

PhatVoice User's Guide

October, 2003

This manual describes the PhatVoice text-to-speech application for the PhatNoise™ Car Audio System.

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Operating System and Version: Microsoft® Windows® 98 Second Edition or later

Software Version: PhatVoice V2.0

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Preface

This guide explains how to install and use the PhatVoice text-to-speech utility.

Intended Audience

This manual is intended for all PhatVoice users. It describes the operation of the PhatVoice utility as well as advanced options such as additional voices, custom pronunciation, and rebuilding PhatVoice from source.

It is expected that the user is already familiar with the installation and operation of the PhatNoise Car Audio System, including the PhatNoise Music Manager (PMM) application.

Important Cautions

Please remember that the PhatVoice software project is not affiliated with PhatNoise, Inc., makers of the PhatNoise Car Audio System.

Use of this product involves making changes to the contents of the PhatNoise Car Audio System. Such changes are made at the sole risk of the user and neither the authors nor PhatNoise, Inc. shall be liable for the results of such changes.

Related Materials

- PhatNoise Car Audio System User Manual
http://www.phatnoise.com/downloads/phantbox_users_manual.pdf
- PhatNoise SSA/Voice - Reference Card
http://www.phatnoise.com/downloads/SSA_Glove_Box_Guide.pdf
- PhatNoise Music Manager - Software
http://www.phatnoise.com/downloads/download_sw.php
- Microsoft Speech SDK 5.1 for Windows - Software
<http://www.microsoft.com/speech/download/sdk51/>
- AT&T Natural Voices - Software
<http://naturalvoices.att.com/buy/index.html>
- AT&T Natural Voices - Documentation
<http://naturalvoices.att.com/support/documentation.html>

Conventions

In this document, the following conventions will be used to refer to the various components:

- **PhatVoice** refers to PhatVoice, the package described in this document.
- **PhatNoise** refers to PhatNoise, Inc. who are not affiliated with this package in any way.
- **PhatBox** refers to the actual car audio player device of the PhatNoise Car Audio System.
- **DMS** refers to the Digital Media Storage cartridge which can be inserted in either the PhatBox or the cradle.
- **cradle** refers to the holder for the DMS which is attached to your PC.
- **PMM** refers to the PhatNoise Music Manager, a software component installed on your PC.
- **Natural Voices** refers to the AT&T Natural Voices software, an optional component of the PhatNoise Music Manager.
- **Microsoft Speech** refers to the Microsoft Speech software, installed on your PC when you install the PhatNoise Music Manager.
- **Microsoft Speech SDK 5.1** refers to the expanded version of the Microsoft Speech software with additional tools and utilities, available as a download from Microsoft.

1 Introduction

This chapter describes the PhatVoice package. It includes an overview of PhatVoice as well as information on additional resources.

1.1 Overview

PhatVoice is a freeware add-on to the PhatNoise system which improves on the speech generation capabilities of the PhatNoise Music Manager. It does this in three ways:

- Using hints to improve the pronunciation of words.
- Generating speech for song titles.
- Utilizing additional Natural Voices (if installed).

Each of these is discussed below.

1.1.1 Using hints to improve pronunciation

The PhatNoise Music Manager (PMM) generates speech based on the ID tags in MP3 files or from data entered by the user. A common limitation of text-to-speech engines is that they are limited by their built-in pronunciation rules. Traditionally, they do not do well with proper names, among other things. While Natural Voices represents a large improvement over prior TTS engines, it can still generate speech that ranges from “creatively mispronounced” to “what the heck did it say?”. In some cases, it is possible to edit the data in PMM to create better speech, but this is not always possible. Further, it might be a repetitive task (for example, if you wanted to change all instances of “CD 1” to “Disc 1”).

PhatVoice lets you perform these substitutions in a simple manner without needing to manually edit each song in PMM. In addition to changing the spelling of words, you can also embed specific commands to the TTS engine, such as phonetic pronunciation for a difficult word, or adding / removing emphasis on a word.

1.1.2 Generating speech for song titles

PMM does not currently generate speech for song (track) titles - it is limited to artist, album, playlist, and genre. PhatVoice adds the ability to generate speech for track titles.

A minor change to a configuration file on the PhatNoise Digital Media Storage (DMS) cartridge and copying a new announcement file to the DMS need to be performed in order to take advantage of this feature. These changes are documented in Section 2.4 of this manual.

1.1.3 Utilizing additional Natural Voices

If you have purchased and installed either the 16KHz versions of the standard Mike and Crystal Natural Voices or any of the additional Natural Voices, those voices are available to you in PhatVoice. You may either change the default voice used for all speech, or you may override the default voice for a particular item of speech. This is useful if you have a number of albums with an artist, album name, or song title in a foreign language. The US English Mike and Crystal Natural Voices tend to do poorly when pronouncing such items. If you have a foreign language Natural Voice installed, you can add a hint to have it switch when it encounters these items. The sample hints file distributed with PhatVoice contains a number of these hints.

1.2 Additional resources

A number of additional resources are available to you.

There are discussion and announcement-only mailing lists for PhatVoice. The discussion group is a user-to-user forum (though the PhatVoice developers monitor it and respond to posts as well) where users can share pronunciation hints, tips and tricks, ask questions, and so forth. The announcement list is used to inform users about updates to PhatVoice. For more information, visit:

<http://listserv.tmk.com/archives>

The PhatVoice home page is located at:

<http://www.tmk.com/PhatVoice>

You may download the latest version of PhatVoice as well as additional materials from the above page.

PhatNoise, Inc. maintains discussion forums at:

<http://www.phatnoise.com/forum/index.php>

While PhatVoice is not affiliated with PhatNoise, Inc. it grew out of an idea first posted in one of those forums, and notices of updates will be posted there as well.

2 Installing PhatVoice

This chapter provides information about the prerequisites for PhatVoice as well as detailed installation steps for both the setup-based and zipfile-based installation processes.

2.1 Installation prerequisites

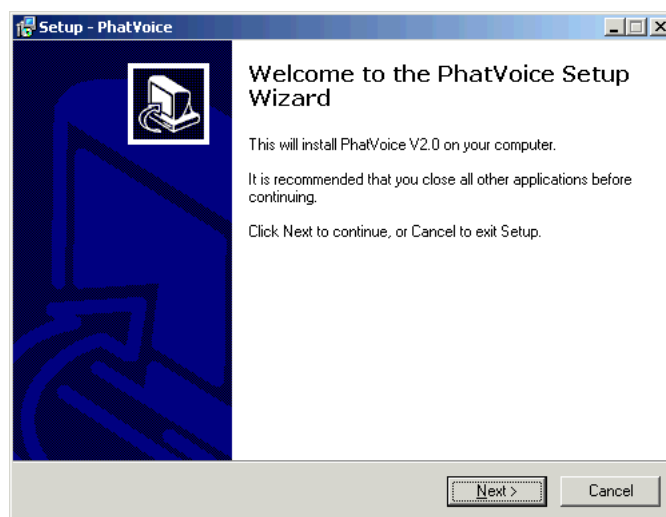
You will need have either the PhatNoise Music Manager or the Microsoft Speech 5.1 SDK installed. One of these is needed in order to provide the SAPI interface that PhatVoice uses. Consult the Related Materials section of this manual for download locations for these software packages if you need to install them.

2.2 Installing using the PhatVoice Setup Wizard

The recommended installation method is to use the PhatVoice Setup Wizard. This provides a Windows-based setup which will install and configure PhatVoice for you.

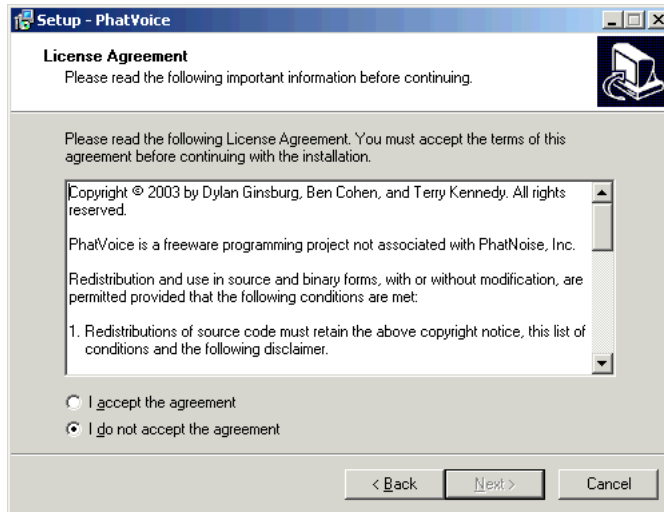
Note: Neither PhatVoice nor the Setup Wizard modify any registry keys or install any files outside of the user-specified installation directory. The only difference between the Setup Wizard and the zipfile-based installation is that the Setup Wizard automates the process and creates Start Menu and optional Desktop shortcuts for you.

To launch the Setup Wizard, simply select the *PhatVoice_setup.exe* file from the Windows *Start / Run / Browse* menu. This will launch the Setup Wizard as shown below:

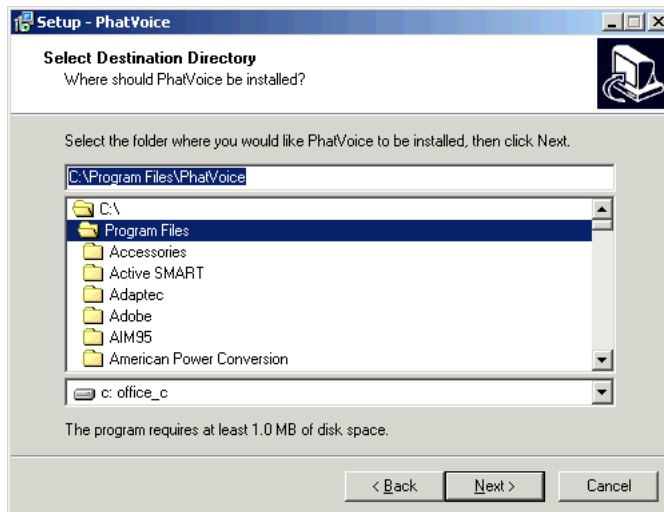


Installing PhatVoice

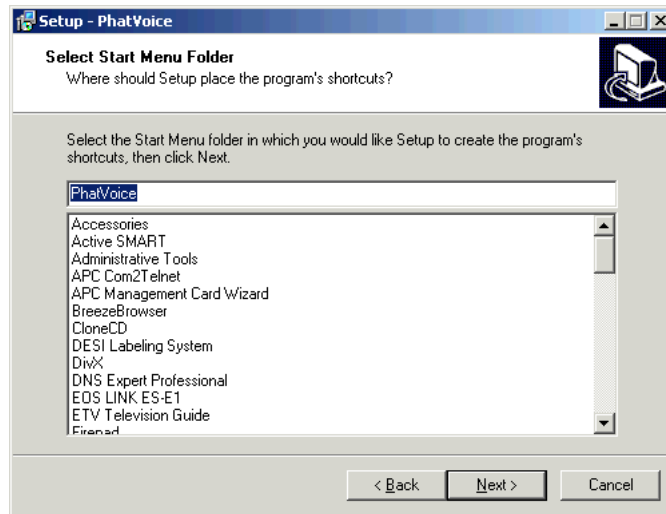
After you click the **Next** button, you will be presented with the License Agreement screen. Be sure to read the license agreement completely and make sure you understand and accept it before continuing.



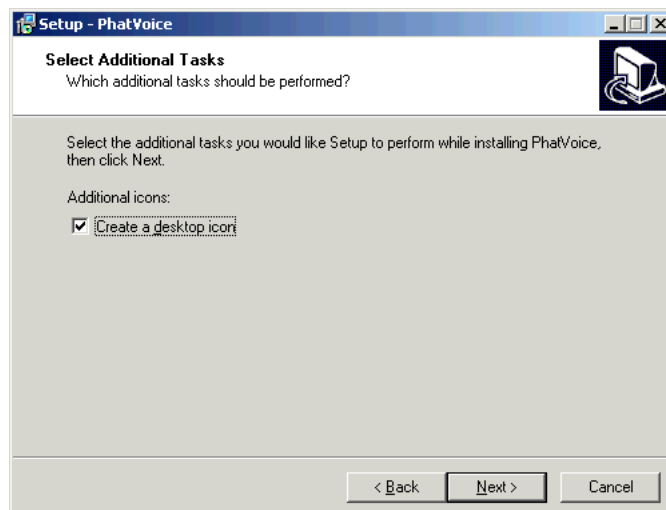
Once you click on the **Accept** button and click the **Next** button, you will see the Select Destination Directory dialog box. The default location has been pre-selected for you, but you may choose any other directory if you prefer. We *strongly* recommend that you install PhatVoice in a directory by itself rather than placing it in a directory with other programs or files.



After you select a destination directory and click **Next**, you may now select the Start Menu Folder (location) for the program. Again, the default location has been pre-selected. Likewise, we *strongly* recommend that you place PhatVoice in its own folder.

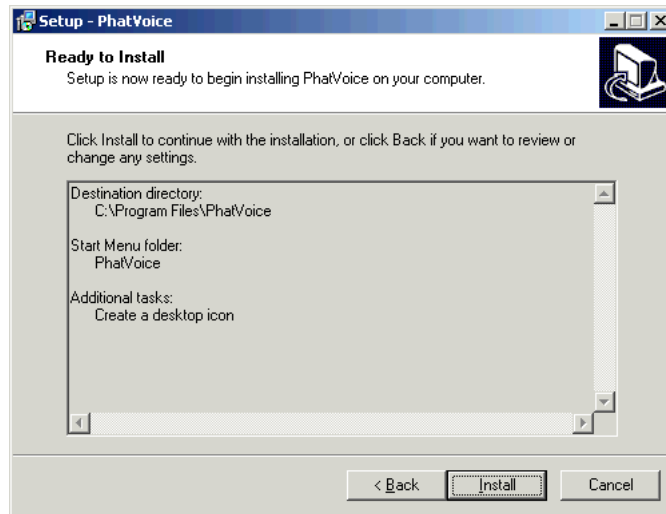


Once you have chosen a Start Menu Folder, click **Next**. Now, you have the choice of having an icon for PhatVoice placed on your Windows desktop. The default is to perform this operation, but if you don't want to clutter your desktop with another icon, feel free to de-select the checkbox here.

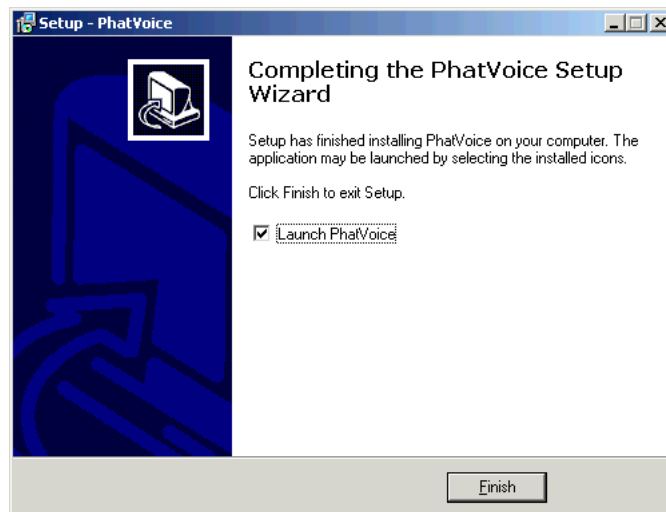


After clicking the **Next** button, you will now have a chance to review (and change, if you desire) your installation options.

Installing PhatVoice



When you click on the **Install** button, installation will proceed automatically.



At this point, PhatVoice setup has been completed. You have the option to run PhatVoice now, or to exit the Setup Wizard without running PhatVoice at this time. Click on the **Finish** button to exit the Setup Wizard.

At any time, you can start PhatVoice from the Windows Start Menu, using the folder name you gave the Setup Wizard. If you chose to install the Desktop shortcut, you may also start PhatVoice via that shortcut.

2.3 Installing from the zipfile

If you decided to download and install from the zipfile instead of using the PhatVoice Setup Wizard, simply open the *PhatVoice.zip* file using a zip utility of your choice and extract the files into a new directory. You will need to create any Start Menu items or Desktop shortcuts manually.

2.4 Necessary changes on the PhatBox DMS

You can use PhatVoice without making any changes to your DMS. In fact, you can experiment with it and work on text pronunciation hints without even having a cradle attached to your PC. However, a few changes to your DMS will let you get even more out of PhatVoice.

2.4.1 Firmware revision

We recommend that you run the latest firmware for your particular PhatBox, regardless of whether you use PhatVoice or not. You can check and / or update your firmware revision from the Device view in PMM. Select the *Hardware Options* item and then *Firmware Setup*. Consult Appendix A of the *PhatNoise Car Audio System User Manual* for more information about updating firmware.

2.4.2 phatbox.ini changes

Your PhatBox will use the new speech for Playlist, Artist, Album, and Genre without requiring any changes to the PhatBox configuration files. However, if you want your PhatBox to announce song names, you will need to edit the *phatbox.ini* file on your DMS. This file is found in the root directory of the *PHTSYS* partition. The following examples all assume that your computer mounts *PHTSYS* as drive G:; if your computer uses a different drive letter substitute it accordingly in each example.

First, make a backup copy of your existing *phatbox.ini* file in case anything goes wrong:

```
G:  
copy phatbox.ini phatbox.ini_save
```

Next, open the *phatbox.ini* file in Notepad. Search for the section for your particular car (it will be inside square brackets). In this example, we will be making the change for a Toyota PhatBox. Scroll down a bit and you will see a number of fields labeled *audioid.3...:*

Installing PhatVoice

```
[Toyota]
auto_pong=on
sync_after_announce=on
.
.
audioid.2.6=WAIT 3
audioid.2.7=END
audioid.3.0=/dos/tts/beep3.wav
audioid.3.1=CURMODE
audioid.3.2=PLAYLIST
audioid.3.3=ARTIST
audioid.3.4=ALBUM
audioid.3.5=GENRE
```

You will be changing the *audioid.3...* tags. First, decide what you want your PhatBox to say. The default is *Playlist / Artist / Album / Genre*. You can change these to add, remove, or rearrange the items that are spoken when a track is announced. Personally, I use:

```
audioid.3.0=/dos/tts/beep3.wav
audioid.3.1=TITLE
audioid.3.2=ARTIST
audioid.3.3=ALBUM
```

Here, I have added the *TITLE* keyword to speak the song title. You can use any set of keywords in your configuration. Experiment until you find a combination you like. The items will be announced in numerical order as shown in the above list. When creating your list, make sure it is in order and there are no gaps in the sequence. You need to make this change on each of your DMS cartridges if you have more than one.

Note: Some PhatBox models (such as the Toyota example above) have a *CURMODE* tag, which generates the “Now browsing...” message. You can keep that keyword as item number 1 in the list and start your announcements at item 2, or you can remove it and start your announcements at item 1.

Note: The [BMW] part of the phatbox.ini file is slightly scrambled in all of the .ini files I've seen:

```
audioid.2.5=TITLE
audioid.2.6=PLAY
audioid.3.0=/dos/tts/beep3.wav
audioid.3.1=PLAYLIST
audioid.3.2=ARTIST
audioid.3.3=ALBUM
audioid.3.4=GENRE
auto_pong=on
audioid.2.7=WAIT 5
audioid.2.8=END
```

Don't worry about the pieces starting with *auto_pong=on* being out of sequence - just arrange the *audioid.3...* tags as you normally would.

2.4.3 The title.mp3 file

As mentioned previously, the PhatNoise system does not directly support track titles. In addition to generating the track titles, PhatVoice supplies a pair of speech file, one of which says “The current track is...” and the other which says “Track”, both in the same voice as the rest of the PhatNoise announcements. One of these files needs to be copied to a file called *title.mp3* in the *TTS* directory of the *PHTSYS* partition on your DMS. Which one you use is a matter of personal preference. The following examples assume that your computer mounts *PHTSYS* as drive G:; if your computer uses a different drive letter substitute it accordingly.

For “The current track is...”:

```
copy "C:\Program Files\PhatVoice\current_track.mp3" G:\TTS\title.mp3
```

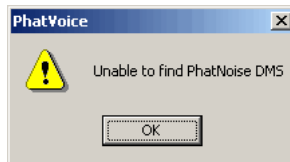
For “Track...”:

```
copy "C:\Program Files\PhatVoice\track.mp3" G:\TTS\title.mp3
```

Again, note that *PHTSYS* is the first of two drive letters on the DMS. If you copy the *title.mp3* file to the *PHTDATA* partition, it won’t be used. You need to make this change on each of your DMS cartridges if you have more than one.

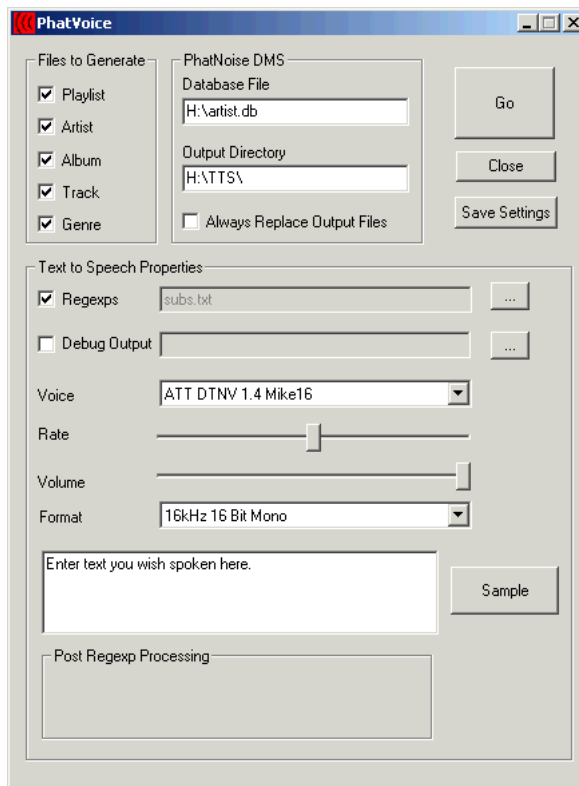
3 Running PhatVoice

You may start PhatVoice from the Windows Start Menu (normally *Start / Programs / PhatVoice / PhatVoice*). If you do not have a PhatNoise DMS on your system, you will receive the following alert:



If this occurs, simply click on the **Ok** button if you only want to test pronunciations, otherwise click on the **Ok** button and then exit PhatVoice, insert your DMS, and then restart PhatVoice.

Once PhatVoice starts, you will see the following screen:



Each of the window areas is described below.

Running PhatVoice

The major function buttons are located in the top right area of the window. They are:

- **Go** - generate speech for the selected items.
- **Close** - exit the PhatVoice program.
- **Save Settings** - save the current settings to the file phatvoice.ini. This file is automatically loaded whenever PhatVoice is started.

The “Files to Generate” area controls which items to generate speech for. The following items are available:

- **Playlist** - the playlist name.
- **Artist** - the artist name.
- **Album** - the album name.
- **Track** - the track (song title) name.
- **Genre** - the genre.

The “PhatNoise DMS” area shows the path to the DMS files if a DMS was found when PhatVoice started, otherwise it will be blank. It contains the following items:

- **Database File** - the DMS file containing all the information about the Artist, Album, Track, and Genre. (Playlist data comes from another location).
- **Output Directory** - where to place the generated speech files.
- **Always Replace Output Files** - if this box is checked, any existing speech files for the selected items in the “Files to Generate” box will be replaced. This is necessary if you want to replace the existing speech.

Note: The PhatVoice developers have different opinions regarding the best way to accomplish the goal of replacing all output files. Some feel that it is better to delete all the .wav files in the TTS directory and let PhatVoice re-generate them all without checking the “Always Replace Output Files” box, while others feel that it is better to not delete the files manually and check the “Always Replace Output Files” box.

There is a performance advantage to manually deleting the output files - this way, PhatVoice will only generate each speech item once. However, there may be cases where PhatVoice would generate a different filename or omit a speech item that PMM generates, which would then result in a missing announcement. If the “Always Replace Output Files” box is checked, PhatVoice will generate text for the selected speech items, but will generate it multiple times (for example, each time a specific artist appears on the DMS that artist’s name will be re-generated).

In essence, it is a time tradeoff - if you have the time, you should probably check “Always Replace Output Files” and let PhatVoice work for an extended period.

The center area of the screen contains items related to pronunciation hints.

- **Regexps** checkbox and file selection button - lets you enable (when checked) the processing of pronunciation hints. Use the file selection button to choose a hints file.
- **Debug Output** - controls the generation and output filename for pronunciation debugging. See Section 4.2.4 for additional information.
- **Voice** - selects which voice is used to generate the speech. All installed voices will be shown in this listbox.
- **Rate** - controls the rate (pacing) of the generated speech.
- **Volume** - controls the volume of the generated speech.
- **Format** - selects the format characteristics of the generated speech.

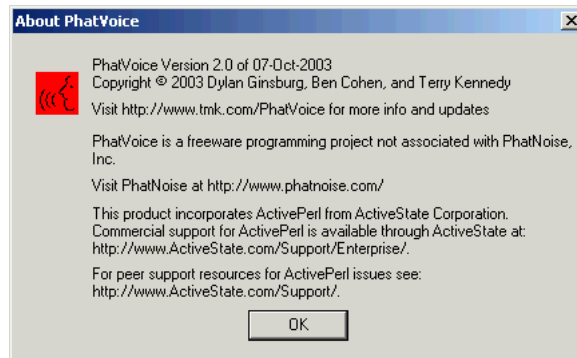
Note: The PhatBox only supports a subset of the rates listed in this box. In particular, only 8KHz, 11KHz, 22KHz, and 44.1KHz (all in 16 bit mono) are supported on all PhatBox firmware revisions.

Note: The Microsoft Speech API does not do a good job of converting the sample rate of speech generated by the Natural Voices engine. You should make sure that the speech format is set to the native mode for the Natural Voices engine you are using (8KHz 16 Bit Mono for voices that do not end in 16 and 16KHz 16 bit Mono for voices ending in 16. If you are using a 16KHz Natural Voice, you will need to convert the speech files as described in Section 3.2 before the PhatBox can use them

- **Sample** - this text entry box and associated button lets you quickly generate samples of speech in order to determine what a particular voice, rate, etc. will sound like.
- **Post Regexp Processing** - this text display box shows the actual command sent to the text-to-speech engine for the text in the sample box. This will show the effect of any substitutions from your hints file if the *Regexps* box is checked.

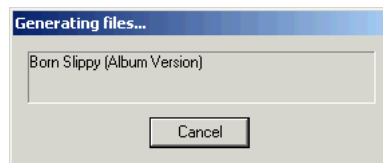
Additionally, if you click on the PhatVoice icon, you can select “About PhatVoice...” which will provide information about the version of PhatVoice in use as well as the copyright notice and additional information, as shown here:

Running PhatVoice

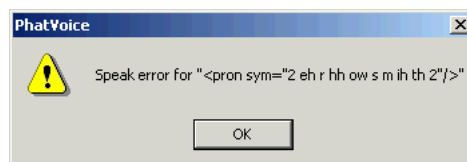


3.1 Generating speech

Once you have selected your desired options as shown above, you should click on the **Go** button to generate the speech files. You will see each of the speech items as they are generated:



If any of the pronunciation hints cause the TTS engine to report an error (for example, if you specify a non-existent phoneme), PhatVoice will report the error, showing the particular speech item which caused the error. This will help you locate the error in your hints file.



Note: The PhatNoise Music Manager sometimes re-generates speech files when used to eject the DMS. We recommend using the DMS Eject Utility (found in the *Start / Programs / PhatNoise Music Manager / DMS Eject* menu) to eject the DMS after generating speech with PhatVoice.

3.2 Post-processing the audio files

Note: The following is an advanced topic for users who have installed the 16KHz Natural Voices. Most users, including those who are using the Natural Voices supplied by PhatNoise on the PMM CD, don't need to worry about this.

As mentioned above, if you have the 16KHz Natural Voices, the PhatBox cannot directly play the generated speech. The obvious solution of generating the speech at a rate the PhatBox supports doesn't work well, as the Microsoft Speech resampling introduces obvious artifacts in the speech. The solution is to use an out-board (additional) utility to convert the speech to a rate that the PhatBox will accept, while controlling conversion artifacts.

If you will be re-sampling your PhatVoice output, we suggest you override the default output location (normally the TTS directory of your DMS *PHTDATA* partition). Instead, put the output files on a scratch directory of your PC's hard disk and then have the resampling utility put its output files on the DMS, or copy them there later manually.

We give examples using two different utilities to do this. This does not mean that these are the only utilities available, only that these are two we have tried. Feel free to experiment with other utilities.

3.2.1 Processing with Yamp

Yamp is a shareware multi-purpose audio utility from Softuarium. It is available from:

<http://www.softuarium.com/yamp.htm>

Use the *WAV / resampler* option to re-sample to *22 050 Hz, 16 bits / sample*. We recommend checking the *Two passes* checkbox.

3.2.2 Processing with SoX

SoX is a freeware utility for manipulating sound files. It is available from:

<http://sox.sourceforge.net/>

You will need a rather convoluted command line to have SoX process all of your files. As an example:

```
for %c in (*.wav) do sox "%c" -r 22050 new\\"%c" resample
```

This will cause Sox to place the output files in a subdirectory called "new". The quotes around *%c* are required because the filenames can have embedded spaces and other special characters in them, and the double backslash is needed as SoX is a Unix-derived program where the backslash is a special character and not a directory delimiter.

4 Customizing Pronunciations

You will find that once you generate speech for your DMS and listen to it, you'll find a number of cases where the text-to-speech engine mispronounces items. Using PhatVoice, you can customize the pronunciation of any speech generated for your DMS. This ranges from simple re-spelling of a word to generate a better pronunciation, all the way through a complete phonetic representation of a phrase, complete with additional hints for emphasis and pacing.

You can also rearrange text elements, such as changing "Sample Album, The" into "The Sample Album" or generating different speech such as changing "Demonstration Album - CD 1" into "Demonstration Album, Disc 1".

4.1 The pronunciation hints file

The pronunciation hints are entered into a plain text file which you can edit with an editor of your choice. A sample hints file called *subs.txt* is supplied with PhatVoice. You can either add your additional pronunciations to this file or create an entirely new file.

The syntax used for the hints file consists of *regular expressions* embedded in *Perl* substitutions. If you don't know what that means, don't panic - for most uses this is pretty simple. We only mention this here so if you are interested in advanced usage, you can locate additional information.

4.1.1 Substitutions and regular expressions

In all of these substitutions, case matters - *The* is not the same as *the*.

The basic substitution is performed with the *s* (substitute) command. If we wanted to change all instances of *Yellow* to *Green*, we would say:

```
s{Yellow}{Green}
```

in our pronunciation hints file. Note that the hint begins with the letter *s* (for "substitute"). The characters for "what we have" and "what we want" are each enclosed in braces (*{ }*).

However, there are two problems with this substitution. The first is that it will only be applied once per line, so if you had a playlist named *Yellow - Yellow*, you would end up with *Green - Yellow*. To correct this, we will make this substitution a global substitution by adding the letter *g* (for "global") to the end of the command. The second problem is that this will change all instances of *Yellow*. So if you had an item named "Yellowman" it would be changed to "Greenman". To avoid this, use the *\b* option at the end of the "what we have" string, like this:

```
s{Yellow\b}{Green}g
```

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This will force the substitution to only apply where there is a word boundary (*b* for “boundary”).

In other cases, you will have a large amount of text in the “what we have” side which you’d need to copy to the “what we want” side. Instead of re-typing the text, we can use the parenthesis grouping operators (*()*) to identify text we will then refer to in the “what we want” side as *\$1*. For example:

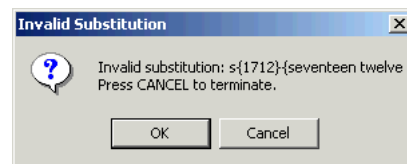
```
s{(Einsturzende Neubauten)}{<voice required="name=Klara16">$1</voice>}
```

Instead of typing “Einsturzende Neubauten” over again, we just enclose it in parenthesis on the left side and refer to it as *\$1* on the right side.

You can use more advanced regular expressions to save you the effort of repeatedly coding a particular hint for slightly different instances. For example, to change the pronunciation of occurrences of a word boundary followed by 4 digits followed by a dash, use:

```
s{\\b(\\d\\d\\d\\d)-}{<context id="date_year">$1</> - }g
```

When you load a hints file, either automatically as part of PhatVoice startup or via the **Regexps** file selection button, the file is checked for proper syntax. If there is an error in any of the hints, you will receive an error message such as this:



You may click **Ok** to ignore this error and continue loading the file, or **Cancel** to exit PhatVoice.

For additional information on debugging your hints, see Section 4.2.4.

4.1.2 The phonetic alphabet and other engine hints

Both the Microsoft Speech engine and the Natural Voices engine use the SAPI phonetic alphabet to express speech in phonemes. In cases where you can’t generate the correct pronunciation using “creative mis-spelling” of a word, you will need to create a phonetic representation of the word or phrase. Table 4–1 shows the SAPI phonetic alphabet for US English. For other languages and dialects, consult either the Microsoft Speech or Natural Voices documentation.

In addition to phonetic pronunciation, there are a large number of other keywords you can use to control the engine. In the example in the previous section, we switched from the default voice to the Klara16 voice to pronounce a German phrase and then switched back to the default voice. Again, consult the Microsoft Speech or Natural Voices documentation for a complete list of the available keywords. If you install a version of PMM which includes Natural Voices, the manual is available in Windows

at *Start / Programs / AT&T Natural Voices 1.2 / Desktop / System Developer's Guide.*

Table 4–1 The SAPI 5 US English Phonetic Alphabet

Phoneme Symbol	Example	Transcription
aa	Bob	b aa b 1
ae	bat	b ae t 1
ah	but	b ah t 1
ao	bought	b ao t 1
aw	down	d aw n 1
ax	about	ax b aw t 1
ay	bite	b ay t 1
b	bet	b eh t 1
ch	church	ch er ch 1
d	dig	d ih g 1
dh	that	dh ae t 1
eh	bet	b eh t 1
er	bird	b er d 1
ey	bait	b ey t 1
f	fog	f ao g 1
g	got	g aa t 1
h	hot	h aa t 1
ih	bit	b ih t 1
iy	beat	b iy t 1
jh	jump	jh ah mp 1
k	cat	k ae t 1
l	lot	l aa t 1
m	Mom	m aa m 1
n	nod	n aa d 1
ng	sing	s ih ng 1
ow	boat	b ow t1
oy	boy	b oy 1
p	pot	p aa t 1
r	rat	r ae t 1
s	sit	s ih t 1
sh	shut	sh ah t 1
t	top	t aa p 1
th	thick	th ih k 1
uh	book	b uh k 1
uw	boot	b uw t 1

Table 4–1 (Cont.) The SAPI 5 US English Phonetic Alphabet

Phoneme Symbol	Example	Transcription
v	<u>v</u> at	v ae t 1
w	<u>w</u> on	w ah n 1
y	<u>y</u> ou	y uw 1
z	<u>z</u> oo	z uw 1
zh	mea <u>s</u> ure	m eh 1 zh er
1	Primary stress	
2	Secondary stress	
-	Syllable boundary	
&	word boundary	
!	Sentence terminator	
,	Sentence terminator	
.	Sentence terminator	
?	Sentence terminator	
—	Silence	

4.1.3 Some useful things to know about Natural Voices

On the Natural Voices bulletin boards, various people have discussed the theory behind the way Natural Voices generates speech. The engine operates at the “half-phoneme” level. Each phoneme is split into two pieces by the engine, and adjacent phonemes are evaluated to see which half-phonemes would generate the best speech, based on the engine’s rules. This normally works well, but in some cases it produces incorrect pronunciations which can be nearly impossible to correct. Consider the Mike16 voice trying to pronounce the phrase “moonshine map”. The word “moonshine” alone is pronounced correctly, but when you add the word “map” to the sentence, you get “myoonshine map”. Normally you would just convert this into its phonetic equivalent of “m uw n 1 sh ay n 2 m ae p 1” and have it work, but the Mike16 Natural Voice will evaluate these phonemes, apply its rules, and continue to say “myoonshine map”.

As one of the developers said in the Natural Voices discussion forum, “You can suggest what you want from the engine, but [there is] no guarantee you will get it. There are ways to control it, but it’s not always possible to get exactly what you want.”

Additionally, not all of the US English Natural voices will generate the same pronunciation from a given hint. The Crystal16 voice has no problem with “moonshine map”. This has the effect of making some pronunciation hints voice-specific.

4.1.4 **Obtaining additional Natural Voices**

In addition to the Crystal and Mike voices that ship with the Natural Voices engine, additional voices are available. As of the publication of this manual, the following voices were available:

- Julia - American English female voice
- Lauren - American English female voice
- Claire - American English female voice
- Mel - American English male voice
- Ray - American English male voice
- Rich - American English male voice
- Audrey - UK English female voice
- Anjali - UK English with Indian accent female voice
- Charles - UK English male voice
- Rosa - Latin American Spanish female voice
- Alberto - Latin American Spanish male voice
- Juliette - French female voice
- Alain - French male voice
- Klara - German female voice
- Reiner - German male voice

Note: The non-English voices cannot be used to produce English speech with a foreign accent without a great deal of additional pronunciation hinting. However, they are fine for pronouncing words in their native language. Also, the UK English voices use different phonetic symbols for their speech hints.

The Natural Voices engine and additional voices are available from a number of vendors. During the development of the PhatVoice software, we purchased voices from NextUp Technologies, LLC. Their order page is located at:

<https://www.regsoft.net/regsoft/vieworderpage.php3?productid=56116>

Note: In order to use the additional Natural Voices, you must be running Version 1.4 or later of the Natural Voices. If you purchase the Version 1.4 engine, you should first deinstall the 1.2 engine using the Windows *Start / Settings / Control Panel / Add/Remove Programs* menu.

4.2 Testing your pronunciations

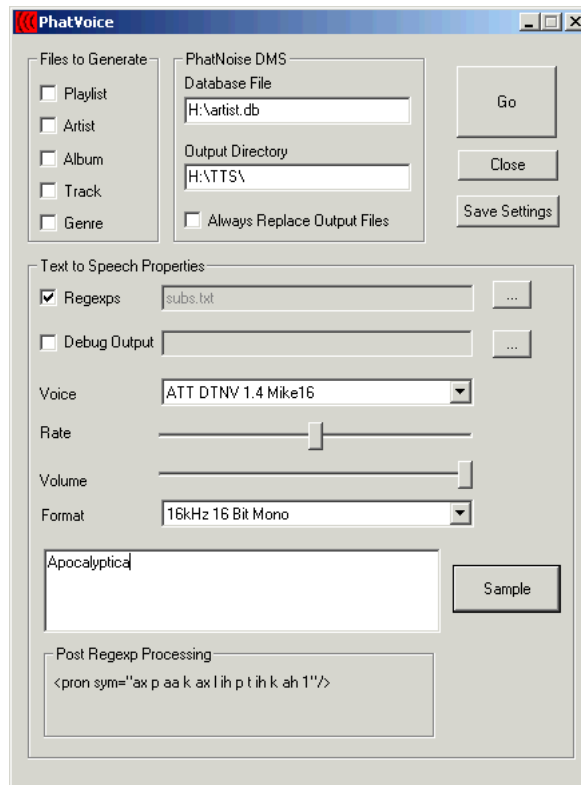
Depending on which additional software packages you have installed on your computer, you will be able to test your pronunciations with one or more utilities. If you have only installed the PhatNoise Music Manager and PhatVoice, you will need to test using PhatVoice. If you have installed the Microsoft Speech SDK 5.1, you may also use the *TTSApp.exe* program included in that SDK. If you purchased and installed Natural Voices version 1.3 or newer, you may use the *WinDictEdit.exe* program. In each of the examples below, we will show the process used to refine the pronunciation of the word *Apocalyptica*.

Note: As noted in the previous chapter, the Microsoft Speech API does not do a good job of converting the sample rate of speech generated by the Natural Voices engine. If you are using either PhatVoice or the Microsoft Speech TTSApp to test your hints, you should make sure that the speech format in the application is set to the native mode for the Natural Voices engine you are using (8KHz 16 Bit Mono for voices that do not end in 16 and 16KHz 16 bit Mono for voices ending in 16).

If you have included a phonetic pronunciation or other SAPI markup tags in your text, you may receive the message “Speak error”. This means that an invalid tag or phoneme was detected in your text. It is not always obvious what the incorrect tag is, and you may have to resort to shortening your text to isolate the offending syntax.

4.2.1 Testing hints using PhatVoice

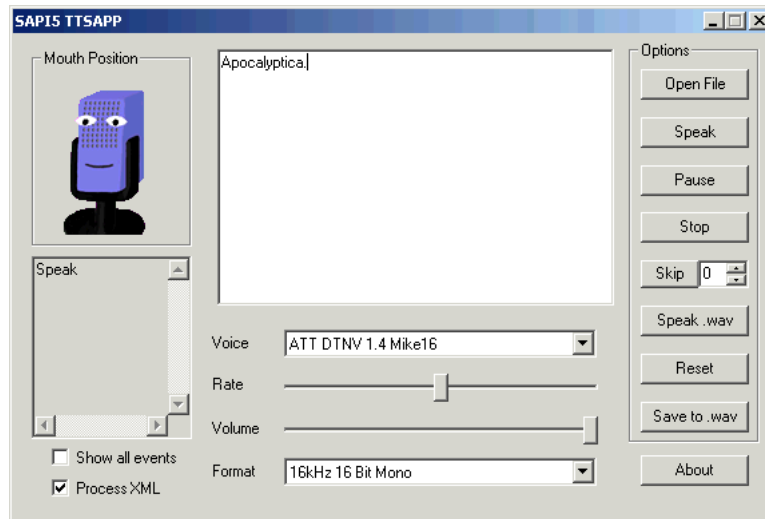
To test hints using PhatVoice, start the PhatVoice program (normally via *Start / Programs / PhatVoice / PhatVoice*) and enter the text you want spoken in the *Text to Speech* box, then click the *Sample* button to generate the speech. If the *Regexps* box is checked, the sample text will be processed through the currently-loaded hints file, displayed in the *Post Regexp Processing* box, and spoken. To refine your hint, enter new text in the *Text to Speech* box and repeat. Once you have the speech sounding the way you want it, you may enter it in your hints file using a text editor as described in the previous chapter.



4.2.2 Testing hints using the Microsoft Speech engine

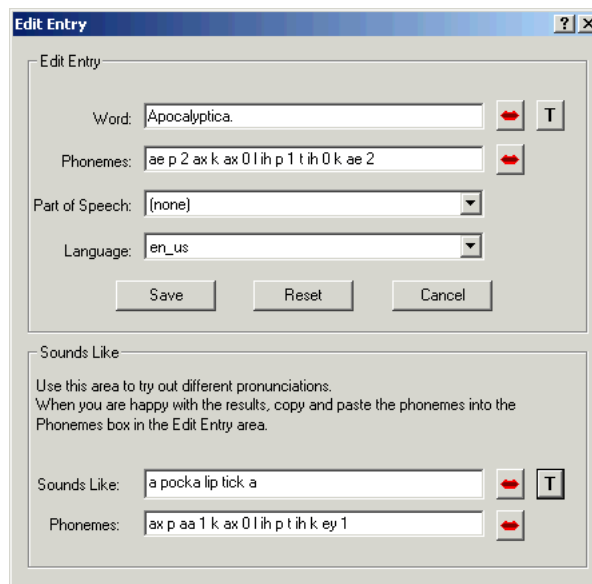
The Microsoft Speech TTSapp program operates in a manner similar to the PhatVoice program, except that it does not process your input through your hints file. Start this program via *Start / Programs / Microsoft Speech SDK 5.1 / Tools / TTSApp*. You need to have the *Process XML* box checked if you plan on including phonetic pronunciation or other SAPI hints in your text. Once you have perfected the speech, you may enter it in your hints file using a text editor as described in the previous chapter.

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4.2.3 Testing hints using the AT&T Natural Voices engine

Natural Voices 1.3 and later provides a Dictionary Editor utility to enter pronunciations into a custom dictionary. While neither the PhatNoise Music Manager nor PhatVoice use custom dictionaries, this utility has a very nice feature which will show you the phonetic representation of words you type in, and also has a *Sounds Like* box to let you explore the phonetic spelling of similar words. Consult the Natural Voices documentation for additional information on using this program. Again, once you have perfected the speech, you may enter it in your hints file using a text editor as described in the previous chapter.



Note: As of this writing, the PhatVoice Music Manager ships with Version 1.2.1 of Natural Voices, which does not include the Dictionary Editor utility. You would need to purchase and install a newer version of Natural Voices as described above in order to obtain this utility.

Note: The Dictionary Editor generates phonetic data based on the DARPA phonetic alphabet, which is similar, but *not* identical to the SAPI phonetic alphabet used by the Microsoft Speech and PhatVoice software. When copying phonetic pronunciations from the Dictionary Editor, you will need to remove all instances of the digit zero (“0”) and convert all instances of “hh” to “h”.

4.2.4 Generating debugging output to to verify pronunciations

Note: This reference to debugging output refers to debugging your pronunciation hints, not debugging the PhatVoice program itself.

One problem with using regular-expression-based substitutions is that your substitutions may act on text where you weren’t expecting it to. For example, if you wanted to change all instances of “Vol” to “Volume”, you might try a substitution of the form:

```
s{Vol}{Volume}
```

However, if you had a disc with info that said “Volume” already, you would end up with “Volumeume” instead. In order to assist you in locating these unintended consequences without having to listen to all of the generated speech, debugging output is available.

To enable this output, ensure that the *Debug Output* box is checked and that the *Always Replace Output Files* box is not checked. You will probably want to have all of the *Playlist*, *Artist*, *Album*, *Track*, and *Genre* boxes checked.

Before loading your new substitutions file, enter a filename such as *old.txt* in the *Debug Output* filename chooser box and click the large *Go* button. This will create a debug output file with the current substitutions (if any).

Now, load your new substitutions file using the *Regexps* filename chooser box and change your *Debug Output* filename to something like *new.txt* and then click the *Go* button.

You now have two debug files named *old.txt* and *new.txt* which you can compare to locate any differences. You can do this under Windows with the DOS *fc* command. You can access the DOS environment in Windows by accessing the *Start / Run* menu and typing *command* in the selection box. Windows 2000 and newer users may also use *cmd* instead of *command*, which has a number of additional features. Here is a sample session:

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```
C:\Temp> cd "C:\Program Files\PhatVoice"
C:\Program Files\PhatVoice>fc old.txt new.txt
Comparing files old.txt and NEW.TXT
***** old.txt
Various Artists
Best of Trance 2000 - Volumeume 1
Unknown Genre
***** NEW.TXT
Various Artists
Best of Trance 2000 - Volume 1
Unknown Genre
*****

***** old.txt
Various Artists
Best of Trance 2000 - Volumeume 1
Unknown Genre
***** NEW.TXT
Various Artists
Best of Trance 2000 - Volume 1
Unknown Genre
*****

.
.
.
C:\Program Files\PhatVoice>
```

Note: For advanced users, if you have access to a Unix system or have Unix-like tools installed on your PC, you can perform some steps to reduce the bulk of this output while preserving the ability to easily find the differences:

```
(0:1) host:~terry/test> sort old.txt | uniq > old.sort
(0:2) host:~terry/test> sort new.txt | uniq > new.sort
(0:3) host:~terry/test> diff old.sort new.sort
89,90c89,90
< <pron sym="f ah ng k 1 k ah ng f y uw 1 zh ax n"/> - Ninja Cuts Volumeume 3 , disc 1
< <pron sym="f ah ng k 1 k ah ng f y uw 1 zh ax n"/> - Ninja Cuts Volumeume 3 , disc 2
---
> <pron sym="f ah ng k 1 k ah ng f y uw 1 zh ax n"/> - Ninja Cuts Volume 3 , disc 1
> <pron sym="f ah ng k 1 k ah ng f y uw 1 zh ax n"/> - Ninja Cuts Volume 3 , disc 2
109c109
< <pron sym="l ay v 1"/> at the Knitting Factory Volumeume 1
---
> <pron sym="l ay v 1"/> at the Knitting Factory Volume 1
428c428
< Best of Trance 2000 - Volumeume 1
---
> Best of Trance 2000 - Volume 1
2158c2158
< New Wave Hits of the 80's - Volumeume 9
---
> New Wave Hits of the 80's - Volume 9
2237c2237
< Ohm Lounge Volumeume 5
---
> Ohm Lounge Volume 5
3319,3320c3319,3320
< Trans Volumeume 2 - A State of Altered Consciousness , disc 1
< Trans Volumeume 2 - A State of Altered Consciousness , disc 2
---
> Trans Volume 2 - A State of Altered Consciousness , disc 1
> Trans Volume 2 - A State of Altered Consciousness , disc 2
3576c3576
< Yevgeniy Osin - Tanya + Volumeodya
---
> Yevgeniy Osin - Tanya + Volodya
(0:3) host:~terry/test>
```

After you have checked for unwanted substitutions, you can either edit your pronunciation hints file (if you found any problems) or proceed to generate speech from your hints file as shown in the previous chapter.

Note: Debug output is an alternative to generating the actual speech files. If you have checked the *Debug Output* box, speech files will not be generated. Once you have verified the debug output, re-run the speech generation with *Debug Output* un-checked to generate the actual speech files. Be sure to check the *Always Replace Output Files* box to replace existing speech with the new files.

5 Uninstalling PhatVoice

While we hope that PhatVoice has been useful to you, we can understand that you might need to uninstall it for some reason. This chapter documents the removal process.

5.1 Uninstalling using the Uninstall PhatVoice Start Menu item

If you installed PhatVoice using the Setup Wizard, your Start Menu will have an item in the Windows *Start / Programs / PhatVoice / Uninstall PhatVoice* which will perform an automated uninstall of PhatVoice. Note that if you have created any additional files in the installation directory (normally *C:\Program Files\PhatVoice*), those additional files (and the PhatVoice directory itself) will not be removed during the uninstall. If you don't want to keep those files, you may delete them and remove the directory yourself.

5.2 Manually uninstalling PhatVoice

If you manually installed PhatVoice from the zipfile, you can delete the program and data files, along with the installation directory as well as removing any Start Menu items and Desktop shortcuts.

6 Changes from previous versions, corrected problems, and known problems

This chapter lists changes made from previous versions, as well as providing lists of corrected problems and known problems.

6.1 Changes from previous versions

The main changes from PhatVoice V1.0 are:

- Support for pronunciation hints.
- Support for speech generation of playlist names.
- Various bugfixes.

Refer to the rest of this manual for more details on these changes.

6.2 Corrected problems

The following problems have been corrected for the release of PhatVoice V2.0.

```
Defect/Enhancement ID: D/E 0003
Affected Version(s): 1.0 through 2.0-beta
Fixed-in Version: 2.0-beta2
Status: resolved
```

```
Summary: Incorrect output file names generated for items containing "!".
Description: If a pronunciation item contains an exclamation point ("!"),
the generated filename is incorrect. It is missing the "!" character. De-
pending on whether or not a file of the same name already exists on the
DMS, users will either hear silence or the previous file's contents.
```

```
Defect/Enhancement ID: D/E 0004
Affected Version(s): 2.0-alpha, 2.0-beta
Fixed-in Version: 2.0-beta2
Status: resolved
```

```
Summary: "|" character in MP3 tag generates COM error.
Description: If a MP3 tag (artist, title, track, etc.) contains a vertical
bar ("|"), when that track is processed by PhatVoice, the user will receive
the error "COM Error -2147287038 %1 could not be found."
```

```
Defect/Enhancement ID: D/E 0006
Affected Version(s): 1.0 through 2.0-alpha
Fixed-in Version: 2.0-beta and subsequent
Status: resolved
```

```
Summary: Enter key doesn't work in "Sample" text box.
Description: PhatVoice should speak the "Sample" text if the Enter key is
pressed while focus is in the Sample text box.
```

```
Defect/Enhancement ID: D/E 0007
Affected Version(s): 1.0 through 2.0-alpha
Fixed-in Version: 2.0-beta and subsequent
Status: resolved
```

```
Summary: Enter and Escape keys causes undesired PhatVoice exit.
Description: If the user presses the Enter or Escape key, PhatVoice will exit.
This is surprising to users and these keypresses should be ignored except for
Enter within the Sample text box.
```

Changes from previous versions, corrected problems, and known problems

Defect/Enhancement ID: D/E 0008
Affected Version(s): 1.0 through 2.0-alpha
Fixed-in Version: 2.0-beta and subsequent
Status: resolved
Summary: PhatVoice lacks the Windows "minimize window" widget.
Description: The PhatVoice application can't be minimized. The only item on the top right of the PhatVoice window is the close ("X") widget.

Defect/Enhancement ID: D/E 0009
Affected Version(s): 1.0 through 2.0-alpha
Fixed-in Version: 2.0-beta and subsequent
Status: resolved
Summary: PhatVoice lacks the ability to save user preferences.
Description: There is no option to save the user's preferences. There should be a "Save Settings" button.

Defect/Enhancement ID: D/E 0010
Affected Version(s): All
Fixed-in Version: 2.0
Status: resolved
Summary: Sample text box doesn't support mouse-based cut/copy/paste operations.
Description: The "Sample text" input box doesn't support right-click mouse cut, copy, and paste operations. As a workaround, use the keyboard accelerator keys Control-I for cut, Control-C for copy, and Control-V for paste.

Defect/Enhancement ID: D/E 0011
Affected Version(s): 1.0 through 2.0-alpha
Fixed-in Version: 2.0-beta and subsequent
Status: resolved
Summary: PhatVoice doesn't generate speech for playlists.
Description: The "Playlist" checkbox is grayed out. This isn't a problem for V1.0 as it doesn't do pronunciation hints, but it is vital for V2.0 as the major purpose of the new version is to generate hinted pronunciations.

Defect/Enhancement ID: D/E 0012
Affected Version(s): 1.0
Fixed-in Version: 2.0-alpha and subsequent
Status: resolved
Summary: PhatVoice lacks support for pronunciation hints.
Description: The ATN Natural Voices product does an amazing job with most text, but it needs assistance with some pronunciations. PhatVoice should support a regular-expression-based substitution engine which also allows the MS SAPI 5 tags for phonetic hints.

Defect/Enhancement ID: D/E 0013
Affected Version(s): 1.0 and subsequent
Fixed-in Version: 2.0-beta
Status: resolved
Summary: PhatVoice needs more info in its "About PhatVoice" dialog box.
Description: PhatVoice should have more complete version and contact info in its "About" box.

Defect/Enhancement ID: D/E 0015
Affected Version(s): 2.0-alpha and subsequent
Fixed-in Version: 2.0
Status: resolved
Summary: "Speak error" alert box should say what text was being spoken.
Description: When the post-regular-expression-processing speech is being generated, it is possible for the Natural Voices engine to report a failure to generated speech for a number of reasons, including the voice not being installed, incorrect phoneme string for the selected voice, and so forth. It would help if PhatVoice would report what was being spoken in order to help the user track down the incorrect SAPI syntax.

6.3 Known problems

The following problems are still present in the PhatVoice 2.0 release. They may be corrected in a subsequent release.

Defect/Enhancement ID: D/E 0001
Affected Version(s): 2.0-alpha and subsequent
Fixed-in Version:
Status: open
Summary: Some syntax errors are ignored.
Description: Some syntax errors are not detected when the regexp file is loaded by PhatVoice. In particular, errors of the form {}() are not flagged as errors. User feedback of any other cases would be appreciated.

Defect/Enhancement ID: D/E 0002
Affected Version(s): All
Fixed-in Version:
Status: open
Summary: Generated speech sounds "scratchy" or is missing.
Description: Choosing an incorrect text-to-speech bitrate or width can generate substandard speech or speech that does not play or makes screeching noises on the PhatBox. There are actually two separate issues here:
1) The MS Speech API introduces resampling errors at bitrates other than the native Natural Voices rates (16KHz for voices ending in "16", otherwise 8KHz).
2) The PhatBox can only play 16-bit files at 8KHz, 11KHz, 22KHz, and 44KHz (newer versions can also play 8-bit files).

So, if you have an 8KHz Natural Voice engine, select "8KHz 16 Bit Mono". If you have a 16KHz engine, things are more complicated. Your best bet is to select "16KHz 16 Bit Mono" and use an out-board utility to re-encode to 22KHz 16 bit mono. If you don't have such a utility or it is too much trouble, you can select "44KHz 16 Bit Mono" with some slight loss of speech quality and a substantial disk space penalty.

Pending input from PhatNoise regarding plans to add 16KHz support to the PhatBox, we may either add resampling to PhatVoice or provide an outboard conversion utility.

Defect/Enhancement ID: D/E 0005
Affected Version(s): 2.0-alpha and subsequent
Fixed-in Version:
Status: open
Summary: Uninstalled Natural Voices generate "Speak Error" messages.
Description: While the PhatVoice "Voice" selection box will only allow the user to select from the installed Natural Voices, it is possible to request a different voice in a substitution regexp. For example:

```
<voice required="name=Klaral6">$1</voice>
```

If the selected voice is not installed on the system where PhatVoice is running, any attempt to use that voice will generate a "Speak Error" message.

Defect/Enhancement ID: D/E 0014
Affected Version(s): 2.0-alpha and subsequent
Fixed-in Version:
Status: open
Summary: PhatVoice should be statically linked with the Perl library.
Description: PhatVoice 2.0-alpha and subsequent requires a Perl Library in order to perform regular expression substitutions. Having an outboard Perl DLL means that a) users have one more file to worry about and b) might have an incompatible DLL on their system.

Changes from previous versions, corrected problems, and known problems

Defect/Enhancement ID: D/E 0016

Affected Version(s): 2.0-alpha and subsequent

Fixed-in Version:

Status: open

Summary: Need additional option for only generating hinted speech.

Description: Instead of the current checkbox for "Always Replace Output Files", have 3 radio buttons: "Always Replace Output Files", "Only Replace Hinted Files", and "Never Replace Output Files". This will let users rapidly re-generate only the hinted speech if desired.

7

Rebuilding PhatVoice from source

In the unlikely event that you want to rebuild PhatVoice from the source code, we have provided some information for you in this section. Normally the way to make changes or add features is to request them from the PhatVoice developers, but given that the way *we* got involved was by making changes to the original author's source, we feel we should provide you with the same opportunity. In any case, we would like to remind you of your obligations under the PhatVoice license agreement, and we request that if you make any changes, that you send them to us as well so we can consider incorporate them in future versions of PhatVoice.

7.1 Other needed software and prerequisites

As a minimum, you will need:

- Microsoft Visual C++ 6.0 Standard Edition

<http://msdn.microsoft.com/visualc/>

- ActiveState ActivePerl 5.6.1 build 635

<http://www.activestate.com/Products/Download/Download.plex?id=ActivePerl>

There are newer versions of both Visual C++ and ActivePerl which may work for rebuilding PhatVoice, but these are the versions it was developed under and we suggest you use them.

7.2 Steps needed for rebuilding

Simply unzip the *PhatVoice_source.zip* file into an empty directory (be sure to select the "Use folder names" option or similar when extracting the source files). Then load the PhatVoice workspace using Visual C++'s *File / Open Workspace* menu item. Use the *Build / Set Active Configuration* menu item to select *PhatVoice - Win32 Release*, and then select *Build / Build PhatVoice.exe* to create the new executable. It will be located in the *Release* subdirectory of your project directory.