the Dictionary Builder.
- You have defined two functions, "Add <color>" and "Get <color>," which do two very different things (they are not synonyms). However, when you say "Add blue," it is frequently recognized as "Get blue." You might want to reword one of the phrases; for example, change "Get blue" to "Mix blue."

Tips for Using the Grammar Test Utility

This section describes some hints and tips for using the Grammar Test utility:

- If your application supports multiple vocabularies, you need to test each one separately first, and then test them together.
- Test your vocabulary with a reasonable population of users. This should help you identify if there are words that are consistently misrecognized over a number of users; if so, you might need to change the word or phrase or add multiple pronunciations. You should test your vocabulary against a variety of factors, including people with accents, males and females, people who speak the language natively and those who speak it as their secondary language, and users who have enrolled and those who have not enrolled.
- Test "out-of-vocabulary" words and phrases as well as those that are in your vocabulary. For example, you might want to test things that users might say when they are interrupted and forget to turn the microphone off (such as "Good morning" and "Hello"). The goal of testing out-of-vocabulary words and phrases is to ensure that VoiceType is not inadvertently recognizing these out-of-vocabulary words and causing functions to be performed that the user did not specify. For more information on how the engine accepts or rejects utterances, refer to “Acceptance or Rejection of Utterances” on page 30.

- Remember that testing your vocabulary is an iterative process. As you make changes to your vocabulary or the pronunciations, you should go back and re-test the entire vocabulary to verify that all of the words and phrases in the vocabulary can still be recognized.
- Use word list files (WDL) for large dynamic vocabularies. This provides you with a mechanism for editing the vocabulary, as well as enabling easier input to the Dictionary Builder and the grammar test utility.