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AD-A244 209



BBN Report No. 7617

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SIMNET

DATA LOGGER

USER MANUAL

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92-00270



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REPORT DOCUMENTATION PAGE

Form Approved
OPM No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

1. AGENCY USE ONLY (Leave Blank)		2. REPORT DATE June 1991	3. REPORT TYPE AND DATES COVERED User Manual	
4. TITLE AND SUBTITLE SIMNET Data Logger User Manual			5. FUNDING NUMBERS Contract Numbers: MDA972-89-C-0060 MDA972-89-C-0061	
6. AUTHOR(S) Author unspecified.				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Bolt Beranek and Newman, Inc. (BBN) Systems and Technologies; Advanced Simulation 10 Moulton Street Cambridge, MA 02138			8. PERFORMING ORGANIZATION REPORT NUMBER BBN Report Number: 7617	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Defense Advanced Research Projects Agency (DARPA) 3701 North Fairfax Drive Arlington, VA 22203-1714			10. SPONSORING/MONITORING AGENCY REPORT NUMBER DARPA Report Number: None	
11. SUPPLEMENTARY NOTES None				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Distribution Statement A: Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE Distribution Code: A	
13. ABSTRACT (Maximum 200 words) A Simulation Network (SIMNET) project user manual describing the use of the Data Logger (DL) workstation of the SIMNET hardware and software training system for vehicle crew training and operational training.				
14. SUBJECT TERMS The SIMNET Data Logger (DL) workstation user manual.			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Same as report.	

Report No. 7617

SIMNET DATA LOGGER USER MANUAL

June 1991

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This research was performed by BBN Systems and Technologies under Contract No. MDA972-89-C-0060 to the Defense Advanced Research Projects Agency (DARPA). The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policy, either expressed or implied, of DARPA, the U.S. Army, or the U.S. Government.

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DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification _____	
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
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1. Introduction

1.1 SIMNET

The SIMNET program is an advanced technology project developed by Bolt Beranek and Newman Inc. and sponsored by the Defense Advanced Research Projects Agency (DARPA) in close cooperation with the Army. Its objective is to develop large-scale networking of military simulators for such vehicles as tanks and fixed-wing and rotary-wing aircraft. By utilizing a network of low-cost, full-crew simulators, each supported by its own set of microprocessors, the Army can conduct platoon-, company-, and battalion-level exercises incorporating all of the tactical, logistic, administrative, and communication elements that are critical to actual field operations. This technology will permit regular and intensive practice of team combat skills.

A SIMNET simulator models the performance of the actual vehicle in mobility, fire control, and communication. A simulator contains crew stations, each of which has a set of controls comparable to those in the actual vehicle. The simulator's visual display system ensures that each crew member sees a depiction of the battlefield terrain as it would be seen from his vision blocks in the actual combat vehicle. SIMNET offers the crew member the opportunity to behave as he would in a real vehicle, succeeding or failing in assigned missions as he would in a battlefield exercise.

SIMNET provides components for recording exercise data and for reviewing an exercise via a plan view (bird's-eye view) of the battlefield. Data packets from a SIMNET exercise are received at the Plan View Display and are used to provide a view of a SIMNET exercise that is currently in progress. These data packets from a SIMNET exercise can also be recorded by the Data Logger. The Data Logger can transmit these recorded data packets to the Plan View Display for the purpose of playing back a SIMNET exercise at a later date.

1.2 The Data Logger

Recording data from an exercise is straightforward in SIMNET, since all of the basic information about vehicle movements, firings, hits, etc., is contained in data packets broadcast onto the SIMNET network by each simulator and the Management, Command, and Control System (MCC).

Data collection is carried out on a machine known as the Data Logger, a Masscomp computer that is attached to the SIMNET network by means of a high-performance Ethernet interface. The Data Logger can capture the network traffic and place the data packets in a disk or tape file. There are two data logging mediums: disk and tape. Logging a disk file is performed by specifying a disk medium, and logging onto magnetic tape is performed by specifying a tape medium.

The Data Logger machine can perform the following functions:

- Packet recording: Packets are received from the SIMNET network, time-stamped and written to disk or tape.
- Packet playback: Packets from a recorded exercise can be transmitted in real time or faster than real time. The Data Logger can also suspend playback (freeze time)

and skip backward or forward to a designated point in time. The Logger can be controlled directly from the keyboard or remotely from the Plan View Display. Playback is visible to any device on the network (PVD, stealth vehicle, vehicle simulator, etc.).

- Copying or converting: Files can be copied to other files that are on the same medium or a different medium, and files from the older version of the Data Logger can be converted to a format compatible with this version of the Logger. For example, a disk file created with the Logger program can be copied to tape. Its format will be the same as the format of the disk file.

1.3 The Plan View Display

The Plan View Display (PVD) provides real-time viewing of an exercise or the playback and review of an exercise at a later time. The PVD program runs on a Masscomp 68020 computer with color graphics enhancements. The PVD provides a view of the battlefield as seen from directly above. It is attached to the SIMNET network by means of a high-performance Ethernet interface.

The PVD can display exercise data that originates from currently active simulators and the MCC computer, and from the playback mode of the Data Logger. During playback of an exercise, the Logger can be controlled directly from its keyboard or from the Plan View Display. Commands can be issued to the Data Logger to select the specific times from within an exercise, to vary the speed of exercise playback, to halt and restart, and to rewind an exercise playback.

The PVD contains a color-coded display showing various geographic details, such as roads, rivers, and terrain relief. Individual vehicles are represented on the PVD by icons that indicate the position and orientation of the hull and the relative orientation of the turret. The user can vary the size of the icons by selecting a magnification level. Shading of the geographic display is performed according to an algorithm which assumes a sun elevation of 45 degrees from the horizon and a sun shining from the top right-hand corner of the display.

The path of a vehicle over time is indicated by a trail of small dots, each representing one of n previous hull positions, and a shot is indicated by a line segment emanating from the firing vehicle. The user can select particular vehicles and obtain detailed information such as the vehicle location, speed, alignment, identification number, and repair and supply status.

The user can zoom in or out on any selected area of the battlefield, pan the display in any direction, obtain intervisibility readings, and optionally overlay grid and/or contour lines at selected intervals. Any terrain cross-section is viewable by selecting its two endpoints. Numeric values for the terrain elevation and corresponding map coordinates (UTM or XY) for any point in the field of view are similarly obtainable.

1.4 Format of Operating Instructions

Instructions for operating the Data Logger are provided in the pages that follow. They can contain:

1. Instructions: A step-by-step description of the interaction between the computer and the user to accomplish the task. When the instructions tell you to enter information, you are to type the information and then press the RETURN key. The RETURN key is written as <cr> in this document. This section is useful to the first-time user, as it attempts to provide more detailed information than an example alone provides. It can be helpful to refer to the example as you are reading and/or trying the instructions.
2. Example: A sample showing what appears on the screen during the interaction between the user and the computer when the task is being accomplished. In the example, what the user needs to enter is shown in boldface. Even though it is not shown in the example, the user must always press the RETURN key after entering information, so that what has just been typed will be sent to the computer. This section is useful to the experienced user who needs a quick reference guide.
3. Notes: User interface, background, and troubleshooting information. This section should be read by the first-time user. Experienced users will find these notes useful for reference if an unanticipated situation arises.

2 Operating the Data Logger

2.1 Getting Started

Instructions

1. To log in at the Data Logger, power on the MASSCOMP; then press <cr>. The computer responds with a prompt of *login:* or *<machine name> login:*.
2. In response to the login prompt, enter **logger**. The computer responds with a prompt (typically *<logger>* or *<logger2>*) or to inform you that you can now enter commands.
3. In response to the computer prompt, enter **logger -h**. You are telling the computer to run the Data Logger with the **-h** (help) switch, i.e., to display all the switches that are allowed when running the Data Logger program.

Example

```
login: logger
```

```
$ logger -h
```

```
Usage: logger switches ...
```

```
Must specify one of the following flags:
```

```
-c(opy or convert data files)
```

```
-p(lay tape of net traffic)
```

```
-r(ecord net traffic)
```

```
-h(elp)
```

```
-s(erver mode -- control from PVD)
```

```
-v(ersion information)
```

```
-q(uey the full set of options)
```

```
$
```

Notes

1. When you see a prompt on the screen, it means that the computer/program is waiting for you to type some command or information.
2. For information about:
 - the **-c** switch, see section 2.4
 - the **-p** switch, see section 2.3
 - the **-r** switch, see section 2.2

3. The `-s` switch tells the Data Logger program to run in server mode. This means that the Logger program will expect you to operate the Logger from the Plan View Display and not from the keyboard. See the documentation for the Plan View Display for a description of operating commands.
4. The `-v` switch tells the Data Logger program to display its version number. This manual describes the Data Logger program whose version number is 6.6.3.
5. The `-q` switch tells the Data Logger program to run in full query mode, i.e., to display the full set of prompts and messages. When this switch is off, only an abbreviated set is displayed, and the Data Logger assumes standard default values for the missing prompts. Once you are familiar with the operation of the Data Logger, you will probably not need the full set of prompts when using the Data Logger in typical operations.
6. If an invalid switch or combination of switches is entered, the Data Logger program responds with a *Logger ERROR:* message to inform you of the error.
7. If you enter `logger` without any switches, the Data Logger displays the same message and list of flags (switches) as when when you enter `logger -h`.

2.2 Recording a SIMNET Exercise

2.2.1 Recording a SIMNET Exercise in Full Query Mode

Instructions

1. Enter `logger -r -q` to tell the computer to record (`-r`) a SIMNET exercise in query (`-q`) mode.
2. The computer prompts you for information. Many prompts will contain a default value in square brackets. To accept the default, press `<cr>`. To see online help for a prompt, enter `?` as a response.
3. The computer first responds with the message *Use maximum priority if you expect high packet rates:* and the prompt *Maximum Priority? [n]*. High packet rates are rates greater than 400 packets per second. Press `<cr>` to enter the default value of 'no'. A reply of `y` tells the Data Logger program to record with maximum priority (see section 2.2.5).
4. The computer next responds with the message *Enter info about the types of packets to be recorded.* You will then see prompts that ask you to enter information. Those prompts may include:
 - *Voice protocol [y]:* - Enter `y` or `n` to indicate whether you want packets of the SIMNET Voice protocol type to be recorded.

- *Simulation protocol [y]*: - Enter **y** or **n** to indicate whether you want packets of the SIMNET Simulation protocol type to be recorded. If you answer **y**, the following prompts appear:
 - *Standard protocols (#2-128) [y]*: - Enter **y** or **n** to indicate whether you want packets of standard protocols to be recorded.
 - *Proprietary protocols (#129-256) [y]*: Enter **y** or **n** to indicate whether you want packets of proprietary protocols to be recorded.
 - *Num exercises [1]*: - The Data Logger program wants to know how many SIMNET exercises you want to record in this file. Press **<cr>** to enter the default value of '1'. If you want to record multiple exercises on this tape, enter an integer (range 2 to 5). This integer indicates the number of valid exercise IDs that you will be prompted for.
 - *Exercise ID [all]*: - The Data Logger program wants you to enter an integer (range 1 to 255) to identify the exercise IDs you want recorded in this file. If you press **<cr>** the default value will tell the Logger to ignore exercise ID number and record all packets on the network.
5. The computer responds with the message *Enter info about SIMNET data file to be RECORDED to*. You will then see prompts that ask you to enter information. The first prompt is *Medium [disk]*: Enter **tape** if you want to record onto magnetic tape; otherwise press **<cr>** to accept the default value of 'disk'. The appearance of several prompts depends on whether you are recording to tape or disk. For information about specific prompts for each medium, see sections 2.2.3 and 2.2.4.
 6. The following prompts appear for either medium:
 - *File Name* - Enter an absolute or relative UNIX path specification. The Data Logger program will record the data on a file named according to your response. A valid name can be any sequence containing from one to fourteen characters. One way to ensure a unique file name is to use the date (mmddyy) and time (hour) of the recording in the file name. An exercise recorded September 05, 1986 at 1400 hours could be named 09058614.file. By assigning a unique name to each recorded exercise, the exercise can be saved until a decision is made to delete it. If the response to the *File Name* prompt is not a unique file name, the computer will issue a *Logger WARNING* to ask whether you really want to overwrite the existing file of the same name. The file name is saved in the file header. It serves as the default name when the data file is copied from tape to disk.
 - *Project ID* - The Data Logger program will record the project ID in the file header. The project ID can contain six characters maximum.
 - *Comment* - The Data Logger program will record the comment in the file header. The comment can contain twenty-four characters maximum.
 7. The computer responds with a message noting that it has opened the specified file for writing.

8. The computer then lists the file header information.
9. The Data Logger enters a suspended state. At this point, you need to enter a character that serves as a runtime command.
10. To tell the Data Logger to continue recording, enter c. The computer responds with 'Logger is entering the active state', followed by the continue time (an offset from the beginning of the exercise).
11. For information about using logger runtime commands during recording, see section 2.2.7.

Example

```
$ logger -r -q
```

Use maximum priority if you expect high packet rates:

```
Maximum Priority? [n] <cr>
```

Enter info about the types of packets to be recorded.

```
Voice protocol [y]: <cr>
```

```
Simulation protocol [y]: <cr>
```

```
Standard protocols (#2-128) [y]: <cr>
```

```
Proprietary protocols (#129-256) [y]: <cr>
```

```
Num exercises [1]: <cr>
```

```
Exercise ID [all]: <cr>
```

Enter info about SIMNET data file to be RECORDED to.

```
Medium [disk]: <cr>
```

```
Contiguous [n]: <cr>
```

```
Num Volumes [1]: <cr>
```

```
File Name: 08159018.file
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Opened '08159018.file' for writing.
```

SIMNET data file header info:

```
File Name: 08159018.file
```

```
Exercise ID: ALL
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Date of Run: 15-AUG-90
```

```
Time of Run: 18:22:30
```

```
Volume Number: 1
```

```
Command String: logger -r -q
```

```
Fiolib Version: 6.6.3
```

Logger entering suspended state.

Time offset 00:00:00 = 0 secs ...

```
c
```

Continue...

Logger is entering the active state.
Time offset 00:00:32 = 32 secs ...

Notes

1. The following UNIX commands are valid only when typed in response to the machine prompt (shown as \$ in this documentation):
 - `ls -s *` gives information (including the name) about all files in the current directory. This command tells the computer to list (ls) files, giving the size (-s) of the file in blocks. Use this command when in doubt about the uniqueness of a file name. If the file name assigned when recording an exercise is not unique, the previously recorded exercise with the same file name will be lost.
 - `rm <filename>` removes a file. If you do not want to keep the file named 08158518.file, type `rm 08158518.file` in response to the machine prompt.

2.2.2 Recording a SIMNET Exercise in Abbreviated Query Mode

Instructions

1. Enter `logger -r` to tell the computer to record (-r) a SIMNET exercise. Since the -q switch is missing, the computer will assume some default information and will not present the full set of query prompts. If you are recording a typical exercise (one exercise id, normal packet rates, etc.) you probably will not need the full set of query prompts. However, if the recording is non-standard (expectation of packet rates greater than 400 packets per second, multiple volumes, specific exercise ids, etc.), you will need to use the -q switch to supply additional information (see section 2.1). When the computer prompts you for information, a default value in square brackets may appear at the end of the prompt. To accept the default, press <cr>. To see online help for a prompt, enter ? as a response.
2. The computer displays the message *Enter info about types of packets to be recorded*. You will then see the following prompt:
 - *Exercise ID [all]:* - The Data Logger program wants you to accept the default or to enter an integer (range 1 to 255) to identify the exercise id you want recorded in this file. If you enter an invalid response or press <cr>, the default value will tell the Logger to ignore exercise ID number and record all packets on the network.
3. The computer responds with the message *Enter info about SIMNET data file to be RECORDED to*. You will then see prompts that ask you to enter information. The first prompt is *Medium [disk]:* Answer with **tape** if you want to record onto magnetic tape; otherwise press <cr> to accept the default value of 'disk'.

The appearance of several prompts depends on whether you are recording to tape or disk (see sections 2.2.3 and 2.2.4 for information about the specific prompts for each medium).

4. The computer prompts for *File Name:*, *Project ID:*, and *Comment:*. For information about answering these prompts, see section 2.2.1.
5. The computer responds with a message that it has opened the specified file for writing and then lists file header information.
6. The Data Logger enters a suspended state. At this point, you need to enter a character that serves as a runtime command. (See section 2.2.7).

Example

```
$ logger -r
```

```
Enter info about types of packets to be recorded.
```

```
Exercise ID [all]: <cr>
```

```
Enter info about SIMNET data file to be RECORDED to.
```

```
Medium [disk]: <cr>
```

```
File Name: 08159018.file
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Opened '08159018.file' for writing.
```

```
SIMNET data file header info:
```

```
File Name: 08159018.file
```

```
Exercise IDS: ALL
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Date of Run: 15-AUG-90
```

```
Time of Run: 18:22:30
```

```
Volume Number: 1
```

```
Command String: logger -r
```

```
Fiolib Version: 6.6.3
```

```
Logger entering suspended state.
```

```
Time offset 00:00:00 = 0 secs ...
```

```
c
```

```
Continue...
```

```
Logger is entering the active state.
```

```
Time offset 00:00:32 = 32 secs ...
```

2.2.3 Recording a SIMNET Exercise on Magnetic Tape

Instructions

1. Enter **logger -r** to tell the computer to record (-r) a SIMNET exercise. The use of full query mode is optional; if you are recording a typical exercise (one exercise id, normal packet rates, etc.) you probably will not need the full set of query prompts. This example is done in abbreviated query mode.
2. The computer responds with the *Maximum Priority* prompt and then the usual *Enter info about types of packets to be recorded*. For information about answering these prompts, see section 2.2.1. You can get online help by responding to prompts with a ?.
3. A prompt asks you to enter information about the types of packets to be recorded (see section 2.2.1).
4. A prompt then asks you to specify a recording medium. Respond by entering **t** or **tape** for magnetic tape. If the first character of your response is not a **t** or a **?**, the computer will assume you want to record on disk. The **?** response invokes online help.
5. The computer will prompt you for more information. These prompts are as follows:
 - *Drives [both]* - Asks which tape drives you will load and have online during the recording. Press **<cr>** if you will use two drives. Answer **0** or **1** if you have only one tape drive. An answer of '0' tells the Logger program to use the drive labeled mt0, and an answer of '1' tells it to use mt1.
 - *Continuous Mode* - If you have an installation with more than one tape drive, respond with **y** to tell the Data Logger program to continue recording on the other drive when the reel on the recording drive becomes full. In this way, recording is done on alternating drives without any pauses for changing reels. The system assumes you will mount an empty reel on a drive while the system is recording on the alternate drive. This prompt only appears if you indicated a response of 'both' to the *Drives* prompt above.
 - *Size [2400 feet]* - The three sizes of tape reels are 600, 1800, and 2400 feet. The Logger will stop recording when enough data has been recorded to fill the specified reel size. The default is 2400. If you are using multiple reels, they must all be able to handle the specified size.
6. The computer prompts for *File Name:*, *Project ID:*, and *Comment:*. For information about answering these prompts, see section 2.2.1.
7. The computer responds with a message that it is opening the specified file for writing and displays file header information.
8. The Data Logger enters a suspended state. At this point, you need to enter a character that serves as a runtime command. (See section 2.2.7).

Example

```
$ logger -r -q
```

```
Use maximum priority if you expect high packet rates:
```

```
Maximum Priority? [n] <cr>
```

```
Enter info about types of packets to be recorded.
```

```
Voice protocol [y]: <cr>
```

```
Simulation protocol [y]: <cr>
```

```
Standard protocols (#2-128) [y]: <cr>
```

```
Proprietary protocols (#129-256) [y]: <cr>
```

```
Num Exercises [1]: 3
```

```
Expecting 3 exercise ids.
```

```
Exercise ID 0: 2
```

```
Exercise ID 1: 3
```

```
Exercise ID 2: 4
```

```
Enter info about SIMNET data file to be RECORDED to.
```

```
Medium [disk] tape
```

```
Drives [both] <cr>
```

```
Continuous mode [y]: <cr>
```

```
Size [2400 feet]: <cr>
```

```
File Name: 08159018.file
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Opened '08159018.file' for writing.
```

```
SIMNET data file header info:
```

```
File Name: 08159018.file
```

```
Exercise IDS: 2 3 4
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Date of Run: 15-AUG-90
```

```
Time of Run: 18:22:30
```

```
Volume Number: 1
```

```
Command String: logger -r -q
```

```
Fiolib Version: 6.6.3
```

```
Logger entering suspended state
```

```
Time offset 00:00:00 = 0 secs...
```

```
q
```

```
Quit...
```

```
Logger is shutting down.
```

```
Internal stats: Received 381, control 0, dropped 0 pkts.
```

```
Net statistics: Received 413, missed 0 pkts in 316.380661 seconds.
```

```
Average packet rate was: 1.3 p/s.
```

Notes

1. **logger -h** gives a description of flags (switches).
2. In the example above, the user responded to the prompt *Num Exercises [1]*: by entering 3. The Data Logger program then kept prompting for *Exercise ID* until three valid exercise IDs were entered.
3. The runtime command in the example above is **q**, which tells the Data Logger to quit. The computer responds with 'Quit ...' followed by a shutdown message and statistics.

2.2.4 Recording a SIMNET Exercise on Disk

Instructions

1. Enter **logger -r -q** to record (-r) a SIMNET exercise in full query (-q) mode. The use of full query mode is optional; if you are recording a typical exercise (one exercise id, normal packet rates, etc.) you probably will not need the full set of query prompts.
2. The computer responds with the *Maximum Priority* prompt and then the usual *Enter info about types of packets to be recorded* prompts. For information about answering these prompts, see section 2.2.1. You can get online help by responding to these prompts with a ?.
3. A prompt asks you to enter information about the types of packets to be recorded (see section 2.2.1).
4. A prompt then asks you to declare a recording medium. Respond by pressing <cr> to accept the 'disk' default.
5. The computer will prompt you for more information. These prompts are as follows:
 - *Contiguous* - When you respond with n (or <cr> to accept the default), the Data Logger is allowed to record the exercise on several smaller disk files instead of one large file. A contiguous file is only needed with a high packet rate (see section 2.2.5).
 - *Num Volumes* - You are allowed to respond with an integer in the range 1 to 9. The usual response is the default of '1'. If you were recording a very large exercise to disk, you might indicate a response greater than '1' for the *Num Volumes* prompt.
6. The computer prompts for *File Name:*, *Project ID:*, and *Comment:*. (See section 2.2.1.)

7. The computer responds with a message that it has opened the file for writing and lists the file header information.
8. The Data Logger enters a suspended state. At this point, you need to enter a character that serves as a runtime command. To tell the Data Logger to continue recording, enter *c*. The computer responds with 'Logger is entering the active state', followed by the message *Time offset <time> = n secs* For information about using logger runtime commands during recording, see section 2.2.7.

Example

```
$ logger -r -q
```

Use maximum priority if you expect high packet rates:

```
Maximum Priority? [n] <cr>
```

Enter info about types of packets to be recorded.

```
Voice protocol [y]: <cr>
```

```
Simulation protocol [y]: <cr>
```

```
Standard protocols (#2-128) [y]: <cr>
```

```
Proprietary protocols (#129-256) [y]: <cr>
```

```
Num Exercises [1]: <cr>
```

```
Exercise ID [all]: <cr>
```

Enter info about SIMNET data file to be RECORDED to.

```
Medium [disk]: <cr>
```

```
Contiguous [n]: <cr>
```

```
Num Volumes [1]: <cr>
```

```
File Name: 08.test
```

```
Project ID: SAF
```

```
Comment: Aug test data
```

```
Opened '08.test' for writing.
```

SIMNET data file header info:

```
File Name: 08.test
```

```
Exercise IDS: ALL
```

```
Project ID: SAF
```

```
Comment: Aug test data
```

```
Date of Run: 29-AUG-90
```

```
Time of Run: 14:06:30
```

```
Volume Number:1
```

```
Command String: logger -r -q
```

```
Fiolib Version: 6.6.3
```

```
Logger entering suspended state
```

```
Time offset 00:00:00 = 0 secs...
```

```
c
```

```
Continue
```

```
Logger is entering the active state.
```

```
Time offset 00:00:54 = 54 secs ...
```

Notes

1. For a high packet rate (400 or more packets per second), see section 2.2.5. The packet rate increases as the number of simulators and semi-automated vehicles (SAF) on the network increases. The packet rate is displayed at the conclusion of a Data Logger run and upon exiting the Plan View Display program. By noting this packet rate and the number of vehicles in the exercise, you will be able to estimate the packet rate for future exercises.
2. If you respond to the *Num Volumes* prompt with 2, the computer will then ask for a name for each of the two volumes (Vol 0 and Vol 1). A physical disk can be subdivided into logical volumes identified by device names. For example, on one physical disk there can be two volumes, identified as devices named ca0 and da0. A file can't be larger than the volume. The concept of a volumes is somewhat different depending on the recording medium. For disk files, volumes correspond to individual UNIX files. For tape files, volumes correspond to individual tape reels.
3. **df** (disk free) is a UNIX command that is valid only when typed in response to the UNIX or machine prompt. This command gives information about the amount of storage available for recording an exercise. The number under the heading 'avail' gives the number of blocks available. If the number of available blocks is insufficient, check to see whether some files can be copied to tape and then removed from disk. Exercise storage requirements are around 3200 blocks per air simulator, 1600 blocks per ground simulator, 1600 blocks per Semi-Automated Force vehicle, 1100 blocks per gunnery target, and 215 blocks per MCC vehicle (fuel truck, repair vehicle, etc.) per recording hour.

2.2.5 Recording When Expecting High Packet Rates

Instructions

1. This procedure is needed only when recording an exercise with a high packet rate (400 or more packets per second). Recording such an exercise on non-contiguous files could result in loss of data packets.
2. Enter **logger -r -q** to tell the computer to record (-r) a SIMNET exercise in query (-q) mode.
3. The computer will prompt you for information. Many prompts will contain a default value in square brackets. To accept the default, press **<cr>**. To see online help for a prompt, enter **?** as a response.
4. The computer first responds with the message *Use maximum priority if you expect high packet rates:* and the prompt *Maximum Priority? [n]*. High packet rates are rates greater than 400 packets per second. Enter a reply of **y** to tell the Data Logger program to record with maximum priority. This means that the Logger process runs at real-time priority with other processes locked out (prevented from running). Unless you are directly logged into the Logger, it will

not respond to runtime commands. Therefore you must be directly connected to the Data Logger (not via telnet or rlogin) in order to use maximum priority.

5. A prompt asks you to enter information about the types of packets to be recorded (see section 2.2.1).
6. Follow the procedure described in **To Record a SIMNET Exercise on Disk** (section 2.2.4), but enter **y** in response to the *Contiguous* prompt. This tells the Data Logger program that a single contiguous file is required. When you respond with **n** to the *Contiguous* prompt, the Data Logger is allowed to record the exercise on several smaller disk files instead of one large file. If this method is used with a high packet rate, the Data Logger might drop some packets while finding another disk area when a disk file gets filled.
7. Answering **y** to the *Contiguous* prompt will cause the Data Logger to prompt you for the size of the contiguous file to allocate. Respond to the prompt, *Size of*, with an integer in the range of 50 to 500 million. This tells the Data Logger program to check whether there is enough room on the disk to set aside one contiguous area of the indicated size.

Example

```
$ logger -r -q
```

Use maximum priority if you expect high packet rates:

Maximum Priority? [n] **y**

Enter info about types of packets to be recorded:

Voice protocol [y]: <cr>

Simulation protocol [y]: <cr>

Standard protocols (#2-128) [y]: <cr>

Proprietary protocols (#129-256) [y]: <cr>

Num Exercises [1]: <cr>

Exercise ID [all]: <cr>

Enter info about SIMNET data file to be RECORDED to.

Medium [disk]: <cr>

Contiguous [n] **y**

Using contiguous files.

Num Volumes [1]: <cr>

File Name: **08159014.file**

Size of '08159014.file': **50000000**

Size of '08159014.file' is 50000000.

Project ID: **SAF**

Comment: **Aug test data**

Opened '08159014.file' for writing.

SIMNET data file header info:

File Name: 08159014.file

Exercise IDS: ALL

Project ID: SAF

Comment: Aug test data

Date of Run: 15-AUG-90
Time of Run: 18:22:30
Volume Number: 1
Command String: logger -r -q
Fiolib Version: 6.6.3

Logger entering suspended state.
Time offset 00:00:00 = 0 secs...

c

Continue ...
Logger is entering the active state.
Time offset 00:00:17=17 secs ...

Notes

1. Exercise storage requirements are around 3200 blocks per air simulator, 1600 blocks per ground simulator, 1600 blocks per Semi-Automated Force vehicle, 1100 blocks per gunnery target, and 215 blocks per MCC vehicle (fuel truck, re; air vehicle, etc.) per recording hour. A block is 512 bytes.
2. If there is enough space on the disk, but the space is not contiguous, the only option is to perform a level 0 **dump mkfs restor**. See Chapter 5 of the Masscomp MC5600/5700 System Management Guide for directions. This operation should be performed by the system manager, because all information on the disk can be lost if it is performed incorrectly.
3. **ls -l -s <filename>** is a UNIX command that tells the computer to list (ls) the named file in the long (-l) form, giving the size (-s) of the file in blocks. **ls -l -s *** gives the same information about all files in the current directory. **ls -l -s *.file** gives the same information about all files in the current directory whose names end in '.file'.

2.2.6 Recording Large Exercises

Instructions

1. Recording large exercises to tape is not a problem, since for tape, volumes correspond to individual tape reels. However for disk, volumes correspond to individual UNIX files, which must be named.
2. Enter **logger -r -q**. This tells the computer to run the Logger in record (-r) mode with a full query (-q) of prompts.
3. See section 2.2.1 for information about most of the prompts you will have to answer.
4. Prompts that are significant when recording a very large exercise to disk are:

- *Num Volumes [1]*: Usually a file will be recorded on one volume and will have a single name. However, a physical disk can be subdivided into logical file systems identified by device name, and each of these can be linked together to record a very large exercise. If the response to the *Num Volumes* prompt indicates multiple volumes, the computer will then ask for a name for each of the volumes (File Name, Vol 0:, File Name, Vol 1:, ...) in place of a single name.
- *File Name* - Enter a relative or absolute UNIX path specification. The Data Logger program will write the data on a disk file and record its assigned name. A valid name can be any sequence containing from one to fourteen characters. If the system finds a file that matches the specified file name, a message will tell you that the file already exists and ask you whether to overwrite it. You will be given the opportunity of entering another name if you do not want to overwrite the existing file.

Example

```
$ logger -r -q
```

```
Use maximum priority if you expect high packet rates:  
Maximum Priority? [n] <cr>
```

```
Enter info about types of packets to be RECORDED.
```

```
Voice protocol [y]: <cr>  
Simulation protocol [y]: <cr>  
Standard protocols (#2-128) [y]: <cr>  
Proprietary protocols (#129-256) [y]: <cr>  
Num Exercises [1]: <cr>  
Exercise ID [all]: <cr>
```

```
Enter info about SIMNET data file to be RECORDED to.
```

```
Medium [disk]: <cr>  
Contiguous [n]: <cr>  
Num Volumes [1]: 2  
    Expecting 2 file volumes.  
File Name, Vol 0: am1.test  
File Name, Vol 1: bm1.test  
Project ID: SAF  
Comment: m1 test run  
Opened 'am1test' for writing.  
Concated 'bm1.test' for writing.
```

```
SIMNET data file header info:
```

```
File Name: m1.test  
Exercise IDS: ALL  
Project ID: SIMNET  
Comment: m1 test run  
Date of Run: 15-AUG-90  
Time of Run: 14:22:30  
Volume Number: 1
```

Command String: logger -r -q
Fiolib Version: 6.6.3

Logger entering suspended state
Time offset 00:00:00 = 0 secs...

2.2.7 Using Logger Runtime Commands During Recording

Instructions

1. When the computer displays the message *Logger entering suspended state, Time offset <absolute time> = n secs ...*, it has paused and is waiting for a runtime command to tell it what to do next.
2. Enter **h** (for help) to see a list of valid runtime commands.
3. Enter the command that corresponds to the action you want the Logger to take.

Example

Logger entering suspended state
Time offset <hh:mm:ss> = <n> secs ...
h

Logger runtime commands for loggerRecording:

- c** - Continue
- h** - Help
- i** - Information about logger status
- q** - Quit
- p** - Pause

See documents for more ...

Notes

1. A response of **c** tells the Logger program to start recording network traffic.
2. A response of **h** tells the Logger program to display the online help message shown above.
3. A response of **i** tells the Logger program to list the following:

Logger status information:

Logger state: loggerSuspended or Active.
Logger activity: loggerRecording
Packets received: <n>.
Time offset: <hh:mm:ss> = <n> secs.

If the logger state is suspended, the SIMNET data file header information follows the status information.

4. A response of **q** tells the Logger program to stop recording network traffic and to exit.
5. A response of **p** tells the Logger program to temporarily halt the recording of network traffic. The exercise clock will continue to run.

2.3 Playing Back a SIMNET Exercise

2.3.1 Playing Back a SIMNET Exercise in Full Query Mode

Instructions

Note: Data Logger and related systems (ie., Stealth, PVD) are disconnected from the main training network prior to playback.

1. Enter **logger -p -q** to tell the computer to play back (-p) a SIMNET exercise in query (-q) mode.
2. The computer responds with the message *Use maximum priority if you expect high packet rates:* and the prompt *Maximum Priority? [n]*. High packet rates are rates greater than 400 packets per second. Press <cr> to enter the default value of 'no'. A reply of **y** tells the Data Logger program to play back with maximum priority. This means that the process runs at real-time priority. To use maximum priority, you must be directly connected to the Data Logger (not connected via telnet or rlogin).
3. The computer responds with the message *Enter info about SIMNET data file to be PLAYED BACK*. You will then see prompts that ask you to enter information. The first prompt is *Medium [disk]*. To accept the default value of 'disk', press <cr>; if you want to play back from magnetic tape, answer with **tape**. If you respond with **?** you will receive online help for the prompt. The appearance of several prompts following 'medium' depends on whether you are playing back from tape or disk. For information about the specific prompts for each medium, see sections 2.3.3 and 2.3.4.
4. The computer displays the prompt *Enter info about protocols to be PLAYED BACK. Play Stealth protocol [y]*: Enter **y** or **n** to indicate whether you want the SIMNET packets used to control the Stealth vehicle to be played back.
5. The computer displays the message *Opened <filename> for reading* and the following file header information:
 - File Name
 - Exercise IDS - A blank line or *ALL* indicates that all exercise IDs were recorded.

- Project ID
 - Comment
 - Date of Run - the date on which the file was created
 - Time of Run - the time at which the file was created
 - Volume Number
 - Command String - the command string used to create the file
 - Fiolib Version - number of the version of fast input/output library routines (fiolib) used by the Logger program to create the file.
6. The Data Logger enters a suspended state. To have the Data Logger resume, you need to enter a character. For information about using logger runtime commands during playback, see section 2.3.6.

Example

```
$ logger -p -q
```

```
Use maximum priority if you expect high packet rates:
```

```
Maximum Priority? [n] <cr>
```

```
Enter info about SIMNET data file to be PLAYED BACK.
```

```
Medium [disk]: <cr>
```

```
Num Volumes [1]: <cr>
```

```
File Name: 08159018.file
```

```
Enter info about protocols to be PLAYED BACK.
```

```
Play Stealth protocol [y]: <cr>
```

```
Opened '08159018.file' for reading
```

```
SIMNET data file header info:
```

```
File Name: 08159018.file
```

```
Exercise IDS: ALL
```

```
Project ID: SAF
```

```
Comment: LHN test run
```

```
Date of Run: 15-Aug-90
```

```
Time of Run: 18:22:30
```

```
Volume Number: 1
```

```
Command String: logger -r -q
```

```
Fiolib Version: 6.6.3
```

```
Logger entering suspended state.
```

```
Time offset 00:00:00 = 0 secs...
```

Notes

1. If the system can't find a file that matches the specified file name, a message will tell you that there is no such file or directory, and you will be given the option of viewing all the files in the current directory. If you still can't find the file you want, you can exit from the *File Name:* prompt by typing **control-c** to exit the Logger and return to the machine (UNIX) prompt.

2.3.2 Playing Back a SIMNET Exercise in Abbreviated Query Mode

Instructions

1. Enter **logger -p** to tell the computer to play back (-p) a SIMNET exercise. Since the -q switch is missing, the computer will assume some default information and will not present the full set of query prompts. If you are playing back a typical exercise (one exercise id, normal packet rates, etc.), you probably will not need the full set of query prompts. However, if the playback is non-standard (expectation of packet rates greater than 400 packets per second OR multiple exercise ids, etc.), you will need to use the -q switch to supply additional information (see section 2.3.1).
2. When the computer prompts you for information, a default value in square brackets may appear at the end of the prompt. To accept the default, press **<cr>**. To see online help for a prompt, enter **?** as a response.
3. The computer responds with the message *Enter info about SIMNET data file to be PLAYED BACK*. You will then see prompts that ask you to enter information. The first prompt is *Medium [disk]:* To accept the default value of 'disk', press **<cr>**. If you want to play back from magnetic tape, answer with **tape**. The appearance of several prompts depends on whether you are recording to tape or disk. For information about the specific prompts for each medium, see sections 2.3.3 and 2.3.4.
4. The computer responds with a message that it has opened the specified file for reading and then lists file header information.
5. The Data Logger enters a suspended state. At this point, you need to enter a character that serves as a runtime command. For information about using logger runtime commands during playback, see section 2.3.6.

Example

\$ logger -p

Enter info about SIMNET data file to be PLAYED BACK.

Medium [disk]: <cr>

File Name: 08159018.file

Opened '08159018.file' for reading.

SIMNET data file header info:

File Name: 08159018.file

Exercise IDS: ALL

Project ID: SAF

Comment: LHN test run

Date of Run: 15-AUG-90

Time of Run: 18:22:30

Volume Number: 1

Command String: logger -r

Fiolib Version: 6.6.3

Logger entering suspended state.

Time offset 00:00:00 = 0 secs ...

c

Continue

Logger is entering the active state.

Time offset 00:00:32 = 32 secs ...

2.3.3 Playing Back a SIMNET Exercise File Directly from Disk

Instructions

1. Enter `logger -p -q` to tell the Logger to play back (-p) a SIMNET exercise in query (-q) mode. The use of full query mode is optional; if you are playing back a typical exercise (one exercise id, normal packet rates, etc.), you probably will not need the full set of query prompts.
2. For information about most of the prompts you will have to answer, see section 2.3.1.
3. The following prompts appear for a disk file (but not for magnetic tape):
 - *Num Volumes [1]*: Usually, a file is recorded on one volume and has a single name. However, a physical disk can be subdivided into logical volumes identified by device name, and each of these can be linked together to record a very large exercise. If your response to the *Num Volumes* prompt indicates multiple volumes, the computer will then ask for a name for each of the volumes (File Name, Vol 0:, File Name, Vol 1:, ...). For disk, volumes correspond to individual UNIX files. For tape, volumes correspond to individual tape reels.

- *File Name* - Enter a relative or absolute UNIX path specification. The Data Logger program wrote the data on a disk file and recorded its assigned name. A name can be any sequence containing from one to fourteen characters. If the system cannot find a file that matches the specified file name, a message will tell you that there is no such file or directory, and you will be given the option of viewing all the files in the current directory. If you still can't find the file, you can exit from the *File Name:* prompt by typing **control-c**.

Example

```
$ logger -p -q
```

```
Use maximum priority if you expect high packet rates:  
Maximum Priority? [n] <cr>
```

```
Enter info about SIMNET data file to be PLAYED BACK.  
Medium [disk]: <cr>  
Num Volumes [1]: <cr>  
File Name: m1.test
```

```
Enter info about protocols to be PLAYED BACK.  
Play Stealth protocol [y]: <cr>  
Opened m1.test for reading.
```

```
SIMNET data file header info:  
File Name: m1.test  
Exercise IDS: ALL  
Project ID: SIMNET  
Comment: m1 test run  
Date of Run: 15-AUG-90  
Time of Run: 14:22:30  
Volume Number: 1  
Command String: logger -r -q  
Fiolib Version: 6.6.3
```

```
Logger entering suspended state.  
Time offset 00:00:00 = 0 secs...
```

2.3.4 Playing Back a SIMNET Exercise File Directly from Magnetic Tape

Instructions

1. Mount a SIMNET exercise tape on the Data Logger tape drive. The SIMNET exercise tape must have been created by Data Logger Version 2.0 or greater. If conversion is necessary, see section 2.4.

2. Enter logger **-p -q**. This tells the computer to run the Data Logger in playback (-p) mode with a full query (-q) of prompts. The use of full query mode is optional; if you are playing back a typical exercise (one exercise id, normal packet rates, etc.), you probably will not need the full set of query prompts.
3. For information about most of the prompts you will have to answer, see section 2.3.1.
4. The following prompts appear for a magnetic tape (but not for a disk file):
 - *Drives [both]* - Asks which tape drives you will load and have online during the recording. Press <cr> if you will use two drives. Answer **0** or **1** if you have only one tape drive. An answer of '0' tells the Logger program to use the drive labeled mt0, and an answer of '1' tells it to use mt1.
 - *Continuous Mode* - If you have an installation with more than one tape drive, respond with **y** to tell the Data Logger program to continue reading on the other drive when the reel on the drive being read reaches its end. In this way, reading is performed on alternating drives without any pauses for changing reels. The system assumes you will mount a reel on a drive while the system is reading on the other drive. This prompt appears only if you indicated a response of 'both' to the *Drives* prompt above.
 - *Size [2400 feet]* - The three sizes of tape reels are 600, 1800, and 2400 feet. The default is 2400. If you are using multiple reels, they must all be the specified size.
5. The computer displays the prompt *Enter info about protocols to be PLAYED BACK. Play Stealth protocol [y]:* Enter **y** or **n** to indicate whether you want the SIMNET packets used to control the Stealth vehicle to be played back.
6. The computer responds with a message that it has opened the first drive for reading and displays header file information.

Example

```
$ logger -p -q
```

```
Use maximum priority if you expect high packet rates:
```

```
Maximum Priority? [n] <cr>
```

```
Enter info about SIMNET data file to be PLAYED BACK.
```

```
Medium [disk]: tape
```

```
Drives [both]: <cr>
```

```
Continuous mode [y]: <cr>
```

```
Size [2400 feet]: <cr>
```

```
Enter info about protocols to be PLAYED BACK.
```

```
Play Stealth protocol [y]: <cr>
```

```
Opened '/dev/r6250smt0' for reading.
```

SIMNET data file header info:

File Name: 08159018.file
Exercise IDS:
Project ID: SAF
Comment: LHN test run
Date of Run: 15-AUG-90
Time of Run: 14:22:30
Volume Number: 1
Command String: logger -r -q
Fiolib Version: 6.6.3

Logger entering suspended state
Time offset 00:00:00 = 0 secs...

2.3.5 Playing Back Large Exercises

Instructions

1. Playing back large exercises from tape is not a problem, since for tape, volumes correspond to individual tape reels. For disk, however, volumes correspond to individual UNIX files, which must be named.
2. Enter **logger -p -q**. This tells the computer to run the Logger in playback (-p) mode with a full query (-q) of prompts.
3. For information about most of the prompts you will have to answer, see section 2.3.1.
4. Prompts that are significant when playing back a very large exercise from disk are:
 - *Num Volumes [1]*: Usually, a file is recorded on one volume and has a single name. However, a physical disk can be subdivided into logical volumes identified by device name, and these can be linked together to record a very large exercise. If your response to the *Num Volumes* prompt indicates multiple volumes, the computer will then ask for a name for each of the volumes (File Name, Vol 0; File Name, Vol 1; ...).
 - *File Name* - Enter a relative or absolute UNIX path specification. The Data Logger program wrote the data on a disk file and recorded its assigned name. A valid name can be any sequence containing from one to fourteen characters. If the system cannot find a file that matches the specified file name, a message will let you know. You will be given the opportunity of viewing the directories to see the names of files.

Example

\$ logger -p -q

Use maximum priority if you expect high packet rates:

Maximum Priority? [n] <cr>

Enter info about SIMNET data file to be PLAYED BACK.

Medium [disk]: <cr>

Num Volumes [1]: 2

Expecting 2 file volumes.

File Name, Vol. 0: **am1.test**

File Name, Vol. 1: **bm2.test**

Enter info about protocols to be PLAYED BACK.

Play Stealth protocol [y]: <cr>

Opened 'am1.test' for reading.

Concated 'bm2.test' for reading.

SIMNET data file header info:

File Name: m1.test

Exercise IDS: ALL

Project ID: SIMNET

Comment: m1 test run

Date of Run: 15-AUG-90

Time of Run: 14:22:30

Volume Number: 1

Command String: logger -r -q

Fiolib Version: 6.6.3

Logger entering suspended state.

Time offset 00:00:00 = 0 secs...

2.3.6 Using Logger Runtime Commands During Playback

Instructions

1. When the computer displays the message *Logger entering suspended state*, the Logger has paused and is waiting for a runtime command to tell it what to do next.
2. Enter **h** for help to see a list of valid runtime commands.
3. Enter the command that corresponds to the action you want the Logger to take.

Example

Logger entering suspended state
Time offset <hh:mm:ss>= <n> secs ...
h

Logger runtime commands for loggerPlayback:

- c - Continue
- f - Forward scan <relative offset (hh:mm:ss)>
- g - Goto <absolute time (hh:mm:ss)>
- h - Help
- i - Information about Logger status
- q - Quit
- p - Pause
- r - Reverse scan <relative offset (hh:mm:ss)>
- s - Speed <play speed>

See documents for more ...

Notes

1. A response of **c** tells the Logger program to start playing back network traffic.
2. A response of **f 00:01:00** tells the Logger program to advance the tape and to start playing back packets when the timestamp is 1 minute greater than the current timestamp. The default time is 00:00:00.
3. A response of **g 00:30:00** tells the Logger program to advance to the place in the file where the timestamp is set to 30 minutes or more and then to start playing back packets. The default time is 00:00:00.
4. A response of **h** tells the Logger program to display the online help message shown above.
5. A response of **i** tells the Logger program to list the following:

Logger status information:

Logger state: loggerSuspended or Active.
Logger activity: loggerPlayback.
Packets sent: <n>.
Logger speed: <n>.
Time offset: <hh:mm:ss> = <n> secs.

If the logger state is SUSPENDED, the SIMNET data file header information follows the status information.

6. A response of **q** tells the Logger program to stop playback and exit the Logger program.
7. A response of **p** tells the Logger program to temporarily halt playback.
8. A response of **r 01:00:00** tells the Logger program to go back in the file to a place where the timestamp is 1 hour less than the current timestamp and then to start playing back packets. The default time is 00:00:00.

9. A response of s 2 tells the Logger program to play back the packets at a speed twice the normal speed. The maximum playback speed is 10. The default response is 1.

2.4 Copying or Converting a SIMNET Exercise File

Instructions

1. Older versions of the Data Logger program produced files whose format is different from and incompatible to the format produced by this new version of the Logger (for example, 'Taper' format exercise tapes).
2. The -c Logger switch allows you to convert tapes from the old format into the new format, or to copy files in the new format to tape or disk.
3. You will first be prompted to enter information about the SIMNET data file that is to be copied or converted.
4. You will then be prompted to enter information about the SIMNET data file to which the named file is to be copied or converted. After you answer the prompts, a message will display the number of packets that were transferred.

Example

\$ logger -c

Enter info about SIMNET data file to be COPIED.

Medium [disk]: <cr>

File Name: 08.test

Opened '08.test' for reading.

Enter info about SIMNET data file to be COPIED to.

Medium [disk]: <cr>

File Name [08.test]: 09.test

Opened '09.test' for writing.

SIMNET data file header info:

File Name: 08.test

Exercise IDs: ALL

Project ID: SAF

Comment: LHN test run

Date of Run: 15-AUG-90

Time of Run: 18:22:30

Volume Number: 1

Command String: logger -r -q

Fiolib Version: 6.6.3

Copying fio_packets from '08.test' to '09.test'
Successfully completed copying files.
Copied a total of 1500 fio_packets.

Notes

1. The Logger does not suspend execution while copying or converting. Therefore you do not need to enter a runtime command.

2.5 Getting Online Help

Instructions

1. To see online help for the switches that you can use with the Logger program, enter **logger -h** in response to the computer prompt.
2. To see online help for the prompts, enter **?** in response to a prompt for information.
3. To see online help for runtime commands to the Logger, enter **h** in response to the message that the Logger is in the suspended state.