CONTEX® Product Specifications

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compunetix
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PROPRIETARY INFORMATION

Questions about this document or the products it describes should be directed to:

Compunetix, Inc.
Communications Systems Division
Documentation Department
2420 Mosside Boulevard
Monroeville, PA 15146

CONTEX® System

CONTEX On-Demand™

Conferencing Features

Options

Technical Specifications

CONTEX® System

Introducing the CONTEX® System

CONTEX® is the award-winning audioconferencing multipoint control unit (MCU) from Compunetix, designed for service bureaus, small to large corporate applications, and mission-critical situations where high-quality and cost-effective audioconferencing is required. With systems ranging from 24 to 960 ports, CONTEX provides full-digital audioconferencing and includes advanced conferencing features, easy-to-use Windows-based operator interfaces, and sophisticated control options. All CONTEX systems are dedicated conferencing platforms developed with more than 30 years of communications experience. CONTEX also offers excellent investment protection because conferencing functions and controls are software-based, allowing for easy upgrades, customized systems, and state-of-the art features. CONTEX systems are available in either the small-scale Mini-CONTEX® or the large-scale CONTEX® 240/480 and in numerous custom configurations.

Mini-CONTEX®

The smallest of the three standard CONTEX models, the Mini-CONTEX offers 24 to 120 ports of audio conferencing in a compact and cost-effective package. The Mini-CONTEX is based on time division switching and shares all CONTEX conferencing features.

CONTEX® 240/480

The CONTEX 240 offers 24 to 240 ports of audio conferencing and the CONTEX 480 offers up to 480 ports—among the largest port capacities available in a "single" enclosure. The CONTEX 240/480 is based on Compunetix's patented Space Division Digital Switch technology. These models offer complete full-featured audio conferencing including sophisticated attended and unattended conference options.

CONTEX On-Demand™

CONTEX On-Demand offers more than 900 ports of audioconferencing in a specially priced package that consists of two spanned CONTEX 480s. CONTEX On-Demand is specifically intended for service providers who want to offer reservationless audio conferencing. Please refer to the sections on CONTEXSpan™ and CONTEX On-Demand for more information.

Basic System Architecture

A basic CONTEX system consists of the MCU (CONTEX 240, 480, or Mini-CONTEX), a central Maintenance Administration Terminal (MAT) PC, and one or more Window Operator Consoles (WOCs) connected to the MAT using direct serial connections, TCP/IP over a LAN/WAN, or remotely using a dial-up modem. Figure 1 shows the basic CONTEX system architecture.

NOTE

The system shown in Figure 1 is for reference only. Actual system installations are influenced by several factors including optional components, number of bridges installed, available network connections, etc.

The basic CONTEX system can be enhanced with several optional components that provide reservations, digital recordings, Web interfaces, etc. These options are:

- **The Reservation, Scheduling, and Billing System (RSB)**
  Interactive Voice Response System (IVR) - *optional touch-tone interface*
  RSB Web - *optional Web interface*
  The RSB is a state-of-the-art, database-managed reservation, scheduling, and billing system that interfaces with the CONTEX and automates many scheduling and reservation functions. The optional IVR interface allows end-users to call into the system and reserve conference time using the DTMF keypad on their phone. RSB Web is an optional interface that enables end-users to make and modify reservations right from their computer using a standard Web browser.
- **CONTEX Digital Record and Playback (CDRP)**
  The CDRP is a fully digital system that can record a conference for later playback. Users access the system using their phone and depending on their user ID, they can play, edit, and record conferences.
- **CONTEXWeb™ Toolkit**
  The CONTEXWeb Toolkit is a fully documented software development environment and application program interface (API) that provides the tools necessary to create custom Web interfaces for controlling conferences over the Internet.
- **CONTEXSpan™**
  CONTEXSpan allows two or more CONTEX bridges of any size to be cascaded together, creating a virtual bridge of almost unlimited size. Using CONTEXSpan, two CONTEX systems can be viewed and managed as one virtual system, allowing operators to view and control conferences on physically separate bridges.
- **Enunciator™ Module (optional on CONTEX 240/480)**
  The optional Enunciator module on the CONTEX 240/480 greatly expands system messaging and that enables the system to provide enhanced unattended conferencing features such as participant name record and chairperson interactive voice response (IVR) control.

Basic System Components

As shown in Figure 1 the basic system is comprised of the following components:

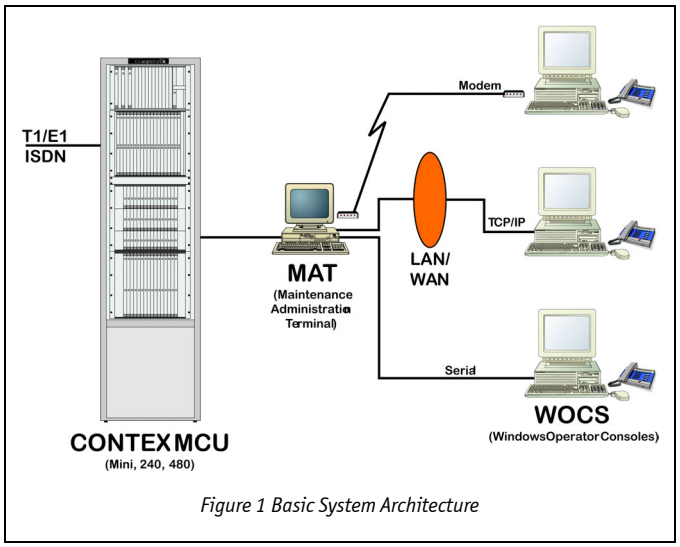

Figure 1 Basic System Architecture

CONTEX MCU

The CONTEX MCU can be a Mini-CONTEX, CONTEX 240, or CONTEX 480.

- **Mini-CONTEX**

  The Mini-CONTEX MCU consists one of shelf of circuit modules installed in a standard 19 inch system rack. Because of its compact dimensions (the Mini-CONTEX is only 22 inches wide, 24 inches deep, and 26 inches high) it is ideal for applications requiring a smaller number of ports and with space limitations. The chassis contains interface ports for connection to the Maintenance Administration Terminal (MAT) and external telephone lines. The chassis also contains redundant power supplies and cooling fans.

- **CONTEX 240/480**

  The CONTEX 240/480 MCUs consists of five shelves of circuit modules installed in one (CONTEX 240) or two (CONTEX 480) standard 19 inch system racks. The CONTEX 240/480 offers high-quality conferencing and unparalleled reliability and quality. The chassis contains interface ports for connection to the Maintenance Administration Terminal (MAT) and external phone lines. The chassis also contains redundant power supplies and cooling fans.

Maintenance Administration Terminal (MAT)

The Maintenance Administration Terminal (MAT) is a standard PC that has pre-installed, custom proprietary software. The MAT provides an interface for system administrators and maintenance personnel to perform system monitoring, configuration, diagnostics, and maintenance. This computer also acts as a gateway between the operator terminals and the CONTEX.

The CONTEX system is shipped with a central MAT PC that serves as a file server, mass storage for the MCU, as well as the connectivity hub for the WOC stations. A MAT may also be located at a remote site and connected to the central MAT via modem or TCP/IP connection. Any WOC computer can also serve as a remote MAT.

Windows Operator Console (WOC)

The Windows Operator Console (WOC) runs on Windows 95/98 or Windows NT and provides a simple and elegant interface for controlling bridge functions and accessing the system's powerful conferencing

features. In its standard configuration, the Mini-CONTEX supports up to 24 operator stations, the CONTEX 240 32, and the CONTEX 480 40. Expansion beyond the standard number is possible.

WOC stations can be connected to the CONTEX system through direct serial connections, interfaced to the site's LAN/WAN using TCP/IP, or remotely using dial-up modem connections. All WOC computers and associated phones are provided by the customer.

Mini-CONTEX System Modules

The Mini-CONTEX contains several different types of circuit modules, each having a different function in the system. Together the modules provide line interfaces, conferencing functionality, switching, and system control. For the Mini-CONTEX, the following modules are installed:

- **Line Interface (LIF) Modules**

  The Mini-CONTEX system can support up to five Line Interface (LIF) modules. For each LIF module installed, there is one Summation Module. The Mini-CONTEX can be equipped with T1 or E1 modules that accept a trunk line from the public telephone network. In a T1 system each module provides 24 channels; in an E1 system each module provides 30 channels. These modules generate and recognize Dual Tone Multi-frequency (DTMF) tones, and perform gain adjustment, echo suppression, and noise filtering. The T1 and E1 Modules have a variety of country approvals. T1 and E1 modules support both ISDN and Robbed-bit signalling.

- **Analog Interface (AIF) Modules**

  The Analog Interface includes up to three Analog Interface (AIF) modules. Each AIF module interfaces with up to six analog inputs (for operator phones, recorders, messaging, etc.), digitizes and serially multiplexes these inputs and sends the data to a Time Division Controller (TDC) module. The AIF modules also accept parallel voice data from a TDC module, de-multiplex the data, build conferences, serially multiplex the output with maintenance data, and convert the results into analog signals.

- **Time Division Controller (TDC) Modules**

  The Mini-CONTEX is equipped with one Time Division Controller (TDC) module in the standard configuration; redundant TDCs are optionally available. The TDC receives serial voice data from both the Line Interface and Analog Interface modules. It monitors maintenance data, which is interleaved on the serial input stream, and converts the serial stream to parallel data for further processing and distribution. The TDC also provides the timing reference for the system and reports status information to the MAT.

- **Summation Modules**

  For each LIF module installed in the Mini-CONTEX, one Summation module is also installed. The Summation modules accept parallel voice data from a TDC module, de-multiplex the data, build conferences, serially multiplex the input combination with maintenance data, and transmit the results to each associated LIF module.

CONTEX 240/480 System Modules

The CONTEX 240/480 contains several different types of circuit modules, each having a different function in the system. Together the modules provide line interfaces, conferencing functionality, switching, and system control. For the CONTEX 240/480, the following modules are installed:

- **Processor Memory Module**

  The CONTEX system uses one Processor Memory Module (PMM) in its standard configuration. The PMM manages the conferencing and switching algorithms in real time.

- **Serial I/O Modules**

  The standard CONTEX system uses two Serial I/O modules (SIO) that work in conjunction with the PMM to control system functioning.

- **System Clock Module**

  The standard CONTEX system uses one Master Clock Module to control the system clocking functions.

- **Line Interface Modules**

  The CONTEX 240 system can support up to 10 Line Interface (LIF) modules and the CONTEX 480 supports up to 20 LIF modules. The CONTEX can be equipped with T1 or E1 modules that accept a trunk line from the public telephone network. In a T1 system each module provides 24 channels; in an E1 system each module provides 30 channels. These modules generate and recognize Dual Tone Multi-frequency (DTMF) tones, and perform gain adjustment, echo suppression, and noise filtering. The T1 and E1 Modules have a variety of country approvals. T1 and E1 modules support both ISDN and Robbed-bit signalling.

- **Space Division Digital Switch Modules**

  The patented Space Division Digital Switch provides the system controller with the ability to connect any conferee with any conference, dynamically increase or decrease conference size, and move parties between conferences. The switch serves as the intermediary between the LIF modules and Conferencing Ring. The switch is non-blocking and can accommodate transmission rates up to 2.048 Mbps per channel.

- **Conferencing Ring**

  The patented conferencing ring utilizes Digital Signal Processors (DSPs) to execute conferencing algorithms that perform full digital conferencing.

- **Enunciator Module (optional)**

  The optional Enunciator module greatly expands system messaging and that enables the CONTEX system to provide additional unattended conferencing features such as participant name record and chairperson interactive voice response (IVR) control. Please refer to the Enunciator section of this document for more details.

Optional CONTEX 240/480 Configurations

The CONTEX 240/480 is available with an optional Triple Redundant Controller (TRC). This uses three PMM and five SIO modules to provide redundant control for the CONTEX. The TRC uses three identical asynchronous PMMs executing the same software. The three processors operate the same commands and compare the results before execution. Two of the processors must agree before any commands are given to the rest of the system. If one of the processors fails, the two remaining processors disqualify the faulty processor and continue operation.

The Maintenance Administration Terminal

The CONTEX Maintenance Administration Terminal (MAT) is a dedicated system application that runs on a centrally located MAT computer. The MAT uses a proprietary, real time operating system that boots from DOS 6.22 and is the primary interface for maintaining the CONTEX system. The MAT's primary functions include logging system messages and alarms, generating reports from these logs, performing diagnostic tests, and downloading data to the CONTEX modules. Many of the MAT's functions, such as monitoring the data paths through the Space Division Digital Switch, run continuously in the background so it is vital that the MAT always be running.

Maintenance and Administration Interface

The MAT application is an easy-to-use, menu-driven interface that enables maintenance personnel to access system configurations. From the MAT, the user can choose from options including conference control, system configuration, report generation, maintenance, and diagnostics.

Port Maintenance

From the MAT any of the CONTEX system's ports can be monitored and port diagnostics can be performed. Maintenance personnel can immediately determine the status of all configured ports, and ports can be designated "busy" to prevent the system from selecting them for conferences. This allows technicians to control ports, evaluate their response, and perform system troubleshooting.

Conference Control

Conferences can be built and controlled directly from the MAT. Using the MAT Conference Control window, technicians can build and control conferences on the CONTEX and troubleshoot the conference functions without leaving the MAT. Conferences in progress on the CONTEX can also be monitored from the MAT by observing the changing port status.

Port Configuration

All CONTEX ports can be configured from the MAT. Available port configurations include ISDN, FXO-Loop Start, FXO-Ground Start, Wink Start, FXS-Ringdown, and E&M. Ports can also be assigned to long distance, music, messages, auto-answer, unattended dial-in, or chairperson dial-out. Configurations can be quickly copied and applied to other ports.

Gain Status

The MAT offers two methods for controlling the gain (audio input/output level) for each port:

- **Automatic Gain Control (AGC)**

  AGC can be turned off or on for each individual port. When AGC is enabled, the audio input from the port to the system is automatically adjusted by the system based on internal bridge thresholds. The bridge attempts to keep all signal levels at the AGC bridge level which is adjustable between -18 and -10 dB. To achieve the AGC bridge level, the system will boost the signal by up to the maximum gain level (adjustable between 0 and 12 dB).

- **Nominal gain (manual adjustment)**
  The gain for any individual port can be set manually using values from -25dB to +25dB. The gain may be applied to the party's voice signal before entering the conference (input gain) and/or to the combined voice signals leaving the conference (output gain).

Switch State Display

The MAT can display all point-to-point connections that exist in the CONTEX switch. This can be very useful for general troubleshooting and diagnosing port problems.

MAT Alarm Messages

MAT alarm messages, which include both alarm and information messages, are logged by the MAT, stored for 60 days, and can be viewed or printed. The messages identify module locations using the standard IEEE numbering scheme. Alarm messages may indicate conditions that might affect the performance of the CONTEX; for example, if a yellow alarm is detected by a LIF module an alarm is sent to the MAT. Information messages are mainly configuration changes. If a port is reconfigured by the MAT or from a WOC, then a descriptive message is logged by the MAT. These messages can be a convenient way to audit system configuration updates and changes.

Maintenance

The MAT provides tools for performing basic maintenance on the CONTEX system. System configuration and billing information can be stored on floppy disks for back-up and system restoration.

Communications Status Display

The MAT displays the number and type of all communications modules installed in the system. It also displays useful information for each channel including baud rates, flow control settings, and non-acknowledgement (NACK) tallies.

Conference Parameters

Input and echo suppressions parameters can be adjusted quickly and easily to correct voice problems with minimal disturbance to conferences. The conference parameters settings can also be used to troubleshoot the CONTEX.

Downloading Module Software

The MAT is used to download system software to the modules in the CONTEX system. Because many of the conferencing features and system functionality are implemented using software, system updates and upgrades can be easily accomplished by downloading module software from the MAT to the CONTEX.

Supported Conference Types

The CONTEX system supports two main types of conferences: Attended and Unattended. Attended conferences are initiated and monitored by WOC operators and can be dial-out, dial-in, or combination. Unattended conferences are initiated and controlled by the conference participants themselves without the assistance of an operator and can be reserved ahead of time or created "on-demand."

Attended Conferences

Attended conferences are initiated and monitored by an operator. During the course of an Attended Conference an operator may call conferees and join them to the conference, answer incoming calls, help participants who signal for assistance, and run features such as Voting or Question & Answer sessions.

Dial-out

Dial-out conferences can be Progressive or Preset. Progressive conferences are built by the WOC operator who calls one party at a time and joins them to the conference. The operator can manually enter each party's name and telephone number or they can select parties from a built-in directory. Preset conferences are created prior to use and are stored in a Preset Conference Directory on the WOC. Once a Preset conference is selected, the WOC will display all of the parties in the conference and the operator can then call and join them to the conference.

Dial-in

Parties can join a conference by dialing the CONTEX system. The operator answers the incoming call, records the party's name, and joins them to the appropriate conference. Dial-in conferences can use CONTEX features such as passcode, passcode+PIN, and DNIS.

Combination

Conferences can have both dial-in participants as well as parties called by the operator or conference chair.

Unattended Conferences

The CONTEX system supports full-featured unattended conferencing. Unattended conferences are created and controlled by the conferees themselves without the help of an operator. Unattended conferences can be held without reservations (On-Demand), or they can be reserved and scheduled ahead of time. Unattended conferences can also be Passcode or DNIS and can be held as Meet-Me, Progressive, or Preset. Please refer to the "Unattended Conferences" section of this document for more details.

CONTEX On-Demand™

Introduction

CONTEX On-Demand™ is a specially priced package that typically includes two CONTEX bridges (240 or 480), the Maintenance Administration Terminal (MAT), CONTEXSpan™, two operator consoles (WOCs), and LAN software. It is designed to provide a large pool of conferencing ports, more than 900, that can be used for reservationless, on-demand conferencing. CONTEX On-Demand builds upon the CONTEX system's award-winning conferencing features, providing crystal-clear digital conferencing to the on-demand market.

On-Demand Conferencing

CONTEX On-Demand is available in 240, 480, or 900+ port configurations. With CONTEX On-Demand you receive not only full-featured unattended conferencing, but all of the CONTEX system's standard attended features as well. This means that as your business develops and changes, the CONTEX system will be ready to meet your demands.

Passcodes

Unattended conferencing customers can use either a Host or Guest passcode. For all passcode conferences, the host holds the key and the system can prevent a conference from starting until a host arrives.

Features

On-demand conferencing can use the following features (this is only a partial list—please refer to the Unattended Conferencing section of this document for a full description of all of the unattended conferencing features): Conferences can be scheduled; Restrict the number of parties; Dial restrictions; Chairperson/host dial restrictions; Special greetings and messages; Conferee self-mute; Conference security; Participant Name Record and Chair IVR (with optional Enunciator module).

CONTEX On-Demand also offers all of the CONTEX system's attended features as well. Please refer to the Conferencing Features section of this document for complete details.

Options

CONTEX On-Demand can be combined with one or more optional features to further enhance its functionality. The Reservation, Scheduling, and Billing (RSB) system and Interactive Voice Response (IVR) can be added to enable customers to schedule their own conferences right from their phone. The CONTEXWeb™ Toolkit provides all of the tools necessary to create full-feature conference control from a custom Web interface.

Please refer to the appropriate sections of this document for detailed descriptions of RSB-IVR and the CONTEXWeb Toolkit.

Conferencing Features

The Windows Operator Console (WOC)

The Windows Operator Console (WOC) is the main interface used by conference operators to create, manage, and control conferences on the CONTEX system. The WOC software package is compatible with any standard PC running Windows 95/98 or Windows NT. Due to its simple and elegant design, the WOC enables operators to control most aspects of the conference from one screen, reducing the time required to learn and master the application.

Operator Interface

The WOC is used to create, manage, and control conferences on the CONTEX. Based on the Windows operating system, the WOC enables operators to manage multiple conferences simply and easily. Many of the CONTEX's powerful conferencing features can be accessed right from the WOC's main screen, allowing operators to focus on the effectiveness of the conference, not the software.

The unique design of the WOC application, as shown in Figure 2, enables the conference operator to view details of ongoing conferences, calls being answered, and the overall status of the CONTEX system at the same time. The main window of the WOC includes:

- Active Conference window
- Conference Control window
- System State Monitor
- Real-Time System Status Bar

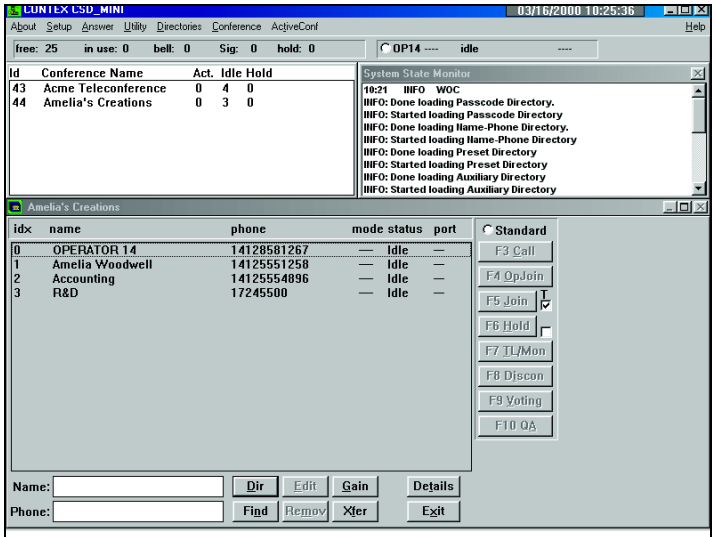

Figure 2 WOC Main Window

Whether the conference operator is monitoring a conference or answering incoming calls, all the required information is displayed on one screen, eliminating the need to access other parts of the WOC system. The operator can concentrate on the flow of the conference and the effectiveness of the meeting rather than maneuvering through the software.

The Active Conference Window

The Active Conference window, Figure 3, displays the names of all conferences currently active on the CONTEX system. Conference names may be listed in the order they were created or alphabetically. Each conference name is displayed with a cross-reference identification number and real-time numerical tallies of total parties, parties who are idle, and parties on hold.

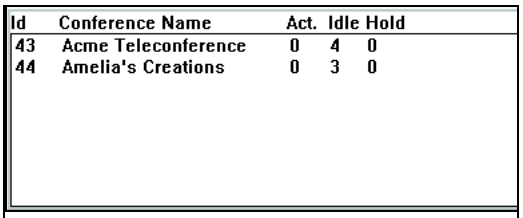

Figure 3 Active Conference Window

The Conference Control Window

The Conference Control window, Figure 4, helps the operator to monitor the conference at the participant level. All functions pertaining to conference control can be executed without leaving the Conference Control window. Conference control functions can be applied to individual conferees, to groups of conferees, or to all conferees which greatly simplifies conferee management. The conference coordinator can easily transfer, disconnect or call new parties with the click of a button. This window displays the following information for each participant:

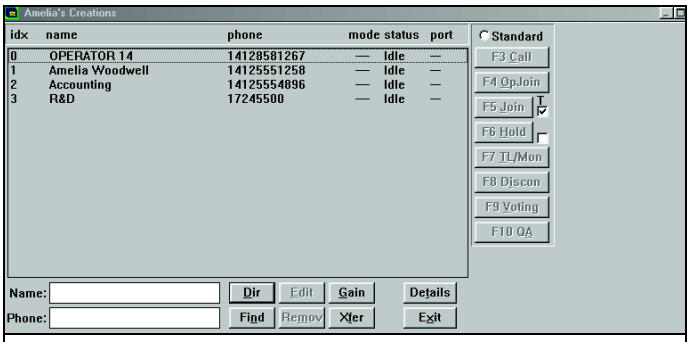

Figure 4 Conference Control Window

- An index number dynamically assigned by the CONTEX system.
- The conferee's name and phone number. This information may be taken from a preset conference configuration, the Answer Calls window, or the operator can enter the information on-the-fly. If the telephone network supports DNIS/DID and ANI, the ANI number can be automatically transferred by the WOC from the Answer Calls window to the Conference Control window.
- The participant's current audio mode in the conference. Conferees can be in either Talk/Listen (T/L) or Monitor (Mon) mode. When a party is in Talk/Listen, they can both hear and be heard in the conference; if they are in Monitor mode, they can hear the conference but anything they say will not be heard by the rest of the conference. The WOC also displays who is actually speaking in a conference by displaying a configurable text string ("talk" for example) in the mode column.
- The participant's current status in the conference. Conferees may be in answer, hold, hold-wait, conference, or idle mode.
- The port number the conferee is connected to in the system. This information can be used to troubleshoot system performance or for adjusting the participant's audio signal.

The System State Monitor Window

The System State Monitor window, Figure 5, displays real-time system messages as they arrive at the WOC. These messages may indicate a change in system configuration, the conference status, or an individual participant. The System State Monitor window displays all idle and signaling parties. If the operator double-clicks on such a message the WOC automatically locates and displays that party's conference.

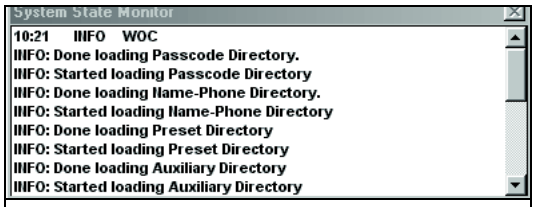

Figure 5 System State Monitor Window

Like the Active Conference window, the System State Monitor window is visible even when the conference coordinator is monitoring a conference. Therefore, new messages displayed in the System State Monitor window will always be visible to the conference coordinator.

Real-time System Status Bar

Current information about free ports, incoming calls, parties signaling for assistance, and parties on hold is displayed in a system status bar visible at the top of the WOC application window as shown in Figure 6. The "Sig:" field can be configured to display a custom text string ("Help" for example).

Figure 6 Status Bar

The status bar also displays the operator's port number, status, and mode (Talk/Listen or Monitor). The conference coordinator can toggle their own mode by clicking on the appropriate control in the status bar. When the conference coordinators are in Talk/Listen mode, the status bar indicator is displayed in red to show that they are "on the air."

The Answer Calls Window

The Answer Calls window, Figure 7, enables the conference operator to manage incoming calls. When an incoming call arrives at the CONTEX system, the conference coordinator is alerted with a tone (if this option is activated) and will see the incoming call counter increase by one. The operator can also create a new conference without exiting the Answer Calls window.

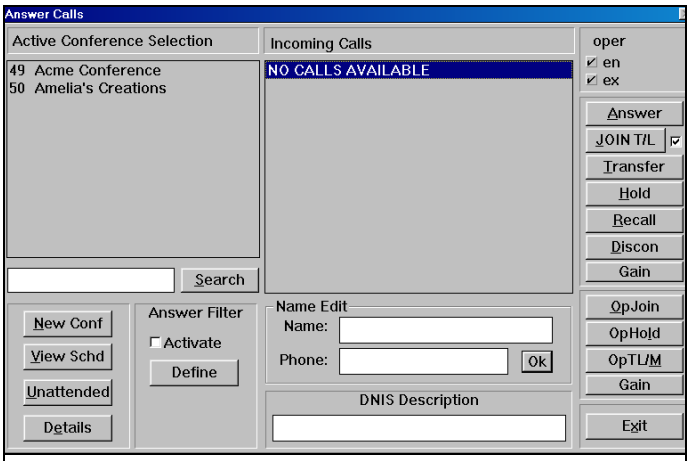

Figure 7 Answer Calls Window

Directories

The CONTEX system includes several directories and tables that store information such as participant names, phone numbers, and preset conference configurations. Many of these tables and directories are managed by the WOC application itself, while others are managed by the operator and are useful for storing frequently used information. There are five directories shared by all WOC stations: Name and Phone (Telephone), DNIS/DID, Preset Conference, Unattended Conference, and Message.

Name and Phone (Telephone) Directory

The WOC's Telephone Directory is used to store name and phone numbers of frequently called parties. The operator can use the Telephone Directory to quickly build a conference. Double-clicking a party's name automatically transfers them to the conference conferee list. An operator can also search through the directory to find names and phone numbers.

DNIS/DID Directory

The CONTEX system supports Dialed Number Identification Service (DNIS) and Direct Inward Dial (DID), which are services provided by the telephone network. DNIS/DID allow the CONTEX system to immediately associate callers with conferences based on the number used to dial in to the system. The DNIS/DID Directory is used to record DNIS/DID telephone numbers and descriptions. When an Operator answers a DNIS/DID call, the associated text message is displayed in the Answer Calls window. This message might indicate the conference the party should be connected to. DNIS/DID numbers can also be used to filter calls at the WOC stations, allowing only certain calls to be answered by certain operators.

Preset Conference Directory

The CONTEX system maintains a directory of preset conference configurations that can be retrieved at any time for repeated use. This information can be retrieved very quickly, eliminating the need to enter the same information over and over again.

Unattended Conference Directory

The Unattended Conference Directory contains all of the unattended conferences currently configured on the CONTEX system. This directory shows each unattended conference, its type (Meet Me, Chairperson Dial-out, etc.), the chairperson and guest passcodes, the conference's billing code, and the expected number of participants. Operators can set up a new unattended conference from this directory by simply clicking the "new" button.

Message Directory

The Message directory lists all of the CONTEX's recorded messages, including a full text version of the message. The text can be edited and is used as a script when recording the messages. A WOC operator can listen to the messages at any time, and if configured, will be able to record a new message.

The first thirteen messages are system messages and although the text and recordings can be changed, the message title cannot. System messages are played under specific circumstances in the system, such as after a caller enters a bad passcode.

The messages that follow the system messages can be customized for special purposes such as greeting DNIS/DID callers. The WOC operator can change the script, the audio recording, and the title if so configured. The system can be configured to allow custom messages to override system messages. Customized messages can be used to greet specific DNIS/DID callers or as confirmation messages for unattended passcode conferences.

Enunciator Messages (Optional)

The CONTEX system is available with an optional Enunciator module. This module greatly expands system messaging, and includes an interactive voice response (IVR) menu for the chairperson of an unattended conference. Enunciator messages are also maintained using the WOC Message Directory. For more information, please refer to the Enunciator section of this document.

DNIS/DID and ANI Features

If the local telephone network provides it, the CONTEX system can make use of Dialed Number Identification Service (DNIS), Direct Inward Dial (DID) information, and Answered Number Identification (ANI) information.

DNIS/DID Features

When an incoming call is received by the CONTEX system, the DNIS/DID information is extracted from the telephone network and compared with entries in the DNIS/DID directory. The CONTEX system can be configured to perform particular tasks when a match is found, automating functions relating to both attended and unattended conferences. Some of the uses for DNIS/DID information are listed here:

- **Override Port Types**

  DNIS/DID information can be used to override a port's configured type making port configuration dynamic. Two of the more common port configurations are "passcode" and "answer-only." Callers who dial in to passcode ports are prompted for a passcode before being placed in a conference; answer-only ports place the caller into the incoming call queue. A DNIS/DID call arriving at a pass-

code port, however, can cause the port to behave as if it were an answer-only port, placing the caller in the incoming call queue. Similarly, a DNIS/DID call arriving at an answer-only port can cause that port to behave as if it were a passcode port, playing the caller a passcode message.

- **Answer Filters**

  Each WOC may have its own answer filter, indicating which DNIS/DID calls to accept. This can be used to route DNIS/DID calls to specific operators. For example, calls can be filtered by language. Calls placed to a reserved DNIS/DID number might be directed to one or more Spanish speaking operators while all other calls are directed to English speaking operators. The WOC can be configured to allow the resident operator re-define or turn the answer filter on or off at any time.

- **Connect Callers with Conferences Automatically**

  DNIS/DID can serve as passcode that provides direct dial in access for hosts and guests in an unattended conference. This way callers are not required to enter a separate passcode after they have dialed the number for their conference.

- **Override Default Greeting Messages**

  DNIS/DID information can be used to play custom messages rather than default system messages. Parties dialing into the system using a DNIS/DID host number would hear a customized message such as "Welcome to the ABC company conference service. Please enter your passcode to join the conference."

- **Branded Service**

  Service can be "branded" using DNIS/DID numbers. Branded service is rendered in the name of a different vendor or for a specific customer. Callers believe their service is being provided by an agent other than the owner of the CONTEX system. DNIS/DID numbers can be reserved for any specific agent, and any calls arriving to the reserved numbers can be treated as if they were arriving at that agent's facility.

- **Route Reservation Callers**

  A DNIS/DID number can be reserved for callers who wish to place or modify conference call reservations. These calls are directed to a specific WOC computer running reservation software such as the CONTEX Reservation, Scheduling, and Billing system. The WOC operator could greet callers by thanking them for calling the reservation line. After entering the reservation information, the WOC operator could then route the caller to a conference.

- **Distribute Accounts to Specific Operators**

  DNIS/DID information can be used to route conferences to specific operators based on their associated accounts. This makes it possible for a specific operator to maintain personal relationships with customers.

ANI Features

The CONTEX system also extracts ANI information (also known as caller ID), and stores it in the conference's billing record. ANI information is the telephone number of the originating telephone. This information can be useful when auditing or approving a customer's bill. The ANI number can also be displayed in the WOC's Conference Control window. This allows the WOC operator to immediately verify each party's originating telephone number.

Conference Control Features

The WOC provides a simple and elegant interface for controlling conferences and participants. Whenever an operator builds or activates a conference, the Conference Control window is automatically opened. All of the most common conference controls are located in this window, and the operator can perform these functions without being forced to navigate through the software. If the operator double-clicks on any conference displayed in the Active Conference window, that conference will be displayed in the Conference Control window.

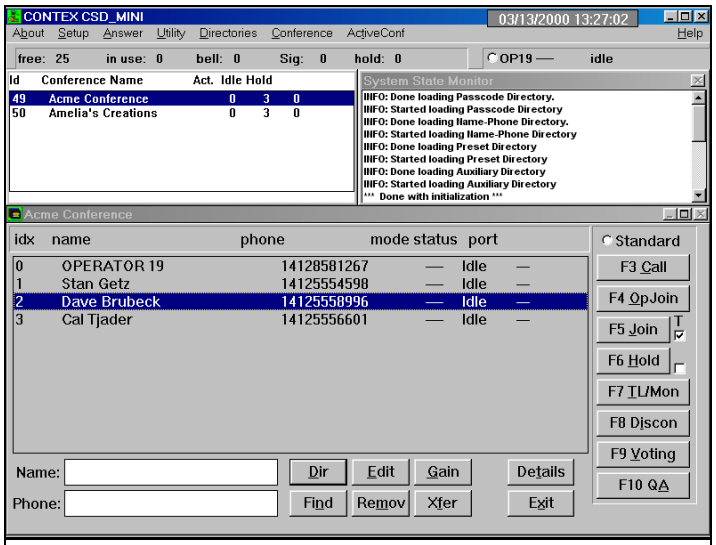

Figure 8 Conference Control Window

From the Conference Control window the operator is able to control the conference—calling, joining, placing on hold, changing the mode, or disconnecting participants—by simply selecting the participant's name and clicking the appropriate button. Participants can also be transferred between conferences simply and easily. Like all Windows applications, the operator can use keyboard shortcuts instead of the mouse; for example, by pressing the F3 key, the highlighted party will be dialed by the CONTEX.

Individual, Group, and Super Functions

While a conference is in progress, the WOC operator can apply standard conferencing functions to individual parties, a selected group of parties, or to all the parties in the conference. By using the group and super functions, operators can greatly simplify conference control since more than one participant can be acted upon. For example, before running a Question and Answer session, all of the participants other than the moderators can be placed in monitor mode by using the group function. If all of the participants need to be placed on hold, this can be done by using the super functions.

Question and Answer Sessions (Q&A)

Operators can easily manage a question and answer session during a conference by using the Q&A feature. As listeners enter the question queue by using the keys on their own telephone, they will hear confirmation tones. A moderator list and question queue displays the session's status. Questions can be addressed randomly or in the order received. At any time, listeners can remove themselves from the question queue by using the keys on their telephone.

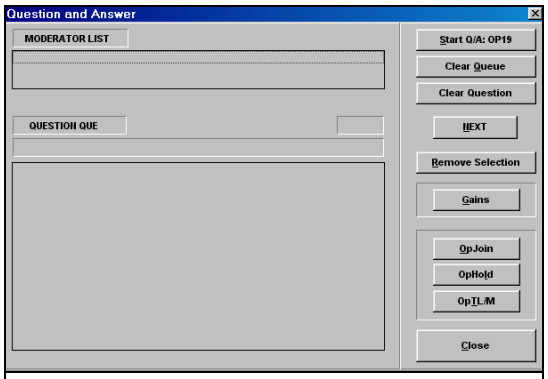

Figure 9 Q&A Window

Voting and Polling Sessions

Voting sessions can be used to conduct surveys or interactive tests. Listeners are polled on topics, and when they respond by pressing pre-assigned keys on their own telephones they will hear confirmation tones. Voting sets can be stored and retrieved for later use. They also can be redefined. Topical results are available immediately and can be saved to a file for later use.

Individual Party Gain Control

The operator can apply gain to any port assigned to any connected party displayed in the Conference Control, Question & Answer, or Answer Calls windows. The amount of gain can range from -10 dB to +10 dB as referenced to the nominal setting on the MAT. Gain can be applied to a party's voice signal before it enters the conference (Input Gain), or it can be applied to the combined conference voice signal leaving the conference and going to the party (Output Gain).

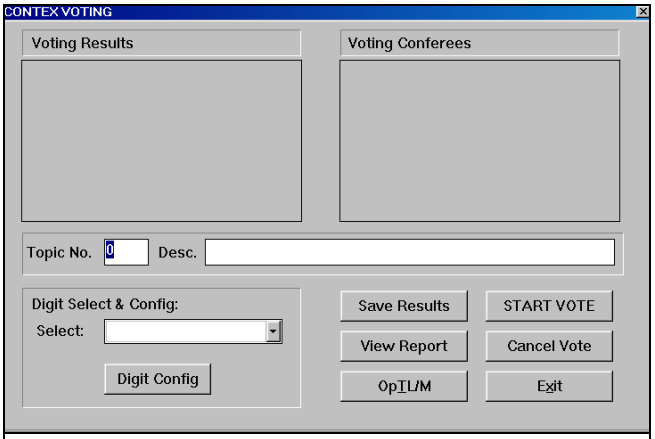

Figure 10 Voting Window

Sub-conferences

An operator can break any number of conferees out of any conference and join them together in a sub-conference. This feature allows selected conferees to participate in private conversations without disrupting the rest of the conference.

Talker Identification

The Conference Control window displays the names and states of all the parties in the conference. After a party is joined with other parties in a conference, that party's status changes to Talk/Listen (T/L), or Monitor (Mon). Whenever a party is speaking in the conference, that party's status changes from "T/L" to a configurable text string ("Talk" for example). The status will remain "Talk" for as long as that party's voice contribution exceeds a specified threshold. After the party finishes speaking, the status changes back to "T/L."

Operator Recall

Any conferee can signal a WOC operator by pressing "*0" on the DTMF keypad. The WOC operator can easily and quickly identify the party and respond immediately.

Conference Security Functions

Conference Locking

Authorized conferees can lock a conference or unlock a conference by pressing a configurable DTMF key sequence (typically *7 or 71# to lock and 70# to unlock). When a conference is locked, no one else, including WOC operators, can join it.

Conferee Self-mute

Authorized conferees can mute or un-mute themselves by pressing a configurable DTMF key sequence (typically *6 or 61# to mute and 60# to un-mute). When a conferee is muted, no one else participating in the conference can hear that conferee speak.

Conference Mute

A conference chairperson can mute or un-mute all other parties in a conference by pressing a configurable DTMF key sequence (typically 621# to mute and 620# to un-mute).

Other Standard Features

Conference Details

A WOC operator can display detailed information about any conference at any time. This can be useful when an operator is starting a conference, or if extra operators are needed during the course of a conference; using the Conference Details window, operators can review the details and settings of the conference quickly and easily. If necessary, the settings displayed here can be changed while a conference is taking place, allowing conference operators to adjust the conference parameters on the fly. The information displayed in this window includes:

- The conference name, its billing code, whether or not its attended or unattended, and a confirmation code.

- Special features including roll calls, Q&A sessions, voting, sub-conferencing, and if it is being recorded.
- The entrance and exit tones settings.
- DNIS/DID numbers. When this is selected the conference will be automatically highlighted in the Active Conference window when a caller arrives on one of the DNIS/DID numbers.
- The conference's current status including the time remaining if it is set for auto-breakdown.
- Special instructions

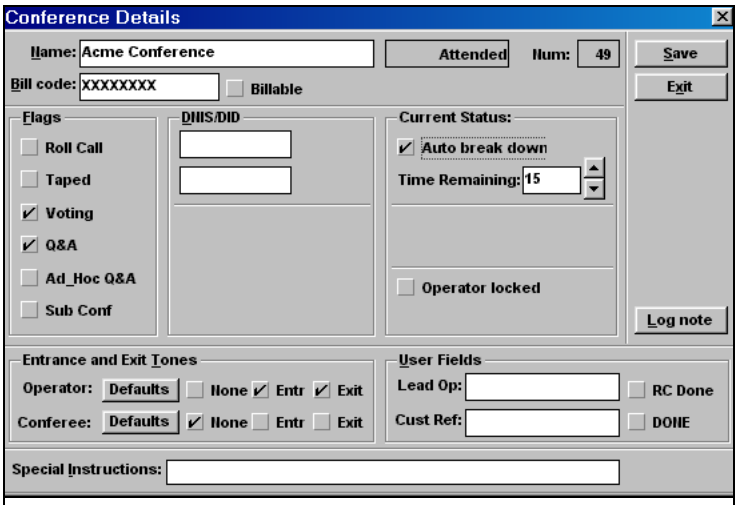

Figure 11 Conference Details

The WOC can be configured to display user-defined fields in the Conference Details window.

Conference Scanning

Operators can conduct quality management checks on each on-going conference, or on a selected group of conferences by using the CONTEX's conference scanning feature. The CONTEX system permits sequential scanning, or monitoring, of each conference for a configurable time interval.

Conference and System Logging

The WOC automatically logs all incoming calls, parties signalling for assistance, and disconnected parties, as well as CONTEX system information and alarms. These logs include the time each event occurred, as well as party and conference names, and they can be displayed and printed at any time. Useful for diagnostic and auditing, CONTEX system logs are stored for a configurable amount of time (typically 60 days).

CONTEX Chat

WOC operators can communicate with one another by typing messages in the CONTEX Chat window. This enables operators located at great distances from one another to communicate easily without disrupting the conference. If a WOC's CONTEX Chat window is not open, a newly arriving message is displayed in the System State Monitor window. The resident operator can then activate the CONTEX Chat window and respond.

Log Notes

The operator can attach notes or comments to either a conference or a conferee. These notes can then be made part of the billing statement.

Music On Hold

Music on hold is available if required. The music to be played can be selected and controlled by the system administrator.

Recorder Interface

Dedicated recorder ports can be used to include a standard audio cassette tape recorder in any conference. The CONTEX is also available with the optional CONTEX Digital Record and Playback (CDRP) system that creates fully digital recordings of conference that can be accessed by numerous listeners. Please refer to the CDRP section of this document for more details.

System Parameters

System parameters governing screen displays, console sounds, and conference tones can be controlled directly from the operator's console. The operator simply activates the System Parameters dialog window and clicks in the appropriate check boxes. These parameters apply to the resident operator console only.

Viewing Scheduled Conferences

When the CONTEX is equipped with the optional Reservation, Scheduling, and Billing (RSB) system or another reservation system, conferences can be scheduled and automatically retrieved by the CONTEX system. WOC operators can view details about these reservations. The operator may choose to view all retrieved reservations or only those scheduled for the current day.

Reports

Operators can generate, view, and print several different types of reports from their stations including System Utilization Reports and Passcode Usage Reports.

Sounds

The WOC can play customized sounds for system actions. Any sound file (in the WAV format) can be used to replace the standard system sounds for ring in, signal, alarm, and idle.

Unattended Conferences

In addition to its fully featured attended conferencing capabilities, the CONTEX system supports unattended conferences with a wide range of easy-to-use features. Unlike attended conferences, which are created and managed by operators who actively participate in the conference, unattended conferences are maintained on the system itself and do not require any operator action. From the user's point of view, the conference is activated and conducted independently; however, an operator can assist unattended conference participants at any time during the conference.

The CONTEX system provides several different unattended conference types that can be tailored to fit the needs of individual users. These include Passcode Meet-me, Unattended Progressive/Chairperson Dial-out, Unattended Preset, and Crash. All unattended conferences offer a wide range of capabilities and features that users can access from within the conference itself.

One of the features shared by all conferences is the availability of two separate types of participants ("Hosts" and "Guests") based on passcodes or DNIS/DID numbers. Host privileges could include the ability to dial-out to additional participants or to mute the entire conference. Participants who use guest passcodes may be configured to enter the conference in monitor (listen-only) or talk/listen modes. Another benefit of different host and guest passcodes/DNIS numbers is that different messages can be played depending on the passcode entered or DNIS number dialed.

Unattended Conference Types

Passcode Meet-Me Conferences

Passcode Meet-me Conferences allow each caller to dial into the system, and after entering their passcode, to be joined directly with the correct conference. Conference participants can be considered hosts or guests depending on the passcode they use.

When a participant dials into the bridge, they are initially greeted with a customizable, recorded message that welcomes them to the system and prompts them to enter their passcode. After the caller has entered their passcode, and once it has been verified by the system, they may hear another customizable message informing them that their passcode has been confirmed and that they will now be joined with the conference. The system automatically joins them to the correct conference solely on the basis of their passcode.

Passcode Progressive/Chairperson Dial-out

An Unattended Progressive/Chairperson Dial-out conference allows a designated host or chairperson to dial into the bridge, activate their desired conference, and call the participants they want joined to the conference.

When the host or chairperson dials into the system, they are initially greeted with a customizable, recorded message that welcomes them to the system and prompts them to enter their passcode. After the caller has entered their passcode, and once it has been verified by the system, they may hear another customizable message informing them that their passcode has been confirmed and that they will now be joined with the conference.

Once the conference has been activated, the host is placed in the conference vestibule—a location outside of the main conference where the host can call one participant at a time and join them to the con-

ference. To join participants from the vestibule, the host calls them, and after they have spoken privately, the host can join them to the conference by simply pressing **1*. If the party doesn't answer, or if they decline to join the conference, the host can disconnect them by pressing **2*. The host can move between the main conference and the vestibule by pressing **1* at anytime, but only when not in a private conversation with a called party.

Unattended Progressive/Chairperson Dial-Out Conferences can be configured so that if the chairperson hangs up, all parties are disconnected.

If a guest passcode has been assigned to the conference, participants can join themselves to the conference by using the passcode.

Passcode Preset Conferences

An Unattended Preset Conference allows a designated host or chairperson to dial into the bridge and automatically connect a preset (pre-defined) group of parties.

When the host dials into the system, they are initially greeted with a customizable, recorded message that welcomes them to the system and prompts them to enter their passcode. After the caller has entered their passcode, and once it has been verified by the system, they may hear another customizable message informing them that their passcode has been confirmed and that they will now be joined to the conference. Once the system has verified the passcode, all of the members of the Preset Conference (which was prepared in advanced) are automatically dialed and joined to the conference. Any unanswered or busy lines are not connected and joined parties do not hear ringback or busy signals.

Unattended Preset Conferences can be configured so that if the chairperson hangs up, all parties are disconnected.

The host of an Unattended Preset Conference has the capability to call and join participants who are not part of the preset conference by using the method described in Unattended Progressive/Chairperson Dial-out conferences.

If a Guest passcode has been assigned to the conference, participants can join themselves to the conference by using the passcode.

Crash Conferences

A Crash Conference is identical to the Unattended Preset conference with the exception that any busy lines are automatically disconnected and joined to the conference. This ability to disconnect a participant's busy line and to force them to join the host's Crash Conference is not available on all teleconferencing systems because the preemptive function is dependent on the telecommunications network used.

DNIS Conferences

Of the above conference types Meet-Me, Unattended Progressive/Chairperson Dial-Out, and Preset Conferences can be activated by using DNIS/DID (Dialed Number Identification Service and Direct Inward Dial) numbers instead of passcodes. DNIS conferences enable the CONTEX system to use the DNIS/DID information provided by the telephone network. This information permits unattended conferencing *without* relying on passcodes. By dialing a specific number, the user will be automatically associated

with the correct conference. DNIS conferences share all of the same major features with Passcode Conferences.

Unattended Conference Features

All types of unattended conferences have numerous options that can be used to tailor the conference to the specific needs of the participants. These options are described here:

Different Host and Guest Passcodes

In the CONTEX, conferences can be set up to prevent fraudulent use. This is accomplished by providing a different Host and Guest passcode. The system is configurable so that the Host passcode is the only one that allows the conference to begin; it is the "key" for the conference. Guests dialing into the conference before the host arrives are placed onto hold music.

Scheduled Time or Always Available

The system allows all passcode conferences to be scheduled in one of several ways:

- Conferences can be scheduled to take place at a certain time and date.
- Conferences can be scheduled to take place for a fixed duration.
- Conferences can also be set up to permanently enabled, so that they can be activated at anytime by a participant with a valid host passcode.

Unlimited Participants or Restricted Number of Parties

Conferences can be set up to allow an unlimited number of parties access to the conference. This is only limited by the number of available ports in the system. Conferences can also be set up so that only a set number of participants can gain access. Parties dialing in once the limit is reached are played a "Conference Full" or "Restricted Access" message.

Guests Placed in Music On Hold

The system can be configured so guests of a Meet-Me or Chairperson Dial-out Conference are placed in music on hold until a host joins the conference. In other words, the host holds the key to the conference, and guests are prevented from conducting a conference without a host in attendance.

Chairperson Dial Restrictions

The system can be configured to prevent a chairperson from dialing certain numbers beginning with a conference dial restriction code. The restriction code is obtained from the conference name and is limited to the digits following the last asterisk in the conference name.

Auto-Breakdown

Any unattended conference can be configured to automatically break down. When this option is selected, the system will automatically disconnect all parties when the assigned time limit is reached.

The bridge can be configured so that a few minutes before the time expires, a beep will sound or a message will play warning the participants that the conference will end soon. Conferees can have the ability to extend their conference by pressing a configurable DTMF sequence or by contacting an operator.

Enunciator Messages and Features (Optional)

The optional Enunciator module greatly expands the CONTEX 240/480 messaging capabilities and adds special features for use during unattended conferences. The Enunciator adds the following features to an unattended conference:

- **Participant Name Record (PNR)**
  With the Enunciator module, the CONTEX 240/480 will record the spoken name of each conference participant for use during the conference.
- **Entrance and Exit Announcements**
  During a conference, the chairperson can toggle Entrance and Exit Announcements on and off. These announcements use the PNR to announce each participant as they enter or leave the conference.
- **Conference Roll Call**
  The Conference Roll Call uses the PNR and can played to the chairperson only or broadcast to all participants.
- **Chair IVR**
  The Enunciator module includes a sophisticated Chair IVR that the conference chairperson can access during the conference. From the Chair IVR, the chairperson can control the conference by signalling the operator, dialing additional parties, locking the conference, and toggling the chairperson disconnect. The host can also control individual parties by listening to their names and selecting them to be disconnected or called. The Chair IVR also includes a spoken conferee count.

Recorded Greeting Messages

Generally, the messages played by the CONTEX fall into two categories: system messages and custom messages. All messages played by the CONTEX may be customized. Here are a few examples of system messages:

- **Passcode Greeting:**
  "Welcome to the CONTEX System. Please enter your passcode followed by the pound sign." This message is played whenever a caller dials into the system for a Passcode conference.
- **Passcode Confirmation:**
  "Your passcode has been confirmed. Please hold while you are joined to the conference."
  This message is played once the caller's passcode has been confirmed.
- **DNIS Greeting:**
  "Welcome to the ABC Corporation Conference."
  This message may be played when a caller dials into the system using a valid DNIS number.

Here are a couple examples of custom greetings based on DNIS/DID:

- **School Greeting:**
  "Welcome to XYZ University. Please enter your course number followed by the pound (#) sign." This message could replace the generic passcode greeting.
- **German 1 Greeting:**
  "Wilkommem zu Deutsche 1."
  This message could replace the generic passcode confirmation.

Here are a couple examples based on passcode:

- **Customizable Host Confirmation:**
  "Good afternoon Mr. Smith, welcome to your conference." This message may be played for either a Passcode or DNIS conference.
- **Customizable Guest Confirmation:**
  "Good afternoon and welcome to Mr. Smith's conference. Today's subjects are the R&D and engineering budgets." This message may be played for either a Passcode or DNIS conference.

Operator Assistance

Participants of all types of unattended conference calls have the ability to request assistance from a conference operator (if on duty) by pressing **0*. This sends a signal to all operator consoles indicating that a participant requires assistance.

Conferee Self-mute

Conferees joined in a conference with Talk/Listen privileges may choose, by entering a configurable code, to mute or un-mute themselves.

Conference Security

A Host or chairperson may choose to lock or secure their conference. When a conference is secured, no operator may gain access, and no additional parties attempting to join the conference are permitted access. The chairperson enters a configurable code to control the securing and unsecuring of the conference and audible tones confirm when the conference is secured or unsecured.

It is possible to configure the CONTEX system to automatically unsecure a secured conference when a conferee dials **0* to request operator assistance.

Conference Mute

A chairperson may be able to mute or un-mute the entire conference by entering a configurable code.

Host-only Control

The bridge can be configured to allow only the conference host or chairperson control over Conference Security and Conference Mute.

Conferee Count

The Host of an Unattended Progressive Conference may enter a configurable string of numbers that will provide them with a count, represented as a series of tones, of the total participants present in the conference.

Lead-time/Trail-time

A configurable lead-time may be provided to allow parties who arrive early for a conference to join before it is scheduled to begin. Participants can join a conference close to when it is scheduled and not be forced to call back if they dial in a little early.

For conferences that are set up to break down automatically, a configurable trail-time may be provided to enable a conference to run past its scheduled end time. This is useful in providing participants with some degree of flexibility for conference run-time.

First Party Message/Hold

The system can be configured to play a special message to the first party to dial into an Unattended Meet-me Conference. The message might say “Welcome to the ABC Corporation conference. You are the first caller, please wait for the other parties to join.” This message can also be used for Chairperson Dial-out calls.

The system can also be configured to place the first party to dial into an Unattended Meet-me Conference on hold with music (instead of silence) until the next party joins the conference.

Passcode Plus PIN

In addition to the host and guest passcodes, the system can be configured to capture a participant’s PIN (personal identification number) as well as the passcode. The system automatically records the PIN and stores it in the system’s billing CDR (conference detail record) for reporting and tracking purposes.

From the participant’s point of view, the passcode and PIN are one number—they are not asked to enter two separate numbers by the system. For example a typical passcode and pin might be 456987 where 4-5-6 is the passcode and 9-8-7 is the PIN; all the customer has to do is to enter the string when prompted for their passcode.

Passcode Plus PIN Verification

With passcode plus PIN verification, callers are prompted for both their passcode and their PIN. The PIN is then verified against a preset list of names and PINs associated with the conference. When the PIN is verified, the caller's information is transferred to the Conference Control window.

From the participant's point of view, they are asked first for their passcode and then for their PIN. For example a typical passcode and pin might be 2005 + 515; the caller will be first prompted for the passcode (2005) and then for their PIN (515). They will then here a message confirming their passcode and PIN: "Your passcode and PIN has been confirmed. Please wait to be joined to the conference."

Chairperson Disconnect

The system can be configured to automatically end the conference if the chairperson/host disconnects. This feature provides extra security and fraud protection by not allowing a conference to continue after its host has disconnected. If the system has the optional Enunciator module, this feature can be transferred between the chairperson and another participant.

Options

Enunciator™ Module

Optional on CONTEX 240/480 systems is the Enunciator module. The Enunciator module greatly expands system messaging and provides several new and useful unattended features. These features center on Participant Name Record (PNR), entrance and exit announcements, participant count, roll call, and a Chairperson Interactive Voice Response (Chair IVR) system for conference and participant control.

- **Participant Name Record (PNR)**

  Whenever a conference participant dials into a CONTEX system equipped with the Enunciator module, and the PNR function is active, they are prompted to speak their name. The Enunciator records the participant's name for use during the conference.

- **Entrance and Exit Announcements**

  The Chairperson can, during the course of a conference, toggle entrance/exit announcements on and off. With entrance and exit announcements turned on, the conference will hear a spoken announcement incorporating the participant's spoken name. For example, Bob Smith from ABC Company joins the conference and records his name and company. When he is joined into the conference, the following announcement is played "Now joining, 'Bob Smith, ABC Company.'" The same holds true for exit announcements.

- **Conference Roll Call**

  The Chairperson can play a conference roll call using the recorded names of the conference participants. Roll calls can be played so the entire conference hears the roll call, or privately for the Chairperson only.

- **Chair IVR**

  The Chairperson can access an Interactive Voice Response (IVR) menu to control the conference and participants. From the main Chair IVR menu, the host can control the conference by signalling the operator, dialing out to an additional party, locking the conference, toggling the chairperson disconnect. The host can also access the participant management menu. The participant management menu uses the PNR to enable the host to scroll through conferees by listening to their names. From the participant management menu, the host can call the current party, disconnect them, listen to a conferee count (spoken by the system), or listen to the conference roll call. The Chairperson can also transfer chair control and/or chair disconnect to another party in the conference.

Specifications

The Enunciator module is installed directly in the CONTEX bridge and adds 45 standard messages for the Chair IVR features and greatly enhances the CONTEX's ability to store and deliver messages. A CONTEX 240 can support one Enunciator module and the CONTEX 480 can support two; with either system all of the available conferencing ports are supported by the Enunciator with non-blocking message delivery.

Reservation, Scheduling, and Billing (RSB)

The CONTEX system's optional Reservation, Scheduling, and Billing (RSB) system is a sophisticated system designed to enable end users to schedule a conference, reserve bridge resources, and be billed for their usage. The RSB system can also be combined with an Interactive Voice Response (IVR) system that enables end-users to call a reservation line and schedule conferences without talking to an operator. Please refer to the IVR section of this document for more information. The RSB system can also be equipped with an optional Web RSB system that allows end-users to access and modify their reservations from any standard Web browser. Please refer to the RSB Web section of this document for more information.

The RSB system allows users to manage databases containing information on the following:

- Customers and Accounts
- **Individual Persons**
- **Equipment**
- **Reservations**
- **Preset Conferences**
- **Billing**

Main Features

The RSB allows operators and reservation specialists to reserve, schedule, and bill conferences that occur on the CONTEX system. The RSB manages information by using databases that can be accessed by any station running the RSB application.

Address Book

The Persons database contains the name and personal information for all contacts contained in the RSB system. These contacts can be conferees, customer contacts, billing contacts, account contacts, or schedulers. Whenever this database is opened for viewing, a searchable list of existing persons is displayed along with detailed information about the selected person. The detailed information that can be entered for a person includes the party's name, main and alternated phone numbers, fax and email, address, and specific notes. Persons can be associated with a customer or account.

Customers/Accounts

The Customers/Accounts database maintains the customer and account information that the RSB uses to generate and manage reservations.

- **Customers**

  Customers are organizations, companies, or groups who use conferencing services. Each customer can have more than one account associated with them. For instance, a large corporation might have accounts for marketing, sales, R&D, and accounting. Conference information entered at the customer level will be carried down as the default settings for each account.

- **Accounts**

  Accounts are sub-divisions or individuals within customers that use conferencing services. In each customer account, the default settings can be altered and tailored to each account.

For each customer and account, the following types of information can be entered:

- General information including the customer or account name, contact name and address, and preferred bridge.
- Conference features including the default conference type, tone settings, conference features (such as roll call, Q&A, voting, etc.) and notification format (phone, fax, or email)
- Billing information including the billing contact's name and address, default billing rates, how the conference is billed (to account, chairperson, account and conferees, or chair and conferees).

Equipment

Conferences can require the use of more than one piece of equipment, including the bridge itself, recorders, cd players, conference rooms, etc. Whenever a reservation includes a piece of equipment, the RSB automatically checks the system for scheduling conflicts to prevent equipment from being overbooked. Equipment can be divided into two categories: system and customer.

- **System Equipment**

  System equipment is dedicated to the CONTEX system itself and is connected directly to the bridge. Dedicated equipment (recorders or cd players) does not have to use a revenue port on the system.
- **Customer Equipment**

  Customer equipment is anything the CONTEX system will dial out to and include in the conference. Because the CONTEX actually calls the equipment, it uses one of the available revenue ports on the system. Customer equipment can include conference or class rooms.

When the equipment database is open for viewing, the operator will see a searchable list of all available equipment and a detailed description of the selected equipment.

Reservations

The RSB provides a simple and efficient way to create and manage conference reservations. Reservations can be sorted and viewed by time, alphabetically, by customer, or by account number; standing reservations can be viewed separately.

- **Creating and editing reservations**

  Reservations can be created at anytime using the RSB system. When creating a conference, the operator can name the reservation; select the customer and account; determine the main contact; set the scheduled time, date, and duration; select the bridge; and add persons to the conference. Persons can be selected from the persons list or they can be added especially for this reservation. Operators can also specify who will be the conference chairperson. Equipment and special instructions can also be added to a reservation.

  Reservations also include information on the conference features such as entrance and exit tones or roll calls, Q&A, and voting sessions.

  Passcode and/or DNIS information is added to the conference, allowing end-users to activate the conference without the aid of an operator. Both host and guest passcodes/DNIS numbers are supported, allowing different levels of control.

  Billing information can be adjusted on a per conference basis. This can include to whom the conference is billed (account only, chairperson only, split between account and conferees, and split

between chairperson and conferees), if it is billed to a credit card, and what rates are used for the conference. These options are configurable for each conference.

All of these features are configurable.

- **Archiving and Purging Reservations**

  Reservations that are older than current date can be archived. Once archived, they will no longer be displayed by the RSB unless specified. Archived reservations can be purged from the system after a configurable amount of time (typically 14 days).

- **Reports**

  The RSB can generate reservation reports detailing the settings and configuration of a reserved conference. A daily summary report, showing all of the scheduled conferences for any given day can also be generated.

- **Port/Operator Utilization Charts**

  Once a reservation has been made, the bridge's port utilization and operator utilization can be viewed as a graph showing what percentage of the bridge resources are being used throughout a selected day.

Standing Reservations

Any standard reservation can be converted into a standing reservation. Standing reservations are a number of conferences associated with one master reservation (which contains the conference details, participant lists, billing information, and contact information), allowing the same conference to reoccur any given number of times. With a standing reservation, reservation specialists can determine the start and end dates for the standing reservation. The specialist can also specify which months of the year, weeks during the month, and days of the week that a conference is to occur. Standing reservations are convenient because they enable an operator to enter information once and then specify how often a conference will occur; the system takes care of creating the individual entries.

Standing reservations can be modified on a conference by conference basis. If, for example, and reservation falls on a holiday, it can be changed to the next available day or deleted altogether. Reservation specialists can also perform global updates on standing reservations (modifying time or duration) and print reports for standing reservations.

Standing reservations can be deleted on a conference by conference basis or globally from the RSB.

Presets

A Preset conference contains a list of conferee names and phone numbers, instructions, and equipment. They can be created ahead of time and saved for multiple use by operators and users. Presets save operators time because they do not have to enter the information multiple times, and they can simply copy the preset to the conference reservation. Presets can be easily created, edited, and managed from the RSB system. They can also be attached to an account and used as the default conference configuration whenever this account is accessed.

Billing

Once a reservation has been made, and the conference has taken place, the conference must be billed. The CONTEX automatically generates a billing record for the conference. The reservation specialist then imports the billing record into the RSB, edits it if necessary, and approves the billing record. Once that has been done, the billing record is ready to be sent to an invoice generating application.

After a conference has taken place, and the billing record generated, the reservation specialist can edit the billing information. This can include conference type (attended dial-out, passcode meet-me, etc.), the billing rate, conferees, billing method, and conference features (Q&A, voting, roll call, etc.).

Conferee billing records can be merged together to allow one party to be billed for more than one participant.

RSB Parameters

The RSB system contains numerous, configurable parameters that enable system administrators to tailor the RSB in many difference ways.

- **Default Conference Parameters**

  The settings for any new conference created by the RSB can be adjusted. This includes entrance and exit tones, conference features (roll call, voting, Q&A, etc.), how contacts and parties are notified (fax, email, or phone), the billing method, and the conference's default billing rate.
- **Long Distance Rates**

  Numerous long distance rates can be configured on the RSB. These are controlled by a "key" that corresponds to an area code or country code (412, 724, or 01144789). Each key has an associated rate that is automatically applied whenever a phone number with the key is dialed by the system.
- **Conference Rates**

  Individual conference rates can be configured for standard and discounted conferences or rates based on date of use. The RSB supports duplicate rate names distinguished by effective dates.
- **Conference Types**

  Different types of conferences (attended dial-out or passcode meet-me) can be billed with different rates including on a per conference basis, per party, per party per minute, or reserved vs. actual time.
- **Dial Types**

  The various types of dial types can be charged at different rates. Dial-in, dial-out (local), dial-out (long distance), and dial-in (toll free) can all be charged different rates.
- **Conference Features**

  Different conference features can be billed individually per occurrence in a conference. In other words, a conference that uses a roll call can have a different charge from a conference that uses Q&A and voting sessions.
- **Confirmation Rates**

  Depending on how a reservation is confirmed (by phone, fax, or email) they can be charged a different rate.
- **Holidays**

  Local and national holidays can be added to the system. The RSB will not accept a reservation on any day marked as a holiday. The system can also automatically suggest an alternate day for the reservation.

- **Operator Schedules**

  Operator schedules showing operator availability throughout the day can be set up and maintained by the system administrator. This schedule is automatically used by the RSB to determine operator utilization during any given time period.

- **Time Zones**

  The RSB system supports the setting of the applicable time zone for the local RSB system, the physical bridges, and for customers/accounts. This enables the RSB to provide reservations relative to the end-user's local time zone (if configured).

System Requirements

Computer	Processor	Pentium II 233Mhz (minimum)
	Memory	32 MB (64 MB recommended)
	Hard drive	2 GB Hard drive (minimum)
	Disk drives	3.5" floppy CD-ROM
	Display	800x600 resolution (minimum)
	Operating System	Windows 95/98, NT

Interactive Voice Response (IVR)

The Reservation, Scheduling, and Billing (RSB) system includes a sophisticated Interactive Voice Response (IVR) system that enables end-users to dial in to the system and create their own unattended reservations. Persons who will have access to the IVR are given a user ID by the RSB system administrator.

IVR users can have their accounts managed so they are given certain features automatically by the system. This can include the automatic generation of Host and Guest passcodes, conference features such as host dial-out, auto-breakdown, entrance and exit tones, and how guests join the conference.

Whenever an IVR user dials into the system, they are greeted with a message asking them to enter their user ID; throughout the reservation process, the user is guided by recorded voice prompts. These prompts can be recorded and managed by the system administrator.

System Requirements

Computer	Processor	Pentium II 233Mhz (minimum)
	Memory	32 MB for each line (minimum)
	Hard drive	2 GB Hard drive (minimum) Install requires 3–5 MB, not including the database files included with the RSB installation.
	Disk drives	3.5" floppy CD-ROM
	Display	800x600 resolution (minimum)
Dialogic cards	Two 4-line analog voice	D/21D, D/41D, D/21H, D/41H (H Series is the latest)
	These cards have been tested with the IVR platform. Other boards are compatible, but they have not been tested.	
Operating system	Windows	NT 4.0 (SP3 or higher) Server or Workstation
	Drivers	Dialogic DNA Drivers 3.2 release 32-bit Borland Database Engine Compunetix recommends obtaining the latest drivers.
Recommended	A sound file editing program capable of manipulating Dialogic Vox files. Recommended programs include CoolEdit Pro and GoldWave.	

RSB Web

RSB Web is an application that can be run on any standard Web-server and that allows an end-user to access and control their own reservations using a customized Web site. RSB Web uses the end-user's IVR user ID and PIN and accesses the RSB's standard databases. This means that any user who has access to the RSB through the IVR system can have access through RSB Web; however the IVR system is not required for RSB Web—it is a complete stand-alone addition to the RSB system.

RSB Web has the following standard features:

- **Unique user logins**

  Each end-user has their own unique ID and PIN. The ID is assigned at the RSB when the account is set up on the RSB and the PIN can be changed by the end-user at any time.

- **End-users can make, modify, or cancel reservations**

  Using RSB Web, end-users have full access to their reservations on the CONTEX system. They can make new reservations, modify existing reservations, or cancel reservations right from their computer using any standard Web browser. Because RSB Web uses the standard RSB databases, reservations made using the IVR system can be viewed, modified, or canceled from the Web, providing unparalleled flexibility in the creation and control of reservations.

- **Users can change their profiles**

  End-users can change their PIN as well as generate new host and guest passcodes for the conferences.

RSB Web is fully customizable: the language, interface, and features can all be easily modified for a custom presentation to end-users.

System Requirements

Web server	Processor	Pentium II 333Mhz (minimum)
	Memory	128 MB (minimum)
	Hard drive	2 GB (minimum)
	Disk drives	3.5" floppy CD-ROM
	Display	800x600 resolution (minimum)
Operating system	Windows	NT 4.0 (SP3 or higher)
	Drivers	32-bit Borland Database Engine
Recommended	For large databases, a Pentium III, 500Mhz with 256 MB RAM is recommended.	

RSB Notification System

The CONTEX RSB Notification System provides notification of a scheduled conference to its participants. It was designed to retrieve information from the existing RSB system and send that reservation information via two methods of communication: e-mail and standard fax. The system will run constantly, querying the RSB database for new reservation and creating e-mail and fax jobs based on the scheduled reservation information.

The Notification System can be setup to send e-mail and faxes, or can be setup to send e-mail only. An e-mail SMTP server must be available to the system for any transmissions to be sent. The Notification System has the ability to send four types of notifications based on the settings from the RSB. They consist of Confirmation, Reminder, Reschedule, and Cancellation. In addition the RSB can determine who gets the conference information, the conference chair with or without the participants.

System Requirements

The RSB Notification System will run on the same PC as the RSB system and only requires that an SMTP e-mail server be available for the system.

CONTEX Digital Record and Playback (CDRP)

The CONTEX Digital Record and Playback (CDRP) system is a stand-alone option that can be added to any conferencing system. The CDRP allows users to digitally record a conference and play it back at a later time. The system ships complete, including a PC, monitor, and DigiBoards®. During a conference, the CDRP can be added at any time to record the proceedings. After the conference, numerous individuals can access the CDRP system simultaneously and listen to the conference. Unlike a tape recording, parties can call in at different times and listen to the conference simultaneously, and they do not need to wait until the recording has finished before starting to listen to it. Listeners can also control the speed of the playback, the volume, play conference information, and listen to instructions.

The CDRP system contains three levels of user access, each permitting a different amount of control over the recording. Each level is determined by the user's account number (end-user, master user, and administrative user). Whenever a user accesses a conference, they can be prompted to speak their name, which is recorded for a participant list.

The CDRP uses a IVR system for users to dial in to the system and record, manage, or listen to conferences.

- **End-users**

  End users can access the system, select an available conference, and listen to it. During the conference, the end-user can play the conference, control the playback speed, rewind, fast-forward, and control the volume.

- **Master Users**

  Master users can access the system, select an available conference, and listen to it. Additionally, they can record and review custom messages for the conference and review the participant list. Custom messages are attached to the conference and are played before the conference is listened to. The participant list contains the spoken recording of all the parties who have accessed the conference, along with a time and date stamp. The master user can review this list and delete any party from it.

- **Administrative Users**

  Administrative users have all of the privileges of end and master users, and they can set the system to record a conference. During a conference, the administrative user dials the CDRP, enters their valid code and selects the option to record the conference. Either a system operator or a conference chairperson might be able to do this during the conference. The administrative user can pause, resume, or stop recording at any point during the conference.

  Users are set up and managed by the CDRP system administrator. Passcodes, user access, and system parameters are all easily controlled from the CDRP administration interface.

System Requirements

Computer	Processor	Pentium II 233Mhz (minimum)
	Memory	32 MB for each line (minimum)
	Hard drive	5 GB Hard drive (minimum) Conferences recorded at optimum quality require 28 MB for each hour. Total length is limited by disk space.
	Disk drives	3.5" floppy CD-ROM
	Display	800x600 resolution (minimum)
Dialogic cards	Two 4-line analog voice	D/21D, D/41D, D/21H, D/41H (H Series is the latest)
	T1 (Windows NT only)	D/240SC-T1
	These cards have been tested with the CDRP platform. Other boards are compatible, but they have not been tested.	
Operating system	Windows	NT 4.0 (SP3 or higher) Server or Workstation
	Drivers	Dialogic DNA Drivers 3.2 release 32-bit Borland Database Engine Compunetix recommends obtaining the latest drivers.
Recommended	A sound file editing program capable of manipulating Dialogic Vox files. Recommended programs include CoolEdit Pro and GoldWave.	

CONTEXSpan™

CONTEXSpan allows conferences to "span" two CONTEX 240/480 bridges of any size and provides a larger pool of ports (900+) to end-users. CONTEXSpan automatically creates the links between the two bridges and can dramatically improve port and operator utilization. The number of simultaneous conferences supported by CONTEXSpan is only limited by the number of span lines. Spanned CONTEX bridges can fully support unattended conferencing features.

CONTEXSpan is totally transparent from the end-user's point of view. Conference participants dial, connect to, and use the CONTEX's conferencing features exactly as if they were conferencing on a single bridge. And CONTEXSpan requires no operator intervention.

CONTEXSpan can connect bridges that are physically separated by any distance; it is not limited to connecting bridges in close physical proximity. The routing of incoming calls can also be configured in a number of different ways to take advantage of CONTEXSpan's efficient use of bridge and operator resources.

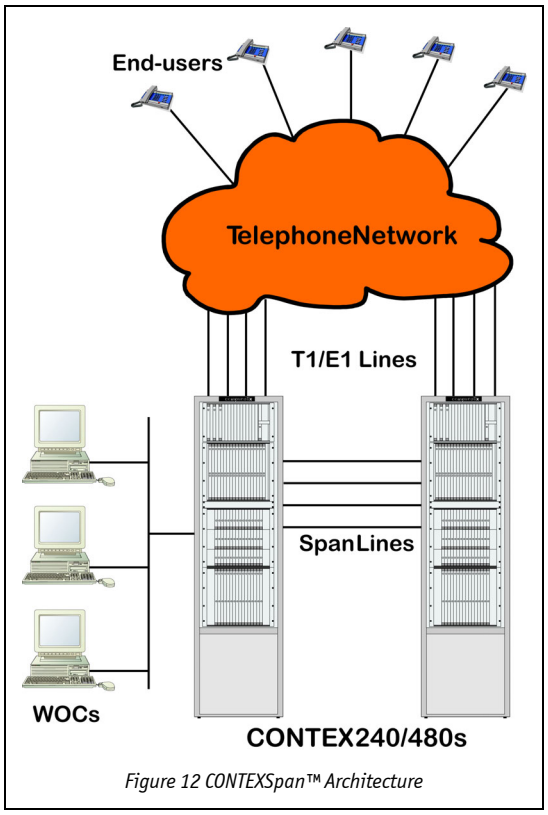

Figure 12 CONTEXSpan™ Architecture

System Requirements

CONTEXSpan is a software technology that only requires dedicated span lines between the spanned bridges.

CONTEXWeb™

The CONTEXWeb is a powerful software development platform that provides all of the tools necessary to create customized Web interfaces. By using a Web-based conferencing control application, it is no longer necessary to develop, distribute, and support multiple customer end-user platforms. Using a standard Web browser, end-users can easily take control of their own conferences. You can customize your Web interface to allow end-users to schedule when a conference is to begin, determine who will be included in the conference, secure the conference, and initiate advanced conferencing features such as Voting and Q&A sessions right from their desktop. With CONTEXWeb, the remote chairperson can be given complete control over their conference. Conferences created using the CONTEXWeb interface can combine attended and unattended passcode conferencing features.

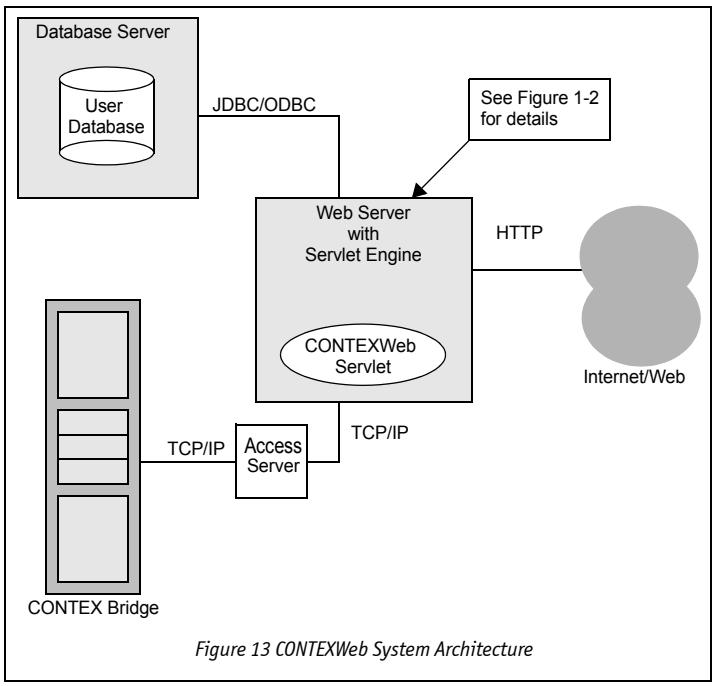

Figure 13 CONTEXWeb System Architecture

By designing a Web interface using the CONTEXWeb , end-users are given full bridge access and control. Unattended conferences can be created and managed without placing reservations. Web-based conference control — easy-to-use, feature-rich, and value-added, — provides new services that save end-users time and

CONTEXWeb Features

The CONTEXWeb Toolkit will enable you to create custom Web interfaces that have the following capabilities:

Chairperson Initiated Conferencing

The conference chairperson can create a conference by simply going to a specific Web page and entering their user name and password. Once the chairperson's login and password has been authenticated, they are sent to a custom-designed conference control page.

Conference Capabilities and Features

From the Web interface, the conference chairperson can have the following capabilities:

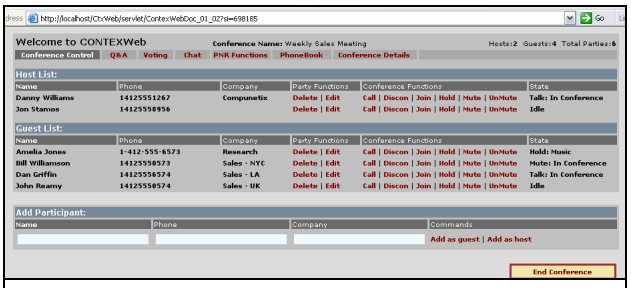

Figure 14 Example of a CONTEXWeb Interface

- Create a conference
- View and edit conference details, including conference name, special instructions, and confirmation code
- Add themselves to the conference
- Add/edit/delete conference participants
- Call participants
- Join participants
- Place participants on music hold
- Disconnect participants
- Change participants' mode between Monitor and Talk/Listen
- End the conference
- Run special conference features such as Q&A or voting
- Access participant name record functionality (PNR)
- View and manage a personal phone book
- Use CONTEXWeb chat to send text message to other users logged into the same conference

Definable Passcodes

Using the Real Time Billing Interface (RTBI), the conference host can define a passcode that dial-in participants can use to access the conference. This is useful when the party's location is not known at the time of the conference.

Loss of Connection Protection

The conference can be configured continue to function normally if the chairperson leaves the Web conferencing page or looses their connection. The chairperson can return to the Web conference page at any time and regain control over the conference.

CONTEXWeb System Components

CONTEXWeb has three main components that work together to provide conference management and control. They are the Web server with servlet engine, the Access Server, and the user database.

Web Server with Servlet Engine

The Web server contains the CONTEXWeb servlet, the CONTEXWeb templates, the configuration file, the static and dynamic HTML pages, and the images, flash files, javascript, applets, etc. used by the interface. These components are described in detail in the next section.

Access Server

In order for CONTEXWeb to provide conferencing control, it must communicate with the Access Server. Access Server is a dedicate communications link between the CONTEXWeb Server and one or more CONTEX bridges. It provides all of the command communication between CONTEXWeb and the bridge(s), enabling conference creation, management and control. For details on Access Server, please refer to the Access Server documentation available from Compunetix.

Access Server communicates with both the CONTEXWeb Server and the CONTEX bridge via TCP/IP communication links. CONTEXWeb will not work unless Access Server has been set up and configured.

User database

CONTEXWeb includes an Microsoft Access database for managing CONTEXWeb bridges, conferences, environments (CONTEXWeb applications), phone books, and Web users. For a user to have access to a CONTEXWeb application they must have an account on the CONTEX system and a valid entry in the Web users database. The Phone book database can be used by CONTEXWeb to provide personalized phone books for users (they can keep and manage conference participants

CONTEXWeb System Requirements

CONTEXWeb runs on a server class PC (Pentium III, 500 Mhz, 128 MB RAM - minimum) using Microsoft Windows NT and Microsoft Internet Information Server. The WEB Server PC connects to a set of configured CONTEX bridges through an Ethernet network. A single CONTEXWeb Access Server can be connected with up to 6 CONTEX bridges.

Technical Specifications

CONTEX Conferencing Specifications

Dynamic Port Allocation

All unused conferencing ports remain in a pool of available ports, from which they are drawn as required. Later, when an entire conference is released or when an individual conferee disconnects, the associated conferencing ports are immediately returned to the pool of available ports.

Unlimited Number of Conferences

The number of conferences is limited only by the number of ports. An unlimited number of conferences is permitted, up to *N*/2 (where *N* is the number of conferencing ports).

Unlimited Number of Conferees

The number of conferees is limited only by the number of ports. An unlimited number of conferees are permitted per conference, anywhere from 2 to *N* parties per conference (where *N* is equal to the total number of conferencing ports).

Full Duplex Conferencing

All conferencing performed by the CONTEX is full duplex and allows all talker-enabled conferees to contribute to the conference simultaneously. In other words, there is no limit to the number of conferees who may speak at the same time.

Complete Digital Conferencing and Clarity

Due to the use of sophisticated, patented digital conferencing techniques, the voice quality and clarity of the conference is excellent. The voice quality is completely independent of the number of conferees per conference, as opposed to analog systems.

Noise Filtering

The conferencing algorithms executed by the Digital Signal Processors (DSPs) completely eliminate extraneous line noise or background noise from entering the conference. The noise floor does not change as the size of the conference increases.

Echo Suppression

Echo suppression is provided for all T1/E1 interfaces.

Echo Cancellation

Optional echo cancellation can be provided for all T1/E1 interfaces.

On-line Diagnostics

The diagnostics routines are performed in the background on a continual basis. This is done automatically and no administrative intervention is required to initiate this testing. In the event of a failure, an alarm is generated that must be interpreted and acted upon by the system administrator.

From any WOC station, an operator can troubleshoot the system and run diagnostics. There are three basic windows that are displayed on the WOC station: the System State Monitor, the Active Conference window, and the Conference Control window. The System State Monitor provides high level diagnostic messages and system events, including alarm reporting such as loss of T1/E1 synchronization, module failure, user signaling, incoming call notification, and party going idle status.

Available Information/logs

Traffic and alarm logs are maintained on all operator consoles and on the MAT. Alarm logs are stored according to severity. Additionally, the MAT stores billing information that is made available to all operator stations. Parameters, parties, features, and records can be managed and accessed from the administrative subsystem. The system records information pertaining to each conference and allows for most parameters to be changed if required.

New Card/Module

When a new card is added to the system, it will go through a Power On Self-Test (POST) routine to test the functionality of the module components. This is performed to ensure that any conferences currently running on the system will not be disturbed by the introduction of the card to the system. If the module passes the POST, it is brought into service by the MAT. Any configuration information that is required is sent to the module at that time. If during the POST, it is determined that the module is not ready for use, the module will request a software download from the MAT.

Bridge Application Program Interfaces (APIs)

CONTEX system software uses a set of ASCII text file report formats that define how data is to be transferred and interpreted. These Bridge Application Program Interfaces (APIs) normally pertain to transfer of data between CONTEX applications. However, they can also be used by other applications to interpret CONTEX data. For example, the CONTEX Reservation, Scheduling, and Billing (RSB) system creates R-Reports which describe edited and approved billing records. These R-Reports may be retrieved and interpreted by a program which prints invoices. The Bridge APIs include the following:

CONTEXWeb Toolkit

The CONTEXWeb Toolkit is a powerful software development platform that includes all of the tools necessary to develop a custom Web-based conference control interface. The CONTEXWeb Toolkit includes the Access Manager which can connect with up to 6 CONTEX bridges (Mini, 240, 480) and that provides the conference control features to the Client Manager. The Client Manager is developed by the customer and includes the custom interface.

Operator Statistics

The CONTEX system can produce several operator statistical reports that can be downloaded and analyzed. These reports are: Attended Statistics Report, Operator Summary Report, and Operator Specific Reports. These reports provide detailed information on bridge usage, general operator statistics for the bridge, and specific operator statistics. Some of the information included is total call counts, average time to operator, maximum and minimum time to operator, average time to conference, etc. All of these reports can be downloaded for review and analysis.

Reservation Transfer Package

The reservation transfer package makes it possible to interface any reservation system with the CONTEX system. It consists of two files transferred from the reservation system and retrieved by the CONTEX system. Each file contains information on a number of conferences. After these files are retrieved, the WOC operator can view, edit, and activate the conferences they describe.

G-Reports

G-Reports contain basic, preliminary information on completed conference calls. These reports are created and displayed at the WOC so the operator can quickly review conference details. These reports include the following information:

- **Connected Parties**

  The G-Report lists each connected party as well as specific details about each party. For example, the G-Report lists each party's port, connect time, disconnect time, on-hold time, and billable minutes.
- **Conference Statistics**

  The G-Report lists the durations for calls of each of the following dial types: standard dial-in, toll-free dial-in, local dial-out, and non-local dial-out.

N-Report

The N-Report is created at the WOC at the same time the G-Report is created. The N-Report contains information similar to that contained in the G-Report. Unlike the G-Report, however, the N-Report is not intended to be displayed and read at the console. Rather, it is transferred from the CONTEX system as a compact data package. The N-Report can be retrieved by billing software, such as the RSB system, or by invoicing software.

E-Report

The E-Report, which is created at the WOC at the same time the G-Report is created, lists error information associated with the N-Report. Therefore, it can be analyzed to determine the possible cause for some system problems. For example, if an N-Report cannot be imported into the RSB system, the E-Report may indicate why.

R-Report

The R-Report is created by the RSB system when approved billing records are exported. Like the N-Report, the R-Report is a compact data package. This report can be retrieved and interpreted by invoicing software.

Customized Report Formats

Compunetix can implement special report formats, including those used by other vendors. It is possible, therefore, for CONTEX equipment to interface seamlessly with software systems other than those developed by Compunetix.

Real Time Bridge Interface (RTBI)

The Real Time Bridge Interface (RTBI) provides a simple TCP/IP link into a CONTEX bridge for maintaining configurable system parameters, managing passcodes, and collecting real time billing data. Using RTBI, configurable system parameters, such as “Prepaid warning time” can be configured. Passcode management includes getting the passcode from the correct port, verifying it, notifying the system if the passcode is valid or invalid, and ending the conference based on passcode settings. Billing data can be requested from the system at anytime by using the RTBI, this data can be used to determine accurate, real time billing.

Operation Event Logging

The CONTEX system collects and logs events such as user log in/off, incoming port events, operator signal for assistance, conference begin/end, conference scan, Question & Answer sessions, Voting sessions, bridge status snap shot, and system alarms. These events can be used to create reports detailing operator efficiency, bridge status, port usage, and external application usage.

Line Interface Module Specifications

The CONTEX external interfaces follow ANSI and CCITT standards and allow the CONTEX to interface, via T1, E1, or Primary Rate ISDN, to any central office, PABX, or channel bank.

To accommodate the various types of telephone networks around the world, the Line Interface module is available in four different versions and configurations: T1 Robbed-bit (24 channels), T1-ISDN (23B + D channels), E1 Channel Associated (30 channels), and E1-ISDN (30B + D channels).

The physical connection for the Line Interface module is a DB-15 female connector style with the following pinouts:

Pin	Meaning
1	TX+
2	GND
3	RX+
4	GND
9	TX-
11	RX-
12	GND

An RJ-45 connector interface is also available with the following pinouts.

Pin	Meaning
1	RX+
2	RX-
4	TX+
5	TX-

T1 Interface Specifications

The receive line on the T1 Line Interface module has the following characteristics.

- The T1 interface has 100 W impedance.
- The signal detect threshold level of the receiver circuit is set at approximately 1.5 V.
- There is no equalization of the received signal.
- The receiver circuit is designed to accurately decode a signal attenuated by a maximum of 3 dB from the digital cross-connect point.

The CONTEX T1 Line Interface module is not designed to directly accept a signal from the last network repeater. Interface to the public network generally requires a Channel Service Unit (CSU). The input jitter tolerance of the T1 Line Interface module is shown in Figure 15. The T1-ISDN signalling messages are sent and received through the D channel (time slot 24).

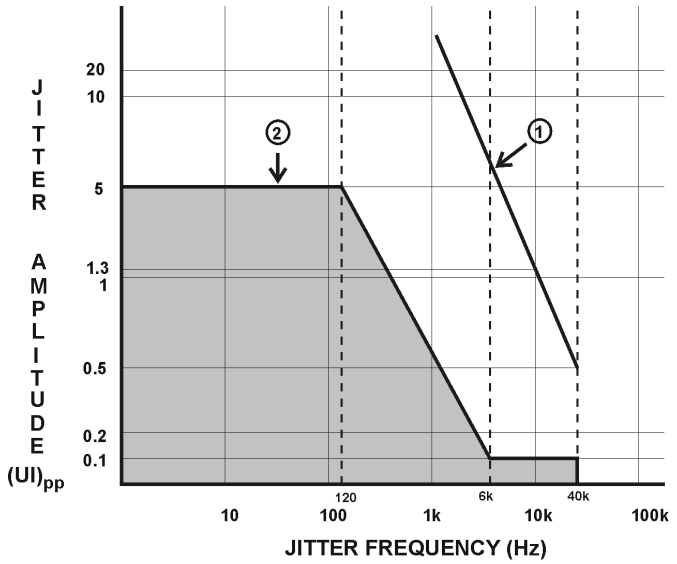

Figure 15 T1 LIF Jitter

The transmit line interface has the following characteristics:

- The configurable transmit equalizer supports up to 65 feet 22 AWG transmission line.
- The output is transformer-coupled output.
- The pulse shape meets the AT&T and CCITT pulse templates.
- The output impedance matches 100 Ω line impedance.
- The line frequency is 1.54 MHz ±200 Hz in Master Mode.
- The line interface uses binary 8 zero suppression.
- The unbalance of transmit line meets the ANSI standards T1.102 and T1.403, so the difference in total power between positive and negative pulses is less than 0.5 dB, and in any window of 17 consecutive bits, the maximum variation in pulse amplitudes is less than 200 mV and the maximum variation in pulse width is less than 20 ns measured at half amplitude.
- The T1 Line Interface module supports either D3/D4 or ESF framing.
- The T1 Line Interface module supports the following:
  - DTMF tone generation and detection.
  - Automatic Gain Control.
  - Insertion and detection of A, B, C, and D bits.
  - Yellow and blue alarm detection.
  - μ-law for audio coding.

Signaling protocols

The following signaling protocol options are provided by the CONTEX T1 interface:

- **Foreign Exchange Subscriber (FXS)**
  Used for connection of the CONTEX to a dedicated phone line via a channel bank.

- **Foreign Exchange Office (FXO) - Loop Start**
  Used for connection of the CONTEX to a loop start dial out line.
- **Foreign Exchange Office (FXO) - Ground Start**
  Used for connection of the CONTEX to a ground start dial out line.
- **E & M**
  Used for the connection of the CONTEX to dedicated four wire line.
- **Wink Start**
  Used for the connection of the CONTEX to a Central Office or PBX tie line.

Here are some examples of how the signalling protocols work:

FXO Loop Start Protocol

Initially, for an idle line: Incoming AB=01, Outgoing AB=01

Outgoing Call Sequence:

- CONTEX goes off hook. Set AB=11.
- Remote switch provides dial tone.
- When the CONTEX recognizes the dial tone, it dials the number to be called.
- At this point the system goes CONNECTED so the operator can hear the call progress tones.
- The CONTEX can terminate the call by returning the signaling bits to 01 and going back on hook.

Incoming Call Sequence:

- The remote switch 'rings' the line by setting the incoming AB=00.
- The AB bits go from 00 to 01 in the standard ringing cadence of two seconds of ringing followed by four seconds of silence.
- If 4 seconds of silence expire without the return of the ringing, the line state returns to Idle.
- The CONTEX sets its outgoing AB bits to 11 to go off hook and respond to the seizure.
- The CONTEX can terminate the call by returning the signaling bits to 01 and going back on hook.

FXO Ground Start Protocol

Initially, for an idle line: Incoming AB=11, Outgoing AB=01

Outgoing Call Sequence:

- CONTEX goes off hook by grounding the ring conductor. Set outgoing AB=00
- Remote switch grounds the tip conductor by setting AB=01.
- The CONTEX then removes the ring ground and goes off hook, (outgoing AB=11), and then dials the number to be called.
- At this point the system goes CONNECTED so the operator can hear the call progress tones.
- The CONTEX can terminate the call by returning outgoing AB to 01 and going back on hook.
- The remote switch can terminate the call by removing the tip ground and returning the incoming AB to 11.

Incoming Call Sequence:

- The remote switch seizes the line by grounding the tip lead and applying the ring cadence (incoming AB alternates between 01 and 00).
- The CONTEX goes off hook to answer the call, (outgoing AB=11).

- The CONTEX can terminate the call by returning outgoing AB to 01 and going back on hook.
- The remote switch can terminate the call by removing the tip ground and returning the incoming AB to 11.

4-Wire Wink Start Protocol

Initially, for an idle line: Incoming AB=00, Outgoing AB=00

Outgoing Call Sequence:

- CONTEX seizes line. Set AB=11.
- Remote switch returns a *wink*, i.e. AB=11 for 140 to 290 milliseconds.
- When the wink is over, (incoming AB goes back to 00) CONTEX then dials the DTMF string.
- At this point the system goes CONNECTED so operator can hear call progress tones.
- When the call is complete the incoming AB bits are set to 11.
- Either side, the CONTEX or the remote switch, signals the termination of the call by setting AB=00.

Incoming Call Sequence:

- The remote switch seizes the line. CONTEX incoming AB goes to 11.
- CONTEX winks back, setting CONTEX AB to 11 for 250 ms.
- CONTEX then waits 1 second, sets the outgoing AB bits to 11 to signal a completed call, and goes CONNECTED.
- Either side, the CONTEX or the remote switch, signals the termination of the call by setting AB=00.

E1 Interface Specifications

The receive line on the E1 Line Interface module has the following characteristics.

- The E1 Interface has 120 Ω impedance.
- The signal detect threshold level of the receiver circuit is set at approximately 1.5 V.
- There is no equalization of the received signal.
- The receiver circuit is designed to accurately decode a signal attenuated by a maximum of 3 dB from the digital cross-connect point.

The E1 Line Interface module is not designed to directly accept a signal from the last network repeater. Interface to the public network generally requires a Channel Service Unit (CSU).

E1-ISDN signaling messages are sent and received through the D channel (time slot 16). The interface uses LAPD as the data link layer protocol as described in CCITT recommendations Q.921. The layer 3 protocol follows the CCITT recommendations Q.931. The input jitter tolerance of the E1 Line Interface module is shown in Figure 16.

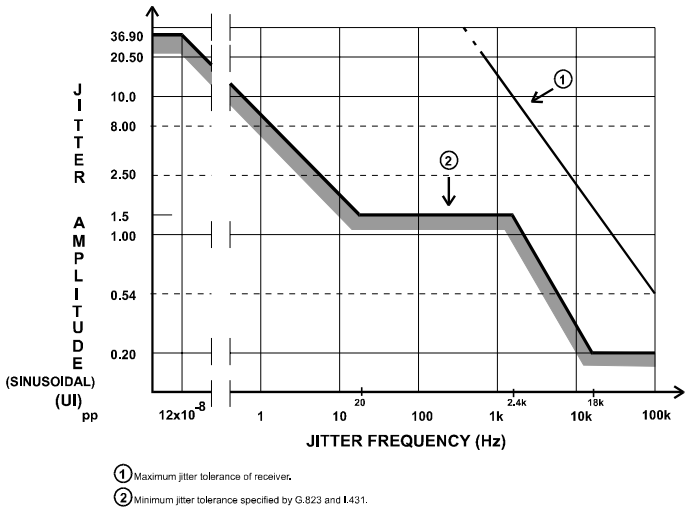

Figure 16 E1 LIF Jitter

The transmit line interface has the following characteristics:

- The output is transformer-coupled output.
- The pulse shape meets the ITU G.703 pulse template.
- The output impedance matches 120 W line impedance.
- The line frequency is 2.048 MHz ±200 Hz in Master Mode.
- The line interface is programmed to HDB3 zero code suppression mode.
- The line interface complies with ITU I.431 ISDN and G.704 for PCM30 (E1 Channel Associated signalling).
- A-law used for audio coding.

Analog Interface Module

The Analog Interface (AIF) module, Figure 17, is used strictly in the Mini-CONTEX system. Each AIF module provides up to six ports to interface with analog telephone equipment. Up to three AIF modules can be installed in a Mini-CONTEX system to provide up to 18 analog ports.

The AIF module is depicted below at the left. It can accept up to six daughter modules, one for each analog port. The 4 wire daughter module is shown in Figure 18.

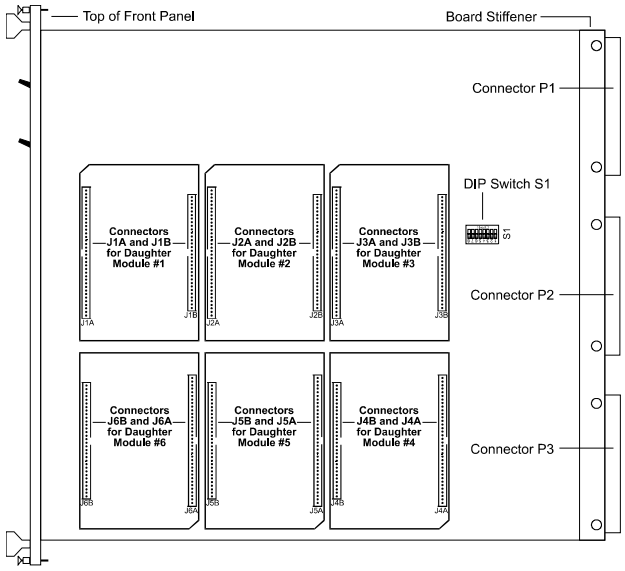

Figure 17 Analog Interface Module

Specifications

Mother Board

The Analog Interface Module mother board has a DSP which recognizes and generates DTMF tones and detects voice activity. The mother board also has line protection capability.

4-Wire Daughter Module

The 4-wire daughter module supports E&M Type I and E&M Type II network circuits. The 4-wire daughter module also supports gain adjustment by ±25 dB. A sliding switch on the 4-wire daughter module makes further gain adjustment possible. Input impedance is 600 W, and output impedance is 600 W.

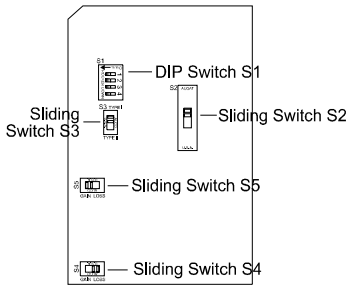

Figure 18 Daughter Module (4-wire)

2-wire Daughter Module

The 2-wire daughter module supports FXS loop start signaling. It has a DSP which can perform echo cancellation and gain adjustment (0 dB to +7 dB for transmit and -7 dB to 0 dB for receive). The 2-wire daughter module has secondary surge protection designed to meet UL-1459 requirements for electrical safety and conforming to FCC part 68 regulations for interfacing to the telephone network. The interface is designed to meet the requirements for point-of-interface standard Interface Group 1 code 2LS2.

CONTEX Specifications

General Features

Model	Total Ports	Optional modules
Mini-CONTEX	24-120	—
CONTEX 240	24-240	Enunciator (1)
CONTEX 480	24-480	Enunciator (2)

Physical Specifications

Power Requirements - Mini-CONTEX

All power requirements assume a fully populated system.

Model	Item	Requirements
Mini-CONTEX AC Power Supply	Input Voltage	85V to 264V AC (Auto-ranging)
	Peak Current	4.6 Amps @ 95V AC
		3.8 Amps @ 115V AC
		1.9 Amps @ 230V AC
	Nominal Power	440 Watts
	Thermal Output	1.50 KBTU/H (nominal)

Power Requirements - CONTEX 240

All power requirements assume a fully populated system.

Model	Item	Requirements
CONTEX 240 Dual Redundant AC Power Supply	Input Voltage	90V to 132 V AC or 175V to 264V AC (Jumper Selectable)
	Peak Current	24.1 Amps @ 95V AC 19.9 Amps @ 115V AC 9.9 Amps @ 230V AC
	Nominal Power	1563 Watts
	Thermal Output	5.33 KBTU/H (nominal)
CONTEX 240 Triple Redundant, Hot swappable AC Power Supply	Input Voltage	90V to 277V AC (Auto-ranging)
	Peak Current	18.8 Amps @ 95V AC 15.5 Amps @ 115V AC 7.8 Amps @ 230V AC
	Nominal Power	1624 Watts
	Thermal Output	5.54 KBTU/H (nominal)
CONTEX 240 Triple Redundant, Hot swappable DC Power Supply	Input Voltage	-42V to -56V DC
	Peak Current	45.7 Amps @ -42V DC 40.0 Amps @ -48V DC 36.9 Amps @ -52V DC 34.3 Amps @ -56V DC
	Nominal Power	1919 Watts
	Thermal Output	6.55 KBTU/H (nominal)

Power Requirements - CONTEX 480

All power requirements assume a fully populated system.

Model	Item	Requirements
CONTEX 480 Dual Redundant AC Power Supply	Input Voltage	90V to 132 V AC or 175V to 264V AC (Jumper Selectable)
	Peak Current	48.2 Amps @ 95V AC 39.8 Amps @ 115V AC 19.8 Amps @ 230V AC
	Nominal Power	3126 Watts
	Thermal Output	10.66 KBTU/H (nominal)
CONTEX 480 Triple Redundant, Hot swappable AC Power Supply	Input Voltage	90V to 277V AC (Auto-ranging)
	Peak Current	37.6 Amps @ 95V AC 31.0 Amps @ 115V AC 15.6 Amps @ 230V AC
	Nominal Power	3248 Watts
	Thermal Output	11.08 KBTU/H (nominal)
CONTEX 480 Triple Redundant, Hot swappable DC Power Supply	Input Voltage	-42V to -56V DC
	Peak Current	91.4 Amps @ -42V DC 80.0 Amps @ -48V DC 73.8 Amps @ -52V DC 68.6 Amps @ -56V DC
	Nominal Power	3838 Watts
	Thermal Output	13.1 KBTU/H (nominal)

Dimensions

Model	Height	Width	Depth	Weight
Mini-CONTEX	26 in (65 cm)	22 in (55 cm)	24 in (60 cm)	110 lbs (49.9kg)
CONTEX 240	87 in (220 cm)	24 in (60 cm)	32 in (80 cm)	650 lbs (284.84 kg)
CONTEX 480	87 in (220 cm)	48 in (120 cm)	32 in (80 cm)	1300 lbs (589.67 kg)

Environment

- **Temperature: 50-90°F / 10-35°C**
- **Humidity: 20%-80%, Non-Condensing**

Warranty

One year parts and labor for all hardware, one year software upgrades and technical support. Post-warranty maintenance programs are available for all hardware and software.

Computer Specifications

WOC Computer Specifications

Processor	Pentium II 233 Mhz (minimum)
Disk drives	3.5 inch floppy disk drive CD-ROM drive
Expansion slots	2 full size ISA expansion slots (minimum)
Memory	32 MB RAM (64 MB recommended)
Cache	256 K cache (minimum)
Hard drive	1.2 GB hard drive (minimum).
Display	SVGA video interface (capable of 800 x 600 resolution)
Operating system	Windows 95/98, NT

The PC used to run the WOC software may be connected to the system directly through a serial port, through a LAN, or through a modem dial-up connection.

MAT Computer Specifications

Processor	Pentium 166 Mhz (minimum)
Disk rives	3.5 inch floppy disk drive CD-ROM
Expansion slots	4 full size ISA expansion slots (minimum)
Memory	32 MB RAM (64 MB recommended)
Cache	256 K cache (minimum)
Hard drive	850 MB hard drive (minimum)
Display	SVGA video interface (capable of 800x600 resolution).
Operating system	MS-DOS 6.22

The PC used to run the WOC software may be connected to the system directly through a serial port, through a LAN, or through a modem dial-up connection.

System Approvals

This document lists the safety, EMC, and Telecom approvals that have been granted to the CONTEX system. The CONTEX is fully approved in all European countries, the United States, Canada, and Australia. Compunetix is continuing to pursue new approvals and will update this list periodically. If the country approval you are interested in does not appear on this list, please contact your Compunetix Account Manager, as it may be a recent addition that is not included in this document.

Manufacturing Standards

Compunetix manufactures and test to the following standards:

- **MIL-P-55110D**
  Printed Wiring Boards.
- **MIL-I-45208A**
  Inspection System Requirements.
- **IPC-A-610**
  Workmanship Standard, Acceptability of Electronic Assemblies.

Design Standards

Compunetix CONTEX systems are designed and manufactured in compliance with the following standards.

European Union

- **European Community compliance per Directive91/263/EEC, Annex I**
  Market Admission: Ministry of Transport, Public Works and Water Management
  HDTP CD Marking: CE 0167 X

Australia

- **Australian AUSTEL compliance**
  AUSTEL permits: A95/89/0150 and A95/63/0521.

Product Safety Certification

Compunetix CONTEX systems meet the following safety standards for information technology equipment, including electrical business equipment.

European Union

- **IEC 950**
  Base Directive for Safety Requirements of:
  - EN 60950:1992