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ScadaPhone Wav Phrase Organizer

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OVERVIEW:

After utilizing one of **ScadaPhone**'s **Alarm Browsers** or **Project Converters**, the construction of the **voice audio files should be analyzed for simplification** especially if a **Text To Speech** (**TTS**) generator is used to generate the voice files used by ScadaPhone.

It is important to have a high quality audio output for alarm messages for clarity.

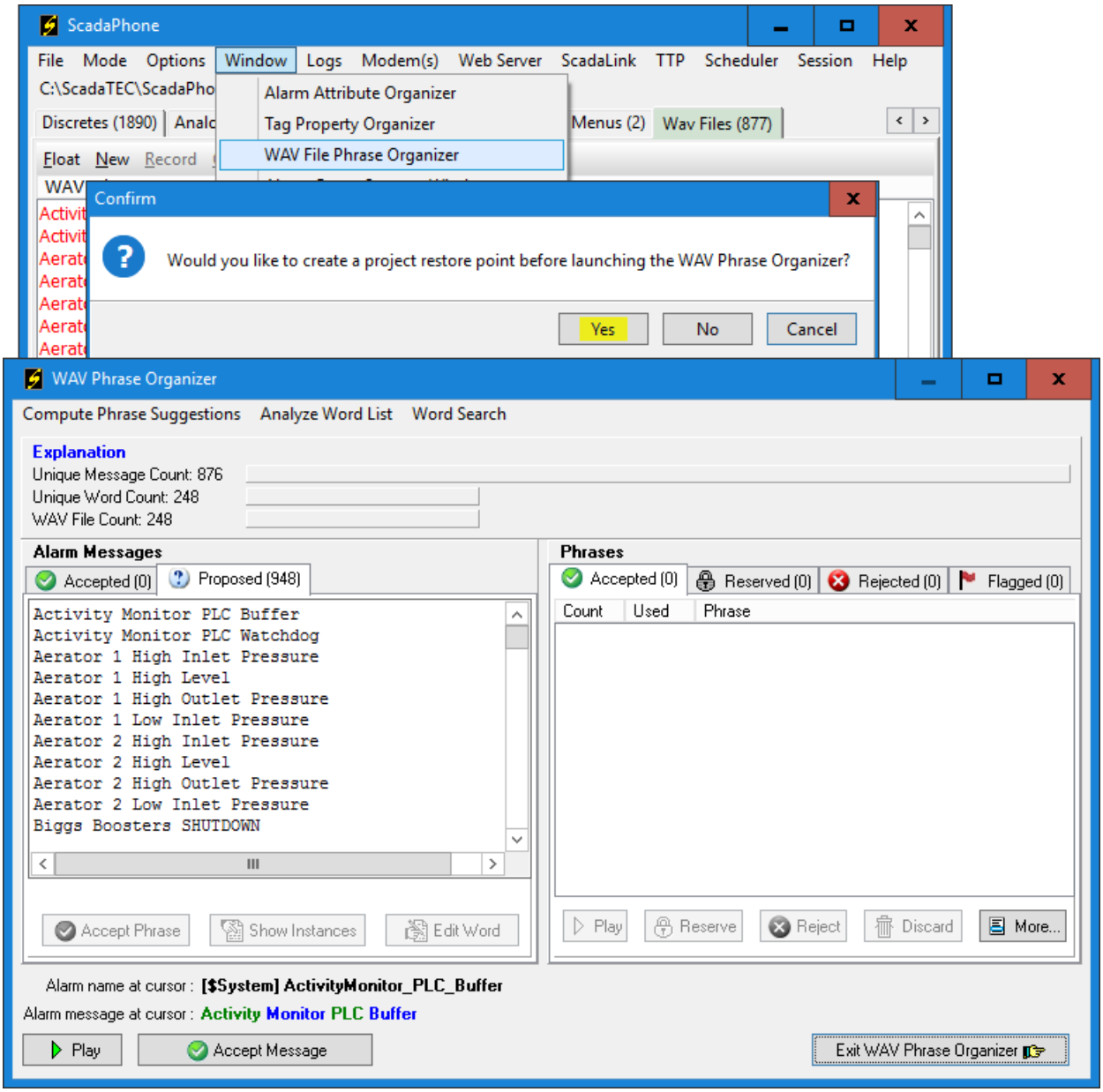
Segmenting messages into logical phrases makes the messages more homogeneous and easier to understand.

ScadaPhone implements a **Wav Phrase Organizer** to facilitate this process. This document gives step-by-step instructions on its use.

Note: Before proceeding, it is strongly suggested that the **Audio Devices Options** settings (under the **Options** menu on **ScadaPhone**'s main window) be set to **Use Soundcard When Possible**. Otherwise, you will be unable to hear **TTS** word renderings in the following steps.

Opening the Wav phrase Organizer

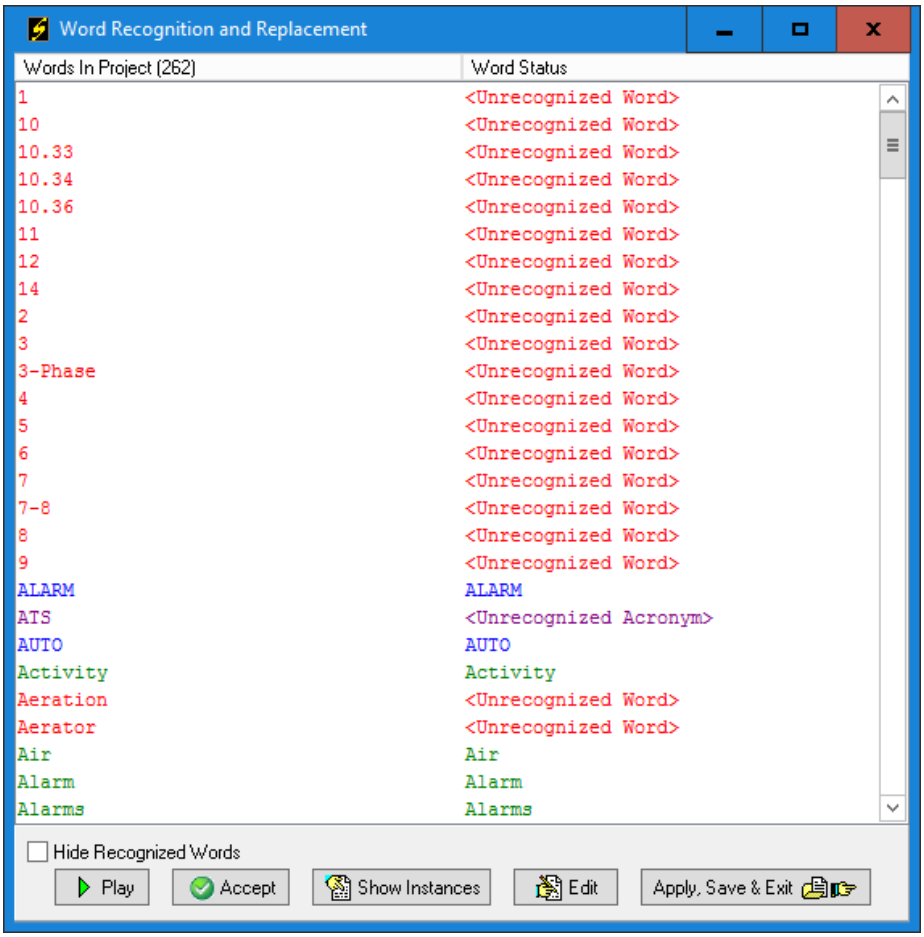
To access the **Wav Phrase Organizer**, click the **Window** pull-down menu on ScadaPhone's main window. Before entering the **Wav Phrase Organizer**, a prompt to create a **Project Restore Point** will be displayed; it is a good idea to create a restore point just in case the **Wav Phrase** editing goes awry; click **Yes** to proceed. This action creates a backup file of the project with the letters (RP) in the file name. RP stands for Restore Point.



The **Wav Phrase Organizer** breaks all of the alarm voice messages into individual words and facilitates the process of identifying words which will be problematic when rendered through **Text To Speech**.

Word Recognition and Replacement

The first function that should be done when starting this process is a complete inspection of the **Word List**; click the **Analyze Word List** menu item to open the **Word Recognition and Replacement** window:



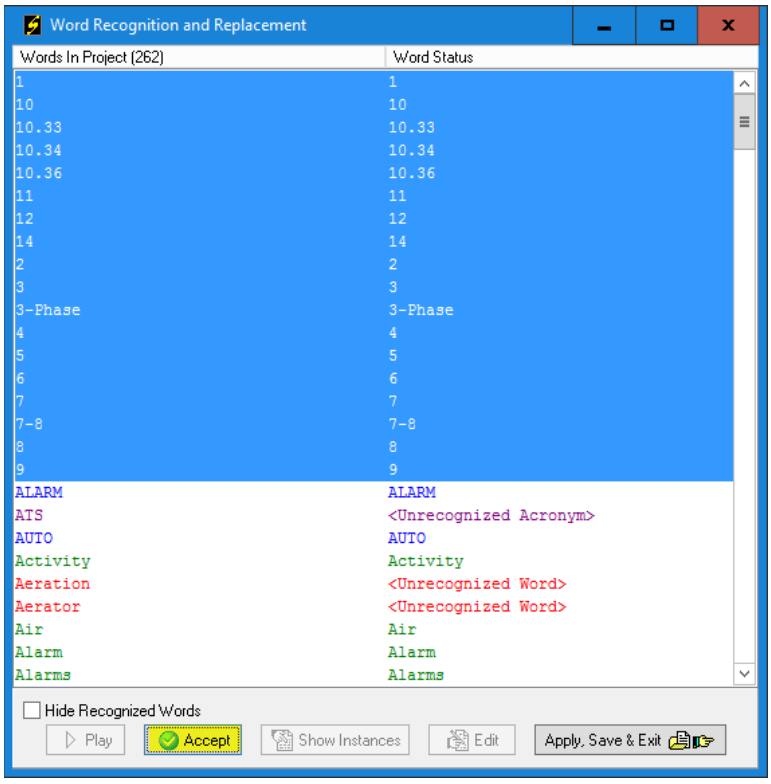
Note that the list of words will usually start with a lot of **numbers** before the alphabetized list of actual **words.** Declare simple integers are listed as **Unrecognized**.

To hear how **TTS** will render the words in this list, highlight the entry in question and click the **Play** button.

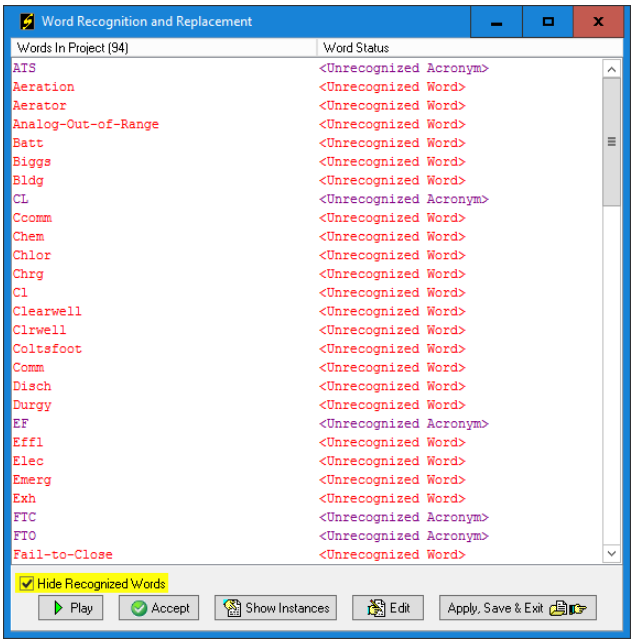
Another reason for examining all of the numeric references is to alter the way numbers such as **105** are pronounced: It may be preferred to pronounce numeric phrases like **Room 105** as "***room one o'five***" rather than "***room one hundred and five***" (which is how **TTS** will render **Room 105**).

Accepting Numeric Entries / Hide Recognized Words:

Most numbers can be accepted as they are; to accept all of the numeric entries, highlight the whole block using **Shift-Left-Click** and click the **Accept** button:



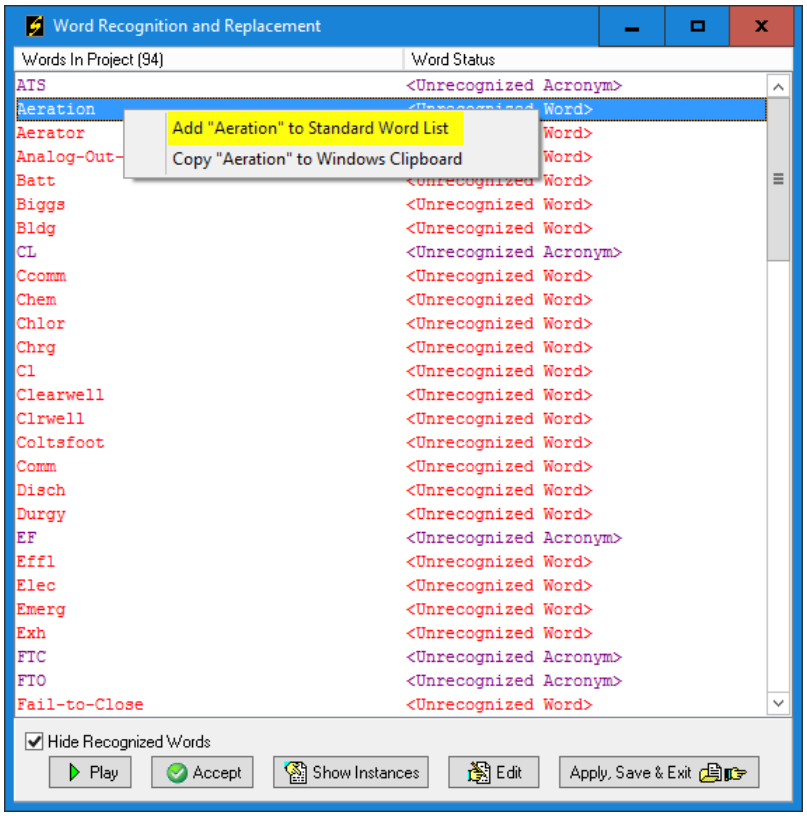
Note that all of the **recognized** words are shown in green font; if you would like to reduce the size of the list so that only the **unrecognized** words remain visible, click the **Hide Recognized Words** box:



Accepting Valid (Unrecognized) Words

Note that there may be numerous words in this list which are actually ***valid*** words. They are only listed as ***unrecognized*** because they do not yet exist in the **WordList.txt** file in ScadaPhone's program-file folder.

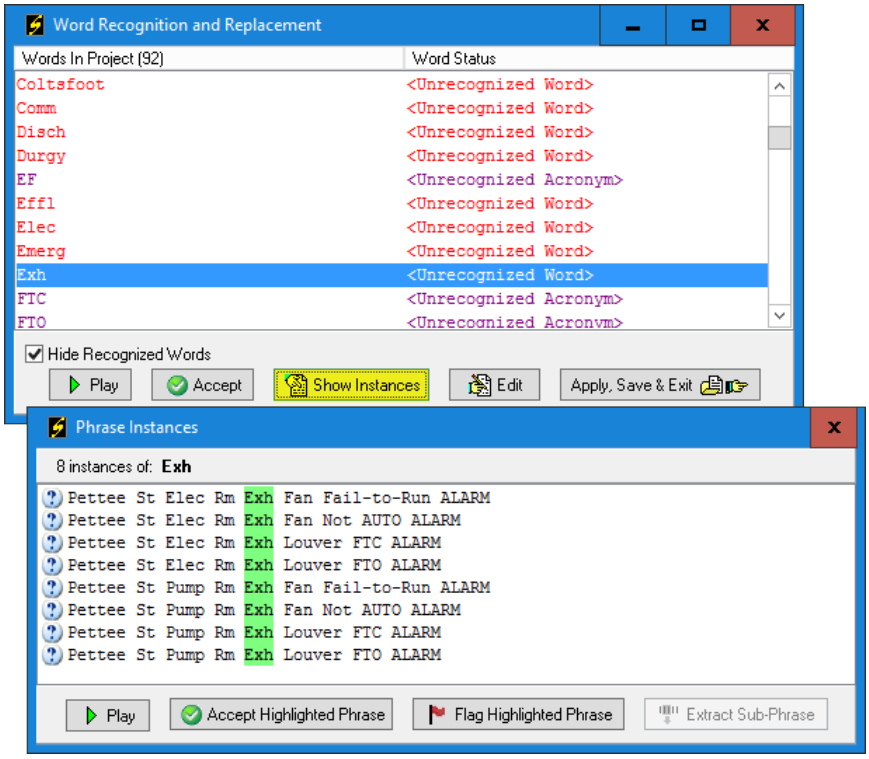
Valid words can be added to this list by ***right-clicking*** the valid word and selecting **Add "word" to Standard Word List** from the pop-up menu.



All remaining words should be tested to hear how TTS will render them. If the uncommon name of a **street** or **town** is encountered, and it is rendered sufficiently well through TTS, simply **Accept** it.

Showing Words In Context:

To improve recogistion of fragmented or abbreviated words it is helpful to view the context in which it is used. To see all messages in which a word-fragment occurs, highlight the word and click **Show Instances**:



In the previous image, the **Exh** abbreviation stands for **Exhaust.** The problem is that the **TTS** generator has no way of knowing that. The resulting audio would be unintelligible over the phone.

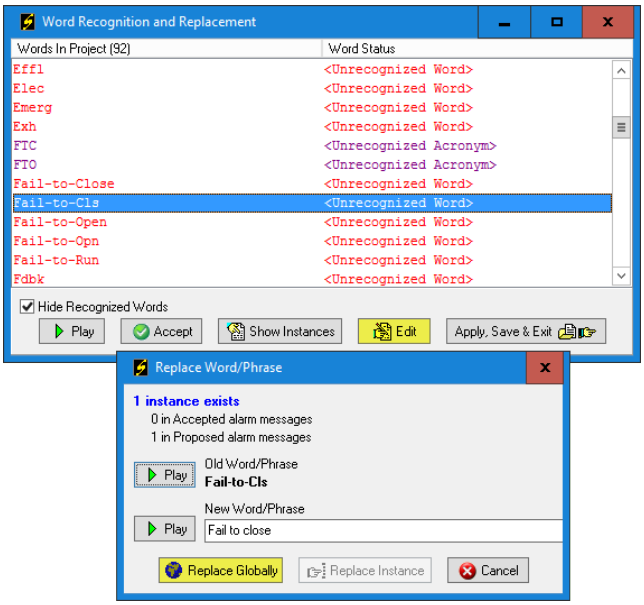
If still unsure about a word after seeing it in the **Show Instances** context, simply **Accept** it for now and it can be dealt with later.

Note that this window makes a distinction between **Acronyms** and **Words**; TTS usually spells-out acronyms letter-by-letter. If the acronym actually spells a *valid word* or is a common acronym (such as **CL** for **Centiliters**) the TTS generator may enunciate the word instead of spelling it out. If this happens, the letter-by-letter enunciation can be forced by **inserting spaces between the letters**.

For all abbreviations and misspelled words which need to be changed into a valid word TTS can recognize, **editing** is required.

Editing Invalid Words

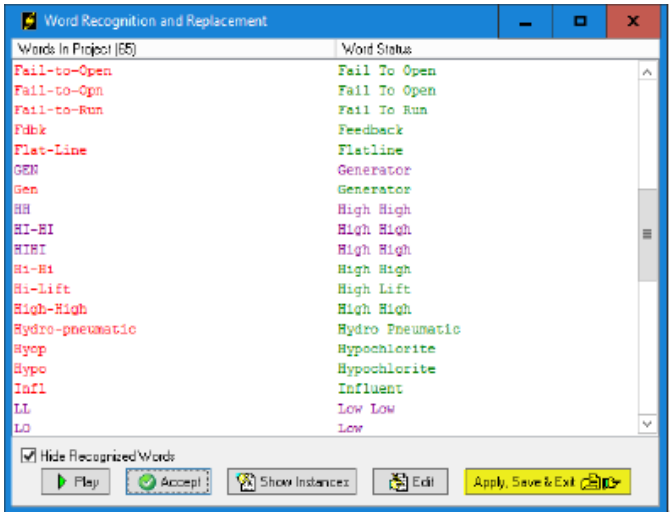
To change all instances of invalid fragments into valid words, highlight the list item and click the **Edit** button:



The **Edit** button opens the **Replace Word/Phrase** window. In this window, a replacement phrase can be entered into the edit box and you can verify that the replacement will be rendered correctly via TTS by clicking the **Play** button and listening to the result. When a suitable replacement has been entered, click the **Replace Globally** button.

Upon returning to the **Word Recognition and Replacement** window; note that the **New Word/Phrase** from the editing window will appear in the **Word Status** column.

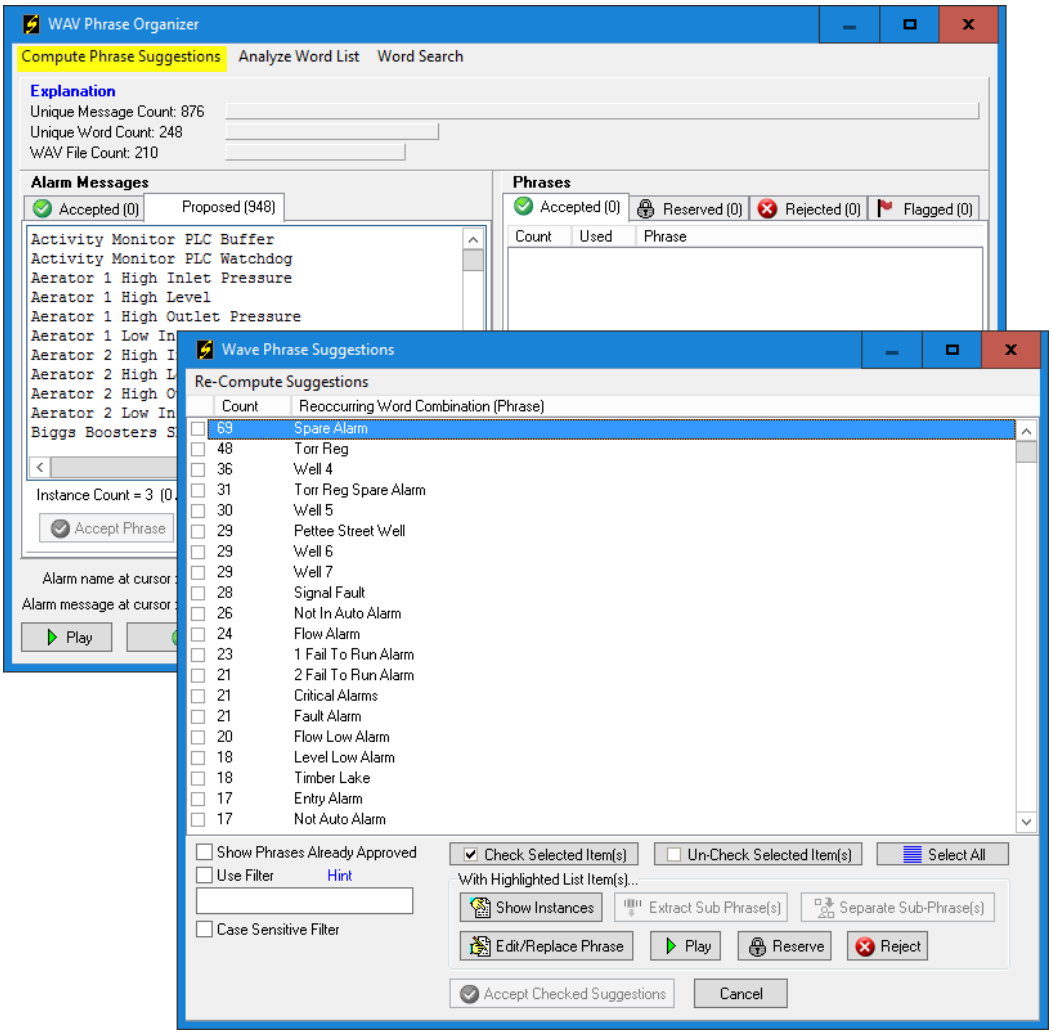
After all of the unrecognized words and acronyms have been **accepted** or **edited**, there should be no red items remaining in the **Word Status** column. At this point, click the **Apply Save & Exit** button.



Selecting Phrases

After closing the **Word Recognition and Replacement** window, you will be returned to the **Wav Phrase Organizer** window; the next phase of this process is to pick the best reoccurring-phrase collection to minimize the wav file count and produce the best audio results for the sake of clarity when reporting the alarm messages over the phone.

A good first step in this process is clicking the **Compute Phrase Suggestions** menu item:



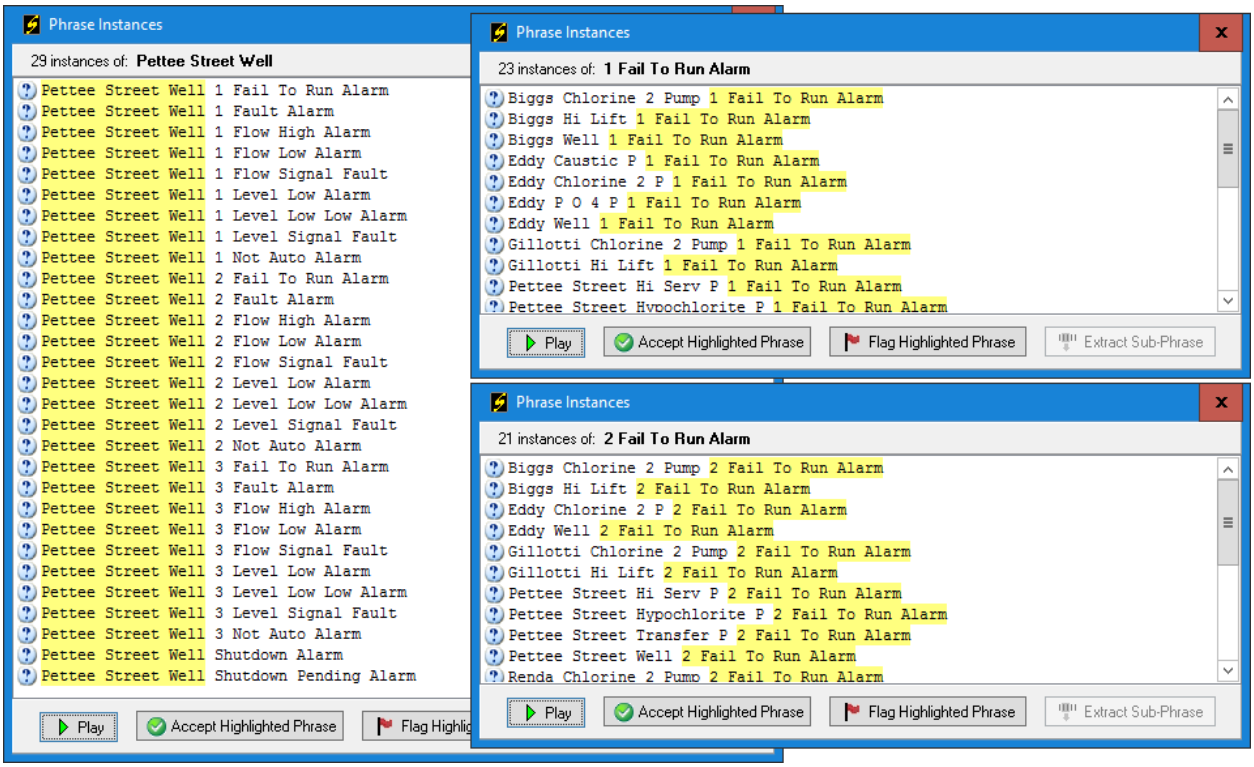
This list is ranked by number of **Reoccurring Word Combinations.** In this case, the phrase "**Spare Alarm**" was found **69** times. This is an indicator that there may have been some extraneous alarm definitions imported from the **DB Dump** file. The extraneous alarms can be removed later.

Note that some familiar buttons (**Show Instances**, **Edit**, **Play**) previously seen in the **Word Recognition and Replacement** window are also available on the **Wav Phrase Suggestions** window (and on the **Wav Phrase Organizer** window too).

The **Show Instances** button is especially helpful on this window because it helps you make decisions about which high frequency phrases to **Accept** or **Reject**.

Start by placing a check mark next to all of the obviously good phrases, but refrain from checking the phrases which you are unsure about. The **Re-Compute Suggestions** menu item can be clicked after each group of good phrases have been accepted. Some phrases occur with high frequency, but are poor choices logically; these can be **Rejected** and they will no longer be shown as a suggestion.

Here are some examples of high-frequency phrases which should be rejected:



The messages containing the "**Pettee Street Well**" phrase would sound better if they were spoken as:

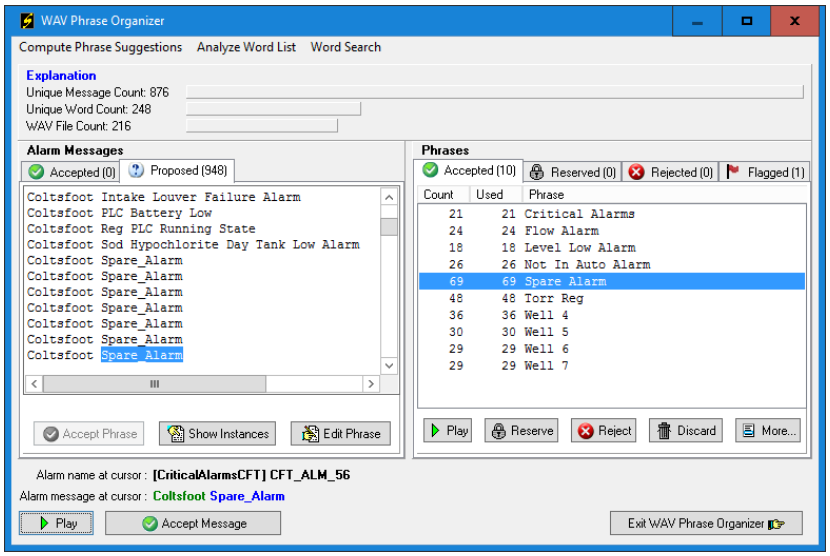
" ***Pettee street*** *<pause>* ***Well one*** *<pause>* ***Fail to run alarm***" …rather than:

" ***Pettee street well*** *<pause>* ***One*** *<pause>* ***Fail to run alarm***".

All of the '***Well 1'***, '***Well 2' … 'Well N***' phrases should be grouped together. Logically grouping the phrases makes a big difference in the clarity of the resulting message announcement.

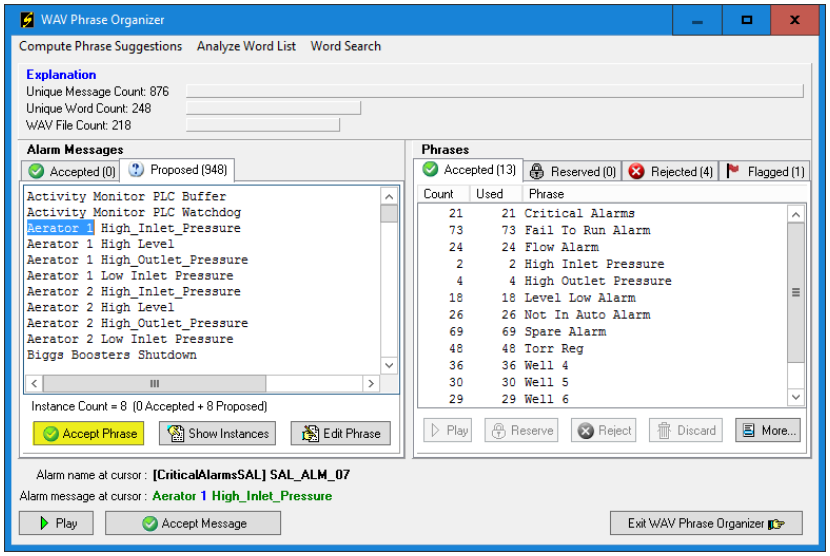
Accepted Phrases

After placing check marks next to several of the highest-ranked suggestions, click the **Accept Checked Suggestions** button and observe the changes made in the **Wav Phrase Organizer** window:



Repeatedly clicking items in the **Accepted** tab list will incrementally advance through the **Proposed** message list (highlighting each instance of the phrase being clicked). This reveals that all of the **Accepted** phrases are marked in the **Proposed** list by replacing the **blanks** between words with **underscores**; these underscores will not be included in the final product; they are only used here to show which adjoining words are linked into accepted phrases.

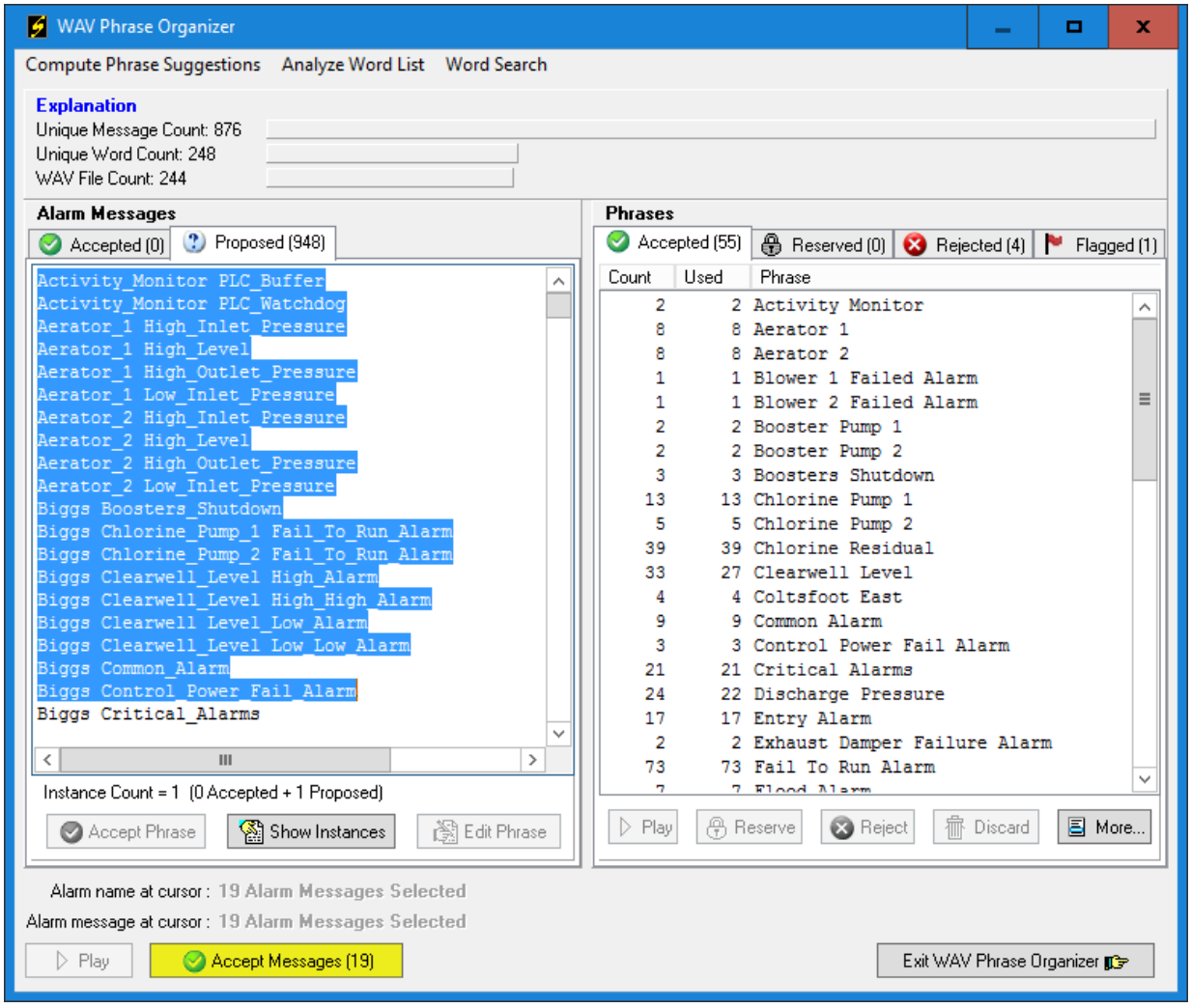
The **Wav Phrase Suggestions** window is one way to select phrases, but you can also select phrases ***manually*** by highlighting desired word groupings in the **Proposed** list and clicking the **Accept Phrase** button:



Accepting Messages:

Whenever the **Play** button is enabled, you can hear the current status of the phrase grouping for the alarm at the cursor and get instant feedback of how the phrase grouping is improving (or degrading) the cadence of the alarm message.

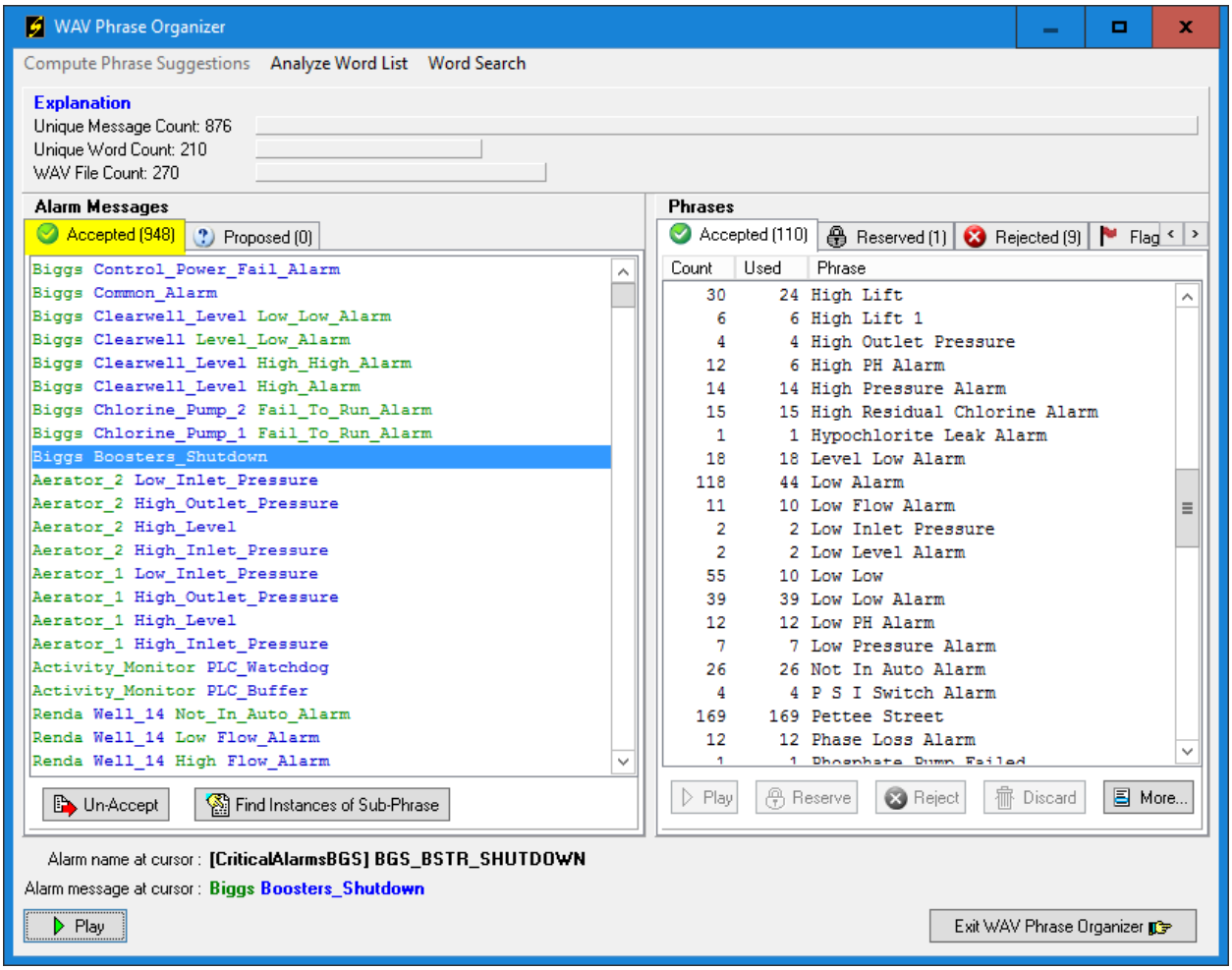
As more and more phrases are **Accepted**, the items visible in the **Proposed** list will begin to be completely marked up into acceptable messages; blocks of acceptable messages can be moved from the **Proposed Alarm Messages** list to the **Accepted Alarm Messages** list by highlighting one or more lines of the **Proposed** list and clicking the **Accept Messages** button:



Moving alarm messages into the **Accepted** list is the ultimate goal of this procedure; after all of the messages have been accepted, this process will be complete.

Accepted Messages

The **Accepted** alarm messages list shows a color-coded display of the phrase groupings which is easier to see than the underscore mark-up on the **Proposed** alarm messages list:

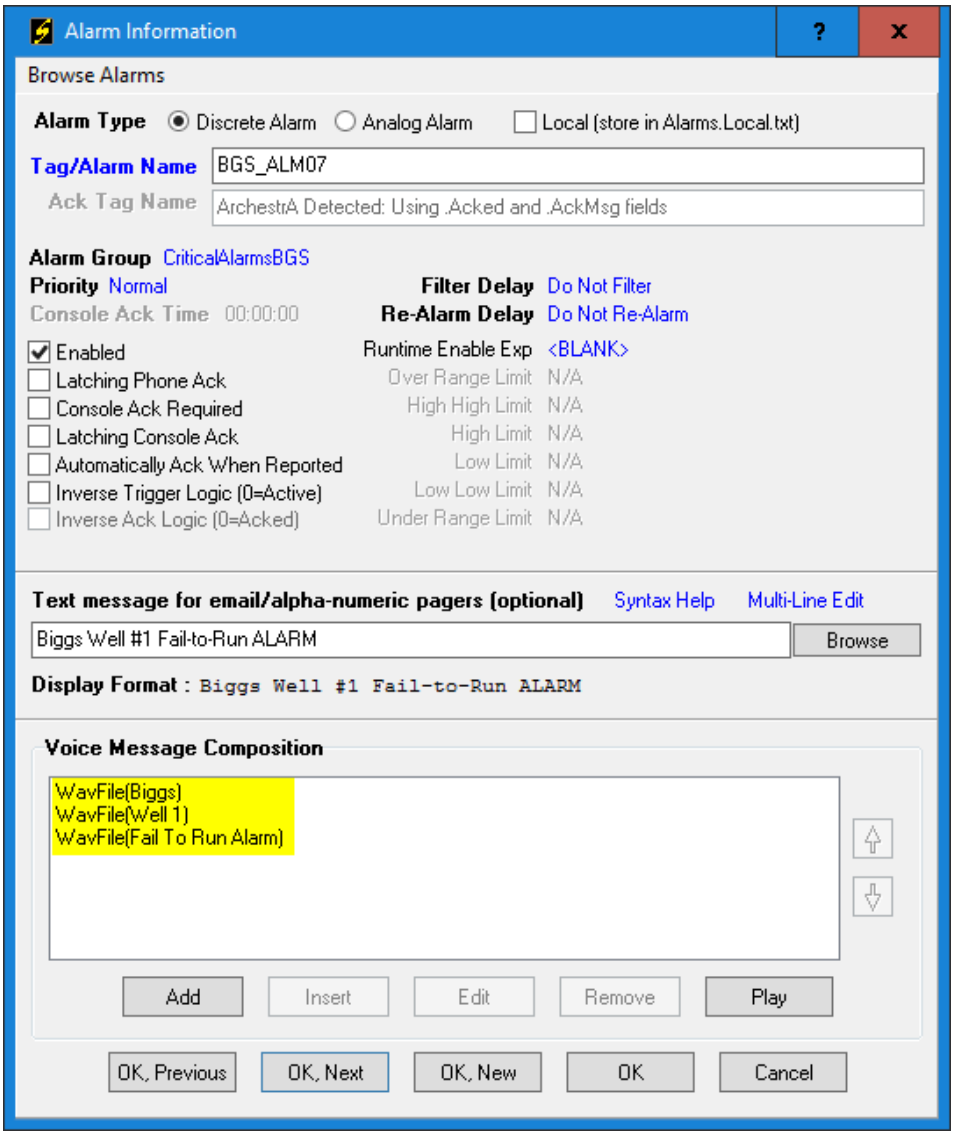


If you see any messages which need to be grouped differently, highlight them here, click the **Un-Accept** button and they will be returned to the **Proposed** list.

After all of the **Proposed** alarm messages have been **Accepted**, clicking the **Exit WAV Phrase Organizer** button will **write** all of the **Accepted message** constructions to the **Alarms** in the ScadaPhone project.

Review of Results

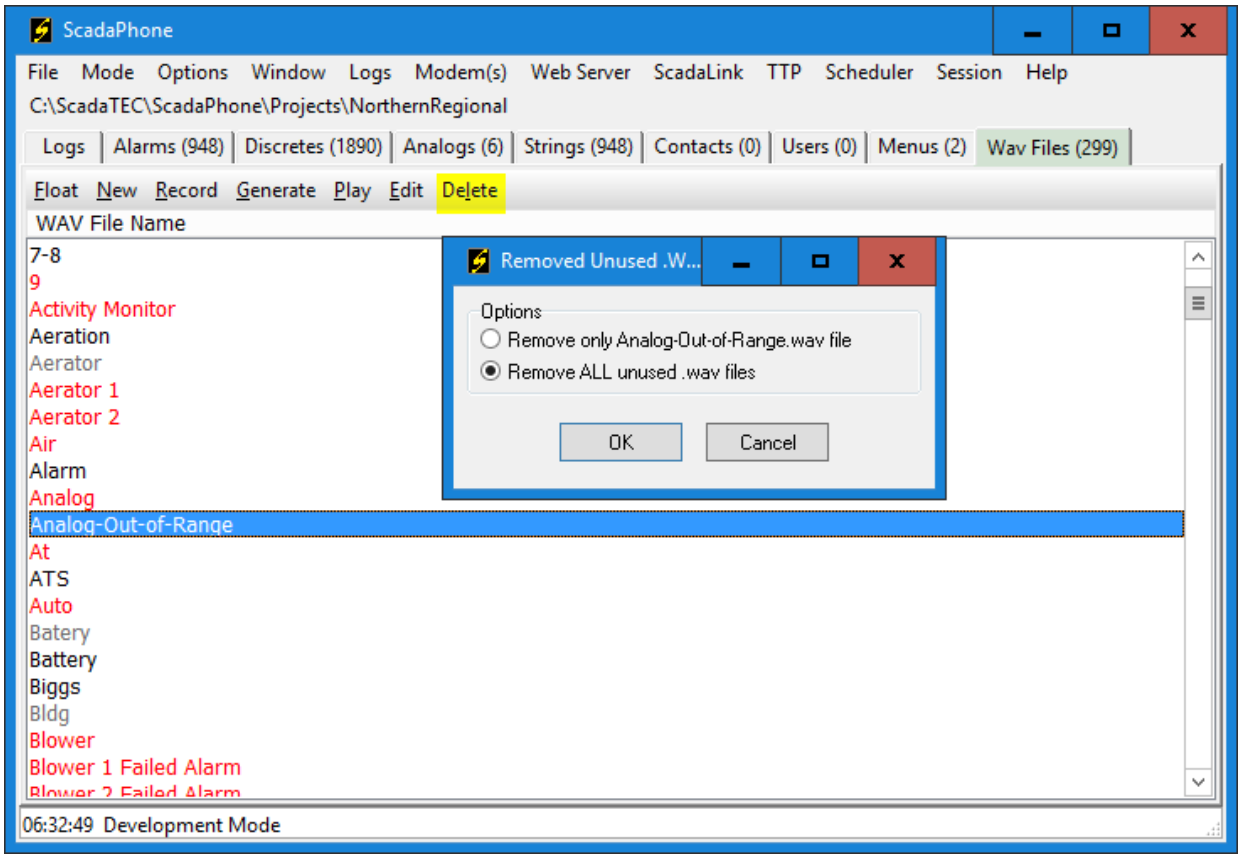
After exiting the **Wav Phrase Organizer**, click the **Alarms** tab of ScadaPhone's main window and double-click any alarm to examine the results of the **Wav File phrase grouping**:



Note that the **Voice Message Composition** now reflects the phrase grouping which was accomplished in the **Wav Phrase Organizer**. The alarm message used to consist of a *single* **WavFile** segment which had a name very similar to the **Text message**. It now has **3** WavFile segments which will render intelligibly via **Text To Speech**.

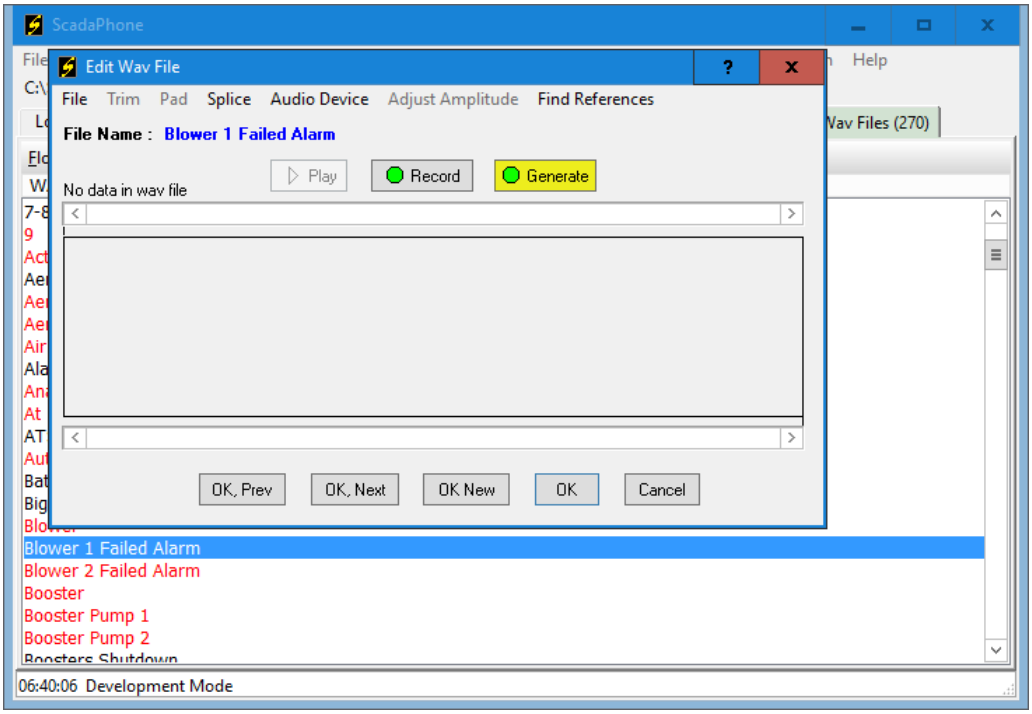
Wav File Removal

At this point, it would be a good idea to return to the **Wav Files** tab on ScadaPhone's main window and remove any unused wav files which were created during the **Wav Phrase Organizer** session and are no longer needed; in order to get the **Delete** menu item to become enabled, you must highlight any grayed-out (unused) wav file name:

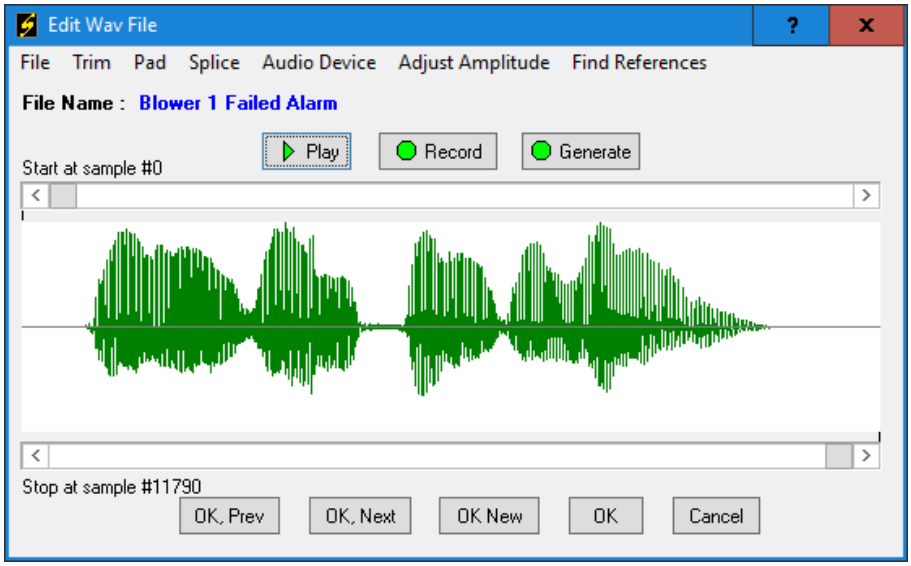


Wav File Generation

Wav file names being displayed in red font to indicate that the file name is being referenced in one or more of the project alarms, but the wav file for that message does not yet exist. If you want to step through the Wav File generation process, you could double-click any of the red items (which will open up the **Edit Wav File** window) and click the **Generate** button for each empty file (such as is shown below with the gray window center box):

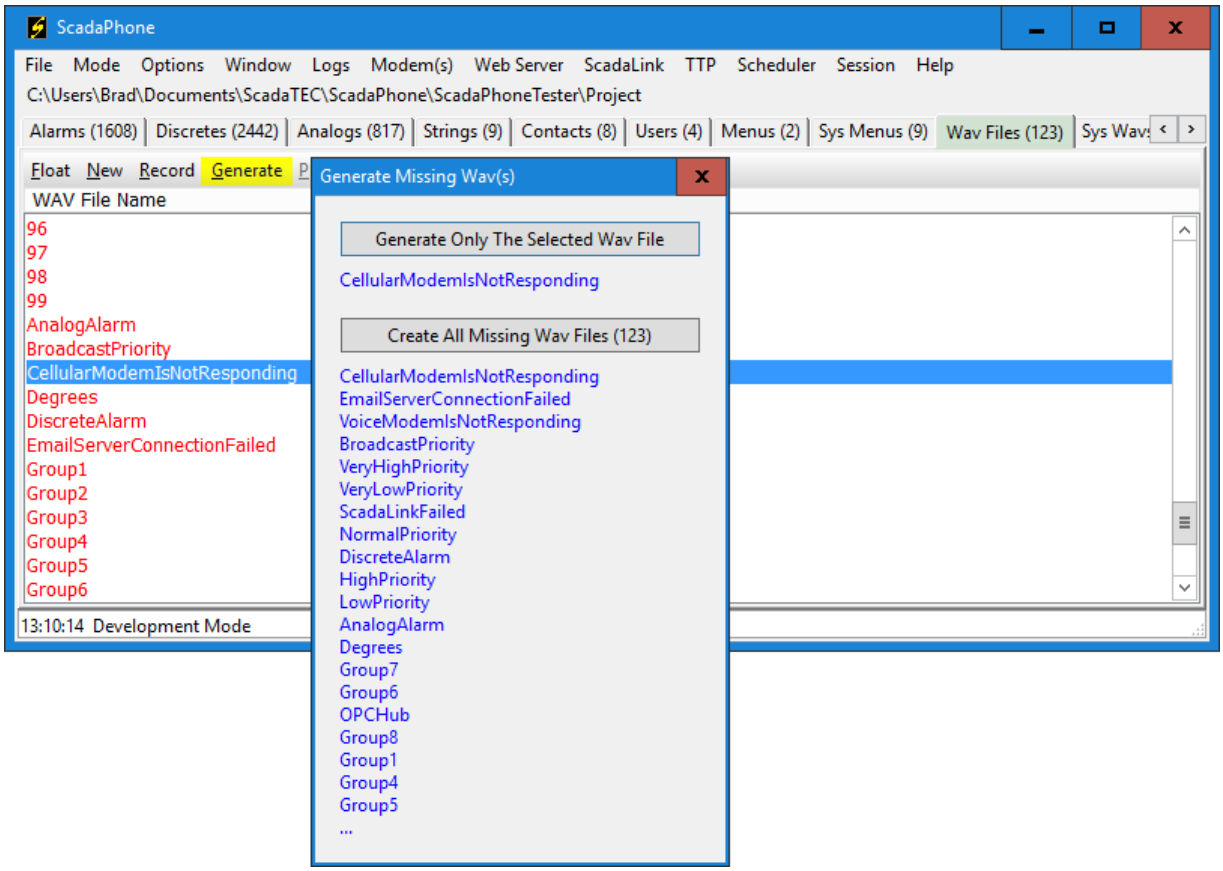


After clicking the **Generate** button, a wav graph will appear; this lets you know that this file has been successfully rendered by the **Text To Speech** generator.



To continue the manual-generation process, you could repeatedly click the **OK, Next** button and click **Generate** each time the "**Next**" file is displayed as an empty gray graph (meaning it doesn't yet exist); however, if there are more than a few dozen files to create, this is a very tedious process (but it does give you the chance to actually *hear* all of the rendered voice audio so that any problems missed while looking over the **Wav Phrase Organizer** results could be discovered).

A faster method to render all of the project wavs is to use the **Generate Missing Wav(s)** feature:



To enable the **Generate** menu item, highlight any WAV file name in the list; if an *existing* WAV file (black font) is highlighted, the prompt will *only* ask if you want to overwrite *that* file; if a *non-existing* WAV file name is highlighted (red font), the **Generate Missing Wavs(s)** window will be opened when the **Generate** menu item is clicked. Clicking the **Create All Missing Wav Files** button will create all of the required audio files.

After all of the necessary WAV files have been generated, the **Wav Phrase Organization** process is complete.