CRS IVR
User & Technical Documentation

CRS IVR Control Panel

File   Help

Wish List Displays
Wish List Options
Start/Stop Watchdog
OmniVox
NFS Mount to CRS

Version 1.01

Console Replacement System
Interactive Voice Response

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September 1998

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User Documentation

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1. SYSTEM OVERVIEW

1.1. What is CRS IVR

The CRS Interactive Voice Response (IVR) system provides residents a menu from which to select a wide range of weather related information. Callers can access any supported weather information from a touch-tone phone. The IVR platform currently uses computer generated text-to-speech technology to convert text weather products from CRS into audio and also converts CRS manually recorded files for distributed use. Once the text file has been converted into a usable audio format, its stored locally and if applicable the system automatically dials up remote locations updating products to the latest information provided from CRS. In addition, the system contains the ability to fax, page or call selected personnel be it weather employees, spotters or emergency management. Although these capabilities exist they will not be implemented in version 1.0.

1.2. How does CRS IVR Work

The CRS IVR system runs under a Microsoft Windows NT 4.0 based operating system (See Section 1.3 *Design Considerations* for further details). The physical computer will become part of the AWIPS network through a 10BaseT Ethernet connection and logically connected to either CRS main processor (0MP or 5MP). Read only file sharing is conducted against the CRS database to obtain products and other database information. This file sharing is accomplished through NFS client software residing on the CRS IVR machine. The NFS mount, along with appropriate search software allows the IVR system to perform network file sharing over the AWIPS network. All other aspects of the system are self contained and managed on the Voice Response platform. Industry leading Dialogic hardware/software, an advanced application generator with Graphical User Interface, fax, and text-to-speech technology have all been incorporated into the platform. All applicable utilities have been included for file conversion, backup & recovery and remote access administration. CRS IVR was configured to meet the initial application requirements as defined by Western Region Headquarters and prepared for future upgrades of advanced technologies if so desired.

The ability to convert a text product into wave file format using text-to-speech synthesis, or utilizing manual made CRS audio files depends first on access to the product. This is accomplished via integration software created to interface between CRS and CRS IVR. Below are the basic steps incorporated into the IVR platform which accomplishes the main objective.

1. CRS IVR system goes off-hook and allows callers access to a menu driven application providing the latest weather and information broadcasts.
2. In addition to taking calls, the system continually accesses CRS via the

AWIPS network and its NFS client software. Utilizing specifically designed search programs the system looks for products with the latest content located on CRS, and retrieves these items into its local database.

3. Once retrieved the CRS IVR system determines by extension whether the products are text based or manually made wave file format.

4. Wave files are sent to a utility for conversion into a usable telephony format and do not access any text-to-speech technology.

5. Simultaneously text files are input into the text-to-speech utility for synthesis into a wave/audio file format.

6. Once a conversion is complete the system routinely populates the application with the appropriate audio file for caller access. Based on header information provided by the CRS IVR administrator, the IVR platform dials out remote devices accordingly.

1.3.   Design Considerations

CRS IVR is run under a WIN NT 4.0 workstation environment. The initial design was to develop a system that closely paralleled the CRS structure, utilizing a UNIX 2.03 platform and associated DECtalk hardware/software, maintaining the audio format and upholding networking consistency. This design was short lived and the NT operating system adopted to cover industry standards held by the telephony community. This option then allows upgrading to either concatenated or improved text-to-speech technologies in a cost effective manor with minimal implementation effort.   The NT operating system also provides a user friendly environment familiar to most people, thus eliminating the need to learn a new platform.

Original design specifications did not require that CRS IVR be utilized as a means to disseminate critical weather products such as severe weather. WatchDog software was organized to query the CRS database and retrieve unprioritized products on a two minute interval. This structure is less effective for warning dissemination, but well within reasonable guidelines for processing non-critical weather information. Despite this restriction the system if fully capable of supporting any products defined in the operational CRS database, including both critical and non-critical items. Future design implementations could certainly incorporate such a function if a need is recognized.

Recognizing the need to design a system capable of keeping pace with dynamic changes associated with the telephony industry, several off the self products were incorporated into CRS IVR. These products are highly recognized and affiliated with industry leaders throughout the IVR community. Some third party software employed are among the following: AcuVoice synthetic speech technology AV2001, Hummingbird NFS Maestro Solo mounting software, ISI Audio Toolbox Digital Processor & Converter, APEX Voice Communications OmniVox graphical user interface, and Dialogic hardware for interface between analog phone lines and telephony software. The key link between all

the above items and CRS is held in the integration software provided on each system. Fifty one separate executable files makeup the bulk of this software.

Due to the engineering of unrelated software packages designed to work as one unit, a systems integrator was partially utilized. Government Micro Resources (GMR) was contracted for support in production assembly of each new unit and as telephony consultants providing input into the latest technologies available within this industry. GMR also supported the robust dial out capabilities run under the OmniVox telephony software.

Finally, the CRS IVR system needs to run in conjunction with AWIPS. Utilizing this system with AFOS and any formatter programs unrelated to the AWIPS structure could result in functionally imperfections.

1.4. Requirements

Phone lines utilized for both incoming and out going processes **MUST** maintain an analog configuration and accommodate hook flash capabilities. Hook flash compliance will allow blind transfer functionality, making direct access to operational personnel possible and simultaneously freeing the occupied phone line for continues use. Unfettered access to phone lines increase throughput allowing greater use of system resources.

System software assumes all products contained within the CRS database (.ASC) of a length 7 to 9 characters. To differ from this structure will cause a runtime error labeling converted audio files incorrectly, in turn corrupting the CRS IVR database.

1.5. CRS IVR Setup Overview

The following are general steps needed for the initial setup of CRS IVR. For complete details on a specific task, consult the provided reference.

1. Connect a 10BaseT Ethernet cable between AWIPS and the IVR Platform.
2. Connect phone lines to IVR Platform.
3. Assign CRS IVR IP address in CRS - section 3.1. & 3.2.
4. Define CRS IVR IP address - section 3.3.
5. Prepare CRS */etc/dfs/dfstab* file for file sharing - section 3.4.
6. Logically connect NFS mounts between CRS & IVR platform - section 4.1.5.
7. Develop local phone tree. Consult the *APEX Voice Communication* book.
8. Build CRS IVR wish list - section 4.
9. Start WatchDog - section 4.1.3.
11. Turn on phone connections - section 5.2.

2. SECURITY CONCERNS

The issue of system security was also addressed on the CRS IVR platform. Several different steps were taken to insure a secure system. First, the CRS IVR platform contains an IP address associated within the AWIPS network. This configuration allows for the same security associated to the network and protects against outside intervention through the IVR platform. Second, direct CRS intervention through NFS client software was also confronted. This logical connection between CRS and CRS IVR is configured as **read only** on both systems.   This redundant configuration will prohibit direct or indirect tampering of CRS file structure from CRS IVR. Finally, incoming calls through Dialogic cards contain no direct access to system file structure and only allows the caller admittance to voice prompts rendered by the OmniVox software.

3. PREPARING CRS

Some preparation of CRS is necessary to correctly integrate the telephony machine into the AWIPS/CRS networks. These tasks include giving CRS IVR an acceptable IP address compatible with the network and preparing specific directories on CRS for file sharing.

3.1.   Representing CRS IVR IP Address on CRS

Each station will have a unique IP address containing an AWIPS/CRS subnode structure. The following is a list of IP addresses that make up the CRS local area network. The red highlighted address could support a possible IP address for a local system.

CRS IP Address	CRS Machine Alias
165.92.xxx.110	CRSIVR
165.92.xxx.111	0MP
165.92.xxx.112	5MP
165.92.xxx.113	1FEP
165.92.xxx.114	2FEP
165.92.xxx.115	3FEP
165.92.xxx.116	4BKUP
165.92.xxx.1	as1
165.92.xxx.2	as2

The 165.92 is the subnode indicating the AWIPS network while the xxx pertains to the local office. The last number represents the CRS machine as it pertains to the above example. With this in mind CRS IVR was given an IP address of 165.92.xxx.110 which will not interfere other machines on this network. For further information on IP addressing consult the local AWIPS and/or CRS administrator.

3.2.   Adding CRS IVR IP Address to CRS

The following steps will walk you through the CRS IVR IP address setup pertaining to CRS:

1. Log into CRS as root from the main login screen. This is done on either CRS main processor (0MP or 5MP).
2. Click the icon marked Admin_Tools
3. Click the icon marked Networking
4. Click the icon marked Internet_Setup

From here select *add* on the menu bar, enter the IP address, click *save* and then exit the entry window.   There are other ways to acknowledge IP addresses and those fluent in the UNIX operation system may prefer an alternative method. Conducting the above steps is the recommended option, remember this is UNIXWARE 2.03 and altered for a specific use.

3.3.   Defining IP Address on CRS IVR Platform

To define an IP address on CRS IVR follow the steps below:

1. Click the *Start* key
2. Click *Settings -> Control Panel*
3. Click the *Network* icon
4. From the top tab keys choose Protocols (3rd tab item over)
5. Double click the TCP/IP Protocol
6. Enter your intended IP address in entry one
7. Enter the submask as 255.255.255.255
8. Default Gateway entry will be the same IP address as step 6
9. Click on the *OK* button then reboot the system to apply the changes.

3.4.   Preparing CRS For File Sharing

The telephony integration software expects access to select portions of the CRS database. Two directories distinctively targeted are */crs/data/DB/components* and */crs/data/SS*. To Utilizing the files identified with these directories, file sharing must be achieved. Using the *vi* editor on 0MP and under a super user login from the UNIX command line edit the */etc/dfs/dfstab* file. Add the following two lines to the bottom of this file:

share -F nfs -o ro -d "crsivr DB items" /crs/data/DB/components
share -F nfs -o ro -d "crsivr DB" /crs/data/SS/

Notice for security reasons **ro** stands for read only. Opening the shared directories as read only insures a first level of protection against unwanted adjustments to CRS files through the IVR system. An example of the *dfstab* file is provided on your CRS IVR machine in the following location: *c:\crsta\DB\tbls\CRS dfstab* or reference Figure 1.

```
#!/sbin/sh
#        Copyright © 1990, 1991, 1992, 1993, 1994 Novell, Inc. All Rights Reserved.
#        Copyright © 1984, 1985, 1986, 1987, 1988, 1989, 1990 Novell, Inc. All Rights Reserved.
#         All Rights Reserved
#        THIS IS UNPUBLISHED PROPRIETARY SOURCE CODE OF Novell Inc.
#        The copyright notice above does not evidence any
#        actual or intended publication of such source code.



#ident    "@(#)/etc/dfs/dfstab.sl 1.1 UW2.01 02/07/95 27194 NOVELL"
#ident "$Header: rstab.sh 1.2 91/04/26 $"
#        place share(1M) commands here for automatic execution



#        on entering init state 3.
#
#        share [-F fstype] [ -o options] [-d "<description>"] <pathname>
#        .e.g,
#        share -F nfs -d "/var/news" /var/news
share -F nfs -o ro -d "crsivr DB items" /crs/data/DB/components
share -F nfs -o ro -d "crsivr DB" /crs/data/SS/
```

FIGURE 1 - Example of modified */etc/dfs/dfstab* file for both 0MP and 5MP.

Once the *dfstab* file is adjusted on 0MP repeat this process again for 5MP. After accomplishing the *dfstab* file alterations on both CRS main processors, execute the file sharing process. This is done by typing ***shareall*** as super user at the command line prompt on 0MP.

Note: Before moving on confirm no file permission alterations took place on either */etc/dfs/dfstab* or */etc/dfs/sharetab* files affiliated with both CRS main processors. The original file permissions are: **-rw-r--r--**. Inspecting this assures a minimal effect to CRS.

4. CRS AND CRS IVR INTEGRATION FUNCTIONALITY

4.1. CRS IVR Main Control Panel

CRS IVR Main Control Panel is the main link and launch pad for the entire CRS IVR system. From here all necessary functions can be carried out by the system administrator. The icon for executing this program is found at the bottom right corner of the desktop. If for some reason the shortcut is not present the original file can be found at *c:\crsta\bin\crsta.gph* and launched from there.

Figure 2: CRS IVR Main
Control Panel

4.1.1. Wish List Display
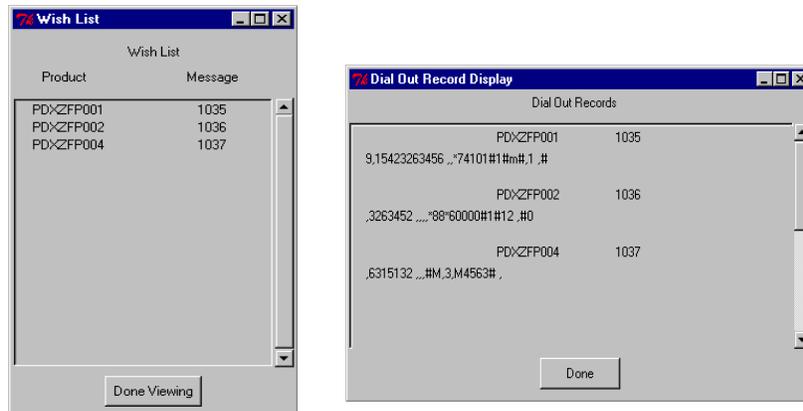
Figure 3 - User Defined Wish List Displays

The wish list displays provide a graphical window of desired products defined by the system administrator. Also provided are the dial out records for those items that update remote devices. No wish list alterations can be conducted from this section. To make changes consult section 4.1.2. of this document.

> **Note:** Wish list displays may update slowly depending on the operation performed on the lists. In some cases new graphical displays take several seconds to reflect changes.

4.1.2. Wish List Options

This selection allows the administrator to manipulate wish list items into different forms that suits the office needs. Enacting this option will open a radio check box window allowing different modifications to be conducted against the IVR wish list - see figure 4. Options include the following: 1) Initial wish list setup 2) Update current wish list 3) Edit current dial records 4) Remove item from wish list 5) Remove record from dial out.

By default *Initial wish list setup* is checked. To make your selection left mouse click on the desired operation and select *Ok*. A *Cancel* button is also provided to abort the window all together.
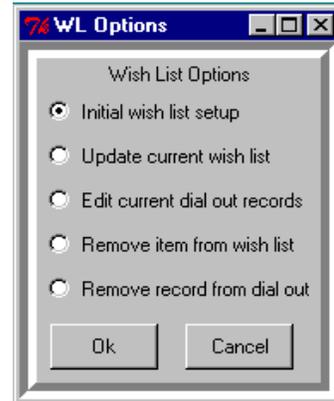
Figure 4- Wish List Options GUI.

4.1.2.1. Initial Wish List Setup

Initiating this function will destroy the present wish list configuration. Removing all files and processes associated with an old wish list configuration prevents corruption of the CRS IVR database.

When using this options its necessary to know which database CRS is being used operationally. This file would have been created by the local CRS administrator. An example file is the generic database *max9_CFG.ASC* provided by CommPower. When prompted, enter the operational CRS database file name in the entry box provided. If a valid database is recognized a window similar to figure 5 should appear. If not, check the trouble shooting section for a possible solution.

Note: The wish list setup GUI may open slow, especially for a large CRS database.

Figure 6- Initial Wish List Setup GUI

At this point, select each product desired for either incoming and outgoing procedures. This is accomplished by clicking with your left mouse button on the appropriate box in front of each desired item. A numerical digit for both a message number and a number of remote locations called is required for each selected item. The message number is simply a numeric file name ranging between 1000 to 8999 which identifies the CRS product name to the phone tree created with the OmniVox software. To define your numeric file name use the slide bar provided under the message number column associated with the selected product. If this item utilizes no dial out capabilities simply leave the dial out column as zero.   Otherwise use the slide bar provided to disclose the total number of remote locations called, for this specific item. For example, figure 5 shows the CRS product PDXZFP001 as a desired item. Its message number which associates the product to the phone tree is 1035. Also notice only one remote location utilizes the information provided by this product.

If dial out items are declared some information supporting this request is needed. Information such as the phone number of the remote device and navigational scripts which allow the IVR system to maneuver through the remote menu. To enter this data click on the *Define Dial Out* button located in the *Define Wish List* GUI. A window similar to figure 6 should open allowing the administrator to enter the expected navigational strings.

The first entry box is for the phone number of the remote location. The second is for navigational instructions revealing the location of where the audio file will be played. The last box supports any features need by the remote system after the audio file is played. If no end codes are needed leave this box blank. When all entries are complete press the *Apply* button to store the information.
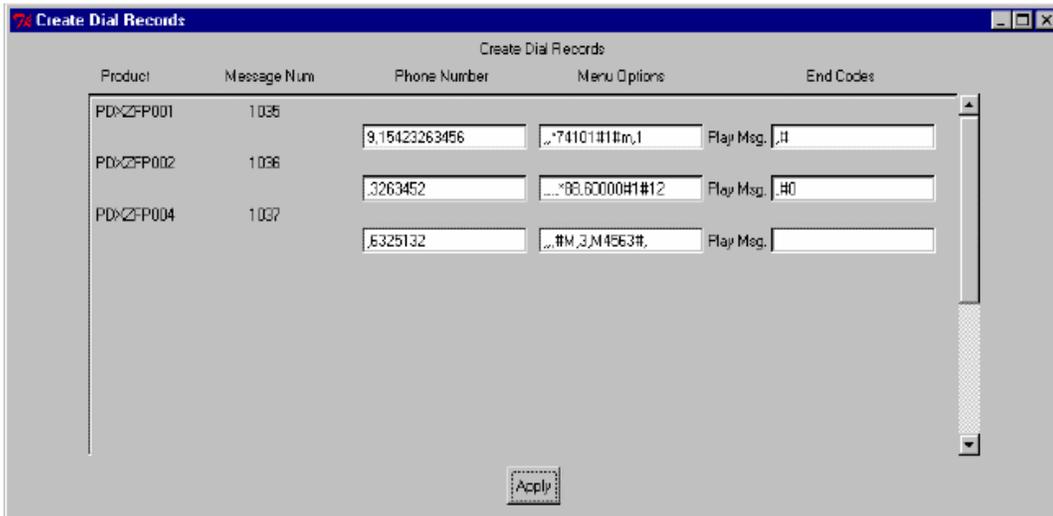
Figure 7 - Define Dial Records GUI

Note: The use of a comma in the dial out string reflects one a second time delay.

The final step after closing the dial out GUI, is to check for entry errors. This is done by clicking the *Verify* button on the bottom left of the *Define Wish List* window. If no errors are received an example of the defined wish list will appear. Make changes if necessary, otherwise click *Apply.*

4.1.2.2.   **Update Current Wish List**

This selection appears very similar to the *initial wish list setup* option described in section 4.1.2.1. However, this program performs a slightly different function. When executed the last known CRS database supplied during the initial setup process is used. Those products previously defined are blocked out prohibiting additional changes. If the original definition of a product held zero dial out locations, they can be added at this time. Otherwise defining additional items is done in the same manor previously described in section 4.1.2.1.
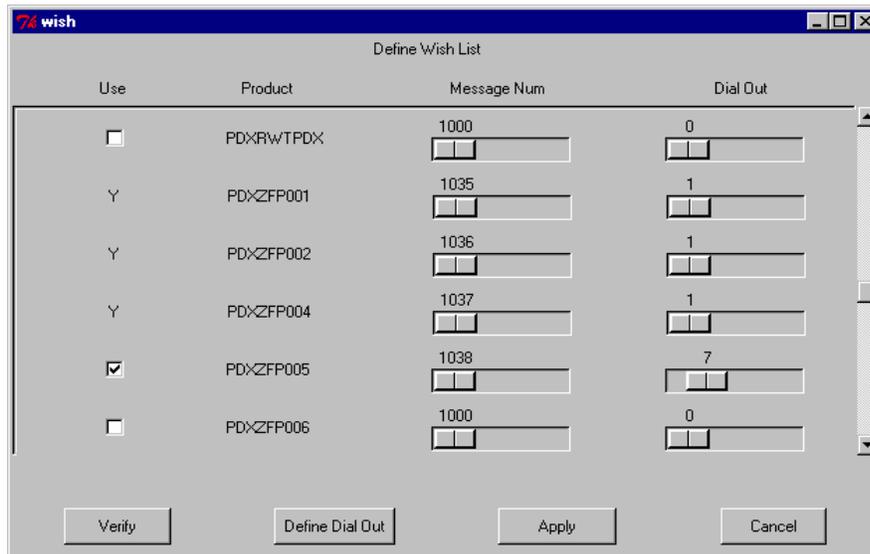
Figure 8 - Update Current Wish List GUI

When assigning dial out scripts through the update option only those items not previously defined for dial out are represented in the *Dial Record Entry* window. Previous wish list options, including dial out scripts, are spared and the new locations are appended to the existing information.

4.1.2.3.   **Edit Current Dial Out Records**

This options is used to add and/or edit current dial out records. When executed a window similar to figure 8 will appear. The current navigational scrips will fill entry boxes

next to each product. Additional entry boxes are supplied below the previously defined dial out list, for new entries. Simply leave them blank if no new locations are desired.
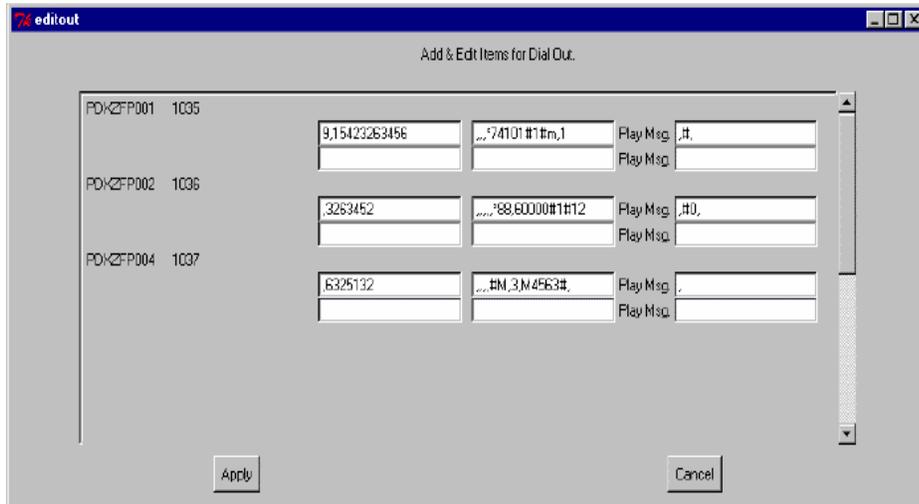
Figure 9 - Add & Edit Items for Dial Out List

4.1.2.4. Remove Item From Wish List

This program allows an administrator to remove one or more items from the CRS IVR wish list. When executed a window similar to figure 9 should appear.
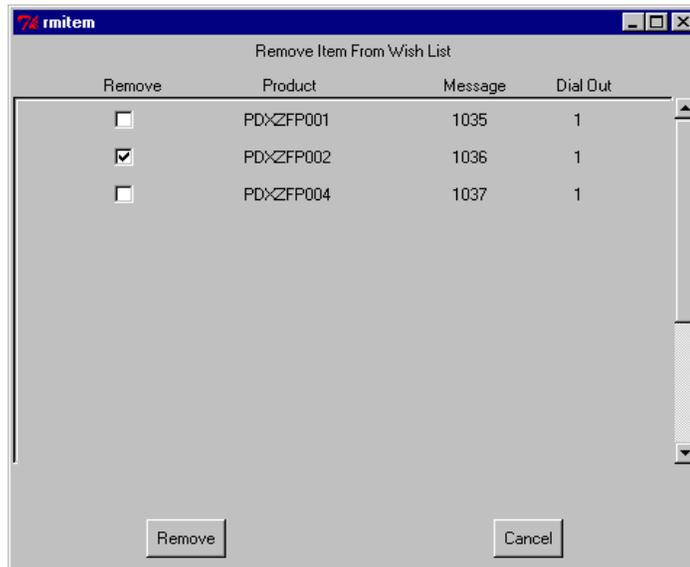
Figure 10 - Remove Item From Wish List GUI

Click on the box left of the product name to delete from the item from the list. Once all selections are made click *Remove* to apply the changes.

> **Note**: If items deleted contain dial out processes, these too will be removed.   Also, the wish list displays will update slow depending on how many items are removed.

4.1.2.5.   Remove Record From Dial Out

This option allows the administrator to remove selected products from the dial out records list.
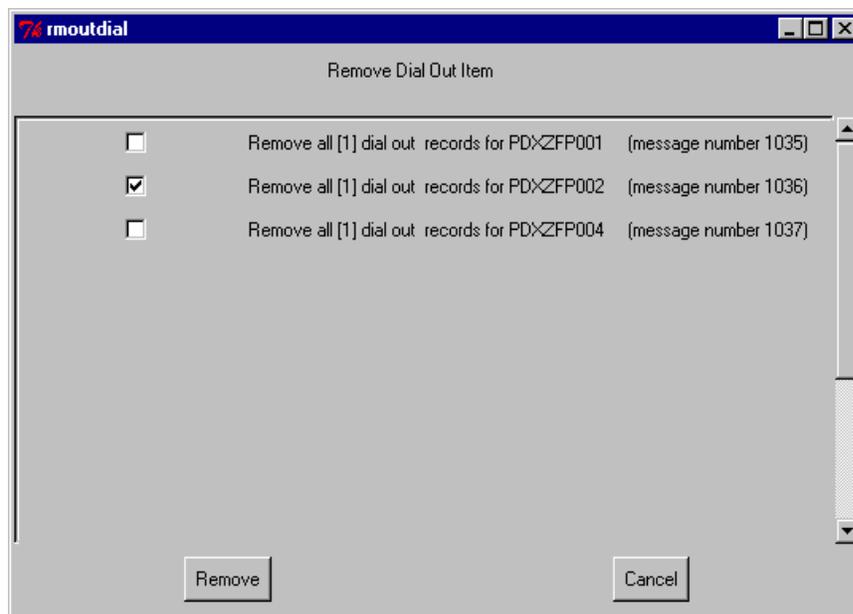
Figure 11 - GUI to Remove Dial Out Records

To remove a dial out record check the box next to that item. This can be done for one or more records listed. Once satisfied, click *Remove* to apply the changes.

4.1.3.   WatchDog

WatchDog is software designed to interact between CRS IVR and CRS querying the operational CRS database for information. Clicking the *Start/Stop WatchDog* button on the *CRS IVR Main Control Panel* reveals the state at which the program resides. When this program is executed a series of "house cleaning" processes are initiated. This is done to remove all files, including audio, associated with the last known wish list. In the case of an unchanged wish list fresh audio conversions are performed, thus placing back

all files removed.   However, if a new list is established all related products in CRS are processed. Since previous wish list information was removed the risk of IVR database corruption is limited.

When the program is active a minimized window display is located on the desktop menu bar. This display can be opened for viewing, but should **never** be closed directly by the user.   Viewing the contents of this window reveals what task the active WatchDog program is currently conducting.

Information provided within this display may appear foreign to most users, however some useful information can be obtained. First, the WatchDog software typically reside in *sleep mode* - see figure 11.   From here information such as: WatchDog start time, process state (running or stopped), time of last CRS query, and interval configurations are exhibited. When new items are obtained this window reveals all functions carried out on the individual files. Because of the tremendous information provided by this display leaving it open on the desktop may be beneficial.

Note: It is extremely important to stop WatchDog through the *CRS IVR Main Control Panel.* Closing the WatchDog display window by clicking the *x* in the upper the upper right corner or by any other means will cause system errors and prevent the program from running correctly. This program was intended to run as a background process and only a last minute change allowed for such a window display. Having process information

Figure 12 - WatchDog Display Window

presented, should out way this imperfection. If an incorrect shutdown does occur default variables need to be reset. This is accomplished by the *Defaults* program located in the *HELP* pull down menu from *CRS IVR Main Control Panel*.

4.1.4. OmniVox

This third party software contains all the necessary controls relating to the telephony software. To better understand this functionally please consult the APEX users documentation provided. A simplistic overview of the most utilized portions of this software are provided in section 5 of this document.
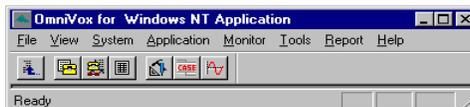
Figure 13 - OmniVox Telephony GUI

4.1.5. NFS Mount to CRS

Selecting this button opens the NFS client software necessary to make the logical connections between CRS and CRS IVR. Provided are the necessary steps to connect each mount between the two systems. It is important to note that the F drive **MUST** be associated with the CRS directory */crs/data/DB/components* and G to */crs/data/SS*. Any variation of this will result in runtime errors.
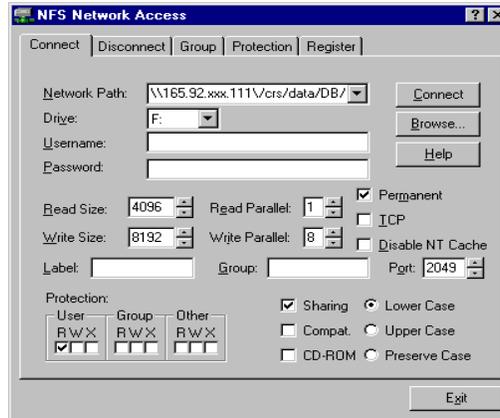
Figure 14 - NFS Mount GUI

1. Click the *NFS Mount to CRS* button on the CRS IVR main control panel
2. Click *Browse*
3. From the list of IP addresses double click the address the represents 0MP for your office.
   a. This IP address will contain .111 as the machine number. This is the last represented in the IP address string.
4. If section 3 *Preparing CRS* was carried out correctly both directories */crs/data/DB/components* and */crs/data/SS* will appear. Select the appropriate path for the drive you are mounting (F or G) and press on the *ok* button.
5. Your selected path should now appear in the top entry box. All that's left is to click the connect button to initiate the mount.
6. If the *NFS Network Access* window is still open repeat steps 2-5 to mount the second directory on CRS represented by the G drive. This time select the */crs/data/SS* path.

Other notable *NFS Network Access* window features are the *Disconnect* and *Register* tabs. If you wish to disconnect a mount click on the *Disconnect* tab option, highlight the mount you wish to remove and press *Disconnect*. The *Register* tab is where the CRS login and password information is stored. This should already be configured to a **crs** login. The standard **crs** login and associated password is assumed, so if alterations were made adjust accordingly.

4.1.6. Menu Bar Options

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4.1.6.1. FILE

4.1.6.1.1. Exit

This selection will shutdown any software associated with the integration process. Because the phone tree and dial out processes are indirectly related to the CRS integration software, shutting down the *CRS IVR Main Control Panel* will only effect the continual update of CRS products.

4.1.6.2. HELP

The help menu holds two separate options to assist the system administrator. First is an online troubling shooting guide as seen in figure 14. This guide explains solutions to the most anticipated problems. The second option is the *About* button. This was added to provide a simple means of version information as well as who to contact incase of trouble beyond any written explanation.

Figure 15 - Online Trouble Shooting Guide

4.2. Automatic Integration Software Shutdown

Another process associated with the WatchDog program is an integration shutdown switch. This process performs a check against the current CRS database for a later version. If a newer CRS database is recognized a window like figure 15 will appear.

Any time this alert box is displayed the system integration software will be suspended. The effect of having the system suspended is the lack new products from CRS. This shutdown will have no direct effect on the operation of the phone tree other than receiving new product from CRS.

Figure 16- Integration Shutdown Alert Box

The only way to restart the integration software is to redefine your CRS IVR wish list with the latest CRS database. After this task is completed the all associated locks will be release allowing the WatchDog program to run.

4.3. CHECKING CRS IVR PRODUCT VERSIONS

4.3.1. Product Versions in Multimedia Wave Format.

The integration software takes an extra step in providing a standard multi media conversion of each decoded CRS product. Access to such files can be obtained from the shortcut wave folder icon located at the bottom right corner of the CRS IVR desktop. The true path is c:\crsta\db\waves. If speakers have been

Figure 17 - CRS IVR Wave File List Representing Products in Use.

installed simply double click on the wave file desired. Even without hearing the audio this directory reveals the time and date of current products utilized by phone tree or dial out procedures - see figure 16.

5. APEX (OMNIVOX) TELEPHONY SOFTWARE

All telephony functions are furnished by the OmniVox software and activated from *CRS IVR Main Control Panel*. From the OmniVox button bar all necessary functions are provided. The overview supplied by this sections should briefly explanation each portion of the telephony software used by the IVR system. However for a complete description consult the APEX User's Manual.

5.1.   Building a Phone Tree Menu Application

To launch the application builder first open the OmniVox software from the main control panel. On the OmniVox button bar click on the button resembled above. When prompted, enter an application name and application code for direct use through the line manager. Figure 17 shows two applications created by the Portland, Oregon office. Line one is running the phone tree *MAIN* with an application code *MA1*. Line two supports the *EUG_SLE* phone tree and line three is occupied by the *OUTDIAL* program. At this point reference the *Getting Started Guide* provided from the APEX company and begin on page 9. Both sample applications *MAIN* and *EUG_SLE* are located in the *c:\usr\Apex\Appdata\Appgen* directory.

When building a phone tree application it is important that the first icon after *start* must be *setvdir* - see Appendix B. Converted CRS products, used by the OmniVox software, are stored in the following directory: *c:\usr\APEX\voice\main*. The *setvdir* option will force the software to look in this directory for all wave files associated to the call flow.

5.1.2.   Message Number Structure

When utilizing a play message the following structure is expected by OmniVox and by the integration software as well. The definition of each message number will come from the wish list setup. The numbers stored during this setup process will be the same message numbers used by the telephony software.

1. All numbers should be between 1000 and 8999. Numbers outside this range are restricted for system software.
2. Numbers 9000 and up represent caned messages heard by the caller guiding them to the product of choice - see Appendix C. As with the rest of the audio files, canned messages need to be located in the *c:\usr\apex\voice\main*.

5.2. 📠 Activating Phone Tree and Dial Out Capabilities.

Activating phone tree and/or dial out procedures are initiated through the OmniVox line manager software. From OmniVox, described in section 4.1.4., click the second icon from the left to start this software - see figure 17.
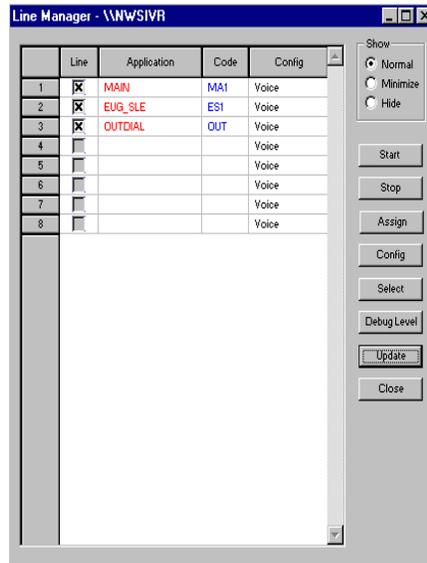
Figure 17 - OmniVox Line Manager GUI

5.3. Dial Out

Dialing remote sites for the purpose of updating system recorders is strictly optional. The dial out program runs through the OmniVox telephony software and specifically under the line manager. Dial out procedures will logically occupy at least one phone line located in the line manager and physically occupy the corresponding port or ports provided in the back of the system.

For offices that have heavy dial out needs its entirely possible to assign more than one port as a dial out procedure. Each port is setup in the same way as described above. In most cases assigning one port is sufficient. Having more than one line designated for a dial out will only reduce the number of lines used for incoming calls. Preliminary estimates indicate that fifty items simultaneously ready for dial out processing is conducted under one hour.

To physically setup dial out captivities place an analog phone line into one or more available port noting the location of placement.   Then define which port or ports contain the phone lines used for dial out in the OmniVox line manager. The application name for the dial out software is *OUTDIAL* and the code is *OUT* - see figure 17 for a pictorial representation.

5.4.   [icon]   Recording Canned Messages

The Speech Editor provided by the OmniVox software is best described on page 5-1 in the OmniVox User's Manual. Since message boxes used to support dynamic weather information come from CRS, the speech editor is only needed to record canned messages.

> **Note**: Its important to restate that all canned recordings must contain a message number between 9000 and 9999.

5.5.   [icons]   Phone Line Statistics

Statistical information is a feature also provided by the OmniVox software. Page 3-50 of the OmniVox User's Manual goes into greater detail pertaining to this function.

6. ACUVOICE TEXT-TO-SPEECH TECHNOLOGY

6.1.   Dictionary Utility

Although the AcuVoice software comes with a very robust dictionary, some words may still need to be added or adjusted for better clarity. To launch the main dictionary utility follow the following: **Start -> Programs -> AV2001 API -> User Dictionary.** From this utility adding, deleting, or viewing words in the dictionary is possible**.** Speakers will need to be attached to effectively carry out dictionary functions.
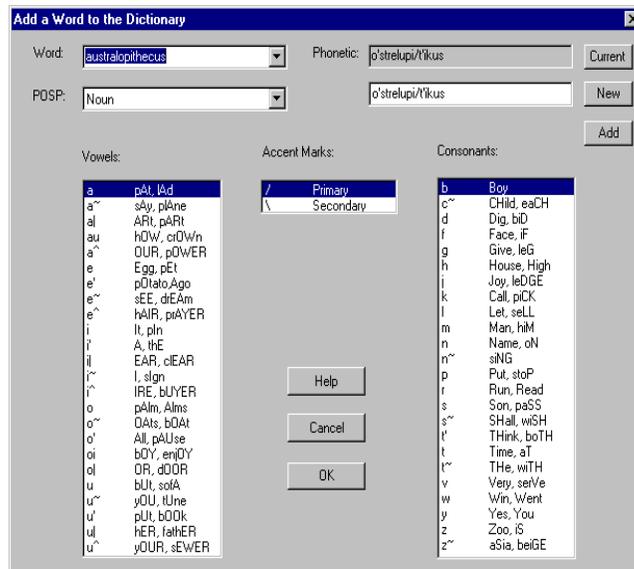
Figure 18 - GUI to Add a Dictionary Entry

6.2. Add a Word to the Dictionary

Click the *Add Word* option from the main window menu to initiate the utility for adding new words to the dictionary - see figure 18.

To add a new word:

1. Type the new word in the *Word* entry box provided
2. Click the *Current* button to hear the current pronunciation (if available).
3. Advance to the *POSP* box and select the part of speech for this new entry
4. In the *Phonetic* box, type the word's phonetic encoding.
5. When satisfied with a pronunciation click *Add* to store the latest change to the Users Dictionary.
6. Click on the *OK* when finished with the *Add Word* utility.

6.3. Delete a Word From the Dictionary

Click the *Delete Word* option from the main window menu to initiate the utility for deleting words from the dictionary - see figure 19.
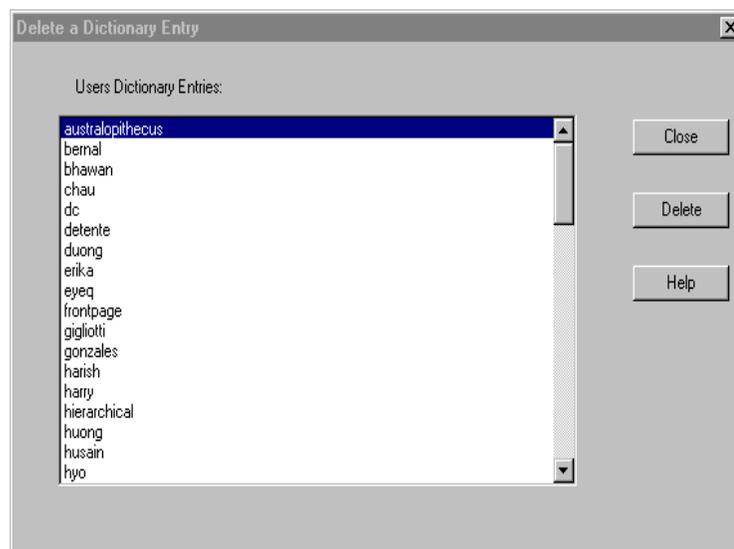
Figure 19 - GUI to Delete a Dictionary Entry

To delete a word:

1. Click on and highlight the word you wish to remove.
2. Click on the *Delete* button to remove this selected word.
3. Click on the *OK* button to return to the main dictionary utility window.

6.4. View Dictionary

Clicking the *View Dictionary* option from the main window menu will initiate the utility for viewing all words currently in the dictionary - see figure 20.
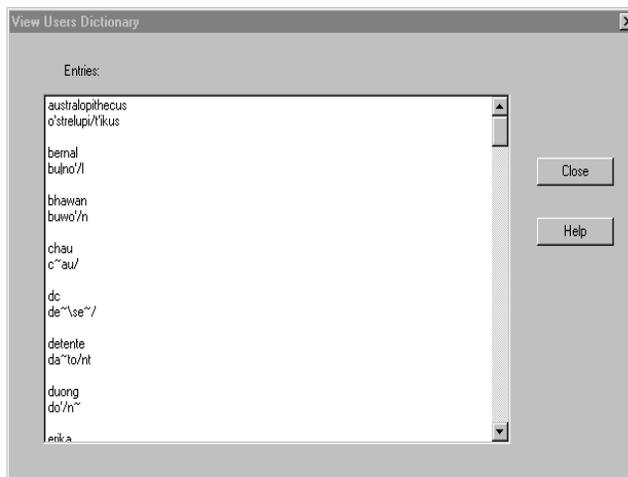
Figure 20 - User Dictionary Display

1. Use the scroll bar to move up or down revealing all dictionary words.
2. Click on the OK button to return to the main dictionary utility window.

6.5. Backup User Dictionary

It may be a good idea to back up your modified dictionary. This can be done by copying the four files listed below into a new location. The following files can be found at *c:\acuvoice\dictfls.*

Files to copy:
- USERDICT.TXT
- USERDICT.FLE
- USERHASH.DVL
- USERHASH.TAB

If it becomes necessary to reinitiate these backed up files simply copy all four files back to the *c:\acuvoice\dictfls* from your secure location.

7. REBOOTING CRS IVR

Refer to the corresponding sections of this document for an accurate description of each step used to power down the IVR system.

1. From the *File* menu located on the *CRS IVR Main Control Panel* select the *Exit* option.
2. On the *CRS IVR Main Control Panel* click on the OmniVox button. Open the line manager and close the phone lines by clicking on *stop*.
3. Disconnect both NFS mounts between CRS and CRS IVR.
4. Close any other open windows and use the shut down command located under the start button on the system menu bar located on the desk top.

Note: Powering down CRS IVR will prohibit incoming and outgoing calls.

7.1. System Configuration After Reboot

Refer to the corresponding sections of this document for an accurate description of each step used to power up the IVR system.

1. Activate the *CRS IVR Main Control Panel*
1. Reconnect the F and G NFS mounts between CRS IVR and CRS
3. Initiate the WatchDog program
4. Start the phone lines for incoming and/or outgoing calls through OmniVox line manager.

8. TROUBLE SHOOTING CRS IVR

8.1. Products are not updating for either incoming or outgoing calls

1. Make sure physical connections are correct between CRS and CRS IVR.
2. Check IP address accuracy on both systems.
3. WatchDog must continuously run for routine retrieval of new CRS products.
4. Check NFS Client software for accurate configuration.
    -> Remember that F: must be mapped to the CRS directory /crs/data/DB/components and G: to the /crs/data/SS directory.
5. Make sure clock settings on the mounted CRS machine (0MP or 5MP) and CRS IVR are accurate to the minute.
    -> After correcting the time stop and start the WatchDog program.

8.2.   Products are continually updating even though they are not new

This is typically associated to a mismatch in times between CRS and CRS IVR. Make sure the clock settings on the CRS mounted machine (0MP ore 5MP) and CRS IVR are accurate to the minute.

-> After correcting the time stop and start the WatchDog program.

Also check to make sure the correct time zone is selected for your region.

8.3.   WatchDog will not shutoff using the *Start/Stop WatchDog* button

This signifies an incorrect shut down of the WatchDog software. Reset the default values located under the HELP menu on the *CRS IVR Main Control Panel*.

8.4.   Wishmaker software is not finding the CRS database entered

1. Check for accuracy in your NFS client software.
    -> F: drive must be mounted to the CRS directory
       /crs/data/DB/components and G: to */crs/data/SS*.

2. Make sure a valid database name is used.

8.5.   Having trouble using the text-to-speech translator

Verify the AcuVoice hardware key placement located on the back parallel port.

8.6.   Unable to start phone lines with OmniVox line manager

Verify the APEX hardware key placement located on the back parallel port.

8.7.   Incorrect products are played to the caller and/or forwarded through the dial out procedure

1. Verify message numbers are correctly associated with the desired CRS products used in each phone tree.

2. A more severe cause is the incorrect CRS pill definition associated with the CRS database The IVR integration software expects defined pill names located in Block 10 of the CRS database to be at least 7 but not greater than 9 characters long. The only solution is to accommodate the 7 to 9 character range even for products not used by CRS IVR.

8.8. **Callers do not hear canned and/or CRS products when calling into CRS IVR**

1. The *setvdir* option **MUST** be used as the first icon passed *start* in your locally developed phone tree. Reread section 5.1 of this documentation.

2. Verify message numbers are correctly associated with the desired CRS products used in each phone tree.

Appendix A

Figure 21 - Portland Oregon Phone Tree c:\usr\Apex\Appdata\Appgen\Main.app.dat

This image represents c:\usr\Apex\Appdata\Appgen\Main.app.dat phone tree created through the OmniVox software. The entire flow is defined by eight play, five branch, three quit and one dial icon combination. Of the eight play icons only three are product bins using converted audio files associated with CRS. The rest are canned messages providing additional information to the caller. Each branch used in the call flow excepts DTMF tones provided by the caller for navigating through the menu. The three quit icons provide different means of releasing the caller from system. Each is associated to a different canned message explaining to the caller why they are being dropped. Finally the Dial icon forwards the caller to a live person in the public service unit.

The development capabilities of each phone tree is endless. This example is only one of many and reading the OmniVox User's Manual will provide all the necessary means of creating the flow best suited for your office.

Figure 22 - Portland Oregon Phone Tree c:\usr\Apex\Appdata\Appgen\EUG_SLE.app.dat

This image represents c:\usr\Apex\Appdata\Appgen\EUG_SLE.app.dat phone tree created through the OmniVox software. This flow uses slightly more advanced tools to create the tree flow. The two major differences are the use of *setvdir* and the addition of a goto option. All applications that are not named main.app.dat the setvdir icon MUST be used. This icon will direct the path to the correct location containing audio files used throughout the tree. The use of the goto option has no functional advantage over the first example, although it does provide a cleaner flow. The play window was opened by a right mouse click on the *EUG Local* play icon.

Appendix C

Welcome Message (9000):

    Hello, thank you for calling the National Weather Service in Portland Oregon.

Trouble Message (9001):

    We are sorry you are having trouble. Please try your call later.

No DTMF Message (9002):

    Your entry was not understood. Please try again.

Closing Message (9003):

    Thank you for calling the National Weather Service in Portland, Oregon. For more detailed information, check out our web page at http://nimbo.wrh.noaa.gov/portland.

Transfer Message (9004):

    Please hold. Your call is being transferred to the next available meteorologist.

PDX Intro Message (9005):

    If you would like river level information press 1, for yesterdays climate information for Portland press 2, for Northern Willamette Valley forecast including Clark county in southwest Washington press 3, for Portland degree day information press 4. For other sources of information press 5. If you would like to hear these options again press 6. If you don't have a touch-tone phone or need further assistance please stay on the line and your call will be transferred.

Hydrology Greeting (9006):

    You have reached the Hydrology desk of the National Weather Service in Portland. If you would like river level information on the Willamette and Columbia rivers including the Portland/Vancouver harbor stage forecast, press 1. If you would like river stage and flow information on other Oregon rivers...Press 2.

Additional Weather Information (9007):

    For complete weather information 24 hours a day, listen to NOAA Weather Radio Broadcasting on FM frequencies from 162.40 to 162.55 MHZ. For information by phone, call 503-243-7575 or 503-225-5555. If you live in the 541 area code you can dial 485-2000.

    For Oregon highway conditions, call 1-800-997-6368. For Washington highway conditions, call 360-690-7100. For northern California highway conditions, call 916-842-4438.

    Climate information can be obtained by calling the National Climatic Data Center at 704-271-4800, the State Climatologist at 541-737-5705, or the Western Regional Climate Center at 702-677-3106. If you have Internet capabilities, check out our home page at http://nimbo.wrh.noaa.gov/portland.

    Thank you for calling.

EUG & SLE Intro Message (9008):

    If you would like the local forecast for Eugene-Springfield and vicinity press 1. For the local forecast for Salem and Vicinity press 2. If you would like the extended forecast for all of western Oregon press 3. For other sources of weather information press 4. If you don't have a touch-tone phone or need further assistance, please stay on the line and your call will be transferred.

Back to Main or Quit (9009):

To return to the main menu press 1 or press 2 to exit the system.

Hydro Switch (9010):

To return to the main menu press 1. To return to the hydro menu press 2 or press 3 to exit the system.

No Answer On Transfer (9011):

Due to heavy calling flow, your call was not connected.

Busy Signal On Transfer (9012):

We're sorry, all lines are busy.

Transfer Branch (9013):

If you would like to try again press 1...to return to the main menu press 2...or to exit press 3.

Technical Documentation

TABLE OF CONTENTS

LIST OF FIGURES

1. OVERVIEW

   This text serves as technical documentation pertaining to the development of the CRS IVR system. The intention is to provide a general explanation into select functionality of the IVR system.   All references are associated to the prototype and or development units running version 1.01 completed September 21, 1998.

2. OPERATING SYSTEM

1.1. Hardware Components

Unit: Rembrandt Master Series 2000	
Case Type :	Rembrandt ATS Full Tower Case (AB-01W)
System Board:	Intel (BE6VS00AAM) Venue Motherboard W/USB & HDWB Monitoring
System CPU:	Intel (BOXBP80521200) Pentium Pro Processor 200MHz w/256k Cache.
CACHE Brand:	Intel Supplied on System Board
RAM Memory:	64MB of RAM Using (2) 32 MB 72 Pin 60ns SIMMs
BIOS Brand:	AMI/Intel "Deep Green" BIOS with Energy Savings Features w/ "Plug in Play"
Power Supply:	Sensation (AP205300FRV) ATX 300w Power Supply
I/O Controller:	Located on Intel System Board (1P-28-1G-FDD-HDD & CD-ROM I/O Controllers
Floppy Drive A:	Teac 3.5" 1.44 MB Floppy Disk Drive
Hard Disk C:	Seagate (ST34572N) 4.5G Hard Drive SCSI Narrow
Hard Disk D:	Seagate (ST34572N) 4.5G Hard Drive SCSI Narrow
CD-ROM Drive:	Acer (CD936E) 36X CD-ROM
Display Mon:	Sceptre P73 17" Monitor
Keyboard:	KEY (E03601QLPS2-C) KB-2000 W/PS2 104 Key
Modem/Fax:	USR (005687-0) 56K Int Fax/Modem
Mouse:	Microsoft (63807) Mouse 2 1A PS/2
Network Adapt:	3CO (3C900-Combo) Etherlink III PCI
Option Item 1:	SEA (STT28000N-RFT)
Option Item 2:	ADARTEC (AHA-294QUK) SCSI Controller
OS:	Microsoft Windows NT Version 4.0 Workstation

Figure 1 - CRS IVR Hardware Components List

1.2. Software Components

1. Apex Voice Communications Telephony Software:
   - Phone tree & dial out operations.

2. AcuVoice Synthetic Speech Technology:
   - Computer voice utilized for text translations.

3. Microsoft Access:
   - Database utilized during dial out procedures.

4. TCL 8.0:
   - Emulator for all graphical user interfaces.

5. Hummingbird NFS Maestro Solo Software:
   - Utilized for connection between CRS & CRS IVR.

6. PC Anywhere:
   - Utilized as a remote maintenance tool via AWIPS network or remote dialin.

1.3. Special Software (development machine only)

Development tools employed during creation of prototype and production units.

Compilers:

1. Perl2exe Active Perl 5.02 compiler:
   - Reference: **www.demobuilder.com**
   - Registration key:
     Mark **McInerney<mark.mcinerney@noaa.gov>,19012**
   - Contact: indy@demobuilder.com

2. Microsoft Visual C++:
   - Version 5.0 Professional Edition

3. WinBatch 39 98B:
   - Wil Interpreter 2.5bbq using WBDBQ321

Miscellaneous Software:

1. Apex Voice communications Telephony Software:
   - Database Key for sentinel: AP98102254(8)
     - Authorization key for *DB*:   48B1F-AYAC9-0ZHA1
     - Authorization key for *FAX*: 18RCY-2QWC9-1Z5A1
     - Authorization key for Base: 0801F-8YAC9-0ZHA1

2. Screen Print Gold 2.5 - used for graphic creation for both user and technical documentation.

3. RETRIEVING PRODUCTS FROM CRS DATABASE:

Format:

      CRS_HEX_NUM+*AWIPS PIL*+*OMNIVOX_FILE*+*DIALOUT*

    CRS_HEX_NUM - CRS database hexadecimal position number, associated with block 10 residing in the c:\crs\data\SS\<database>.asc file created by the local CRS system administrator.

    AWIPS PIL - 7 to10 character product identifier directly associated with the CRS database and indirectly to the AWIPS databases.

    OMNIVOX_FILE - Numeric file name associating the CRS product to all phone tree and dial out procedures through the system integration software.

    DIALOUT - Numerical digit representing the number of total locations product will remotely update.

Example:

    0002+PDXSVRPDX+1000+2

Figure 2: Descriptive breakdown of CRS IVR wish list components. Specifically
C:\crsta\DB\tbls\WL.tbl file.

Products are automatically retrieved from CRS through a designed WatchDog scheduler. On a two minute interval WatchDog determines what items are needed from the CRS database, retrieves and processes each item accordingly. The system administrator provides the information correctly identifying all items utilized by the IVR system. This list of information is identified through a ***wish list*** table.   The specific file created is *c:\crsta\DB\tbls\wl.tbl*. Each line within the table represents a CRS database item and all defining characteristics. Since each line within the table contains different

defining qualities it was necessary to separate the information with a plus (+) character - see figure 1.

One portion of the *wish list* table needing further explanation is the CRS_HEX_NUM datum. To best describe this item its first necessary to understand a select portion of the CRS database. Two separate CRS database directories are needed to correctly obtain each item used by the IVR platform. They are */crs/data/DB/components* and */crs/data/SS* directories residing on either CRS main processor (0MP and 5MP). The *components* directory stores all weather related products supplied by AWIPS and the *SS* directory is home for the CRS administrators locally defined database. This database provides table information used to decode the complicated file naming structure of files located in the *components* directory.

Each file in the *components* directory holds a distinct file naming structure, revealing all information necessary to correctly interrogate the data. Two hexadecimal numbers, in association with a unique end tag make up the file naming characteristics - see figure 2.

/crs/data/DB/components/

000001.Pt	00a001.Pt	00a001.St
000002.Pv	002001.Pt	002000.Kt
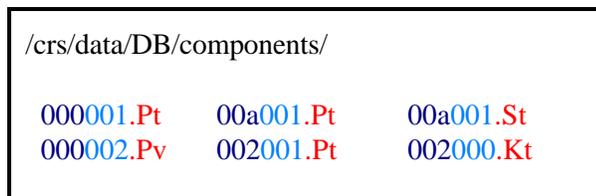
Figure 3- File examples associated to the CRS main
processor /crs/data/DB/components directory.

From figure 2 file 002001.Pt represents a typical file found in the components directory. The first hexadecimal number 002 represents the second item counting down from 001 in **Block 10** of the defined CRS database - see figure 4. From figure 4 its revealed, *PDXZFP001,* the local forecast for the north Oregon coast, is this location. The second hexadecimal digit, 001, reveals the version of stored data, while .Pt defines file format. Of interest to the CRS IVR system are files ending with a .Pt or .Pv. Files with an end tag .Pt signify an ASCII text data structure, while .Pv alerts to a manually recorded 10mhz vox file. The end tag is utilized for proper decoding and processing.

Using the above information, integration software was then developed to correctly retrieve those desired products from CRS. When the CRS IVR administrator initially defines a wish list, a prompt for the active CRS database is displayed. When entered, a copy of the CRS database file is made from the mounted CRS main processor and stored at *c:\crsta\DB\tbls\DBused.tbl* on the IVR platform for future referencing. This file is then utilized when building the WL.tbl table file described in figure 2.

```
   .
   .
   .
:BLOCK 10:
#MessageTypeBlock

#Msg        title                   L-over desig- E-over language
#Type                               ride    nation ride
> STATIONID "Station ID"            0      0      0      0
#indicator LAC_Codes(Area/zone)
#area
#indicator TxMnemonics
SAME NULL
#indicator duration     periodicity  save confirm interrupt alert
default    00.00:00:00 00.00:00:00    0      0        0        0
#indicator and voice parameters
voice
#TxMnemonics voice rate baseline hatrise stress rate baseline hat stress ampl
#            type Flag fallFlag Flag    riseFlag    Fall    Rise Rise  tude
ALL           3    1    1       1          1   240  10       18   30    70


#Msg        title                       over- desig- E-Over language
#Type                                    ride  nation  ride
> PDXZFP001 "Severe Wx ID/GRR"           0     2      0      0
#indicator LAC_Codes(Area/zone)
area MIC081
#indicator TxMnemonics
SAME NULL
#indicator duration     periodicity  save confirm interrupt alert
default    00.08:00:00 00.00:10:00    0      0        0        0
#indicator and voice parameters
voice
#TxMnemonics voice rate baseline hatrise stress rate baseline hat stress ampl
#            type Flag fallFlag Flag    riseFlag    Fall    Rise Rise  tude
ALL           3    1    1       1          1   246  9        20   30    50

#Msg        title                       over- desig- E-Over language
#Type                                    ride  nation  ride
> PDXZFP002 "Station ID1/GRR"            0     2      0      0
#indicator LAC_Codes(Area/zone)
area MIC081
#indicator TxMnemonics
SAME NULL
#indicator duration     periodicity  save confirm interrupt alert
default    00.00:00:00 00.00:15:00    0      0        0        0
#indicator and voice parameters
voice
#TxMnemonics voice rate baseline hatrise stress rate baseline hat stress ampl
#            type Flag fallFlag Flag    riseFlag    Fall    Rise Rise  tude
ALL           3    1    1       1          1   246  9        20   30    50

   .
   .
   .
```

Figure 4 - Block 10 example of CRS database

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The provided WatchDog software decodes the WL.tbl file to determine what items are needed from CRS.   Only the latest versions of each recognized file are brought into the IVR platform and stored in the */crsta/DB/Intmp* CRS IVR directory.   When determining the latest CRS file a time/date stamp is utilized rather than the provided version number.   Provided version numbers were deemed unreliable, thus constituting a better method such as time/date comparison. If the item compared has a later time stamp on CRS, its retrieved and processed accordingly by the CRS IVR software.

4. PROCESSING & UTILIZING NEW PRODUCTS FROM CRS

Once a new item arrives into the IVR system, as described in section 7, the file is place in a temporary directory *c:\crsta\DB\Intmp* where individual processing begins. Its first determined what file type is located in the directory. Files containing an end tag .Pt are text base, translated into synthetic speech. Files containing an end tan .Pv are 10MHz VOX files converted to 11MHz format and stored accordingly. A common shared subdirectory is the storage location of all files processed from CRS. This directory, *c:\usr\apex\voice\main* is the same directory where the OmniVox telephony software will reference active voice files. OmniVox phone tree design requires a numeric file name for each voice prompt utilized by the software. This then closes the last link between the phone tree and information provided from CRS. For further information on message numbering for OmniVox play records, consult section 4.1.2.1 in the CRS IVR users manual.

5. FILE STRUCTURE

The following file structure is for directories and associated files comprising the integration software, linking CRS and the telephony system.
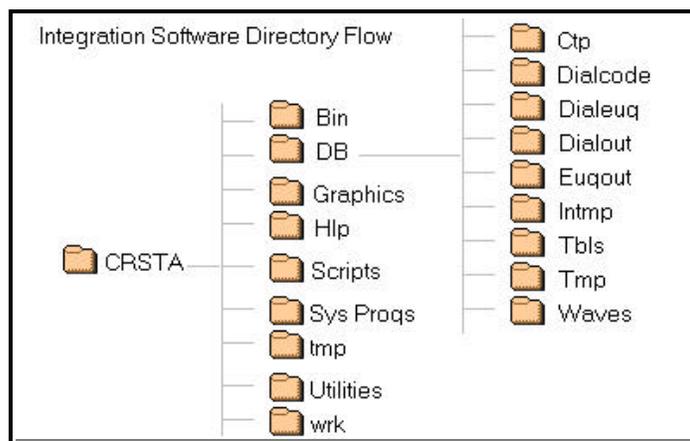
Figure 5 - Directory structure for CRS IVR Integration Software

📁 /CRSTA/Bin

This folder contains 51 separate executable and graphical user interface procedures conducting all integration functions between CRS and CRS IVR.

Launch_cleanup.exe	515KB	Application	09/10/98 12:17 PM

- WinBatch GUI launch for cleanup.exe.

Launch_codescrub.exe   515KB   Application   09/02/98 12:17 PM
- WinBatch GUI launch for codescrub.exe.
Launch_creatermout.exe   515KB   Application   09/10/98 11:48 AM
- WinBatch GUI launch for creatermout.gph.
Launch_defaults.exe   515KB   Application   09/16/98 02:40 PM
- WinBatch GUI launch for defaults.exe.
Launch_editdial.exe   515KB   Application   09/10/98 09:33 PM
- WinBatch GUI launch for editdial.exe, dodply.exe, and nwlgui.exe.
Launch_nwlgui.exe   515KB   Application   09/02/98 12:43 PM
- WinBatch GUI launch for nwlgui.exe.
Launch_rmitem.exe   515KB   Application   09/11/98 08:53 AM
- WinBatch GUI launch for rmitem.gph, codechk.exe, and dodply.exe.
Launch_updatewish.exe   515KB   Application   09/10/98 06:34 AM
- WinBatch GUI launch for wish.gph.
Launch_updatewl.exe   515KB   Application   09/02/98 12:42 PM
- WinBatch GUI launch for updatewl.exe.
Launch_wish.exe   515KB   Application   09/02/98 03:43 PM
- WinBatch GUI launch for wish.exe. Opening the wish.gph GUI and executing dodply.exe.
Launch_WMDB.exe   515KB   Application   09/09/98 01:15 PM
- WinBatch GUI launch for ask box warning, if yes launch WMDB.gph.
watchdogGUI.exe   517KB   Application   09/02/98 11:31 AM
- WinBatch GUI launch for WatchDog procedures.
Tts.exe   21KB   Application   10/28/97 12:46 PM
- C based AcuVoice text-to-speech translator.
wishmaker.exe   701KB   Application   09/22/98 05:15 AM
- Active Perl 5.02 CRS IVR database constructor. Items originating from CRS database.
updatemaker.exe   706KB   Application   09/11/98 08:18 AM
- Active Perl 5.02 CRS IVR database update tool, based on last known CRS database.
Updatewl.exe   617KB   Application   09/02/98 11:14 AM
- Active Perl 5.02 application updating the *c:\CRSTA\DB\tbls\WL.tbl* file executed through updatemaker.exe. Input *c:\CRSTA\tmp\nwl.tbl*.
watchdog.exe   623KB   Application   09/02/98 11:12 AM
- Active Perl 5.02 Scheduler application querying CRS for new items to populate CRS IVR database. Two minute interval.
Shutdown.exe   517KB   Application   09/10/98 12:17 PM
- Active Perl 5.02 application utilized through the Main CRS IR Control Panel to correctly shutdown integration software and all associated processes.
editdial.exe   678KB   Application   09/22/98 12:16 AM
- Active Perl 5.02 application creating ediout.gph GUI.
Error1.exe   515KB   Application   09/02/98 11:45 AM
- WinBatch GUI displaying unrecognized CRS database entry.
find.exe   696KB   Application   09/02/98 11:15 AM

- Active Perl 5.02 application launched by WatchDog, retrieving new items into the CRS IVR database.

nwlgui.exe   618KB   Application   09/02/98 11:15 AM
- Active Perl 5.02 application updating wish list GUI. Excluding dial out display.

scrubber.exe   617KB   Application   09/02/98 11:14 AM
- Active Perl 5.02 application that conducts house cleaning when WatchDog is executed.

cleanup.exe   616KB   Application   09/10/98 12:22 PM
- Active Perl 5.02 application deleting wish list items. Input provided by system administrator through creatermout.exe application. Input data *c:\CRSTA\tmp\tmptbl.tbl*.

codechk.exe   616KB   Application   09/11/98 08:51 AM
- Active Perl 5.02 application deleting dial out items. Input provided by system administrator through rmoutdial.gph software.

codescrub.exe   616KB   Application   09/22/98 12:55 AM
- Active Perl 5.02 application that cleans out all old files from dialcode directory and deletes current WL information. Used when initializing a new CRS database.

createrm.exe   630KB   Application   09/11/98 08:57 AM
- Active Perl 5.02 application creating RmItem.gph allowing system administrator to delete selected items from CRS IVR wish list.

creatermout.exe   626KB   Application   09/11/98 08:34 AM
- Active Perl 502 application creating RmOutDial.gph allowing system administrator to delete select dial out items from the CRS IVR wish list.

dbchk.exe   616KB   Application   09/02/98 11:20 AM
- Active Perl 5.02 application verifying operational CRS database. Software launched through WatchDog.

defaults.exe   615KB   Application   09/02/98 11:19 AM
- Active Perl 5.02 application resetting default values utilized by WatchDog. Triggered from the CRS IVR Main Control Panel. Necessary for incorrect WatchDog shutdown.

dodply.exe   624KB   Application   09/11/98 08:03 AM
- Active Perl 5.02 application creating dialdsply.gph GUI.

editdial.exe   678KB   Application   09/22/98 12:16 AM
- Active Perl 5.02 program that creates the dial out entry boxes as launched through the wishmaker.exe software.

tmpDOdply.exe   623KB   Application   09/11/98 08:37 AM
- Active Perl 5.02 application creating tmpdialdsply.gph GUI.

Wbdbq32i.dll   419KB   Application Extension 08/04/98 11:03 AM
- DLL application Extension used by the Perl software.

CodeScrub.bat   1KB   MS-DOS Batch File   09/02/98 04:11 PM
- MS-DOS Batch File used as an intermediate launch program initiating codescrub procedures by launching launch_codescrub.exe.

editout.gph   15KB   GPH File   12/04/98 04:06 AM*
- TCL 8.0 GUI allowing system administrator to enter dial out string instructions provided through the wishmaker.exe and updatemaker.exe.

olddial.gph   11KB   GPH File   09/18/98 07:05 PM*
- TCL 8.0 GUI of last known dial out display. Not directly utilized by system administrator. Reserved for future use.

oldwish.gph   1KB   GPH File   09/18/98 07:05 PM*
- TCL 8.0 GUI of last known wish list display. Not directly utilized by the system administrator. Reserved for future use.

RmItem.gph   14KB   GPH File   12/10/98 04:00 PM*
- TCL 8.0 GUI utilized by system administrator for removing wish list items from current CRS IVR database.

RmOutDial.gph   10KB   GPH File   12/10/98 04:00 PM*
    - TCL 8.0 GUI utilized by system administrator for removing dial out items from current CRS
      IVR database.
Sys_Stop.gph   4KB   GPH File   09/02/98 10:00 AM
    - TCL 8.0 GUI, displayed if new operational CRS database is found.
tmpdialsply.gph   1KB   GPH File   12/04/98 04:03 AM*
    - TCL 8.0 GUI temporary dial out display. Not directly used by system administrator.
tmpWishList.gph   1KB   GPH File   12/04/98 04:03 AM*
    - TCL 8.0 GUI temporary wish list display. Not directly used by system administrator.
Crsta.gph   9KB   GPH File   09/16/98 02:40 PM
    - TCL 8.0 CRS IVR Main Control Panel. All CRS IVR functions are executed from this panel.
      Icon on IVR desktop bottom right corner.
DBchkexpl.gph   3KB   GPH File   09/11/98 07:54 AM
    - TCL 8.0 GUI informational display alerting to a new CRS database. Display used along side
      Sys_Stop.gph program.
Wish.gph   306KB   GPH File   09/18/98 07:05 PM*
    - TCL 8.0 GUI created by wishmaker.exe or wishupdate.exe software allowing administrator
      to assign message numbers against CRS products.
WishList.gph   1KB   GPH File   12/10/98 04:00 PM*
    - TCL 8.0 GUI displaying the current CRS IVR database items.
Wlopt.gph   1KB   GPH File   09/02/98 05:15 AM
    - TCL 8.0 GUI used to display both wish list and dial out displays from the CRS IVR
      Main Control Panel.
WLoption.gph   4KB   GPH File   09/11/98 08:39 AM
    - TCL 8.0 GUI allowing the system administrator to chose what functions are carried out on
      CRS IVR database. Utilized through the CRS IVR Main Control Panel.
Wmdb.gph   3KB   GPH File   09/11/98 07:50 AM
    - TCL 8.0 GUI prompt for administrator to enter operational CRS database file name.
      Used when initiating CRS IVR database.
Dial.gph   9KB   GPH File   12/04/98 04:03 AM*
    - TCL 8.0 GUI created by wishmaker software providing dial out string input.
dialdsply.gph   8KB   GPH File   12/10/98 04:00 PM*
    - TCL 8.0 GUI displaying the current CRS IVR dial out database.

    * - Denotes dynamic files conforming to system administrator requests.

📁 /CRSTA/DB

CRSIVR.ldb   1KB   Microsoft Access Read 09/21/98 02:30 AM
CRSIVR.mdb   450KB   Microsoft Access Data 09/19/98 07:30 AM
Lock   0KB   File   08/31/98 02:11 PM
    - Three files are used by dial out software to keep track of dial out retries in the
      case of a missed call.

📁 /CRSTA/DB/Ctp

    This folder holds the latest known CRS files retrieved from the previous
WatchDog scan. Items are stored in their CRS original file naming structure.

📁 /CRSTA/DB/Dialcode

This folder contains all dial out information relative to each product defined as having dial out capabilities. Files in this directory are stored by the user defined numeric file naming structure, ranging between 1000 and 8999.

📁 /CRSTA/DB/Dialeug

This folder is to handle the special case situation for the Portland Oregon forecast office. Folder will contain dial out information relative to each product containing dial out capabilities for the Eugene voice recording update. Files in this directory are stored by the user defined numeric file naming structure, ranging between 1000 and 8999.

📁 /CRSTA/DB/Dialout

This directory is a temporary holding place for 11mhz vox files used in remote dial out transmissions. Files are stored by their user defined numeric naming structure. Once dial out software successfully processes each item in this directory, the transmitted file is removed.

This folder will always contain one file, 0000 4KB, used by the dial out procedure to recognize the number of dial out items being processed or lack there of.

📁 /CRSTA/DB/Eugout

This is a special case directory also serving as a temporary holding place for 11mhz vox files used in dial out transmissions. Only the Portland Oregon office will utilize this directory during times of Eugene voice recording updates. Once dial out software successfully processes each item in this directory, the transmitted file is removed.

This folder will always contain one file, 0000 4KB, used by the dial out procedure to recognize the number of dial out items being processed or lack there of.

📁 /CRSTA/DB/Intmp

Directory used to temporary hold new files arriving from CRS.   Once processed this directory is cleared for future file processing. All files stored, contain CRS file naming characteristics - see figure 3.

📁 /CRSTA/DB/Tbl

Directory stores reference tables utilized by integration software.

CRS dfstab   1KB   File   07/06/98 01:25 PM
          - File contains a working example of CRS dfstab alterations necessary for file sharing between
            CRS and the IVR platform
DBchk.tbl   1KB   TBL File   09/18/98 07:05 PM
          - Switch bit representing a good CRS database comparison. 1 bit denotes successful comparison.
DBused.tbl   1KB   TBL File   09/18/98 07:05 PM
          - Storage of the last known CRS database supplied to the IVR platform by system administrator.
Dial String Template   1KB   File   08/26/98 01:36 AM
          - File contains dial out string templates for updating remote unites. Specific examples pertain to
            interalia, Oregonian*, and Register Guard* locations.

Interalia:
                     2619381,,,8855+,,,1,,7,,+,#,,412,,,#,0,+

Oregonian inside line:
                   ,,2255071+,,*74101#3#+,&&

Eugene Register Guard:
                   1,541,333,8765+..*88*,,600000#,4#,3,,+,67,5,&&+
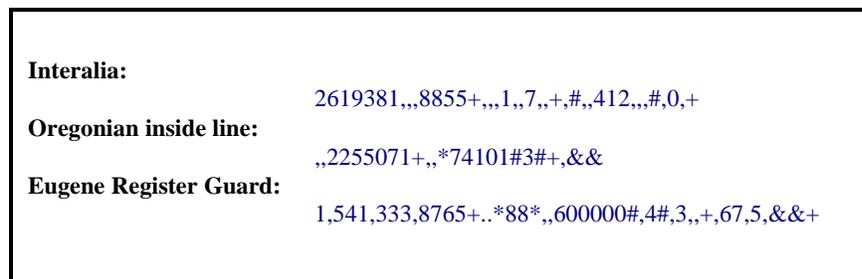
Figure 6 - Three separate dial out string examples as created by
wishmaker software. Dial String Templet file.

Wd.tbl   1KB   TBL File   11/21/98 07:00 A
          - On/off switch bit used by WatchDog software. 1 bit denotes WatchDog software running.
Wl.tbl   1KB   TBL File   12/04/98 04:04 AM
          - CRS IVR database referencing table used to discern products associated to the CRS operational
            database.
Wn.tbl   1KB   TBL File   11/21/98 07:00 AM
         -On/off switch bit used by WatchDog software. 1 bit denotes WatchDog software running.

          * - Represents Portland, Oregon special case dial out procedures only, but provided as
              dial string examples .

📁 /CRSTA/DB/Tmp

Files that end up in this directory are MS-DOS Batch Files. The batch process is not actually used by the IVR software, but rather as output provide from the decoder software revealing exact commands used to decode and process each item arriving from CRS. Debugging outside of binary source code was the objective of this directory and associated files.   Files stored in this directory are done so under the CRS hexadecimal database structure, with *.bat* tacked on to the end for debugging processes.

📁 /CRSTA/DB/Waves:

This directory holds standard wave files converted from CRS items. This was provided for ease in verification of product quality. As products arrive they stored by the CRS pill identifier. Each file in this directory is converted from those files located in */CRSTA/DB/Ctp*. Files in the *Ctp* directory are stored by their literal CRS database names, where as in the *Waves* directory files are represented by their pill identifier as highlighted in figure 4.

Note: Every second of converted information, 7.89KB of memory is occupied in secondary storage.

📁 /CRSTA/Graphics

f.bmp	4KB	Bitmap Image	08/07/98 09:02 PM
- Reserved for future versions			
g.bmp	4KB	Bitmap Image	08/07/98 09:02 PM
- Reserved for future versions			
Phone.gif	9KB	GIF Image	06/28/98 04:23 PM

Example *c:\CRSTA\DB\tmp* file.

T0024002b.Pt.bat   1KB   MS-DOS Batch File   09/18/98 4:28 PM

Commands inside - T0024002b.Pt.bat:

c:\crsta\bin\TTS.exe c:\crsta\DB\INTMP\0024002b.Pt c:\crsta\DB\waves\PDXZFP001.wav wav
PCMCvt c:\crsta\DB\waves\PDXZFP001.wav c:\usr\apex\voice\main\1001 -diG11F08

Figure 7 - Sample text-to-speech tmp file and associated contents produced by IVR software. Target Purpose...software debugging.

          - Graphic used in the CRSTA Main Control Panel

stop.gif	4KB	GIF Image	08/07/98 07:32 PM

          - Graphic used by the integration shutdown alert box

warning.gif	1KB	GIF Image	06/23/98 11:00 AM

          - Reserved for future versions

📁 /CRSTA/Hlp

Help files are accessed through the CRS IVR Main Control Panel from the PC desktop.

Help1.gph	3KB	GPH File	09/21/98 02:30 AM

          - Trouble shooting guide for non updating files, incoming or out going.

Help2.gph	3KB	GPH File	09/21/98 08:08 AM

          - Trouble shooting guide for products updating when not necessary.

Help3.gph	3KB	GPH File	09/21/98 08:22 AM

          - Trouble shooting guide for WatchDog functions.

Help4.gph	3KB	GPH File	09/21/98 09:03 AM

          - Trouble shooting guide for unfound CRS database, supplied by the system administrator.

Help5.gph	3KB	GPH File	09/21/98 02:34 AM

          - Trouble shooting guide for text-to-speech errors.

Help6.gph	3KB	GPH File	09/21/98 08:33 AM

          - Trouble shooting for product incorrectly supplied under the wrong pill name.

Help7.gph	3KB	GPH File	09/21/98 08:47 AM

          - Trouble shooting for product incorrectly supplied under the wrong pill name.

Help8.gph	3KB	GPH File	09/21/98 08:52 AM

          - Trouble shooting unheard products when calling into the IVR system.

Mhlp.gph	3KB	GPH File	09/21/98 09:09 AM

          - Main help panel launched through the Main CRS IVR Control Panel.

MKWLhlp.gph	3KB	GPH File	09/21/98 09:17 AM

          - Directions on how to define a wish list on CRS IVR. Triggered bye stop integration software upon recognition of a new CRS database.

📁 /CRSTA/Scripts

Reserved for future use.

📁 /CRSTA/Sys Progs

The *Sys Progs* directory holds scripting tools necessary when running the IVR system software. Although each system should arrive with these tools already installed they have been included as a precautionary measure. The two contained file utilities contain all the necessary software for running both Active Perl 4.0 and TCL 8.0 Graphical Emulator. Each file is self extracting.

| Pw32i316.exe | 1,511KB | Application | 06/18/98 05:26 PM |

- Self extracting Active Perl 4.0 application.

| Tcl80p2.exe | 1,704KB | Application | 06/23/98 10:17 AM |

- Self extracting TCL 8.0 application.

📁 /CRSTA/tmp

All files located in this directory are created and used by the integration software to setup different parts of the IVR database. Although files are always held in this directory they are dynamic, always changing as software is utilized.

| look.txt | 1KB | Text Document | 07/07/98 06:54 AM |
| nwl.tbl | 1KB | TBL File | 09/21/98 02:43 AM |

- New wish list items added by the system administrator through the updatewl.exe
    software.

text.txt	1KB	Text Document	07/02/98 12:35 AM
testout.txt	1KB	Text Document	08/08/98 11:59 AM
Tmp.chg	1KB	File	09/18/98 04:28 PM
TmpWL.tbl	1KB	TBL File	08/12/98 08:18 AM
tmptbl.tbl	1KB	TBL File	08/12/98 09:23 PM

- Table created by creatermout.exe storing all wish list items ready for removal.
    Data becomes input for cleanup.exe program deleting the items accordingly. File
    is dynamic, created and removed once all associated processes have executed.

| rmout.tbl | 1KB | TBL File | 08/23/98 09:23 PM |

- Table created by rmoutdial.gph containing the information necessary to remove
    flagged dial out items from IVR database. File is dynamic, created and removed
    once all associated processes have executed.

| Vars.txt | 1KB | Text Document | 12/04/98 04:03 AM |
| Varstring.txt | 1KB | Text Document | 12/04/98 04:03 AM |

📁 /CRSTA/Utilities

This directory stores two programs associated with NFS mounting features launched from within the IVR integration software.

| CRSmount.bat | 1KB | MS-DOS Batch File | 08/18/98 11:24 AM |
| CRSmount.exe | 1KB | Shortcut | 12/10/98 11:01 AM |

📁 /CRSTA/wrk

Reserved for future use.

6. GMR (Government Micro Resources)

        Due to the complex nature of this project it was necessary to incorporate the aid of a third party. GMR (Government Micro Resources) was utilized for the development of the dial out procedures and also used as a means to assemble future CRS IVR systems for NWS offices.

```
GMR Contacts:

                Senior VP for Computer/Telephony
                Integration Division:              Bob Keigley
                                                   703-330-1199
                                                   rkeigley@gmri.com

                Senior Network Engineer:           Joe Carrieri
                                                   703-330-1199
                                                   jcarrieri@gmri.com

                Global Account Manager:            Joe Webb
                                                   703-330-1199
                                                   jwebb@gmri.com
```

Figure 8 - GMR Contact Points

7. DIAL OUT FUNCTIONALITY

        Joe Carrieri an engineer from Government Micro Resources designed and implemented the dial out procedures for the IVR platform. The dialout code was developed as a OmniVox procedure under the APEX telephony software. The dial out OmniVox procedure can be found at *c:\usr\APEX\Appdata\Appgen\OUTDIAL.app.dat*

        When new items are ready, the WatchDog application will place a 11MHz vox file in the *c:\crsta\DB\dialout* directory. This directory is where the dialout application checks for new out bound items on a two minute interval. When new items are recognized by the application the associated dial string information is retrieved from the *c:\crsta\DB\dialcode* directory to carry out the correct dial sequence. If for any reason a connection is not made the dial out software will attempt the connection a total of three times. After that any future attempts will be suspended and the information is removed from the c:\crsta\DB\dialout directory.