DNA100
Digital Network Adapter

Ring Communications Inc.

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DNA100 DIGITAL NETWORK ADAPTER

INTRODUCTION

The **D**igital **N**etwork **A**dapter (DNA100) interfaces an external RS232 or RS422 device to *Ring Communications'* Crisis Alert System. By setting DIP switches, the DNA100 can be selected to drive these devices:

Termina:l

The external device may be a VT100 Terminal or a PC with VT100 emulation software. The DNA100 is used to configure the following devices:

EX901	Processor card CB901EX
EX500	Processor card RM5000EX
DNA200	Video switcher
DNA300	Input Output Module
DNA400	Pocket page interface
DXC901	Exchange controller for CB901
DXC910	Exchange controller for CB910/RM5K

A menu of options on the terminal also allow the user to set the Time/Date, List devices connected to the Crises Alert Network ,View Errors on network, and Monitor network data traffic. The terminal may also be used as an annunciator display. (see MENU SYSTEM OPERATION).

Printer:

Provides an event activity log of all annunciation and event handling with time/date stamp   (see ACTIVITY LOG PRINTER).

The DNA100 operates on +24 VDC (+12, -12 VDC). It can be powered from the central exchange or can be powered locally by a separate 24 VDC regulated power supply.

The recommended cord is the BF640A to connect the DNA100 to the RJ45 network jack, KB171. Cords and jacks must be ordered separately.

INSTALLATION

Each DNA100 in a system can be individually powered from a fuse in the CB901 or a local power supply operating off 24V regulated DC.

RS422	**RS232**	**RS485**
123456		12345678
J3	J2	J1
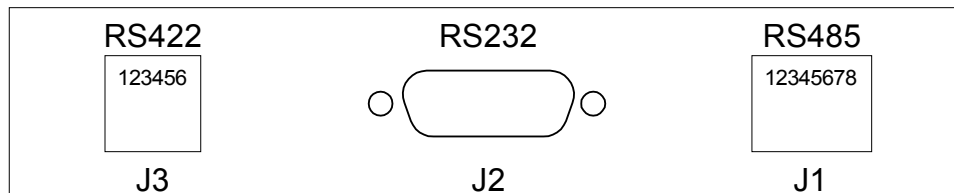
J1 - 8 pin (RJ45) Network connections :

Two modular jacks are provided at the rear of the DNA100. See **Figure C1**. **Use modular cables with straight through pin configuration only!** An 8-pin (RJ45) modular jack (KB171) and cord (BF640A) are required for connection to the network.

        PIN# -   DESIGNATION
     1 - No connection.
     2 - +12 VDC power input
     3 - Data + (positive)
     4 - No connection.
     5 - No connection.
     6 - Data - (negative)
     7 - -12 VDC power input
     8 - External Alarm.

The maximum total network length is 7000 feet. A unshielded twisted pair cable should be used for the data pair (24 or 22 AWG).

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Connect the DATA pair from the network to pins 3 and 6 of the RJ45 wall jack maintaining polarity of the pair.

If a remote power source is being used, the negative side of the supply must be referenced to Earth Ground, as well as, the CB901 power supply.

J2 - 9 pin (DB9) RS232 signals :

The DNA100 has a RS232 serial port interface, J2, that can connect to a terminal or printer. Check your terminal, printer or video switcher manual for the correct RS232 connector type, input, output and handshaking signal connections.

The maximum length for a RS232 cable connecting the DNA100 and other equipment is 50 feet.

A null-modem (LapLink) cable can be used to connect a DNA100 and a laptop or computer together if they are close enough to each other.

The following is a description of the pinout of the DB9 connector on the DNA100.

J2 PIN#	SIGNAL NAME	DIRECTION/ DESIGNATION
1	DCD	Data Carrier Detect, input.
2	RXD	Receive Data, input.
3	TXD	Transmit Data, output.
4	DTR	Data Terminal Ready, output.
5	GND	Signal Ground.
6	DSR	Not used.
7	RTS	Request to Send, output.
8	CTS	Clear to Send, input.
9	RI	Not used.

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J3 - 6 pin (RJ11) RS422 signals :

A two twisted pair installation utilizing RS422 signals can be used to connect two bridges up to 7000 feet apart.

Use a six wire RJ11 cord with straight through wiring from J3 to another RJ11 jack on both sides of the installation, and then use two twisted pairs between the two RJ11 jacks as shown in **Figure C2**.

A strap **MUST** be installed between RTS and CTS of J2 (DB9), in order to disable flow control for the RS422. To do this, simply place a strap between pin 7 and pin 8 of J2. You could also solder this strap to a female DB9 connector with solder lugs on the rear, then insert it into the J2 connector. **Figure C2** illustrates the strapping of J2.
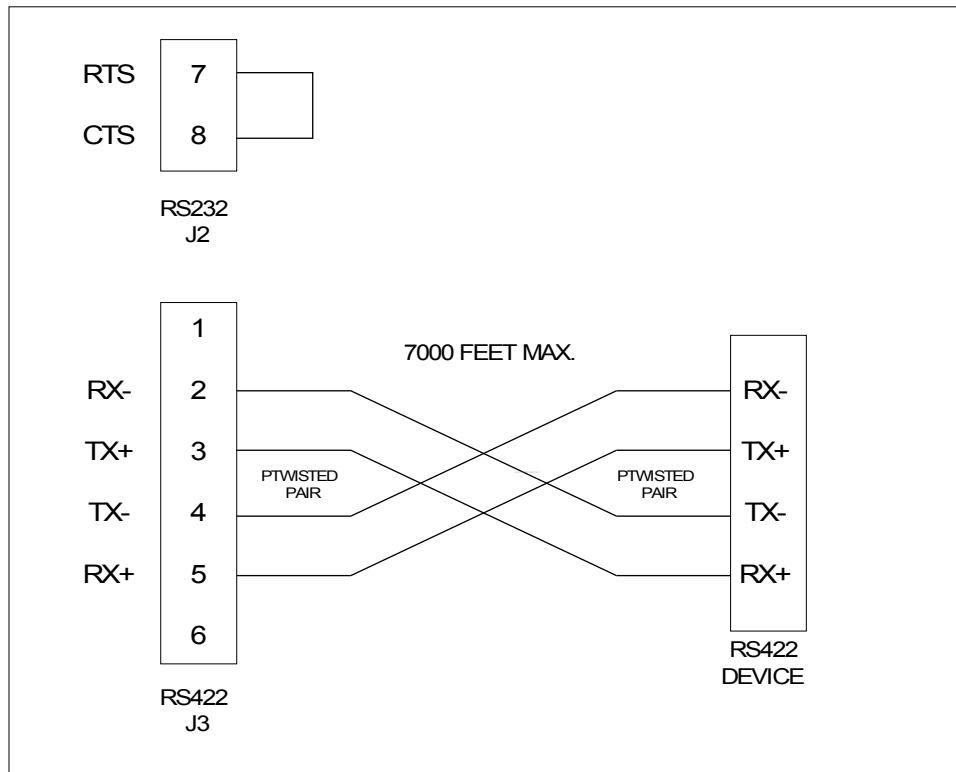
Setting Baud Rate / Selecting Device Type   (For switch locations see **Figure C3**.)

DIP switches SW3-1 through SW3-6 are used to set the desired baud rate for the RS232 device. SW3-7 and SW3-8 are used to select the RS232 device the DNA100 is driving (see chart below).

BAUD RATE	SW3 1	2	3	4	5	6		DEVICE	SW3 7	8
19200	1	0	0	0	0	1		Terminal	0	0
9600	1	0	0	0	1	0	0 = off	Printer	0	1
4800	0	1	0	0	0	1	1 = on	Not used	1	0
2400	0	1	0	0	1	0		Not used	1	1
1200	1	0	0	0	1	1				

Communication Protocols

Aside from the baud rate, the terminal emulation should be set for VT100.
The DNA100 has No Parity, 8 Data Bits, and 1 Stop Bit.

Hardware flow control is used (RTS/CTS). The DNA100 will send data only if CTS is high from the other device.

Compatible emulation software:
Procomm Plus
Terminal for Windows 3.11
Hyper Terminal for Windows 98/XP

Set software flow control to OFF and hardware flow control to ON.
Set Pace character to **>**

Setting Network and Device Address

DIP switch SW2 is used to set the address of the DNA100. See SETTING NETWORK ADDRESS of Chapter A -NETWORK for a full description for setting addresses, as well as, an addressing chart.

External Alarm Output

If an external signaling device is required in addition to the audible signal in the terminal device, a driver is available at the RJ45 jack. The driver can be directly connected to a 24 relay. Connect the relay between   pin 2 (positive supply) of the RJ45 jack and pin 8 of the RJ45.
No alarms turn the relay on.
One ore more alarms turn the relay off.

The DNA100 pin 8 can drive 100mA.

FRONT PANEL SWITCHES AND INDICATORS

SWITCHES

SW1   -   Reset. Creates a local reset for this node only.
SW2   -   Node & Network Address
SW3   -   RS232 Baud Rate, Device selection

L.E.D.'s (left side, network)

RUN   -   Indicates the local processor in the DNA100 is running. Will illuminate after power up or reset.

MASTER -   Will light steady if this node is the master on the network. There can only be one master on each network. On power up, each device waits for a response from a master. If no response is received, then this device will take over as a master. Therefore, the first device powered up will be the master.

TX   -   Transmit data to the Network. Will flash when the DNA100 sends data out on the Network. If the Master LED is on, the TX LED will flash constantly. When the Master LED is off, TX will only flash when transmitting to other devices.

RX   - Receive data from the Network. Will flash when data is transmitted from another device to the network. If the Master LED is on, the RX LED will flash when other devices respond to scanning from the Master. When the Master LED is off, the RX LED will flash constantly.

L.E.D.'s (right side, RS232)

RTS   - Request to send. Output, indicates the DNA100 is ready to receive data from the RS232 device.

CTS   - Clear to send. Input, (selectable for internal or external input) illuminated when the RS232 device is ready to receive data from the DNA100.

TX   -   Transmit data. Output to RS232 device. Should flash every second when the time is updated or data is transmitted to the RS232 device.

RX   - Receive data. Input from RS232 device. Will flash when keys are pressed on the terminal device or data is sent to the DNA100.
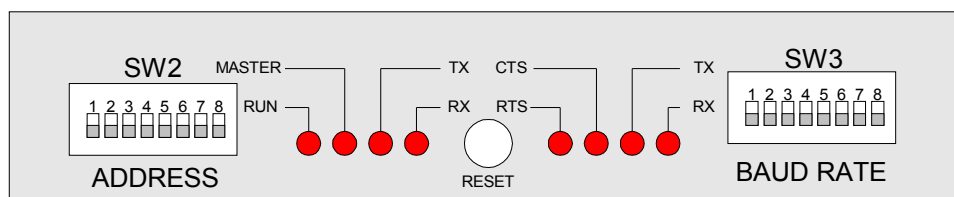
MENU SYSTEM OPERATION

```
   2012/03/22          RING CRISIS ALERT SYSTEM              11:57:42
  ==================================================================


1- STATUS DISPLAY

2 - SET DATE/TIME

3 - CRT EMULATION

4 - NETWORK MONITOR

5 - NETWORK INFORMATION

6 - COMMUNICATIONS LINK

7 - CONFIGURE (DXC901/DXA100)

8 - BACKUP (DXC901/DXA100)

9 - RESTORE (DXC901/DXA100)

10 - MEMORY DISPLAY

11 - PACKET MONITOR
```

MAIN MENU

When a DNA100 is initialized, after power on or reset, the Sᴛᴀᴛᴜꜱ Dɪꜱᴘʟᴀʏ is brought up automatically (see Sᴛᴀᴛᴜꜱ Dɪꜱᴘʟᴀʏ option below). To access the Mᴀɪɴ Mᴇɴᴜ the user must press and hold the Control (CTRL) key and then press X on the terminal keyboard (CTRL-X).

The Mᴀɪɴ Mᴇɴᴜ displays the date and time on the top line and eight options. To choose an option from the Mᴀɪɴ Mᴇɴᴜ, move the highlighted line by using the ↑ or ↓ (UP or DOWN) arrows on the keyboard, or enter the number associated with the menu option required, highlighting your choice, and then press the enter key.

MENU OPTIONS:

1 - STATUS DISPLAY (See Figure C5 & Figure C6): Default power up screen. This option allows the user to view the real time status of all supervised stations and to receive and handle events. To go to the MAIN MENU from STATUS DISPLAY press and hold CTRL then press X.

2 - SET DATE/TIME : Select to set network date and/or time. The date format is YY/MM/DD and time is in 24 hour format, HH:MM:SS. Use the ← and → (LEFT and RIGHT) arrows to place the cursor on the digits you wish to change, and press the ↑ or ↓ (UP or DOWN) arrows to increase or decrease the digits until the correct date and/or time is set. Pressing Esc will return you to the MAIN MENU.

3 - CRT EMULATION : To set emulation mode. Wyse 350 for color terminal, Wyse 50 for monochrome terminal or VT100 for PC emulation . Enter the number on the keyboard to select your choice. Press ESC to return to main menu.

4 - NETWORK MONITOR (See Figure C13): Displays all active nodes on all active networks including receive errors and retransmissions. Useful during installation and trouble shooting or basic network management. Press Esc to return to the MAIN MENU.

5 - NETWORK INFORMATION (See Figure C14): Displays all active nodes on all active networks including receive errors, retransmissions, software versions, and more for each node. Provides more useful information regarding each node in the system to aid in troubleshooting during installation or general network maintenance. Press Esc to return to the MAIN MENU.

6 - COMMUNICATION LINK: Allows communication with DXC910, DNA200, DNA300 and DNA400 (used for configuration).

7 - CONFIGURATION (DXC901/DXA100) : Allows for configuratio of DXC901/DXA100.

8 - BACKUP (DXC901/DXA100) : Allows for backup of programmed data in the DXC901/DXA100.

9 - RESTORE (DXC901/DXA100) : Used for uploading data saved during BACKUP in DXC901/DXA100

10 - MEMORY DISPLAY : Used to view memory locations of any node on the system. Useful for technicians to view error counters and for system software debugging. You will be prompted for Network Address and starting Memory Address. Once entered the next 64 memory locations are displayed. If the DNA100 Network Address presently being used by your terminal is inserted, the next 128 memory locations are displayed instead. Press Esc to return to the MAIN MENU.

11 - PACKET MONITOR: For use by technical support staff **<u>ONLY</u>** for monitoring all network traffic, polling and responses for all node addresses for a specific network address. Press Esc to return to the MAIN MENU.

1- STATUS DISPLAY

The upper half of the Status Display shows the status of up to 50 supervised subscriber positions simultaneously. When a system has more than 50 supervised subscribers the ← and → (LEFT and RIGHT) arrows are used to scroll the screen left and right one column at a time. The bottom half of the screen, used for event handling, does not move. The upper half of the display will view the 50 subscribers in five columns of 10 rows. The station dial numbers will be on the left-hand side of each column while it's status (OK, CALL, FAULT, BUSY, etc.) will be on the right-hand side. **Figure C6** shows an example of a status display with different statuses for 10 different stations in the left-most column. All stations will be displayed in ascending numerical order starting from the left, working down the column, and then moving to the next column to the right, etc. Unused areas of the upper display area will show ellipses (....) in place of station numbers and statuses.

If the DXC901, Subscriber Address $FF, is programmed as a Subscriber Type 1, with a text description and a dial number code, the number will be displayed in the first column on the left. All reset activity from this stage then can be printed to the defined printer. This is useful when a system is installed with many networks and/or stages. **Figure C5** & **Figure C6** show what the DXC901 status would look like on the Status Display. It is the "01 OK" on the top line of the leftmost column. **Figure C12** shows what the Network Configuration should look like to get this result on the Status Display. (See Network Configuration - Subscriber Address later in this chapter for more details).

The lower half of the status display screen indicates status of five incoming annunciated events. If more than five annunciated events are in queue (Que), use the ↑ and ↓ (UP and DOWN) arrows to scroll to your choice. There is room in the queue for up to 60 annunciated events.

```
                          STATUS DISPLAY
==========================================================================
  01   OK        ....  .....     ....  .....    ....  .....    ....  .....
0101   OK        ....  .....     ....  .....    ....  .....    ....  .....
0102   OK        ....  .....     ....  .....    ....  .....    ....  .....
0103   OK        ....  .....     ....  .....    ....  .....    ....  .....
0104   OK        ....  .....     ....  .....    ....  .....    ....  .....
0105   OK        ....  .....     ....  .....    ....  .....    ....  .....
0106   OK        ....  .....     ....  .....    ....  .....    ....  .....
0107   OK        ....  .....     ....  .....    ....  .....    ....  .....
0108   OK        ....  .....     ....  .....    ....  .....    ....  .....
0109   OK        ....  .....     ....  .....    ....  .....    ....  .....
==========================================================================
 QUE      DATA        TIME   PRI   STATUS    EXT    LOCATION DESCRIPTION
--------------------------------------------------------------------------



--------------------------------------------------------------------------
  00 2012/03/28  11:27:38        IDLE     0111    MASTERSTATION 111
==========================================================================
```

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Description of Status :

OK	-	Supervised station in idle.
CALL	-	Incoming event in queue, designated as CALL by annunciating device.
ALARM	-	Incoming event in queue, designated as ALARM by annunciating device.
TALK	-	In conversation with this DNA100's master station.
FAULT	-	Incoming event indicating a hardware problem at/to that location.
PARK	-	An event placed on hold.
BUSY	-	Another Display is handling this call.
PWRFAIL	-	Power failure in a device (CB901 lost power and is running on batteries).
ACKNOWL	-	Non voice event has been acknowledged (such as PWRFAIL).

Description of Status Headings :

QUE   -   Actual numbered position in the queue for incoming events.

DATE/TIME - The date and time the event was detected.

PRI   -   Priority level of incoming event (1 - 9; 1 - highest, 9 - lowest).

STATUS   -   Status of each line (CALL, FAULT, TALK, PARK, BUSY, ALARM).

EXT   -   The dial number of the calling station.

LOCATION DESCRIPTION -   Text description of calling location. Created during NETWORK CONFIGURATION.

The bottom line of the STATUS DISPLAY is the status for the master station for this DNA100's display.

QUE   -   The total number of events in queue

DATE/TIME - The present date and time (updated every second)

STATUS   -   Status of the Master station. (IDLE, TALK, WAIT, DIAL)

EXT   -   Dial number of the Master station

LOCATION DESCRIPTION -   Text description of this Master station. Created during NETWORK CONFIGURATION.

Additional Status For Master Display Line :

IDLE   -   Indicates no DNA100 activity present at the master station.

DIAL   -   Indicates the DNA100 sent a request to dial. It sends a request to dial when an attempt is made to answer an incoming event.

WAIT   -   Indicates status change for master. No keyboard entries will be accepted during WAIT state. WAIT status occurs after the master cancels an event that was handled.

TALK   -   Master station is in conversation initiated by the DNA100. The DNA100 must be used to cancel the conversation to remove the TALK status from the display line.

Operation :

IDLE -

When there are no annunciations (ALARMS, FAULTS or CALLS) to display, QUE will display 00, the TIME will always be visible and the event display lines will be off. The real-time status display will show all stations programmed to report to this annunciator as OK unless FAULTS are present in the system. In IDLE mode the Intercom master station assigned to the CRT will also be idle and may be used in normal intercom mode by using the dial pad on that station. Unused slots on the screen are filled with ellipses (...dots....).

INCOMING EVENT -

When the CRT DISPLAY receives an event a display line will appear and an audible tone will be heard from the terminal. There is room to display five events in the queue. The middle line will be highlighted as the current line that can be activated. See HANDLING MULTIPLE INCOMING ANNUNCIATIONS later in this chapter. The QUE will show the number of display lines in use. The user should always note the status of the event (ALARM, CALL, FAULT, PARK) before responding since the incoming status of the line will not be apparent when answered. The event lines will be placed in queue in the order they are received if they all have equal priority. When an event with greater priority is received it is placed ahead of existing events with lower priority level. Priority (PRI) level is programmable from 1 through 9, 1 being top priority (see NETWORK CONFIGURATION for programming).

HANDLING AN EVENT - The SPACE BAR

Once the status has been observed, the current highlighted display line can be answered by pressing the SPACE BAR on the CRT keyboard. When the SPACE BAR is pressed, the audible annunciation tone will stop, and the DXC901 will connect the intercom master station at the CRT DISPLAY with the substation that initiated the event. A warning tone will sound at both stations, and you may begin speaking after the tone. The intercom will normally switch your voice hands free, although it may be necessary to use the 'T' button on the intercom station for simplex operation (push to talk) to overcome background noise at either location. The 'T' may also be used whenever you want to continue monitoring a station for information or security reasons.

PRIORITY OVERRIDE - Intercom Privilege Feature

The master station at the CRT DISPLAY should be programmed with the "Priority override" privilege by SVT. If a busy or privacy signal is encountered, you may then press the 0 (zero) key on the intercom to override the signal and obtain voice contact before the intercom times out (default is 15 seconds for time out). If the intercom times out, you must dial the EXTENSION number shown on the DISPLAY line manually on the intercom ignoring leading zeros, and then use the priority override privilege. All substations reporting to an annunciator may also be programmed with "Privacy Category, Never" through SVT to avoid having to use the Priority feature on a station that appears in privacy.

REMOTE CONTROL - The O key

This key is used for Door Lock Control of the connected Substation.
       EX901 sends DTMF digit 5 to Substation
       EX500 sends DTMF digit 5 to Substation
       DXC901 sends DTMF digit 5 to Substation
       DXC910 sends DTMF digit 5 to Substation
       DXA100 sends out event REMCON

CANCEL A CONNECTION - The X key

When the intercom call is completed, press the X key on the CRT DISPLAY keyboard, this will cancel both the intercom connection and the current DISPLAY line.

A FAULT will return within two seconds after being canceled if it is a solid fault. FAULTS can occur intermittently during the scanning of the system due to electrical interference or disturbance at, or near, the station or its cable. Each substation is scanned for faults 80 times per second. Hard faults can be removed from the system temporarily by setting their device type to 0 in NETWORK CONFIGURATION and then reprogramming when the fault is corrected.

PARK - The P key

PARK is used to temporarily hold events that you need to get back to after handling other events or obtaining information.

HANDLING MULTIPLE INCOMING EVENTS -

If the QUE indicator displays a number greater than five, you can use the ↑ or ↓ (UP or DOWN) arrow keys to view the additional events and decide which lines should be handled first based on location of event or PRIORITY level. If the scrolling feature is not used, events can be handled on a first in first out basis by starting at the current line. When each event is canceled each DISPLAY line will automatically move into the middle highlighted line, and the middle DISPLAY line will be used each time until all lines are handled.

SILENCING THE AUDIBLE ANNUNCIATOR TONE -

When an incoming event is received and cannot be handled immediately, the tone can be temporarily silenced by pressing the X key on the terminal keyboard. If any additional activity occurs, the audible annunciation tone will sound again.

The audible tone will also sound if another event is received while you are presently handling one. Two options are available to handle an event while in conversation: One is to complete the present event, press cancel, then proceed to handle the additional events. The second option is to place the present event in PARK, then answer the additional events to assess the priority of the event handling using Park or "X" (cancel) as needed.

```
                           STATUS DISPLAY
==================================================================
  01   OK        ....  .....    ....  .....    ....  .....    ....  .....
0101   OK        ....  .....    ....  .....    ....  .....    ....  .....
0102   FAULT     ....  .....    ....  .....    ....  .....    ....  .....
0103   BUSY      ....  .....    ....  .....    ....  .....    ....  .....
0104   OK        ....  .....    ....  .....    ....  .....    ....  .....
0105   TALK      ....  .....    ....  .....    ....  .....    ....  .....
0106   CALL      ....  .....    ....  .....    ....  .....    ....  .....
0107   FAULT     ....  .....    ....  .....    ....  .....    ....  .....
0108   CALL      ....  .....    ....  .....    ....  .....    ....  .....
0109   ALARM     ....  .....    ....  .....    ....  .....    ....  .....
==================================================================
 QUE     DATA        TIME    PRI  STATUS   EXT    LOCATION DESCRIPTION
------------------------------------------------------------------
  01 2012/02/27   13:36:49 01    ALARM   0109    LEVEL C1 BUILDING 3
  02 2012/02/27   13:34:22 04    CALL    0106    AREA Z - ZONE 7/OUTSIDE
  03 2012/02/27   13:36:05 04    TALK    0105    ROOM 6 BUILDING 6
  04 2012/02/27   13:42:19 05    FAULT   0102    ROOM 3 BUILDING 6
  05 2012/02/27   13:43:23 05    BUSY    0103    DOOR 5A ZONE 2/INSIDE
------------------------------------------------------------------
  07 2012/02/28   15:27:38       IDLE    0111    MASTERSTATION 111
==================================================================
```

NIGHT TRANSFER MODE -

The DNA100 is placed in Night Transfer mode by placing the associated intercom station in privacy. Calls to this DNA100 will now be sent to the next Annunciator device in the Annunciator address chain (for the sub station) without the programmed delay. The delay is used in normal Day mode to delay calls before they transfer (Max delay 9.9 minutes). When the DNA100 is in transfer mode the time display will flash the word "TRANSFER" . Calls are still qued in the DNA100 but the beeper is silenced. The beeper will beep once every 60 seconds as a reminder that the we are in transfer mode. The DNA100 may answer calls in the Que while in transfer mode.

NETWORK MONITOR

The NETWORK MONITOR is activated by selecting option five on the MAIN MENU screen. The NETWORK MONITOR allows real time viewing of all networks and nodes presently operating in a Crisis System. This screen should be used by technical personnel to verify network operation during installation and trouble shooting. The NODES shown are as seen by the master of that network. FREE, RETR, and RXERR are master information as well. To return to the MAIN MENU at any time press ESC.

When a node number is displayed steady (not flashing on and off) and the error columns are zero and/or not incrementing then those nodes are 'on-line' and working. Node numbers that are flashing may also increase the RETR and RXERR counters and indicate a trouble on that network. This could be due to an internal failure in a node or a poor data connection in the network.

If the network has excessive traffic, the FREE pool of elements will become depleted. This could lead to loss of communication with this node or network. Excessive traffic can be caused by one defective node, poor quality or damaged data pairs.

```
   2012/01/16                   NETWORK MONITOR                        11:47:25
====================================================================================

        NET    NODES   FREE RETR RXERR     NET  NODES   FREE RETR RXERR
        00   _____   00   00   00       16  _____   00   00   00
        01   76_4_2_0   27   00   00       17  _____   00   00   00
        02   _____2_0   27   00   00       18  _____   00   00   00
        03   _____   00   00   00       19  _____   00   00   00
        04   _____   00   00   00       20  _____   00   00   00
        05   _____   00   00   00       21  _____   00   00   00
        06   _____   00   00   00       22  _____   00   00   00
        07   _____   00   00   00       23  _____   00   00   00
        08   _____   00   00   00       24  _____   00   00   00
        09   _____   00   00   00       25  _____   00   00   00
        10   _____   00   00   00       26  _____   00   00   00
        11   _____   00   00   00       27  _____   00   00   00
        12   _____   00   00   00       28  _____   00   00   00
        13   _____   00   00   00       29  _____   00   00   00
        14   _____   00   00   00       30  _____   00   00   00
        15   _____   00   00   00       31  _____   00   00   00
```

NET   -   Network number. Networks 01-30 are for standard nodes, 00 is not used, and 31 is reserved for a DIGITAL EXCHANGE MASTER bridge.

NODES   -   Node number. The master of that network is receiving messages from the nodes displayed. Node numbers are from 0-7 listed from right to left.

FREE   -   The number of free queue elements for transmission. In each node, there is a free pool of message locations that can contain queued up messages generated for the node's internal housekeeping. When queued messages are handled, the queue element is placed back into the pool. This number is the remaining queue elements that can be used by the master node. This number is usually HEX 28 but will decrease depending on data traffic.

RETR   -   The number of retransmissions logged by the master of this network. To reset the counter the master must be reset. Some retransmissions may exist on a good network due to data disturbance when installing or removing a node, or if transmissions are sent to a node that is not present on the system.

RXERR   -   Number of receive errors logged by the master of this network. To reset the counter the master must be reset.

NETWORK INFORMATION

NETWORK INFORMATION is activated by selecting option five on the MAIN MENU screen. Then enter a network number or * to view all networks. This screen can be used if there is a question about how the network is operating or if you want to see details about individual nodes on the system. While NETWORK MONITOR shows information based on the master's point of view, NETWORK INFORMATION shows information from the individual node's point of view. The information here is based on each node as opposed to the entire network. It's very useful for finding that errant node or for general information about each node in the system. Each line represents one node in the system and displays information described on the next page.

Unlike NETWORK MONITOR, NETWORK INFORMATION is not a real time display. The information displayed is not updated while in NETWORK INFORMATION, to update the information you must exit and then re-enter.

To exit and return to the MAIN MENU at any time, press ESC.

```
   2012/01/16                  NETWORK INFORMATION                    11:47:25
========================================================================
Network number (0-31,*:*

ADDR   NET  NODE    TYPE      VERSION    FREE RETR RXERR HOURS
----   ---  ----  ---------  ----------  ---- ---- ----- -----
 08     01   0     EX500    2012/02/16   25   00    00   0007
 0A     01   2     DNA100   2009/01/30   25   00    00   0007
 0C     01   4     DAD104   2011/08/10   25   00    00   0007
 0F     01   6     DNA100   2009/01/30   25   00    00   0007
 10     02   2     ******
```

ADDR   -   Network address. The network address of the node on that display line.

NET   -   Network number. The network the device on the display line is a member of.

NODE   -   Node number. The node number of the device on the display line.

TYPE   -   Type of device. The device type (DXC901, DNA100, DAD104, etc.) of the node on that display line.

VERSION   -   Version date. The version date of the device on this display line. The date is in the format of YYYY/MM/DD (year, month, day). To be compatible with the NETWORK INFORMATION screen the version date of the firmware has to be dated 960105 or later. If the firmware in the device is older, it will display asterisks (***) in place of TYPE and nothing else to the right of TYPE for that display line.

FREE   -   The number of free queue elements for transmission. In each node, there is a free pool of message locations that can contain queued up messages generated for the node's internal housekeeping. When queued messages are handled, the queue element is placed back into the pool. This number is the remaining queue elements that can be used by the device on this display line. This number is usually HEX 28 but will decrease depending on data traffic.

RETR   -   The actual number of retransmitted messages logged from the device on this display line. To reset the counter this device must be reset. Some retransmissions may exist on a good network due to data disturbance when installing or removing a node, or if transmissions are sent to a node that is not present on the system.

RXERR   -   Number of receive errors logged by the device on this display line. To reset the counter the device on this display line must be reset.

HOURS   -   Time since reset. Number of hours in hexadecimal format.

PACKET MONITOR

Option eight on the main menu is Packet Monitor. This feature allows a technical person to actually view the data packets on the network. This monitor is a powerful debugging tool used primarily for software development and testing although it also can be utilized for trouble shooting.
To exit and return to the MAIN MENU, press Esc. This will reset the DNA100.

Each lettered item in the example indicated by an arrow is described on the following page. These descriptions are intended to assist field personnel to explain Packet Monitor listings to a *Ring Communications* technician. They are not intended for a complete understanding of the data packets on the network.

A = Error counter. Maintains total number of errors on network. This number is stored in the network master and can be reset by resetting the network master. A secure network will have no errors but some are possible if nodes are installed or disconnected and cause data disturbance.

Possible errors are:

- checksum error
- network error
- receiver overrun error
- noise error
- framing error
- number of retransmits

B = To node. In this example FF indicates a broadcast to all nodes. Other numbers indicate a node address.

C = From node. The example shows node 0C sending to FF (broadcast).

D = Event definition CALL, CONNECT, CLEAR, PARK, TALK, BUSY, etc.

E = Total number of bytes in this packet, 09.

F = Device to/from. The node may represent a device such as a master station. The example shows device 01 (line equipment 01 is the second subscriber port in the CB901) sending to FF (broadcast)

G = Checksum. The total of all data in the packet. This is recalculated when received and checked for accuracy. If the calculated checksum does not match the received checksum then a request to retransmit the packet occurs.

H = Time. Time is transmitted by the network master as a broadcast and the time may also be part of a packet indicating when an event occurred. The format is SS:MM:HH (45:40:19).

I = Date. Date is transmitted by the network master as a broadcast and the date may also be part of a packet indicating when an event occurred. The format is DD:MM:YY (08:01:03).

J = ASCII text field. The 30 character description for this device.

ACTIVITY LOG PRINTER

A serial RS232C printer can be attached to a DNA100 to provide a complete activity log of system. All stations to be logged must have the printer defined in their **SAR**. The DNA100 must be configured to drive a printer by setting SW3-7 off and SW3-8 on. The printer must have a RS232C serial interface. The standard print format is 80 columns, 66 lines per page.

Figure C16 shows a sample printed page of the Crisis Alert Activity Log Printer.

Description of Status Headings :

DATE   The DATE this page was printed. If the date changes before the page is full a new page is printed with events for the new date.

TIME   The actual time the event on each line occurred.

PRI   PRIORITY of the incoming event.

STATUS   Status of each event (CALL, FAULT, CONNECT, PARK, CANCEL, RESET, ALARM).

EXT   The dial number of the station generating the event.

LOCATION DESCRIPTION   Written description of the location or device stated under the EXT heading.

CONNECTED TO   Indicates the station connected to the device generating the event.

Description of Status :

CALL   CALL to annunciator. This only indicates a call condition was placed from type 1 sub station or type 3 sub-master station.

CONNECT   Indicates an event being handled in accordance with the annunciator display through Crisis Alert. (See HANDLING AN EVENT earlier in this Chapter or in Chapter D - DAD104)

FAULT Indicates a hardware problem for the location printed and sent to the annunciator five seconds after the fault occurs. The time delay is due to a noise filter in the DXC901 that only records solid faults.

PARK   An event that was placed in PARK. A new CONNECT message will be generated when this event is retrieved again.

CANCEL   Indicates a disconnection of two devices that were previously connected. For example, a master station that presses the 'X' key on the terminal keyboard using a DNA100 will generate a CANCEL event.

ALARM ALARM to annunciator. This indicates that an alarm condition was placed from a type 3 sub-master station.
PWRFAIL   The CB901 has detected loss of Power. It is now running on battery backup.

ACKNOWL   An event has been acknowledged by a DAD104 (such as PWRFAIL).

CLEAR The Power has been restored to normal for the CB901 central exchange.

Additional Status For Devices :

RESET Indicates when a device has been Reset. This message is only printed if the device has a Printer Address defined during Network Configuration. To enter a description for the DXC901 Digital Exchange Controller use Subscriber address $FF and enter it as a Subscriber Type 0 station with the description needed. The dial number if inserted can be displayed on a CRT status display. Generally a two digit number is used to indicate a building or stage number in a multi stage configuration. Do not enter a priority or program channel for the DXC901.

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```
                         ACTIVITY LOG
                             FOR
                   RING CRISIS ALERT SYSTEM
----------------------------------------------------------------
   DATE        TIME    PRI  TO     EVENT    FROM LOCATION
---------- -------- --- ----  --------  -----------------------------
2011/08/24 15:59:50            RESET         Activity LOG Printer
2011/08/24 16:28:12  2   10   CALL      17 Elevator 4A
2011/08/24 16:28:23      17   CONNECT   10 Security
2011/08/24 16:28:48      17   CANCEL    10 Security
2011/08/24 17:32:45  5   10   CALL      28 Gate E
2011/08/24 17:33:16      28   CONNECT   10 Security
2011/08/24 17:35:03      28   PARK      10 Security
2011/08/24 17:35:05  1   11   CALL      10 Security
2011/08/24 17:35:08      10   CONNECT   11 Lobby
2011/08/24 17:35:22      10   CANCEL    11 Lobby
2011/08/24 17:35:28      28   CONNECT   11 Lobby
2011/08/24 17:36:56      28   CANCEL    11 Lobby
```

Figure C10 - Activity Log Print Example