

# VIP USER'S GUIDE

VIP V4.0

May 2007

VOICE IMPROVEMENT PROCESSOR (VIP) USER'S GUIDE  
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# VOICE IMPROVEMENT PROCESSOR (VIP) USER'S GUIDE

This document serves as the user guide for NOAA Weather Radio's Voice Improvement Processor. VIP is a KDE Linux based application designed by the Meteorological Development Laboratory's Decision Assistance Branch, in the Office of Science and Technology.

The VIP User's Guide breaks into eight basic parts which provide information to help understand use of the VIP application. The following sections are detailed in this User's Guide.

- Introduction
- Getting Started
- VIP Window
- System Settings
- Dictionary Manager
- Substitution Dictionary (pre-processor)
- Logging Files
- Audio Player Operating VIP (start/stop)

## INTRODUCTION

### Text-To-Speech (TTS) Information

The commercial TTS speech engine product used in VIP, called Speechify, is built and managed by Speechworks Inc (SWI). The TTS version deployed with VIPv3.2 is Speechify v2.1.5. Through purchase agreements with Speechworks (<http://www.speechworks.com>), improvements to Speechify have been received by NWS and have been incorporated as part of the voice improvement process. Speechify is a client/server based, text-to-speech, software package integrated into the VIP application. In the VIP model TTS servers are contained within the VIP system itself. The client resides within the VIP server through shared library functions and API calls. This VIP version handles multiple voice types utilized as separate servers, one for the new Male English, another for Female English and finally one for the new Female Spanish.

### VIP information

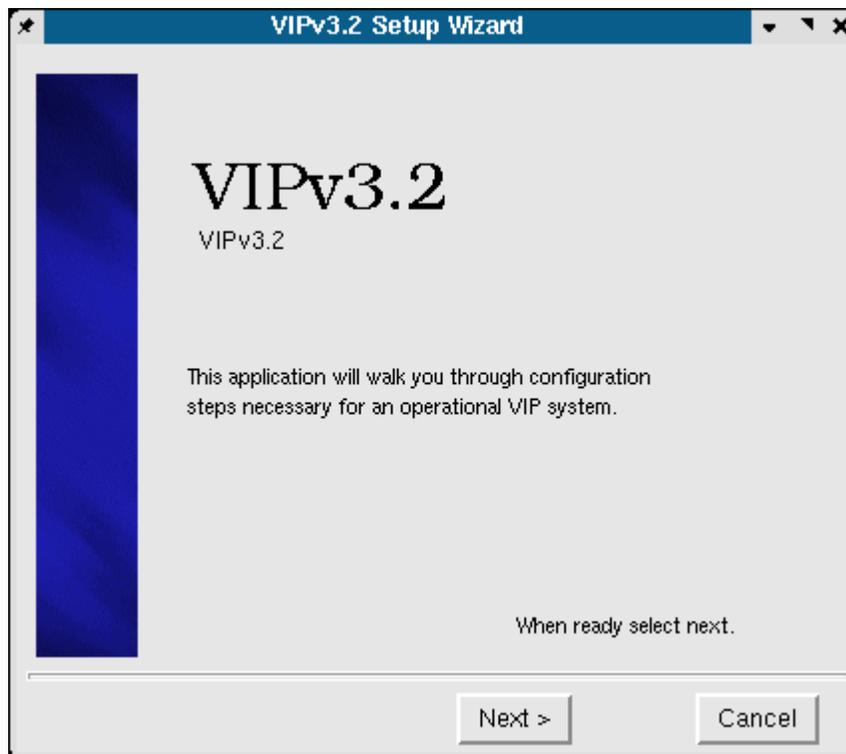
In addition to adding a new Spanish voice, VIP incorporates Speechify 2.1.5 with its voice algorithm improvements and Tom a new male voice. In most cases the new VIP will outperform the VIP 2.0 with out-of-the-box pronunciations. However, Speechify is a computer generated voice and some words may still need a better definition to obtain an optimal pronunciation.

The VIP application has two external methods to manage word pronunciation. The preprocessor (often referred to as the substitution dictionary) and the dictionary manager (often referred to as VIP User's Guide 1 April 8, 2003 the local dictionary). The VIP has eliminated the sharing of one preprocessor dictionary and one dictionary manager by multiple voices. Now each voice has its own preprocessor

and dictionary manager used uniquely for that voice's pronunciations. Other VIP features exist to help fine tune word pronunciations. These methods include a TTS Clipboard and word playback functions found in the dictionary manager (local) and preprocessor (substitution) dictionary screens, speech rate controls and volume control. However, with the improved technology incorporated in Speechify "word tuning" is anticipated to be less than in older TTS technologies.

## GETTING STARTED

The VIP system has an installation *Wizard* that will help you initially configure the VIP software. Once configured changes can be made to the configuration by editing settings through the *Systems Settings* window or re-running the *Wizard* also available through the *Systems Settings* window.



Click *next* to precede to next step, *cancel* to cancel the wizard

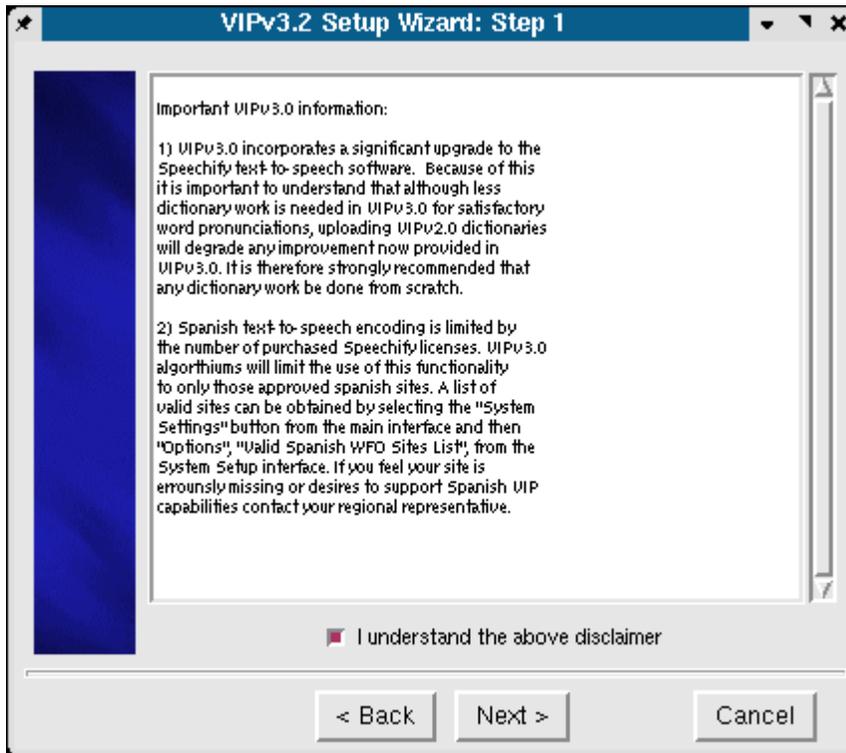
### Step 1:

Parts of the VIP system are licensed software. You must read and accept the licensing agreement. Information is providing on how to obtain this inexpensive license. Please read the agreement and acknowledge it to proceed. The text is included below for easy review.

#### *Important VIPv3.2 information:*

*1) VIPv3.2 incorporates a significant upgrade to the speechify text-to-speech software. It is important to understand that although less dictionary work is needed in VIPv3.2 for satisfactory word pronunciations, uploading VIPv2.0 dictionaries will degrade any improvement now provided in VIPv3.2. It is therefore strongly recommended that any dictionary work be done from scratch.*

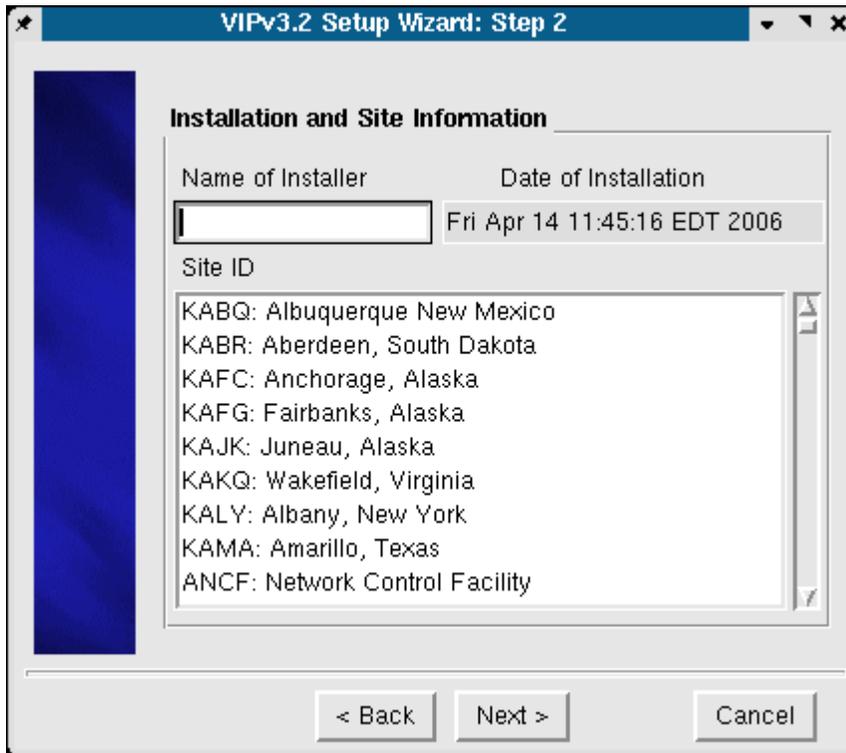
2) Spanish text-to-speech encoding is limited by the number of purchased Speechify licenses. VIPv3.2 algorithms will limit the use of this functionality to only those approved Spanish sites. A list of valid sites can be obtained by selecting the "System Settings" button from the main interface and then "Options", "Valid Spanish WFO Sites List", from the System Setup interface. If you feel your site is erroneously missing or desires to support Spanish VIP capabilities contact your regional representative.



Click *next* to proceed to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen.

### Step 2:

Enter your name and select your site from the scrollable list. Click *next* to proceed to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen. This screen will only appear on the initial use of the Wizard.



Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen.

### Step 3:

#### Enter your CRS NETWORK INFORMATION

Converted audio is sent back to CRS via FTP. Because of this it is necessary to provide IP addressing for both 0MP & 5MP. Enter the IP address for 0MP and 5MP. If the numeric 0MP and/or 5MP IP addressing is not known consult your AWIPS or CRS administrator for this information. It is recommended that numeric IP addresses be used when defining these fields, rather than 0MP or 5MP.

**CRS Network Information**

0MP Numeric IP Address	5MP Numeric IP Address
165.92.21.111	165.92.21.112

**Gateway setting for Firewall FTPs**

Gateway IP address

gw-NMTW 165.92.20.118

The VIP audio FTP function uses the /etc/hosts gw-CCC definition to FTP either .wav or .mp3 files to a defined remote computer.

< Back    Next >    Cancel

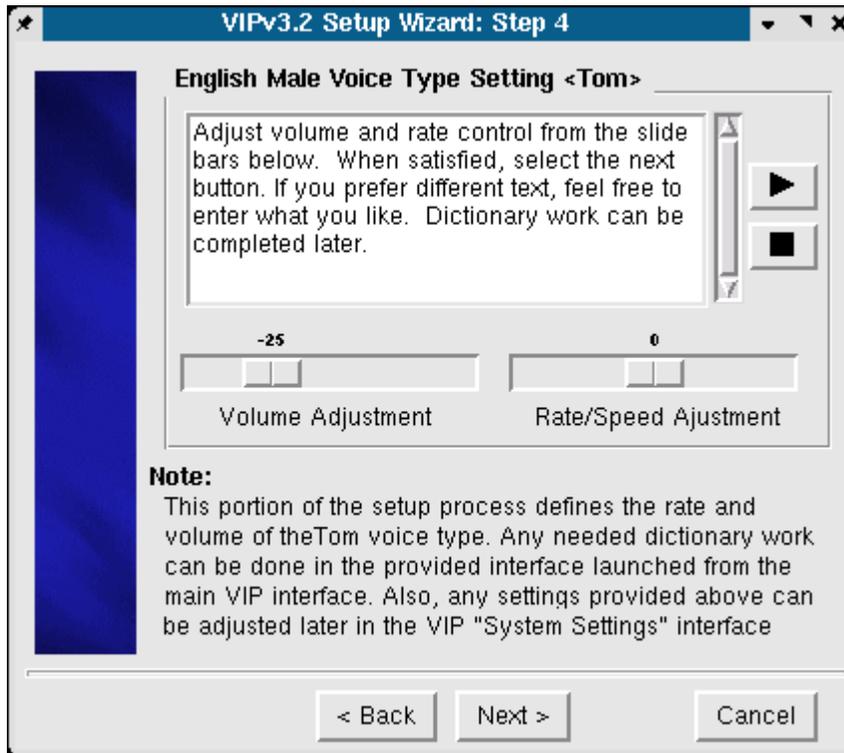
#### **Enter your GATEWAY SETTING FOR FIREWALL FTPS information:**

If you intend to use the VIP audio FTP function you must enter here the Gateway IP address. Remote FTP can be used to populate web servers by providing audio for every product sent through the VIP. File naming is provided from the AWIPS key name found in the CRS header of each formatted product. Audio uploads are 16khz, 16bit multimedia wav files or .mp3 files which differ from the 10khz audio sent to CRS.

Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen.

### Step 4:

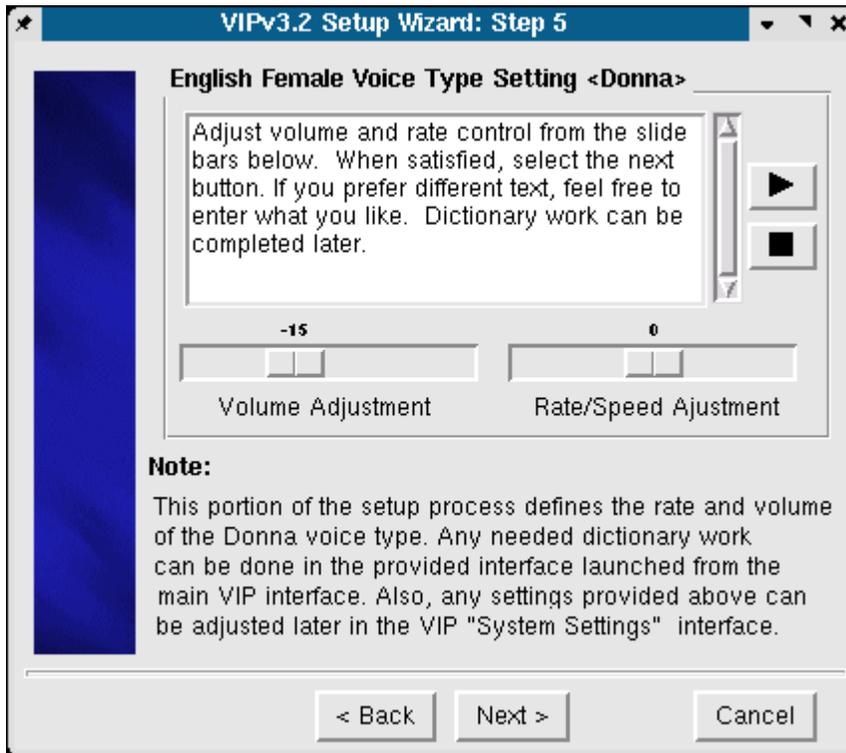
This step allows you to define the rate and volume of the Tom voice. Any settings set here can be adjusted later in the VIP Systems Settings window. Adjustments increase or decrease the settings from a default zero setting. The  button allows you to play the text in the window. The  button will stop playing. You may edit the text as desired.



Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen.

#### Step 5:

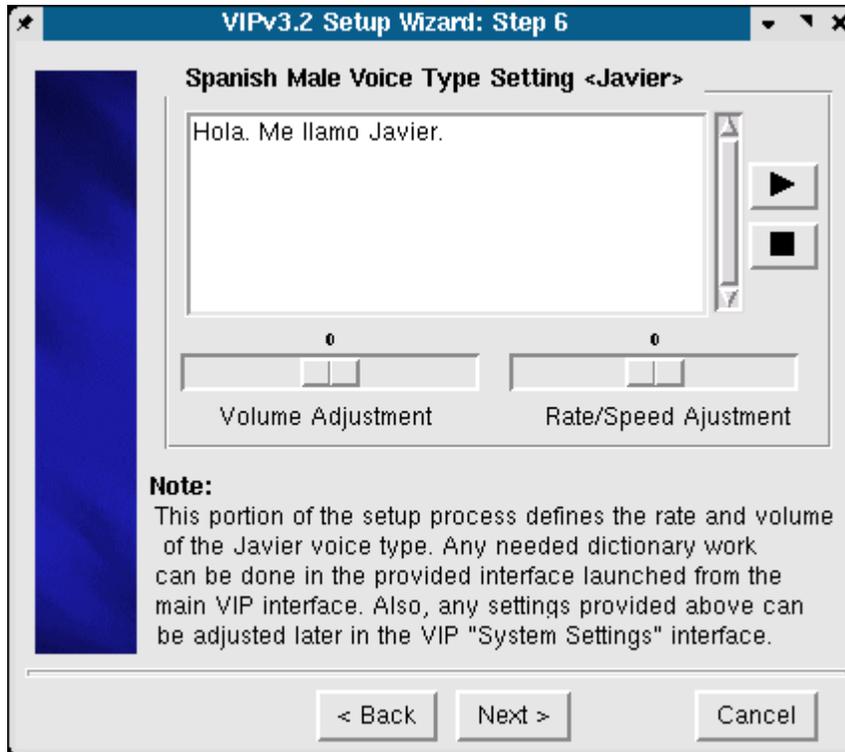
This step allows you to define the rate and volume of the Donna voice. Any settings set here can be adjusted later in the VIP Systems Settings window. Adjustments increase or decrease the settings from a default zero setting. The  button allows you to play the text in the window. The  button will stop playing. You may edit the text as desired.



Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen

### Step 6:

This step allows you to define the rate and volume of the Spanish female voice, Javier voice. Any settings set here can be adjusted later in the VIP Systems Settings window. Adjustments increase or decrease the settings from a default zero setting. The  button allows you to play the text in the window. The  button will stop playing. You may edit the text as desired.



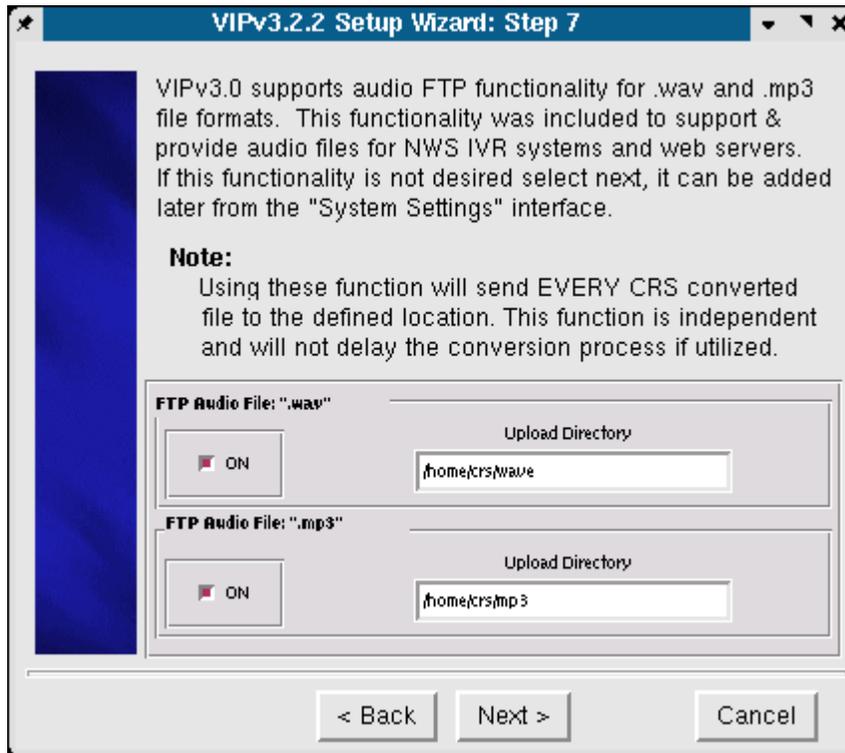
Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen

### Step 7:

#### Audio FTP Configuration:

Remote FTP can be used to populate web servers by providing audio for every product sent through the VIP. File naming is provided from the AWIPS key name found in the CRS header of each formatted product. Audio uploads are 16khz, 16bit multimedia wav files (which differ from the 10khz audio sent to CRS) or .mp3 files.

Entries are required to turn on the .wav file or .mp3 ftp feature and four fields to setup this function. The first field is the "on" toggle. Once all the remote system information is defined select "on" to active this function. The remaining four fields are the User and Password of the account on the remote system and the numeric IP Address and the Upload directory of storage locations where the converted audio files will be placed.



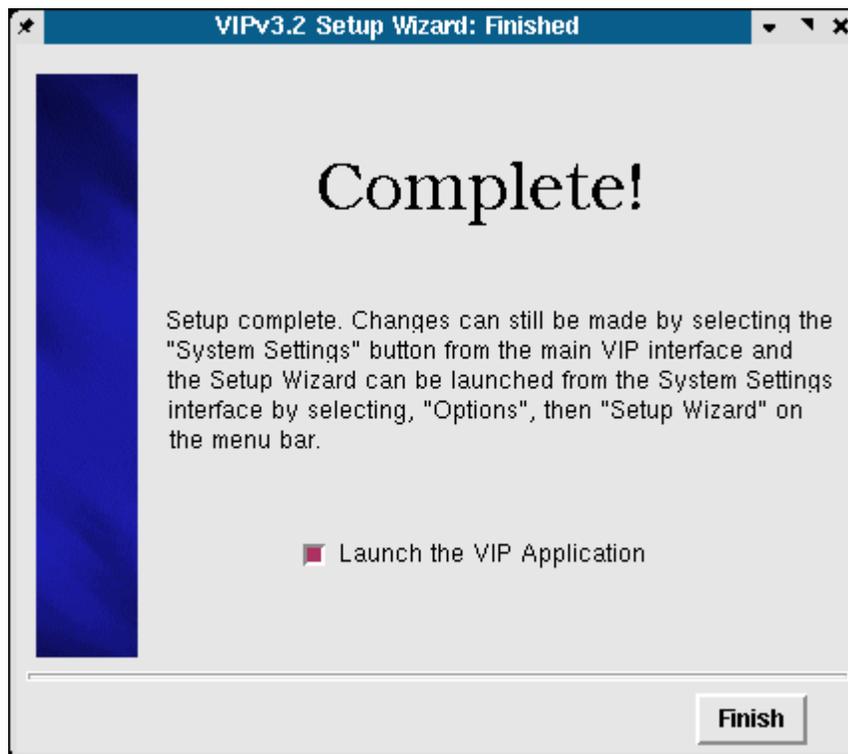
Note: If an upload directory is the default directory, upon a successful ftp connection, place a DOT, ".", in the entry box rather than leaving it blank.

If you intend to use this feature it is strongly recommended you first contact the regional AWIPS representative for approval. An activated Remote FTP function will upload every product sent through the VIP system. Because of this, bandwidth may be an issue depending on your regional WAN capabilities.

Remote FTP was designed as a threaded process. Therefore, utilizing this feature will not affect (runs independent of) the product ingest function. Although this feature provides an audio ftp operation for critical products, safe guards were not included to insure a timely or successful transfer for this or any product type managed by the VIP application.

Click *next* to precede to next step, *cancel* to cancel the wizard or *back* to go back to the previous screen

**Final Step:** You have completed all VIP system settings. If you wish to launch the VIP application after the Wizard finishes, toggle the *launch* button. Click *finish* to finish the setup, *cancel* to cancel the Wizard, or *back* to go back to the previous screen.



## THE VIP WINDOW

The VIP window has seven push buttons that activate sub-applications for configuring, investigating, and controlling VIP Operations. The VIP toggles may open operations windows or start/stop VIP applications. In addition, the VIP window Status Display Area at the bottom of the window displays the current status of the VIP application, either stopped or running.

### Startup/Shutdown

When the VIP application software is launched the TTS servers are started, but the application is not yet "Running". To run VIP select the start button and to halt select stop. Each option is found on the main VIP interface near the bottom of the button bar. To launch the VIP application select the VIP icon found on the desktop or type `/usr/local/bin/VIP &` at an xterm command prompt. In either case the VIP application must run under the user: `crs`. Configuring CRS for your local office before running is an easy process. All settings are handled through the provided system settings interface.



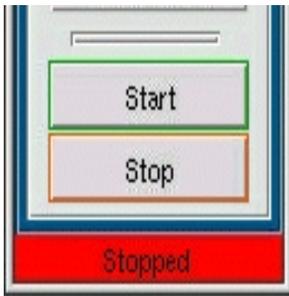
### Starting VIP

Start VIP by executing the VIPserver. This multithreaded process should be launched from the main VIP interface by selecting the start button. Once selected, the status window will change from Stopped to Running. Once the server is activated it is possible to monitor the VIP server's life cycle. This is done by looping the current VIP server log through the log viewer interface or for quick access by selecting a "green" status window.



### Stopping VIP

To halt the VIPserver select the stop button on the main VIP interface. Other processes such as the TTS servers will remain running for offline use of the playback function found in the local & substitution dictionary managers, the TTS clipboard, and interface narrations summaries. This option as well as the start function only effects the VIPserver binary.



### Monitor Conversion Life Cycle

The VIP server continuously logs the life cycle of each product sent through VIP, from the time it was ingested to the final audio transfer to CRS. To activate this monitoring function select the "green" status window located on the main user interface. For complete information on logging functions including the VIP server reference the Log Viewer section.

## Defining VIP Desktop Icon

The VIP system should have a VIP application icon located on the desktop. If not the following steps will help you create one.

- 1 Right click anywhere on the desktop to display pull down menu.
- 2 Select "Create New" from the menu options.
- 3 Select "Link to Application"
- 4 Enter VIP Application in the provided entry box.
- 5 Select the "Execute" tab
- 6 In the "Command" entry box type the following: /usr/local/bin/VIP
- 7 Select "OK" to save and exit.

An icon marked VIP Application is now on the desktop, double click to execute.

## Menu Bar

The VIP window has two menus on the menu bar located along the top. These menus are File and Help and provide access to pull down menus that provide functionality.

### FILE

#### System Shutdown:

Selecting this option will immediately shutdown VIP, closing any running applications. System Reboot: Similar to system shutdown this option will immediately stop any running applications and reboot to the Linux login prompt.

#### TTS Clipboard:

Opens the Text-to-Speech clipboard window. Text is entered in the window and then played back through the VIP audio system.

#### Remote Product Filter:

Select this option will create a *VIP Product Filter Dialog* interface that would allow sites to add specific Message Types for routing wave and mp3 files to the DS1 data servers.

#### Interface Audio:

Used to turn the application audio on or off. This audio consists of audio and voice error, warning alerts, etc.

#### Exit:

Selecting this will exit the VIP application including the TTS servers.

#### HELP Help Menu:

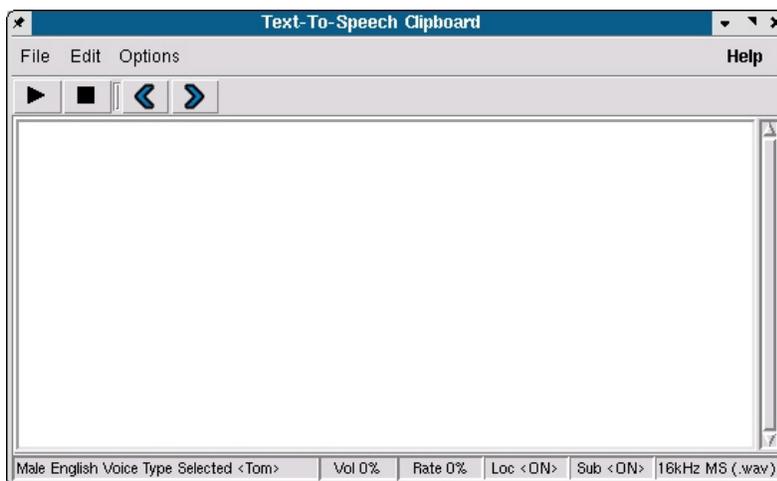
This option loads the VIP help page, specific to the interface where selected.

#### About VIP:

Local VIP version history can be obtained by selecting this function. Information includes: version numbers, installation dates, installer names, and locations.

## The Text-To-Speech Clipboard

The Text-To-Speech Clipboard is a full functioning editor with a provided feature to playback text as typed or imported by the user. The Text-To-Speech Clipboard window has three menus: file, edit, and options. The TTS clipboard also has a button bar to provide another method of selecting voices and controlling the playing of entered text.



To use this feature:

Select a voice type and audio type under Options on the menu bar or cycle through the voices using the > and < buttons on the button bar (Voice is displayed at bottom of screen).

Turn on or off the Local dictionary and preprocessor.

Enter the desired text for playback in the provided text window.

Click on the play symbol button  on the button bar.

*Note: The play button will remain in until the text is completely converted to audio.*

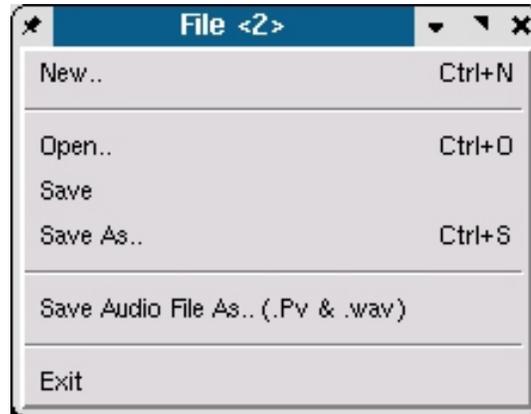
To stop, click on the stop  button.

To exit the window, click on the X at the top right or exit under the file menu.

## MENU BAR

Along the top of the text-to-speech clipboard window is a menu bar containing three pull down menus: File, Edit, Options, and Help.

### File Menu



**New:** Use this to create a new text

**Open:** Use to open an existing text file that you must select from the Unix directories

**Save:** Saves the text to the existing file name and location

**Save As:** Allows you to define a new file name and select file storage location

**Save Audio file as (.pv and .wav)** - Saves both the .pv (10 khz) audio file and the .wav (16khz)

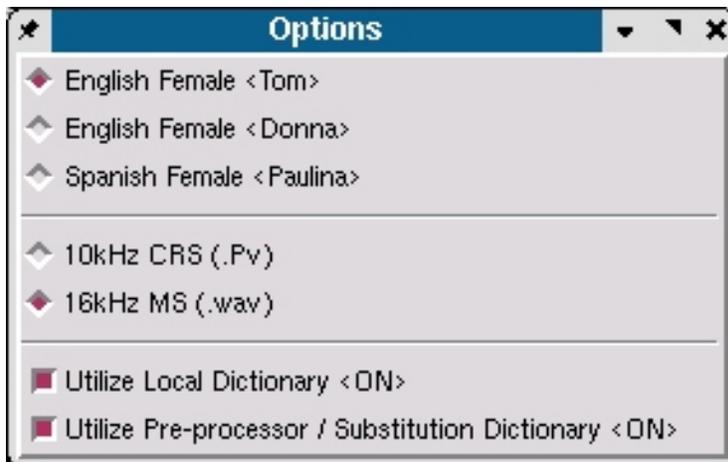
audio file

**Exit:** Exits window

## Edit Menu

Provides the cut, copy and paste functions useful in creating and editing text in the window.

## Options Menu



This menu list contains several toggle areas that allows you to select the voice you wish to hear, the sampling rate you wish to hear, and decide whether or not to utilize the Local dictionary and/or Pre-processor dictionaries.

Current selections are listed at the bottom of the clipboard along with the volume and rate settings

## Help Menu:

This option loads the VIP help page, specific to the interface where selected

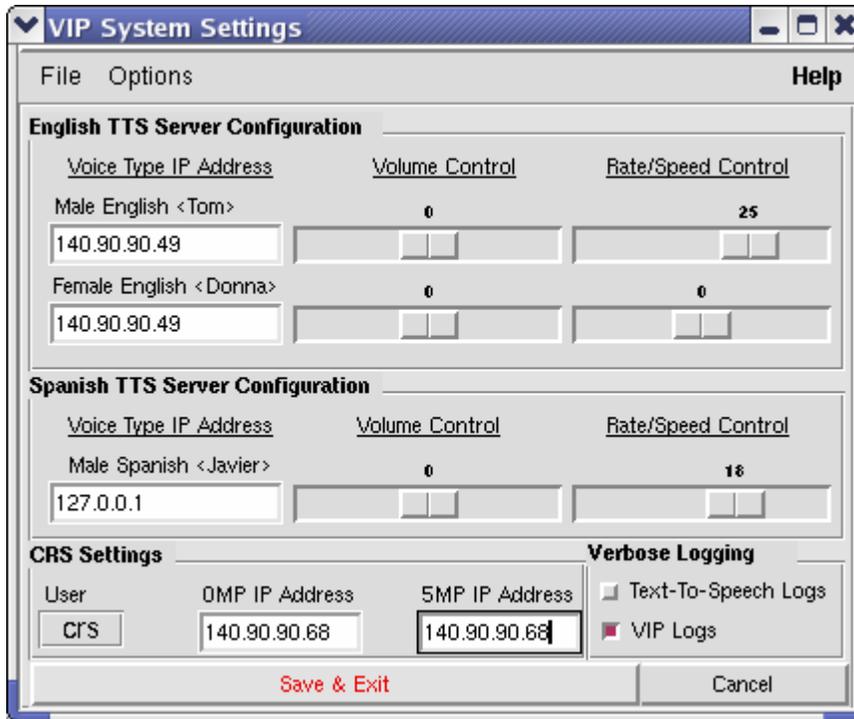
## Helpful Hints

The pronunciation of specific sections of text words highlighted can be checked by clicking the left mouse button and highlighting the text and then by selecting playback with a click of the right mouse button.

Audio played through the TTS clipboard will be played using the selected voice, volume, rate, and sample rate sequenced through the dictionaries activated.

## VIP SYSTEM SETTINGS

The "System Settings" interface provides VIP administrators a tool for setting up and changing local VIP settings. This section provides details for fields requiring local input.



### The Menu Bar

Along the top of the VIP System Settings window is a menu bar containing three pull down menus: File, Options, and Help.

### FILE MENU:

Under *File* is one method to exit this window.

### OPTIONS MENU:

Under the *options menu* you can activate the *Setup Wizard* to change you VIP Configuration information, modify the *Audio FTP Configuration* or view the list of sites with legal licenses to use Spanish voice.

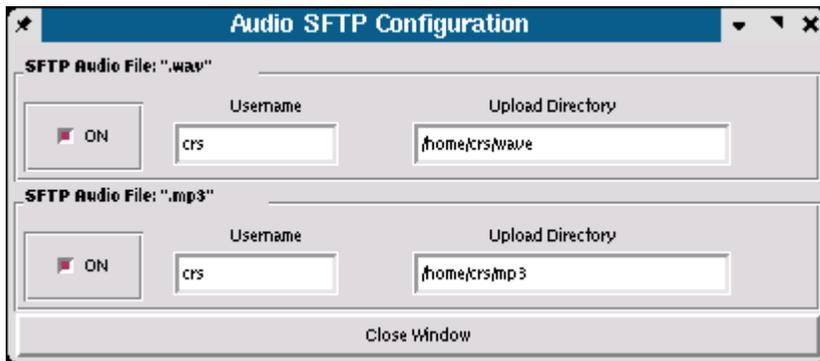
### Setup Wizard:

The setup Wizard is described in the Getting Started section of this document.



### Audio FTP Configuration:

Audio FTP can be used to populate web servers by providing audio for every product sent through the VIP. File naming is provided from the AWIPS key name found in the CRS header of each formatted product. Audio uploads are 16khz, 16bit multimedia wav files (which differ from the 10khz audio sent to CRS) or .mp3 files.



Entries are required to turn on the .wav file or .mp3 ftp feature and four fields to setup this function. The first field is the "on" toggle. Once all the remote system information is defined select "on" to activate this function. The remaining four fields are the Username and Password of the account on the remote system and the numeric IP Address and the Upload directory of storage locations where the converted audio files will be placed.

Note: If an upload directory is the default directory, upon a successful ftp connection, place a DOT, ".", in the entry box rather than leaving it blank.

If you intend to use this feature it is strongly recommended you first contact the regional AWIPS representative for approval. An activated Remote FTP function will upload every product sent through the VIP system. Because of this, bandwidth may be an issue depending on your regional WAN capabilities.

Audio FTP was designed as a threaded process. Therefore, utilizing this feature will not affect (runs independent of) the product ingest function. Although this feature provides a audio ftp operation for critical products. However, safeguards were not included to ensure a timely or successful transfer for this or any product type managed by the VIP application.

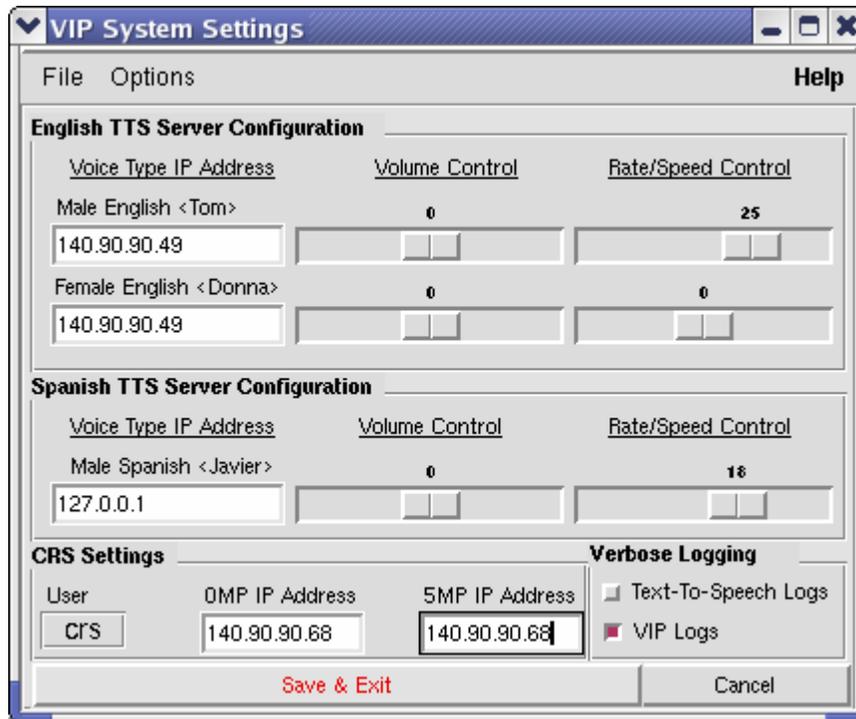
Valid Spanish WFO sites list: This window lists those sites for which a valid Spanish license exists. *If your site is not on this list you cannot use the Spanish voice for Broadcasting. If you need Spanish, contact your regional VIP Point of contact to get an approved requirement for Spanish.*



**HELP MENU:**

*Help Menu*, will load help pages pertinent to his window similar to this page.

THE *VIP SYSTEM SETTINGS* WINDOW has data setting areas as described below.



These fields can be initially set or reset by running the install wizard or changed via this window.

## **English TTS Server Configuration**

Voice Type IP Address Because the text-to-speech software is a client/server model, the IP address of each server must be provided to the VIP application. In a standard VIP system the IP address entered should be the IP address of the VIP computer (127.0.0.1) or actual.

### **Volume Control**

This allows you to adjust the Volume of the voice up or down from the default. This can be used to adjust the individual voice volumes to help align the NWR transmission path.

### **Rate/Speed Control**

This allows you to adjust the rate of speech up or down from the default.

## **Spanish TTS Server Configuration**

### **Voice Type IP Address**

Because the text-to-speech software is a client/server model, the IP address of each server must be provided to the VIP application. In a standard VIP system the IP address entered should be the IP address of the VIP computer (127.0.0.1).

### **Volume Control**

This allows you to adjust the Volume of the voice up or down. This can be used to align the NWR transmission path.

### **Rate/Speed Control**

This allows you to adjust the rate of speech up or down from the default.

## **CRS Settings**

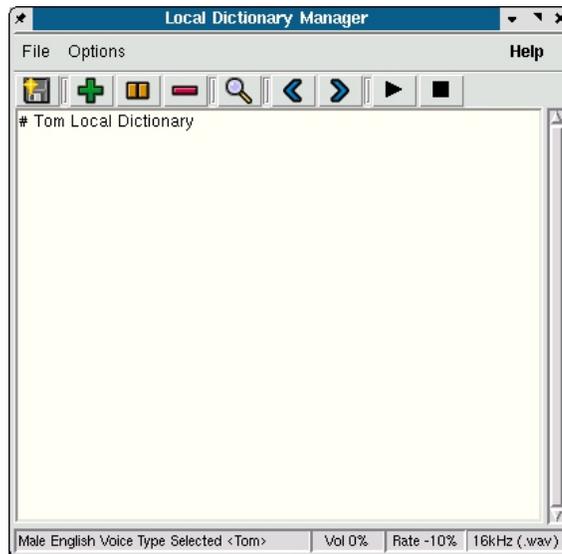
Converted audio is sent back to CRS via FTP. Because of this it is necessary to provide IP addressing for both 0MP & 5MP. Enter the IP address for 0MP and 5MP. If the numeric 0MP and/or 5MP IP addressing is not known consult your AWIPS or CRS administrator for this information. It is recommended that numeric IP addresses be used when defining these fields, rather than 0MP or 5MP.

## **Verbose Logging**

The on/off switches provide VIP administrators a way of activating and controlling the level of logging of VIP server logs indicated. Error logs are accessed through the main VIP window.

## DICTIONARY MANAGER

The local dictionary manager is a tool provided to help fine-tune troublesome pronunciations for both English voices and the Spanish voice. Word definitions defined in this dictionary are formal phonemic transcriptions, while in the pre-processor or substitution dictionary phonetic spelling substitutions are utilized. Again with VIP 3.2, voices no longer need to share pronunciations. So if the new male voice pronounces something fine only the female voice may need to be adjusted. Now no compromise pronunciations need to be used.



### The Menu Bar

Along the top of the VIP Local Dictionary Manager is a menu bar containing three pull down options: File, Options, and Help.

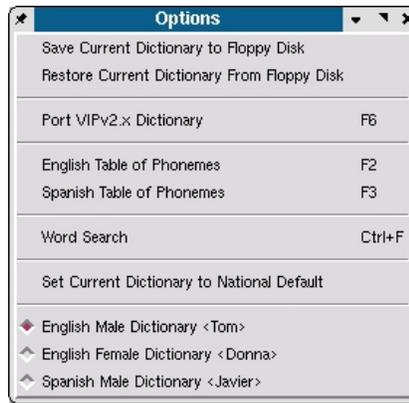
### File:

Under File is one of two provided methods to exit this interface.

**Save:** Saves the local dictionary and applies it to the VIP.

**Exit:** Exits the local dictionary manager. A pop-up window will ask if you wish to save any changes you may have made since opening the Local Dictionary Manager window.

## Options:



The Options menu holds eight different functions. They are:

### **Save Current Dictionary To Floppy Disk:**

The local dictionary files for the voice selected below will be saved to disk with a file name: en-(voicename)-root.dic.

Note: MARA is the name used by the application for the female files, I.e., Mara=Donna.

### **Restore Current Dictionary From Floppy Disk:**

The local dictionary stored on a floppy disk for the voice selected with a file name of en-(voicename)-root.dic is restored.

Note: MARA is the name used by the application for the female files, I.e., Mara=Donna.

### **Port VIPv2.x Dictionary:**

Exercises the function that supports the checking and editing of VIPv2.x Local Dictionary entries for use in VIP 3.2. VIP 2.0 entries need to be check one-by-one for need in VIP3.2. In many cases, old dictionary entries are no longer needed and may degrade the quality of the voice and impact the performance of the system. Also, local dictionary entries for the Donna voice may no longer be needed for the Tom voice. The porting function is described in more detail below:

### **English Table of Phonemes:**

To help aid in defining phonemic spellings, a static table of US English symbolic phonemic representations (SPRs) is included for quick reference. Speechworks documentation for use of SPRs is included in the appendix.

### **Spanish Table of Phonemes:**

To help aid in defining phonemic spellings, a static table of Mexican Spanish symbolic phonemic representations (SPRs) is included for quick reference. Speechworks documentation for use of SPRs is included in the appendix.

### **Word Search:**

This is a simple search function. The search is simple in that only exact matches are checked against word entries. Using wild cards or other standard searching techniques will result in a literal search.

### **Set Current Dictionary to National Default:**

This function will reset you dictionary listing to that provided with the VIP3.2 delivery. You should save any customizing dictionary work done previously.

### **Select Voice Dictionary**

This toggle area allows you to select the local dictionary for the specific voice you wish to display and work on.

### **Help:**

The Help Menu, will load the help page for the local dictionary manager.

### **BUTTON BARS:**

#### **The Dictionary Manager buttons on the button bar allow you to (from left to right buttons)**

Save and Exit the dictionary chosen

Add a word “+”

Edit a highlighted word

Delete a highlighted word “-“

Search for a word

Switch voices “<“ “>”

play  and

stop playing of a dictionary word

Double clicking on a word or clicking the add and edit buttons cause the Word Entry window to pop up.

This window allows you to try out a word and its translation thru controlling playing the word (play  and stop  playing of a word). It also let you save the word to the dictionary list, erase the entries and close the pop-up window. Enteries in the translation field must follow the SPC

representation format without the \,!, [, ] needed. The Application will handle adding theseCharacters.

### **Adding a Word**

When adding a word to the dictionary, both the word and its substitution are required. To add a word follow the instruction set below.

- 1 Enter the spelled word in the word entry box.

- 2 Enter the translation for of that word in the translation entry box.
- 3 Select listen to playback and verify pronunciation of translation.
- 4 Save button to save (words are placed into the list alphabetically).

### Editing an Existing Word



To edit a word double click the left mouse button on the desired word to pull it from the buffered list. Make any changes necessary and then select the add button to place the item back into the buffered list alphabetically.

### Deleting a Word

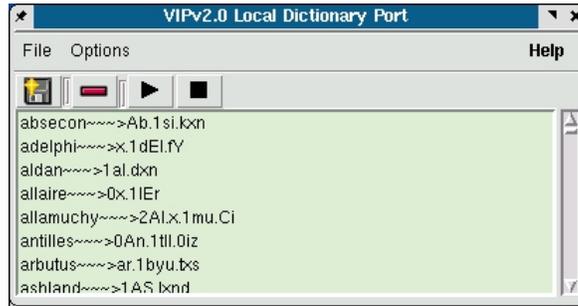
To delete a word from the local dictionary, double click the left mouse button on the desired word to pull it from the buffered list. Then select the clear/remove button to delete the word or use delete key. Repeat this process until all desired words are removed from the buffered list. Remember to save your changes before exiting.

Note: If you wish to delete a newly added word, you must first always select the word with the mouse even though it might be currently highlighted, then select a delete function.

### Hearing a Pronunciation

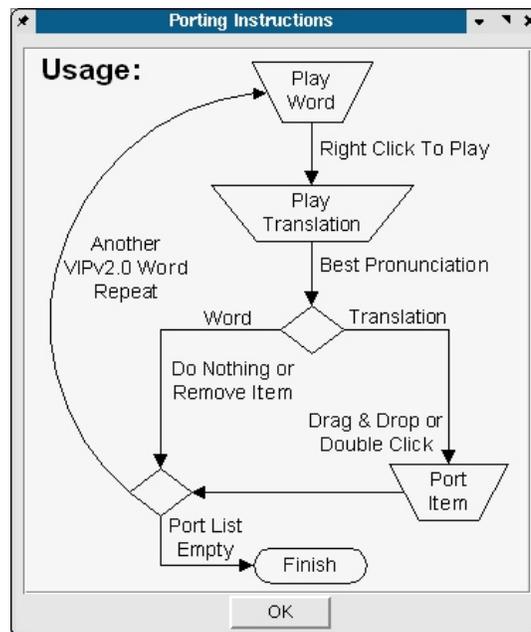
To playback a word, enter the word and translation in the provided entry boxes, then select the listen button. You can also hear a pronunciation of a word already in the dictionary by either double clicking the left mouse button on the word, then by selecting listen or by selecting the word with a right mouse click and then selecting playback in the pull down menu. If items are pulled from the buffered list, remember to select add to replace the definition when finished. If you don't, you may unintentionally delete the word.

## VIPv2.x Local Dictionary Port



This window allows you to load in from floppy your previously saved VIP2.x Dictionary. An alphabetic list of words will appear. Each word listed should be checked for the new pronunciation by the VIP3.2 upgraded female and new male voices. You can play a selected word on the list or highlighted sections of the list using the play  and stop play  buttons on the button bar. You may delete a word using the “ – “ button . *Pronunciations in this porting window are that of the left hand column NOT the phonemic representation.* If the word listed does not sound correct then double click on the word and the word entry window will appear with the word and its translation representation.

Activation of this function also causes the *Porting Instructions Window* to pop-up providing a flowchart explanation of steps to port an existing VIP2.x dictionary to VIP3.2.



The word entry window is used to develop, test, and save the improved phonemic pronunciation.



**VIPv2.x Local Dictionary Port Menu Bar;**

**File**

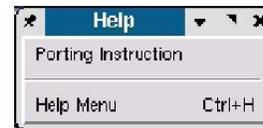
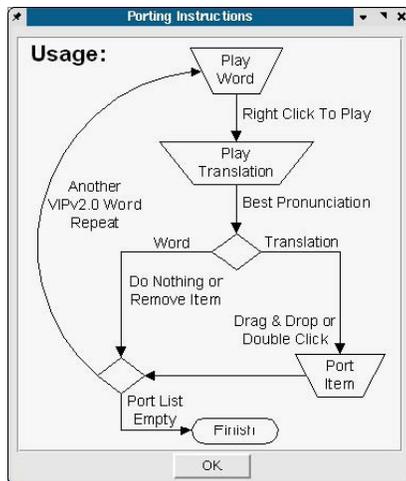
This drop down menu allows you to *save* any changes to imported VIPvZx dictionary or *exit* the window.

**Option**

This drop down menu allows you to import the local VIPv2.0 Dictionary from the inserted floppy which contains the dictionary saved as part of the install process.

**Help:**

Porting Instructions: will display the flowchart on how to port words from an existing dictionary. Help Menu: will load the help page for the local dictionary manager.



### **Helpful Hints:**

There is a simple search function found under Options on the menu bar. The search is simple in that only exact matches are checked against word entries. Using wild cards or other standard searching techniques will result in a literal search.

Changes made to the local dictionary affect only the selected voice type.

It is not necessary to stop/start any part of the VIP application after making changes to the dictionary (i.e. for the TTS servers to recognize the changes). This operation is managed by the application when save is selected.

The pronunciation of words already in the local dictionary can be checked by clicking the left mouse button on the desired word and then by selecting playback with a click of the right mouse button.

Words are placed in the local dictionary alphabetically, and duplicate definitions are not accepted.

When adding a word to the local dictionary, spaces are not permitted in either the word or phonemic entries. The following characters are invalid: < > ” “ – \$ ( ) \ ! ? [ ] ‘ ’

To switch voice types for the playback functions found on this interface, use the toggles proved under the Options on the menu bar.

### **Customizing Word Pronunciations**

In certain cases, you may want to specify a pronunciation that differs from the one generated by Speechify's internal text analysis rules. The tags described in this section are used to customize Speechify's word pronunciations.

You can use the Symbolic Phonetic Representation (SPR) further discussed in the appendix to specify the exact pronunciation of a word using Speechify's special phonetic symbols. The SPR tag takes the following form:

However, when entering an SPR in the translation entry box do not type the "/", "!", "[", or "]" i.e., do not type the slash, exclamation point or brackets. VIP will enter these characters for the user.

SPR tag	Description
\![SPR]	Pronounce the word phonetically as specified inside the square brackets

## **Symbolic Phonetic Representations**

An SPR is the phonemic spelling used by Speechify to represent the pronunciation of a single word. An SPR represents:

The sounds of the word

How these sounds are divided into syllables

Which syllables receive stress

You can use SPRs as input to Speechify in order to specify pronunciations that are different from those generated by the system automatically. SPRs are used in two different ways:

Enter an SPR directly into text in place of the ordinary spelling of a word. In the following example, an SPR replaces the word root in order to trigger a pronunciation that rhymes with foot rather than boot: We need to get to the rUt of the problem.

To make the pronunciation change more permanent, enter an SPR as the translation value of the Local Dictionary entry. The specified pronunciation is then generated whenever that word is encountered in any text.

An SPR consists of a sequence of allowable SPR symbols for a given language:

though .1Do

shocking .1Sa.0kIG

The periods signal the beginning of a new syllable, the digits 1 and 0 indicate the stress levels of the syllables, and the letters D, o, S, a, k, I, and G represent specific US English speech sounds. Each of these elements of the SPR is discussed below.

*An SPR entry which does not conform to the requirements detailed in this guide is considered invalid and ignored.*

*Enteries in the translation field must follow the SPC representation format without the "\", "!", "[“,or ”]" needed.*

### **Syllable boundaries**

Use periods to delimit syllables in an SPR in order to enhance readability - they are not required, and do not have any effect on the way the word is syllabified in the speech output. Speechify's internal syllabification rules apply as usual to divide the word into syllables.

### **Syllable stress**

Syllables can be marked for stress with the digits 0, 1, or 2, for no stress, primary stress, and secondary stress, respectively.

Note: If a word has more than one syllable, at least one of these syllables must be marked for primary stress, or the SPR is considered invalid. Other syllables may be marked for secondary or no stress, or left unmarked. A syllable that is not marked for stress is assumed to have no stress, unless it is the only syllable of a word, in which case it is assigned a primary stress.

### **Speech sound symbols**

Each language uses its own inventory of SPR symbols for representing its speech sounds. The tables below contain SPR symbols for US English, with examples of words in which each sound occurs.

Note: Letters are case-sensitive, so e and E represent two distinct sounds. Multi-character symbols must be contained in single quotes. SPRs containing sound symbols that are not in the inventory of US English are considered invalid and are ignored.

Some speech sounds have limited distributional patterns in specific languages. For example, in English, the sound G of sing .1sIG does not occur at the beginning of a word. Other US English sounds that have a particularly narrow distribution are the flap F, and the syllabic nasal N. (See US English SPRs below) Entering a sound symbol in a context where it does not normally occur may result in unnatural-sounding speech.

Speechify applies a sophisticated set of linguistic rules to its input to reflect the processes by which sounds change in specific contexts in natural language. For example, in US English, the sound t of write .1rYt is pronounced as a flap F in writer .1rY.0FR. SPR input undergoes these modifications just as ordinary text input does. In this example, whether you enter .1rY.0tR or .1rY.0FR, the speech output is the same.

### **SPR Tables**

The following tables show the allowable symbolic phonemic representations for US English language vowels and consonants. These tables can be used to create a phonemic spelling for words added into the local dictionary.

Each sound symbol is accompanied by examples illustrating typical spellings of the sound in actual words, with the letters representing the given sound in italics. Remarks specific to SPRs in individual languages are included in the language-specific sections below. Refer to SPR formats for general guidelines on creating and using SPRs.

Note: Due to dialectal differences, the SPR examples shown may not always agree with your own pronunciations.

## US English SPRs

### Vowels

US English Symbol	Example Words	US English Symbol	Example Words
<b>a</b>	father, lot	<b>O</b>	toil, boy
<b>A</b>	back, had	<b>R</b>	butter, hurt
<b>c</b>	law, cough	<b>u</b>	zoo, truth
<b>e</b>	cake, pain	<b>U</b>	took, put
<b>E</b>	hedge, let	<b>W</b>	out, cow
<b>H</b>	mug, son	<b>x</b>	sofa, alone
<b>i</b>	see, speak, believe	<b>X</b>	roses, hinted
<b>I</b>	pick, ill	<b>Y</b>	life, fly, bonsai, Einstein
<b>o</b>	both, oak		

### Consonants

US English Symbol	Example Words	US English Symbol	Example Words
<b>b</b>	bad, sob	<b>n</b>	never, sun, winner
<b>C</b>	chip, witch, nature	<b>N ("syllabic n")</b>	Button satin burden
<b>d</b>	dip, had	<b>p</b>	pit, ripC
<b>D</b>	this, breathe	<b>r</b>	borrow, rake
<b>f</b>	field, if, graph	<b>s</b>	seal, miss, ceiling
<b>F ("flap")</b>	writer, fiddle	<b>S</b>	ship, wish
<b>g</b>	good, bug	<b>t</b>	tip, pet
<b>G</b>	sing, finger	<b>T</b>	thing, Beth

## Spanish Vowels and Consonants

Phone	Example	Phone	Example
a	ropa, abuelo	m	mi, amor
A	bajo, grande	n	no, mano
b	basta, hubo	N	mañana, año
C	coche, chico	o	uno, bajo
d	dar, nada	O	dos, onda
e	donde, escapar	p	parte, apagar
E	esta, comer	pau	[Indicates a pause]
f	flaco, afuera	r	arena, pero
g	goma, haga	R	ropa, perro
i	importante, milagro, oigo tiesta	s	si, casa
I	amigo, hija	S	Shanghai, Washington
j	jota, gente	t	toma, atar
J	llave, milla	u	ayudar, rutina
k	coger, irak	U	luna, uve
l	loco, algo	w	fuera, deuda

## Syllable Stress

Within phonemic transcriptions, syllables can be marked for stress using the symbols in the following table. If a word has more than one syllable, at least one of these symbols must be marked for primary stress.

Symbol	Description
0	No stress
1	Primary stress (most prominent stress in the word)
2	Secondary stress

The syllable stress marker should be within the boundaries of the syllable, and to the left of the vowel. If you do not know where the syllable boundaries in a word like construction are located, any of the following SPRs correctly places the primary stress on the second vowel:

construction

kXn1strHkSXn

kXns1trHkSXn

kXnst1rHkSXn

kXnstr1HkSXn

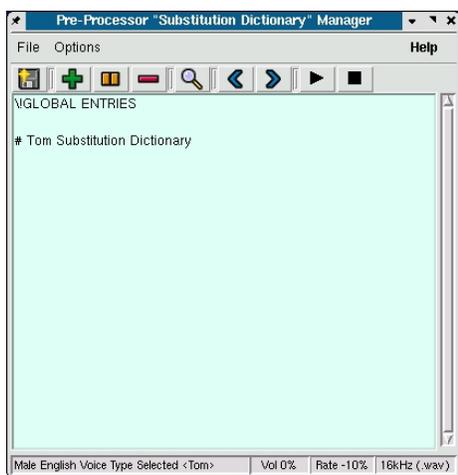
**Syllable boundary**

Beginning of a syllable

## PRE-PROCESSOR WINDOW

This interface provides administrators a tool used in part to define full text substitutions for acronyms, pronunciation substitutions, homographs, and phonetic spelling entries. This feature provides the ability to expand MPH into "miles per hour" or "miles an hour" depending on the preference. Defining a phonetic spelling substitution through the substitution dictionary manager is another way to alter words like "Washington" to be pronounced as "War shing ton" or "Oregon" as "Oregen" depending on the desired pronunciation. This is an alternative to the more formal phonemic definition found in the local dictionary manager and allows substitutions to be made at the time of TTS conversion.

The preprocessor, replaces text in messages before the TTS conversion process. You can also use the preprocessor to define things such as keyword-based pauses (long pauses, short pauses, abbreviations, numeric pronunciations). Here is where the ability to expand unique abbreviations exists such as converting "I95" into "Interstate ninety-five".



### The Menu Bar

Along the top of the Pre-Processor "Substitution Dictionary" Manager is a menu bar containing three pull down options: File, Options, and Help.

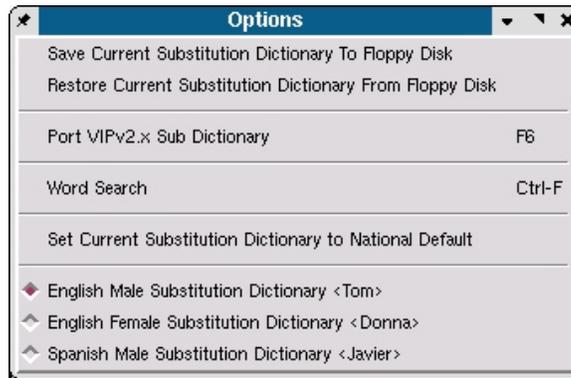
#### File:

Under File is one of two provided methods to exit this interface

**Save:** Saves the substitution dictionary and applies it to the VIP.

**Exit:** Exits the substitution dictionary manager. A pop-up window will ask if you wish to save any changes you may have made since opening the Substitution dictionary Manager window.

Options:



**The Options menu holds six different functions. They are:**

**Save Current Substitution Dictionary To Floppy Disk:**

The substitution dictionary files for the voice selected below will be saved to disk with file name (dictionary name) Sub.dic i.e., tom\_Sub.dic.

**Restore Current Substitution Dictionary From Floppy Disk:**

The substitution dictionary stored on a floppy disk for the voice selected will be restored.

**Port VIPv2.x Sub Dictionary:**

Exercises the function that supports the checking and editing of VIPv2.x substitution dictionary entries for use in VIP 3.2. VIP 2.0 entries need to be check one-by-one for need in VIP3.2. In many cases, old dictionary entries are no longer needed and may degrade the quality of the voice conversion and impact the performance of the system. Also, dictionary entries for the Donna voice may no longer be needed for the Tom voice. The porting function is described in more detail below:

**Word Search:**

This is a simple search function. The search is simple in that only exact matches are checked against word entries. Using wild cards or other standard searching techniques will result in a literal search.

**Set Current Substitution Dictionary to National Default:**

This function will reset the selected substitution dictionary to the provided default VIP3.2 substitution dictionary.

**Select Voice Substitution Dictionary:**

This toggle area allows you to select the voice substitution dictionary you wish to display and work on.

**Help:**

The Help Menu, will load the help page for the Pre-Processor “Substitution Dictionary” Manager.

**BUTTON BARS:**

**The Pre-Processor “Substitution Dictionary” Manager buttons on the button bar allow you to (from left to right buttons)**

Save and Exit the dictionary chosen

Add a word “+”

Edit a highlighted word “\*\*\*”

Delete a highlighted word “-“

Search for a word

Switch voices “<“ “>”

play  and

stop playing of a dictionary word

Double clicking on a word or clicking on the add and edit buttons cause the Sub Word Entry window to pop up.

This window allows you to try out a word and its representation thru controlling playing the word (play  and stop  playing of a word). It also let you save the word to the dictionary list, erase the entries and close the pop-up window.

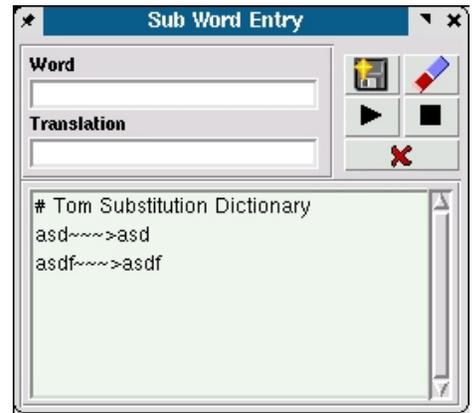
**Adding a Word**

When adding a word to the dictionary, both the word and its translation spelling are required. To add a word follow the instruction set below.

- 1 Enter the spelled word in the word entry box
- 2 Enter the translation spelling of that word in the translation entry box
- 3 Select listen to playback and verify pronunciation.
- 4 Select the location in the list where you wish to save the word.
- 5 Select the close and save button to save (Words are placed into the list at the location selected. Duplicate definitions are not accepted.)

**Editing an Existing Word**

To edit a word in the substitution dictionary, double click the left mouse button on the desired word to pull it from the buffered list. Make any changes necessary and then select the add button to place the item back into the buffered list at the location selected.



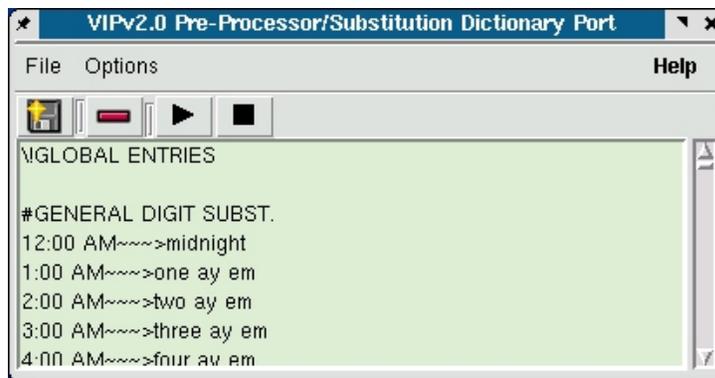
### Deleting a Word

To delete a word from the substitution dictionary, highlight the word and click the delete key. Repeat this process until all desired words are removed from the buffered list. Remember to save your changes before exiting.

### Hearing a Pronunciation

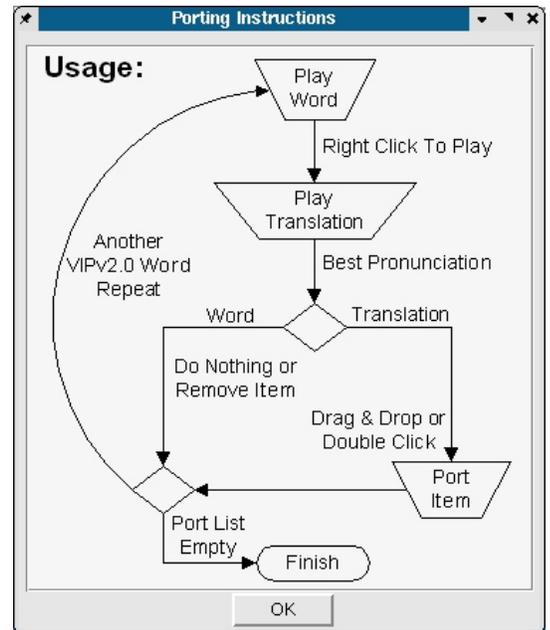
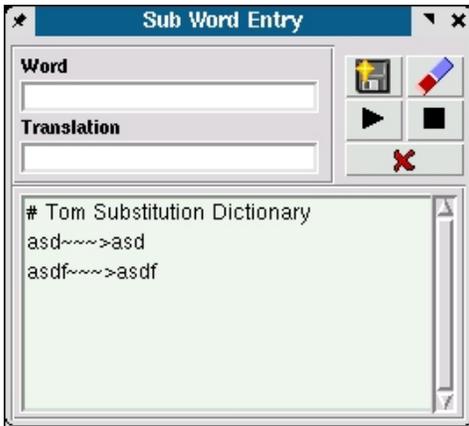
To playback a word, enter the word and phonetic spelling in the provided entry boxes, then select the listen button. You can also hear a pronunciation of a word already in the substitution dictionary by either double clicking the left mouse button on the word, then by selecting the play button or by selecting the word with a right mouse click and then selecting playback in the pull down menu.

### VIPv2.x Pre-Processor/Substitution Dictionary Port



This window allows you to load in from floppy your previously saved VIP2.x Pre-Processor or Substitution Dictionary. A list of words will appear. Each word listed should be checked for the new pronunciation by the VIP3.2 upgraded female and new male voices. You can play highlighted word on the list or highlighted sections of the list using the play  and stop play  buttons on the button bar. You may delete a word using the “-“ button . *Pronunciations in this porting window are that of the left hand column NOT the substitution representation.* If the word listed does not sound correct, double-click on the word and the word entry window displays with the word and its substitution representation or drag and drop the word into the dictionary GUI. Activation of this function also causes the *Porting Instructions Window* to pop-up providing a flowchart explanation of steps to port an existing VIP2.x dictionary to VIP3.2.

The Sub Word Entry window is then used to develop, test, and save the improved phonemic pronunciation.



## VIPv2.x Substitution dictionary Port Menu Bar

### File:

This drop down menu has two functions:

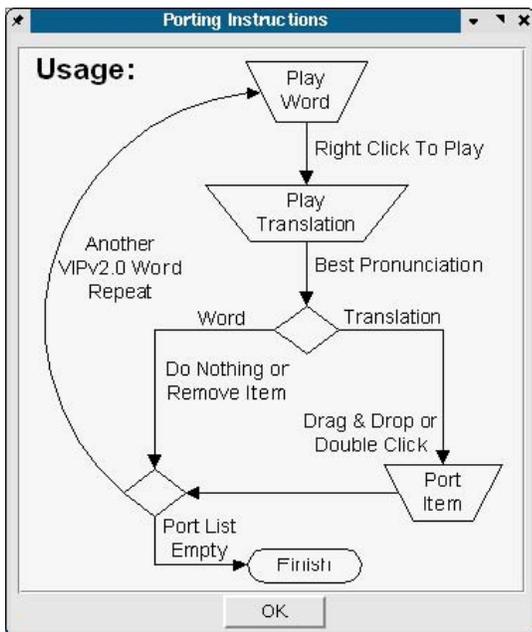
**Save:** Allows the user to *save* the port dictionary for placement in the event items are removed.

**Exit:** Closes the porting function.

**Option:** This drop down menu allows you to import the substitution VIPv2.0 Dictionary from the inserted floppy which contains the dictionary saved as part of the install process.

### Help:

Porting Instructions will display a flowchart on how to port words from an existing dictionary. Help Menu will load the help page for the local dictionary manager.



## Managing the Pre-Processor

### Format:

The substitution dictionary is an ASCII text file containing one entry per line. Each entry specifies a target expression (i.e. an expression to be replaced) and a substitution string. The format is as follows:

TARGET~~~>SUBSTITUTION

For instance, the following line: mph, miles an hour would cause any occurrence of "MPH" in the input text to be replaced with "miles an hour".

Note: White space is considered part of both the target and the substitution string. A target string containing white spaces will only match text in the input text containing the same white spaces, and substitution strings containing white spaces will be inserted into the output text with the same white space.

**Maximal Matching:**

The Weather Preprocessor replaces the longest string possible from left to right. For instance, the following lines:

```
US*~~~>United States
USA*~~~>U S A
```

would cause all occurrences of "US" to be replaced with "United States", except in the case of "USA", which would get replaced with "U S A". Note that the "\*" symbols appended to the targets in the above example causes matching to be case sensitive.

**Case-Sensitivity:**

By default, the substitution dictionary entries are matched case-insensitively. However, the following characters can be appended to the target string to modify the way case is treated:

<b>Character:</b>	<b>Effect:</b>
*	<b>Match characters case-sensitively</b>
^	<b>Match the first character case-sensitively se-sensitively, and remaining characters case-insensitively.</b>

For instance, the following entry:

```
MPH*~~~>miles an hour
```

would cause any instance of "MPH", "mph" (and all case variations) to be replaced with

"miles an hour" However, the following entry:

```
MPH*^~~~>miles an hour
```

would cause only occurrences of "MPH" (all letters capitalized) to be matched. And the following:

```
Mph^~~~>miles an hour
```

would cause all occurrences of "MPH", "Mph", "MpH",..., where the first letter is capitalized, to be replaced with "miles an hour".

**Digit Matching:**

Because of weather message requirements such as the handling of sub-zero temperatures, where, for instance, "b23" must be replaced with "23 degrees below zero", limited pattern matching functionality was embedded in the Weather Preprocessor.

Any occurrence of the "@" symbol in the target string matches any digit [0-9]. The same symbol can be used in the substitution string as a place marker where the matched digits must be replaced. As an example, the following line:

B@@~>@@ degrees below zero would cause "B10" to be replaced with "10 degrees below zero", "B11" to be replaced with "11 degrees below zero", and so on. The following is a more complex example.

@@@ AM~>:@@ AM

would match a string such as "530 AM", and replace it with "5:30 AM", a time format that would be identified as such by Speechify. As can be seen in this example, the first "@" symbol in the target string gets inserted in place of the first "@" symbol in the substitution string, and so on. There is currently no way of changing the order in which the matched digits are inserted in the substitution string.

Note: In some cases, a target string containing a wild card such as the "@" symbol could potentially match the contents of a more specific target string. Here is an example:

1B~>one degree below zero  
@B~>@ degrees below zero

In this example, a string such as "5B" could only match the first line, and would be replaced with "5 degrees below zero", but in the case of "1B", both target strings could be matched! To ensure that the substitution is made on the most specific target string, here is the rule to follow:

Always put the general rules (containing "@" symbols) BELOW the more specific rules

Because of the above rule, "1B" in the previous example, would correctly be replaced with "1 degree below zero(singular), and any other 1-digit instance ("2B", "3B", etc.) would be replaced with "@ degrees below zero" (plural).

### Abbreviation Handling:

Most abbreviations can be handled with straightforward entries in the substitution dictionary. Consider the following entries:

&~>AND 100S~>one hundreds A.M.~>A M Ctr.~>Center SUN~>Sunday

The above entries will cause the Preprocessor to substitute any occurrences of "&" for "AND", and so on. However, there are a number of particularities of this functionality to keep in mind.:

By default, entries in the substitution dictionary are case-insensitive. This means that "Ctr." in the above example will also match "ctr." and "CTR." The "\*" and "^" modifiers can be appended to the target string with the effect described under Case-Sensitivity. You can take advantage of case-insensitivity to reduce the number of entries in the substitution dictionary. However, it can be slightly more error-prone, as it may generate more possibilities of matching than maybe desired. For instance, "SUN", would match "sun" in the input text, and cause it to be replaced with "Sunday". This may not be the desired behavior! If the desired effect is to replace only "Sun" or "SUN" with "Sunday", a better approach may be to use the following entries:

SUN\*~>Sunday  
Sun\*~>Sunday so that an entry such as "The sun will shine" remains unchanged.

Symbols such as "," and "+" are considered word boundaries. When matching normal text (words), the Preprocessor stops at word boundaries. An interesting corollary to this is that when matching symbols, the

Preprocessor stops at the first character that is not a symbol. (This can be viewed as a "symbol boundary".) As a result, an entry such as:

+ ,plus would only replace occurrences of a "+" standing between two words. For instance, "++" would not get replaced with "plusplus" for the same reason that an entry such as:

USA~~~>U S A

would NOT cause "Usage" to be replaced with "US Age".

The "@" symbol can be used to match any digits, but for grammatical reasons it may sometimes be preferable to treat the "1" digit differently . For instance, the following should be used:

B1~~~>one degree below zero 1B~~~>one degree below zero B@~~~>@ degrees below zero @B~~~>@ degrees below zero

To ensure that the singular form gets used appropriately. Note that the more general cases (using the "@" symbol) must imperatively be placed below the specific cases for the Preprocessor to give precedence to the specific cases.

#### Geographical Homographs:

The case of geographical names that have different pronunciations depending on the context is loosely referred to as "geographical homographs". An example of this is "Arkansas state" versus "Arkansas river".

Weather Message Specific Punctuation: In most cases, weather message specific punctuation can be handled with straightforward substitutions. For instance, the following line:

...~~~>!\p300

would simply replace occurrences of "..." with a 300ms pause. However, some substitutions are more difficult to achieve. For instance, it is difficult to replace ".[FORECAST\_PERIOD]..." with "[FORECAST\_PERIOD]," because the pre-processor does not have predefined knowledge of what a forecast period is.

In this case, and in the general case of substitution a punctuation mark occurring at the beginning of a given string, or punctuation marks surrounding a given string, for a different punctuation mark at the end of that same string, there is no simple solution, unless the string itself is a fixed string or can be expressed in only a few lines. For instance

.MONDAY...~~~>MONDAY \!p300 .TUESDAY...~~~>TUESDAY \!p300

.SUNDAY...~~~>SUNDAY \!p300

would cause occurrences of ".[DAY\_OF\_WEEK]..." to be replaced with "[DAY\_OF\_WEEK]," with a 300 ms pause.

#### Keyword-based Pauses:

In some cases it may be desired to define a certain number of key words to be used within weather messages to produce pre-determined pauses. For instance, the key words "SHORT\_PAUSE" and "LONG\_PAUSE" could be defined, with obvious effects. The following entries could then be added to the substitution dictionary:

SHORT\_PAUSE\*~~~>!p150 LONG\_PAUSE\*~~~>!p300

This would cause, for instance, any occurrence of "SHORT\_PAUSE" (all uppercase) to be replaced with the special tag for a 150 ms pause.

**Embedded Tags** Embedded tags are special codes that can be inserted into input text to customize Speechify's behavior in a variety of ways. You can use embedded tags to:

< Create pauses at specified points in the speech outline. < Customize word pronunciations.

An embedded tag begins with the sequence \! followed immediately by a string of alphanumeric characters. For example:

\!p300	Synthesize a pause of 30 ms.
\!tsc	Pronounce all characters individually by name.

Separate a tag from any preceding input by at least one unit of white space. A tag cannot be followed immediately by an alphanumeric character, though most tags may be followed immediately by punctuation, parentheses, and similar symbols.

Any sequence of non-white-space characters beginning with the prefix \! that is not a recognizable Speechify tag is ignored in the speech output.

## Creating Pauses

Use a pause tag to create a pause of a particular duration at a specified point in the speech output.

Pause tag	Description
\!pN	Pronounce all characters individually by name.

The maximum value of the integer argument in a pause tag is 32767. To create a longer pause, use a series of consecutive pause tags.

The behavior produced by the pause tag varies depending on its location in the text. When a pause tag is placed immediately before a punctuation mark, the standard pause duration triggered by the punctuation is replaced by the pause duration specified in the tag. In other locations, the tag creates an additional pause.

For example, sentence (a) has a default 150 ms pause at the comma. Sentences (b) and (c) replace the default pause with a longer and shorter pause, respectively, while sentence (d) inserts an additional pause of 300 ms, resulting in a total pause duration of 450 ms. In sentence (e) a 25 ms pause is inserted in a location where no pause would otherwise occur.

Input	Pronunciation
(a) Tom is a good swimmer, because he took lessons as a child.	Tom is a good swimmer (150 ms pause), because he took lessons as a child.
b) Tom is a good swimmer \!p300, because he took lessons as a child.	Tom is a good swimmer (300 ms pause), because he took lessons as a child.
(c) Tom is a good swimmer \!p100, because he took lessons as a child.	Tom is a good swimmer (100 ms pause), because he took lessons as a child.
(d) Tom is a good swimmer, \!p300 because he took lessons as a child.	Tom is a good swimmer (150 ms pause), (300 ms pause) because he took lessons as a child.
(e) Tom is a good swimmer, because he took lessons \!p25 as a child.	Tom is a good swimmer (150 ms pause), because he took lessons (25 ms pause) as a child.

**Helpful Hints:** All voiced text is sent through the pre-processor except on the TTS playback feature when no pre-processor is selected.

It is not necessary to reboot or restart the VIP system or application after making changes to the substitution dictionary.

When saving the substitution dictionary to a floppy, the file name should remain mar\_root.dic, tom\_root.dic, javier\_root.dic.

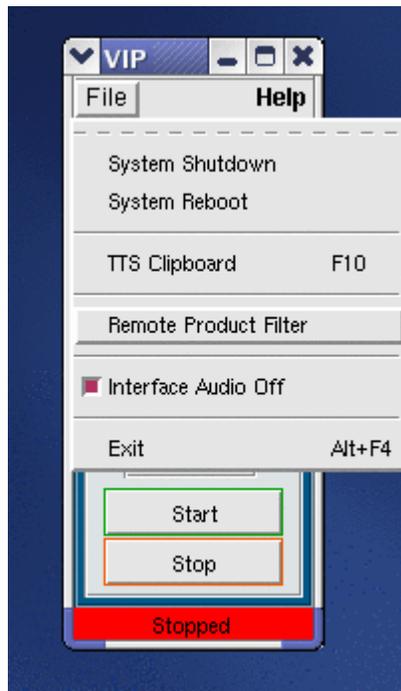
There is a simple search function found under Options on the menu bar. The search is simple in that only exact matches are checked against word entries. Using wild cards, or other standard searching techniques will result in a literal search.

Items already in the dictionary list can be pronounced by first selecting the desired word with a left click of the mouse button, then by selecting playback with a right click of the mouse button. The substitution pronunciation is used in the playback function.

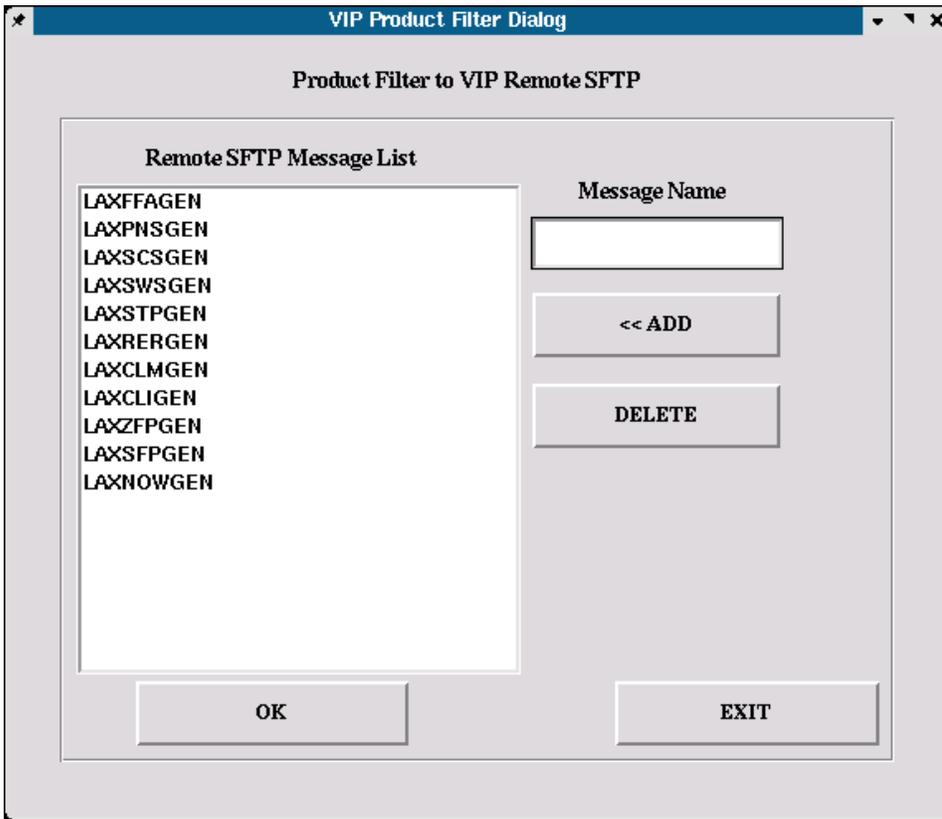
To switch voice types for the playback functions found on this interface use toggle switches in the options menu.

## PRODUCT FILTER TO VIP REMOTE SFTP

The “Product Filter” interface provides VIP administrator a tool that would allow sites to select specific Message Types for routing wave and mp3 files to the DS1 data servers.



Select *File* from VIP window then select *Remote Product Filter*



**Adding a message type:**

Enter Message Type in the text box for Message Name then click **Add** button

**Delteting a message type:**

Click on a desired message type from the message list then click **DELETE** button

**OK:**

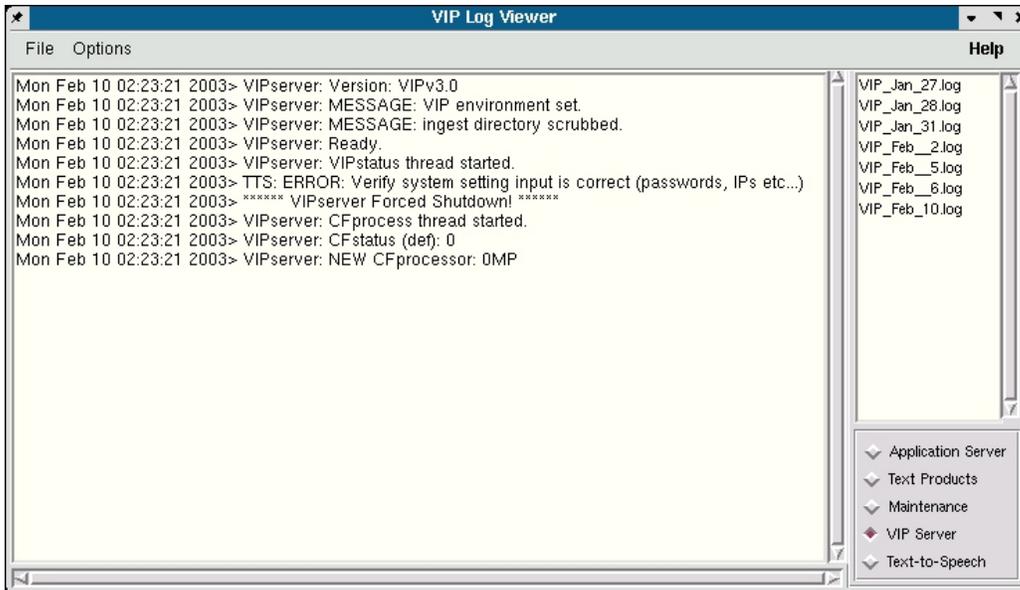
Select this option will save the current message list

**EXIT:**

Select this option will exit the *VIP Product Filter Dialog*.

## RUNTIME LOGGING / VIP SERVER LOGS

This interface provides an easy method of viewing the logs provided by the VIP application. VIP server logs will provide most of the information needed by field sites. VIP server logs are truly runtime logs providing life cycle information of each product passed through the VIP server, from the text product ingest to the audio transfer. Error and warning messages are also posted to these log files.



### Menu Bar

Along the top of the VIP Log Viewer interface are three pull down options: File, Options, and Help.

### File:

Under File is one of two provided methods to exit this interface.

### Options:

Two features reside under this menu option: System Snapshot and Remove All Logs. The system snapshot option will collect all the necessary information needed by a maintenance programmer to troubleshoot potential problems. For more information on this reference the troubleshooting section of this users guide. The second option Remove All Logs will delete every log file located on the hard disk.

### Help:

Help will load help pages specific to the interface where this options was selected.

## AUDIO PLAYER

An audio player was included to playback audio converted from products sent through the VIP system. Audio used by this feature is located at /crs/vip/db/products/audio/IVRaudio. File names are defined by the AWIPS key name found in the CRS header.



### The Menu Bar

Along the top of the VIP System Settings window is a menu bar containing two pull down menus: File, and Help.

To hear an audio file:

- 1 Select the open button found on the button bar, bottom left of the interface.
- 2 Double click the left mouse button on the desired audio file
- 3 Select the play button on the bottom left button bar.

Note: The VIP system incorporates a scrubber program that operates every 12 hours. It cleans several different directories ./CRS/VIP/db/products/audio/IVRaudio, CRS/VIP/db/products/audio/IVRaudio and /CRS/VIP/db/products/audio/CRSaudio are included among the directories cleaned by the scrubber function.

## APPENDIX A

This appendix contains Speechworks documentation on:

Standard Text Normalization, Chapter 3

Embedded Tags, Chapter 4

Symbolic Phonetic Representation (SPR), Chapter 5

Remember the VIP application will add the , (comma) separator and \![ ] required by dictionary entries using SPR.

These chapters provide further explanation of Speechify operation. They can be used to design in-line text controls for additional pronunciation control.

## APPENDIX B

This appendix contains the Speechify English Language Supplement documentation for:

Standard Text Normalization, Chapter 3

Embedded Tags, Chapter 4

Symbolic Phonetic Representations, Chapter 5

## APPENDIX C

This appendix contains the Speechify Mexican Spanish Supplement documentation for:

Embedded Tags, Chapter 3

Symbolic Phonetic Representations, Chapter 4