# SYSTEM 930
## TELEPHONY SIMULATOR

## System 930 E1 Version Reference Document

**Covers topics including Euro ISDN and QSIG**

**GORDON KAPES|INC.**

# The System 930 Table of Contents

# The System 930 Table of Contents

# The System 930 Help Menu

This document describes the System 930 menu system for E1 ISDN PRI signaling, version 1.40, dated 06-Feb-2001.

For information about this product contact:
Gordon Kapes, Inc.
5520 West Touhy Ave.
Skokie, Illinois 60077 U.S.A.
Telephone: +1 847 676 1750
Fax: +1 847 982 0747
www.gkinc.com

### Introduction to the System 930

The System 930 is a central office T1/E1 telephony simulator. The system provides two digital interfaces and up to 32 analog ports. The E1 version can be licensed for Euro ISDN network side, Euro ISDN user side, and QSIG both sides. A CAS version is not available. A T1 version is available as a separate product. Each interface is configured independent of the other, permitting both to be identical or different. Splitting interfaces between network side and user side allows calls to be sent from one interface to the other. Use the reversing data cable provided with the system to connect interface 1 to interface 2. The functionality of the system can be explored using features such as the call generator and data analyzer. The RJ48 pins are wired for connection as the network side. Bantum jacks are also provided, wired in parallel with the RJ48 pins.

Communication to user screens is by RS-232: 9600 BPS, 8-N-1, XON/XOFF. VT-100 terminal emulation is used for display and keyboard operation. Configuration and status screens are selected from the main menu. Online help is available from all screens by pressing <F1>. Screens are quickly configured in real time and shown in real time. Once a screen has been selected, pressing <ESC> <F4> or <ESC> <F3> skips to the next or previous screen without going to the main menu.

The factory default condition can be set by typing FACTORY then <ENTER> from this help screen. Note that all saved system configuration profiles will be destroyed and restored to their factory default condition.

# The System 930 Help Menu

## Software Version History

Version 1.40 highlights: Changed Euro ISDN overlap dialing to send the called number IE instead of keypad IE and concatenate digits on the receive side.
Screen 3: Added calling name to NI-2, 4ESS, and EURO ISDN.
Screen 21: Added maximum number of calls to the call generator.

Version 1.36 highlights: Screen 1: Added GR-303 hybrid signaling.
Screen 3: Renamed caller to calling. Added calling name to 5ESS and DMS-100.
Screen 21: Added random called number groups to the call generator.

Version 1.35 highlights: Screen 25: Added new screen to configure the 939 Analog Card.

Version 1.34 highlights: Screen 3: Added random and sequential caller numbers.
Screen 17: Added send channel ID in first message only. Added increment after each call to cause code override.
Screen 24: Added new screen for time and date configuration.

Version 1.33 highlights: Screen 18: Increased data capture to 10 pages.
Screen 21: Fixed call generator to start correctly the first time a new software version is installed. Fixed internal call ID so that connected calls are not disconnected after 16384 additional calls.

Version 1.32 highlights: Screen 1: Added GR-303 CSC switch emulation to T1 version. Added QSIG switch emulation to E1 version. Added NFAS signaling to E1 and T1 versions. Added loop disconnect to T1 loop start FXO and SAO.
Screen 7: Allow en-bloc or overlap dialing when switch emulation is T1 RBS network or user side.
Screen 8: Added Z to allow match for no outbound prefix.
Screen 11: Added any digital interface or analog port to audio monitor source selection.
Screen 18: Added ISDN message types to data capture.
Screen 20: Added restart system to save/restore action.
Screen 22: Added connect action counters.
Screen 23: Added new screen for connect action configuration. Added ability to route incoming calls to connect action.

Version 1.31 highlights: Screen 6: Added Z to allow match for no inbound called number.

Version 1.30 highlights: Screen 2: Added new selection: Send D-channel status to T1 ISDN.
Screen 4: Added new selections: Receive loss and reference tone. This coincides with a change to 938 card firmware that inserts a –6dB loss in the audio level sent to analog ports required by V.90 (56k) analog  modems.
Screen 7: Changed access digits to be flexible instead of hard coded to 8 and 9.

Version 1.29 highlights: Screen 7: Allow only en-bloc dialing when switch emulation is T1 RBS network side.
Screen 9: Added redirect ACD overflow action.
Screen 18: Enhanced call detail records for analog ports.
Former screen 19: Split call generator into screen 21 and 22.
Screen 21: Added running – until no connect to call generator mode.
Screen 22: Extended call counters to 32 bits.

Version 1.28 highlights: Fixed DTMF digit transfer from analog ports. Fixed bearer information element when redirecting from RBS to ISDN.
Screen 4: Added signaling method to individual analog ports.
Screen 18: Added call detail records for analog ports.

Version 1.27 highlights: Increased minimum time between analog port calls.

Version 1.26 highlights: Increased analog port on-hook debounce to 200ms.
Screen 21: Added call routing to analog port call generator.

# The System 930 Help Menu

## Software Version History (continued)

Version 1.25 highlights: Added support for 932 processor card revision F. This card contains a battery powered clock and selectable A-law/mu-law audio monitoring and recorder/announcer. Software is backwards compatible with 932 processor card revision C.
Screen 2: Added ability to change ISDN channel service on the fly. Fixed ISDN channel disabled to place channel out of service upon layer 2 startup.
Screen 9: Changed least busy ACD hunt method to clockwise circular.
Screen 17: Added selectable exclusive / preferred channel ID.
Screen 18: Added current year, month, and time zone.

Version 1.24 highlights: Fixed intermittent response to ISDN messages. Fixed system reset due to unacknowledged service messages. Fixed ACD queuing problem due to version 1.17 changes. Improved call generator burst mode.
Screen 4: Added configurable alerting time. Allow analog extensions to begin with 7.
Screen 7: Changed explicit channel access digit from 7 to *.
Screen 18: Added text to show ISDN transfer capability after bearer capability information elements. Added text to show ISDN channel number after channel ID information elements.

Version 1.23 highlights: Screen 11: Improved audio monitor.

Version 1.22 highlights: Fixed multirate to connect channels when bearer capability information element length is 2.
Screen 3: Allow call generator to overlay caller number.
Screen 10: Improved redirect by copying display, transit network selection, low layer compatibility, high layer compatibility, and user-user ISDN information elements from incoming to outgoing call.
Screen 11: Improved fixed channel or port on audio monitor.
Screen 12: Added configurable password reminder.
Screen 17: Added configurable multirate slot assignment.
Screen 18: Add milliseconds to ISDN data capture timestamp. Show call state name in RBS data capture.
Screen 21: Allow sequential DTMF numbers in the call generator connect action.
Screen 22: Save call generator historical data during power loss.

Version 1.20 highlights: Improved analog disconnect synchronization with 938 card.

Version 1.19 highlights: Screen 2: Fixed RBS exclusive channel operation and added it to T1 ISDN.

Version 1.18 highlights: Fixed T1 RBS loop start signaling. Fixed user side 5ESS custom to accept unknown type of number. Added sending complete information element to Euro ISDN setup messages during en-bloc dialing. Fixed numerous problems in redirect.
Screen 2: Added selection to send T1 ISDN service messages upon establishment of layer two.
Screen 6: Added selection to route incoming calls to voice message play continuously.
Screen 7: Added selection for whether analog ports use en-bloc or overlap dialing.
Screen 12: Added selection for automatic startup of ISDN layer two. Added selection for ISDN channel ID format. This allows the system to work with products that accept number format only.
Screen 18: Decode IA5 characters such as called number instead of showing them in hex on data capture screen. Fixed display of single byte information elements such as sending complete.
Screen 22: Added incoming message count to call counter screen.

Version 1.17 highlights: Changed redirect to echo incoming bearer capability information element rather than use screen 17 settings.
Screen 17: Added setup bearer rate for testing multirate calls. Accidentally changed channel ID format in ISDN proceeding messages to send slot map format. Added selection to use last 3 digits of called number for testing cause codes.

Version 1.15 highlights: Screen 17: Added selection do not send channel ID. Fixed network side Euro ISDN to accept messages without channel ID. Added selection do not send ISDN proceeding message and do not send ISDN alerting message to test ISDN quick connect.

# The System 930 Help Menu

## Software Version History (continued)

Version 1.12 highlights: Combined T1 ISDN and T1 RBS into a single product.

Version 1.10 highlights: First release of Euro ISDN. Updated tone ROM.

## Abbreviations and Terminology

ACD: Automatic Call Distribution. Routes incoming calls to analog ports as required. The system provides 32 ACD groups, one for each analog port.

Bearer Channel: Contains digital information for delivery to the end user.

Bonding: Pre-ISDN feature that combines multiple calls to increase data transfer rate. Receiver must adjust for multipath delays. Also see multirate.

CAS: Channel Associated Signaling. See E1 CAS.

CPE: Customer Premise Equipment. Equipment connected to network.

Call by call: Calls are routed by their called number, not the channel they come in on.

DCN: Digital Channel Number.

DNIS: Dialed Number Inbound Service. Inbound calls are routed according to the called number.

DTMF: Dual Tone Multiple Frequency. Tones used for dialing numbers. Also known as touch tones.

Data Channel: Contains signaling information.

E1: Trunk operating at 2.048 MBPS. E1 contains 30 bearer channels, one data channel, and one framing channel.

E1 CAS: E1 Channel Associated Signaling. The data channel contains a set of signaling bits associated with specific bearer channels. DNIS is accomplishing using in-band MF (multi frequency) tones. E1 CAS is not supported by this system.

E1 ISDN: E1 Integrated Services Digital Network. The data channel contains ISDN signaling.

Euro ISDN: European ISDN defined by European Telecommunications Standards Institute (ETSI). Also known as NET5.2 and V5.2. Besides allowing 30 bearer channels, there are some subtle differences between Euro ISDN and its North American counterpart. Euro ISDN does not require the user to send a channel ID information element, giving network side full control of channel selection and eliminating glare. Channels are always enabled. Overlap dialing is allowed in the user to network direction, eliminating outbound number configuration on the user side. Provides a sending complete information element that indicates the called number is complete or there is no called number. Does not allow NFAS (non-facility associated signaling) and hence eliminates the need for backup D-channel signaling. Euro ISDN sends calling name using the Display IE whereas North American NI-2 did not support calling name and NI-3 uses the Facility IE.

En-bloc: The called number is sent all at once as opposed to overlap dialing which sends the digits one at a time. Dial tone is supplied locally.

Glare: User and network sides simultaneously seize the same channel, creating a conflict.

Layer 2: Provides error-free communication between the network and user. Also known as the data link layer. Layer 2 down indicates that communication has not be established.

Multirate: ISDN feature that uses multiple channels during a single call to increase data transfer rate. This system supports multirate calls through the redirect facility. Also see bonding.

NFAS: Non-facility associated signaling. ISDN feature that allows one D-channel to provide signaling for multiple DS1s.

# The System 930 Help Menu

## Abbreviations and Terminology (continued)

Overlap: The called number is sent one digit at a time as opposed to en-bloc dialing which sends the digits all at once. Dial tone is supplied by the near end.

PRI: Primary Rate Interface. ISDN over T1 or E1.

Pulse Dialing: Dialing accomplished by breaking of DC current, or the analog or digital equivalent. Pulse dialing is not supported by this system.

QSIG: Switch emulation for linking PBXs on a private network. Similar to Euro ISDN.

Remote Alarm: Alarm bit sent by E1 carrier to indicate loss of frame synchronization.

RBS: Robbed Bit Signaling. See T1 RBS.

Switch Hook Flash: A method for holding and transferring calls from one analog port to another. Activated by depressing the receiver hook for one second. This product supports this feature.

T1: Trunk operating at 1.544 MBPS. Contains 24 channels.

T1 ISDN: T1 Integrated Services Digital Network. T1 trunk containing 23 bearer channels and one ISDN signaling channel.

T1 RBS: T1 Robbed Bit Signaling. T1 trunk containing 24 bearer channels and no data channels. Signaling is accomplished by stealing one bit from each bearer channel.

Unframed Ones: E1 carrier containing all ones, including the framing channel.

## Standards

The signaling standards used by this system are: Layer-1: ITU-T G.703, G.704, G.706. Euro ISDN (Net5): ETS 300 102-1, ETS 300 102-2, ETS 300 104, ETS 300 125, and ETS 300 172. QSIG: ETS 300 001, ETS 300 170, ETS 300 172, and ETS 300 239.

VT-100 Display Standards: The VT-100 display codes used by this system are ⌃[[2J for clear screen, ⌃[[0m for normal video, ⌃[[7m for reverse video, and ⌃[[row;columnf for row and column screen position. ⌃[ represents ASCII ESC.

VT-100 Keyboard Standards: The VT-100 keyboard codes used by this system are ⌃[OP for F1, ⌃[OQ for F2, ⌃[OR for F3, ⌃[OS for F4, ⌃[[A for up, ⌃[[B for down, ⌃[[C for right, and ⌃[[D for left. ⌃[ represents ASCII ESC.

## Calling Name

There are two methods for sending calling name: Display IE (information element) and Facility IE.

In North America, Display IE is sent in codeset 6 (network specific) because it is a proprietary method. This works for names originating from the network or user side. In Europe, ETSI recommends sending Display IE in codeset 0 (normal). The Display IE is sent from the network to user side only. In either case, calling name is sent in setup messages. Coding of the display IE is very simple. Here is an example:

Coding of Display IE for Calling Name "ABC":
0x28 Display IE
0x03 IE Length
0x41 Display Information: A
0x42 Display Information: B
0x43 Display Information: C

Use of the Facility IE follows the Telcordia GR-1367-CORE recommendation. This service is part of the 1996 NI-3 feature offering and is available on National and 5ESS Custom PRIs. Calling Name consists of three separate features: Calling Name Delivery, Privacy of Calling Name, and Electronic Directory Service.

# The System 930 Help Menu

## Calling Name (continued)

Calling Name Delivery provides name information to a subscribed terminating CPE. Name characters are obtained from a name database based on the calling party number. Privacy of Calling Name allows an originating CPE to signal on a per-call basis whether the calling name should be displayed. Electronic Directory Service allows an originating CPE to send original calling name to intrabusiness group calls.

The System 930 supports the first of these features: Calling Name Delivery. This feature is implemented using the ROSE (Remote Operation Service Element) invoke service component of the facility IE.

Calling Name Delivery is a two-step process. The first step depends on whether the calling number is available and whether the privacy indicator is turned on or off. If the calling number is missing or the privacy indicator is turned on, a facility IE is sent in the setup message indicating that the name is not available or is private. If the calling number is present and the privacy indicator is turned off, a facility IE is sent in the setup message indicating information following. This gives the central office time to look up the calling name. The central office then sends a facility message containing the facility IE with the calling name.

Coding of the facility IE is very complex. It uses ASN.1 (Abstract Syntax Notation One), which is a database language defined in ITU-T X.209. Here are four examples:

Coding of Facility IE for Name Not Available:
0x1c Facility IE
0x0e IE Length
0x9f Service Discriminator: Network Extension
0x8b Component Type: Interpretation
0x01 Component Length
0x00 Discard Unrecognized Invoke Components
0xa1 Component Type: Invoke
0x08 Component Length
0x02 Invoke ID Tag: Universal Integer
0x01 Invoke ID Length
0x00 Invoke ID Value
0x02 Operation Tag: Universal Integer
0x01 Operation Length
0x00 Operation Value: Calling Name
0x84 Argument Tag: Context-Specific NameNotAvailable
0x00 Argument Length

Coding of Facility IE for Name Presentation Restricted:
0x1c Facility IE
0x0e IE Length
0x9f Service Discriminator: Network Extension
0x8b Component Type: Interpretation
0x01 Component Length
0x00 Discard Unrecognized Invoke Components
0xa1 Component Type: Invoke
0x08 Component Length
0x02 Invoke ID Tag: Universal Integer
0x01 Invoke ID Length
0x00 Invoke ID Value
0x02 Operation Tag: Universal Integer
0x01 Operation Length
0x00 Operation Value: Calling Name
0x87 Argument Tag: Context-Specific NamePresentationRestrictedNull
0x00 Argument Length

# The System 930 Help Menu

## Calling Name (continued)

Coding of Facility IE for Information Following:
0x1c Facility IE
0x15 IE Length
0x9f Service Discriminator: Network Extension
0x8b Component Type: Interpretation
0x01 Component Length
0x00 Discard Unrecognized Invoke Components
0xa1 Component Type: Invoke
0x0f Component Length
0x02 Invoke ID Tag: Universal Integer
0x01 Invoke ID Length
0x00 Invoke ID Value
0x06 Operation Tag: Universal Object ID
0x07 Operation Length
0x2a Operation Value: informationFollowing 42 (Note 1)
0x86 informationFollowing 840
0x48
0xce informationFollowing 10005
0x15
0x00 informationFollowing 0
0x04 informationFollowing 4
0x0a Argument Tag: Universal Enumerated
0x01 Argument Length
0x00 Argument Value: includesNameInformation

Note 1: The object ID for informationFollowing is 1.2.840.10005.0.4
The first two digits are encoded as (40 * 1) + 2 = 42.

Coding of Facility IE for Calling Name "ABC":
0x1c Facility IE
0x11 IE Length
0x9f Service Discriminator: Network Extension
0x8b Component Type: Interpretation
0x01 Component Length
0x00 Discard Unrecognized Invoke Components
0xa1 Component Type: Invoke
0x0b Component Length
0x02 Invoke ID Tag: Universal Integer
0x01 Invoke ID Length
0x01 Invoke ID Value (must be different from other Invoke IDs)
0x02 Operation Tag: Universal Integer
0x01 Operation Length
0x00 Operation Value: Calling Name
0x80 Argument Tag: Context-Specific NamePresentationAllowedSimple
0x03 Argument Length (1 to 50 characters)
0x41 Argument: A
0x42 Argument: B
0x43 Argument: C

# The System 930 Main Menu

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Main 1

                            MAIN MENU

          1. DIGITAL INTERFACE CONFIGURATION
          2. RESERVED FOR FUTURE USE
          3. NUMBERING PLAN CONFIGURATION
          4. ANALOG PORT CONFIGURATION
          5. RECORDER/ANNOUNCER
          6. INBOUND MATCH CONFIGURATION
          7. ANALOG PORT DIALING CONFIGURATION
          8. ANALOG PORT OUTBOUND CALL CONFIGURATION
          9. ACD CONFIGURATION
         10. REDIRECT CONFIGURATION
         11. AUDIO MONITOR CONFIGURATION
         12. SECURITY CONFIGURATION
         13. DIGITAL INTERFACE CALL STATUS
         14. TRANSMISSION STATUS


          Enter Selection:

      Enter number or press Up/Down Arrow then <ENTER>
             Press "x" exit, <F1> help, <F4> next
```

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Main 2

                            MAIN MENU

         15. DATA MONITOR
         16. TONE CONNECT TEST FUNCTIONS
         17. DIGITAL INTERFACE TEST FUNCTIONS
         18. DATA CAPTURE
         19. QUICK SYSTEM STATUS
         20. SAVE/RESTORE SYSTEM CONFIGURATION
         21. CALL GENERATOR CONFIGURATION
         22. CALL COUNTERS
         23. CONNECT ACTION CONFIGURATION
         24. TIME & DATE CONFIGURATION
         25. 939 ANALOG CARD CONFIGURATION




          Enter Selection:

      Enter number or press Up/Down Arrow then <ENTER>
             Press "x" exit, <F1> help, <F3> previous
```

# Digital Interface Configuration—Master

This screen configures the methods used for sending information across both digital inter-faces. Press <ENTER> then Y to update both interfaces. Use detailed screens to configure individual interfaces.

```
Gordon Kapes, Inc.       System 930 Telephony Simulator      Screen 1-1

                  DIGITAL INTERFACE CONFIGURATION - MASTER

  Interface 1 Status:  SYNCHRONIZED
  Interface 2 Status:  SYNCHRONIZED

  Framing:             CRC4*                    ALL DETAILED SCREENS MATCH
  Line Coding:         HDB3 (ZERO SUPPRESSION)* ALL DETAILED SCREENS MATCH
  Line Build Out:      -14dB @ 120 OHMS*        ALL DETAILED SCREENS MATCH
  Sync Source:         INTERNAL*
  Switch Emulation:    EURO ISDN*               ALL DETAILED SCREENS MATCH
  Location:            MIXED*                   ALL DETAILED SCREENS MATCH
  Channel Search:      MIXED                    ALL DETAILED SCREENS MATCH
  Interface Enabled:   YES*                     ALL DETAILED SCREENS MATCH




  * Indicates factory default.



                  Press Space Bar or Backspace then <ENTER>
             Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Digital Interface Configuration—Master

Interface Status: Shows CARD NOT PRESENT, DISABLED, RECEIVING UNFRAMED ONES, RECEIVING REMOTE ALARM, SYNCHRONIZED, NOT SYNCHRONIZED, or LAYER 2 DOWN. Indicates framing status of digital interface.

Framing: Select CRC4* (default) or NO-CRC4. CRC4 is the preferred method.

Line Coding: Select HDB3* (zero suppression) (default) or AMI (no zero suppression). HDB3 stands for high density bipolar of order 3. HDB3 is the preferred method as it transparently maintains the one's density necessary for accurate clock recovery. AMI stands for alternate mark inversion with no zero suppression performed.

Line Build Out: Select −14dB @ 120 OHMS* (default), −27dB @ 120 OHMS, −0.9dB @ 120 OHMS, or −3.8dB @ 120 OHMS. Indicates strength of transmit signal. −0.9dB provides the strongest signal and −27dB provides the weakest.

Sync Source: Select INTERNAL* (default), DIGITAL INTERFACE 1, or DIGITAL INTERFACE 2. Indicates whether system timing synchronizes to the internal timing source or to the incoming frame. Sync source is common to both digital interfaces. Affects the outgoing frame only. The incoming frame is always self-synchronizing. This feature is not selectable from detailed screens.

Switch Emulation: Select EURO ISDN* (default), QSIG MASTER, QSIG SLAVE, or QSIG MIXED. Euro ISDN, also known as NET5, is used on the public network. QSIG is used for linking PBXs on private networks. QSIG MIXED indicates interface 1 emulates master and interface 2 emulates slave. Some selections may not be available depending on how the system is licensed. <ENTER> must be pressed to change this feature. Changing this field causes all calls in progress to be disconnected, system reboot and the screen to be cleared.

# Digital Interface Configuration—Master

## Help for Digital Interface Configuration—Master (continued)

Location: Select MIXED* (default), NETWORK SIDE, PRIVATE NETWORK SIDE (ISDN only), or USER SIDE. Mixed indicates interface 1 emulates a central office and interface 2 emulates CPE. Network side indicates both interfaces emulate a central office. Private network side indicates both interfaces emulate the network side of a private system. User side indicates both interfaces emulate CPE. QSIG presets this field to USER SIDE on the detailed configuration screens and cannot be changed. ISDN sends this information in the progress indicator information element and cause information elements of ISDN messages. Changing this field causes all calls in progress to be disconnected. When changed to user side, outbound channel search is set to descending sequential and synchronization source is set to digital interface 1. When changed to network side, outbound channel search is set to ascending sequential and synchronization source is set to internal. Some selections may not be available depending on how the system is licensed.

Channel Search: Select MIXED* (default), ASCENDING SEQUENTIAL, DESCENDING SEQUENTIAL, CLOCK-WISE CIRCULAR, or COUNTER CLOCKWISE CIRCULAR. Used for finding the next outbound idle bearer channel. Mixed sets digital interface 1 to ascending sequential and digital interface 2 to descending sequential. Ascending sequential starts searching from channel one. Descending sequential starts searching from the highest channel. Clockwise circular starts one channel higher than the previously utilized channel, wrapping around from the highest channel to channel one. Counter clockwise circular starts one channel lower than the previously utilized channel, wrapping around from channel one to the highest channel. To reduce glare, ascending sequential is appropriate for the network side, while descending sequential is appropriate for the user side.

Interface Enabled: Select YES* (default) or NO. Yes enables the digital interface. No disables the interface by forcing it to send unframed ones, sending a carrier but no line synchronization. If yes is selected and the interface is not synchronized, the associated front panel lamp blinks. If yes is selected and the interface is synchronized, the lamp lights steadily. If no is selected, the lamp is extinguished.

After most selections the screen displays ALL DETAILED SCREENS MATCH, SOME DETAILED SCREENS MATCH, or NO DETAILED SCREENS MATCH. This indicates whether the selection matches the same field on the detailed screens.

# Digital Interface Configuration—Detailed

This screen configures the methods used for sending information across the digital interface. There are two configuration screens, one for each digital interface. Use the master screen to simultaneously configure both interfaces.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 1-2

              DIGITAL INTERFACE 1 CONFIGURATION - DETAILED

 Interface Status:  SYNCHRONIZED

 Framing:           CRC4*
 Line Coding:       HDB3 (ZERO SUPPRESSION)*
 Line Build Out:    -14dB @ 120 OHMS*
 Switch Emulation:  EURO ISDN*
 Location:          NETWORK SIDE*
 Channel Search:    ASCENDING SEQUENTIAL
 Interface Enabled: YES*




 * Indicates factory default.


                  Press Space Bar or Backspace to select
      Press Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for Digital Interface Configuration—Detailed

Interface Status: Shows CARD NOT PRESENT, DISABLED, RECEIVING UNFRAMED ONES, RECEIVING REMOTE ALARM, SYNCHRONIZED, NOT SYNCHRONIZED, or LAYER 2 DOWN. Indicates framing status of digital interface.

Framing: Select CRC4* (default) or NO-CRC4. CRC4 is the preferred method.

Line Coding: Select HDB3* (zero suppression) (default) or AMI (no zero suppression). HDB3 stands for high density bipolar of order 3. HDB3 is the preferred method as it transparently maintains the one's density necessary for accurate clock recovery. AMI stands for alternate mark inversion with no zero suppression performed.

Line Build Out: Select –14dB @ 120 OHMS* (default), –27dB @ 120 OHMS, –0.9dB @ 120 OHMS, or –3.8dB @ 120 OHMS. Indicates strength of transmit signal. –0.9dB provides the strongest signal and –27dB provides the weakest.

Switch Emulation: Select EURO ISDN* (default), QSIG MASTER, or QSIG SLAVE. Euro ISDN, also known as NET5, is used on the public network. QSIG is used for linking PBXs on private networks. Some selections may not be available depending on how the system is licensed. <ENTER> must be pressed to change this feature. Changing this field causes all calls in progress to be disconnected, system reboot and the screen to be cleared.

# Digital Interface Configuration—Detailed

## Help for Digital Interface Configuration—Detailed (continued)

Location: Select NETWORK SIDE*, PRIVATE NETWORK SIDE (ISDN only), or USER SIDE. Indicates whether the interface emulates a central office (network side), a private network (private network side), or CPE (user side). <ENTER> must be pressed to change this feature. Changing this field causes all calls in progress to be disconnected. ISDN sends this information in the progress indicator information element and cause information elements of ISDN messages. Some selections may not be available depending on how the system is licensed. NFAS signaling on digital interface 2 does not used this field. QSIG presets this field to USER SIDE and cannot be changed.

Channel Search: Select ASCENDING SEQUENTIAL, DESCENDING SEQUENTIAL, CLOCKWISE CIRCULAR, or COUNTER CLOCKWISE CIRCULAR. Used for finding the next outbound idle bearer channel. Ascending sequential starts searching from channel one. Descending sequential starts searching from the highest bearer channel. Clockwise circular starts one channel higher than the previously utilized channel, wrapping around from the highest channel to channel one. Counter clockwise circular starts one channel lower than the previously utilized channel, wrapping around from channel one to the highest channel. To reduce glare, ascending sequential is appropriate for the network side, while descending sequential is appropriate for the user side. Factory default varies, depending on how location is set.

Interface Enabled: Select YES* (default) or NO. Yes enables the digital interface. No disables the interface by forcing it to send unframed ones, sending a carrier but no line synchronization. If yes is selected and the interface is not synchronized, the associated front panel lamp blinks. If yes is selected and the interface is synchronized, the lamp lights steadily. If no is selected, the lamp is extinguished.

# Numbering Plan Configuration

This screen configures calling party number related parameters. It also configures the called number plan. There are two screens, one for each digital interface.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 3-1

            NUMBERING PLAN CONFIGURATION - DIGITAL INTERFACE 1

Calling Number:            --
Calling Number Mode:       NOT SENT*
Calling Presentation:      ALLOWED*
Caller Type of Number:     NATIONAL NUMBER*
Calling Number Plan:       ISDN NUMBERING PLAN*
Called Number Plan:        ISDN NUMBERING PLAN*
Calling Name Method:       DISPLAY IE*
Calling Name Mode:         NOT SENT*
Calling Name:              --
Setup Progress Indicator:  SEND WHEN CALLING NUMBER IS NOT SENT*




* Indicates factory default.


   Enter fixed, sequential, or random number (0-35 digits). Backspace to edit.
           Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Numbering Plan Configuration

Calling Number: Enter up to 35 digits, including special characters. Digits 0123456789 are allowed. This is the calling party number to be sent when making an outbound call by way of a digital interface. Hyphens (--) indicate no number entered. The factory default is no number entered. The system can send and receive up to 31 digits without problems.

Digits [+-] are special characters. Sequential numbers may be created using [min+max]. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. A left bracket, a hyphen (-) or a plus (+), and a right bracket are required. For example: 55512[00-99] indicates to send a random number between 5551200 and 5551299. The minimum and maximum values may range from 0 through 9999 and do not require the same number of digits. Brackets may be repeated, but may not be nested.

Calling Number Mode: Select NOT SENT* (default), SEND CALLING NUMBER, SEND CALLING NUMBER WITH EXT NUMBER OVERLAY, or SEND CALLING NUMBER WITH TWO DIGIT OVERLAY. This selection indicates how the system will send the calling party number when calls are originated from the system. NOT SENT indicates the system does not send the calling party number. On ISDN digital interfaces the ISDN setup message may send a progress indicator information element indicating that the origination address is non-ISDN. SEND CALLING NUMBER indicates the system sends the calling party number. On ISDN digital interfaces the calling party number is sent in the calling party number information element of the ISDN setup message. SEND CALLING NUMBER WITH EXT NUMBER OVERLAY indicates the system sends the calling party number, replacing the last 3 to 5 digits with the extension number of the analog port that generated the call. If the call is generated by the call generator, the last two digits are replaced by the active call number starting from call 01 through the number of active calls on the Call Generator Configuration screen. Initially active call numbers are assigned in ascending sequential order, but in rolling mode may become randomized as calls disconnect and then become active again. SEND CALLING NUMBER

# Numbering Plan Configuration

## Help for Numbering Plan Configuration (continued)

WITH TWO DIGIT OVERLAY indicates the system sends the calling party number, replacing the last two digits with the last two digits of the extension number of the analog port that generated the call. If the call is generated by the call generator, the last two digits are replaced by the active call number starting from call 01 through the number of active calls on the Call Generator Configuration screen. Initially active call numbers are assigned in ascending sequential order, but in rolling mode may become randomized as calls disconnect and then become active again.

Calling Presentation: Select ALLOWED* (default) or RESTRICTED. Calling presentation is sent in the calling party number information element of the ISDN setup message. ALLOWED indicates that the called party is allowed to retrieve the calling party number. RESTRICTED indicates that the calling party number is sent, but that only law enforcement may retrieve it.

Calling Type of Number: Select NATIONAL NUMBER* (default), INTERNATIONAL NUMBER, SUBSCRIBER NUMBER, ABBREVIATED NUMBER, or UNKNOWN NUMBER. Calling type of number is sent in the calling party number information element of the ISDN setup message.
NATIONAL NUMBER includes a national area code. Example: 3125551212.
INTERNATIONAL NUMBER includes a country code. Example: 443125551212.
SUBSCRIBER NUMBER includes a local exchange number. Example: 5551212.
ABBREVIATED NUMBER is 3 to 5 digits long. Example: 1212 or 51212.
UNKNOWN NUMBER is either not identified or contains prefix digits that are not part of the calling party number. Example: *70 to disable call waiting.

Calling Number Plan: Select ISDN NUMBERING PLAN* (default), TELEPHONY NUMBERING PLAN, PRIVATE NUMBERING PLAN, or UNKNOWN NUMBERING PLAN. Calling number plan is sent in the calling party number information element of the ISDN setup message. Select ISDN NUMBERING PLAN if the system is emulating a public network.

Called Number Plan: Select ISDN NUMBERING PLAN* (default), TELEPHONY NUMBERING PLAN, PRIVATE NUMBERING PLAN, or UNKNOWN NUMBERING PLAN. Called number plan is sent in the called party number information element of the ISDN setup message. Select ISDN NUMBERING PLAN if the system is emulating a public network.

Calling Name Method: DISPLAY IE* (default), or FACILITY IE. This selection indicates how the system will send the calling party name. DISPLAY IE indicates Display IE (information element) is used to send the calling party name. In North America, Display IE is sent in codeset 6 (network specific) because it is a proprietary method. This works for names originating from the network or user side. In Europe, ETSI recommends sending Display IE in codeset 0 (normal). The Display IE is sent from the network to user side only. In either case, calling name is sent in the setup message whether or not the calling number is present or the calling number presentation is restricted. FACILITY IE indicates that Facility IE is used to send the calling party name. This follows the Telcordia GR-1367-CORE recommendation and is available on National and 5ESS Custom PRIs. This is a two-step process. The first step is to send a setup message with a facility IE indicating information following. A facility message with a facility IE containing the calling name is sent at a later time so as not to delay call setup. However, if the calling number is not present a facility IE is sent in the setup message indicating that the name is not available. If the calling number presentation is restricted a facility IE is sent in the setup message indicating that the calling number is restricted. See the calling name tutorial on the main help screen for more details.

Calling Name Mode: Select NAME* (default), or NAME WITH NUMBER OVERLAY. NOT SENT indicates that the calling party name is not sent. SEND NAME sends the calling name only if the calling number is present and calling number presentation is allowed. SEND NAME WITH CALLING NUMBER APPENDED is similar to SEND NAME except the calling number is appended to the end of the calling name. See the calling name tutorial on the main help screen for more details.

Calling Name: Enter up to 17 digits. All characters are allowed. This is the calling party name to be sent by way of an ISDN digital interface.

# Numbering Plan Configuration

## Help for Numbering Plan Configuration (continued)

Setup Progress Indicator: Select SEND WHEN CALLING NUMBER IS NOT SENT* (default) or DO NOT SEND. This selection indicates when the system will send a progress indicator information element in the ISDN setup message indicating that the origination address is non-ISDN. SEND WHEN CALLING NUMBER IS NOT SENT sends the progress indicator when the calling number is not sent. DO NOT SEND indicates the progress indicator is not sent. This selection does not apply to redirected calls which always pass the progress indicator information element from the incoming to the outgoing setup message.

Sidenote: When the digital interface is configured for ISDN and the call is redirected by the system's redirect feature, the original calling party number is sent using the calling party number information element. The system calling party number is sent using the redirecting number information element. This is to assist law enforcement in identifying calls that are redirected through a third party.

# Analog Port Configuration—Master

This screen allows configuration of all analog ports. Press <ENTER> then Y to update all analog ports. Use detailed screens to configure individual ports. This screen also sets the audio coding and signaling method used by all analog ports.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 4-1

                      ANALOG PORT CONFIGURATION - MASTER

  Extension Digit Length: 4*                      ALL DETAILED SCREENS MATCH
  Base Extension Number:  1001                    ALL DETAILED SCREENS MATCH
  ACD Assignment:         ACD 1*                  ALL DETAILED SCREENS MATCH
  Outbound Access:        ENABLED*                ALL DETAILED SCREENS MATCH
  Signaling Method:       LOOP START*             ALL DETAILED SCREENS MATCH
  Flashhook:              DISABLED*
  Audio Compression:      G.711 A-LAW*
  Ring Fault Action:      CONTINUE RINGING*
  Maximum Alert Time:     NONE*
  Receive Loss:           -6 dB*
  Reference Tone:         OFF*




  * Indicates factory default.

                  Press Space Bar or Backspace then <ENTER>
              Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Analog Port Configuration—Master

Extension Digit Length: Select 3, 4* (default), or 5. Number of digits assigned to an analog port extension number. Press <ENTER> after selecting the number. Changing the number of digits causes all analog extensions to be renumbered sequentially starting from the base extension number.

Base Extension Number: Enter a 3, 4, or 5-digit number. Digits 0123456789 are allowed. Starting number used to sequentially number all analog extensions. The number of digits must agree with the analog extension digit length. Press <ENTER> after entering the number. The system renumbers all analog extensions after <ENTER> is pressed. The base extension number is automatically adjusted so as to not conflict with outbound access digits.

If the caller number mode in the Numbering Plan Configuration screen is set for send caller number with analog extension overlay, it is recommended that the base extension number be set to match the last few digits of the caller number. If, for example, the assigned caller number in the Numbering Plan Configuration screen is 3125556600, and the extension digit length is 4, set the base analog extension number to 6600.

ACD Assignment: Select ACD 1* (default) through ACD 4, CONSECUTIVE ACD, or NONE. Assigns analog ports to an ACD group. The system supports more than four ACD groups, but for ease of use only the first four are assignable from this screen. Consecutive ACD means that analog port 1 is assigned to ACD 1, analog port 2 is assigned to ACD 2, etc. Use it when one-to-one mapping between the analog ports and the ACD groups is desired. None restricts all analog ports from ACD assignment.

Outbound Access: Select ENABLED* (default) or DISABLED. Enables or disables analog port access to digital interface channels for making outbound calls.

# Analog Port Configuration—Master

## Help for Analog Port Configuration—Master (continued)

Signaling Method: Select LOOP START* (default) or GROUND START. Supported by 938 Analog Card only. The 914 OPS card and 939 Analog Card use loop start only. This assigns the signaling method used by the analog ports. Loop start is used by plain old telephones (POTS). Ground start is used by tie trunks.

Flashhook: Select DISABLED* (default) or ENABLED. When this feature is disabled, the time needed to detect the on-hook condition is shortened from 1.4 seconds to 0.4 seconds. When enabled, flashhook is activated by depressing the receiver hook for one second. Upon releasing the receiver hook, a stutter dial tone is sent, indicating the call is on hold and the system is ready to accept dialed digits of an analog extension number. The user dials the analog extension, hangs up, and the call is transferred to that analog extension. This feature is not selectable from detailed screens.

Audio Compression: Select G.711 A-LAW* (default) or G.711 MU-LAW. Supported by 938 Analog Card and 939 Analog Card only. The 914 OPS card uses mu-law compression only. A-law is normally used with E1. Mu-law is normally used with T1. This setting selects the audio compression used by the analog ports. ISDN sends a code representing this compression in the bearer capability information element. This selection has no effect on voice messages or the audio monitor which use A-law compression on E1 systems. This feature is not selectable from detailed screens.

Ring Fault Action: Select CONTINUE RINGING* (default), SEND REORDER, or REMOVE FROM ACD. Action to be taken when analog port fails to sense ring current during alerting. This condition occurs when no device is connected to the analog port. Supported by 938 Analog Card only. The 914 OPS card and 939 Analog Card do not sense ring current. Continue ringing indicates that an analog port should continue ringing when ring current is not detected. Send reorder indicates that the caller is sent reorder progress tone when ring current is not detected. Remove from ACD indicates that an analog port is temporarily removed from ACD selection when ring current is not detected. In addition, the caller is sent reorder progress tone. Once an analog port is removed from ACD selection it is automatically reinstated upon power up, reboot, or the analog port goes off-hook. This feature is not selectable from detailed screens.

Maximum Alert Time: Select NONE* (default), or 15 SECONDS through 120 SECONDS in 15 second increments. Amount of time analog port should be alerted before returning reorder progress tone. None means there is no maximum time. Applies to calls originated from an analog port as well as calls from a digital interface. If digital interface uses ISDN, returns disconnect message with cause code 19, user alerted no answer. This feature is not selectable from detailed screens.

Receive Loss: Select −6dB* (default) or 0dB. −6dB reduces the audio level sent to all analog ports and is required by V.90 (56k) analog modems. 0dB does not reduce the audio level. Supported by 938 Analog Card and 939 Analog Card only. This feature is preset to 0dB on 914 cards, older 938 card firmware (revision 1.02 and prior), and is not selectable from detailed screens.

Reference Tone: Select OFF* (default) or ON. On causes a 1 kHz 1 milliwatt (0dB) reference tone to be sent to all analog ports. Supported by 938 Analog Card and 939 Analog Card only. This feature is not available on 914 cards, older 938 card firmware (revision 1.02 and prior), and is not selectable from detailed screens.

After some selections the screen displays ALL DETAILED SCREENS MATCH, SOME DETAILED SCREENS MATCH, or NO DETAILED SCREENS MATCH. This indicates whether the selection matches the same field on the detailed screens.

# Analog Port Configuration—Detailed

This screen configures individual analog ports for extension number, ACD group assignment, and outbound access. It also displays the port's current state. There are four detailed screens, one for every eight analog ports.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 4-2

                   ANALOG PORT CONFIGURATION - DETAILED

 Card 1 Present:  YES - 938 CARD

 Port  Ext    ACD      Outbound  Sig   Connect   Hold   State
  1    1001   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  2    1002   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  3    1003   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  4    1004   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  5    1005   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  6    1006   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  7    1007   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK
  8    1008   ACD 1*   ENABLED*  LS*   --        --     01-ON HOOK




 * Indicates factory default.


       Enter extension (1000-9999) then <ENTER>. Backspace to edit.
  Press Tab, Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for Analog Port Configuration—Detailed

Card Present: Shows YES – 938 CARD, YES – 939 CARD, YES – 914 CARD, or NO. The 938 card contains eight analog loop start or ground start drivers. The 939 card contains eight analog loop start receivers. The 939 card emulates the FXS (subscriber) side of a loop start circuit. The 914 card contains eight analog loop start line drivers. It has been discontinued but is supported by this software.

Port: Shows 1 through 32. Identifies the internal hardware number of each analog port.

Ext: Shows the extension number associated with the analog port. If a different extension number is desired, enter it here and then press <ENTER>. Numbers that are not unique, or are outside the permissible range, are automatically disallowed. Outbound access digits and analog extensions must not conflict with each other.

ACD: Select ACD 1* (default) through ACD 32, or NONE. Assigns the analog port to an ACD group. NONE restricts the analog port from being part of an ACD group.

Outbound: Select ENABLED* (default) or DISABLED. Enables or disables analog port access to digital interface channels for making outbound calls.

Sig: Select LS* (default) or GS. This assigns the signaling method used by the analog port. Supported by 938 Analog Card only. The 914 OPS card uses loop start only. Loop start (LS) is used by plain old telephones (POTS). Ground start (GS) is used by tie trunks.

Connect: Shows ACT, DCN, GEN, MSG, or PORT. Shows resource connected to analog port. DCN stands for digital channel number. GEN stands for call generator. MSG stands for recorder/announcer message number. PORT stands for analog port number. Hyphens (--) indicate no connection.

# Analog Port Configuration—Detailed

## Help for Analog Port Configuration—Detailed (continued)

Hold: Shows DCN or PORT. Shows resource placed on hold by the analog port using flashhook. Hyphens (--) indicate no connection.

State: Shows analog port internal state number followed by description: ALERTING, AUDIBLE RING, BUSY TONE, CONNECT, DIAL TONE, DIALING, HOWLER TONE, MSG DIAL TONE, MSG DIALING, MSG PROGRAM, MSG PLAYBACK, MSG RECORD, RING FAULT, ON HOLD, ON HOOK, PROGRESS TONE, REORDER TONE, SILENCE, STUTTER TONE, VACANT TONE, or WAIT ACCESS (wait for access to a digital interface channel). Indicates active condition. Hyphens (--) indicate analog card is not present.

# Recorder/Announcer

This screen allows the recorded messages to be erased. It also shows the real-time status of the voice messages.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 5

                          RECORDER/ANNOUNCER

Erase voice messages:  NO*

Message 1 Status:  FF - IDLE
Message 2 Status:  FF - IDLE


Use any analog port to play or record voice messages.
Go off hook and DTMF dial *99.
Dial 1 to play message 1.
Dial 2 to play message 2.
Dial 3 to record message 1.
Dial 4 to record message 2.



* Indicates factory default.

                    Press Y or N then <ENTER>
                    Press <F1> help, <F2> exit
```

## Help for Recorder/Announcer

Erase voice messages: Select NO* (default) or YES. Select Y, then press <ENTER> to erase all voice messages.

Message Status: Shows hexadecimal representation of digitally encoded voice followed by the current state: PLAY, RECORD, PAUSE, or IDLE. Hexadecimal 7F or FF is the normal state when a voice signal is not present.

Use any analog port to play or record voice messages. Go off hook and DTMF dial *99. A periodic beep, once every second, indicates connection to the recorder/announcer. Four commands are available:
Dial 1 to play message 1.
Dial 2 to play message 2.
Dial 3 to record message 1.
Dial 4 to record message 2.
Hang up to stop recording.

Recorded messages can be as long as 20 seconds. Hang up to disconnect from the recorder/announcer. Messages cannot be recorded while the recorder/announcer is playing a message.

# Inbound Match Configuration

This screen configures inbound routing for calls received on both digital interfaces. If preset is set to shared by both interfaces, there are a total of four screens which are shared by both digital interfaces. If preset is set to separate for each interface, there are a total of eight screens, four for each digital interface. Each screen contains 12 match numbers.

```
Gordon Kapes, Inc.       System 930 Telephony Simulator       Screen 6-1

        INBOUND MATCH CONFIGURATION - SHARED BY BOTH INTERFACES

No.  Match Number                          Route if Match
 1.  --                                    ACD 1*
 2.  --                                    ACD 1*
 3.  --                                    ACD 1*
 4.  --                                    ACD 1*
 5.  --                                    ACD 1*
 6.  --                                    ACD 1*
 7.  --                                    ACD 1*
 8.  311                                   ACD 1*
 9.  411                                   ACD 1*
10.  911                                   ACD 1*
11.  [2-9]NNNNNN                           ACD 1*
12.  [0-1][2-9]NNNNNNNNN                   ACD 1*

Preset:  SHARED BY BOTH INTERFACES*

* Indicates factory default.

  Enter match number (0-31 digits) or match range. Backspace to edit.
        Press Tab, Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Inbound Match Configuration

When the digital interface is configured for ISDN, the system routes incoming ISDN calls by comparing the called number with the list of match numbers. The list is scanned starting from match number 1 until a successful match is found. If the system does not find a match, it connects the call to reorder tone for 30 seconds, followed by a forced disconnect.

Match Number: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. Indicates the called number to be matched. Digits NXZ[-] are special characters. Match ranges may be created using N and X. N matches any number from 0 through 9. Example: 9NN matches any number from 900 through 999. X matches any number from 0 through #. Example: *XX matches any 2 digits after *. Z creates a match for calls containing no called number. No called number is permitted by switch emulations such as Euro ISDN, DMS100, T1-RBS, and GR-303. Otherwise incoming calls containing no called number will be rejected. Match ranges are created using [min-max]. A left bracket, hyphen (-), and a right bracket are required. Example: [2-9]NN matches any number from 200 through 999. Minimum and maximum values may range from 0 through 9. Minimum and maximum values may not contain * or #. Brackets may be repeated, but not nested. Two hyphens (--) indicate that no match number is specified.

# Inbound Match Configuration

## Help for Inbound Match Configuration (continued)

Route if Match: Select ACD 1 through ACD 32, REDIRECT 1 through REDIRECT 4, PORT 1 through PORT 32, MESSAGE 1 PLAY TWICE, MESSAGE 2 PLAY TWICE, MESSAGE 1 PLAY CONTINUOUS, MESSAGE 2 PLAY CONTINUOUS, CONNECT ACTION 1 through CONNECT ACTION 3, BUSY, or REORDER. ACD routes the call to the specified ACD group. Redirect routes the call to the specified redirect group. PORT routes the call to the specified analog port. Message 1 play twice and message 2 play twice routes the call to the specified voice message, plays the message twice, and followed by a forced disconnect. Message 1 play continuous and message 2 play continuous routes the call to the specified voice message and plays it until the caller disconnects. Connect action routes the call to the connect action on the connect action screen. Busy routes the call to busy progress tone for 30 seconds, followed by a forced disconnect. Reorder routes the call to reorder (fast busy) tone for 30 seconds, followed by a forced disconnect.

Preset: Select SHARED BY BOTH INTERFACES* (default), SEPARATE FOR EACH INTERFACE, NORTH AMERICAN NUMBERING PLAN, PROGRESSIVE DIGITS, CONSECUTIVE EXTENSION ACD, CONSECUTIVE EXTENSION PORTS, CONSECUTIVE GR-303 USER TERMINAL PORTS, MATCH FOR NO NUMBER, ANY 1 DIGIT MATCH through ANY 31 DIGIT MATCH, ANY DIGIT MATCH, or COPY TO OTHER INTERFACE. Use preset to determine whether there is a common or separate inbound match configuration for each digital interface. It is also a means to quickly configure several useful inbound match configurations. Shared by both interfaces indicates that a single configuration is used by both digital interfaces. Separate for each interface indicates that there is a separate configuration for each digital interface. North American Numbering Plan routes 311, 411, 911, seven digit numbers starting with 2 through 9, and eleven digit numbers whose first digit is 0 or 1 and second digit is 2 through 9 to ACD 1. Progressive digits route numbers whose first digit indicates the number of digits to be dialed to ACD 1. Consecutive extension ACD route analog extension numbers to consecutive ACD groups. Consecutive GR-303 terminal ports route 0001 through 0032 to consecutive analog ports. It is useful for GR-303 user side. Match for no number routes a call lacking a called number to ACD 1. Any 1 digit match routes any single digit match to ACD 1. Any 2 digit match routes any two digit match to ACD 1, etc. Any digit match creates a list of matches to ACD 1. Copy to other interface copies all inbound match parameters from the current interface to the other interface.

# Analog Port Dialing Configuration

This screen configures analog port dialing features.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 7

                    ANALOG PORT DIALING CONFIGURATION

Dial # Mode:                          END OF NUMBER*
Outbound First Digit Timeout:         10* SECONDS
Outbound Interdigit Timeout:          10* SECONDS
Outbound Access Mode:                 ACCESS DIGIT REQUIRED*
Interface 1 Access Digit:             9*
Interface 2 Access Digit:             8*
Interface 1 Explicit Channel Access:  *1
Interface 2 Explicit Channel Access:  *2
Recorder/Announcer Access Digits:     *99
Interface 1 Dialing Method:           EN-BLOC*
Interface 2 Dialing Method:           OVERLAP*




* Indicates factory default.

               Press Space Bar or Backspace to select
               Press Arrow Keys, <F1> help, <F2> exit
```

## Help for Analog Port Dialing Configuration

Dial # Mode: Select END OF NUMBER* (default) or PASS THROUGH. Action taken when DTMF # has been dialed on an outbound call. End of number speeds up outbound call processing by immediately processing the dialed number. The # is stripped. The remaining digits are matched with the prefix number on the analog port outbound call configuration screen. Maximum length is ignored. Overlap dialing sends an information message with sending complete. Pass through enables # to be included in the dialed number but does not speed up outbound call processing.

Outbound First Digit Timeout: Select 1 through 10* (default). The maximum time in seconds that the system waits to detect the first digit in the outbound number, after the outbound access digit has been dialed. When this time expires, the caller is sent reorder progress tone.

Outbound Interdigit Timeout: Select 1 through 10* (default). The maximum time in seconds that the system waits to detect interdigit numbers in the outbound number. When this time expires, the system processes the number as dialed.

Outbound Access Mode: Select ACCESS DIGIT REQUIRED* (default), IMMEDIATE ACCESS TO INTERFACE 1, IMMEDIATE ACCESS TO INTERFACE 2, IMMEDIATE ACCESS ALTERNATE INTERFACES, or IMMEDIATE ACCESS TO BOTH INTERFACES. Access digit required indicates that an access digit must be dialed by a device connected to the analog port to access a digital interface. If an access digit is not dialed, only analog extension numbers and recorder/announcer can be dialed. Immediate access indicates that calls are sent to the selected digital interface without dialing an access digit. Analog extension numbers cannot be dialed, but calls can be routed to ACD groups from Analog Port Outbound Call Configuration screen or Inbound Call Configuration screen. Recorder/Announcer cannot be dialed, but calls can be routed to voice messages from Analog Port Outbound Call Configuration screen or Inbound Call Configuration screen. In all cases, calls sent to a digital interface are routed according to the Analog Port Outbound Call Configuration screen. Immediate access alternate interfaces indicates that the interface alternates between interface 1 and 2. Immediate access to both interfaces is shown when NFAS signaling is enabled.

# Analog Port Dialing Configuration

## Help for Analog Port Dialing Configuration (continued)

Interface 1 Access Digit: Select 0 through 9. Factory default is DTMF 9. Digit dialed on an analog port to access digital interface 1. Functional only when access digit is required. The system will match the remaining digits dialed with the Analog Port Outbound Call Configuration screen to determine when the dialed number is complete. Shows DISABLED BY IMMEDIATE ACCESS when outbound access mode is immediate access.

Interface 2 Access Digit: Select 0 through 9. Factory default is DTMF 8. Digit dialed on an analog port to access digital interface 2. Functional only when access digit is required. The system will match the remaining digits dialed with the Analog Port Outbound Call Configuration screen to determine when the dialed number is complete. Shows DISABLED BY IMMEDIATE ACCESS when outbound access mode is immediate access. Shows DISABLED BY NFAS SIGNALING when NFAS signaling is enabled.

Interface 1 Explicit Channel Access: Factory preset to DTMF *1. Digit dialed on an analog port to access a specific channel on digital interface 1. Functional only when access digit is required. Two digits must follow *1, representing the channel number. For example, dial *102 to access digital interface 1, channel 2. A leading 0 is required for channel numbers 1 through 9. The system will match the remaining digits dialed with the Analog Port Outbound Call Configuration screen to determine when the dialed number is complete. Shows DISABLED BY IMMEDIATE ACCESS when outbound access mode is immediate access. This feature does not work correctly with Euro ISDN user side because channel selection is done on the network side.

Interface 2 Explicit Channel Access: Factory preset to DTMF *2. Similar to interface 1 explicit channel access but for interface 2. For example, dial *203 to access digital interface 2, channel 3.

Recorder/Announcer Access Digits: Factory preset to *99. Digits dialed on an analog port to record or playback voice messages. Functional only when access digit is required. Shows DISABLED BY IMMEDIATE ACCESS when outbound access mode is immediate access.

Interface 1 Dialing Method: Select OVERLAP* (default) or EN-BLOC. Dialing method used by analog port on digital interface 1. Overlap sends the dialed digits one digit at time. Dial tone is supplied by near end. The called number is not processed by the Analog Port Outbound Call Configuration screen. Digits are sent using information messages. En-bloc sends the dialed digits all at once. Dial tone is supplied locally. The called number is processed by the Analog Port Outbound Call Configuration screen and sent when the called number is complete. The called number and sending complete information element are sent using the setup message. No called number is permitted. Preset to EN-BLOC* (default) when restricted by switch emulation.

Interface 2 Dialing Method: Select OVERLAP* (default) or EN-BLOC. Similar to interface 1 dialing method but for interface 2.

# Analog Port Outbound Call Configuration

This screen configures how the system will interpret outbound number dialing from the analog ports. There are four configuration screens, two for each digital interface. Each screen contains 12 match configurations.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 8-1

       ANALOG PORT OUTBOUND CALL CONFIGURATION - DIGITAL INTERFACE 1

No. Prefix                        Max   Strip  Type   Route if Match
 1. --                            --    --      -     --
 2. --                            --    --      -     --
 3. --                            --    --      -     --
 4. --                            --    --      -     --
 5. --                            --    --      -     --
 6. --                            --    --      -     --
 7. 311                            3     0      N     SEND OUT*
 8. 411                            3     0      N     SEND OUT*
 9. 611                            3     0      N     SEND OUT*
10. 911                            3     0      N     SEND OUT*
11. [2-9]NNNNNN                    7     0      S     SEND OUT*
12. 011                           17     3      I     SEND OUT*

Preset:  --

* Indicates factory default.

            Enter number (0-31 digits). Backspace to edit.
         Press Tab, Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Analog Port Outbound Call Configuration

This screen is used when the dialed number is sent en-bloc. This screen is not used when the interface uses overlap dialing. This screen is not used by the call generator. GR-303 network side sends the last four digits as the terminal ID using the ISDN CRV (call reference value). Terminal IDs may range from 1 to 2048. This screen is used to determine when the caller has finished dialing, after which the call is sent to the indicated route. After an outbound access digit has been dialed, the system collects the dialed digits until a combination that matches prefix, max length, and strip length is found. The list is scanned starting from line one until a successful match is found. If a match is not found, the call is not sent out and caller is sent vacant tone.

Prefix: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. These are the digits to be compared with the leading digits of the dialed number to determine a match. Digits NXZ[-] are special characters. Prefix ranges may be created using N and X. N matches any number from 0 through 9. Example: 9NN matches any number from 900 through 999. X matches any number from 0 through #. Example: *XX matches any 2 digits after *. Z creates a match for calls containing no called number. No called number is permitted by switch emulations such as Euro ISDN, DMS100, T1-RBS, and GR-303. Otherwise outbound calls containing no called number will be sent out but rejected on the inbound side. Prefix ranges are also be created using [min-max]. Min and max represent the minimum and maximum values of the prefix range. A left bracket, hyphen (-), and a right bracket are required. Example: [2-9]NN matches any number from 200 through 999. Minimum and maximum values may range from 0 through 9. Minimum and maximum values may not contain * or #. Brackets may be repeated, but not nested. Hyphens (--) indicate no entry has been made.

# Analog Port Outbound Call Configuration

## Help for Analog Port Outbound Call Configuration (continued)

Max: Select 1 through 31. The maximum number of digits (after the outbound access digit) that the caller must dial before a match is automatically sent to the indicated route. The system ignores this number when an interdigit timeout occurs or when the caller dials #, and # is configured as a immediate outdial on the Analog Port Dialing Configuration screen. Hyphens (--) indicate no prefix entry has been made.

Strip: Select 0 through 31. The number of digits that the system removes from the beginning of the dialed number, after the access digit, to isolate and send out the desired called number. Hyphens (--) indicate no strip entry has been made.

Type: Select N (default), I, S, A, or U. Shown for ISDN digital interfaces only. Indicates the called number type used to dial the called party. N indicates national: a number that includes a national area code. Example: 3125551212. I indicates international: a number that includes a country code. Example: 443125551212. S indicates subscriber: a number that includes a local exchange number. Example: 5551212. A indicates abbreviated: a number that is 3 to 5 digits long. Example: 1212 or 51212. U indicates unknown: a number that is either not identified or contains prefix digits that are not part of the called number. Example: *70 to disable call waiting. This information is sent in the called party number information element of the ISDN setup message.

Route if Match: Select SEND OUT* (default), REORDER, BUSY, MSG 1 PLAY CONTINUOUS, MSG 2 PLAY CONTINUOUS, CONNECT ACTION 1 through CONNECT ACTION 3, or ACD 1 through ACD 32. The action the system takes if a number match is made. Send out sends the dialed number as the called number to the digital interface. Reorder and busy are provided as a means of blocking specific called numbers. If a match is made, the caller is sent reorder or busy progress tone and the outbound call is not processed. Msg 1 play continuous and msg 2 play continuous routes the call to the specified voice message and plays it until the caller disconnects. Connect action 1 through connect action 3 routes the call to the specified connect action. ACD routes the call to the specified ACD group. Hyphens (--) indicate no prefix entry has been made.

Preset: Select NORTH AMERICAN NUMBERING PLAN* (default), PROGRESSIVE DIGITS, or COPY TO OTHER INTERFACE. Use preset to set up examples of outbound match configurations to filter outgoing digits. Hyphens (--) do nothing. North American Numbering Plan allow the following to be sent: 311, 411, 611, 911, seven digit numbers starting with 2 through 9, eleven digit numbers starting with 17 digit numbers starting with 011, and 31 digit numbers starting with 0 or *. Progressive digits allow numbers whose first digit indicates the number of digits to be sent. Copy to other interface copies all outbound match parameters from the current interface to the other interface.

# ACD Configuration—Master

This screen allows configuration of ACD parameters for all 32 ACD groups. Press <ENTER> then Y to update the ACD parameter for all ACD groups. Use detailed screens to configure individual ACD groups.

```
Gordon Kapes, Inc.       System 930 Telephony Simulator       Screen 9-1

                         ACD CONFIGURATION - MASTER

   Queue Depth:      0*                      ALL DETAILED SCREENS MATCH
   Queue Action:     AUDIBLE RING*           ALL DETAILED SCREENS MATCH
   Overflow Action:  BUSY TONE*              ALL DETAILED SCREENS MATCH
   Hunt Method:      ASCENDING SEQUENTIAL*









   * Indicates factory default.


           Press Space Bar or Backspace to select then <ENTER>
      Press Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for ACD Configuration—Master

Incoming calls are routed through ACD groups to analog ports. If an analog port is not available, the incoming call can be placed in queue. Queued calls are connected to the next available analog port assigned to the ACD group. While a call is in queue, queue action provides either audible ring, continuous message playback, or play message twice. If the queue becomes full, queue overflow action causes additional calls to hear busy progress tone, or connect to a voice message. If no analog ports are assigned to a specific ACD group, calls routed to that ACD group are connected to reorder progress tone.

Queue Depth: Select 0* (default) through 32. Indicates the maximum number of calls that can be queued. 0 indicates that no calls can be queued.

Queue Action: Select AUDIBLE RING* (default), MESSAGE 1 CONTINUOUS, MESSAGE 2 CONTINUOUS, MESSAGE 1 PLAY TWICE, or MESSAGE 2 PLAY TWICE. Message 1 continuous and message 2 continuous routes the call to the selected voice message until an analog port becomes available. Message 1 play twice and message 2 play twice routes the call to a hold progress tone after the voice message has played twice. The hold progress tone is a 440Hz tone sent for 100 ms once every five seconds, and indicates to the caller that a connection is still active.

Overflow Action: Select BUSY TONE* (default), MESSAGE 1 PLAY TWICE, or MESSAGE 2 PLAY TWICE, or REDIRECT 1-4. Message 1 play twice and message 2 play twice does a forced disconnect after the selected message has played twice. Redirect routes calls to the associated redirect group.

Hunt Method: Select ASCENDING SEQUENTIAL* (default), or CLOCKWISE CIRCULAR. Determines the method used for routing inbound calls to analog ports assigned to ACD groups. Ascending sequential uses the lowest available port number. Clockwise circular assigns port numbers in a clockwise circular pattern. This feature is not selectable from detailed screens.

# ACD Configuration—Master

## Help for ACD Configuration—Master (continued)

After most selections the screen displays ALL DETAILED SCREENS MATCH, SOME DETAILED SCREENS MATCH, or NO DETAILED SCREENS MATCH. This indicates whether the selection matches the same field on the detailed screens.

# ACD Configuration—Detailed

This screen configures individual ACD groups. There are 32 detailed screens, one for each ACD group.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 9-2

                      ACD 1 CONFIGURATION - DETAILED


 Queue Depth:      0*
 Queue Action:     AUDIBLE RING*
 Overflow Action:  BUSY TONE*

 Channels Assigned by Interface 1:  30
 Channels Assigned by Interface 2:  30
 Analog Ports Assigned:             PORT-1,2,3,4,5,6,7,8




 Number of Queued Calls:    0
 Number of Overflow Calls:  0




 * Indicates factory default.

                  Press Space Bar or Backspace to select
     Press Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for ACD Configuration—Detailed

Incoming calls are routed through ACD groups to analog ports. If an analog port is not available, the incoming call can be placed in queue. Queued calls are connected to the next available analog port assigned to the ACD group. While a call is in queue, queue action provides either audible ring, continuous message playback, or play message twice. If the queue becomes full, queue overflow action causes additional calls to hear busy progress tone, or connect to a voice message.

Queue Depth: Select 0* (default) through 32. Indicates the maximum number of calls that can be queued. 0 indicates that no calls can be queued.

Queue Action: Select AUDIBLE RING* (default), MESSAGE 1 CONTINUOUS, MESSAGE 2 CONTINUOUS, MESSAGE 1 PLAY TWICE, or MESSAGE 2 PLAY TWICE. Message 1 continuous and message 2 continuous routes the call to the selected voice message until an analog port becomes available. Message 1 play twice and message 2 play twice routes the call to a hold progress tone after the voice message has played twice. The hold progress tone is a 440Hz tone sent for 100 ms once every five seconds, and indicates to the caller that a connection is still active.

Overflow Action: Select BUSY TONE* (default), MESSAGE 1 PLAY TWICE, MESSAGE 2 PLAY TWICE, or REDIRECT 1-4. Message 1 play twice and message 2 play twice does a forced disconnect after the selected message has played twice. Redirect routes the call to the specified redirect group.

Channels Assigned by Interface: Shows the total number of channels assigned to this ACD group by each digital interface. When the digital interface is configured for ISDN, inbound matches are assigned on the Inbound Match Configuration screen.

# ACD Configuration—Detailed

## Help for ACD Configuration—Detailed (continued)

Analog Ports Assigned: This is a static display that shows PORT followed by the port number of all ports assigned to this ACD group. Hyphens (---) indicate no ports are assigned. Analog ports are assigned on the Analog Port Configuration screen.

Number of Queued Calls: This is a real-time display that shows the number of inbound calls currently waiting in the ACD queue.

Number of Overflow Calls: This is a real-time display that shows the number of inbound calls currently routed to overflow action.

# Redirect Configuration—Master

This screen allows configuration of redirect parameters for all four redirect groups. Press <ENTER> then Y to update the redirect parameter for all redirect groups. Use detailed screens to configure individual redirect groups.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 10-1

                   REDIRECT CONFIGURATION - MASTER

Prefix Number:    --                       ALL DETAILED SCREENS MATCH
Inbound Number:  INSERT ENTIRE NUMBER*     ALL DETAILED SCREENS MATCH
Type of Number:  UNKNOWN NUMBER*           ALL DETAILED SCREENS MATCH
Action:          IMMEDIATE*                ALL DETAILED SCREENS MATCH
Destination:     OPPOSITE DIGITAL INTERFACE* ALL DETAILED SCREENS MATCH




* Indicates factory default.


 Enter fixed, sequential, or random number (0-31 digits) then <ENTER>.
         Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Redirect Configuration—Master

Redirect causes an incoming call to initiate an outbound call on a digital interface, dial a specified number, and then connect both calls together. If desired, the incoming call can be connected to a voice message first, after which the outbound call is initiated.

Sidenote: ISDN calls redirected by the system's redirect facility copy the following information elements from incoming to outgoing call: bearer capability, display, calling party (caller), high layer compatibility, low layer compatibility, progress indicator, transit network selection, and user-user. The channel ID is not copied, but must be recalculated. The number of outgoing channels is determined from the bearer capability information transfer rate. The called number may be copied or replaced as configured by prefix number, inbound number, and type of number. The redirecting number information element is sent using the system's caller number. This is to assist law enforcement in identifying calls redirected through a third party.

Prefix Number: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. Factory default shows hyphens (--) to indicate that a number has not been entered. This number is inserted in front of the inbound number to form the called number. The called number should not contain an access digit (8 or 9) and is not processed by the Analog Port Outbound Call Configuration screen. The called number is sent in the called party number information element of the ISDN setup message. The system can send and receive up to 31 digits without problems.

# Redirect Configuration—Master

## Help for Redirect Configuration—Master (continued)

Digits [+-] are special characters. Sequential numbers may be created using [min+max]. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. A left bracket, a hyphen (-) or a plus (+), and a right bracket are required. For example: 55512[00-99] indicates to send a random number between 5551200 and 5551299. The minimum and maximum values may range from 0 through 9999 and do not require the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but may not be nested.

Inbound Number: Select INSERT ENTIRE NUMBER* (default), STRIP FIRST DIGIT, STRIP FIRST 2 DIGITS through STRIP FIRST 30 DIGITS, or EXCLUDE ENTIRE NUMBER. Selects the number of inbound digits to insert after the prefix number when dialing the redirect called number. Numbers are stripped starting from left to right. Example: *1*5551212, strip first 3 digits becomes 5551212.

Type of Number: Select UNKNOWN NUMBER* (default), INTERNATIONAL NUMBER, NATIONAL NUMBER, SUBSCRIBER NUMBER, or ABBREVIATED NUMBER. Type of number is sent in the called party number information element of the ISDN setup message.
Unknown number is either not identified or contains prefix digits that are not part of the called number. Example: *70 to disable call waiting.
International number includes a country code. Example: 443125551212.
National number includes a national area code. Example: 3125551212.
Subscriber number includes a local exchange number. Example: 5551212.
Abbreviated number is 3 to 5 digits long. Example: 1212 or 51212.

Action: Select IMMEDIATE* (default), MESSAGE 1 PLAY ONCE, or MESSAGE 2 PLAY ONCE. If message is selected, the message is played once before the call is redirected.

Destination: Select OPPOSITE DIGITAL INTERFACE* (default), SAME CHANNEL OPPOSITE INT, SAME DIGITAL INTERFACE, or PAIRED CHANNEL SAME INTERFACE. Opposite digital interface indicates that the redirected call will use the digital interface not used by the inbound call. For example, if a call comes in on digital interface 1, the redirected call will go out on digital interface 2. The channel number is determined by the channel search configuration. Same channel opposite interface indicates that the redirected call will use the same channel on the opposite digital interface. Same digital interface indicates that the redirected call will use the same digital interface that is used by the inbound call. For example, if a call comes in on digital interface 1, the redirected call will go out on digital interface 1. The channel number is determined by the channel search configuration. Paired channel same interface indicates that the redirected call will use the even/odd pair of the channel used by the inbound call. For example, if a call comes in on channel 3, the redirected call will go out on channel 4.

After each selection the screen displays ALL DETAILED SCREENS MATCH, SOME DETAILED SCREENS MATCH, or NO DETAILED SCREENS MATCH. This indicates whether the selection matches the same field on the detailed screens.

# Redirect Configuration—Detailed

This screen configures individual redirect groups. There are four detailed screens, one for each redirect group.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 10-2

                   REDIRECT 1 CONFIGURATION - DETAILED

Prefix Number:    --
Inbound Number:   INSERT ENTIRE NUMBER*
Type of Number:   UNKNOWN NUMBER*
Action:           IMMEDIATE*
Destination:      OPPOSITE DIGITAL INTERFACE*

Channels Assigned by Interface 1:  0
Channels Assigned by Interface 2:  0
Inbound Matches Assigned:          --


ACD Overflows Assigned:            --

Number of Redirected Calls:  0


* Indicates factory default.

   Enter fixed, sequential, or random number (0-31 digits). Backspace to edit.
        Press Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for Redirect Configuration—Detailed

Redirect causes an incoming call to initiate an outbound call on a digital interface, dial a specified number, and then connect both calls together. If desired, the incoming call can be connected to a voice message first, after which the outbound call is initiated.

Sidenote: ISDN calls redirected by the system's redirect facility copy the following information elements from incoming to outgoing call: bearer capability, display, calling party (caller), high layer compatibility, low layer compatibility, progress indicator, transit network selection, and user-user. The channel ID is not copied, but must be recalculated. The number of outgoing channels is determined from the bearer capability information transfer rate. The called number may be copied or replaced as configured by prefix number, inbound number, and type of number. The redirecting number information element is sent using the system's caller number. This is to assist law enforcement in identifying calls redirected through a third party.

Prefix Number: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. Factory default shows hyphens (--) to indicate that a number has not been entered. This number is inserted in front of the inbound number to form the called number. The called number should not contain an access digit (8 or 9) and is not processed by the Analog Port Outbound Call Configuration screen. The called number is sent in the called party number information element of the ISDN setup message. The system can send and receive up to 31 digits without problems.

Digits [+-] are special characters. Sequential numbers may be created using [min+max]. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. A left bracket, a hyphen (-) or a plus (+), and a right bracket are required. For example: 55512[00-99] indicates to send a random number between 5551200 and 5551299. The minimum and maximum values may range from 0 through 9999 and do not require the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but may not be nested.

# Redirect Configuration—Detailed

## Help for Redirect Configuration—Detailed (continued)

Inbound Number: Select INSERT ENTIRE NUMBER* (default), STRIP FIRST DIGIT, STRIP FIRST 2 DIGITS through STRIP FIRST 30 DIGITS, or EXCLUDE ENTIRE NUMBER. Selects the number of inbound digits to insert after the prefix number when dialing the redirect called number. Numbers are stripped starting from left to right. Example: *1*5551212, strip first 3 digits becomes 5551212.

Type of Number: Select UNKNOWN NUMBER* (default), INTERNATIONAL NUMBER, NATIONAL NUMBER, SUBSCRIBER NUMBER, or ABBREVIATED NUMBER. Type of number is sent in the called party number information element of the ISDN setup message.
An unknown number is either not identified or contains prefix digits that are not part of the called number. Example: *70 to disable call waiting.
An international number includes a country code. Example: 443125551212.
A national number includes a national area code. Example: 3125551212.
A subscriber number includes a local exchange number. Example: 5551212.
An abbreviated number is 3 to 5 digits long. Example: 1212 or 51212.

Action: Select IMMEDIATE* (default), MESSAGE 1 PLAY ONCE, or MESSAGE 2 PLAY ONCE. If message is selected, the message is played once before the call is redirected.

Destination: Select OPPOSITE DIGITAL INTERFACE* (default), SAME CHANNEL OPPOSITE INT, SAME DIGITAL INTERFACE or PAIRED CHANNEL SAME INTERFACE. Opposite digital interface indicates that the redirected call will use the digital interface not used by the inbound call. For example, if a call comes in on digital interface 1, the redirected call will go out on digital interface 2. The channel number is determined by the channel search configuration. Same channel opposite interface indicates that the redirected call will use the same channel on the opposite digital interface. Same digital interface indicates that the redirected call will use the same digital interface that is used by the inbound call. For example, if a call comes in on digital interface 1, the redirected call will go out on digital interface 1. The channel number is determined by the channel search configuration. Paired channel same interface indicates that the redirected call will use the even/odd pair of the channel used by the inbound call. For example, if a call comes in on channel 3, the redirected call will go out on channel 4.

Channels Assigned by Interface: This is a static display that shows the total number of channels assigned to this redirect group by each digital interface. When the digital interface is configured for ISDN, inbound matches are assigned on the Inbound Match Configuration screen.

Inbound Matches Assigned: This is a static display that shows MATCH followed by the reference number of all matches assigned to this redirect group. Hyphens (--) indicate no matches are assigned. Inbound matches are assigned on the Inbound Match Configuration screen.

ACD Overflows Assigned: This is a static display that shows ACD followed by the ACD number containing the overflow action assigned to this redirect group. Hyphens (--) indicate no ACD overflows are assigned. ACD overflows are assigned on the ACD Configuration screen.

Number of Redirected Calls: This is a real-time display that shows the total number of inbound calls currently being redirected.

# Audio Monitor Configuration

This screen configures audio monitor operation.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 11

                       AUDIO MONITOR CONFIGURATION

Output:                 ON*
Mode:                   NEXT CALL - MONITOR UNTIL DISCONNECT*
Source:                 ANY DIGITAL INTERFACE OR ANALOG PORT*
DCN/Port:               ---

Audio Monitor Status:   ---






* Indicates factory default.



                     Press Space Bar or Backspace
                 Press Arrow Keys, <F1> help, <F2> exit
```

## Help for Audio Monitor Configuration

Output: Select ON* (default) or OFF. Enables or disables the audio output.

Mode: Select NEXT CALL – MONITOR UNTIL DISCONNECT* (default), NEXT CALL, or FIXED CHANNEL OR PORT. Next call – monitor until disconnect: monitors the most recent call until the call disconnects. Next call: monitors the most recent call. Note that next call – monitor until disconnect and next call can monitor calls starting only from the initial call setup. Monitoring cannot be started once a call has been established. Fixed channel or port can monitor calls at any time during the call process.

Source: Select ANY DIGITAL INTERFACE OR ANALOG PORT* (default), DIGITAL INTERFACE 1, DIGITAL INTERFACE 2, ANALOG PORT, or DIGITAL INTERFACE 1 OR 2. Selects the primary source to be monitored.

DCN/Port: Select the DCN or PORT to be monitored when mode is set to fixed channel or port. DCN stands for digital channel number. PORT stands for analog port number. Shows hyphens (---) when mode is not fixed channel or port.

Audio Monitor Status: Shows the specific channel or port being monitored. Digital interfaces show DCN. Analog ports show PORT. Hyphens (---) indicate no channel is currently being monitored. Shows DCN-X/X OUT OF RANGE when the fixed digital channel number exceeds the range of possible digital channels.

# Security Configuration

This screen configures access security features. These can be useful when accessing the menu system through a local area network. The security configuration is saved in non-volatile memory, but not in the profile area and is not affected by the Save/Restore System Configuration screen.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 12

                           SECURITY CONFIGURATION

Login Required:           NO*
Password:                 SYS930
Password Reminder:        Default password is SYS930
VT100 Compatibility Test: NO*
Automatic Logoff:         NO*
Inactivity Time:          120  MINUTES







* Indicates factory default.


                    Press Space Bar or Backspace to select
                    Press Arrow Keys, <F1> help, <F2> exit
```

## Help for Security Configuration

Login Required: Select NO* (default), or YES. No allows the operator to immediately access the main menu. Yes requires the operator to enter the password and, if selected, VT100 compatibility test before accessing the main menu.

Password: Enter password, up to 10 characters, using alphabetic letters, numbers, or punctuation characters. This is the password entered upon login that allows access to the main menu. Factory default password is SYS930.

Password Reminder: Enter password reminder, up to 39 characters. This text is displayed during login. Choose text to help remember the password. Example: If the password is a telephone number from early childhood, Enter childhood telephone number. Factory default is Default password is SYS930.

VT100 Compatibility Test: Select NO* (default), or YES. No skips this feature. Yes asks user to press function keys F1, F2, F3, F4, and backspace after successful password entry. This test ensures that correct keyboard entry can be performed.

Automatic Logoff: Select NO* (default), or YES. No disables automatic logoff, allowing continuous access to the screens. Yes automatically logs the user off when the inactivity time is reached.

Inactivity Time: Enter number from 1 to 999 in minutes. Amount of time that the keyboard must remain inactive before the system automatically logs off. Factory default is 120 minutes.

# Digital Interface Call Status

This screen shows each digital interface's call status. There are six status screens, three for each digital interface. Each screen has two modes: display called number or display caller number. Press the space bar to toggle between them.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 13-1

         DIGITAL INTERFACE CALL STATUS - DIGITAL INTERFACE 1

Interface Status:  SYNCHRONIZED

DCN    State           Dir   Connect    Called Number
1/1    OO-NOT IN USE   ---   --         ---
1/2    OO-NOT IN USE   ---   --         ---
1/3    OO-NOT IN USE   ---   --         ---
1/4    OO-NOT IN USE   ---   --         ---
1/5    OO-NOT IN USE   ---   --         ---
1/6    OO-NOT IN USE   ---   --         ---
1/7    OO-NOT IN USE   ---   --         ---
1/8    OO-NOT IN USE   ---   --         ---
1/9    OO-NOT IN USE   ---   --         ---
1/10   OO-NOT IN USE   ---   --         ---
1/11   OO-NOT IN USE   ---   --         ---
1/12   OO-NOT IN USE   ---   --         ---




         Press Space Bar to toggle between called and caller number
                   Press <F1> help, <F2> exit, <F4> next
```

## Help for Digital Interface Call Status

Interface Status: Shows CARD NOT PRESENT, DISABLED, RECEIVING UNFRAMED ONES, RECEIVING REMOTE ALARM, SYNCHRONIZED, NOT SYNCHRONIZED, or LAYER 2 DOWN. Indicates framing status of digital interface.

DCN: Shows digital channel number as interface/number.

State: Shows state number followed by state name: ALERTING, MULTIRATE, CONNECT, DATA CHAN, DISCONNECT, NOT IN USE, PROCEEDING, PROGRESS, RESERVED, SETUP, SETUP ACK, TRANSITION, or WINK.

Dir: Shows direction. IN for inbound or OUT for outbound. Hyphens (---) indicate channel not in use.

Connect: Shows ACD, ACT, DCN, GEN, MSG, or PORT. Shows resource connected to digital channel. ACD stands for automatic call distribution. ACT stands for connect action. DCN stands for digital channel number. GEN stands for call generator. MSG stands for recorder/announcer message. PORT stands for analog port number. Hyphens (---) indicate no connection.

Called Number: Shows the called number, up to 31 digits. Hyphens (---) indicate that a call is not present.

Calling Number: Shows the calling party number that originated the call, up to 17 digits. Hyphens (---) indicate that a call is not present or number not available. Shows PRIVATE if ISDN presentation is restricted. Press space bar to view this field.

# Transmission Status

This screen displays digital interface transmission information. There are two status screens, one for each digital interface.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 14-1

                TRANSMISSION STATUS - DIGITAL INTERFACE 1

Card Present:            YES
Synchronized:           YES
Debounced Synchronized: YES
Transmit Slips:         00001
Receive Slips:          00000
Bipolar Violations:     00000
CRC4 Errors:            00058
System Reboots:         00001
Synchronization Losses: 00001
Elapsed Sync Time:      00 01:33:03
Alarm Status:           NO ALARMS
Reboot Error:           NONE

Reset Status Counters:  NO*


* Indicates factory default.

             Press Space Bar or Backspace then <ENTER>
               Press <F1> help, <F2> exit, <F4> next
```

### Help for Transmission Status

Card Present: Shows YES or NO.

Synchronized: Shows YES, NO, or NO – INTERFACE DISABLED. Indicates whether the digital interface card is synchronized with the incoming frame.

Debounced Synchronized: Shows YES or NO. Yes indicates digital interface has maintained synchronization for one second or more. No indicates it has lost synchronization for five seconds or more.

Transmit Slips: Increments each time transmit elastic store buffer either repeats or deletes a frame. This number can increment only when debounced synchronized is yes.

Receive Slips: Increments each time receive elastic store buffer either repeats or deletes a frame. This number can increment only when debounced synchronized is yes.

Bipolar Violations: Increments each time the receiver circuitry fails to detect an alternate pulse or excessive zeros. This number can increment only when debounced synchronized is yes.

CRC4 Errors: Shows number of CRC4 checksum errors. Hyphens (---) indicate Non-CRC4 framing. This number is updated only when debounced synchronized is yes. System Reboots: Shows number of times system has rebooted due to power failure, manual reset through keystrokes, or software run-time error.

Synchronization Losses: Shows number of times system has lost synchronization.

Receive Level: Hyphens (---) indicate information not available.

Elapsed Sync Time: Shows time since start of last debounced synchronization. Format is days hours:minutes seconds.

# Transmission Status

## Help for Transmission Status (continued)

Alarm Status: Shows NO ALARMS, REMOTE ALARM, or UNFRAMED ONES. No alarms indicates incoming frame does not contain a remote or unframed ones alarm. Remote alarm indicates that the remote alarm bit in the incoming framing channel is set. Unframed ones indicates that the incoming frame contains ones in all bit positions including the framing channel. Unframed ones causes loss of synchronization and loss of channel data.

Reboot Error: Shows NONE, BUS ERROR, ADDRESS ERROR, ILLEGAL INSTRUCTION, DIVIDE BY ZERO, PRIVILEGED INSTRUCTION, UNEXPECTED SINGLE STEP, UNEXPECTED TRAP, and GENERAL ERROR. Used by factory to show cause of unexpected system reboot.

Reset Status Counters: Select NO* (default), THIS SCREEN ONLY, or ALL TRANSMISSION STATUS SCREENS. The selections allow status counters on this screen or all screens to be reset. <ENTER> must be pressed to reset the status counters. Status counters are saved when power is shut off.

# Data Monitor—Digital Interface

This screen displays channel data for each digital interface. It also shows the interface status. There are two digital interface status screens, one for each digital interface.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 15-1

                   DATA MONITOR - DIGITAL INTERFACE 1

Interface Status:   SYNCHRONIZED

                              1 1 1 1 1 1   1 1 1 2 2 2 2 2 2 2 2 2 3 3
Channel: F 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

Inbound Data (Hex):
Bits 5-8: D F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F
Bits 1-4: B F F F F F F F F F F F F F F F F 9 F F F F F F F F F F F F F F




                    Press <F1> help, <F2> exit, <F4> next
```

## Help for Data Monitor—Digital Interface

Interface Status: Shows CARD NOT PRESENT, DISABLED, RECEIVING UNFRAMED ONES, RECEIVING REMOTE ALARM, SYNCHRONIZED, NOT SYNCHRONIZED, or LAYER 2 DOWN. Indicates framing status of digital interface.

Channel: Shows channel number for items below.

Inbound Data: Shows data coming into the system in hexadecimal. Channel F (framing channel) contains frame alignment, error checking, and data link maintenance bits. Channels 1 through 15, and 17 through 31 (bearer channels) contain digitally encoded voice or data. 00 indicates that the interface is not synchronized. FF is the idle state. Channel D (data channel) contains out-of-band signaling. If connected to a CAS (Channel Associated Signaling) digital interface, channel 16 contains signaling bits. If connected to an ISDN digital interface, channel 16 contains HDLC packets. FF indicates HDLC packets are not present. 3F, 7E, 9F, CF, E7, F3, F9, and FC are valid HDLC idle states. Idle state tends to change when receiving HDLC packets.

# Data Monitor—Analog Ports

This screen displays port data for the analog ports.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 15-3

                       DATA MONITOR - ANALOG PORTS

                       1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3 3
Port:  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2

Inbound Data (Hex):
Bits 5-8:F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F
Bits 1-4:F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F




            Press <F1> help, <F2> exit, <F3> previous
```

## Help for Data Monitor—Analog Ports

Port: Shows port number for items below.

Inbound Data: Shows data coming into the system in hexadecimal. Ports 1 through 32 contain digitally encoded voice or data.

# Tone Connect Test Functions

This screen connects a test tone to a digital interface channel or analog port. Note that DTMF tones don't have a cadence, but are steady tones.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 16

                        TONE CONNECT TEST FUNCTIONS


Connect Status:   NORMAL OPERATION*
Tone Number:      1 (DTMF 1)*
Destination:      DIGITAL INTERFACE 1*
DCN/Port:         DCN 1*










* Indicates factory default.



                Press Space Bar or Backspace to select
                Press Arrow Keys, <F1> help, <F2> exit
```

### Help for Tone Connect Test Functions

Connect Status: Select NORMAL OPERATION* (default) or CONNECT TONE. Normal operation indicates the tone is not connected. Connect tone indicates to connect the tone to the destination device. Upon power up or system reboot, connect status is normal operation.

Tone Number: Select 0 through 9 and 14 through 19. See tone list.

Destination: Select DIGITAL INTERFACE 1* (default), DIGITAL INTERFACE 2, or ANALOG PORTS. This selects the group of ports or channels the tone should be connected to.

DCN/Port: Select the specific DCN or PORT the tone should be connected to. DCN stands for digital channel number. PORT stands for analog port number. The factory default is DCN 1.

Tone List

| | | | |
|---|---|---|---|
| 0 - DTMF 0 | 4 - DTMF 4 | 8 - DTMF 8 | 16 - Dial Tone |
| 1 - DTMF 1 | 5 - DTMF 5 | 9 - DTMF 9 | 17 - Audible Ring |
| 2 - DTMF 2 | 6 - DTMF 6 | 14 - DTMF * | 18 - Busy/Reorder |
| 3 - DTMF 3 | 7 - DTMF 7 | 15 - DTMF # | 19 - 440Hz |

# Digital Interface Test Functions—Digital Interface

This screen allows configuration of digital interface test functions. There are four screens, two for each digital interface. Many of these tests are not related to each other.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator      Screen 17-1

            DIGITAL INTERFACE TEST FUNCTIONS - DIGITAL INTERFACE 1

Loopback:                    NO LOOPBACK*
Send Alarm:                  AUTO ALARM*
Setup Bearer Capability:     SPEECH*
Information Transfer Rate:   64 KBPS*
Channel ID Format:           SEND CHANNEL ID WITHOUT INTERFACE ID*
Channel ID Mode:             SEND CHANNEL ID IN FIRST MESSAGE ONLY*
ISDN Setup Ack Message:      SEND SETUP ACK MSG*
ISDN Proceeding Message:     SEND PROCEEDING MSG*
ISDN Alerting Operation:     SEND ALERTING MSG*
ISDN Progress Description:   IN-BAND PROGRESS AVAILABLE*
In-band Progress Tones:      SEND IN-BAND PROGRESS TONES*
Cause Code Override:         DO NOT OVERRIDE CAUSE CODE*

ISDN Alerting Action:  SEND ALERTING MSG WITH PROGRESS IE
ISDN Progress Action:  SEND ALERTING MSG WITH PROGRESS IE

* Indicates factory default.

             Press Space Bar or Backspace then <ENTER>
         Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Digital Interface Test Functions—Digital Interface

Loopback: Select NO LOOPBACK* (default), LINE LOOPBACK, or INTERNAL LOOPBACK. This selection affects layer 1. No loopback causes the digital interfaces to operate normally. No loopback is the default condition upon power up or reboot. Line loopback takes the received data and transmits it back to the source. Received data is retransmitted without change in framing format and any bipolar violations are not removed. Received data is also passed unchanged through to the system as incoming data. Internal loopback takes the transmitted data and loops it back internally as the incoming data. Received data from the source is ignored. Transmit data is not sent to the source.

Send Alarm: Select AUTO ALARM* (default), REMOTE ALARM, UNFRAMED ONES, or NO ALARM. This selection affects layer 1. Auto alarm sends a remote alarm as part of the transmitted data whenever the received data has been out of sync for more than five seconds. Upon power up or reboot, send alarm is set to auto alarm. Remote alarm is sent in the remote alarm bit on channel 0. Does not cause loss of synchronization or corruption of transmitted data. Unframed ones sends ones in all bit positions, including the frame alignment signal on channel 0. Causes loss of synchronization and essentially no transmit data. No alarm prevents transmitting a remote alarm or unframed ones, even when the incoming data warrants it.

Setup Bearer Capability: Select SPEECH* (default), UNRESTRICTED DIGITAL INFORMATION, RESTRICTED DIGITAL INFORMATION, 3.1 KHZ AUDIO (ANALOG MODEM), 7 KHZ AUDIO, or VIDEO. This information is sent in the bearer capability information element. This selection is not used by redirected calls.

Information Transfer Rate: Select 64 KBPS* (default) through 30 x 64 KBPS (H12) in 64 KBPS increments. This information is sent in the bearer capability information element and channel ID information element. This selection is not used by redirected calls. 5ESS, DMS100, Euro ISDN, and NI-2 accept all transfer rates. 4ESS accepts 64 KBPS and 6 x 64 KBPS (H0) only. All other 4ESS transfer rates are special cases and are not coded according to CCITT standards.

# Digital Interface Test Functions—Digital Interface

## Help for Digital Interface Test Functions—Digital Interface (continued)

Channel ID Format: Select SEND CHANNEL ID WITHOUT INTERFACE ID* (default) or SEND CHANNEL ID WITH INTERFACE ID. Send channel ID without interface ID indicates that the channel ID information element is sent in ISDN messages with interface ID not present. This is the normal case for FAS (Facility Associated Signaling) and indicates that each digital interface contains its own ISDN signaling channel. Send channel ID with interface ID indicates that the channel ID information element is sent in ISDN messages with interface ID present. This is the normal case for NFAS (Non-Facility Associated Signaling) and indicates that only one digital interface contains an ISDN signaling channel. This system must be licensed for NFAS to operate properly on more than one interface.

Channel ID Mode: Select SEND CHANNEL ID IN FIRST MESSAGE ONLY* (default), SEND CHANNEL ID IN ALLOWABLE MESSAGES, or DO NOT SEND CHANNEL ID. Send channel ID in first message only indicates that the channel ID information element is sent in the first ISDN message of a new call. This is usually the setup, call proceeding, or setup acknowledge message. Send channel ID in allowable messages indicates that the channel ID information element is sent in all allowable ISDN messages. This includes the setup, setup acknowledge, proceeding, progress, and connect messages. Do not send channel ID indicates that the channel ID information element is not sent in ISDN messages. This is allowed for user side Euro ISDN and causes problems for other switch emulations.

ISDN Setup Ack Message: Select SEND SETUP ACK MSG* (default), or DO NOT SEND SETUP ACK MSG. Send setup ack msg causes the system to send the ISDN setup acknowledge message in response to receiving an ISDN setup message. Do not send setup ack msg prevents the system from sending the ISDN setup acknowledge message. This message is normally sent by GR-303 and Euro ISDN to acknowledge a setup message not containing a called number.

ISDN Proceeding Message: Select SEND PROCEEDING MSG* (default), or DO NOT SEND PROCEEDING MSG. Send proceeding msg causes the system to send the ISDN call proceeding message in response to receiving an ISDN setup message. Do not send proceeding msg prevents the system from sending the ISDN call proceeding message. This message is normally sent to acknowledge a setup message containing a called number.

The next four test functions provide a way to test how the receiving side handles progress tones. In-band (circuit switched) progress tones are sent across the digital interface faster than ISDN progress messages (packet switched), but automated equipment might prefer using ISDN progress messages. Network side dial tone (after any access digits) is always supplied locally. User side uses overlap sending, so dial tone (after any access digits) must be supplied by the network side. The ISDN call proceeding message is always sent after the call setup message.

ISDN Alerting Operation: Select SEND ALERTING MSG* (default), SEND PROGRESS MSG, SEND CONNECT MSG, or DO NOT SEND ALERTING MSG. Send alerting msg causes the system to send the ISDN alerting message and supply in-band audible ring progress tones. Send progress msg prevents the ISDN alerting message from being sent. Instead, it sends the ISDN progress message while supplying in-band audible ring progress tones providing ISDN progress description is not do not send progress IE. Send connect msg prevents the ISDN alerting message from being sent. Instead, it sends the ISDN connect message while supplying in-band audible ring progress tones providing ISDN progress description is not do not send progress IE. Do not send alerting msg prevents any ISDN messages from being sent when an alerting message would normally be sent. This creates an abnormal situation. Combined with do not send proceeding msg, the near end should resend the setup message and then release the call. To help understand the full effect from this selection, the message sent is shown at the bottom of this screen.

# Digital Interface Test Functions—Digital Interface

## Help for Digital Interface Test Functions—Digital Interface (continued)

ISDN Progress Description: Select IN-BAND PROGRESS AVAILABLE* (default), NOT END-TO-END ISDN, RETURN TO END-TO-END ISDN, or DO NOT SEND PROGRESS IE. This is a code sent in the progress indicator information element of progress messages and alerting messages. It also determines which ISDN messages are sent. To help understand the full effect from this selection, the message sent is shown at the bottom of this screen. Use in-band progress available, not end-to-end ISDN, and return to end-to-end ISDN to indicate there are in-band progress tones. Use do not send progress IE to indicate there are no in-band progress tones. Do not send progress IE implies an end-to-end ISDN connection and there are no in-band progress tones.

In-band Progress Tones: Select SUPPLY IN-BAND PROGRESS TONES* (default) or DO NOT SUPPLY IN-BAND PROGRESS TONES. Supply in-band progress tones permits the system to supply in-band busy, reorder, or audible ring progress tones to be sent across the digital interface. These tones are normally sent by the system when it is the terminating side to a call. Do not supply in-band progress tones prevents the system from supplying in-band progress tones across the digital interface. This is not the normal case for the public network. Use this selection to determine the origin of progress tones. This selection affects the audio path only, it has no effect on ISDN messages sent by the system.

Cause Code Override: Select DO NOT OVERRIDE CAUSE CODE* (default), CAUSE 0 through CAUSE 127, USE LAST 3 DIGITS OF CALLED NUMBER, or INCREMENT AFTER EACH CALL. This is the code sent in the cause information element of ISDN progress and disconnect messages. Other ISDN messages are not affected and send the cause code normally supplied by the system. This affects cause codes sent by the system, not cause codes received by the system. Do not override cause code indicates to ignore this selection and send the cause code normally supplied by the system. Cause 0 through cause 127 indicates to send the indicated cause code instead of the cause code normally supplied by the system. Use last 3 digits of called number indicates to send the last three digits of the called number as the cause code. If the last three digits exceed 127, send the cause code normally supplied by the system. Increment after each call indicates to increment the cause code after each call. Wraps around from 127 to 0.

The next two fields are static displays to help understand the full effects from ISDN Alerting Operation and ISDN Progress Description.

ISDN Alerting Action: Shows SEND ALERTING MSG, SEND ALERTING MSG WITH PROGRESS IE, NONE, SEND PROGRESS MSG WITH PROGRESS IE, or SEND CONNECT MSG WITH PROGRESS IE. Send alerting message indicates that the ISDN alerting message is sent without the progress indicator information element and the system supplies in-band audible ring progress tones. This indicates that the receiving side should supply local audible ring progress tone even though the remote audible ring progress tone is present. Send alerting message with progress information element indicates that the ISDN alerting message is sent with the progress indicator information element and the system supplies in-band audible ring progress tones. None indicates that no ISDN message is sent and the system supplies in-band audible ring progress tones. Send progress message with progress information element indicates that the ISDN progress message is sent with the progress indicator information element and the system supplies in-band audible ring progress tones. Send connect message with progress information element indicates that the ISDN connect message is sent with the progress indicator information element and the system supplies in-band audible ring progress tones.

ISDN Progress Action: Shows SEND DISCONNECT MSG, SEND PROGRESS MSG WITH PROGRESS IE or NONE. Send disconnect message indicates that the ISDN disconnect message is sent without supplying an in-band progress tone, indicating that the far end should supply local busy or reorder progress tones based on the cause information element included in the disconnect message. Send progress message with progress information element indicates that the ISDN progress message is sent with the progress indicator information element and the system supplies an in-band busy or reorder progress tone. None indicates that the switch emulation does not send a progress message.

# Digital Interface Test Functions—Digital Interface

This screen allows configuration of digital interface test functions. There are four screens, two for each digital interface. Most of these tests are not related to each other.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator      Screen 17-2

           DIGITAL INTERFACE TEST FUNCTIONS - DIGITAL INTERFACE 1

   ISDN Layer 2 Startup:          START USER SIDE IMMEDIATELY*
   Setup Exclusive Channel ID:    PREFERRED*
   Non-Setup Channel ID Format:   NUMBER/SLOT MAP*
   Multirate Slot Assignment:     FIXED SLOTS*
   Redirect Elements:             COPY END TO END ELEMENTS*
   Network Specific Service:      DO NOT SEND NETWORK SPECIFIC SERVICE*





   * Indicates factory default.

                  Press Space Bar or Backspace then <ENTER>
       Press Arrow Keys, <F1> help, <F2> exit, <F3> previous, <F4> next
```

## Help for Digital Interface Test Functions—Digital Interface

ISDN Layer 2 Startup: Select START USER SIDE IMMEDIATELY* (default), START NETWORK SIDE IMMEDI-ATELY, START EITHER SIDE IMMEDIATELY, or WAIT UNTIL FIRST OUTGOING CALL. This selection selects whether the interface should initiate layer 2 handshaking or wait for the near end to initiate handshaking. Start user side immediately indicates to initiate handshaking if this interface is the user side. Start network side immediately indicates to initiate handshaking if this interface is the network side. Start either side immediately indicates to initiate handshaking whether this interface is the network side or user side. Wait until first outgoing call indicates to initiate handshaking upon making the first outgoing call.

Setup Exclusive Channel ID: Select PREFERRED* (default) or EXCLUSIVE. This information is sent by the ISDN channel ID information element in setup messages. Preferred indicates that the channel is being requested and may be changed by the near end if the channel is already in use. Exclusive indicates that the channel is not negotiable and the call should be rejected by the near end if the channel is already in use. This feature was added to test for rejection of preferred channel IDs and to allow testing for glare. Applies only to channel IDs sent in setup messages. Non-setup messages always send exclusive channel IDs. DMS100 always sends exclusive channel IDs regardless of this setting.

Non-Setup Channel ID Format: Select NUMBER/SLOT MAP* (default) or SLOT MAP ONLY. This is the format sent by the ISDN channel ID information element in non-setup messages. Number/slot map indicates that number format is used for 64 KBPS calls and slot map format is used for 128 KBPS or higher calls. Slot map only indicates that slot map format is used for all calls. Use number/slot map on older Lucent (AT&T) switches that do not support slot map format for 64 KBPS calls. Slot map only will cause older Lucent (AT&T) switches to return cause code 82, channel does not exist, when sent slot map format in call proceeding messages.

# Digital Interface Test Functions—Digital Interface

### Help for Digital Interface Test Functions—Digital Interface (continued)

Multirate Slot Assignment: Select FIXED SLOTS* (default) or FLEXIBLE SLOTS. This selection applies to H0, H11, and multirate channels. Fixed slots indicate that slot assignment must be contiguous and end on a slot evenly divisible by the rate multiplier. Example: 6 x 64 KBPS transfer rates must end on slot 6, 12, 18, 24, or 30. Flexible slots indicate that slot assignment may be contiguous or noncontiguous.

Redirect Elements: Select COPY END TO END ELEMENTS* (default) or DO NOT COPY END TO END ELE-MENTS. This selection indicates when the system's redirect facility will copy the display, high layer compatibility, low layer compatibility, progress indicator, transit network, and user-user information elements from the incoming setup message to outgoing setup message. Copy end to end elements: allows these elements to be copied. Do not copy end to end elements: inhibits these elements from being copied.

Network Specific Service: Select DO NOT SEND NETWORK SPECIFIC SERVICE* (default), or SEND CODE 0 through SEND CODE 31. Network specific service identifies a specific service. It is sent in the network specific facility information element of ISDN setup messages. Do not send network specific service does not send the network specific facility information element when originating a call and does not check for it when receiving a call. Send code 0 through send code 31 sends the network specific facility information element when originating a call and checks for it when receiving a call. If missing, the call is rejected with cause 96; mandatory information element is missing.

# Data Capture Configuration

This screen configures the way signaling messages and call detail records are captured and displayed. It also starts or stops the call generator. To display captured data, press <ENTER> from this screen.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator      Screen 18

                        DATA CAPTURE CONFIGURATION

   Status:                 NOT RUNNING*
   Screen Mode:            VT100 EMULATION*
   Capture Type:           LAYER 3 WITH INFORMATION ELEMENTS*
   Calls to Capture:       ALL*
   Source:                 INTERFACE 1 AND INTERFACE 2*
   Message Type 1:         ALL MESSAGE TYPES*
   Message Type 2:         NONE*
   Message Type 3:         NONE*
   Message Type 4:         NONE*
   Call Generator Mode:    NOT RUNNING*

   Call Generator Status:  NOT RUNNING




   * Indicates factory default.

         Press Space Bar or Backspace. Press <ENTER> to view results.
                      Press <F1> help, <F2> exit
```

## Help for Data Capture Configuration

Status: Select NOT RUNNING or RUNNING. Not running stops data capture and holds the information shown in VT100 emulation mode. Upon power up or reboot, status is set to not running. Running allows new information to be captured. In VT100 emulation mode, press <ENTER> to display the last page of captured information. In raw ASCII output screen mode, press <ENTER> to display the special raw ASCII output screen.

Screen Mode: Select VT100 EMULATION* (default) or RAW ASCII OUTPUT. VT100 emulation displays captured information using normal screen output. Raw ASCII output sends newly arrived information to the display device with VT100 emulation disabled. This feature is useful for capturing screen output to a file.

Capture Type: Select LAYER 3 WITH INFORMATION ELEMENTS* (default), LAYER 3 – NO INFORMATION ELEMENTS, LAYER 2 & LAYER 3 WITH INFORMATION ELEMENTS, LAYER 2 & LAYER 3 – NO INFORMATION ELEMENTS, LAYER 2 ONLY, or CALL DETAIL RECORDS. Layer 3 with information elements shows ISDN layer 3 messages with information elements on separate lines. Layer 3 – no information elements: shows ISDN layer 3 messages without information elements. Layer 2 only: shows ISDN layer 2 frames. Use layer 2 to check layer 2 handshaking with the near end. Call detail records show basic information such as channel used and called number. They are displayed after a call is disconnected. See help in the Data Capture Display Screen section for more details.

# Data Capture Configuration

## Help for Data Capture Configuration (continued)

Calls to Capture: Select ALL* (default), NEXT INCOMING, NEXT OUTGOING, or UNTIL INTERNAL ERROR. Indicates whether to capture all calls or only the next incoming or outgoing call. ALL captures all calls. It is undesirable to run data capture with all calls for long periods of time because it may interfere with normal system operation. This selection is preset to ALL when Capture Type is CALL DETAIL RECORDS. NEXT INCOMING captures the next incoming call. Data capture may be retriggered by changing data capture status from running to not running and then running again. NEXT OUTGOING captures the next outgoing call. Data capture may be retriggered by changing data capture status from running to not running and then running again. UNTIL INTERNAL ERROR captures all calls until an internal ISDN error is reported. Upon detecting an internal ISDN error, data capture status is changed to not running so that data capture is preserved for later analysis.

Source: Select INTERFACE 1 AND INTERFACE 2* (default), INTERFACE 1, INTERFACE 2, or ANALOG PORTS. Indicates the source from which the data will be captured. Analog ports work only with call detail records.

Message Type 1: Select ALL MESSAGE TYPES* (default), SETUP, SETUP_ACK, CALL_PROC, ALERTING, PROGRESS, CONNECT, CONNECT_ACK, DISCONNECT, RELEASE, RELEASE_COMP, INFO, NOTIFY, RESTART, RESTART_ACK, STATUS, STATUS_ENQ, or USER_INFO. Indicates whether to capture all message types or only the selected message type.

Message Type 2: Select NONE* (default), SETUP, SETUP_ACK, CALL_PROC, ALERTING, PROGRESS, CONNECT, CONNECT_ACK, DISCONNECT, RELEASE, RELEASE_COMP, INFO, NOTIFY, RESTART, RESTART_ACK, STATUS, STATUS_ENQ, or USER_INFO. Allows a second message type to be captured.

Message Type 3: Similar to message type 2. Allows a third message type to be captured.

Message Type 4: Similar to message type 2. Allows a fourth message type to be captured.

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING UNTIL NO CONNECT. Indicates current call generator status.

# Data Capture Display

The display screen shows layer 2, layer 3, and call detail records. It is accessed from the configuration screen by pressing <ENTER>.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 18-10

                        DATA CAPTURE DISPLAY PAGE 10


  Version 5.00
  SEND    DSL=1 TIME=00:31 45.800 CRV=0001 CRF=0 SETUP
               SENDING_COMPLETE  A1
               BEARER_CAPABILITY 04 03 80 90 A3  SPEECH
               CHANNEL_ID        18 03 A1 83 81  CHANNEL 1
               PROGRESS_IND      1E 02 80 83  ORIGIN ADDRESS NON-ISDN
               CALLED_NUMBER     70 08 C1 "5551212"
  RECEIVE DSL=1 TIME=00:31 45.850 CRV=0001 CRF=1 CALL_PROC
               CHANNEL_ID        18 03 A1 83 81  CHANNEL 1
  RECEIVE DSL=1 TIME=00:31 45.850 CRV=0001 CRF=1 ALERTING
               PROGRESS_IND      1E 02 80 88  IN-BAND PROGRESS
  RECEIVE DSL=1 TIME=00:31 49.200 CRV=0001 CRF=1 CONNECT
  SEND    DSL=1 TIME=00:31 49.200 CRV=0001 CRF=0 CONNECT_ACK
  SEND    DSL=1 TIME=00:31 55.800 CRV=0001 CRF=0 DISCONNECT
               CAUSE             08 02 82 90  #16:NORMAL CLEARING
  RECEIVE DSL=1 TIME=00:31 55.800 CRV=0001 CRF=1 RELEASE
  SEND    DSL=1 TIME=00:31 55.850 CRV=0001 CRF=0 RELEASE_COMP


       RUNNING - Press Space Bar to stop. Press C to clear screen.
              Press <F1> help, <F2> exit, <F3> previous
```

## Help for Data Capture Display

In VT100 emulation mode, information is scrolled upward, starting from the bottom of the last page. It is best to start viewing from the last page as it contains the most recent information. In raw ASCII output mode, each line is sent as 8 bit ASCII text followed by carriage return (CR) and line feed (LF).

Select NOT RUNNING and RUNNING by pressing the space bar. Not running stops data capture and holds the information shown. Upon power up or reboot, status is set to not running. Running allows new information to be captured. If there is a lot of screen activity, the message ***DATA OVERFLOW IN DATA CAPTURE*** will appear in the text. Pressing the space bar also retriggers data capture when configured for next incoming call or next outgoing call.

Press C to clear screen. Pressing C also retriggers data capture when configured for next incoming call or next outgoing call. Pressing C has no effect on data capture status.

The following text applies to ISDN layer 2 and layer 3. Robbed bit signaling and call detail records are explained later.

The first word of each line identifies the information source: RECEIVE, SEND, STATUS, and ERROR. Receive indicates the message was received by the system. Send indicates the message was sent by the system. Status indicates the message is internal to the system and typically indicates digital interface shutdown and startup requests due to loss of synchronization. Error indicates an error has occurred within the system. Error messages are captured even when the status of data capture is not running.

ISDN records are displayed in several different formats: layer 2, layer 3, and layer 3 with information elements.

When capture type is layer 3, the format for the first line of ISDN messages that are sent and received is: SEND or RECEIVE, DSL, TIME, CRV, CRF, and ISDN message name. Information elements then follow on separate lines.

# Data Capture Display

## Help for Data Capture Display (continued)

When capture type is layer 2 & layer 3, the first line shows ISDN layer 2 frames. Use layer 2 to check layer 2 handshaking with the near end. The format is: SEND or RECEIVE, DSL, TIME, TEI, SAPI, frame type, NS, NR, and PF. SEND or RECEIVE, CRV, CRF, and ISDN message name appear on next line. Information elements then follow on separate lines.

Format of status messages is: STATUS, DSL, TIME, TEI, SAPI, and primitive type.

Format of error messages is: ERROR followed by text describing the error.

Definitions:

CES: Connection Endpoint Suffix. Layer 3 information. Associated with TEI. Private to each side of the digital interface. CES 0 is broadcast, 1 is PRI endpoint.

CID: Call ID. Hexadecimal number used to identify each call. Private to the system. Associated with Call Reference, which identifies the call between the user and the connected equipment. CID 0 is non-call related, 0001 through 7FFF are incoming calls, 8001 through FFFF are outgoing calls.

CRF: Call Reference Flag. The most significant bit of the call reference. This bit is 0 for the originating side and 1 for the terminating side.

CRV: Call Reference Value. Shown in hexadecimal. Layer 3 information. Numbers range from 0001 through 7FFF. Used to identify a specific call between the system and the connected equipment. CRV is associated with Call ID, which is private to each side of the connection.

DSL: Digital Subscriber Line. Layer 1 information.

SAPI: Service Access Point Identifier. Layer 2 information. SAPI 0 is signaling, 16 is packetized data, and 63 is network management.

TEI: Terminal Endpoint Identifier. Layer 2 information. Identifies the terminating endpoint to the central office. Associated with CES. TEI 0 is broadcast, 1 is PRI endpoint.

TIME: Time shown as hh:mm ss.mmm representing hour, minute, second, and millisecond. Uses current system time.

Frame Type: Layer 2 information:
DISC: Disconnect.
DM: Disconnect mode.
FRMR: Frame Reject.
I: Information; followed by NS and NR.
REJ: Reject.
RNR: Receive Not Ready.
RR: Receive Ready; followed by NR.
SABME: Set Asynchronous Balanced Mode Extended.
UA: Unnumbered Acknowledge.
UI: Unnumbered Information.
XID: Exchange Identification.

NR: Frame Received Number. Layer 2 information.

NS: Frame Sent Number. Layer 2 information.

PF: Poll/Final Bit. Layer 2 information. PF 0 is poll, 1 is final.

Primitives are ISDN layer to layer messages. Primitives are displayed by status messages and are generally useful only to the factory. Although there are too many to fully describe here, the most common are:
MDL_ERR_IND: Layer 2 error indication.
MDL_STARTUP_REQ: Layer 2 startup request.
MDL_SHUTDOWN_REQ: Layer 2 shutdown request.

# Data Capture Display

## Help for Data Capture Display (continued)

Message Name: Layer 3 information. Although there are too many to fully describe here, the most common are:
SETUP: Begin call setup.
CALL_PROC: Proceeding; near end has received setup.
PROGRESS: Far end is sending a progress tone.
ALERTING: Far end is sending an audible ring progress tone.
CONNECT: Far end has answered.
DISCONNECT: Disconnect far end.
RELEASE: Near end has disconnected.

Information elements contain details about each message. Layer 3 information. Information elements are displayed on separate lines after the message name. There are two information element formats: standard Q.931 and nonstandard. Both formats display the information element name followed by hex octets representing the information element data. Q.931 octet 1 contains the information elements identifier. Q.931 octet 2 shows the number of octets to follow. Some Q.931 information elements only contain one octet. Nonstandard information elements are preceded by a tilde (~) and are for factory use. Nonstandard octets 1 and 2 are the information element identifier. Nonstandard octet 3 shows the number of octets to follow. IA5 (International Alphabet) characters are decoded and shown as readable characters surrounded by quotes (").

The most common information elements are:
BEARER_CAPABILITY: Encoding method. Transfer capability shown as text.
CALLING_NUMBER: Originating phone number.
CALLED_NUMBER: Destination phone number.
CAUSE: Cause of problem. Cause shown as text.
CHANGE_STATUS: Channel is in or out of service.
CHANNEL_ID: Bearer channel. Channel number shown as text.
DISPLAY: Send text such as an extension number or name.
NETWORK_FACILITY: Type of long distance service.
PROGRESS_IND: Whether or not call is end to end ISDN.
REDIRECTING_NUM: Redirecting phone number.

Call detail records show basic call information such as channel used and called number. Call detail records are displayed after a call is disconnected. The header *I/O,CID,DCN,CONN,START_T,CONNECT_T, DISC_T,CALLED,CALLING, (CDR Format) is displayed when data capture starts running. Call detail records start with * and commas separate each field.
I/O shows whether the call was inbound or outbound.
CID shows call id (4 hex digits).
DCN shows the digital channel number (Dnnn) or analog port (Pnnn).
CONN shows the connecting device and is formatted as Annn (connect action number), Dnnn (digital channel number), Gnnn (call generator), Mnnn (message number), Pnnn (analog port), or XXXX (no device).
Time is shown as ddhhmmss representing day, hour, minute, and second.
START_T shows the time call was started.
CONNECT_T shows the time call was connected.
DISC_T shows the time call was disconnected.
CALLED shows called number.
CALLING shows calling party number. Adjacent commas (,,) indicate information was not available.

Example: *O,8ABC,D201,P016,01143915,,,5551212,, shows that the call was sent by the system, call id is 8ABC, uses digital interface 2 channel 1, originated from analog port 16, started at day 01 hour 14 minute 39 second 15, no connect or disconnect time, called number is 5551212, and no calling number.

# Quick System Status

This screen shows a simple real time overview of each analog port or digital interface channel. It also shows the audio monitor status and call generator status. It starts or stops the call generator.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator      Screen 19

                              QUICK SYSTEM STATUS

                          1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3 3
                  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2

Analog:           - - - - - - - -

Interface 1:  - - - - - - - - - - - - - - - -   - - - - - - - - - - - - - - - -

Interface 2:  - - - - - - - - - - - - - - - -   - - - - - - - - - - - - - - - -

Call Generator Mode:     NOT RUNNING*

Call Generator Status:   NOT RUNNING

Audio Monitor Status:    ---




                  Press Space Bar or Backspace then <ENTER>
                        Press <F1> help, <F2> exit
```

## Help for Quick System Status

Analog: Shows single character status for each analog port: hyphen (-) for on-hook or break-loop current, A for alerting, C for off-hook, or N for no ring current detected (ring fault). If analog card is not present, nothing is shown for its associated ports.

Interface 1 and Interface 2: Shows single character value for each digital interface channel: hyphen (-) for not in use, A for alerting, C for connected, D for disconnect, G for progress, K for setup acknowledge, M for multirate, P for proceeding, R for reserved, S for setup, T for transition, and W for wink. The line may also show CARD NOT PRESENT, DISABLED, RECEIVING UNFRAMED ONES, RECEIVING REMOTE ALARM, NOT SYNCHRONIZED, or LAYER 2 DOWN indicating framing status of digital interface.

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. Indicates current call generator status.

Audio Monitor Status: Shows the specific analog port or digital channel being monitored. Analog ports show PORT. Digital interfaces show DCN. Hyphens (---) indicate no channel is currently being monitored.

# Save/Restore System Configuration

This screen loads the system configuration to or from non-volatile memory. Before installing new program ROM chips to upgrade the system, record the system configuration as all configuration parameters in system memory will be cleared.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 20

                    SAVE/RESTORE SYSTEM CONFIGURATION

Action:             --
Selected Profile:  1

No. Profile Description
1    FACTORY DEFAULTS
2    FACTORY DEFAULTS
3    FACTORY DEFAULTS
4    FACTORY DEFAULTS

Active Profile:  1 - FACTORY DEFAULTS
Active Status:   MATCHES SYSTEM CONFIGURATION




              Press Space Bar or Backspace then <ENTER>
                    Press <F1> help, <F2> exit
```

## Help for Save/Restore System Configuration

Action: Select hyphens (--), SAVE SYSTEM CONFIGURATION INTO SELECTED PROFILE, RESTORE SELECTED PROFILE INTO SYSTEM CONFIGURATION, RESTORE FACTORY DEFAULTS AND RESTART SYSTEM, SEND SELECTED PROFILE TO OUTPUT DEVICE, RECEIVE INCOMING DATA AND STORE INTO SELECTED PROFILE, or RESTART SYSTEM. <ENTER> must be pressed to initiate selected action. Hyphens (--) indicate no selection. Save system configuration into selected profile writes the current system configuration into the selected profile. Restore selected profile into system configuration loads the selected profile as the current system configuration. If the version numbers match, the system is restarted and the screen is cleared. If the version numbers do not match, NOT RESTORED – WRONG VERSION NUMBER appears on the action line. Restore factory defaults into system configuration loads the factory default values into the system configuration but not the profile database. The system is then restarted, which clears the screen. Restore factory defaults and profile database loads the factory default values into the system configuration and profile database. The system is then restarted, which clears the screen. Send selected profile to output device displays a special screen that gives further instructions regarding sending a profile to a remote storage device. Receive incoming data and store into selected profile displays a special screen that gives further instructions regarding receiving a profile from a remote storage device. Restart system restarts the system, which clears the screen.

Selected Profile: Select 1 through 4. Selects the profile to be acted upon by the action or new description function.

Profile Description: Enter text to uniquely describe a profile. Hyphens (--) indicate no text has been entered. Press <ENTER> to write the new name into the selected profile. This field can not be changed until the profile has been saved.

# Save/Restore System Configuration

## Help for Save/Restore System Configuration (continued)

Active Profile: Shows 1 through 4 and its associated description. Indicates the most recently loaded or saved profile. When not factory default, the associated description is also displayed at the top of each screen.

Active Status: Shows MATCHES SYSTEM CONFIGURATION or DOES NOT MATCH SYSTEM CONFIGURATION. Indicates whether the active profile matches the current system configuration.

Note: Profiles saved by version 1.10 and up are upward compatible with this software version. New features may or may not be initialized to their factory default settings. Manually set them to their factory default or strange behavior may result.

# Call Generator Configuration—Digital Interface

This screen tells the call generator how to initiate a call through the digital interface, when to terminate it, and what to do after the call is connected. There are two digital interface configuration screens, one for each digital interface. Interface 2 is not used when NFAS signaling is enabled.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator       Screen 21-1

            CALL GENERATOR CONFIGURATION - DIGITAL INTERFACE 1

Call Generator Mode:        NOT RUNNING*
Number of Active Calls:     0*
Time Between Calls/Cycles:  5      SECONDS
Call Start Interval:        0*     MILLISECONDS
Called Number:              55500[01+99]
                            --
Called Type of Number:      UNKNOWN NUMBER*
Mode:                       ROLLING*
Maximum Number of Calls:    --
Setup Time Limit:           60   SECONDS
Proceed Time Limit:         60   SECONDS
Progress/Alert Time Limit:  60   SECONDS
Connect Action:             CONNECT ACTION 1*

Call Generator Status:  NOT RUNNING

* Indicates factory default.

           Press Space Bar or Backspace then <ENTER>
         Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Call Generator Configuration—Digital Interface

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Number of Active Calls: Select 0* (default) through maximum number of destination channels. Indicates the maximum number of outgoing calls that can be initiated by the call generator. 0 indicates that no calls are initiated.

Time Between Calls/Cycles: Enter 1 through 999. Factory default is 5 seconds. Indicates the time until the first call begins. Also indicates the time interval after a call is complete until the next call begins (rolling) or time interval after last call is complete until the next cycle begins (burst). A minimum time, a hyphen (-), and a maximum time creates a random time. For example: 10-30 indicates to wait a minimum of 10 seconds and maximum of 30 seconds.

Call Start Interval: Select 0* (default) to 5000. Indicates minimum time in milliseconds between call start ups.

# Call Generator Configuration—Digital Interface

## Help for Call Generator Configuration—Digital Interface (continued)

Called Number: Enter up to 47 digits, including special characters. Digits 0123456789*# are allowed. The factory default is 55500[01+99]. This is the called number sent during call setup. Hyphens (--) indicate no number entered (default on row two). The called number should not contain an access digit (8 or 9) and is not processed by the Analog Port Outbound Call Configuration screen. Two rows are provided to allow more groups (discussed later). See Numbering Plan Configuration screen for other parameters sent during call setup. The system can send and receive up to 31 digits without problems.

Digits [+-]?; are special characters. Sequential numbers may be created using [min+max]. The sequential number is reset to its minimum value when the call generator is started. Random numbers may be created using [min-max]. Left bracket, plus (+) or minus (-), and right bracket are required. Example: 55500[01+99] sends a sequential number between 5550001 and 5550099. The minimum and maximum values may range from 0 through 9999 and do not need to have the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but not nested.

Groups may be created using number?certainty;. The number after question-mark (?) determines the certainty factor that the number will be sent. Semicolon (;) separates each group. If the certainty factor is missing, it is assumed to be 100 percent. Only one group per call is sent. The system compares the certainty factor to a random number between 1 and 100. If the certainty factor is greater than or equal to the random number then the number is sent. If the certainty factor is less than the random number then the next group is analyzed. No called number is sent if the list of groups has been exhausted. Up to 16 groups are allowed. Example: 911?10;611?30;5551212 sends 911 ten percent of the time, 611 thirty percent of the time, and 5551212 sixty percent of the time. The certainty factor is averaged over many cycles, the number of times a group is chosen is random within a cycle. Random numbers and sequential numbers are allowed within each group.

Called Type of Number: Select UNKNOWN NUMBER* (default), INTERNATIONAL NUMBER, NATIONAL NUMBER, SUBSCRIBER NUMBER, or ABBREVIATED NUMBER. Called type of number is sent in the called party number information element of the ISDN setup message.
Unknown number is either not identified or contains prefix digits that are not part of the called number. Example: *70 to disable call waiting.
International number includes a country code. Example: 443125551212.
National number includes a national area code. Example: 3125551212.
Subscriber number includes a local exchange number. Example: 5551212.
Abbreviated number is 3 to 5 digits long. Example: 1212 or 51212.

Mode: Select ROLLING* (default) or BURST. Rolling indicates that a new batch of calls can begin even though calls from the current batch have not ended. The time between cycles must elapse before a new batch of calls are started. Burst indicates that a new batch of calls cannot begin until all calls from the current batch have ended. The time between cycles must elapse before a new batch of calls are started.

Time limits tell the call generator how long to wait for an acknowledgment after a request has been sent before determining that the other side has failed and the call should be disconnected.

Maximum Number of Calls: Enter 0 through 9 digits. Hyphens (--) indicate no number entered (default). This is the maximum number of calls that may be started before the call generator stops running. No number indicates the number of calls is unlimited. When exceeded, the call counters on the Call Counter Screen must be reset and the call generator mode changed to RUNNING – START NEW CALLS or RUNNING – UNTIL NO CONNECT to start new calls.

Setup Time Limit: Enter 1 through 999. Factory default is 60 seconds. This is the time limit that the call generator will wait for a setup ack, proceed, alert, connect, or disconnect response after a setup request is sent. If one is not received, release complete is sent.

Proceed Time Limit: Enter 1 through 999. Factory default is 60 seconds. This is the time limit that the call generator will wait for an alert, connect, or disconnect response after a proceed response is received. If one is not received, a disconnect request is sent.

# Call Generator Configuration—Digital Interface

## Help for Call Generator Configuration—Digital Interface (continued)

Progress/Alert Time Limit: Enter 1 through 999. Factory default is 60 seconds. This is the time limit that the call generator will wait for a connect or disconnect response. After a progress or alert response is received. If one is not received, a disconnect request is sent.

Connect Action: Select CONNECT ACTION 1 through CONNECT ACTION 3, or NONE. The factory default for digital interface 1 and digital interface 2 is CONNECT ACTION 1* and CONNECT ACTION 2* respectively. Instructs the call generator what to do after a connection has been established with the called party. The connect action is configured on the connect action screen. None indicates that the call is connected but no connect action is performed.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. Indicates current call generator status.

# Call Generator Configuration—Analog Ports

This screen tells the call generator how to initiate a call through the analog ports, when to terminate it, and what to do after the call is connected. This screen is specific to the analog ports.

```
Gordon Kapes, Inc.       System 930 Telephony Simulator      Screen 21-3

                  CALL GENERATOR CONFIGURATION - ANALOG PORTS

  Call Generator Mode:        NOT RUNNING*
  Number of Active Calls:     0*
  Time Between Calls/Cycles:  5    SECONDS
  Call Start Interval:        0*   MILLISECONDS
  Called Number:             9,55500[01+99]
  Call Routing:               ALL PORTS*
  Mode:                       ROLLING*
  Maximum Number of Calls:    --
  Alert Time Limit:           60   SECONDS
  Connect Action:             CONNECT ACTION 3*

  Call Generator Status:  NOT RUNNING



  * Indicates factory default.

               Press Space Bar or Backspace then <ENTER>
         Press Arrow Keys, <F1> help, <F2> exit, <F3> previous
```

## Help for Call Generator Configuration—Analog Ports

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Number of Active Calls: Select 0* (default) through maximum number of analog ports. Indicates the maximum number of outgoing calls that can be initiated by the call generator. 0 indicates that no calls are initiated.

Time Between Calls/Cycles: Enter 1 through 999. Factory default is 5 seconds. Indicates the time until the first call begins. Also indicates the time interval after a call is complete until the next call begins (rolling) or time interval after last call is complete until the next cycle begins (burst). A minimum time, a hyphen (-), and a maximum time creates a random time. For example: 10-30 indicates to wait a minimum of 10 seconds and maximum of 30 seconds.

Call Start Interval: Select 0* (default) to 5000. Indicates minimum time in milliseconds between call start ups.

# Call Generator Configuration—Analog Ports

## Help for Call Generator Configuration—Analog Ports (continued)

Called Number: Enter up to 47 digits, including special characters. Digits 0123456789*# are allowed. The factory default is 9,55500[01+99]. Hyphens (--) indicate no number entered. This field is used by the 939 Analog Card only. It contains the number to be DTMF dialed when the call is initiated by the call generator. The called number may contain an access digit (8 or 9) and is not processed by the Analog Port Outbound Call Configuration screen. The system can send up to 31 DTMF digits without problems.

Digits ,[+-] are special characters. Comma (,) causes DTMF dialing to pause for two seconds. Sequential numbers may be created using [min+max]. The sequential number is reset to its minimum value when the call generator is started. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. Left bracket, hyphen (-) or a plus (+), and right bracket are required. For example: 55500[01+99] indicates to send a sequential number between 5550001 and 5550099. The minimum and maximum values may range from 0 through 9999 and do not need to have the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but not nested.

Call Routing: Select ALL PORTS* (default), or ACD 1 through ACD 32. All ports indicates that calls can be made to all analog ports. ACD 1 through ACD 32 indicates that calls are restricted to analog ports assigned to the ACD on the Analog Port Configuration screen. Analog ports are chosen in ascending sequential order starting from port 1. If no analog ports are available, the call is not made. Resources on the ACD Configuration screen are not used.

Mode: Select ROLLING* (default) or BURST. Rolling indicates that calls are started with a minimum 50ms interval between any two calls. Upon completion, the time between cycles must elapse before the call is restarted. Burst indicates that all calls will start simultaneously. All calls must end and the time between cycles must elapse before a new batch of calls are started.

Maximum Number of Calls: Enter 0 through 9 digits. Hyphens (--) indicate no number entered (default). This is the maximum number of calls that may be started before the call generator stops running. No number indicates the number of calls is unlimited. When exceeded, the call counters on the Call Counter Screen must be reset and the call generator mode changed to RUNNING – START NEW CALLS or RUNNING – UNTIL NO CONNECT to start new calls.

Alert Time Limit: Enter 1 through 999. Factory default is 60 seconds. This is the time limit that the call generator will wait for the call to be answered after being alerted. If the call is not answered within the specified time, alerting stops.

Connect Action: Select CONNECT ACTION 1 through CONNECT ACTION 3* (default), or NONE. Instructs the call generator what to do after a connection has been established with the called party. The connect action is configured on the connect action screen. None indicates that the call is connected but no connect action is performed.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. Indicates current call generator status.

# Call Counters—Digital Interface

This screen displays the call generator's current status and historical data for each digital interface. Statistics are saved during power down. It also starts or stops the call generator and allows historical data to be reset. <ENTER> must be pressed to changed these features. There are two digital interface call counter screens, one for each digital interface. Screen 2 is not used when NFAS signaling is enabled.

```
Gordon Kapes, Inc.        System 930 Telephony Simulator        Screen 22-1

                    CALL COUNTERS - DIGITAL INTERFACE 1

  Call Generator Mode:      NOT RUNNING*
  Reset Counters:           NO*
  Enable Counters:          ENABLED*
  Call Generator Status:    NOT RUNNING
  Call Generator Cycle:     0              Call Generator Active Calls:  0

                    Outbound                    Incoming
                Sent      Received       Sent      Received
  Setup:        1         ---            ---       0
  Setup Ack:    ---       0              0         ---
  Proceed:      ---       1              0         ---
  Progress:     ---       0              0         ---
  Alert:        ---       1              0         ---
  Connect:      0         1              0         0
  Action:       0         ---            0         ---
  Disconnect:   1         0              0         0
  Release:      0         1              0         0
  Clear:        ---       0              ---       0
                Press Space Bar or Backspace then <ENTER>
              Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Call Counters—Digital Interface

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Reset Counters: Select NO* (default), THIS SCREEN ONLY, or ALL CALL COUNTER SCREENS. The selections allow counters on this screen or all screens to be reset. <ENTER> must be pressed to reset counters.

Enable Counters: Select ENABLED* (default), or DISABLED. This selection enables or disables counters to accumulate information. By design the counters accumulate information for all calls, not just calls generated by the call generator.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. Indicates current call generator status.

Call Generator Cycle: Shows the number of times the call generator has started a new batch of calls. This applies to both rolling and batch modes.

# Call Counters—Digital Interface

## Help for Call Counters—Digital Interface (continued)

Call Generator Active Calls: Shows current number of outgoing calls that were initiated by the call generator. Burst mode won't start until this number is zero and the time between cycles has elapsed.

The next few status lines shows the number of outbound and incoming calls. Outbound calls are calls initiated by the system. Incoming calls are calls terminated by the system. The status lines show counters indicating the number of requests sent and responses received. The sent count indicates that an attempt was made to send the request but the request may not actually be sent due to the call state. The received count indicates the number of responses accepted by the system. A response may be received but not accepted due to the call state. Counters increment from 0 through 4294967295 then wrap around to 0.

Setup: Shows the number of call setup states sent and received by the system. Setup is used to start a call.

Setup Ack: Shows the number of setup acknowledge states sent and received by the system. Setup acknowledge is used by Euro ISDN to indicate that the system is ready to receive a called number.

Proceed: Shows the number of call proceeding states sent and received by the system. Proceed indicates that the called number or lack thereof is being processed.

Progress: Shows the number of progress states sent and received by the system. Progress indicates that the called number is not being alerted.

Alert: Shows the number of alert states sent and received by the system. Alerting indicates that the called party is being alerted.

Connect: Shows the number of connect states sent and received by the system. Connect indicates that the called party is connected.

Action: Shows the number of times the C command was executed from an outgoing or incoming call connect action.

Disconnect: Shows the number of disconnect states sent and received by the system. Disconnect indicates to disconnect the bearer channel.

Release: Shows the number of release states sent and received by the system. Release indicates to release the call.

Clear: Shows the number of clear states received by the system. Clear indicates that an unexpected release complete was released and that the call was released.

# Call Counters—Analog Ports

This screen displays the call generator current status and historical data for the analog ports. Statistics are saved during power down. It also starts or stops the call generator and allows historical data to be reset. <ENTER> must be pressed to changed these features. This screen is specific to the analog ports.

```
Gordon Kapes, Inc.      System 930 Telephony Simulator      Screen 22-3

                     CALL COUNTERS - ANALOG PORTS

Call Generator Mode:     NOT RUNNING*
Reset Counters:          NO*
Enable Counters:         ENABLED*


Call Generator Status:  NOT RUNNING
Call Generator Cycle:   0                 Call Generator Active Calls:  0

                  Outbound                 Incoming
             Sent      Received      Sent         Received
Alert:       ---       ---           1            0
Connect:     0         2             0            1
Action:      0         ---           0            ---
Disconnect:  0         2             1            0



* Indicates factory default.


            Press Space Bar or Backspace then <ENTER>
        Press Arrow Keys, <F1> help, <F2> exit, <F3> previous
```

## Help for Call Counters—Analog Ports

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Reset Counters: Select NO* (default), THIS SCREEN ONLY, or ALL CALL COUNTER SCREENS. The selections allow counters on this screen or all screens to be reset. <ENTER> must be pressed to reset counters.

Enable Counters: Select ENABLED* (default), or DISABLED. This selection enables or disables counters to accumulate information. By design the counters accumulate information for all calls, not just calls generated by the call generator.

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. Indicates current call generator status.

Call Generator Cycle: Shows the number of times the call generator has started a new batch of calls. This applies to both rolling and batch modes.

# Call Counters—Analog Ports

## Help for Call Counters—Analog Ports (continued)

Call Generator Active Calls: Shows current number of outgoing calls that were initiated by the call generator. Burst mode won't start until this number is zero and the time between cycles has elapsed.

The next few status lines shows the number of outbound and incoming calls. Outbound calls are calls initiated by the system. Incoming calls are calls terminated by the system. The status lines also show counters indicating the number of requests sent and responses received. Counters increment from 0 through 4294967295 then wrap around to 0.

Alert: Shows the number of alert states sent by the system. Alert indicates the presence of ring voltage.

Connect: Shows the number of connect states sent and received by the system. Connect indicates the off-hook condition.

Action: Shows the number of times the C command was executed from an outgoing or incoming connect action.

Disconnect Sent: Shows the number of disconnect states sent and received by the system. Disconnect sent indicates the break loop condition. Disconnect received indicates the on-hook condition.

# Connect Action Configuration

This screen instructs the system what to do after a call is routed to connect action and a connection has been established with the called party. It also starts or stops the call generator. There are three screens, one for each connect action.

```
Gordon Kapes, Inc.     System 930 Telephony Simulator        Screen 23-1

                     CONNECT ACTION 1 CONFIGURATION

Call Generator Mode:     NOT RUNNING*
Connect Action:
  T19,1;W10;C;H
  --
  --
  --
  --


Call Generator Status:  NOT RUNNING





* Indicates factory default.

              Press Space Bar or Backspace then <ENTER>
         Press Arrow Keys, <F1> help, <F2> exit, <F4> next
```

## Help for Connect Action Configuration

Call Generator Mode: Select NOT RUNNING* (default), RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING – UNTIL NO CONNECT. This is a global selection that affects all digital interfaces and analog ports. Upon power up or reboot, the call generator is not running. Not running immediately disconnects all calls started by the call generator and prevents the call generator from starting new calls. Running – start new calls allows the call generator to start new calls. By design the call generator waits the selected time between cycles before making the first call. Running – no new calls prevents new calls from starting but does not disconnect calls in process. Running – until no connect prevents new calls from starting after a call has failed to connect but does not disconnect calls in process. <ENTER> must be pressed to change this feature.

Connect Action: Instructs the system what to do after a connection has been established with the called party. Enter up to five lines of commands. Factory default (T19,1;W10;C;H) sends tone 19 (440Hz) for one second, waits 10 seconds, increments the action counter on the call counter screen, then disconnects. Hyphens (--) indicate no entry has been made. Eight commands are available: C for count, D for dial, H for hangup, M for message connect, S for silence detection, T for tone connect, V for voice detection, and W for wait. Use semicolon (;) to append commands together. A single command may not be spread over two lines. Commands are executed starting from the top line.

Count: C. This command increments the action counter by one on the call counter screen.

Dial: D followed by the DTMF digits to dial. There are no default DTMF digits. This command sends in-band DTMF tones. Each tone is on for 100 ms, with 100 ms between tones. Digits 0123456789*# are allowed. The number of digits is limited only by the line length. Sequential numbers may be created using [min+max]. The sequential number is reset to its minimum value when the call generator is started.

# Connect Action Configuration

## Help for Connect Action Configuration (continued)

Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the random number. A left bracket, hyphen (-) or a plus (+), and right bracket are required. For example: D55512[00-99] indicates to dial a number between 5551200 and 5551299. Minimum and maximum values may range from 0 through 9999 and do not need to have the same number of digits. Random values may not contain * or #. Brackets may be repeated, but not nested.

Hangup: H followed by the disconnect certainty factor in percent. The disconnect certainty factor may range from 0 to 99 percent. If certainty factor is not specified, command will always cause disconnect, canceling any remaining commands. The disconnect certainty factor is used to create randomization. Sometimes the call will disconnect and sometimes it won't. If the call doesn't disconnect, the next command is allowed to execute. Obviously, if the call disconnects the remaining commands are not executed. For example: H50 indicates to disconnect 50 percent of the time.

Message Connect: M followed by the message number, comma, and time in seconds. This command sends an in-band voice message using the recorder/announcer resource. The message number may be 1 or 2. If message number is not specified, the default is message 1. If message time is not specified, the specified message is started immediately and plays once until the message ends. Each message has a maximum length of 20 seconds. Time may range from 1 through 999 seconds. If the message is shorter than the specified time, the message will simply repeat until the time expires. A hyphen (-) between two times creates a random time. For example: M1,10-30 causes message 1 to play for a minimum of 10 seconds and a maximum of 30 seconds.

Silence Detection: S followed by time in seconds. This command waits for silence to be detected for the specified time. If time is not specified, the default is 3 seconds. Time may range from 1 through 999 seconds. Audio is detected when the digital sample is between hexadecimal 00-59 or 80-D9 for mu-law and 00-2A or 80-AA for A-law. This corresponds to 30% of the maximum audio level. Example: S10 waits for 10 seconds of silence. If silence is not detected for the specified time, no further commands are processed. A hyphen (-) between two times creates a random time. For example: S10-30 waits for silence to be detected for a minimum of 10 seconds and maximum of 30 seconds.

Voice Detection: V followed by time in seconds. This command waits for a voice message of any time duration, followed by an interval of silence for the specified time. If time is not specified, the default is 1 second. Time may range from 1 through 999 seconds. Audio is detected when the digital sample is between hexadecimal 00-4C or 80-CC for mu-law and 00-1D or 80-9D for A-law. This corresponds to 40% of the maximum audio level. Example: V10 waits for voice energy, followed by 10 seconds of silence. If voice energy is not detected followed by silence for the specified time, no further commands are processed. A hyphen (-) between two times creates a random time. For example: V10-30 waits for voice energy to be detected followed silence to be detected for a minimum of 10 seconds and a maximum of 30 seconds.

Tone Connect: T followed by the tone number, comma, and time in seconds. If tone number is not specified, the default is tone 19 (440Hz). Time may range from 1 through 999 seconds. If time is not specified, the default is 1 second. This command sends an in-band tone using the tone facility. A hyphen (-) between two times creates a random time. For example: T19,10-30 indicates to send a 440Hz tone for a minimum of 10 seconds and maximum of 30 seconds. See tone list.

Wait: W followed by the time in seconds. If time is not specified, the default is 1 second. While waiting, silence is sent on the associated channel. A hyphen (-) between two times creates a random wait time. For example: W10-30 indicates to wait for a minimum of 10 seconds and a maximum of 30 seconds. Time values may range from 1 through 999 seconds.

Command Separator: Semicolon (;). Used to append commands on a line. For example: D123;M1;H indicates to dial DTMF digits 123, play message 1 until the end of the message, and then disconnect.

# Connect Action Configuration

## Help for Connect Action Configuration (continued)

Tone List

| | | | |
|---|---|---|---|
| 0 - DTMF 0 | 4 - DTMF 4 | 8 - DTMF 8 | 16 - Dial Tone |
| 1 - DTMF 1 | 5 - DTMF 5 | 9 - DTMF 9 | 17 - Audible Ring |
| 2 - DTMF 2 | 6 - DTMF 6 | 14 - DTMF * | 18 - Busy/Reorder |
| 3 - DTMF 3 | 7 - DTMF 7 | 15 - DTMF # | 19 - 440Hz |

Call Generator Status: Shows NOT RUNNING, NOT RUNNING – MAXIMUM NUMBER OF CALLS REACHED, RUNNING – START NEW CALLS, RUNNING – NO NEW CALLS, or RUNNING UNTIL NO CONNECT. Indicates current call generator status.

# Time & Date Configuration

This screen sets the time and date used by the data capture display screens.

```
Gordon Kapes, Inc.     System 930 Telephony Simulator          Screen 24

                       TIME & DATE CONFIGURATION

Current Time Zone:  --
Current Year:       00
Current Month:      01
Current Day:        01
Current Hour:       00
Current Minute:     40






* Indicates factory default.

                    Enter Time Zone or Backspace.
                      Press <F1> help, <F2> exit
```

## Help for Time & Date Configuration

Time Zone: Enter time zone abbreviation, up to 5 characters. Shows hyphens (--) if no time zone has been entered. Example: UTC for Universal Time Coordinated.

Current Year: Select 00 through 99. Current time appears in data capture records. Revision C processor card does not advance time during power down. Revision F processor board maintains time during power down through use of a battery powered clock. Changing any time field resets seconds to 00.

Current Month: Select 01 through 12.

Current Day: Select 01 through 31. Upper limit depends on year and month.

Current Hour: Select 00 through 23.

Current Minute: Select 00 through 59.

# 939 Analog Card Configuration

This screen configures parameters for the 939 Analog Card. The 939 Analog Card emulates the FXS (subscriber) side of a loop start circuit.

```
Gordon Kapes, Inc.     System 930 Telephony Simulator        Screen 25

                    939 ANALOG CARD CONFIGURATION


Inbound Analog Call Configuration:
Number of Rings:       1*
Route Action:          CONNECT ACTION 3*
Called Number:         55500[01+99]
Called Mode:           SEND CALLED NUMBER*
Type of Number:        UNKNOWN NUMBER*

Outbound Analog Calls Initiated from a Digital Interface:
Analog Dialed Number:  9,55500[01+99]
Analog Dialed Mode:    SEND ANALOG DIALED NUMBER*




* Indicates factory default.

              Press Space Bar or Backspace to select
              Press Arrow Keys, <F1> help, <F2> exit
```

## Help for 939 Analog Card Configuration

The 939 Analog Card allows the system to answer an incoming analog call. Incoming analog calls are detected by the presence of ring voltage. The system initiates an outbound call according to the selected route action. The calls are then connected together. Call teardown is initiated by a break in analog loop current or a disconnect from the outbound side. The Analog Port Dialing Configuration screen and Analog Port Outbound Call Configuration screen are not used.

The 939 Analog Card also allows the system to make an outbound analog call. Calls may be initiated from one of three sources; an incoming call from a digital interface, the call generator, or an outgoing call from another analog port. To make an outbound analog call the 939 analog port goes off-hook, DTMF dials the analog dialed number, and connects the calls together. Digital interface calls are routed to the 939 Analog Card when route if match on the Inbound Match Configuration screen is set to an ACD or PORT containing a 939 analog port. Call generator calls are routed to the 939 Analog Card when call routing on the Call Generator Configuration – Analog Ports screen is set to an ACD containing a 939 analog port. Analog port calls are routed to the 939 Analog Card by dialing the extension of a 939 analog port. When going off-hook, if the 939 analog port does not detect loop current within the outbound first digit timeout time as configured on the Analog Port Dialing Configuration screen, the port goes on-hook and the call is terminated.

Number of Rings: Select 1* (default) through 9. Number of incoming alerting cycles before going off-hook and processing the call.

# 939 Analog Card Configuration

## Help for 939 Analog Card Configuration (continued)

Route Action: Select CONNECT ACTION 1 through CONNECT ACTION 3* (default), DIGITIAL INTERFACE 1, DIGITAL INTERFACE 2, ALTERNATE INTERFACES REORDER, BUSY, MSG 1 PLAY CONTINUOUS, MSG 2 PLAY CONTINUOUS, or ACD 1 through ACD 32. Selects the action taken after the 939 analog port answers a call. Connect action 1 through connect action 3 routes the call to the specified connect action. Digital

interface and alternate interfaces sends the call to the specified digital interface. Alternate interfaces uses digital interfaces 1 & 2, alternating between them on every other call. Reorder and busy routes the call to the specified progress tone and remains connected until the caller disconnects. Msg 1 play continuous and msg 2 play continuous routes the call to the specified voice message and plays the message until the caller disconnects. ACD routes the call to the specified ACD group.

Called Number: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. The factory default is 55500[01+99]. Hyphens (--) indicate no number entered. Used when an inbound call is routed to a digital interface. Determines part of the called number sent to the digital interface. An access digit (8 or 9) is not required. The system can send and receive up to 31 digits without problems.

Digits [+-] are special characters. Sequential numbers may be created using [min+max]. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. A left bracket, a hyphen (-) or a plus (+), and a right bracket are required. For example: 55512[00-99] indicates to send a random number between 5551200 and 5551299. The minimum and maximum values may range from 0 through 9999 and do not require the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but may not be nested.

Called Mode: Select SEND CALLED NUMBER* (default), SEND CALLED NUMBER WITH 1 DIGIT EXT OVER-LAY through SEND CALLED NUMBER WITH 4 DIGIT EXT OVERLAY, SEND CALLED NUMBER WITH EXTENSION OVERLAY, or SEND NO NUMBER. Used when an inbound call is routed to a digital interface. Determines the called number sent to the digital interface. Send called number sends the called number. Send called number with 1 digit ext overlay through Send called number with 4 digit ext overlay sends the called number and overlays the last one to four analog port extension digits at the end of the called number. The digits are overlaid from left to right. Send called number with extension overlay sends the called number and overlays up to five analog port extension digits at the end of the called number. Send no number means that there is no number. Example: If this selection is send called number with 2 digit ext overlay, the called number is 5550000, and the extension is 1234, then the number sent is 5550034.

Type of Number: Select UNKNOWN NUMBER* (default), INTERNATIONAL NUMBER, NATIONAL NUMBER, SUBSCRIBER NUMBER, or ABBREVIATED NUMBER. Used when an inbound call is routed to an ISDN digital interface. The digital interface type of number is sent in the called party number information element of the ISDN setup message.
Unknown number is either not identified or contains prefix digits that are not part of the called number. Example: *70 to disable call waiting.
International number includes a country code. Example: 443125551212.
National number includes a national area code. Example: 3125551212.
Subscriber number includes a local exchange number. Example: 5551212.
Abbreviated number is 3 to 5 digits long. Example: 1212 or 51212.

Analog Dialed Number: Enter up to 31 digits, including special characters. Digits 0123456789*# are allowed. The factory default is 9,55500[01+99]. Hyphens (--) indicate no number entered. This deter-mines part of the number to be DTMF dialed by the 939 Analog Card when calls are initiated from a digital interface. Digital interface calls are routed to the 939 Analog Card from the Inbound Match Configuration screen when route if match is set to an ACD or PORT containing a 939 analog port. This selection is not used for calls initiated by the call generator or when dialing a 939 analog port from a non-939 analog port. Each DTMF tone is on for 100 ms, with 100 ms between tones. The system can send up to 31 DTMF digits without problems.

# 939 Analog Card Configuration

## Help for 939 Analog Card Configuration (continued)

Digits ,[+-] are special characters. Comma (,) causes DTMF dialing to pause for two seconds. Sequential numbers may be created using [min+max]. Random numbers may be created using [min-max]. Min and max represent the minimum and maximum values of the number. A left bracket, a hyphen (-) or a plus (+), and a right bracket are required. For example: 55512[00-99] indicates to send a random number between 5551200 and 5551299. The minimum and maximum values may range from 0 through 9999 and do not require the same number of digits. The minimum and maximum values may not contain * or #. Brackets may be repeated, but may not be nested.

Analog Dialed Mode: Select SEND ANALOG DIALED NUMBER* (default), SEND ANALOG DIALED NUMBER WITH CALLED NUMBER OVERLAY, SEND ANALOG DIALED NUMBER FOLLOWED BY CALLED NUMBER, or SEND NO NUMBER. This determines the complete number to be DTMF dialed by the 939 Analog Card when calls are initiated from a digital interface. Digital interface calls are routed to the 939 Analog Card from the Inbound Match Configuration screen when route if match is set to an ACD or PORT containing a 939 analog port. This selection is not used for calls initiated by the call generator or when dialing a 939 analog port from a non-939 analog port. Send analog dialed number allows the analog dialed number to be DTMF dialed. Send analog dialed number with called number overlay DTMF dials the analog dialed number with the called number overlaid at the end of the analog number. The digits are overlaid from left to right. The called number is the called number received from the digital interface. Send analog dialed number followed by called number DTMF dials the analog dialed number followed by the called number. Send no number does not DTMF dial a number.