CONTAX IVR V.2.1 User Guide

User's Manual

First Edition

（C）2002-2004 Eletech Enterprise Co., Ltd.
All Rights Reserved.

IBM is a registered trademark of IBM Corporation.

Intel is a registered trademark of Intel Corporation.

Microsoft, Windows 2000/XP, IIS, SQL Server, Access, MSDE are either registered trademarks or trademarks of Microsoft Corporation in the USA and/or other countries.

All referred trademarks or registered trademarks not listed above are the trademarks or registered trademarks of their respective owners.

All telephone numbers in the figure of this manual contain unassignable central office codes. All the user names in this manual are entirely fictitious. They are hypothetical examples only. We intend not to violate any person or organization's privacy.

Contacting Eletech Enterprise Co., Ltd.

Tel: +886 (2) 2218-0068

Fax: +886 (2) 2218-0254

Email: *eletech@ms2.hinet.net*

Web: *www.eletech.com*

Eletech Enterprise Co., Ltd

3F, No.531, Chung-Chean Rd., Hsin-Tien,

Taipei Hsien 231, Taiwan

Copyright© 2002, Eletech Enterprise Co., Ltd.

All Rights Reserved.

Table of Contents

About This User Guide

Audience

This CONTAX IVR User Guide is written for IVR application designers and administrators who have basic industry knowledge required to develop and implement useful IVR applications. Some programming background will be a plus while composing the operation and variable functions.

Conventions

Boldface	Boldface font is used for function names, buttons, commands, folder names, menu names, and chapter and section names.
Italic	Italic font is used for Internet addresses or email addresses as well as arguments or syntax items that you need to replace with values or expressions.
->	The arrow symbol is used for a sequential operation from a drop-down menu or list. For example, **File** -> **Send To** -> **My Documents** represents "click the **File** button then click the **Send To** item and then click the **My Documents** item".
Click "an item"	This means to move the mouse pointer to the item and then press or click the mouse's primary button once (usually the left button is the primary button for right-handed users).
Double-click	This means to press or click the mouse's primary button twice within the Double-click speed that has been set in the mouse

properties (**Start** -> **Settings** -> **Control Panel** -> **Mouse**) under the "Double-click to open an item (single-click to select)" mode set also in the mouse properties.

Drag and drop — Drag means to move the mouse pointer over the icon you want to select, then press the mouse's primary button down to highlight it and while not releasing the mouse button, you move the mouse and watch your selected object move on screen. Drop means release the mouse button when you have reached your destination. Drag and drop is used to move icons, files, or folders on the screen from one location to another.

Announcement — An IVR greeting that informs but does not instruct the caller to act. Contrast to "Prompt".

Prompt — An IVR greeting that instructs the caller to respond. Contrast to "Announcement".

Press — Press is used to ask a caller to press a single key (e.g., to select an option from a list).

Enter — Enter is used to ask a caller to press multiple keys (e.g., to input an account number or a password).

Most of the terms follow international standards or guidelines. We encourage application designers to follow HFES 200.5, ISO 13714, or TSSC standards and guidelines for their user interface in IVR and telephony. Thus the terminology used will be consistent throughout an application and among integrated applications.

HFES: Human Factors and Ergonomics Society

ISO: International Organization for Standardization

TSSC: Telephone Speech Standards Committee

Contacting Eletech

Call

+886 (2) 2218-0068

Fax

+886 (2) 2218-0254

E-Mail

eletech@ms2.hinet.net

Website

www.eletech.com

Write

3F, No.531, Chung-Cheng Rd., Hsin-Tien, Taipei Hsien 231, Taiwan, R.O.C.

Chapter 1

Product Overview

1.1 Features

GUI and Web Based

Centralized administration

Support TAPI 3.0/NMS T1 Card (MVIP Version)

Support SAPI 5.0 (TTS/ASR Engine)

User function and Customize Component

Provide Template Wizard

Reports Facility

1.2 Basic Configuration

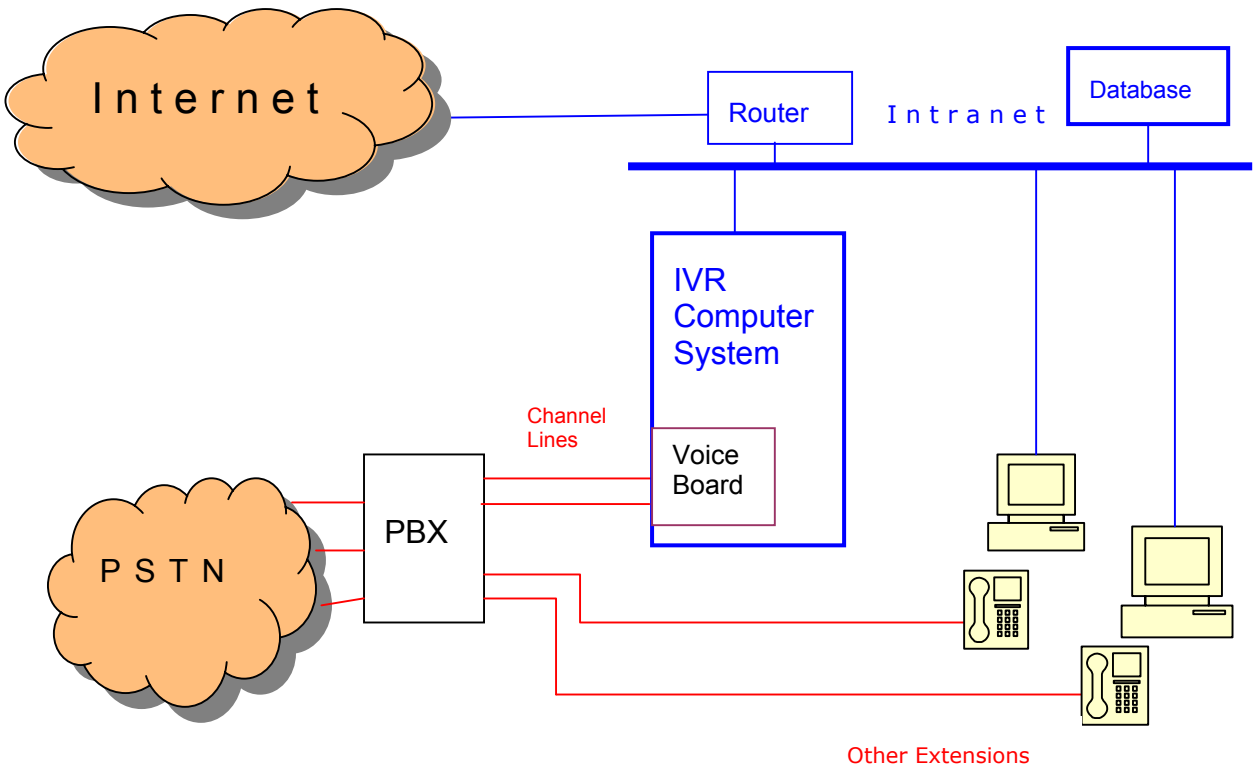
Usually a computer based IVR system is connected as one or more analog extensions on the corporate phone system (PBX, Private Branch eXchange). A Web based IVR system is also connected to the Internet.

IVR systems use remote touchtone telephones for entering data just like computers use keyboards for inputting information. An IVR system uses TTS (Text To Speech) to read the information to its callers just like a computer uses a screen to display the information to its users. The bridge of voice and data for an IVR system is called voice board or telephone board.

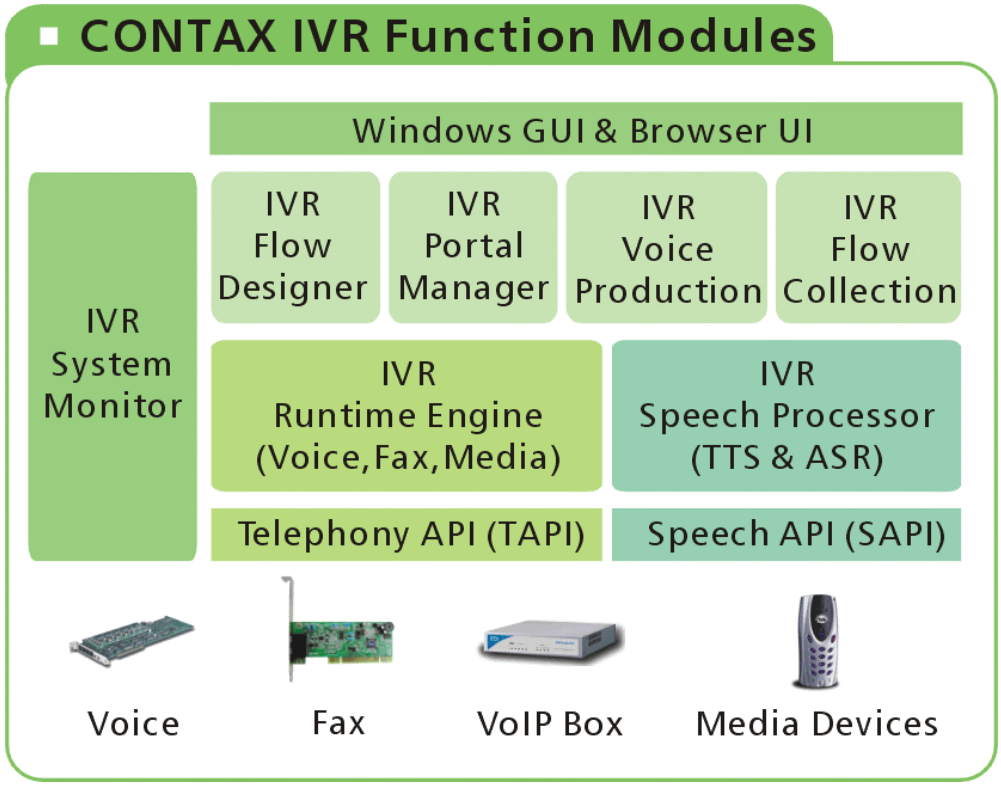
A voice board installed on an IVR computer system is able to process voice signals from its telephone interfaces. It also has a computer bus connection (ISA, PCI, or CompactPCI) to accept computer commands. So a voice board bridges between telephone and computer/data communication as well as analog and digital.

A voice board can simulate to interact with a PBX. It can send flash hook and dial digits. It can detect hang-up signal and notify termination of a call. It can also answer, initiate, and terminate a call.

CONTAX IVR supports voice boards that support TAPI (Telephony API). TAPI is a programming interface from Microsoft and Intel. So CONTAX IVR can work with those PBX that work with the voice boards that support TAPI.



1.3 Function Modules

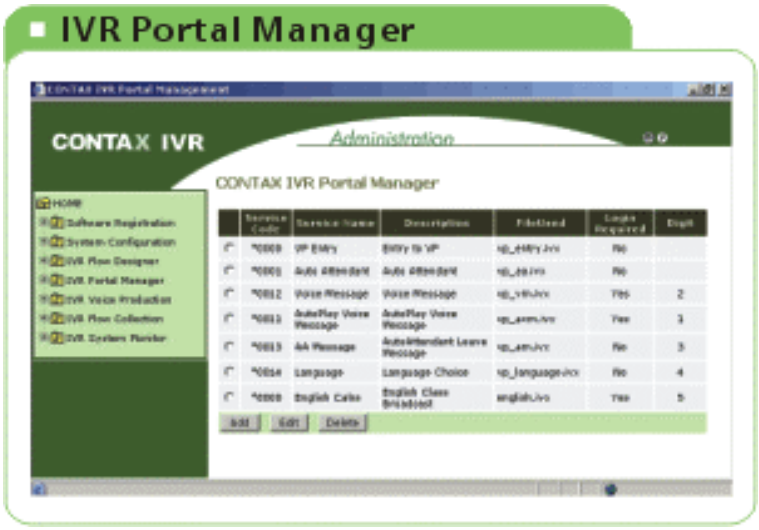


1.3.1 CONTAX IVR Flow Designer

This module allows designers to create, edit, test, and debug their call flows. This is also the module that this CONTAX IVR User Guide discusses the most. Please refer to **Chapter 3**, **Chapter 4**, and **Chapter 5** for detail.

1.3.2 CONTAX IVR Portal Manager

The CONTAX IVR Portal Manager is a single entry window to manage IVR flow services.



1.3.3 CONTAX IVR Voice Production

This CONTAX IVR Voice Production is the recording mechanism for IVR call flows. Developers can use this module to record and produce their respective greetings (announcements and prompts) as wav files corresponding to their call flow cell's property tables.

1.3.4 CONTAX IVR Flow Collection

Eletech collects 50 sample call flows, which are classed into 17 kinds of application for your reference. You can learn to familiarize yourself with the use of cells by studying these samples.

Start -> **Programs** -> **CONTAX IVR v2.1** -> **FlowDesigner**. The CONTAX IVR Flow Designer main window will appear. On the main window, **File** -> **Open** -> **Sample Folder** -> **Sample File** to open a sample call flow.

1.3.5 CONTAX IVR Runtime Engine

The CONTAX IVR Runtime Engine contains **Registration**, **Channel**, and **Console** function.

You can use the **Registration** function to register your software license. When you grow with more telephone lines, you can update your less line license with more line license by using the **Registration** function without reinstalling your software.

The **Channel** function allows you to add and remove channel lines on your system, assign channel lines to work in inbound and/or outbound mode.

The **Console** function displays real time activity information for a selected channel line.

Start -> **Programs** -> **CONTAX IVR v2.1** -> **RuntimeEngine** to display the Runtime engine dialog box.

1.3.6 CONTAX IVR Speech Processor

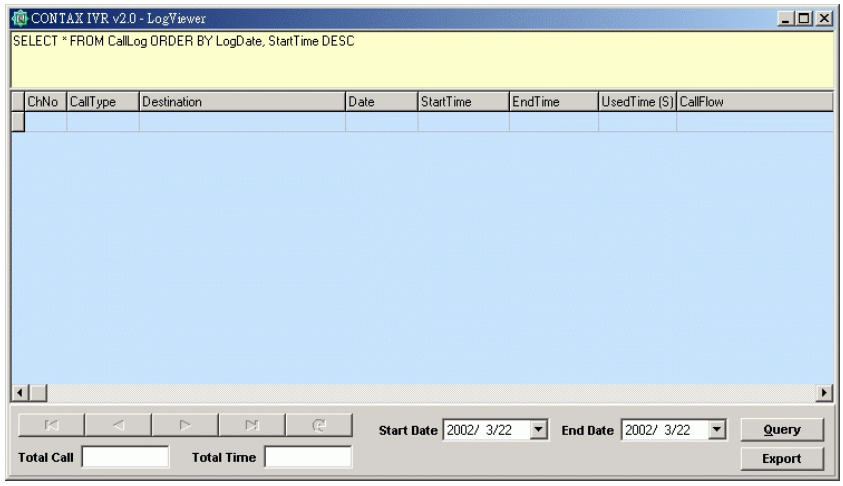
CONTAX IVR builds in speech pre-processor for the Text-to-Speech (**TTS**) and Automatic Speech Recognition (**ASR**) functions.

CONTAX IVR supports Microsoft Speech API (SAPI) engine. Microsoft Windows XP already includes Text-to-Speech (**TTS**) function. For other Windows operating systems, you can install the TTS function from CONTAX IVR CD (run **setup.exe** under **SAPI51** folder to install Microsoft Speech SDK5.1 and run **setup.exe** under **SAPI51LangPack** folder to install Microsoft Speech SDK5.1 Language Pack).

1.3.7 CONTAX IVR System Monitor

The CONTAX IVR System Monitor contains system log and system report. System log records all system activities. System report records incoming, outgoing, and abandoned call information.

Start -> **Programs** -> **CONTAX IVR v2.1** -> **LogViewer**.


CONTAX IVR v2.0 - LogViewer
SELECT * FROM CallLog ORDER BY LogDate, StartTime DESC
ChNo
CallType
Destination
Date
StartTime
EndTime
UsedTime (S)
CallFlow
Start Date
2002/ 3/22
End Date
2002/ 3/22
Query
Total Call
Total Time
Export

C h a p t e r 2

Installation and Registration

2.1 Installing the CONTAX IVR

2.1.1 System Requirements

Intel Pentium III 450 MHz/128 MB RAM/10 MB HD Space

Microsoft Windows 2000 / XP, with IIS 5.0 server

Analog Voice boards with TAPI driver

Fax boards with COM port driver

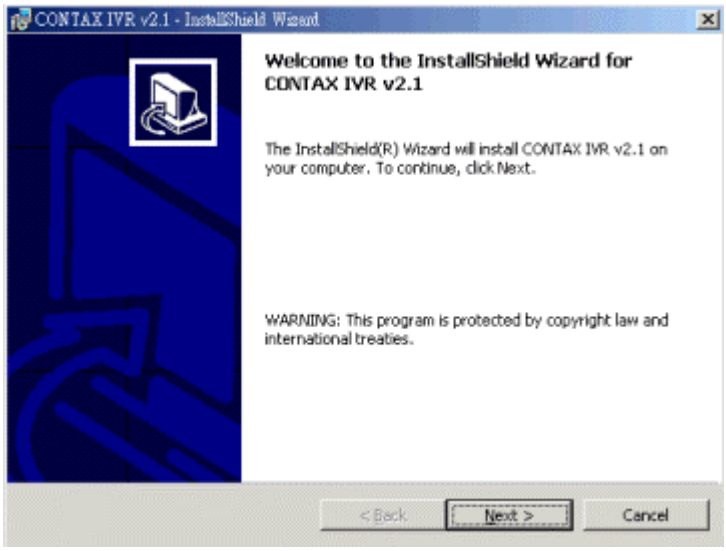
Microsoft SAPI 5.0 (standard in Windows XP, provided with CONTAX IVR CD)

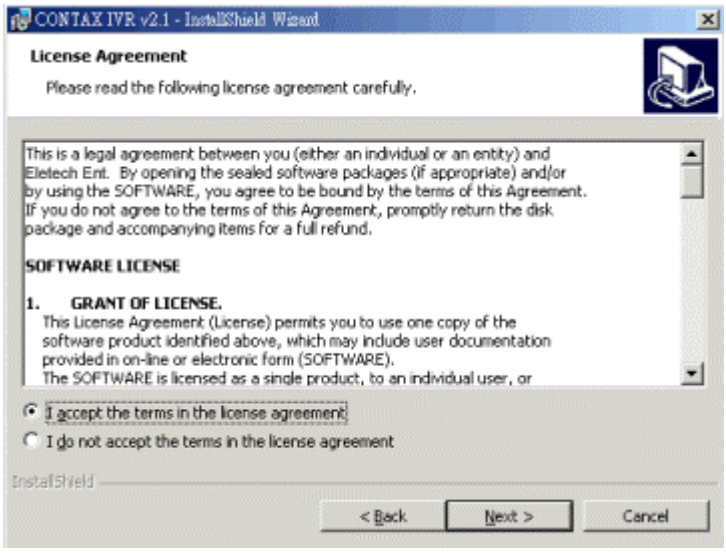
PBX connected with the voice board that support TAPI

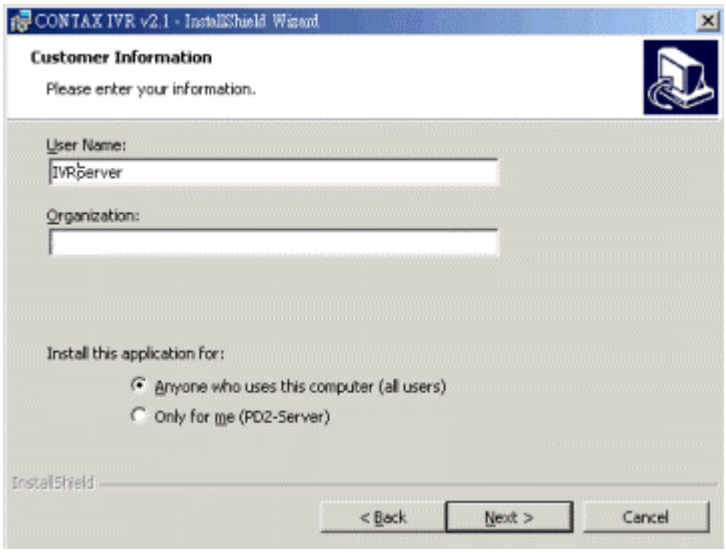
2.1.2 Installation Steps

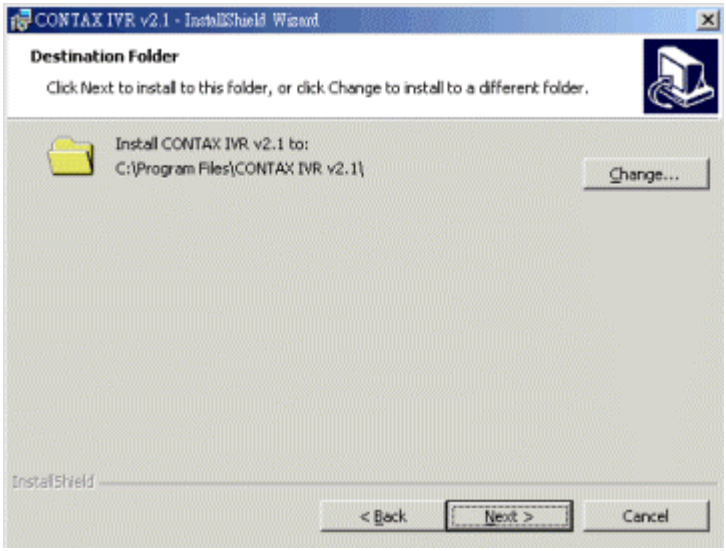
Insert CONTAX IVR CD in your CD-ROM drive.

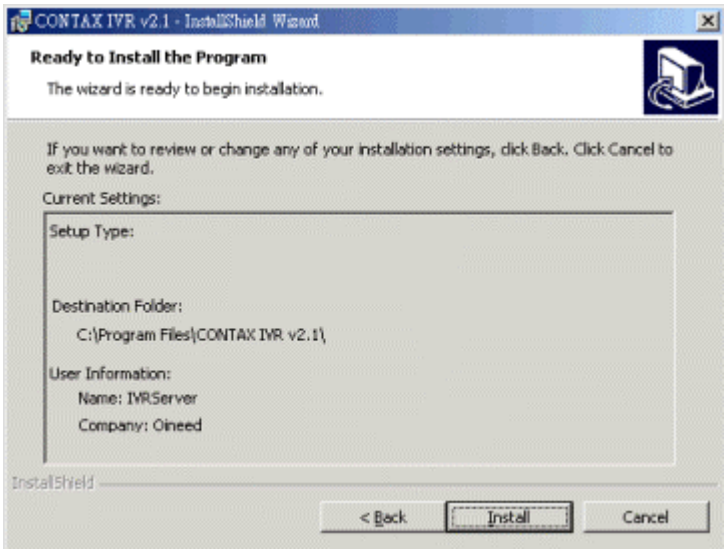
Double-click the **setup.exe** file to execute the installation process. The following CONTAX IVR v2.1 install wizard will appear. Follow its instructions to complete your installation.

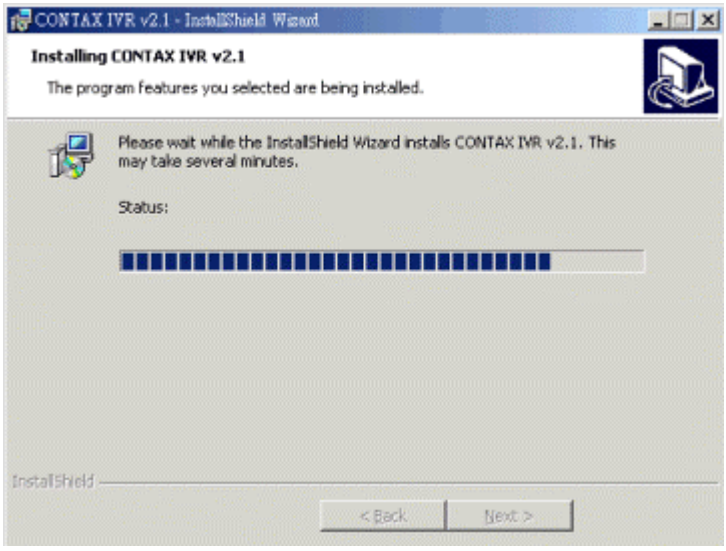

CONTAX IVR v2.1 - InstallShield Wizard
Welcome to the InstallShield Wizard for CONTAX IVR v2.1
The InstallShield(R) Wizard will install CONTAX IVR v2.1 on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

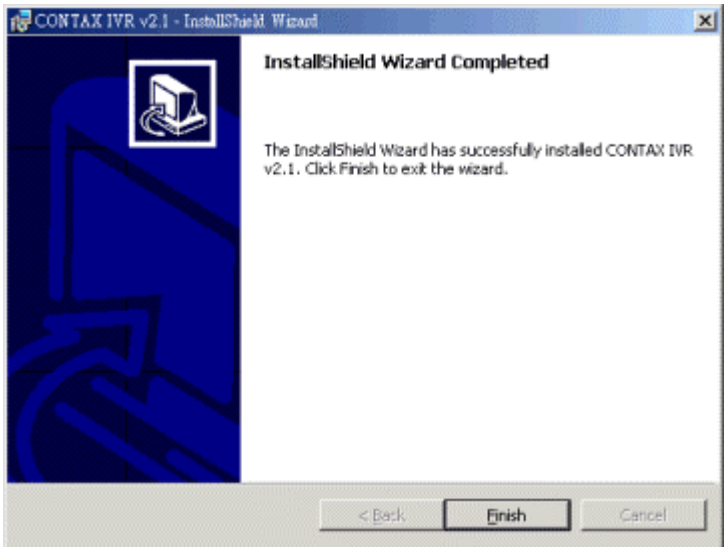

CONTAX IVR v2.1 - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
This is a legal agreement between you (either an individual or an entity) and Eletech Ent. By opening the sealed software packages (if appropriate) and/or by using the SOFTWARE, you agree to be bound by the terms of this Agreement. If you do not agree to the terms of this Agreement, promptly return the disk package and accompanying items for a full refund.
SOFTWARE LICENSE
1. GRANT OF LICENSE.
This License Agreement (License) permits you to use one copy of the software product identified above, which may include user documentation provided in on-line or electronic form (SOFTWARE).
The SOFTWARE is licensed as a single product, to an individual user, or
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel


CONTAX IVR v2.1 - InstallShield Wizard
Customer Information
Please enter your information.
User Name:
IVRserver
Organization:
Install this application for:
Anyone who uses this computer (all users)
Only for me (PD2-Server)
InstallShield
< Back
Next >
Cancel


CONTAX IVR v2.1 - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install CONTAX IVR v2.1 to:
C:\Program Files\CONTAX IVR v2.1\
Change...
InstallShield
< Back
Next >
Cancel


CONTAX IVR v2.1 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
Current Settings:
Setup Type:
Destination Folder:
C:\Program Files\CONTAX IVR v2.1\
User Information:
Name: IVRServer
Company: Oineed
InstallShield
< Back
Install
Cancel


CONTAX IVR v2.1 - InstallShield Wizard
Installing CONTAX IVR v2.1
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs CONTAX IVR v2.1. This may take several minutes.
Status:
InstallShield
< Back
Next >



2.2 Software License

There are two kinds of licenses:

1. Operation License, which has no defined life span, but is based on the number of voice lines supported.

2. Evaluation License, valid for 2 voice lines and 30 days trial.

2.3 Register Software

To ensure continued support for your purchased software copy, CONTAX IVR should be registered with Eletech Ent. or its authorized distributor in your country.

This registration will authorize the runtime engine of CONTAX IVR to support a defined number of lines/channels for the voice board installed in the server (web-based or application-based server) corresponding to the number-of-line license purchased. For example,

if a customer purchases an 8-line IVR Runtime License, after registration, the customer's server can support up to 8 lines for their voice board to run IVR applications developed by CONTAX IVR. Their IVR applications will not support any voice line exceeding 8 unless they upgrade their license to support a larger number of lines.

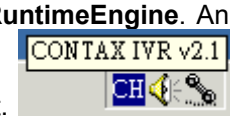
CONTAX IVR uses typed codes, known as 'software keys', for product registration.

There are two keys that you will need for registration. These are:

1. **Register ID**: After the installation of your software copy, a Register ID will be generated, automatically, based on the hardware environment of your computer.

2. **License Key**: Each Register ID has a corresponding License Key. This key is the product license for your copy of the software. It is machine dependent and cannot be used on a different server. To get this License Key for your product copy, you must contact Eletech Ent.'s authorized distributor in your country or Eletech Ent.'s sales department.

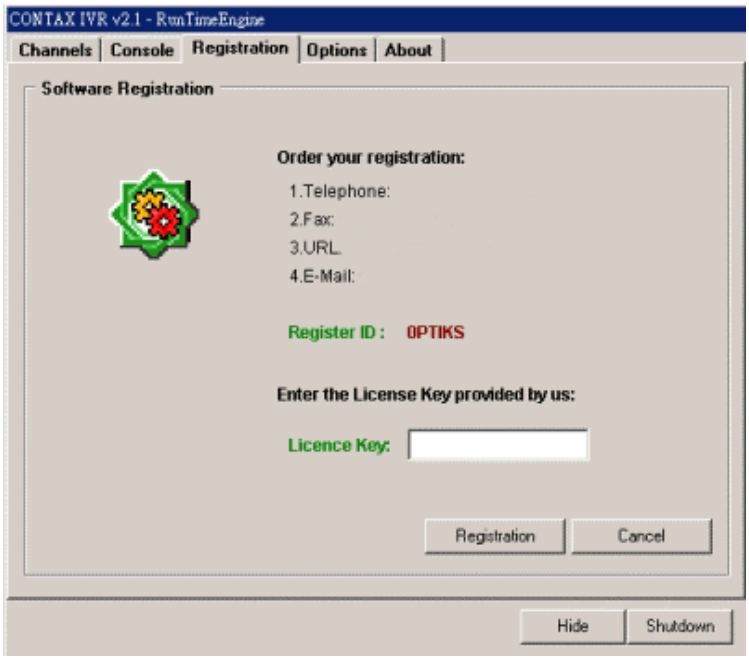
When you upgrade from evaluation license to Operational license (unlimited time and different number of lines support), or from one kind of formal license to another (with a different number of lines support), you will be given a new set of the register ID and the license key. You can enter the license key in the RunTime Engine's registration tab and register, without re-installing your CONTAX IVR software. Please follow the steps given here:

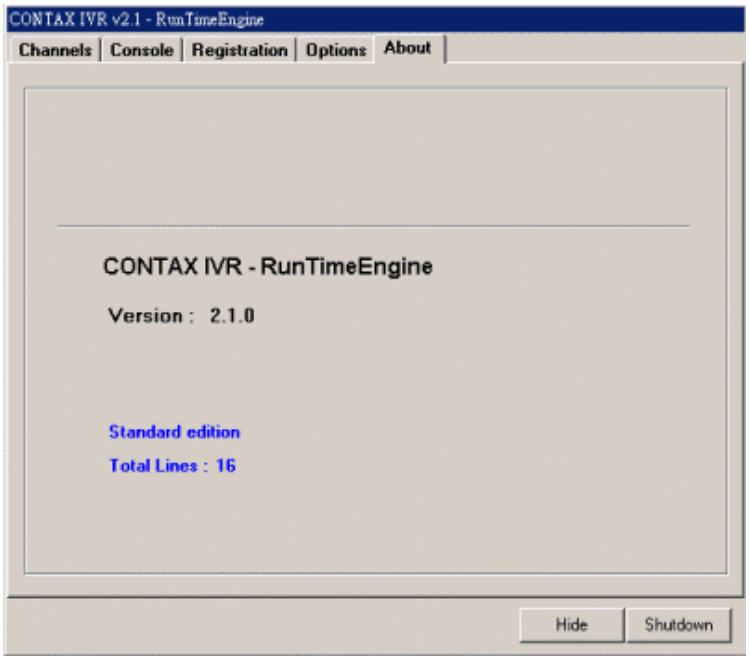
Start -> **Programs** -> **CONTAX IVR v2.1** -> **RuntimeEngine**. An 

icon will appear on the Windows taskbar's right. Double-click this icon. The CONTAX IVR RunTime Engine dialog box appears. Click the **Registration** tab. Then click the **License Key** box and enter the License Key in the box and then click the **Registration** button.

If it is a 30 days evaluation license, then you can leave the **License Key** box blank. You don't need to register. By default, the license authorizes you with 2 lines and 30 days evaluation.

You can click the **About** tab on the CONTAX IVR RunTime Engine dialog box to check your license status.


CONTAX IVR v2.1 - RunTimeEngine
Channels
Console
Registration
Options
About
Software Registration
Order your registration:
1.Telephone:
2.Fax:
3.URL:
4.E-Mail:
Register ID : OPTIKS
Enter the License Key provided by us:
Licence Key:
Registration
Cancel
Hide
Shutdown


CONTAX IVR v2.1 - RunTimeEngine
Channels
Console
Registration
Options
About
CONTAX IVR - RunTimeEngine
Version : 2.1.0
Standard edition
Total Lines : 16
Hide
Shutdown

Note: After installing and registering the software, if you upgrade your system hardware then you must contact Eletech Ent. to get an updated license key.

When you install your evaluation software, you will be automatically given a register ID, a license key and a 30-day evaluation period validity, during which you can use the software without any formal registration. If this 30-day period is not sufficient for your evaluation purposes, you can contact Eletech Ent. sales department to get a temporary extension. To continue using this software after the evaluation period, you must formally register by receiving and manually inputting a license key.

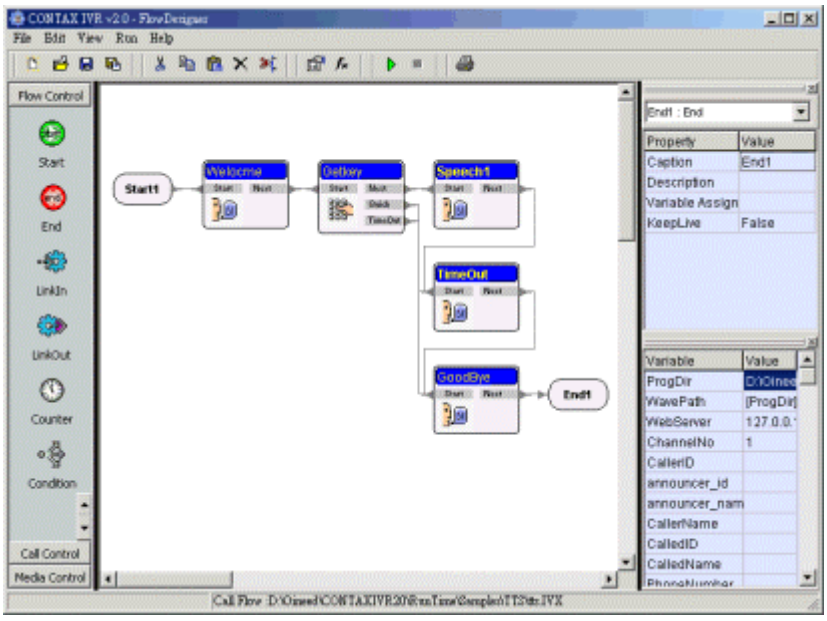
Chapter 3

Using CONTAX IVR Flow Designer

3.1 The Main Window

Start -> **Programs** -> **CONTAX IVR v2.1** -> **FlowDesigner**. The CONTAX IVR Flow Designer main window will appear. You will notice that there are two toolbars, one along the top and another along the left side.

There are also three panes in the main window: the Design pane, the Property table pane, and the Variable table pane.

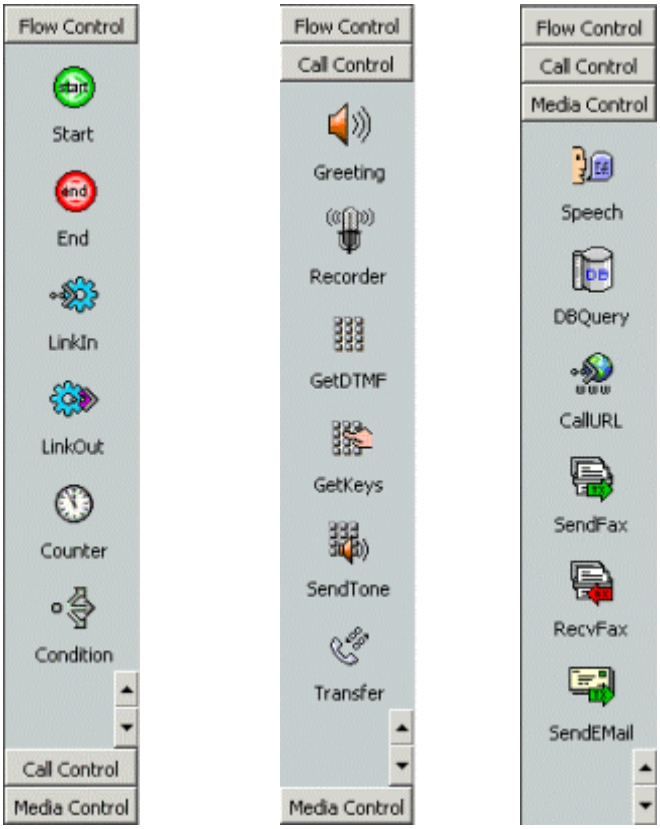


You can adjust the size of each pane by moving the mouse pointer to the boarder between two panes then dragging and dropping the boarder line to your desired position while the mouse pointer turns to one of the following.

3.2 Toolbars

3.2.1 The Side Toolbar

The toolbar along the left side of the main window contains tool cells for the designer to select.



There are **Flow Control**, **Call Control**, and **Media Control** cells. The default main window displays the 7 **Flow Control** cells as shown on the above left picture.

Click the **Call Control** button to switch to view the **Call Control** cells. To view more **Call Control** cells, just click the down arrow at the bottom right corner of the side toolbar as shown on the above middle picture.

Click the **Media Control** button to switch to view the **Media Control** cells as shown on the above right picture.

Click the **Flow Control** or **Call Control** button to switch back to view the **Flow Control** cells or the **Call Control** cells.

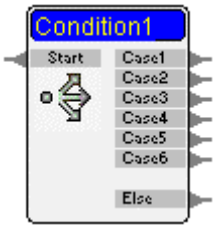
You can click to select one of the cells from the side toolbar, move the mouse pointer towards the design pane, then click to place that cell at an insertion point on the design pane. Then an icon for that cell appears on the design pane with the cell icon's upper left corner positioned at the insertion point. The table below lists a summary of the cell buttons on the side toolbar, the corresponding cell icons, and their function descriptions:

Flow Control Cells:

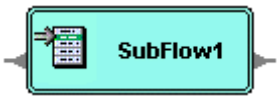
Cell	Button	Cell Icon	Function Description
Start			Start a call flow
End			End a call flow
LinkIn			Go to **LinkOut** cell with the same name in the same call flow
LinkOut			Come from **LinkIn** cell with the same name in the same call flow

Counter  

Count a loop

Condition  

Execute on condition

SubFlow  

Go to a sub-flow (another call flow) in the same channel line

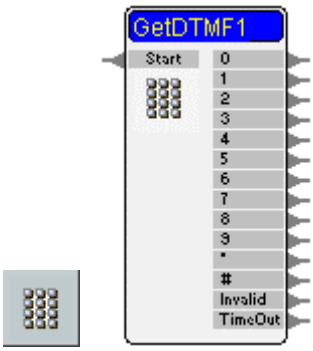
Call Control Cells:

Greeting  

Play a greeting

Recorder  

Record an audio message as a (.wav) file



GetDTMF Get one touch-tone input (DTMF) from a (caller's) phone keypad

GetKeys  Get a certain number of touch-tone (DTMF) inputs from a (caller's) phone keypad

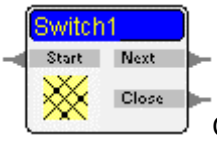
SendTone  Send DTMF tones

Transfer  Transfer a call to another extension via a PBX

Conference  Connect a call with another extension via a PBX

MakeCall  

Call via another channel to execute a new call flow

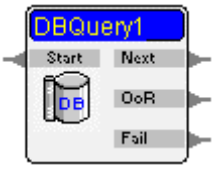
Switch  

Connect two channels

Media Control cells

Speech  

Convert text to speech

DBQuery  

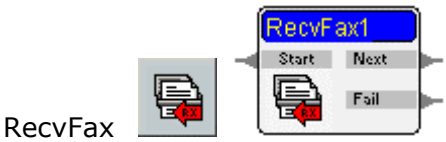
Execute a Database operation

CallURL  

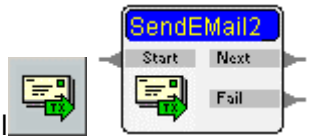
Link to an URL page

SendFax  

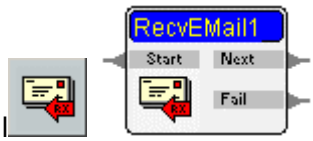
Send Fax



RecvFax Receive Fax



SendEmail Send Email



RecvEmail Receive Email

SendSMS Send Short Message

Please refer to **Chapter 4** for the detailed description and usage of each tool cell.

3.2.2 The Top Toolbar

The toolbar at the top of the main window has the following cell buttons:

File:

 Open a new IVR file.

 Open an existing IVR file.

 Save the current IVR file.

 Save the current IVR file as another file name.

 Print out the IVR call flow layout as a document.

Edit:

 Cut the selected cell icon(s), its property table(s), and link trace(s) on the design pane.

 Copy the selected cell icon(s), its property table(s), and link trace(s) on the design pane.

 Paste the copied cell icon(s) and link trace(s) to the position at 20 pixels lower and right of the original cell icon(s). The cell's property table(s) is/are also be pasted.

 Delete the selected cell icon(s) and link trace(s) on the design pane as well as its/their property table(s) on the property table pane.

 Select All (in the Edit drop-down function list)

 Delete a trace line between two cell icons.

Refresh (in the Edit drop-down function list): Automatically rearrange the layout of all trace lines after individual trace line connection was completed separately.

View:

 Show properties Table.

 Show Global Variable Table.

Run:

 Run the current call flow.

 End the current call flow.

3.3 Design Pane

The design pane is a working area (size = horizontal A4) for the IVR designer in the main window. You can click to select a cell from the side toolbar then place that cell on the design pane. After your desired cells are placed on the design pane, you can click to select the cell to move them and arrange their relative positions, place link trace between two cells, and finally form the call flow for your IVR applications.

3.3.1 Create a Cell Icon on the Design Pane

From the side toolbar, click on a cell button once, move the mouse pointer towards the design pane, you will notice that the mouse pointer turns to a small cell symbol on the design pane as shown below:

Move your mouse pointer to a desired position (which will be an insertion point) on the design pane, click your mouse again, the desired cell icon will appear with its upper left corner at the insertion point.

3.3.2 Select and Deselect Cell Icons

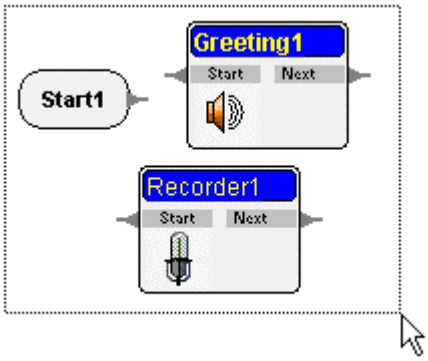
On the design pane, after a cell icon is placed or it is selected by clicking on it, you will see 4 small square blocks at its corners (as shown above).

To deselect a cell icon, you need to click on a point on the design pane anywhere outside the cell icon's imaginary rectangular area defined by its 4 corners.

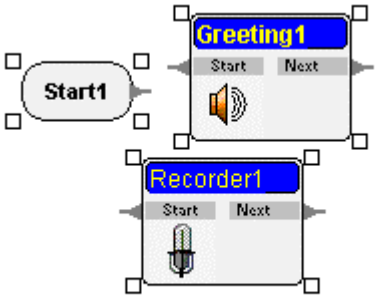
You can also search and select a cell icon from a number of cell icons in a call flow by clicking its caption name from the cell drop-down list on the property table pane. Please refer to section **3.4 Property Table Pane** for detail.

To select multiple cell icons, you can do it with either way of the following:

1. Click on a point outside the cell icons, drag the pointer to make a dot sided rectangular to contain all the cell icons you want to select, then release your mouse.



2. Click to select one of the cell icons, its 4 small square block corners appear. Move your mouse pointer to another cell icon, hold down the control key <Ctrl> and then click on the cell icon. Continue move your mouse pointer and hold down the <Ctrl> + click on the next cell icon until all cell icons you want to select are selected.



To deselect multiple cell icons, you need to click on a point on the design pane anywhere free from any selected cell icon's imaginary rectangular area defined by its 4 corners.

To deselect only one of the selected multiple cell icons, move your mouse pointer to the cell icon you want to deselect, hold down the control key <Ctrl> and then click on the cell icon.

3.3.3 Delete a Cell Icon on the Design Pane

Select the cell icons you want to delete.

Click the delete button on the top toolbar.

The cell icon and the property content in its property table (please refer to section **3.4 Property Table Pane**) will be deleted. All trace lines connected to this cell icon will be deleted too.

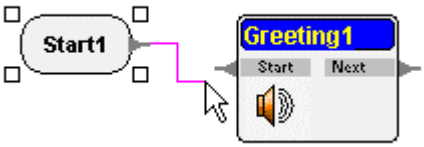
3.3.4 Place Link Trace between 2 Cell Icons

A cell icon represents a set of program with predefined functions. Most cell icons have pins in both sides. Cell icon **Start** and **LinkOut** have only right side pin. Cell icon **End** and **LinkIn** have only left side pin. Left side pin is the entrance of a cell icon. Right side pin or pins is/are the exit or exits of the cell icon. Depending on conditions, the program will exit from one of the right side pins during runtime.

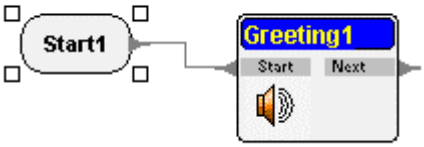
Connecting a cell icon's right side pin to another cell icon's left side pin means linking two program sets with the right cell being executed after the left cell.

Every cell icon has one to many pins for its connection with other cell icons. The pin area includes pin itself and the dark gray pin text area shown below. Note that some cell icons' pin areas have pin itself only and have no pin text area with them (e.g. **Start**, **End**, **LinkIn**, **LinkOut**, and **SubFlow**).

To connect pins between two cell icons, click the pin area at the right side of one cell icon, move your mouse pointer towards the pin area at the left side of the other cell icon. A pink bent line will follow your mouse pointer trace. When your mouse pointer touches the pin area of the other cell icon, click your mouse again.



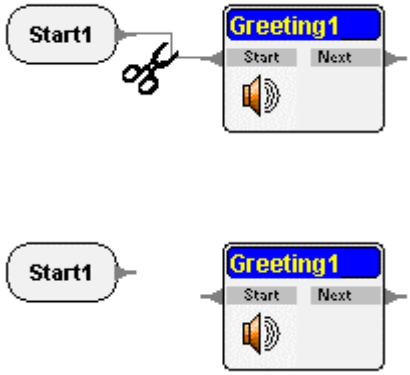
You will see that the pink trace line be fixed and turned to gray as shown below. Thus the two cell icons are connected via their respective specified pins.



If the pink line appears (perhaps by your unintentional click) and you do not want to connect it to any other cell icons, before it turns fixed and gray, just click one more time at any point free from any left side pin area on the design pane, the pink line will disappear.

3.3.5 Delete a Trace Line between 2 Cell Icons

Click the Delete Trace Line button on the top toolbar. You will see the mouse point turns to a pair of small scissors on the design pane. Move the scissors mouse pointer to touch the trace line you want to delete. Click on the trace line, and the trace line will be deleted as shown below:



3.3.6 Drag and Drop (Move) Cell Icons

Select the cell icon you want to move. Place your mouse pointer within the selected cell icon's rectangular area. Drag the selected cell icon to your desired location then drop it. Please be careful not to place your mouse pointer at any right pin area before you drag the selected cell icon. Because thus will generate a pink line to connect to another cell icon. So place your mouse pointer at the cell name (caption) area will be an easy way to drag or move the selected cell icon.

Move a single cell icon will change the relative position for this cell icon to other cell icons. All link traces connected to this cell icon will automatically be rerouted.

If you want to drag or move multiple cell icons at the same time, place your mouse pointer at the cell name (caption) area of any of the selected cell icons. Move multiple cell icons at the same time will keep their relative positions and link traces among the moved/dragged cell icons the same.

3.3.7 Cut/Copy Cell Icons and Link Traces

Select the cell icons you want to cut/copy.

Click the cut or copy button on the top toolbar.

The cell icon and the property content in the cell's property table (please refer to section **3.4 Property Table Pane**) will be cut/copied. All trace lines connected from outside to the selected cell icons will be deleted after cut/copy. All trace lines connected among the selected cell icons remain the same and will be stored in the memory buffer/clip board after cut/copy. You can paste them to other positions on the design pane of the same call flow as well as of other call flows.

3.3.8 Paste Cell Icons and Link Traces

After cut/copy the selected cell icons, click the paste button on the top toolbar. The selected cell icons that have been cut or copied will appear at the position 20 pixels lower and right to that of the original cell icons. You can drag/move these cell icons and link traces to your desired position after they are pasted.

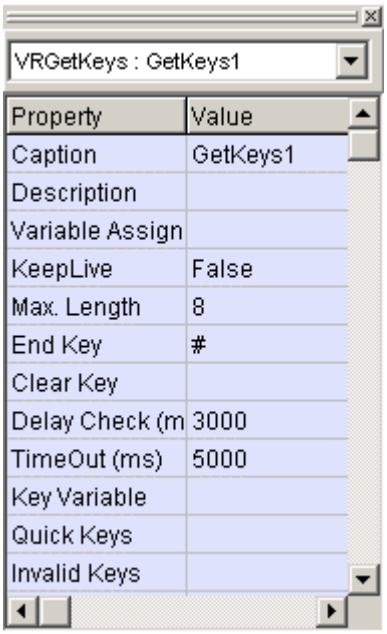
The cell icon and the property content in its property table (please refer to section **3.4 Property Table Pane**) as well as all trace lines connected among the cut/copied cell icons will be pasted.

If you paste the cut/copied cell icons to another call flow, they will appear at the same relative position on the design pane as if they are pasted to the same call flow.

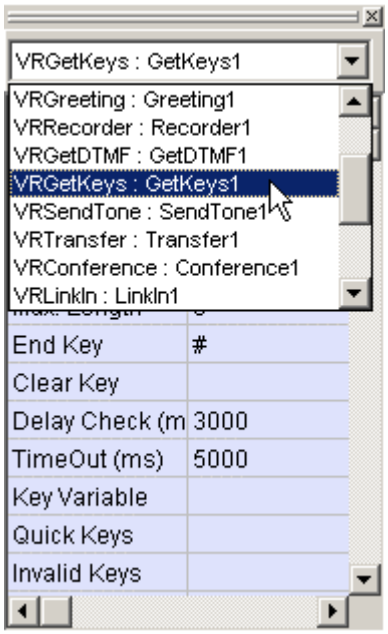
You can move these cell icons and link traces to the desired position to form a duplicated part of call flow. So you do not need to create their property tables and variable table from zero. Edit or change the captions and/or variables in the property tables and/or variable table to form a similar call flow.

3.4 Property Table Pane

The property table pane is next to the design pane and is located on the upper right portion of the main window. Each cell created on the design pane carries its own property table. A cell's property table will appear on the property table pane if you click to select a cell icon on the design pane. Otherwise the property table pane will display the property table of the last placed or displayed cell.



A sample property table



A drop-down cell list

A cell's property table records property values and parameters for that cell. The number of properties/parameters for different kind of cell varies. Varied kinds of cells carry various property and parameter items. Different cell of the same kind carries the same property items and the same number of properties with different property values (at least the table name (Caption) will be different). Property items include **Caption** (table name), **Variable Assign**, **KeepLive**, **TimeOut** value, **Max.** key **Length**, **Quick Keys**, **Invalid Keys**, etc. You can define and edit a property table on the property table pane by clicking its

value fields and then entering values in those fields. Please refer to **Chapter 4** about the property details for each cell.

If an item in the field is too long to be displayed completely, you can always adjust the column's width by moving the mouse pointer to the edge of the top field and then dragging and dropping the separator line to your desired position when the mouse pointer turns to the following:

3.4.1 Drop-Down Cell List

There is a drop-down cell list at the top of the property table pane (as shown above). If there are many cells in a call flow, you can also switch to a specified cell's property table by clicking its name from the drop-down cell list.

3.5 Variable Table Pane

The variable table pane is below the property table pane and is located on the lower right portion of the main window. It displays the variable table for a call flow. Usually each IVR file contains a single call flow, which carries its own variable table. The values in a call flow's variable table are shared among the call flow and its sub-flows. You can define and edit a variable table on the variable table pane by clicking its value fields then entering values in those fields.

Variable	Value
ProgDir	D:\Eletech\CONTAXIVR20\RunTime\
WavePath	[ProgDir]Waves\
WebServer	127.0.0.1
ChannelNo	1
PhoneNumber	
ServiceID	0
CallerID	
CallerName	
CalledID	
CalledName	
CallData	

3.5.1 Adding Variables to The Variable Table

ProgDir, **WavePath**, **WebServer**, **ChannelNo**, **CallerID**, **CallerName**, **CalledID**, **CalledName**, **CallData** ana **ServiceID** are default variables for every call flow.

In addition to the above nine default variables, when you need to define a new variable in the property table, you need to add this variable to the variable table in order to be shared throughout the call flow.

Variables can be added in the variable field (at the left portion) of the variable table. Move the mouse pointer to the last row of the variable table and click on it. The cursor will appear on the last row (either on the variable field or on the value field). Press the down arrow key to create a new row of variable and value fields. Press the up arrow key or Delete key to delete a created row.

After creating a variable in your variable table, you can set an initial value to this variable. Click to select the value field for the variable you want to set an initial value to. Click the field again to edit the field. You will notice that an empty field with a blinking cursor at the first character of the field appears. Enter either a number or a string in this field as an initial value for this variable.

You can set another variable or string combination of other variables as the initial value here by using a pair of parentheses ([]) to enclose a variable name in the value fields (e.g. set the initial value for variable A to be Dial [B] for [C], when B=123 and C=Mary, then A=Dial 123 for Mary. A will change its content when B or C changes its content, e.g. when B=1-800-7661234, C=help, then A=Dial 1-800-7661234 for help). Later you can use **Speech** (text to speech) function to read variable A.

Variable	Value
ProgDir	C:\Program Files\CONTAX IVR v2.0\
WavePath	[ProgDir]Waves\
WebServer	127.0.0.1
ChannelNo	1
CallerID	
A	Dial [B] for [C]
B	123
C	Mary

You cannot set the initial value of a variable in the variable table to be inclusive of the variable itself (e.g. to set A to be Dial [A] for [C] is incorrect).

3.5.2 Assign a Variable

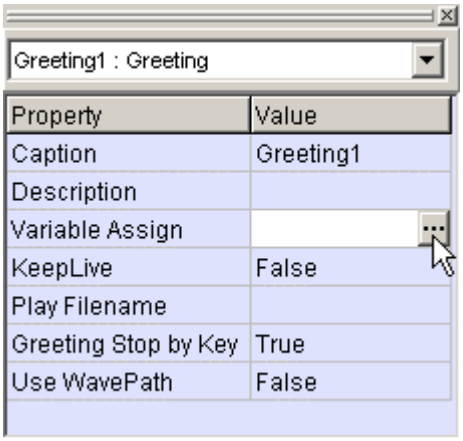
Variables can be assigned in the value fields (at the right portion) of a cell's property table. You need to use a pair of parentheses ([]) to enclose a variable name in the value fields, for example, [IDnumber], [UserNo], [MyPhoneNumber], etc. Thus the program will not mistakenly regard the variable as a text string.

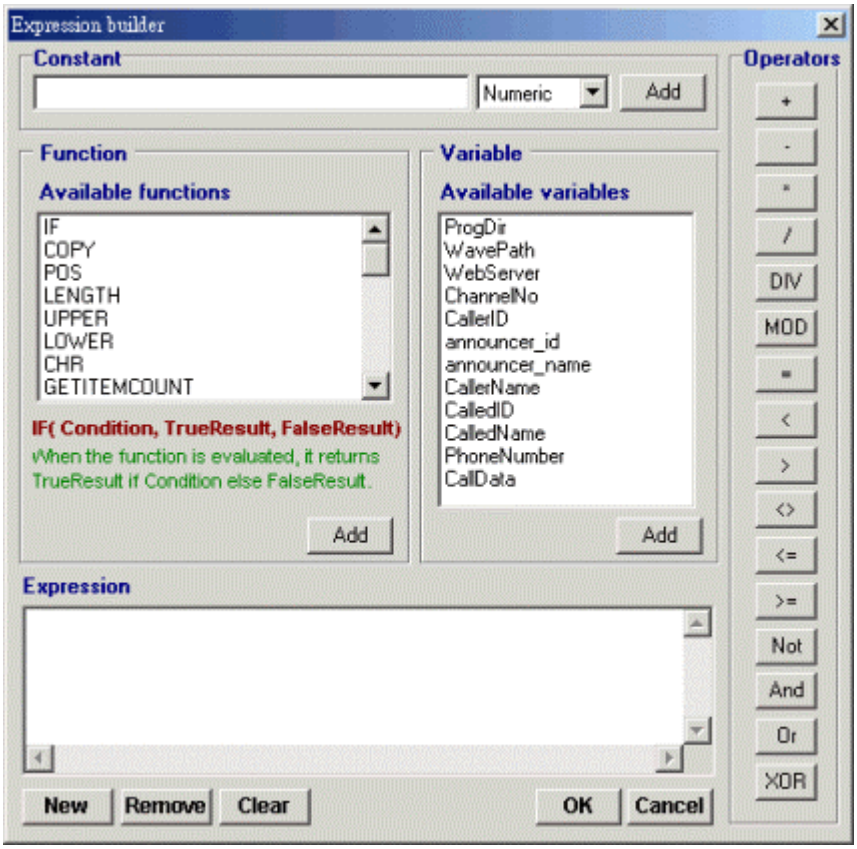
Whenever a cell is executed in a call flow, its variable assign field will be executed once too.

Using the Expression Builder

You can use the **Expression builder** dialog box to create an expression in the value field of a property table:

Click to select the value field of the variable assign property in a property table. Click the value field again to edit the field. You will notice that an empty field with a blinking cursor at the first character of the field appears. Also a button with ellipses (three periods) mark appears at the right edge of the empty value field. You can direct enter an expression in this field. You can also double click the empty field or just click the ellipses button, and then the expression builder dialog box appears.





Enter a Constant

Click the constant field in the constant section of the **Expression builder** dialog box to enter a constant.

If you enter a number as a string here, you need to select this constant to be string instead of numeric type. Click the down arrow in the constant section. Select and click String from the drop down list. Click the **Add** button to add this constant to the expression pane.

Instead of using the **Expression builder**, if you direct enter a number as a string in the value field of the property table, please remember to use a pair of apostrophes (e.g. '123') to enclose the number.

If you use the expression builder to enter a number string, a pair of apostrophes will automatically be added.

Enter a Function

Click to select a function from the function list in the function section of the **Expression builder** dialog box. The description of that function will also appear at the lower portion of the function section. Click the **Add** button to add the function onto the expression pane. The function containing a number of vertical bars (|) separated by commas (,) appears in the expression pane. You can replace any | with an expression by direct entering it or by using the **Expression builder** again to enter it.

Enter a Variable

Click to select a variable from the available variable list in the variable section of the expression builder dialog box. Click the **Add** button to add the variable to the expression pane.

Enter an Operator

Click an operator button in the operators section of the **Expression builder** dialog box to add the operator onto the expression pane.

Enter Expressions in a Property Table

If you want to enter more expressions after one expression is entered in the expression pane, then press the **Enter** key on your keyboard to change to the next line of the expression pane to enter the next expression. Repeat the above method until all your desired expressions are entered.

After all expressions have been entered in the expression pane, then click the **OK** button at the bottom of the expression builder dialog box. You will notice that all expressions are entered onto the value field of a cell's property table and that a semicolon (;) separates them between two adjacent expressions.

Chapter 4

Flow Designer Tool Cells

Each cell represents a set of programs executing a specific function. You can easily link various cells to form a call flow. A cell contains its own property and variables. Variables can be carried over throughout a call flow.

4.1 Tool Cells

Each cell represent a functional program defined by its property table and variable table.

Except that cell **Start**, **End**, **LinkIn**, and **LinkOut** have one pin on only one side, every cell has pins on its both sides (one pin on its left side and at least one pin on its right side).

A left side pin represents an entry point to this cell of functional program. The right side pin or pins represent the exit point of this cell. It will lead to the entry point of the next cell. Depending on situations, a cell may have one to many right side pins. Thus the program will exit from one of the right side pins based on given conditions.

4.1.1 Common Properties

Caption, **Description**, **Variable Assign**, and **KeepLive** are the four common properties to all tool cells.

Caption

CONTAX IVR will give a default caption name to a cell according to the order of that cell's being dragged and dropped from the side toolbar to the design pane (e.g. Greeting1, Greeting2, …, Recorder1, Recorder2, …, etc.)

A cell's caption will be displayed on that cell's icon as its identification in the call flow chart on the design pane.

To replace a default given caption name, you need to enter a name for a cell in a call flow. Using the same Caption name for different cells in a call flow is OK providing no one gets confused. Usually we name a cell by what it does in a call flow. For example, Enter Account #, Listen Messages, and GetDate, etc are all clear captions. This will help yourself and other people more easy to understand the call flow when simulating or maintaining it at a later time.

Description

Give further description of what the cell is doing in a call flow.

Variable Assign

Variables can be assigned in the value fields here. Whenever a cell is executed in a call flow, its variable assign field will be executed once too. So the variable can be updated. The update value of the variable may be used at other places in a call flow.

You can use the **Expression builder** dialog box to create an expression in the value field of a property table.

Please refer to section **3.5.2 Assign a Variable** for detail.

KeepLive

A call flow is opened and executed after the phone call goes through. When the telephone is hung up during a call flow execution, the program will check the current cell's **KeepLive** value. If the value is false, then the call flow will end accordingly.

The default value for **KeepLive** is false.

If the telephone is in hang up status and the **KeepLive** field of the currently executing cell is selected to be true, then the

program won't be end until it executes a next cell with a false **KeepLive** value.

Usually a call flow ends when the phone is hung up. The **KeepLive** feature will be very convenient to database operation while a call flow won't immediately end after the telephone is hung up. So the call flow can execute count or other required functions after hang-up.

Click the **KeepLive** value field. An empty field with a down arrow button appears. Click the down arrow button, the drop down list appears. Select and click true from the drop down list to assign the **KeepLive** value to be true.

4.2 Flow Control Cells

The following cells control a call flow.

4.2.1 Start

Start a call flow

Property	Value
Caption	Start1
Description	
Variable Assign	
KeepLive	False

This cell starts a call flow. When a telephone call goes through a channel line, CONTAX IVR will trigger the call flow file defined in the **Incoming Call-flow file** field of **Channel Configuration** section in the **Channel Setting** dialog box (please refer to **Channel Setting** in Section **6.2.1**).

When you are simulating or testing only part of a call flow, you can insert a temporary **Start** and **End** cell at the beginning and the end of the partial call flow you want to test or simulate. Then the testing or simulating will only execute

from this **Start** cell to this **End** cell instead of the whole call flow.

4.2.2 End

End a call flow

Property	Value
Caption	End1
Description	
Variable Assign	
KeepLive	False

This cell ends a call flow. If you do not place an **End** cell at the end of a call flow, CONTAX IVR system will hang up the call after execution of the last cell.

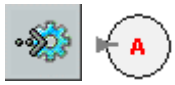
If you place an **End** cell at the end of a call flow, two situations may happen:

1. If there is no other call flow calls this call flow via a **SubFlow** cell, then CONTAX IVR system will hang up the call after execution of the **End** cell.

2. If there is another call flow calls this call flow via a **SubFlow** cell (the called flow file name is defined in the calling flow **SubFlow** cell's property table, please refer to Section **4.2.7 SubFlow**), then CONTAX IVR system will return to that **SubFlow** cell after execution of the **End** cell and then continue to execute the **SubFlow**'s next cell.

When you are simulating or testing only part of a call flow, you can insert a temporary **Start** and **End** cell at the beginning and the end of the partial call flow you want to test or simulate. Then the testing or simulating will only execute from this **Start** cell to this **End** cell instead of the whole call flow.

4.2.3 LinkIn



Go to a **LinkOut** cell with the same name in the same call flow

Property	Value
Caption	LinkIn1
Description	
Variable Assign	
KeepLive	False
Link Name	A

This cell is used with a corresponding **LinkOut** cell. They are often used in a call flow that contains many cells at different locations all connect to the same next cell. Using of **LinkIn** and **LinkOut** will decrease the complexity of too many link trace lines going to a same cell. This will also avoid connecting a link trace line between two distant cells of a call flow chart on the design pane. In a call flow, there are always many **LinkIn** cells corresponding to one **LinkOut** cell.

Link Name: enter a name consistent with that of the corresponding **LinkOut** cell. This name will be displayed on the cell's icon as the cell's identification.

4.2.4 LinkOut

Come from **LinkIn** cell with the same name in the same call flow

Property	Value
Caption	LinkOut1
Description	
Variable Assign	
KeepLive	False
Link Name	A

This cell is used with many corresponding **LinkIn** cell. They are often used in a call flow that contains many cells at different locations all connect to the same next cell. Using of **LinkOut** and **LinkIn** will decrease the complexity of too many link trace lines going to a same cell. This will also avoid connecting a link trace line between two distant cells of a call flow chart on the design pane.

Link Name: enter a name consistent with that of the corresponding **LinkIn** cell. This name will be displayed on the cell's icon as the cell's identification.

4.2.5 Counter

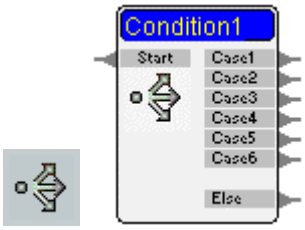
Count a loop

Property	Value
Caption	Counter1
Description	
Variable Assign	
KeepLive	False
Count	3

While executing, this cell will exit from its **Next** pin if the **Count** is not over and exit from its **Over** pin if the **Count** is over.

Count: Enter a number.

4.2.6 Condition



Execute on condition

Property	Value
Caption	Condition1
Description	
Variable Assign	
KeepLive	False
Case1	
Case2	
Case3	
Case4	
Case5	
Case6	

While executing, this cell will exit from one of its **Case** pin if the condition stated in that case's value field of its property table is evaluated to be true. The cell will exit from its **Else** pin if no case is evaluated to be true.

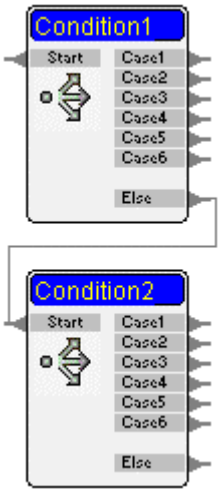
Case1 thru **Case6**: Enter variable operation, function, or expression. If a Case's value field of a **Condition** cell is left blank, then that case will not be evaluated.

You can use the **Expression builder** dialog box to create an expression in the value field of a property table:

Click to select the value field of the variable assign property in a property table. Click the value field again to edit the field. You will notice that an empty field with a blinking cursor at the first character of the field appears. Also a button with ellipses (three periods) mark appears at the right edge of the empty value field. You can direct enter an expression in this field. You can also double click the empty field or just click the ellipses button, and then the expression builder dialog box appears.

Please refer to **Using the Expression Builder** in **Section 3.5.2**.

If you need the number of condition cases to be larger than 6, you can link a second **Condition** cell from the **Else** pin of the first **Condition** cell to form a 12 cases condition as shown below.



4.2.7 SubFlow

Go to a sub-flow (another call flow) in the same channel line

Property	Value
Caption	SubFlow1
Description	
Variable Assign	
KeepLive	False
Call flow Filename	
Use ProgDir	True

While executing, this cell will go to run a sub call flow defined here and then the program will return to exit from this cell's right pin if there is an **End** cell at the end of that sub call flow (if there is no **End** cell at the end of that sub call flow, CONTAX IVR will hang up the phone after execution of that sub call flow).

Call flow Filename: Enter a partial file path if the **Use ProgDir** value is selected to be True.

Use ProgDir: Select True or False

ProgDir is a variable defined in the variable table that is shared throughout the whole call flow. In the example variable table shown below,

ProgDir = **C:\Program Files\Eletech\ContaX IVR**

So if in the property table you select True in the **Use ProgDir** field, and you fill in a call flow file name e.g. **01sub.IVX** in the **Call Flow Filename** field, then the sub-call-flow file to go to will be:

C:\Program Files\Eletech\ContaX IVR\01sub.IVX

If you select False in the **Use ProgDir** field, you need to fill in the full path of a call flow file in the **Call flow Filename** field.

Variable	Value
ProgDir	C:\Program Files\Eletech\ContaX IVR\
WavePath	[ProgDir]Waves\
WebServer	127.0.0.1
CallerID	

An example of Variable Table

After development, when you copy the call flow files to run on another computer, please copy the sub call flow files to the same folder with the main call flows. Otherwise you need to select **Use ProgDir** to be **False** and enter the absolute file path of the sub call flow into the **Call flow Filename** field.

4.3 Call Control Cells

The following cells control a call process. It is based on a computer and voice board perspective. For example, **Transfer** means the computer and voice board transfers a call via the PBX connected to the voice board.

4.3.1 Greeting

Play a greeting

Property	Value
Caption	Greeting1
Description	
Variable Assign	
KeepLive	False
Play Filename	
Stop by Key	True
Keep Stop Key	True
Use WavePath	False

The cell will be executed from its left (Start) pin, then play greeting file, and then exit from its right (Next) pin.

Play Filename: Enter the file name of a greeting to play.

Stop by Key: Select True or False. If True is selected, then pressing any key any time while playing may terminate the greeting. If False is selected, then the greeting will be done to its end without being interrupted by pressing any key during it's playing.

Keep Stop Key: Select True or False. Default is True. Usually we select it to be true.

True: means keep the stop key in the memory buffer. Normally a caller has no idea of stop key. He or she may input the DTMF required by the next cell while the greeting of this cell is still playing. So we need to keep these DTMF input for the next cell.

False: means to clear the memory buffer that stores the stop key pressed during greeting. If a caller is informed of the stop key, before executing the next cell (may be **GetKeys**) and the caller interrupts the greeting and then inputs DTMF (that will also be stored in the memory buffer) for the next cell,

clearing the memory buffer will let the next cell have correct DTMF information without mixing it with the stop key pressed for the previous cell.

Use WavePath: Select True or False

WavePath is a variable defined in the variable table that is shared throughout the whole call flow. In the example variable table shown below,

WavePath = **[ProgDir]Waves**

ProgDir = **C:\Program Files\Eletech\ContaX IVR**

So

WavePath = C:\Program Files\Eletech\ContaX IVR\Waves\

If in the property table you select True in the Use WavePath field, and you fill in a wave file name e.g. **01.wav** in the **Play Filename** field, then the greeting will play the file:

C:\Program Files\Eletech\ContaX IVR\Waves\01.wav

If you select False in the **Use WavePath** field, you need to fill in the full path of a greeting wave file in the **Play Filename** field.

Variable	Value
ProgDir	C:\Program Files\Eletech\ContaX IVR\
WavePath	[ProgDir]Waves\
WebServer	127.0.0.1
CallerID	

An example of Variable Table

After development, when you copy the call flow files to run on another computer, please copy the wave files to the same folder with the main call flows. Otherwise you need to select **Use WavePath** to be **False** and enter the absolute file path of the wave file into the **Play Filename** field.

4.3.2 Recorder

Record an audio message as a (.wav) file

Property	Value
Caption	Recorder1
Description	
Variable Assign	
KeepLive	False
Record Filename	
Stop by Key	True
Keep Stop Key	True
Use WavePath	False
MsgLength (Sec.)	6
Before Greeting	
Beep Sound	

The cell will be executed from its left (Start) pin, record a message on the channel line, and then exit from its right (Next) pin.

Record Filename: Enter the file name to be recorded as.

Stop by Key: Select True or False. If True is selected, then pressing any key any time while recording may terminate the recording. If False is selected, the message will be recorded till its end (**MsgLength**) without being interrupted by pressing any key during its recording.

Keep Stop Key: Select True or False. Default is True. Usually we select it to be true.

True: means keep the stop key in the memory buffer. Normally a caller has no idea of stop key. He or she may input the DTMF required by the next cell while the greeting of this cell is still playing. So we need to keep these DTMF input for the next cell.

False: means to clear the memory buffer that stores the stop key pressed during greeting. If a caller is informed of the stop key, before executing the next cell (may be **GetKeys**) and the caller interrupts the greeting and then inputs DTMF (that will also be stored in the memory buffer) for the next cell, clearing the memory buffer will let the next cell have correct DTMF information without mixing it with the stop key pressed for the previous cell.

Use WavePath: Select True or False

WavePath is a variable defined in the variable table that is shared throughout the whole call flow. In the example variable table shown above,

WavePath = **[ProgDir]Waves**

ProgDir = C:\Program Files\Eletech\ContaX IVR\

So

WavePath = C:\Program Files\Eletech\ContaX IVR\Waves\

If in the property table you select True in the **Use WavePath** field, and you fill in a wave file name e.g. **02.wav** in the Record Filename field, then the message will be recorded as the file:

C:\Program Files\Eletech\ContaX IVR\Waves\02.wav

If you select False in the **Use WavePath** field, you need to fill in the full path of a wave file in the **Record Filename**, **Before Greeting**, and **Beep Sound** field.

MsgLength (Sec.): enter message length in seconds.

Before Greeting: The greeting file played before the recording starts.

If this field is left blank, then no before greeting will be played.

Fill in a full path here if the **Use WavePath** field is selected to be False,

e.g. C:\Program Files\Eletech\ContaX IVR\Waves\03.wav

Enter partial file name here if the **Use WavePath** field is selected to be True, e.g. **03.wav**

Beep Sound: The beep sound file played after the Before Greeting and before the recording starts.

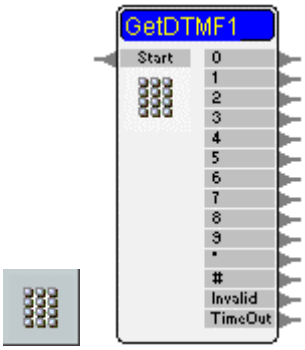
If this field is left blank, then no beep sound will be played.

Fill in a full path here if the **Use WavePath** field is selected to be False,

e.g. C:\Program Files\Eletech\ContaX IVR\Waves\04.wav

Enter partial file name here if the **Use WavePath** field is selected to be True, e.g. **04.wav**

4.3.3 GetDTMF



Get one touch-tone input (DTMF) from a (caller's) phone keypad

Property	Value
Caption	GetDTMF1
Description	
Variable Assign	
KeepLive	False
TimeOut (ms)	3000

This cell is executed from its left (Start) pin, gets input from one of the 12 touch-tone keys, depending on which touch-tone key is input, the cell then exits from one of its corresponding right pin.

TimeOut (ms): in **m**illi**s**econd (a thousandth of a second, 3000 ms = 3 second). The program will wait the DTMF input for this TimeOut value of time. If there's no DTMF input before the TimeOut value, the program will exit from the **TimeOut** pin on the right side of the cell.

Invalid pin: If any message other than the 12 keys (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, and #) is input, then the program exits from the **Invalid** pin on the right side of the cell.

4.3.4 GetKeys

Get a certain number of touch-tone inputs from a (caller's) phone keypad or a voice input from a (caller's) phone

Property	Value
Caption	GetKeys1
Description	
Variable Assign	
KeepLive	False
Clear key buffer first	False
Max. Length	8
End Key	#
Clear Key	
Delay Check (ms)	3000
TimeOut (ms)	5000
Key Variable	
Quick Keys	
Invalid Keys	
Retries Count	3
Before Voice	
After Voice	
Invalid Voice	
Stop by Key	True
Use WavePath	False
ASR Enabled	False
ASR Commands	
ASR Invalid key	
ASR Keyword Variable	

This cell is executed from its left (Start) pin, gets touch-tone key inputs, and then exits from its right (Next) pin.

Clear key buffer first: Clear any DTMF that buffered in the variable assign by **Key Variable** property before **GetKey** cell detect input.

Max. Length: The maximum number of touch-tone inputs.

End Key: This key (usually #) denotes the end of a series of key inputs.

Clear Key: This key clears the input buffer and then starts to receive the input from the beginning (the first key).

Delay Check (ms): Time value in millisecond allowable between two touch-tone inputs. If the time between two touch-tone inputs exceeds this **Delay Check**, then the program exits from the **Next** pin on the right side of the cell.

TimeOut (ms): Enter a value in **m**illi**s**econd (a thousandth of a second, 5000 ms = 5 second). The program will wait the first touch-tone input for this **TimeOut** value of time. If there isn't any touch-tone input before **TimeOut**, the program will exit from the **TimeOut** pin on the right side of the cell.

Key Variable: Enter a variable name. The touch-tone input will be assigned to this variable and then will be used by other cells or other call flows.

Quick Keys: When pressing the quick **keys defined** here, the program will exit from the **Quick** pin on the right side of the cell.

Invalid Keys: Enter keys that are not defined in the voice menu, extension, **Quick Keys**, **Clear Key**, or **End Key**. For example, the voice menu uses key 1 through key 5. You can define 6,7,8 as **Invalid Keys** (use comma between two keys).

Invalid Voice: When invalid keys are input, play the **Invalid Voice** file defined here. If this field is left blank, then no invalid voice will be played.

Before Voice: The voice file played before this cell.

If this field is left blank, then no before voice will be played.

Fill in a full path here if the **Use WavePath** field is selected to be False,

e.g. C:\Program Files\Eletech\ContaX IVR\Waves\05.wav

Enter partial file name here if Use WavePath field is selected to be True, e.g. **05.wav**

After Voice: The voice file played after touch-tone inputs.

If this field is left blank, then no **After Voice** will be played.

Fill in a full path here if the **Use WavePath** field is selected to be **False**,

e.g. C:\Program Files\Eletech\ContaX IVR\Waves\06.wav

Enter partial file name here if the **Use WavePath** field is selected to be **True**, e.g. **06.wav**

Retries Count: If invalid keys are input, this is the number of times that the program will retry executing from the **Start** pin of the cell. If the retry count is over, then the system exits from the **TimeOut** pin.

Stop by Key: Select True or False. If True is selected, then pressing any key any time while CONTAX IVR is playing **Before Voice**, **After Voice**, or **Invalid Voice** may terminate the playing. If False is selected, then the voice will be played to its end without being interrupted by pressing any key during it's playing.

Use WavePath: Select True or False

Please refer to **Use WavePath** in section **4.3.1 Greeting**.

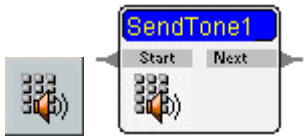
ASR Enabled: Select true to enable ASR engine to translate user voice input into strings as **GetKey**'s input. Touch-tone output by ASR will be stored in **Key Variable**; Keyword string output will be stored in **ASR Keyword Variable**.

ASR Commands: Click to edit, a text edit box will appear, enters the grammar rules for ASR engine.

ASR Invalid Key: Enter keys that are defined in the voice menu, extension, **Quick Keys**, **Clear Key**, or **End Key**. When ASR cannot detect any useful information from user voice input. **GetKey** will follow this setting to perform next step. For example, if you define **ASR Invalid Keys** as **End Key**. When ASR fails to recognize input voice, it will exit to next cell.

ASR Keyword Variable: Enter a variable name. The keyword output by ASR will be assigned to this variable and then can be used by other cells or other call flows.

4.3.5 SendTone



Send DTMF tones

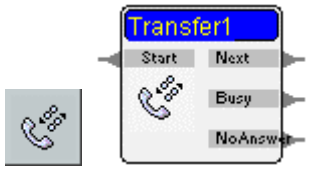
Property	Value
Caption	SendTone1
Description	
Variable Assign	
KeepLive	False
DTMF String	856#2379*
Wait complete	True

This cell sends touch-tones (DTMF) out. It is usually used in communication and control over the telephone line. You can also use this cell to send account number, password information, or system respond voice menu.

DTMF String: enter a number of keys from the 12 keys in the keypad (0 through 9, *, and #).

Wait complete: select **True** means to wait for the DTMF string to be sent completely (it takes definite time to send DTMF tones to be received by the receiving end) before executing the next cell.

4.3.6 Transfer



Transfer a call to another extension via a PBX

Property	Value
Caption	Transfer1
Description	
Variable Assign	
KeepLive	False
Target	22180068
Blind Transfer	False
Conference	False
Wait for hangup	False

This cell transfers a call to an extension or to an outside phone then exit from its **Next** pin. If a busy tone is detected, exit from its **Busy** pin. If the phone keeps ringing without answering, then exit from its **NoAnsw** pin.

Target: enter an extension number or an outside phone number. E.g. 2385 or +1 (408) 766-1234.

If you set 0 or 9 for **Outgoing prefix dialing** in the **Channel Setting** section of **6.2 Runtime Engine**, you do not need to enter the prefix here to get an outside line.

If country code and area code are entered in **Target** and the number is a local phone number, then the country code and area code will be screened providing you have set them in your Windows system (**Start** -> **Settings** -> **Control Panel** -> **Phone and Modem** -> **DialingRules**/**My Location**). The system will only dial the local number for you.

You may enter the local phone number without country code and area code in **Target** if you are sure it is a local number.

Blind Transfer: select True or False. If true is selected, **Transfer** cell perform blind(automatic) transfer. In this method, **Runtime Engine** let the switch (PBX) to handle the transfer task.

Note: By default, **Transfer** cell perform supervised transfer. Not every PBX support this method.

Conference: select True or False. If true is selected, then the system will connect three parties (caller, transferrer

(computer), and transferred target) like a conference instead of only two (connects caller and transferred target, hangs up transferrer (computer)). Hanging up the transferrer (computer) means to end up the call flow. If you want the call flow to monitor or record a call after transfers it, you need to select True for the **Conference** property of the **Transfer** cell.

If False is selected, then the system performs transfer function without conferencing.

The difference between **Transfer** cell with **Conference** property and the following **Conference** cell is that **Conference** cell can connect more than three parties by chain linking of many **Conference** cells while **Transfer** cell with **Conference** property can only connect three parties.

4.3.7 Conference

Connect a call with another extension via a PBX

Property	Value
Caption	Conference1
Description	
Variable Assign	
KeepLive	False
Target	

This cell connects a call with an extension or with an outside phone then exit from its **Next** pin. If a busy tone is detected, exit from its **Busy** pin. If the phone keeps ringing without answering, then exit from its **NoAnsw** pin.

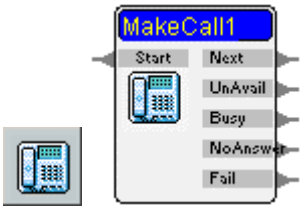
Target: enter an extension number or an outside phone number. E.g. 2385 or +1 (408) 766-1234.

If you set 0 or 9 for **Outgoing prefix dialing** in the **Channel Setting** section of **6.2 Runtime Engine**, you do not need to enter the prefix here to get an outside line.

If country code and area code are entered in **Target** and the number is a local phone number, then the country code and area code will be screened providing you have set them in your Windows system (**Start** -> **Settings** -> **Control Panel** -> **Phone and Modem** -> **DialingRules**/**My Location**). The system will only dial the local number for you.

You may enter the local phone number without country code and area code in **Target** if you are sure it is a local number.

4.3.8 MakeCall



Call via another channel line to execute a new call flow

Property	Value
Caption	MakeCall1
Description	
Variable Assign	[A] = [A] + 1;[B] = [B] + [A]
KeepLive	False
Target	2219-5499
Select Channel	2
Call flow Filename	C:\Program Files\CONTA
Call flow Parameters	F=[A];K=[B]
Delay Call (ms)	300
Use ProgDir	False

Via another channel line of the voice board, this cell calls to an extension or an outside line to execute a new call flow and then exit from its **Next** pin.

If the specified channel line (entered in the **Select Channel** field of the cell's property table) is not available (may be occupied), then this cell will exit from its **UnAvail** pin.

While the system is making the call, if a busy tone is detected, the cell exits from the **Busy** pin. If the phone keeps ringing without answering, the cell then exits from the **NoAnsw** pin.

For all other fails, the cell exits from the **Fail** pin.

Target: enter an extension number or an outside phone number. E.g. 2385 or +1 (408) 766-1234.

If you set 0 or 9 for **Outgoing prefix dialing** in the **Channel Setting** section of **6.2 Runtime Engine**, you do not need to enter the prefix here to get an outside line.

If country code and area code are entered in **Target** and the number is a local phone number, then the country code and area code will be screened providing you have set them in your Windows system (**Start** -> **Settings** -> **Control Panel** -> **Phone and Modem** -> **DialingRules**/**My Location**). The system will only dial the local number for you.

You may enter the local phone number without country code and area code in **Target** if you are sure it is a local number.

Select Channel: enter a channel number (which is defined in section **6.2.1 Channel Tab** of the **Runtime Engine**).

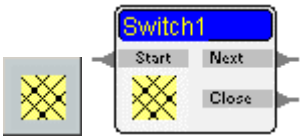
Call flow Filename: Enter the call flow file name that CONTAX IVR system will trigger when the **Target** is dialed through successfully.

Call flow Parameters: Assign variables of this call flow to variables of the new call flow. For example, A is a variable of this call flow. F is a variable of the new call flow. We can assign A to F. Because F is not a variable of this call flow, no parentheses ([]) to enclose F are needed.

Delay Call (ms): The value is in **m**illi**s**econd (a thousandth of a second, 300 ms = 0.3 second). This property is used to delay a certain amount of time before executing this cell.

Often it is used to wait previous cell to fully complete PBX hang up action. If the delay time is zero or too short, the channel line may be still unavailable when **MakeCall** starts to execute.

4.3.9 Switch



Connect two channels

Property	Value
Caption	Switch1
Description	
Variable Assign	
KeepLive	False
Target Channel	
Switch Action	

Connect
Monitor
Disconnect

This cell is used to connect two channels in T1/E1 connection.

Target Channel: enter a channel number (which is defined in section **6.2.1 Channel Tab** of the **Runtime Engine**).

Switch Action: Select from the drop down list.

Connect: The cell connects the other channel then exits from its **Next** pin.

Monitor: The cell monitors the other channel then exits from its **Next** pin. If the other channel hangs up, the cell then exits from the **Close** pin.

Disconnect: The cell disconnects the other channel then exits from its **Next** pin.

4.4 Media Control Cells

The following cells control various media (voice/speech, data/database, Web page, Fax, Email, and SMS).

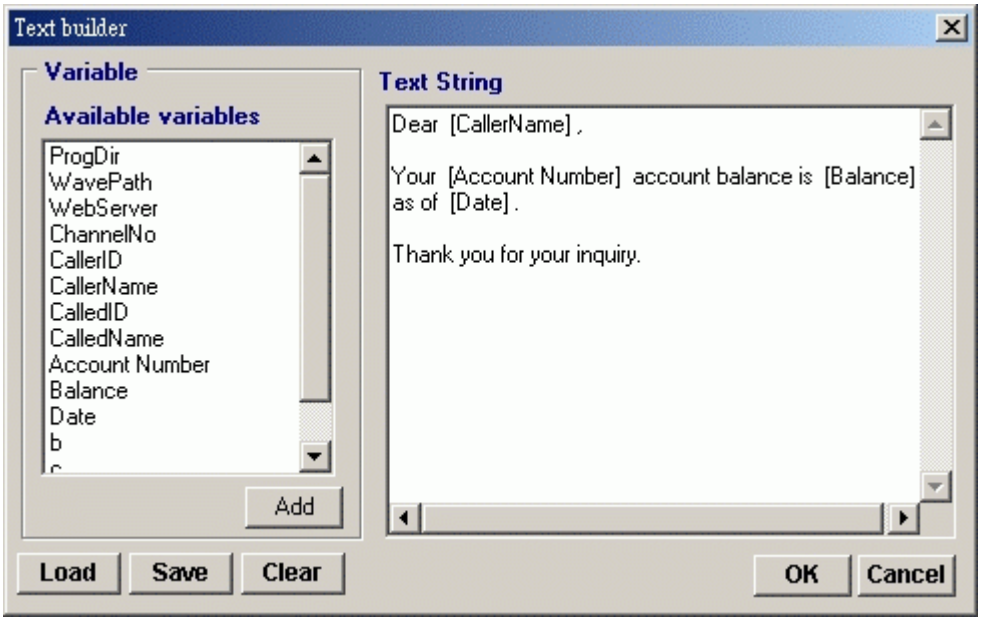
4.4.1 Speech

Convert text to speech

Property	Value
Caption	Speech1
Description	
Variable Assign	
KeepLive	False
Text	
Stop by Key	True
Keep Stop Key	True
Voices	Microsoft Mary
Rate	0
Volume	100
Speech from file	
Speech to Wave file	

CONTAX IVR supports Microsoft Speech API (SAPI) engine. Microsoft Windows XP already includes Text-to-Speech (**TTS**) function. For other Windows operating systems, you can install the TTS function from CONTAX IVR CD (run **setup.exe** under **SAPI51** folder to install Microsoft Speech SDK5.1 and run **setup.exe** under **SAPI51LangPack** folder to install Microsoft Speech SDK5.1 Language Pack).

Text: enter texts directly here or you can enter texts with a **Text Builder** by clicking the button with ellipses (three periods) mark appears at the right edge of the field after clicking on the Text field. The text can contain variables enclosed by a pair of parentheses



Stop by Key: Select True or False. If True is selected, then pressing any key any time while executing the TTS will terminate the TTS. If False is selected, then the TTS will be executed till the end (of the text/file) without being interrupted by pressing any key during it's executing.

Keep Stop Key: Select True or False. Default is True. Usually we select it to be true.

True: means keep the stop key in the memory buffer. Normally a caller has no idea of stop key. He or she may input the DTMF required by the next cell while the TTS or greeting of this cell is still playing. So we need to keep these DTMF input for the next cell.

False: means to clear the memory buffer that stores the stop key pressed during TTS. If a caller is informed of the stop key, before executing the next cell (may be **GetKeys**) and the caller interrupts the TTS (or greeting) and then inputs DTMF (that will also be stored in the memory buffer) for the next cell, clearing the memory buffer will let the next cell have correct DTMF information without mixing it with the stop key pressed for the previous cell.

Voices: click the Voices field and then click the down arrow at its right end. The Voice drop down list appears. Select a voice from the list.

Microsoft Mary is a woman's voice.

Microsoft Mike is a young man's voice.

Microsoft Sam is an adult man's voice.

Microsoft Simplified Chinese is a man's voice for converting simplified Chinese text to speech.

Currently Microsoft does not provide the TTS for traditional Chinese text. You may use Microsoft WORD to convert the traditional Chinese to simplified Chinese first.

Rate: It is the speed of the speech. Ranged from –10 to +10.

0: normal speed

Negative integer: slower

Positive integer: faster

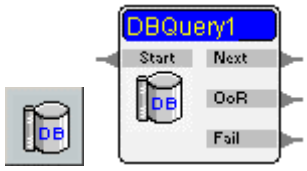
Volume: Can be adjusted from 0 to 100

Speech from file: Enter a text (.txt) or XML file name. TTS will convert its text to speech.

Speech to Wave file: Enter a Wave (.wav) file name. The speech of the text will be saved to this Wave file.

.

4.4.2 DBQuery



Execute a Database operation

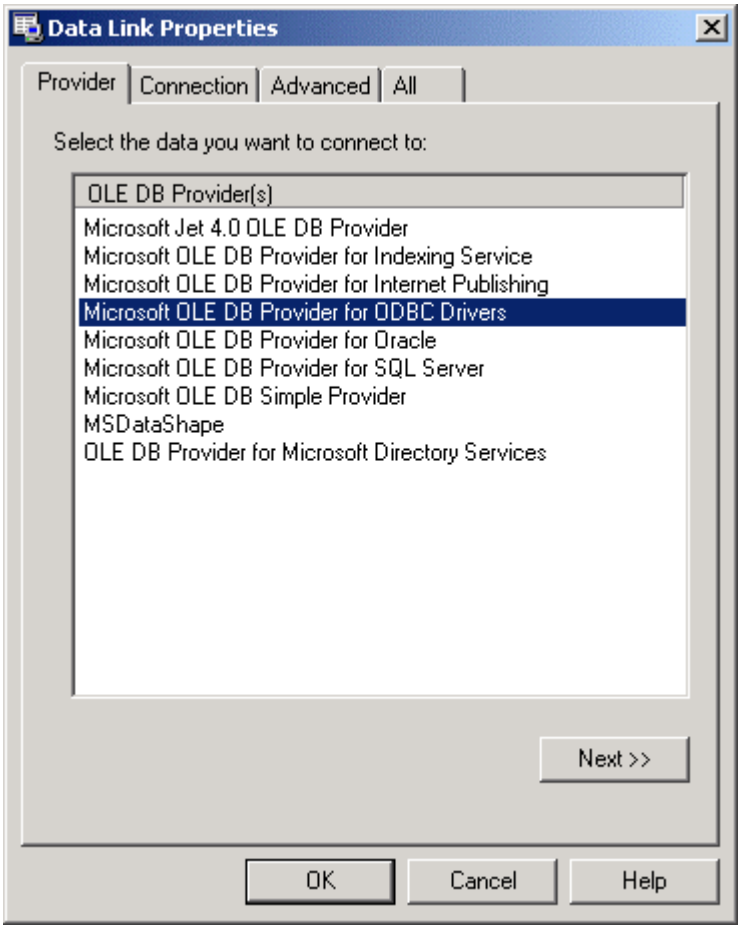
Property	Value
Caption	DBQuery1
Description	
Variable Assign	
KeepLive	False
Conn Name	Db1
Connect String	
SQL Command	
Action	Query Open
RecordCount Variable	
Key Field Name	
Key Field Value	
Auto Refresh	False

This cell executes a Database operation and then exits from its **Next** pin. If the operation result is out of range, not found, or database empty, the cell then exits from its **OoR** pin. If the operation is not successful, the cell then exits from its **Fail** pin.

Conn Name: The default name is Db1. You can create your own connection name. This connection name is a dynamic variable. All column names under Db1 will also become dynamic variables (e.g. Db1.Name, Db1. Order_No, etc).

Connect String: If the **Action** field below is selected to be **Query Open**, then you need to select this field (otherwise leave this field bank).

Click the field and a button with ellipses (three periods) mark appears. Click the button. The Data Link Properties dialog box appears. Select a Database defined by Windows from the list in the **Provider** tab of the Data Link Properties.



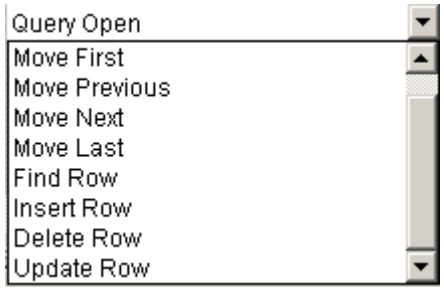
SQL Command: If the **Action** field below is selected to be **Query Open**, then you need to enter this field (otherwise leave this field bank). Enter the SQL command you want the cell to execute.

In other words, the first time a **DBquery** cell opens a database (with Query Open **Action**) in a call flow, it is needed to specify the **Connect String** and **SQL Command** field. Afterwards in the same call flow for the same database, unless you operate with a different command in Query Open

Action, you can use other **Action**s (Move, Find, Insert, Delete, or Update) to operate the database without re-specifying the **Connect String** and **SQL Command** field.

CONTAX IVR system will not check the **Connect String** or the **SQL Command** field if any other **Action** than Query Open is selected.

Action: Click the field. The down arrow at the right end of the field appears. Click the down arrow. The **Action** drop down list appears. Select an action item from the **Action** drop down list. If your selection is **Query Open**, then you need to select the **Connect String** field and enter the **SQL Command** field on above.



The **Action** drop down list

RecordCount Variable: If you want the system returns the total number of rows in a database table after execution of this cell's database operation, you need to assign a variable here for the total number of rows. Otherwise leave this field blank.

Key Field Name: This field is used only if the Find Row **Action** is selected.

Click this field. The down arrow at the right end of the field appears. Click the down arrow. The **Key Field Name** drop down list appears. Select an index key from the **Key Field Name** drop down list for the database to find a row (or rows) by the selected index key.

Key Field Value: This field is used only if the Find Row **Action** is selected.

Same as the **Key Field Name**, enter an index key value for the database to find a row (or rows) by the entered index key value.

Auto Refresh: Select **True** or **False**.

True means after writing back the database tables from memory to disk, the system reads them back to the memory again. Because different callers or users may update different fields of the table at the same time, **Auto Refresh** ensures the tables in the memory to be the latest updated one.

4.4.3 CallURL

Link to an URL page

Property	Value
Caption	CallURL1
Description	
Variable Assign	
KeepLive	False
Web URL	http://[WebServer]/Sample.ASP
Response Variable	

This cell links to an URL page then exit from its **Next** pin. If after the Web sever is connected but no information is returned for a period of time, the cell then exits from its **TimeOut** pin. For all other fails including network failure and any error code returned from the Web server, the cell exits from its **Fail** pin.

The Internet address or Web page may be an Active Server Page (ASP) that contains HTML and embedded programming code written in VBScript or Jscript. When Microsoft's Internet Information Server (IIS) encounters an ASP page requested by the browser from this cell, it executes the embedded

program. This will allow the call flow to interact with databases and other programs via the called Web pages.

Web URL: Enter the Uniform Resource Locator (URL) or the Internet address you want the call flow to call (for example, *http://www.eletech.com/Sample.ASP*) containing the access protocol (*http*), the domain name (*www.eletech.com*), and the path to a file or resource residing on that Web server (*Sample. ASP*).

4.4.4 SendFax

Send Fax

Property	Value
Caption	SendFax1
Description	
Variable Assign	
KeepLive	False
Source File(s)	
Header Line	To : $R From
Header Title	
Header Recipient	
Header Sender	
Header Font	
Text Font	
Station ID	
Fax Class	Auto Detect
Remote ID Variable	

This cell sends Fax to a specified Fax number after that Fax number is dialed successfully by previous cell(s), then it exits from its **Next** pin. If it fails to send the Fax, then it exits from its **Fail** pin.

Source File(s): Click to select the **Source File(s)** field. Click the field again to edit the field. You will notice that an empty field with a blinking cursor at the first character of the field appears. Also a button with ellipses (three periods) mark appears at the right edge of the empty field. You can direct enter the source Fax file(s) you want to send in this field. You can also double click the empty field or just click the ellipses button, and then the open file dialog box appears. From it you can select the source Fax file(s) you want to send.

Multiple files will be separated with semicolons (;). They will be sent in the order of your input or selection.

File format supported are text (.txt), TIFF (.tif), JPEG (.jpg), GIF (.gif), BMP (.bmp), PCX (.pcx), and DCX (.dcx) files.

Header Line: This header line will appear on each page of the Fax received by the recipient. The space between two tags is shown as on the field. You can edit those spaces on the field.

$R is the tag for the recipient's name defined in the **Header Recipient** property item. It has a variable length.

$F is the tag for the sender's name defined in the **Header Sender** property item. It has a variable length.

$I is the tag for the station ID defined in the **Station ID** property item. It has a variable length.

$D is today's date in MM/DD/YY format. Total 8 characters.

$T is current time in HH:MMam or HH:MMpm format. Total 7 characters.

Header Title: Enter the title of the Fax, e.g. Invitation or Quotation.

Header Recipient: Enter the recipient name or variable.

Header Sender: Enter the sender name or variable.

Header Font: Double-click the field and the Font dialog box appears. Select the Font, Font style, Size, and Effects for the header.

Text Font: Double-click the field and the Font dialog box appears. Select the Font, Font style, Size, and Effects for the text file.

Station ID: Enter the station ID to identify your organization, e.g. Eletech Ent. You can also enter different Station ID for different departments or cost centers of your organization. Then it will be easy to do statistics for each Station ID.

Fax Class: Click the field. A down arrow button will appear at the right edge of the field. Click the down arrow button. The Fax Class drop down list appears. From the drop down list, select Auto Detect, Class1, Class2, or Class2.0 for the target Fax machine.

Remote ID Variable: Enter a variable name. The remote ID will be captured while handshaking. Assign the remote ID to the variable for later use, e.g. statistics.

4.4.5 RecvFax

Receive Fax

Property	Value
Caption	RecvFax1
Description	
Variable Assign	
KeepLive	False
Name mode	Channel-Serial-page
Output file type	TIFF file
Destination path	
Fax class	Auto Detect
Station ID	
RemoteID variable	
Receive files variable	

This cell receives incoming Fax and save the Fax to an assigned file, then it exits from the **Next** pin. If it fails to receive the Fax, then it exits from the **Fail** pin.

In an incoming call instead of Fax situation, if the caller hangs up, then the cell exits from its **Next** pin. Otherwise it exits from its **Fail** pin.

Name mode: The incoming Fax will be saved as image files. One file is saved for each Fax page. The Name mode will define how to automatically assign the file name.

From the drop down list, select Channel-Serial-page or Channel-MonthDay-page.

Channel-Serial-page: Each Fax page will be saved as a file with the file name automatically assigned by Channel Number- System-wise Serial Number (accumulated from total Fax events in the system) – page number. For example, file 5-28-1 means the 1st page for Fax serial number 28 on channel 5.

Channel-MonthDay-page: Each Fax page will be saved as a file with the file name automatically assigned by Channel Number- DateTime – page number. For example, file 7-04101731-1 means the 1st page at 17:31 of April 10th on channel 7. The time is acquired when the cell completes receiving the Fax and before saving as image files. Usually a

Fax process including handshaking will exceed one minute. So the file name won't be duplicated.

Output file type: Select TIFF, JPEG, GIF, BMP, PCX, or DCX from the drop down list.

Destination Path: Enter a file path for the Fax files, for example, C:\Sales. So the above mentioned Fax page file name will be C:\Sales\5-28-1.

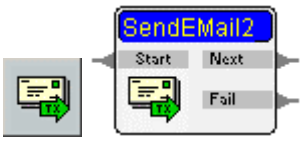
Fax Class: From the drop down list, select Auto Detect, Class1, Class2, or Class2.0 for the incoming Fax machine.

Station ID: Enter the station ID for the receiving end to identify your organization, e.g. Eletech Ent. You can also enter different Station ID for different departments or cost centers of your organization. While handshaking, the sending Fax will acquire this Station ID and then it will be easy for the sending Fax to do their statistics.

Remote ID Variable: Enter a variable name or select it from the drop down variable list. The remote Station ID of the sending Fax will be assigned to this variable.

Receive files variable: Enter a variable name or select it from the drop down variable list. The received files will be assigned to this variable. This variable will contain a string of file names separated with semicolons (;).

4.4.6 SendEmail



Send Email

Property	Value
Caption	SendEMail1
Description	
Variable Assign	
KeepLive	False
From Address	purchase@oineed.com
Recipient	[Supplier]
CCList	[Dealer]
BccList	
Subject	Order [order number]
Body	
Attachment	
SMTP Server	
SMTP Port	25

This cell sends email via the SMTP server then exits from the **Next** pin. If fails to send the email, it will exit from the **Fail** pin.

From Address: Enter the sender's email address. This address is also where the returned email goes to if the recipient replies.

Recipients: Enter recipient email address. Separate multiple recipients with semicolons (;).

You can also click the ellipses (three periods) button at the right edge. The **Recipient builder** dialog box appears. Enter email address on the **Email address** field at the top of the box. Separate multiple recipients with semicolons (;). Click the **Recipients** button to copy and paste the email addresses to the Recipients box. You can also click the **CC** or **Bcc** button to copy and paste the email addresses to the CC or Bcc box.

You can use a string variable to represent an email address or many email addresses. For example, [sales] to represent all email addresses for the sales department.

Email address variables can be used with database operation to create powerful e-commerce or v-commerce tools. For example, when a caller purchases a product, an email will

automatically be sent to the product's supplier and/or its dealer. The email Subject and/or content (Body) may be different regarding whom it is sent to.

After all the required email addresses are pasted on the recipients boxes, click the **OK** button to paste them to the respective property fields.

CCList: same as above **Recipients** property.

BccList: same as above **Recipients** property. Here **Bcc** means **B**lind **c**arbon **c**opy. The Bcc recipients are not displayed in the message header. The TO and CC recipients will not know that a copy has sent to these addresses.

Subject: Enter the subject of the email. You can also enter a string variable here.

Body: Click the ellipses (three periods) button at the right edge of the field. The **Text builder** dialog box appears. Enter the content on the **Text String** box. You can insert variables among the text to have a programmable content by selecting variables from the **Available variables** box and then clicking the **Add** button.

You can also copy the content of a file and paste it to the **Text String** box. Click the **Load** button at the left bottom. The open file dialog box appears. Click to select a text file then click the **Open** button. The text content of the selected file will be pasted to the **Text String** box.

To clear the content of the **Text String** box, click the **Clear** button.

To save the content of the **Text String** box, click the **Save** button.

Click the **OK** button to paste the content of the **Text String** box to the **Body** property field.

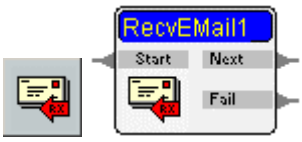
Attachment: Enter the attachment file names. You can also click the ellipses (three periods) button at the right edge of the Attachment property field. The **Open** file dialog box

appears. Click to select the files you want to attach with the email.

SMTP Server: Enter the SMTP (Simple Mail Transfer Protocol) server name that routes your messages.

SMTP Port: Use the default value 25 unless it has been changed during email server installation.

4.4.7 RecvEmail



Receive Email

Property	Value
Caption	RecvEMail1
Description	
Variable Assign	
KeepLive	False
POP3 Server	
POP3 Port	110
UserId	[UserID]
Password	[PassWord]
Action	Query Message Count
Message Index	1
Delete	True
Retrieve Attachment	False
Retrieve Body	False
MessageCount Variable	
Sender Variable	
Date Variable	
Subject Variable	
Body Variable	
Attachment Path	
Attachment Variable	

This cell receives email from the POP3 server then it exits from its **Next** pin. If it fails to receive email from the POP3 server then it exits from its **Fail** pin.

POP3 Server: Enter the POP3 (Post Office Protocol 3) server name that stores the incoming emails.

POP3 Port: Use the default value 110 unless it has been changed during the email server installation.

Userid: Enter the User ID for the email account. Usually enter a variable here to get input from a caller via a **GetDigits** cell.

Password: Enter the Password for the email account. Usually enter a variable here to get input from a caller via a **GetDigits** cell.

Action: Click the down arrow button at the right edge of the field. From the drop down list, click to select **Retrieve Mail** or **Query Message Count**.

Retrieve Mail: Retrieve the sender, Cc, Subject, Date, Time, mail body, and attachment information from the mail server.

Query Message Count: Count the total number of emails stored in the mail server for the email account.

Message Index: Enter a number to index which email to retrieve. 1 means the first email, 2 means the second email, etc. You can also enter a variable here.

Delete: Select **True** or **False**. True means to delete the email from the mail server after this retrieval. False means do not delete the email from the mail server after this retrieval.

Retrieve Attachment: Select **True** or **False** to retrieve the attachment or not.

Retrieve Body: Select **True** or **False** to retrieve the email body or not.

MessageCountVariable: Define a valuable to store current total email number for the email account in the mail server.

Sender Variable: Enter a valuable to store the sender information. You can also click to select from the drop down available variable list by clicking the down arrow button at the right edge of the field.

Date Variable: Enter a valuable to store the date information. You can also click to select from the drop down available variable list by clicking the down arrow button at the right edge of the field.

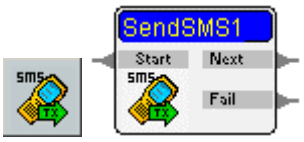
Subject Variable: Enter a valuable to store the subject. You can also click to select from the drop down available variable list by clicking the down arrow button at the right edge of the field.

Body Variable: Enter a valuable to store the email body. You can also click to select from the drop down available variable list by clicking the down arrow button at the right edge of the field.

Attachment Path: Enter a file path to save the attachment after this retrieval.

Attachment Variable: Enter a valuable to store the attachment path. You can also click to select from the drop down available variable list by clicking the down arrow button at the right edge of the field.

4.4.8 SendSMS



Send Short Message

Property	Value
Caption	SendSMS1
Description	
Variable Assign	
KeepLive	False
SMS Model	Nokia 3xxx
SMS Port	COM2
SMS Mode	DAU-9P
Target	
Contents	

This cell sends SMS (Short Message Service) to a target mobile phone and then the cell exits from its **Next** pin. If it fails to send the SMS, then it exits from its **Fail** pin.

SMS Model: This is the model of the mobile phone installed beside CONTAX IVR runtime server. The mobile phone is connected to one of the COM ports on the server. It is used to send out short messages for the server.

Click to select a model from the drop down list.

SMS Port: Click to select a serial port on CONTAX IVR runtime server to send this short message from the server via the mobile phone selected in the above **SMS Model** property item. You can connect 8 mobile phones with COM1 through COM8.

SMS Mode: Select the connection data cable or infrared connection between the server and mobile phone to send this short message.

Target: Enter the target mobile phone number you want to send the SMS to.

The SMS is sent through a mobile phone installed beside the CONTAX IVR runtime server. You do not need to enter the prefix here to get an outside line.

Contents: Click the ellipses (three periods) button at the right edge of the field. The **Text builder** dialog box appears. Enter the content on the **Text String** box. You can insert

variables among the text to have a programmable content by selecting variables from the **Available variables** box and then clicking the **Add** button.

You can also copy the content of a file and paste it to the **Text String** box. Click the **Load** button at the left bottom. The open file dialog box appears. Click to select a text file then click the **Open** button. The text content of the selected file will be pasted to the **Text String** box.

There is no limit to the maximum number of characters you can enter in the **Text String** box. However, generally no more than 140-160 characters in length (depending on the mobile service system) will be sent and transmitted. If a double-byte mobile phone set is used (e.g. in China, Japan, Korea, Taiwan, Hong Kong, etc.), the character length is around 70. The mobile phone will truncate all extra characters, which exceed 140-160 or 70 in length.

To clear the content of the **Text String** box, click the **Clear** button.

To save the content of the **Text String** box, click the **Save** button.

Click the **OK** button to paste the content of the **Text String** box to the **Contents** property field.

4.5 Variables, Operations, and Functions

4.5.1 Variables

In addition to the eight default variables, the additional variables are created in the variable table of a call flow. These variables can be assigned as operations of other variables, as functions of other variables, or as an expression (combination of both).

4.5.2 Operations

The following operators are supported (usually the operand types are automatically identified/converted):

Binary Arithmetic Operators

Operator	Operation
+	addition
-	subtraction
*	multiplication
/	division
div	integer division
mod	modulo (resulting the remainder of a division. For example, 17 MOD 5 result in 2 (17/5 = 3 with a remainder of 2)).

Unary Arithmetic Operators

Operator	Operation
+	sign identity
-	sign negation

String Operator

Operator	Operation

| --- | --- |
| + | concatenation |

Boolean Operators

Operator	Operation
not	negation
and	logical and
or	logical or
xor	logical xor (returns a true value if one of its operands, but not both, is true. Also called exclusive OR)

Bitwise Operators

Operator	Operation
not	bitwise negation, flip
and	bitwise and
or	bitwise or
xor	bitwise xor

Relational Operators

Operator	Operation

=	equal
<>	not equal
<	less than
>	greater than
<=	less than or equal to
>=	greater than or equal to

4.5.3 Functions

The following functions are supported. For a full description of these functions and their parameters, please refer to the next section (**4.5.4 Functions Detail**).

String Functions

CHR, COPY, POS, LENGTH, UPPER, LOWER, GETITEM, GETITEMCOUNT

Arithmetic functions

ABS, INT, TRUNC, ROUND, PI, SIN, COS, ARCTAN, EXP, LN, POWER, SQR, SQRT, FRAC

Time Functions

TIMER, NOW, DATE, TIME

Type Cast

BOOLEAN, STRING, INTEGER, FLOAT

IF Function

IF (*Condition*, *TrueResult*, *FalseResult*)

Condition is a Boolean expression. When the function is evaluated, it returns *TrueResult* if *Condition* else *FalseResult*. *TrueResult* and *FalseResult* need not be of the same type and the type of the IF expression may change depending on Condition.

4.5.4 Functions Detail

String Functions

CHR

Return s the character for a specified ASCII value.

CHR(X: integer): string

COPY

Returns a sub-string of a string containing Count characters staring at Index.

Copy(S, Index, Count: integer): string

Description

S is an expression of a string. Index and Count are integer-type expressions. Copy returns a sub-string containing Count characters starting at Index.

If Index is larger than the length of S, Copy returns an empty string.

If Count specifies more characters than are available, only the characters from Index to the end of S are returned.

POS

Returns the index value of the first character in a specified sub-string that occurs within a given string.

Pos(Substr: string, S: string): integer

Description

Pos searches for a sub-string, Substr, in a string, S. Substr and S are string-type expressions.

Pos searches for Substr within S and returns an integer value that is the index of the first character of Substr within S. Pos is case-sensitive. If Substr is not found, Pos returns zero.

LENGTH

Returns the number of characters in a string.

Length(S): integer

Description

Length returns the number of characters actually used in the string.

For single-byte (AnsiString) and multi-byte strings, Length returns the number of bytes used by the string. For Unicode (WideString) strings, Length returns the number of bytes divided by two.

S is a string-valued expression.

UPPER

Returns a copy of a string in uppercase.

Upper(S: string): string

Description

Upper returns a copy of the string S, with the same text but with all characters between 'a' and 'z' converted to uppercase.

LOWER

Converts an ASCII string to lowercase.

Lower(S: string): string

Description

Lower returns a string with the same text as the string passed in S, but with all letters converted to lowercase. The conversion affects only characters between 'A' and 'Z'.

GETITEM

Get the nth item of a string separated by character(s) SepChar.

GETITEM(n, S: string, SepChar: string): string

Here n is a positive integer.

GETITEMCOUNT

Get the items count of string separated by character(s) SepChar.

GETITEMCOUNT(S: string, SepChar: string): integer

Arithmetic functions

ABS

Returns the absolute value of the argument X.

ABS(X)

INT

Returns the integer part of a real number.

INT(X)

TRUNC

Truncates a real number to an integer.

TRUNC(X)

ROUND

Returns the value of X rounded to the nearest whole number.

ROUND(X)

PI

Returns 3.1415926535897932385.

SIN

Returns the sine of the angle X in radians.

SIN(X)

COS

Returns the cosine of the angle X, in radians.

COS(X)

ARCTAN

Returns the arctangent of X.

ARCTAN(X)

EXP

Returns the exponential of X.

EXP(X: real): real

LN

Returns the natural log of a real expression.

LN(X: real): real

POWER

Raises Base to any power.

Power(Base, Exponent)

SQR

Returns the square of a number.

SQR(X)

SQRT

Returns the square root of X

SQRT(X)

FRAC

Returns the fractional part of a real number.

FRAC(X)

Time Functions

TIMER

Retrieves the number of milliseconds since the computer was started.

NOW

Returns the current date and time.

DATE

Returns the current date.

TIME

Returns the current time.

Type Cast

BOOLEAN

Boolean Typecast.

BOOLEAN(X)

STRING

String Typecast.

STRING(X)

INTEGER

Integer Typecast.

INTEGER(X)

FLOAT

Float Typecast

FLOAT(X)

IF Function

IF (Condition, TrueResult, FalseResult)

Condition is a Boolean expression. When the function is evaluated, it returns TrueResult if Condition else FalseResult. TrueResult and FalseResult need not be of the same type and the type of the IF expression may change depending on Condition.

Chapter 5

Creating and Simulating an IVR Application

5.1 Creating an Application

In order to understand your customer needs, you need to analyze your customer's requirements. Turn the requirements to a structured draft flow will increase the communication with customers and with future maintenance persons. This method will also ease your design effort with clear function blocks and expansions.

Here are a few guidelines for the draft flow. You may adapt them for use with your organization's methodology.

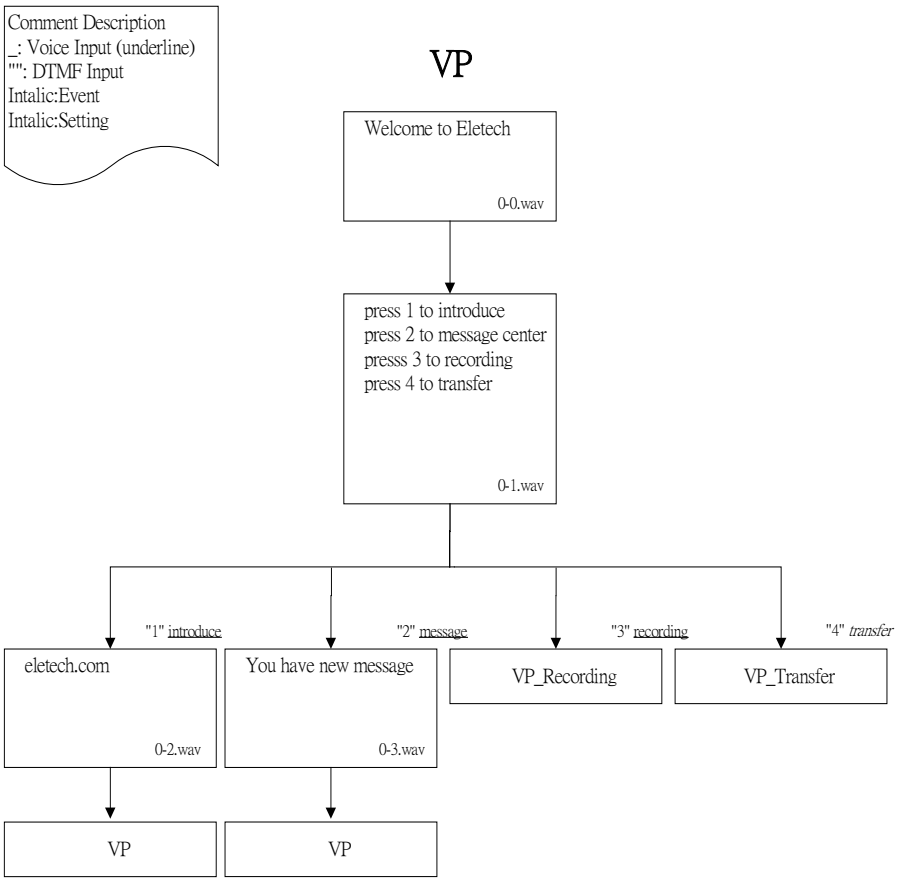
1. use a pair of quotation mark " " to include a DTMF input.

2. underlines the equivalent of voice input for the Automatic Speech Recognition (ASR).

3. Place the content of greetings in the function blocks and the wav file names at the right bottom corner of the blocks. So it will be easy for you to complete the voice recording production.

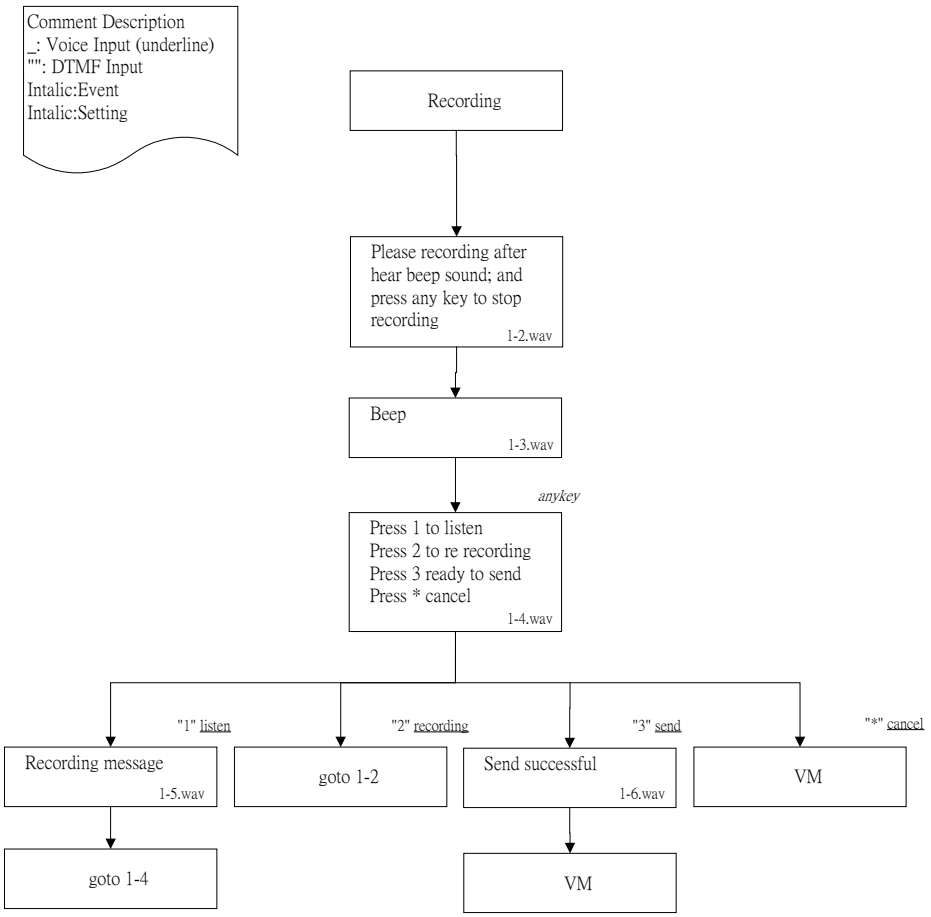
4. If a block is too complex to be described in the box, expand the sub-modules to a detailed flow in the next page (e.g. in the following example, VR_Recording block is expanded on the next page).

Voice Portal



Eletech Ent.	Project	Auto Attendant	Date	2001/12/10		
	Designer	James Chen / SW dept.	Note			
	Module	Voice Portal main menu	Version	1.0.1	No. / Total	01 / 03

VP_Recording

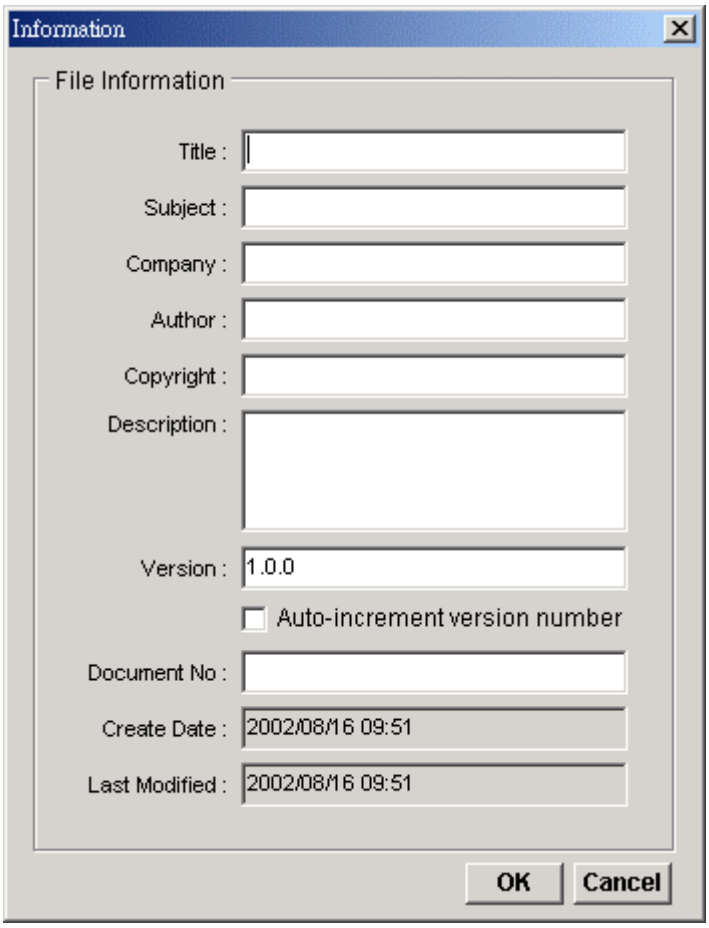


Eletech Ent.	Project	Auto Attendant	Date	2001/12/10		
	Designer	James Chen / SW dept.	Note			
	Module	VP Recording	Version	1.0.1	No. / Total	02 / 03

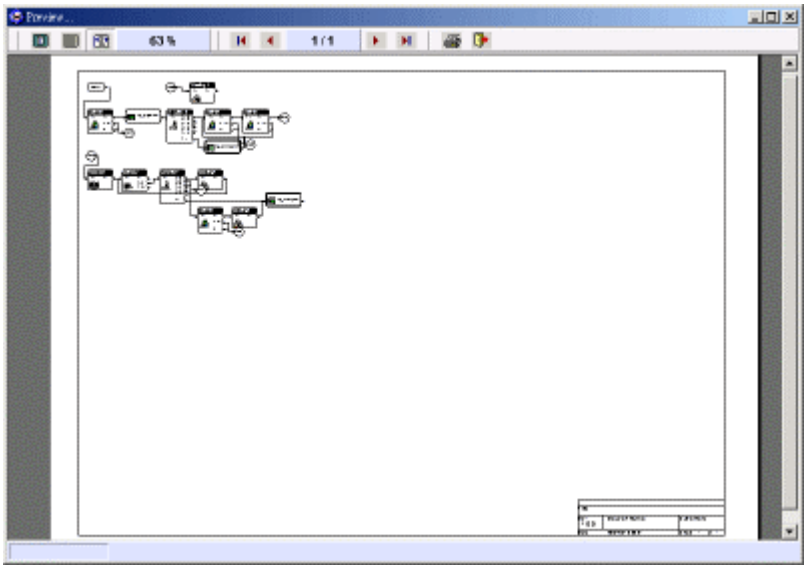
5.2 Simulating and Testing

When you complete designing an IVR call flow using CONTAX IVR Flow Designer, you can save the call flow as an .ivx file.

Before saving you call flow. Click View/Information on the menu bar of the main window, an Information dialog box appears. Enter detail information for this .ivx file. The details for call flow file will appear on the printed call flow layout.



You can click File/Print… to perform this printing job.

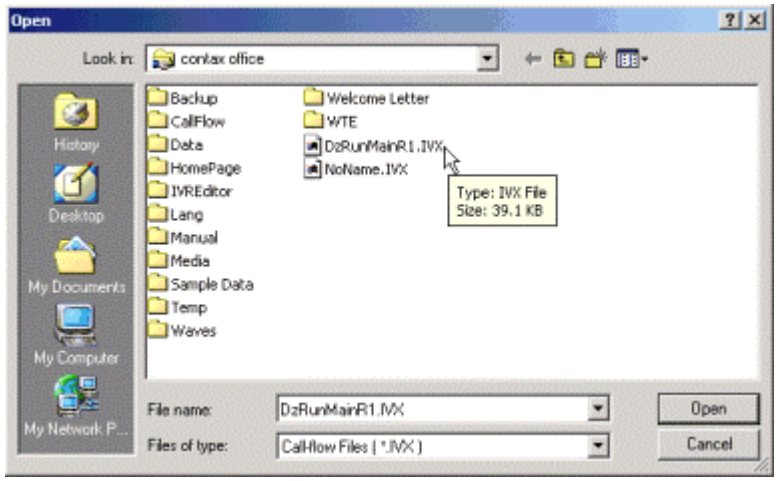


If you click Run button  from the top toolbar without saving it, a Save dialog box will appear to ask you to save the call flow first.

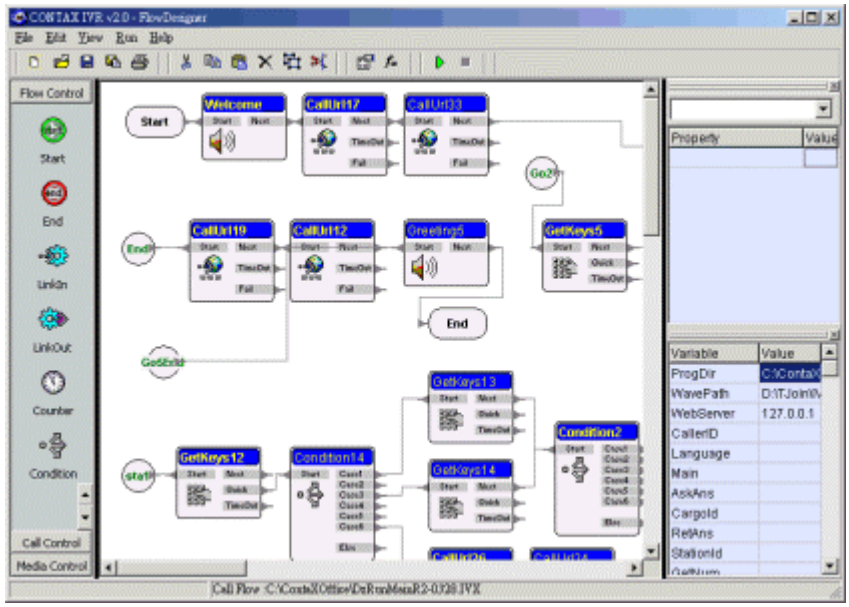
5.2.1 Simulating An Existing Call Flow

Click the Run button to run the CONTAX IVR program on your computer or from Internet connection. The CONTAX IVR main window with an empty design pane will appear.

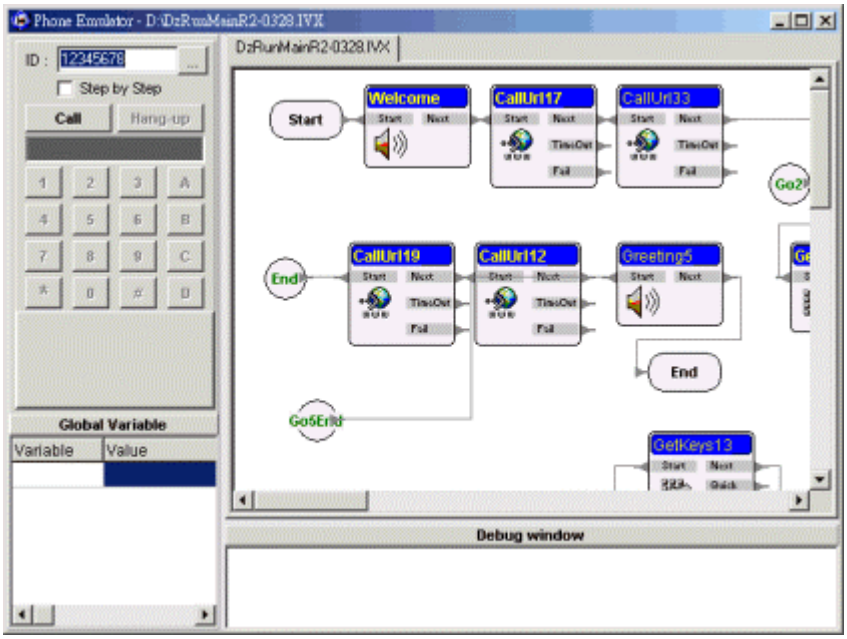
Click File/Open on the menu bar of the main window, a CONTAX IVR file open dialog box appears. Click to select an existing call flow file (.IVX file) from the file open dialog box or from the Look in drop down list. The selected call flow file name will appear on the File name field.



Click the Open button on the file open dialog box. The selected call flow will appear on the design pane of the main window. The variable table of the call flow is also displayed on the variable table pane.



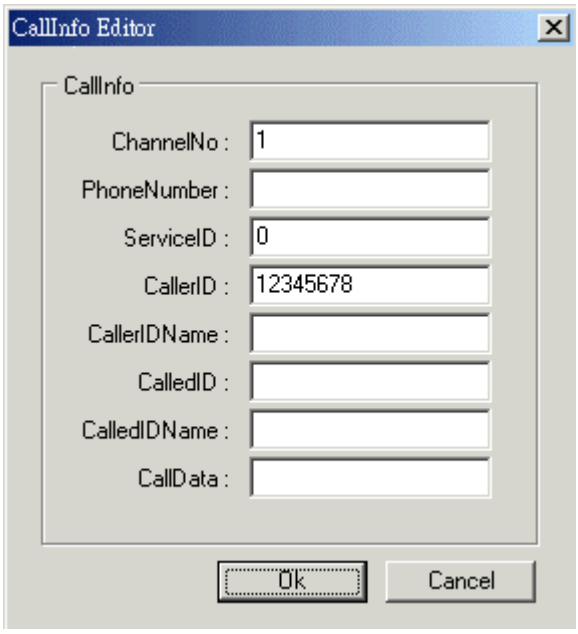
Click the Run button on the top toolbar, the Phone Emulator window appears.



Click the **Call** button on the phone emulator to run the call flow. You will notice that the executing current cell icon is highlighted with yellow color. The global variable table at the left lower portion of the window is updated accordingly during the executing process of the call flow. A debug window in below displays step-by-step status and variable content for each cell's execution. The call flow will stop at a cell that needs keypad input (e.g. **GetDTMF**). Click the number key on the phone emulator keypad to input the digits. The call flow execution will continue based on your input information.

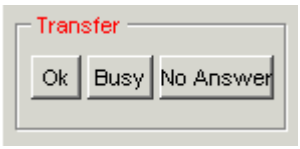
The 

edit field can be used to specify the CallerID for this simulation session. Click the button near by the edit field, a CallInfo Editor dialog will appear. This dialog allows you to view/edit additional call information that associates with global variables. Include "**ChennelNo**", "**PhoneNumber**", "**CallerID**", "**CallerName**", "**CalledID**", "**CalledName**", "**CallData**" And "**ServiceID**".

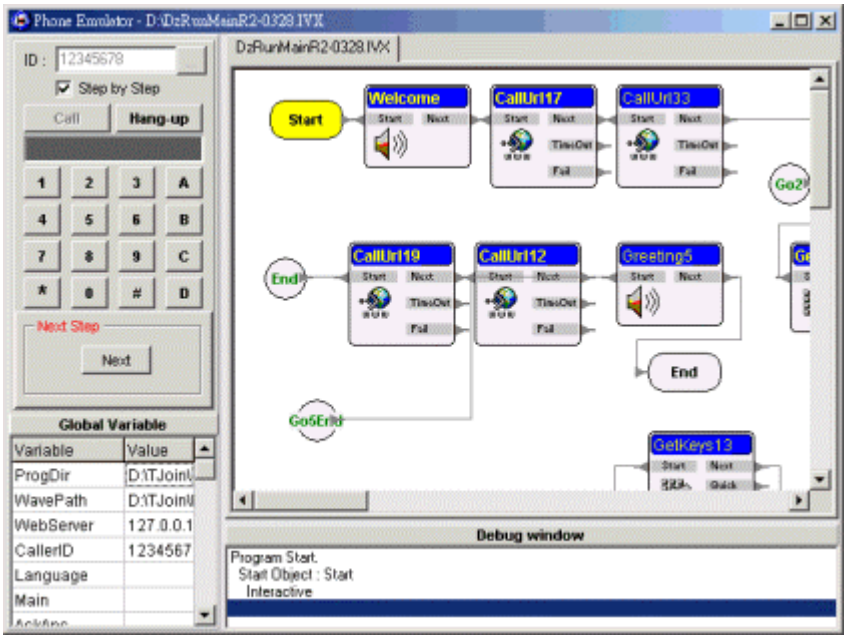


You can check 

to enable step-by-step capability. When enabled, you need to click the Next button in the "Next Step" panel to make the simulator continues until next break point. In this panel, you can also supervise witch branch the flow goes on. For example, you can assume transfer no answer to force call flow run into a branch that handling this situation.



To run the flow again, you need to stop the current running call flow. Just click the highlighted End button  then click the Run button again.


Phone Emulator - D:\DzRunMainR2-0328.IVX
ID : 12345678
Step by Step
Call
Hang-up
1 2 3 A
4 5 6 B
7 8 9 C
* 0 # D
Next Step
Next
Global Variable
Variable
Value
ProgDir
WavePath
WebServer
127.0.0.1
CallerID
1234567
Language
Main
DzRunMainR2-0328.IVX
Start
Welcome
CallUrl17
CallUrl33
End
CallUrl19
CallUrl12
Greeting5
End
Go5End
GetKeys13
Debug window
Program Start.
Start Object : Start
Interactive

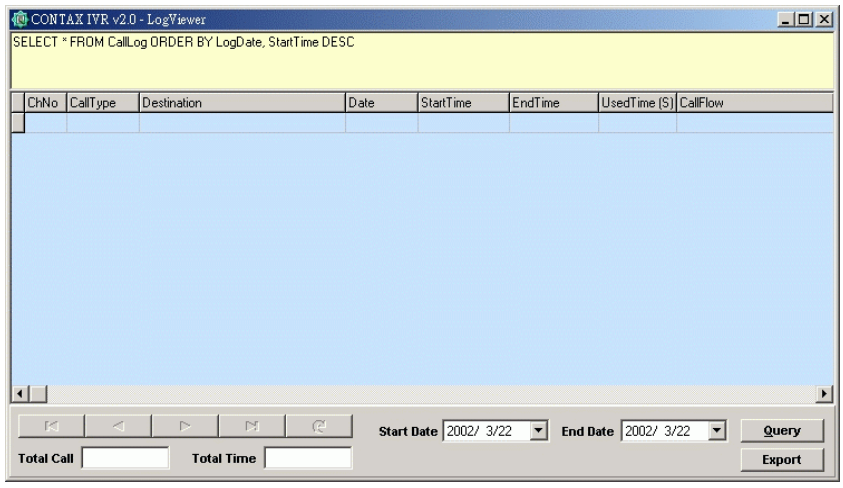
Chapter 6

IVR System Monitor and Runtime Engine

6.1 System Monitor

The CONTAX IVR System Monitor contains system log and system report. System log records all system activities. System report records incoming, outgoing, and abandoned call information.

Start -> **Programs** -> **CONTAX IVR v2.1** -> **LogViewer** to display the **LogViewer** window.



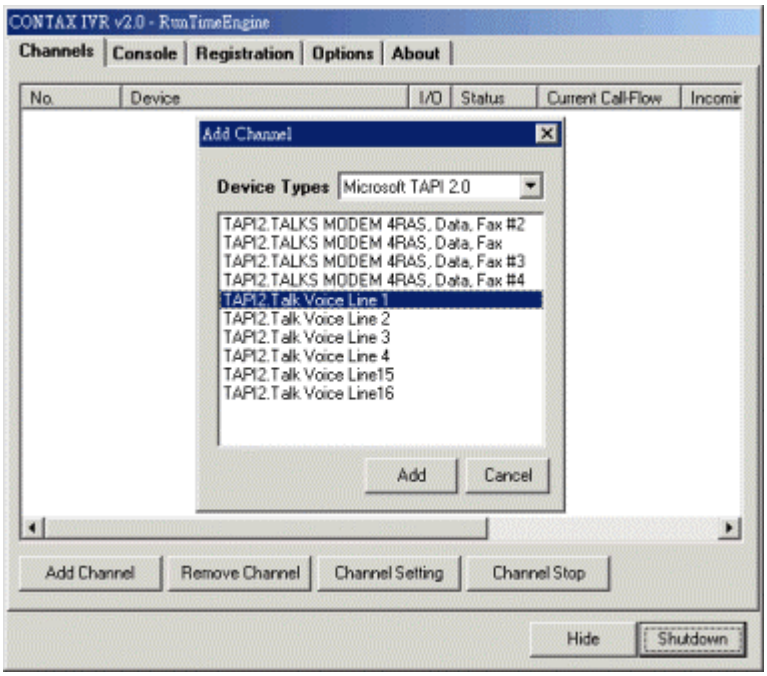
6.2 Runtime Engine

Start -> **Programs** -> **CONTAX IVR v2.1** -> **RuntimeEngine** to display the **Runtime engine** dialog box.

6.2.1 Channel Tab

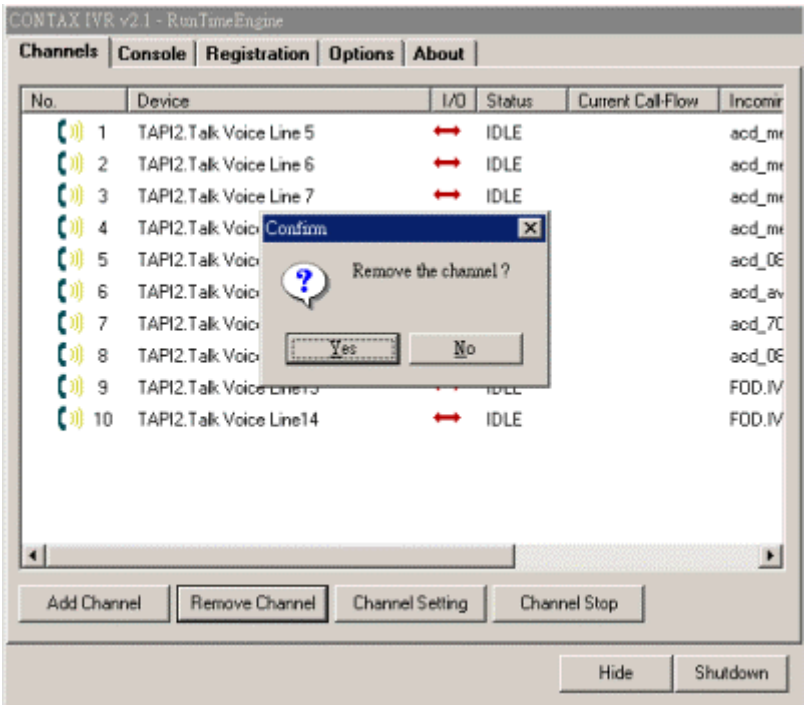
Add Channel

Click the **Channels** tab. Click the **Add Channel** button. The Add Channel dialog box appears. Click to select a channel line and then click the **Add** button. The selected channel will be added on the Runtime engine dialog box.



Remove Channel

To remove an added channel line, click the **Remove Channel** button. A **Confirm** dialog box appears. Click **Yes** to confirm it.



Channel Setting

To set a channel line, click the **Channel Setting** button. The **Channel Setting** dialog box appears.

If you have many channel lines to set with the same content, you can check to select the **Apply to all channels** item at the bottom of the Channel Setting dialog box. After you check the **Apply to all channels** item, if you enter values to an item field, you will see the item name will change its color from black to red. This means this item value will be applied and duplicated to all other channel lines. So you don't bother with entering this value for other channel lines repeatedly.

Phone Number: Enter the PSTN/PBX phone number for this channel.

Incoming Call Flow File: Click to select the field of the item box. Enter a full path of the file so that an incoming call of this channel line will trigger to run this call flow. You can also click the button with ellipses (three periods) mark at the right edge of the field. The file open dialog box will appear. Click to select an ivx file then click the **Open** button. The selected file will be entered in the field.

CallURL Web Server: Enter the web server IP address that this channel's call flow file will use a **CallURL** cell to call an URL. (If the field is blank, the Web Server in the call flow will use its declaration, if you specify a value, all the Web Server in the call flow will be replaced to this value)

Internal prefix dialing: leave it blank if no prefix is required for dialing an internal extension. Enter the prefix key if required.

Outgoing prefix dialing: Enter the prefix key (usually 0 or 9). The CONTAX IVR system will add the prefix to dial an outside phone number for **Tranfer**, **Conference**, and **MakeCall** cell in the call flow. Usually we attach one comma to 0 0r 9 (to be 0, or 9,). One comma means one second of pause give by the voice board to wait to get PBX's outside line tone.

Voice Encoding Format: Click to select the WAV file format of the item box that this channel's

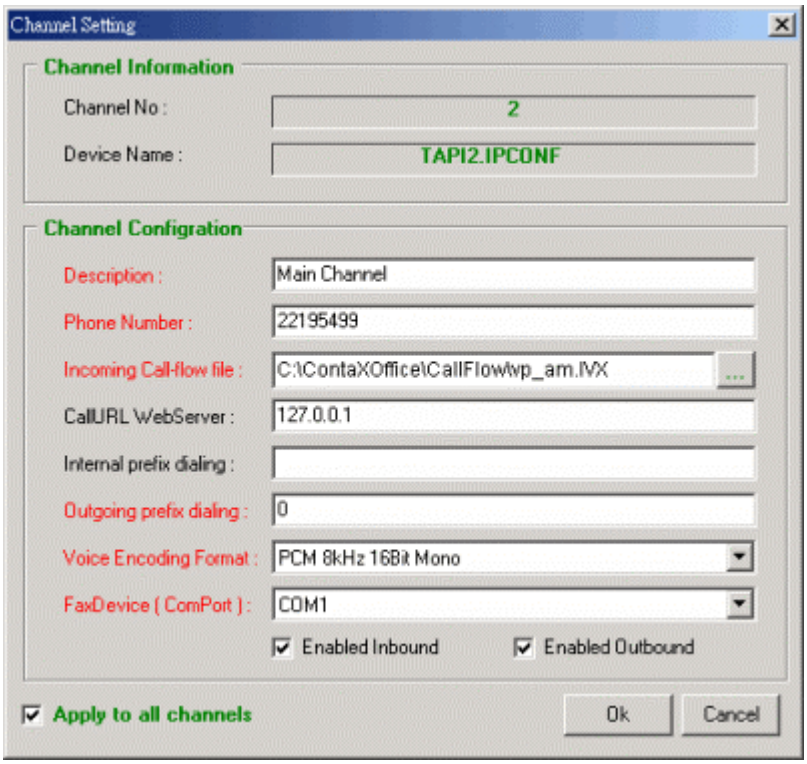
call flow file will use selected format to open, play and record voice.

FaxDevice(ComPort): Click to select the RS232 COM port of the item box that this channel's call flow file will use selected port to perform fax operations.

Enabled Inbound: Check to select. If you do not check this item, then this channel line will be not available for inbound calls.

Enabled Outbound: Check to select. If you do not check this item, then this channel line will be not available for outbound calls.

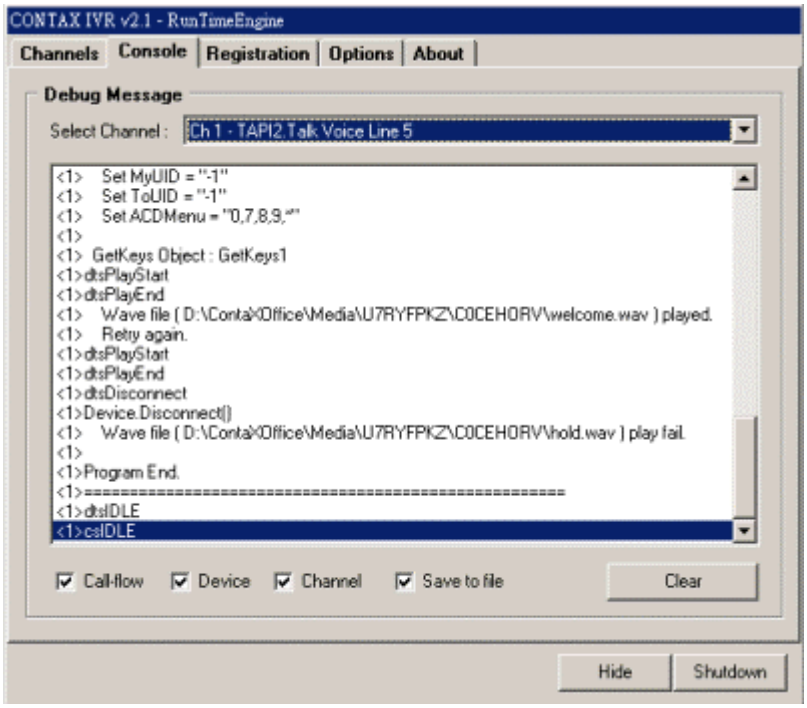
OK: Click the **OK** button after you complete entering the above values.



Channel Stop

Click to select a channel line you want to stop on the **Channel** tab. Click the **Channel Stop** button. The selected channel's runtime activities will be stopped.

6.2.2 Console Tab



Click the **Console** tab. From the **Select Channel** drop-down list, click to select a channel you want to monitor or debug. You will see the runtime activities of the channel displayed on the **Console** tab window.

There are some click buttons to display different information for debug.

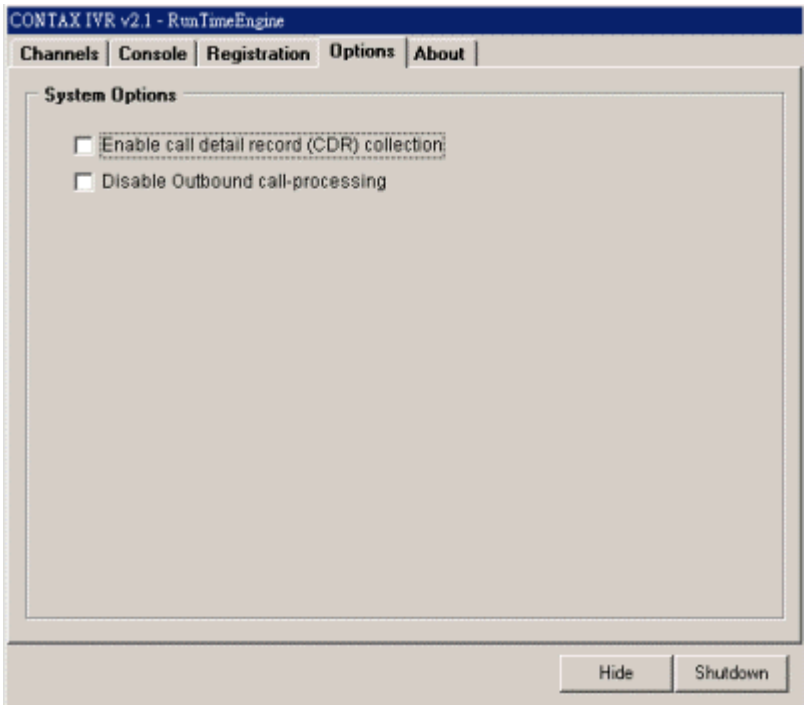
Call-flow: display the call flow components log

Device: display Device information

Channel: display Channel information

Save to file: save the Log Data to a file named install directory \ ChX.log. (file path is same as RunTimeEngine.exe)

6.2.3 Option Tab



Click the **Option** tab. Two system options are listed.

Enable Call detail record (CDR) collection: Check to enable call detail record (CDR) collection. This option can make **RunTimeEngine** record detail information into call log database for further analysis. By default, CDR information will be stored into CallLog table in a Microsoft Access MDB database that you can find it in your install directory /data/system.mdb

Disable outbound call-processing: This option allow **RunTimeEngine** to read the OutBound table in a Microsoft Access MDB database that you can find it in your install directory /data/system.mdb then make outbound calls.

Chapter 7

IVR Flow Collection

Eletech collects 50 sample flows, which are classed into 17 kinds of application for your reference. You can learn to familiarize yourself with the use of a cell by studying these samples. You can also collect your own samples and add them to the sample folders.

Start -> **Programs** -> **CONTAX IVR v2.1** -> **FlowDesigner**. The CONTAX IVR Flow Designer main window will appear. On the main window, **File** -> **Open**. The file open dialog box appears. Double-click the sample folder. A list of 17 classes of call flow folder will appear on the box. Double-click a folder you want to refer to. The call flows under that folder will appear for your reference.

7.1 Press Key Sample