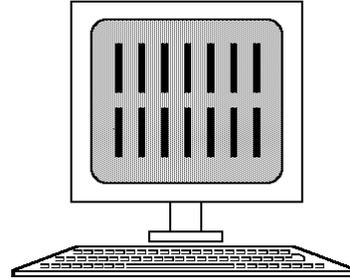


**THE DIPLOMAT  
NETWORK MONITOR**



**Contents**

|                     |             |          |
|---------------------|-------------|----------|
| <i>Introduction</i> | <i>Page</i> | <i>2</i> |
|---------------------|-------------|----------|

**General Information**

|                              |             |           |
|------------------------------|-------------|-----------|
| <i>Data Communications</i>   | <i>Page</i> | <i>3</i>  |
| <i>LED Indicators</i>        | <i>Page</i> | <i>3</i>  |
| <i>Operation</i>             | <i>Page</i> | <i>4</i>  |
| <i>Title Screen</i>          | <i>Page</i> | <i>4</i>  |
| <i>Program Control</i>       | <i>Page</i> | <i>4</i>  |
| <i>Main Selection Menu</i>   | <i>Page</i> | <i>5</i>  |
| <i>Main Monitor Display</i>  | <i>Page</i> | <i>6</i>  |
| <i>Pre-Configuration</i>     | <i>Page</i> | <i>7</i>  |
| <i>Configuration Byte</i>    | <i>Page</i> | <i>8</i>  |
| <i>Values</i>                | <i>Page</i> | <i>9</i>  |
| <i>Diagnostics Screen</i>    | <i>Page</i> | <i>10</i> |
| <i>Connection Matrix</i>     | <i>Page</i> | <i>11</i> |
| <i>Statistics</i>            | <i>Page</i> | <i>12</i> |
| <i>Firmware Revisions</i>    | <i>Page</i> | <i>12</i> |
| <i>Maintenance of BB RAM</i> | <i>Page</i> | <i>13</i> |
| <i>Toggle Printer Log</i>    | <i>Page</i> | <i>13</i> |
| <i>Set Rack ID</i>           | <i>Page</i> | <i>13</i> |

**Module Configuration**

|                          |             |           |
|--------------------------|-------------|-----------|
| <b>SA1 Configuration</b> | <i>Page</i> | <i>14</i> |
| <b>SA2 Configuration</b> | <i>Page</i> | <i>16</i> |
| <b>SS1 Configuration</b> | <i>Page</i> | <i>19</i> |
| <b>SSA Configuration</b> | <i>Page</i> | <i>24</i> |
| <b>LAN Configuration</b> | <i>Page</i> | <i>27</i> |

**Introduction**

The D90 Diplomat Network Monitor module (D90-DNM) runs on SA1 hardware which is fitted with a single asynchronous port. The DNM enables all the modules in a D90 rack to be re-configured either temporarily or permanently. Re-configuration means the ability to change communication parameters (parity, data rates etc) as well as the application specific parameters that are held in the firmware of each module.

The DNM can also be used to configure slots that do not yet contain modules. This is described under the heading *Pre-Configuration*.

All D90 modules will have been configured by Lucidata as specified in the Configuration Section of the D90 manual. This configuration is stored in the firmware of the module and cannot be changed by the user without using a DNM. Some application parameters such as terminal profiles *can* be changed by the user, but they will not be stored and consequently will not survive over a power failure. The DNM runs on an SA1 type of module, but in addition to the standard hardware features, the DNM contains battery backed RAM. This RAM can store configuration parameters for each of the modules in the D90 rack and preserve the values if the unit is powered down.

The behaviour of the DNM is controlled by the settings in its *Configuration Byte*. This is described later in this section.

**Data Communications**

Each D90-DNM module is fitted with a single asynchronous port. This port is fitted with a D25 female connector, configured as DCE. The signalling levels are RS232. The use of screened cable with the outer conductor grounded to the connector shell is recommended.

**Ensure that the plug is securely fixed to the screwlock pillars.**

The port is normally connected to a terminal or PC running a terminal emulation. Details of the pin assignments are given below.

PIN  
NO.

|    |     |   |
|----|-----|---|
| 1  |     | Protective Ground                                 |
| 2  | TXD | Received Data - DNM receives data on this pin     |
| 3  | RXD | Transmitted Data - DNM transmits data on this pin |
| 4  | RTS | Request to Send - sensed by DNM                   |
| 5  | CTS | Internally connected to +12V via 1Kohms           |
| 6  | DSR | Data Set Ready controlled by DNM firmware         |
| 7  | SG  | Signal Ground                                     |
| 8  | DCD | Data Carrier Detect - controlled by DNM firmware  |
| 13 |     | Protective Ground                                 |
| 20 | DTR | Data Terminal Ready - sensed by DNM               |

The DNM module will not send data to the port until both pins 4(RTS) and 20(DTR) are pulled high by the terminal.

**LED Indicators**

There are 8 LEDs on the front panel of the D90-DNM module. The indicators are Red(R), Yellow(Y) or Green(G) and have the following meanings when illuminated.

- (Y) Heartbeat approx every 2.5 secs
- (R) DNM Ready, (DCD held high)
- (R) Terminal Ready, (pin 4(RTS) & pin 20(DTR) high)
- (R) Data received (pin 2 toggling)
  
- (R) D90 BUS CREQ signal
- (R) D90 BUS CACK signal
- (R) D90 BUS DREQ signal
- (G) Dialogue with another module

The heartbeat shows the DNM module is alive and well. The D90 BUS LEDs should only flicker. A D90 BUS LED staying on indicates a module failure somewhere.

**Operation**

On power up, the DNM firmware will first of all calculate the CRC (Cyclical Redundancy Count) value for its own battery backed RAM tables. If the calculated value disagrees with the value that is stored, it assumes that there has been a hardware failure and will reload its own tables from the default values held in EPROM. In this case all previous configuration data for the rack is lost.

If the DNM's battery backed RAM is intact, the DNM will proceed to interrogate the whole D90 rack to establish which slots contain modules. Any occupied slot for which the DNM holds a set of stored configuration tables with a valid CRC, is down loaded, if so configured, with these tables and is then commanded to perform a soft restart.

After checking the whole rack, the DNM interrogates all the slots again in order to obtain all the current configuration values for display.

**Title Screen**

In order to use the DNM, a terminal, or PC running a terminal emulation, must be connected to its port. On power up the main title screen will appear.

```

===
===          ==  ==  ==          DDDD  999  000
===          ==  ==  ==          D  D 9  9  0  0
===          ==  ==  ==          D  D 9  9  0  0
=== ==  ==  =====  ==  =====  =====  =====  D  D 9  9  0  0
=== ==  ==  =====  ==  =====  =====  =====  D  D 9  9  0  0
=== ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  D  D 999  0  0
=== ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  ==  D  D  9  0  0
=== =====  =====  =====  =====  =====  D  D  9  0  0
=== =====  =====  =====  =====  =====  D  D  9  0  0
=== =====  =====  =====  =====  =====  D  D 9  9  0  0
=====  =====  =====  =====  =====  DDDD  999  000

LUCIDATA D90 NETWORK MONITOR Model D90-DNM rev 1.20:960
Copyright 1990-2001, Lucidata Ltd. Cambridge, England

TECHNICAL SUPPORT TELEPHONE HELP LINE +44(0)1223 846100
e-mail: support@lucidata.com, FAX +44(0)1223 846200

ENTER A DIGIT FOR YOUR TERMINAL TYPE          <1> VT100  <2> WYSE50  <3> DUMB
    
```

Underneath the Lucidata logo the revision number of the firmware is given followed by the Configuration Code. These digits uniquely identify the firmware.

The user types the single digit which corresponds with his terminal type and proceeds to the Main Selection Menu.

**Program Control**

In general numeric values are used to move down a tree of options and the Escape key is used to go back one level at a time. Any departures from this rule are stated on those screens.

**Main Selection Menu**

This menu presents various options which are described in turn on the following pages. To select from this menu type a single digit at the keyboard.

```
MAIN SELECTION MENU

<1> Main Monitor Display
<2> Configure a Slot
<3> Diagnostics
<4> Connection Matrix
<5> Statistics
<6> Firmware Revisions
<7> Maintain BB-RAM
<8> Toggle Printer Log [OFF]
<9> Set Rack ID

ENTER SINGLE DIGIT TO SELECT :
```

If (1) is selected, the Main Monitor Display illustrated on the next page appears. From this display the user may proceed to the *Configuration Screen* for the slot he selects. The *Configuration Screen* can also be reached directly by selecting (2) on the Main Menu. In this case the following message will appear:

```
ENTER NUMBER OF SLOT TO BE CONFIGURED:
```

Entering the Slot Number will result in the *Configuration Screen* for the module in that slot being presented.

## Main Monitor Display

The following illustrations of the DNM screens are for a VT100 type of terminal or terminal emulation. Other terminals will not have the same presentation.

```

DIPLOMAT D90 CONFIGURATION NO. 900 RACK NO. 1 TO CONFIGURE: <SLOT NO.> <CR>

SLOT/MOD [ 1] LAN [ 2] SS1 [ 3] NUL [ 4] SS1 [ 5] SSA [ 6] NUL [ 7] SS1

SPEED TX ### 10MB ### EXTER          ### EXTER ### 9600          ### EXTER
SPEED RX # #      ### EXTER          ### EXTER #A# EXTER          ### EXTER
FORMAT   ### 8bit # # 8NE            # # 8NE # # 8NE          # # 8NE
RS/TR/CD # #      # # HLL            # # HHH ### HLL          # # HHH
C=CLUSTR ### N=00 # # TR=HI          # # TR=HI ### 9600        # # TR=HI
ADDRESS  ###      # # XC=N           # # XC=N #B# 9600          # # XC=N
N=ACTIVE ###      ### C=01           ### C=03 # # 7S1          ### C=06
SESSIONS ###      ### N=04           ### N=00 ### LHH          ### N=00

SLOT/MOD [ 8] SA2 [ 9] NUL [10] NUL [11] SA2 [12] NUL [13] NUL [14] DNM

SPEED TX ### 9600                    ### 9600                    ### 9600
SPEED RX #A# 9600                    #A# 9600                    ### 9600
FORMAT   # # 7S1                      # # 7S1                      # # 7S2
RS/TR/CD ### HHH                      ### HHH                      # # HHH
C=CLUSTR ### 9600                      ### 9600                      # #
ADDRESS  #B# 9600                      #B# 9600                      # #
N=ACTIVE # # 7S1                      # # 7S1                      ###
SESSIONS ### HHH                      ### HHH                      ###

```

The main configuration screen displays the hardware configuration of the D90 rack. The slots are numbered from the left as you face the front panels and the hardware in each filled slot is indicated. The main communication parameters - *as they currently stand* - for each module are displayed.

*Note:* These parameters may be different from those given in the Configuration Section of this manual if the DNM has been used before.

To return to the *Main Selection Menu*, press the ESC key (ASCII value 27). Each time Return is pressed, the DNM will interrogate the modules in the rack again and display the current state.

To reconfigure any one of the modules

**TYPE** <slot no.> CR

and refer to the paragraph relevant to the type of module.



## Configuration Byte

A configuration byte is a set of 8 "Silicon Switches" which select low level options. The parameters that each bit represents are not displayed on the Configuration Screen as they depend on the installed firmware. The user will find the values tabulated in the relevant **Module Section** of the manual.

To set the Configuration Byte, the space bar is pressed when the cursor is at the configuration byte line on the display. The following will then appear:

```

#####
##### CONFIGURATION BYTE : 11111011
##### OVERLAY -

```

The cursor will be positioned under the first bit. At this stage the following characters can be typed in to change the Configuration Byte:

- CR** Return will record the current value in the Configuration Byte and move the cursor to the next field.
- Space** move cursor to the right without changing the byte.
- BS** move the cursor to the left without changing the byte.
- 0** Change the 'Switch' above the cursor to 0 and move cursor right.
- 1** Change the 'Switch' above the cursor to 1 and move cursor right.

*Note: if any operation moves the cursor off either end the current value is saved and the cursor moves to the next field.*

By convention the switches or bits of a configuration byte are numbered as follows

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

**Values of the DNM's Configuration Byte**

The following table summarizes the options available in the *Configuration Byte* of the DNM. The default values will be found in the **Rack Configuration Section** of the manual.

The characteristics of the DNM on power up are determined by these configuration bits. If problems have been experienced it is advisable to set the "Error Messages to Aux Printer" bit to one. Then, either attach a printer to the Aux Port on the VDU or otherwise monitor it by some other means. All error messages will then be captured which will assist in determining the cause of the problem.

| Bit | Name     | Description  |
|-----|----------|--|
| 0   | Reserved | [0] - Must be zero   |
| 1   | BEREPO   | [0] – Ignore error messages from other modules<br>[1] – Display/Print error messages reported by other modules on the rack.  |
| 2   | BPRINT   | [0] – Only display on VDU screen<br>[1] – Route certain messages to auxilliary printer   |
| 3   | B POLL   | [0] – Only interrogate modules on demand<br>[1] – Poll all modules every 30 seconds to refresh selected screens  |
| 4   | Reserved | [0] – Must be zero   |
| 5   | BDLL     | [0] – Do not automatically down-load modules<br>[1] – During the power-up sequence down-load stored memory images of configuration parameters for each module.   |
| 6   | BAUTO    | [0] – Start up in Title Screen<br>[1] – Start up in Main Display Screen  |
| 7   | BMODNM   | [0] – Normal recommended setting<br>[1] – Enable activation of DNM internal monitor for debugging purposes only. Entering the monitor halts the normal operation of the DNM module and is not recommended to the user. |

## Diagnostics Screen

This screen allows various tests to be performed on one or more modules at the same time. If no list of slots is given, the selected test will be performed on all the slots that contain modules. The DNM never tries to test a slot that it has already determined is empty.

```
DIAGNOSTICS SCREEN

(1) Continuous Read Parameters
(2) Probe LAN
(3) Hard Start
(4) Soft Start
(5) Test LEDs
(6) Down Line Load
(7) Clear out Old Slot Selection
(8) Remote Debug

SELECT DIAGNOSTIC TEST BY SINGLE DIGIT:
```

If the user types a digit between 1 and 6, the following message appears:

```
Enter list of slots to test separated by spaces
Return starts test, ESC to Quit
```

The user enters the list of slots he wishes to test. He may repeat the selected test as many times as wished by repeatedly typing [RETURN]. The list of slots is kept and may be used by other tests by simply entering [RETURN].

Typing the ESC key at any time will return the user to the previous menu.

A short description of each of the tests follows.

### Continuous Read Parameters

Configuration tables are continuously read from each module in turn until a character is entered. The green LED on the DNM module should appear brighter than on the other modules. No error messages should appear on the screen while the rack is idle. If the rack is heavily loaded, an occasional informative error message may appear. All the modules in the rack can be used normally while this test is running as diagnostic functions are of lower priority than normal operations.

A simulated rotating wheel is displayed while the test is running.

Any error message will specify the slot at fault. If a persistent error message appears, power down the unit, wait ten seconds, and power it up again. Then re-run the test. If the failure is repeated when the rack is idle, then power down and remove the specified module.

Typing any character will end the test and return to the Diagnostic Screen display.

|                              |  |
|------------------------------|--|
| Probe LAN                    | This test allows any installed LAN module(s) to send an ARP message or Echo request (PING) to its default server. It is best to send an ARP first - to ensure the LAN module has discovered the correct hardware address - before sending a PING. If the test is successful a beep is emitted from the terminal when the echo returns. If no beep is heard, the target server either was not found or did not respond. A ping is sent every second and a simulated rotating wheel is displayed whilst the test is running. |
| Hard Start                   | This option causes all the selected modules in the rack to restart from the beginning using the parameter values stored in their EPROMs ie the factory set defaults. The DNM does NOT do an automatic down line load.<br><br><i>A full stop character is printed for each slot tested as a guide to what has happened. The test may be repeated by typing [RETURN].</i>  |
| Soft Start                   | This option causes all the selected modules in the rack to restart, but the configuration parameters currently in place will remain unchanged.<br><br><i>A full stop character is printed for each slot tested as a guide to what has happened. The test may be repeated by typing [RETURN].</i>   |
| Test LEDs                    | This tests all the LEDs on all the selected modules by lighting them for approximately one second.<br><br><i>A full stop character is printed for each slot tested as a guide to what has happened. The test may be repeated by typing [RETURN].</i>   |
| Down Line Load               | This option will down load the parameter values currently stored in the DNM for each of the slots that have been specified. It should be noted that the DNM holds values for each of the slots separately so that only those slots listed will receive their parameters from the DNM.<br><br><i>A full stop character is printed for each slot tested as a guide to what has happened. The test may be repeated by typing [RETURN].</i>  |
| Clear out Old Slot Selection | This option will reset the slot list to empty. This is equivalent to selecting all the slots in the rack.  |
| Remote Debug                 | This option opens up a diagnostic channel to the selected slot. Its main use is in conjunction with telephone assistance from Lucidata, to help diagnose exceptional problems.   |
| <b>Connection Matrix</b>     | Some modules handle multiple connections to other services for client slots on the rack. The state of these connections can be observed.   |

```

<1> Select a Slot
<2> Toggle Auto-Refresh [OFF]

ENTER SINGLE DIGIT TO SELECT :
```

Option 2 toggles the current state of the Auto-refresh flag set up at power up by the Configuration Bit BPOLL

The currently implemented displays will be found described in the paragraphs specific to the relevant module.

**Statistics**

Two options are presented on the statistics screen: Read Statistics and Clear Counters. After making a choice you are prompted to enter the slot number you wish to interrogate. The DNM displays a line identifying the module type and the firmware running on the module followed by the response from the module.

```

STATISTICS INTERROGATION MENU

<1> Read Statistics
<2> Clear Counters

ENTER SINGLE DIGIT TO SELECT:

Enter Slot Number to Interrogate : 2
    
```

In general the response will be the same as when the data is viewed from the module itself. Some modules, SS1 and LAN for example cannot display data locally so are only accessible through the DNM. Typing ESC will return to the menu. Any other character will cause the selected module to be interrogated to get the latest values. Some options are not defined for some modules as the information displayed under read is important to the continued functioning of the module. The currently implemented displays will be found in the paragraphs specific to the relevant module.

**Firmware Revisions**

This option displays the firmware revision details of all the modules in the rack. It would be useful to have this information available if any problems are encountered.

```

                FIRMWARE REVISIONS FITTED

SLOT  MOD   FIRMWARE              REVISION CONF
-----
  2    SA2   Model D90-HVN rev 1.06:903
  3    SA2   Model D90-HVN rev 1.06:903
  4    SA2   Model D90-HVN rev 1.06:903
  5    SA2   Model D90-HVN rev 1.06:903
  6    SA2   Model D90-HVN rev 1.06:903
  9    SA2   Model D90-HVN rev 1.06:903
 10   SS1   Model D90-VIP rev 1.07:903
 11   DNM   Model D90-DNM rev 1.06:904
 12   LAN   Model D90-LAN rev 1.06:800
 14   SA2   Model D90-HV3 rev 1.06:903

Any key to return
    
```

**Maintenance of BB RAM** The following display is presented:

```

MAINTENANCE OF CONFIGURATION IMAGES IN BBRAM

<1> Check all Saved Images
<2> Copy a Configuration
<3> Clear a Saved Image
<4> Save a Working Image
<5> Reset to Factory defaults

ENTER SINGLE DIGIT TO SELECT
Hit ESC to quit
    
```

- Option 1 lists the status of all slots for which saved images are recorded. The CRC of each is checked and a message indicating whether it is good or bad is displayed for each slot.
- Option 2 allows the saved configuration of one slot to be copied to other similar slots thus saving having to repeat a potentially lengthy sequence.
- Option 3 allows removal of individual saved images.
- Option 4 allows the current working image, that is the last one to be read from the operating module, to be saved in BB-RAM.
- Option 5 allows selected images to be replaced with the factory default image containing default parameter values for that module type.

**Toggle Printer Log**

The power up state of the Aux Printer bit in the Configuration Byte determines where "Panic" messages from the other modules on the rack will be displayed. The state of this bit can be more easily switched using the Toggle Printer Log menu item. Each time it is selected, it will reverse the current setting and give a one line status:

```

Printer Log Enabled   OR   Printer Log Disabled
    
```

**Set Rack ID**

When a system comprises several D90 racks they should be individually identified by assigning a rack number. Selecting option 8 displays the following –

```

SET THE RACK ID FOR USE BY ALL MODULES IN THIS RACK

This Rack is currently No.    1

Enter a number unique among racks in this system -
    
```

SA1 Configuration

If the slot contains an SA1 module, the following screen will appear.

```

MODULE TYPE SA1 SLOT NUMBER 3
#####
##### TRANSMIT SPEED      : UNDEF
#####
##### RECEIVE SPEED      : UNDEF
#####
##### CHARACTER FORMAT    : 7S2    (DATA,PARITY,STOP)
#   #
#   # LINE SIGNALS READ   : HHH    (DCD,DTR,RTS)
#   #
#   # CONFIGURATION BYTE  : 11111011
#   #
#   #
#####
##### PORT DTR/DSR       : HIGH
#####
##### ENABLE PIN 24 CLOCK : DISABLED
#####
#####

SPACE BAR CYCLES THROUGH VALUES, TAB MOVES THROUGH FIELDS, RETURN TO QUIT.
    
```

The cursor will appear at the first field. The permissible parameter values in each field can be cycled through by pressing the space bar. The DNM will check the validity of the selections and may generate error messages if inconsistencies are detected. Possible values are given in the table below.

| Field               | Values                                 |
|---------------------|--|
| TRANSMIT SPEED      | 75,150,300,600,1200,2400,4800,9600 bps |
| RECEIVE SPEED       | 75,150,300,600,1200,2400,4800,9600 bps |
| CHARACTER FORMAT    |  |
| DATA                | 7,8 (No. of Data bits)                 |
| PARITY              | O,E,M,S,N (Odd,Even,Mark,Space,None)   |
| STOP                | 1,2 (No. of stop bits)                 |
| PORT DTR/DSR        | H,L (High/Low)                         |
| ENABLE PIN 24 CLOCK | ENABLED,DISABLED                       |

For details on changing the *Configuration Byte* - refer to the paragraph under this heading earlier in this section.

*Note:* The configuration screen can be left at any time by entering the ESC character - leaving the configuration unchanged.

The cursor can be moved to the next field by pressing the TAB key (ASCII value 9). If the TAB key is pressed when on the last field, the cursor will move up to the first field again.

When you have finished changing the configuration, press the RETURN key (ASCII value 13). The following message will appear at the bottom of the screen.

SAVE THIS CONFIGURATION N/Y?

#### Save Configuration

Pressing the Y key (either upper or lower case) will cause this configuration to be saved in the part of battery backed RAM of the DNM reserved for this slot. Any other key will not save the configuration but you may proceed to temporarily change the parameters in the module for experiment.

#### Down-Load Configuration

Whatever key is pressed the following message will appear next.

SAVE THIS CONFIGURATION N/Y? DOWN LOAD TO SLOT N/Y?

Pressing the Y key at this juncture will cause the parameter values as displayed to be downloaded to the module and the module commanded to re-start. These values will then become operative for the module, but will not be preserved over a power-up unless the SAVE option was also chosen. Any other key pressed is interpreted as NO.

The system will return to the menu it was called from.

*Note: Any application level parameters which are changed by the user connected to a particular module, such as terminal profile, will also be saved in battery backed RAM provided they are changed prior to configuration.*

**SA2 Configuration**

If the slot contains an SA2 module, the following screen will appear.

```

MODULE TYPE SA2 SLOT NUMBER 3
#####
##### TRANSMIT SPEED      : 9600
#####
#####
#A ## RECEIVE SPEED      : 9600
# ##
# ## CHARACTER FORMAT     : 7S2      (DATA,PARITY,STOP)
# ##
##### LINE SIGNALS READ   : HHH      (DCD,DTR,RTS)
#####
##### CONFIGURATION BYTE  : 11111011
#####
##### TRANSMIT SPEED      : 9600
#####
#####
#B ## RECEIVE SPEED      : 9600
# ##
# ## CHARACTER FORMAT     : 7S2      (DATA,PARITY,STOP)
# ##
##### LINE SIGNALS READ   : HHH      (DCD,DTR,RTS)
#####
##### CONFIGURATION BYTE  : 11111011
#####

SPACE BAR CYCLES THROUGH VALUES, TAB MOVES THROUGH FIELDS, RETURN TO QUIT.
    
```

The cursor will appear at the first field. The permissible parameter values in each field can be cycled through by pressing the space bar. The DNM will check the validity of the selections and may generate error messages if inconsistencies are detected. Possible values are given in the table below.

| Field            | Values                                       |
|------------------|--|
| TRANSMIT SPEED   | 75,150,300,600,1200,2400,4800,9600,19200 bps |
| RECEIVE SPEED    | 75,150,300,600,1200,2400,4800,9600,19200 bps |
| CHARACTER FORMAT |  |
| DATA             | 7,8 (No. of Data bits)                       |
| PARITY           | O,E,M,S,N (Odd,Even,Mark,Space,None)         |
| STOP             | 1,2 (No. of stop bits)                       |

For details on changing the *Configuration Byte* - refer to the paragraph under this heading earlier in this section.

*Note:* The configuration screen can be left at any time by entering the ESC character - leaving the configuration unchanged.

The cursor can be moved to the next field by pressing the TAB key (ASCII value 9). If the TAB key is pressed when on the last field, the cursor will move up to the first field again.

When you have finished changing the configuration screen, press the RETURN key (ASCII value 13). The following message will appear at the bottom of the screen.

SAVE THIS CONFIGURATION N/Y?

### Save Configuration

Pressing the Y key (either upper or lower case) will cause this configuration to be saved in the part of battery backed RAM of the DNM reserved for this slot. Any other key will *not* save the configuration but you may proceed to temporarily change the parameters in the module for experiment.

### Down-Load Configuration

Whatever key is pressed the following message will appear next.

SAVE THIS CONFIGURATION N/Y? DOWN LOAD TO SLOT N/Y?

Pressing the Y key at this juncture will cause the parameter values as displayed to be downloaded to the module and the module commanded to re-start. These values will then become operative for the module, but will not be preserved over a power-up unless the SAVE option was also chosen. Any other key pressed is interpreted as NO.

The system will return to the menu it was called from.

*Note: Any application level parameters which are changed by the user connected to a particular module, such as terminal profile, will also be saved in battery backed RAM provided they are changed prior to configuration.*

### Error Messages

The following error messages may appear during the configuration process.

1. *MAXIMUM OF TWO DIFFERENT CLOCK SPEEDS AVAILABLE*

If for example, Port A was set to 9600/9600 and Port B was set for split speed 1200/75, this error message would appear. (A solution would be to set Port A to 1200/1200.)

2. *NO EXTERNAL CLOCK OPTION ON SA2 MODULE*

## Statistics

The statistics option is selected from the Main Menu. First select whether you want to read stored statistics or to clear out tables. Then the Statistics Interrogation Screen requests the Slot Number of the module you wish to interrogate.

```
STATISTICS INTERROGATION MENU

<1> Read Statistics
<2> Clear Tables

ENTER SINGLE DIGIT TO SELECT:

Enter Slot Number to Interrogate : 2
```

When an SA2 module type running D90ASR firmware is in the selected slot the following display will result.

```
SLOT No. 2 IS SA2 MODULE RUNNING ASR FIRMWARE

RETURN to refresh display, ESC to QUIT

Reply from Slot No. 2
Collected Statistics since last Reset.

Time Since Power-Up : 4210
Received Bus Frames : 9
Transmitted Bus Frames : 569
High Level Bus Errors : 0

PORT A
RTS Status - Hi
DTR Status - Hi
Connected - No

PORT B
RTS Status - Lo
DTR Status - Lo
Connected - No
```

The information is labelled and consists of basic inter module statistics, which will be of little interest to the user, and some specific port status values. If the user is remote from the rack and cannot see the module directly then the status of the port LEDs reported here may be of interest.

### SS1 Configuration

There are two variants of SS1 displays depending on which firmware is installed. If the firmware supports a basic poll and select protocol, such as Bull VIP, IBM3270 or ICL CO3, then the module will behave as a Local Server. The following screen will appear.

```

MODULE TYPE SS1 SLOT NUMBER 1

#####
##### TRANSMIT SPEED      :  EXTER  BPS
#####
##### RECEIVE SPEED      :  EXTER  BPS
#####
##### CHARACTER FORMAT   :  8NE      (DATA,PARITY,CODE)
#####
##### LINE SIGNALS READ  :  HLL      (RTS,DTR,DCD)
#####
##### CONFIGURATION BYTE :  10100000
#####
##### PORT DTR/DSR      :  LOW
#####
##### ENABLE PIN 24 CLOCK :  DISABLED
#####
#####
##### POLL ADDRESS      ***  SLOT MAP  ***          CLUSTER ADDRESS : 07
#####
##### 00..15  02A 02B 03A 03B XXX XXX P07 P08 XXX XXX XXX XXX XXX XXX XXX XXX
##### 16..31  XXX XXX
#####
#####
##### SPACE BAR CYCLES THROUGH VALUES, TAB THROUGH FIELDS, RETURN TO QUIT
    
```

The cursor will appear at the first field. The permissible parameter values in each field can be cycled through by pressing the space bar. The DNM will check the validity of the selections and may generate error messages if inconsistencies are detected. Possible values are given in the table below.

| Field               | Values   |
|---------------------|--|
| TRANSMIT SPEED      | 75,150,300,600,1200,2400,4800,9600,16000,19200,32000,38400,48000,64000 bps or EXTERNAL |
| RECEIVE SPEED       | EXTERNAL   |
| CHARACTER FORMAT    |  |
| DATA                | 7,8 (No. of Data bits)   |
| PARITY              | O,E,M,S,N (Odd,Even,Mark,Space,None)   |
| CODE                | A,E (ASCII,EBCDIC)   |
| PORT DTR/DSR        | H,L (High/Low)   |
| ENABLE PIN 24 CLOCK | ENABLED,DISABLED (outputs TX clock)  |

For details on changing the *Configuration Byte* - refer to the paragraph under this heading earlier in this section.

*Note:* The configuration screen can be left at any time by entering the ESC character - leaving the configuration unchanged.



When the Poll/Cluster address section on the lower part of the screen is reached, the message at the bottom of the screen changes.

ENTER DECIMAL VALUES FOR ADDRESSES, TAB THROUGH FIELDS, RETURN TO QUIT

### Cluster Address

The cluster address can be set by typing in a number between 0 and 31. The Tab key will move the cursor on to the poll address fields.

### Poll Address

Poll addresses between 0 and 31 are represented in sequential order on the bottom of the screen. If a slot number, followed by a port (A or B) is entered at a particular poll address, then that port will be logically associated with that poll address. Thus in the example illustrated above, port A of slot 2 will respond to poll address 0, port B to poll address 1, port A of slot 3 to poll address 2 and port B of slot 3 to poll address 3. Entries may be cleared by entering a space. If any digit is entered followed by a TAB then the SS1 will respond to that poll address and the linking to another module is dynamic.

When you have finished changing the configuration, press the RETURN key (ASCII value 13). The following message will appear at the bottom of the screen.

SAVE THIS CONFIGURATION N/Y?

### Save Configuration

Pressing the Y key (either upper or lower case) will cause this configuration to be saved in the part of battery backed RAM of the DNM reserved for this slot. Any other key will *not* save the configuration but you may proceed to temporarily change the parameters in the module for experiment.

### Down-Load Configuration

Whatever key is pressed the following message will appear next.

SAVE THIS CONFIGURATION N/Y? DOWN LOAD TO SLOT N/Y?

Pressing the Y key at this juncture will cause the parameter values as displayed to be downloaded to the module and the module commanded to re-start. These values will then become operative for the module, but will not be preserved over a power-up unless the SAVE option was also chosen. Any other key pressed is interpreted as NO.

The system will return to the menu it was called from.

*Note: Any application level parameters which are changed by the user connected to a particular module, such as terminal profile, will also be saved in battery backed RAM provided they are changed prior to configuration.*

**Statistics  
Point to Point  
Protocol**

The statistics option is selected from the Main Menu. First select whether you want to read stored statistics or to clear out tables. Then the Statistics Interrogation Screen requests the Slot Number of the module you wish to interrogate.

```
STATISTICS INTERROGATION MENU

<1> Read Statistics
<2> Clear Tables

ENTER SINGLE DIGIT TO SELECT:

Enter Slot Number to Interrogate : 2
```

```
SLOT No. 5 IS SS1 MODULE RUNNING IB7 FIRMWARE

Reply from Slot No. 5
Collected Statistics since last Reset.

False Starts           :      0
Hardware Errors        :      0
Communications Aborts  :      0
Received Text Blocks   :    103
Blocks in Error        :      0
WACKs sent by us      :     18
Number of RVIs received :      0
Files Received         :      0
Transmitted Text Blocks :      0
Repeat requests received :      0
TTDs sent by us       :      0
Files Transmitted      :      0
```

Selecting option 2 clears the above values to zero otherwise they just keep incrementing modulo 65536.

### Connection Matrix Poll & Select

```
SLOT No. 2 IS SS1 MODULE RUNNING IH3 FIRMWARE
```

| Contr. | Poll | State     | Buffers |
|--------|------|-----------|---------|
| 01     | 00   | CONNECTED | TQ      |
| 01     | 01   | CONNECTED | TQ      |
| 01     | 02   | CONNECTED |         |
| 01     | 03   | CONNECTED | RQ      |

This display shows the Controller and terminal Poll addresses of all IBM3270 terminal type devices that are being serviced by the IBM3270 Host module(D90-IH3). The buffer column might have the symbols RQ or TQ present showing that received data is yet to be serviced or that data is waiting to be sent and acknowledged.

The exact display will vary according to the firmware installed.

### Connection Matrix Point to Point

```
SLOT No. 3 IS SS1 MODULE RUNNING IB7 FIRMWARE
```

```
RETURN to refresh display, ESC to QUIT
```

| <Type> | <State> | <BufferQ> | <Connection> |
|--------|---------|-----------|--------------|
| 3780   | MASTER  | TQ        | ESTABLISHED  |

OR

|      |       |    |             |
|------|-------|----|-------------|
| 3780 | SLAVE | RQ | ESTABLISHED |
|------|-------|----|-------------|

OR

|      |      |  |        |
|------|------|--|--------|
| 3780 | IDLE |  | BROKEN |
|------|------|--|--------|

This display shows the state of an SS1 module supporting IBM 2780/3780 BSC stations.

The TQ and RQ indicate that there are buffers waiting in the Transmit and/or Receive queue respectively.

**SSA Configuration**

If the slot contains an SSA module, the following screen will appear.

```

#####          MODULE TYPE SSA SLOT NUMBER 3
#####          TRANSMIT SPEED      : 9600
#####
#####          RECEIVE SPEED       : EXTERNAL
# #
# #          CHARACTER FORMAT      : 8NE      (DATA, PARITY, STOP)
# #
#####          LINE SIGNALS READ   : HHH      (DCD, DTR, RTS)
#####
#####          CONFIGURATION BYTE  : 11111011
#####
#####          TRANSMIT SPEED      : 9600
#####
#####          RECEIVE SPEED       : 9600
#B #
# #          CHARACTER FORMAT      : 7S2      (DATA, PARITY, STOP)
# #
#####          LINE SIGNALS READ   : HHH      (DCD, DTR, RTS)
#####
#####          CONFIGURATION BYTE  : 11111011

          SPACE BAR CYCLES THROUGH VALUES, TAB MOVES THROUGH FIELDS, RETURN TO QUIT.
    
```

The cursor will appear at the first field. The permissible parameter values in each field can be cycled through by pressing the space bar. The DNM will check the validity of the selections and may generate error messages if inconsistencies are detected. Possible values for each port are given in the tables below.

**Port A**

| Field               | Values   |
|---------------------|--|
| TRANSMIT SPEED      | 75,150,300,600,1200,2400,4800,9600,16000,19200,32000,38400,48000,64000 bps or EXTERNAL |
| RECEIVE SPEED       | EXTERNAL   |
| CHARACTER FORMAT    |  |
| DATA                | 7,8 (No. of Data bits)   |
| PARITY              | O,E,M,S,N (Odd,Even,Mark,Space, None)  |
| CODE                | A,E (ASCII,EBCDIC)   |
| PORT DTR/DSR        | H,L (High/Low)   |
| ENABLE PIN 24 CLOCK | ENABLED,DISABLED (outputs TX clock)  |

For details on changing the Configuration Byte - refer to the paragraph under this heading earlier in this section.

*Note:* The configuration screen can be left at any time by entering the ESC character - leaving the configuration unchanged.

**Port B**

| Field            | Values                                   |                            |
|------------------|--|----------------------------|
| TRANSMIT SPEED   | 75,150,300,600,1200,2400,4800,9600,19200 | bps                        |
| RECEIVE SPEED    | 75,150,300,600,1200,2400,4800,9600,19200 | bps                        |
| CHARACTER FORMAT |  |                            |
| DATA             | 7,8                                      | (No. of Data bits)         |
| PARITY           | O,E,M,S,N                                | (Odd,Even,Mark,Space,None) |
| STOP             | 1,2                                      | (No. of stop bits)         |

For details on changing the Configuration Byte - refer to the paragraph under this heading earlier in this section.

The cursor can be moved to the next field by pressing the TAB key (ASCII value 9). If the TAB key is pressed when on the last field, the cursor will move up to the first field again.

When you have finished changing the configuration screen, press the RETURN key (ASCII value 13). The following message will appear at the bottom of the screen.

SAVE THIS CONFIGURATION N/Y?

**Save Configuration**

Pressing the Y key (either upper or lower case) will cause this configuration to be saved in the part of battery backed RAM of the DNM reserved for this slot. Any other key will *not* save the configuration but you may proceed to temporarily change the parameters in the module for experiment.

**Down-Load Configuration**

Whatever key is pressed the following message will appear next.

SAVE THIS CONFIGURATION N/Y?    DOWN LOAD TO SLOT N/Y?

Pressing the Y key at this juncture will cause the parameter values as displayed to be downloaded to the module and the module commanded to re-start. These values will then become operative for the module, but will not be preserved over a power-up unless the SAVE option was also chosen. Any other key pressed is interpreted as NO.

The system will return to the menu it was called from.

*Note:* Any application level parameters which are changed by the user connected to a particular module, such as terminal profile, will also be saved in battery backed RAM provided they are changed prior to configuration.

## Statistics

The statistics option is selected from the Main Menu. First select whether you want to read stored statistics or to clear out tables. Then the Statistics Interrogation Screen requests the Slot Number of the module you wish to interrogate.

```
STATISTICS INTERROGATION MENU

<1> Read Statistics
<2> Clear Tables

ENTER SINGLE DIGIT TO SELECT:

Enter Slot Number to Interrogate : 5
```

If there is an SSA module in the slot, the following type of screen will be displayed.

```
SLOT No. 5 IS SSA MODULE RUNNING IB8 FIRMWARE

Reply from Slot No. 5
Collected Statistics since last Reset.

False Starts           :      0
Hardware Errors        :      0
Communications Aborts  :      0
Received Text Blocks   :    103
Blocks in Error        :      0
WACKs sent by us      :     18
Number of RVIs received :      0
Files Received         :      0
Transmitted Text Blocks :      0
Repeat requests received :      0
TTDs sent by us       :      0
Files Transmitted      :      0
Asynchronous RX Errors :      0
Port B drops of RTS    :      0
```

Selecting option 2 clears the above values to zero otherwise they just keep incrementing modulo 65536.

**LAN Configuration**

If the slot contains a LAN module, the following screen will appear

```

MODULE TYPE - LAN SLOT NUMBER 1

#####
##### CONFIG. BYTE 'A' : 10010000
#####
# ##
# ## CONFIG. BYTE 'B' : 11000001
#####
#####
#####
# ## LOCAL IP ADDRESS : 128.18.18.30
# ##
##### REMOTE IP ADDRESS : 128.18.18.1
#####
##### GATEWAY IP ADDRESS : 128.18.18.250
#####
##### SUBNET ADDRESS MASK: FFFFFFF0
#####
##### LOCAL TCP SOCKET : 2000
##### REMOTE TCP SOCKET : 3000
##### ETHERNET ADDRESS : 00 A0 EF 02 00 0E
#####
#####
#####
SPACE BAR CYCLES THROUGH VALUES, TAB THROUGH FIELDS, RETURN TO QUIT

```

The cursor will appear in the first field and may be moved forward through the fields until a new value is entered or the RETURN key is pressed.

For details on changing the *Configuration Bytes* - refer to the paragraph under this heading earlier in this section.

*Note:* The configuration screen can be left at any time by entering the ESC character - leaving the configuration unchanged.

**IP Addresses**

The IP address format is the standard decimal dot '.' notation. Values between 0 and 255 may be typed in each of the byte fields followed by a '.' which causes a skip to the next field. Entering a '.' by itself moves the cursor to the next byte field of the address and retains the value skipped over. Typing a TAB at any point moves the cursor onto the next address field. Typing RETURN terminates the screen and presents the Save prompt.

**Sub-Net Address Mask**

The subnet mask is changed by typing in exactly eight hex digits. The value entered should be carefully checked by tabbing round the screen until it is repainted.

**Local TCP Socket**

The local socket is changed by typing in a value between 0 and 65535 decimal. Typing a TAB at any point moves the cursor onto the next address field. Typing RETURN terminates the screen and presents the Save prompt.

**Remote TCP Socket** The remote socket is changed by typing in a value between 0 and 65535 decimal. Typing a TAB at any point moves the cursor onto the next address field. Typing RETURN terminates the screen and presents the Save prompt.

**Ethernet Address** The Ethernet address cannot be changed as it is unique to the LAN module.

When you have finished assigning values on this screen typing RETURN will move on to the following screen. This enables a value to be defined for the UDP timeout which is the only way of breaking down a UDP association with a port.

```
ADVANCED FEATURE MENU FOR LAN MODULE
```

```
UDP CLIENT TIMEOUT : 3
```

Entering RETURN, or a new value for the number of seconds followed by RETURN, will cause the display of the Firewall definition menu

```
Firewall/Remote Server Definition Menu
( feature activated by non-zero values )
```

```
Acceptable Hosts and Ports
```

```
1.  0.0.0.0 : 0
2.  0.0.0.0 : 0
3.  0.0.0.0 : 0
4.  0.0.0.0 : 0
5.  0.0.0.0 : 0
6.  0.0.0.0 : 0
7.  0.0.0.0 : 0
8.  0.0.0.0 : 0
9.  0.0.0.0 : 0
10. 0.0.0.0 : 0
11. 0.0.0.0 : 0
12. 0.0.0.0 : 0
13. 0.0.0.0 : 0
14. 0.0.0.0 : 0
15. 0.0.0.0 : 0
16. 0.0.0.0 : 0
17. 0.0.0.0 : 0
18. 0.0.0.0 : 0
19. 0.0.0.0 : 0
20. 0.0.0.0 : 0
21. 0.0.0.0 : 0
22. 0.0.0.0 : 0
23. 0.0.0.0 : 0
24. 0.0.0.0 : 0
25. 0.0.0.0 : 0
26. 0.0.0.0 : 0
27. 0.0.0.0 : 0
28. 0.0.0.0 : 0
29. 0.0.0.0 : 0
30. 0.0.0.0 : 0
31. 0.0.0.0 : 0
32. 0.0.0.0 : 0
```

```
<C> Clear All entries, Disable feature
```

```
<A> Add an entry, <D> Delete an entry, <E> Edit an entry
```

```
<CR> Returns to Configuration Screen
```

The simple editing functions listed at the bottom of the screen allow values for IP addresses and optionally Port numbers to be used to construct a table. An existing table maybe disabled just by setting the first two bytes of entry 1 to zeroes. This saves the effort of having to retype all the other entries in again when the firewall is reenabled. If a port value is not required it is necessary to enter a zero explicitly not just RETURN.

When you have finished, press the RETURN key. The following message will appear at the bottom of the screen.

```
SAVE THIS CONFIGURATION N/Y?
```

### Save Configuration

Pressing the Y key (either upper or lower case) will cause this configuration to be saved in the part of battery backed RAM of the DNM reserved for this slot. Any other key will *not* save the configuration but you may proceed to temporarily change the parameters in the module for experiment.

### Down-Load Configuration

Whatever key is pressed the following message will appear next.

```
SAVE THIS CONFIGURATION N/Y?  DOWN LOAD TO SLOT N/Y?
```

Pressing the Y key at this juncture will cause the parameter values as displayed to be downloaded to the module and the module commanded to re-start. These values will then become operative for the module, but will not be preserved over a power-up unless the SAVE option was also chosen. Any other key pressed is interpreted as NO.

The system will return to the menu it was called from.

*Note:* Any application level parameters which are changed by the user connected to a particular module, such as terminal profile, will also be saved in battery backed RAM provided they are changed prior to configuration.

### Connection Matrix

The connection matrix option is selected from the Main Menu.

The Connection Matrix screen requests the slot number you wish to interrogate.

```
CONNECTIVITY MATRIX
```

```
<1> Select a Slot
```

```
<2> Toggle Auto-Refresh [OFF]
```

```
ENTER SINGLE DIGIT TO SELECT :
```

If there is a LAN module in the slot, the following type of screen will be displayed.

```

SLOT No. 1 IS LAN MODULE RUNNING TCP FIRMWARE

<Slot and Port><TCP Session Status><Buffers><Remote Port and Host>

2A      2000      80      OPEN                      1026  128.18.18.103
2B      2000      80      OPEN                      1035  128.18.18.1
3A      2000      20  PARTIALLY OPEN          TQ    1201  128.18.19.23

```

In this example the LAN module is running D90TCP firmware and has been configured as a Server on Socket 2000. Connections have been made successfully to the A and B ports of Slot 2 from two remote hosts. The TCP port number that they used is shown along with their IP address.

A third connection has started but not yet completed the initial handshake as shown by the Session Status and the fact that there is an unacknowledged packet still waiting in the TX queue buffer (TQ). The meaning of the TCP Session Status 80 is described in the module specific section.

## Statistics

The statistics option is selected from the Main Menu. First select whether you want to read stored statistics or to clear out tables. Then the Statistics Interrogation Screen requests the Slot Number of the module you wish to interrogate.

```

                        STATISTICS INTERROGATION MENU

<1> Read Statistics
<2> Clear Counters

ENTER SINGLE DIGIT TO SELECT:

Enter Slot Number to Interrogate : 1

```

When a LAN module type is in the selected slot the following display will result if it is running D90TCP firmware.

```
SLOT No. 1 IS LAN MODULE RUNNING TCP FIRMWARE
```

```
RETURN to refresh display, ESC to QUIT
```

```
Reply from Slot No. 1  
Collected Statistics since last Reset.
```

```
Time Since Power-Up      : 4774  
Received Bus Frames      : 4294  
Transmitted Bus Frames   : 22  
High Level Bus Errors    : 0  
  
Unicast packets Received : 0  
Unicast packets Transmitted : 1  
Multicast packets Received : 0  
Broadcast packets Received : 33  
RX CIO BOVF Warnings     : 0  
TX aborts on busy network : 0  
Currently Free Buffers    : 15  
Lowest free buffer count  : 14
```

The information is labelled and consists of basic inter module statistics which will be of little interest to the user and some specific information recorded by the network interface.

The Packet statistics are modulo 65536 and simply record the number of packets of the various types handled by this module.

BOVF warnings are when the arrival rate of packets exceeds the capability of the module to process them. Excessive broadcast traffic is the most probable cause if this value is non-zero.

TX aborts occur when the network is so busy that the NIC (Network Interface Controller) fails to send a packet after exhausting its 15 re-tries.

The Current Free buffers is a snapshot of how many free buffers are available at the instant the statistics were grabbed. The Lowest free buffer count will vary between close to 15 for a very lightly loaded LAN module to a small number if there has been high peak activity. It should never show zero.