Series 32000®

GENIX V.3™
Documentation Roadmap

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Series 32000®

GENIX V.3™
Documentation Roadmap

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REVISION RECORD

REVISION	RELEASE DATE	SUMMARY OF CHANGES
A	02/87	First Release. *Series 32000*® GENIX V.3™ Documentation Roadmap NSC Publication Number 424510771-310.

PREFACE

The *Documentation Roadmap* is intended to help users identify documents to use with their *Series 32000* computer. The *Roadmap* contains a variety of information. It describes the different types of documents available. It shows, in a series of diagrams, the relationships among the different documents and which documents are needed to accomplish various tasks. It also summarizes the contents of each document and specifies the intended audience and any prerequisite documents or knowledge.

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GLOSSARY

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Chapter 1

INTRODUCTION

1.1 OVERVIEW

The Documentation Roadmap is intended for all users of GENIX V.3™ on the *Series 32000®* Computer. Whether new to computers and the GENIX V.3 system or experienced with them, the *Roadmap* will help users find their way around the documentation. Needed terms are described as they are introduced.

All users need to know the basic concepts and skills described in the *User's Guide*. However, most *Series 32000* Computer users will also need a few of the other documents described in this *Roadmap*; exactly which documents they need will depend on the kind of work they do. For example, if a user is responsible for the *Series 32000* Computer in their organization, they will want to familiarize themselves with the *Owner/Operator Manual* and perhaps, the *System Administrator's Guide*. If a user will be developing software on the *Series 32000* Computer, he or she will find the *Programmer's Guide* helpful, as it describes how to take advantage of the GENIX V.3 system programming tools appropriate for their needs. Frequent users of the GENIX V.3 system will find the *User's Reference Manual* invaluable.

1.2 ORGANIZATION

The remainder of this chapter describes the different types of documents available—guides, reference manuals, product overviews, and utilities notes—and conventions used for document titles.

Chapter 2, Identifying Documents by User Task, helps users find the document they need according to the task they want to accomplish. Typical tasks might be learning the UNIX® system, preparing memos or reports, and writing and compiling a program. Six major categories of tasks are used: Obtaining Background Information, Enhancing the System, General Use, Administration, Programming, and Networking.

Chapter 3, Document Descriptions, is organized alphabetically by document title. For each document it gives: the document title, the name of the product described, any prerequisite documents or knowledge, the intended audience, the NSC Customer Order Number (the number you use to order the document), and a summary of the document's contents.

The Glossary defines the computer industry terms that are used in the *Roadmap*.

1.3 TYPES OF DOCUMENTS

This section describes the different types of documents according to the kind of material they contain and the way that it is presented.

For many users, three types of documents provide most of the information they will need: guides and reference manuals. Documents describing hardware are usually called simply "manuals," in contrast with the "reference manuals" used for software documentation. Other types of documents available for some products include the product overview, utilities notes, and roadmap.

Here are brief descriptions of these types of documents.

- **guide**

  A guide contains both conceptual and procedural information; it tells readers when and why they might do something, as well as how they can do it. It is organized so that experienced users can skip over information they are familiar with and easily identify information they would like to read.

- **reference manual**

  A reference manual, usually organized one description per page, contains complete descriptions of how to use commands, utilities, system calls, library functions, or system file formats. Each description usually includes the following items:

  — the name of the command, utility, system call, library function, or file format

  — a summary of the options for the command or utility, or arguments for system calls and library functions

  — a detailed factual description of how to use it

  — sample input and the output resulting from the input (in some cases)

  — references to related commands or functions

  — references to the guide that describes when and why to use it

- **manual**

  A manual contains descriptions of hardware that can be used with a *Series 32000* Computer, including instructions for installing and operating it.

- **roadmap**

  A roadmap helps identify which documents are needed to do particular tasks. It describes how a product's documentation is organized, and gives a description of each document.

- **product overview**

  A product overview gives a technical summary of the features of a software product and tells which are standard and which are optional. It is intended for a prospective buyer or information systems manager. A more detailed section also highlights aspects of the product that make it unique with respect to earlier releases of the product or to products from other vendors.

- **utilities notes**

  A utilities notes document contains software installation or upgrade procedures and should be read carefully before attempting those activities. It describes differences between the delivered release of the software and the previous release. It also contains, as appropriate, page, section, or chapter replacements for various documents.

  Similar information may also be found in National Semiconductor's *Quarterly Software Bulletin*.

1.4 CONVENTIONS FOR DOCUMENT TITLES

In this document references to documents about products whose name includes NSC, *Series 32000*, or GENIX V.3 System, omit that qualifier from the title. You should assume that the full title of the document includes NSC, GENIX V.3 System, or NSC *Series 32000* Computer.

Chapter 2

IDENTIFYING DOCUMENTS BY USER TASK

2.1 INTRODUCTION

The purpose of this chapter is to help users identify the documents they need to do a particular task. This chapter uses figures and an alphabetical task index to familiarize users with the documents, and to show how these documents may be used.

2.2 USING THE FIGURES

Figure 2-1 illustrates a breakdown of possible tasks into six major categories: obtaining background information, enhancing the system (for example, work done by customers with GENIX V.3 system source licensees), general use, administration, programming, and networking. Figures 2-2 through 2-7 divide these categories into separate illustrations. Each illustration shows which documents are used for the different categories of task and how these documents are related.

The illustrations are composed of small rectangles that contain document titles. Some of these rectangles are surrounded by a larger rectangle with a heavy border; this shows that the documents named in the small rectangles are related. Within the heavy border, the small rectangles may overlap or may be distinct. Documents named in overlapping rectangles are closely related and should be used together. Documents named in distinct rectangles may be used independently of one another. Arrows connecting rectangles show the order in which those documents should be read. Additional arrows at the bottom of illustrations point to figures that contain titles of other documents which may be read next.

2.3 USING THE ALPHABETICAL TASK INDEX

Table 2-1, the "Alphabetical Task Index," contains a list of tasks ordered alphabetically by key words. Each task refers to a document that describes how to do that task, and to the section in the *Roadmap* where you can find a description of that document. For example, a user wishes to identify which document will describe how to send mail electronically. He or she can look in Table 2-1 for the keyword "send." Among the entries in the Task column, "Send information to others" is a good match, so the user can use the *User's Guide* to find out how to accomplish this task. If the user has a *User's Guide*, its Index will tell exactly where the manual discusses information sending. If the user does not have a *User's Guide*, he or she can read a description of it in the *Roadmap* (in the section shown in the table) and decide if they would like to order it.

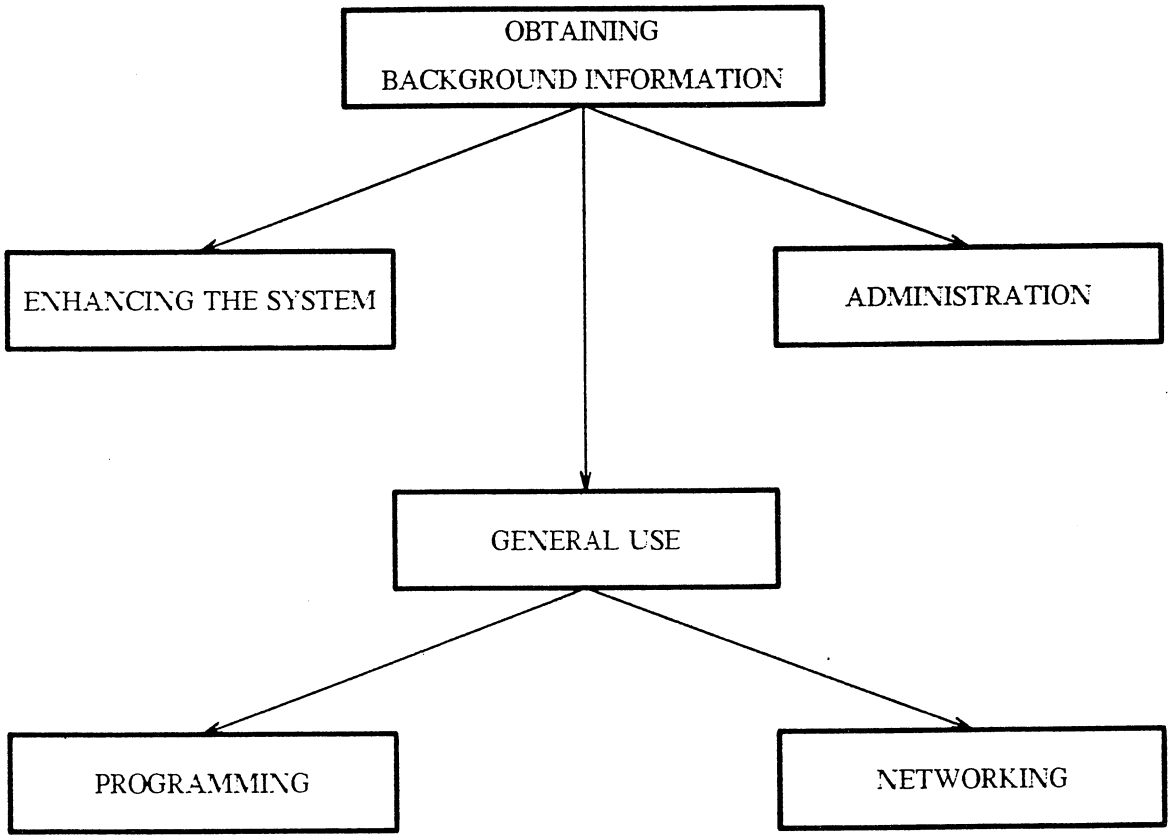

Figure 2-1. The Big Picture: Categories of Tasks

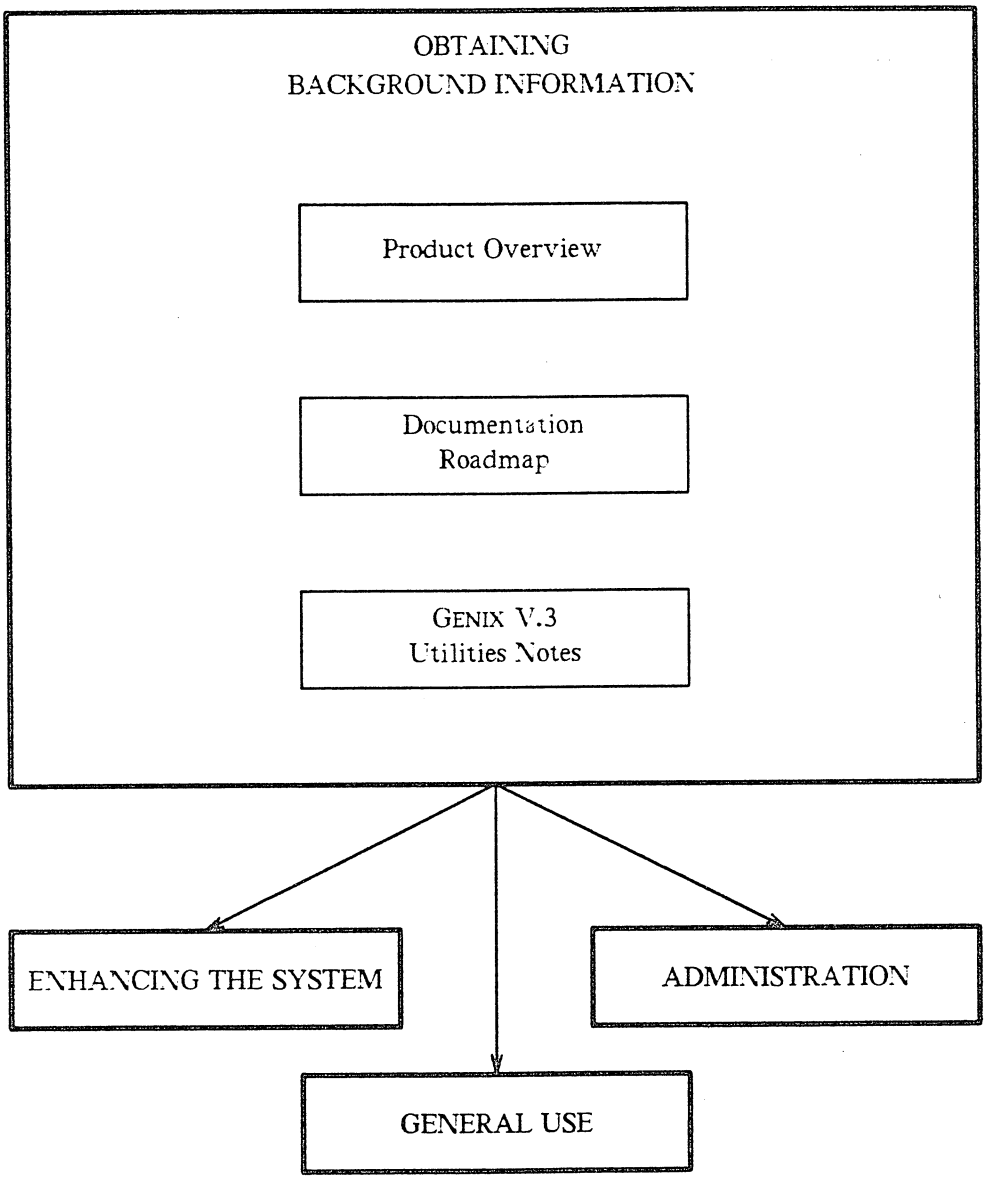

Figure 2-2. Obtaining Background Information

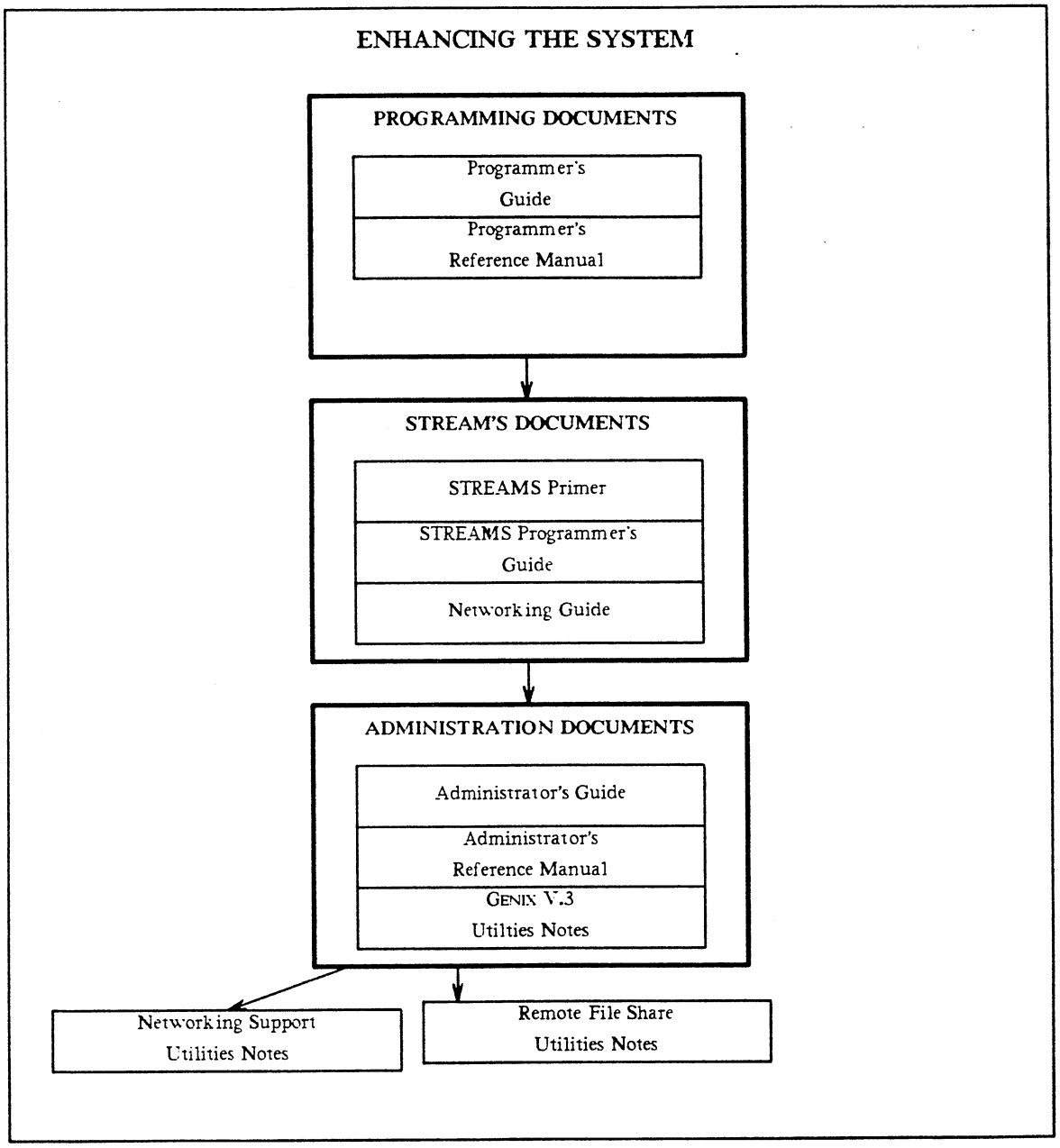

Figure 2-3. Enhancing the System

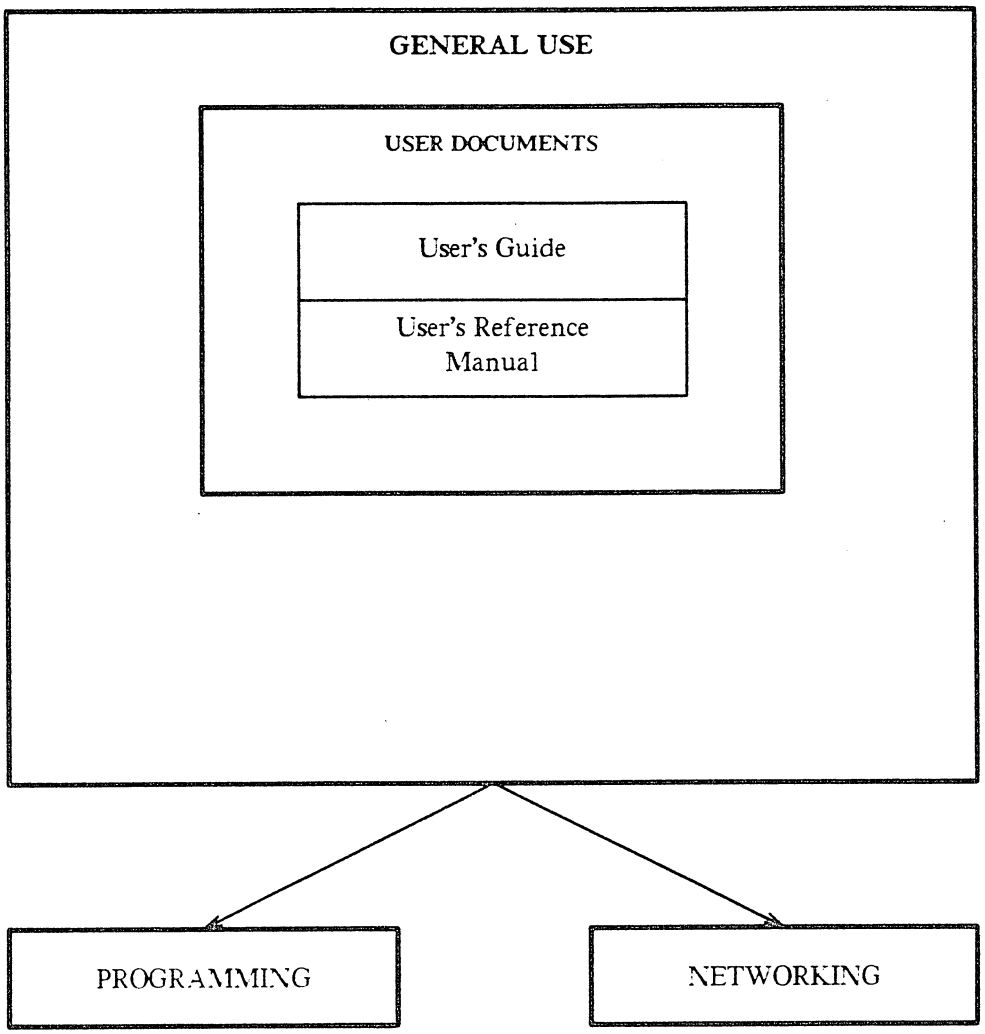

Figure 2-4. General Use

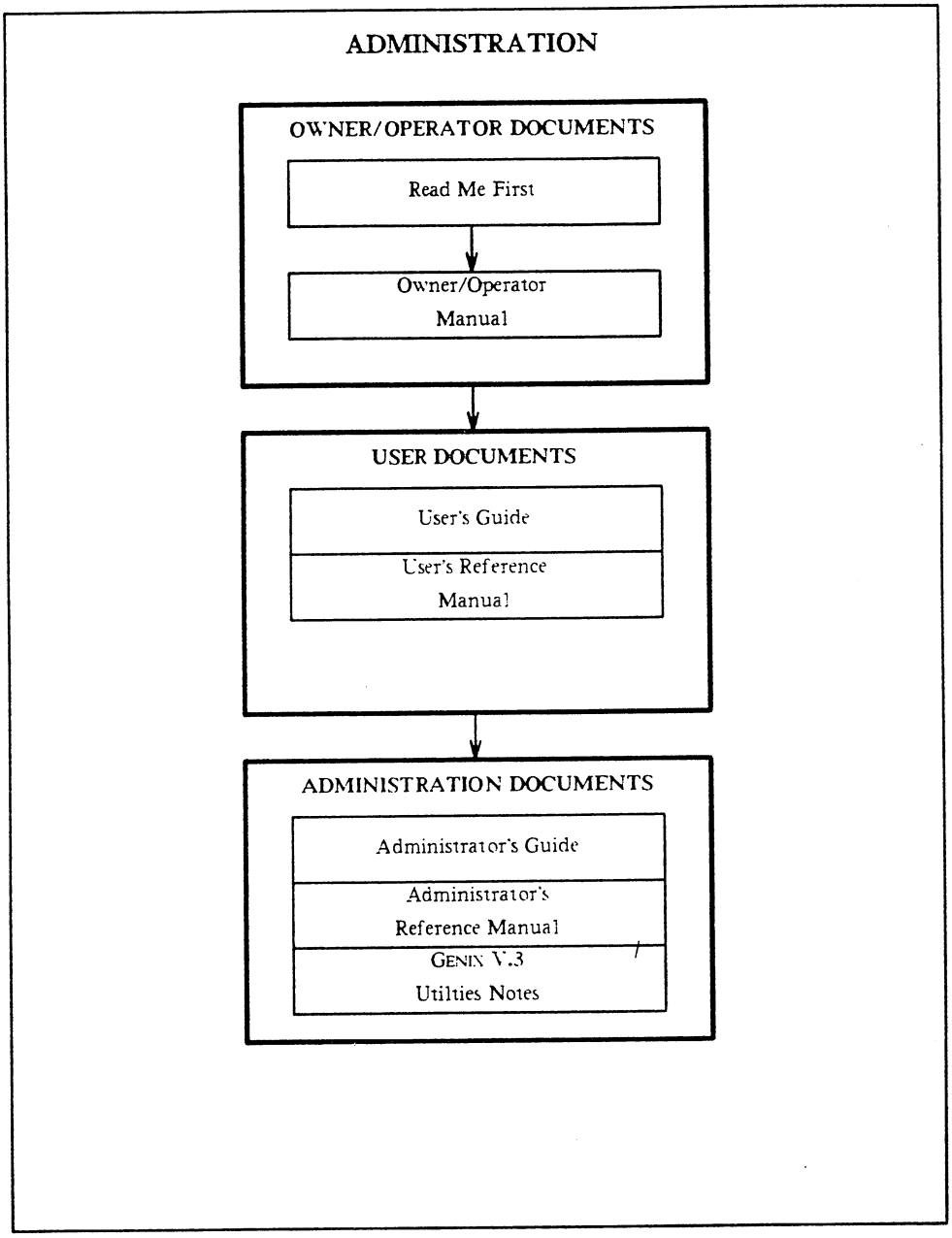

Figure 2-5. Administration

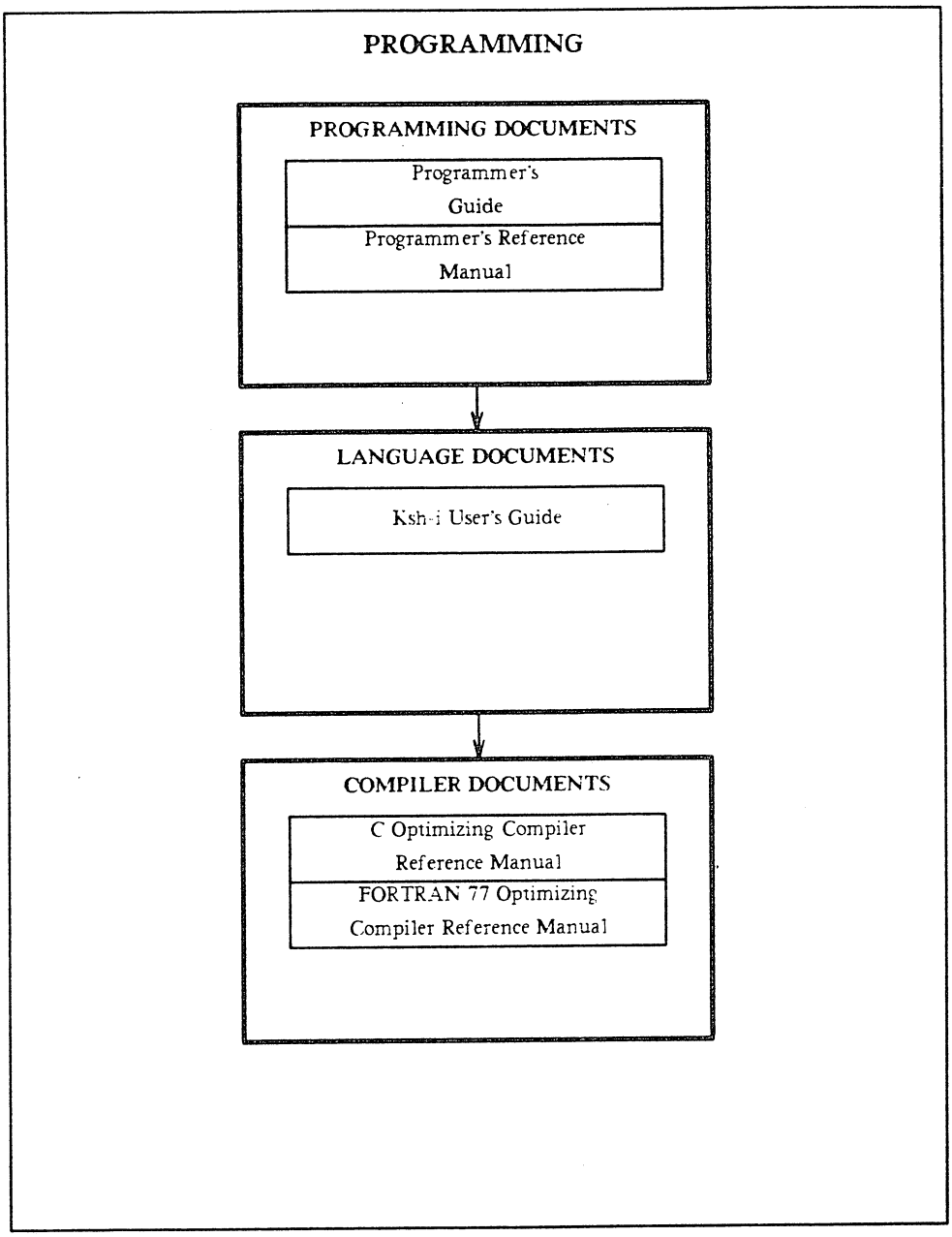

Figure 2-6. Programming

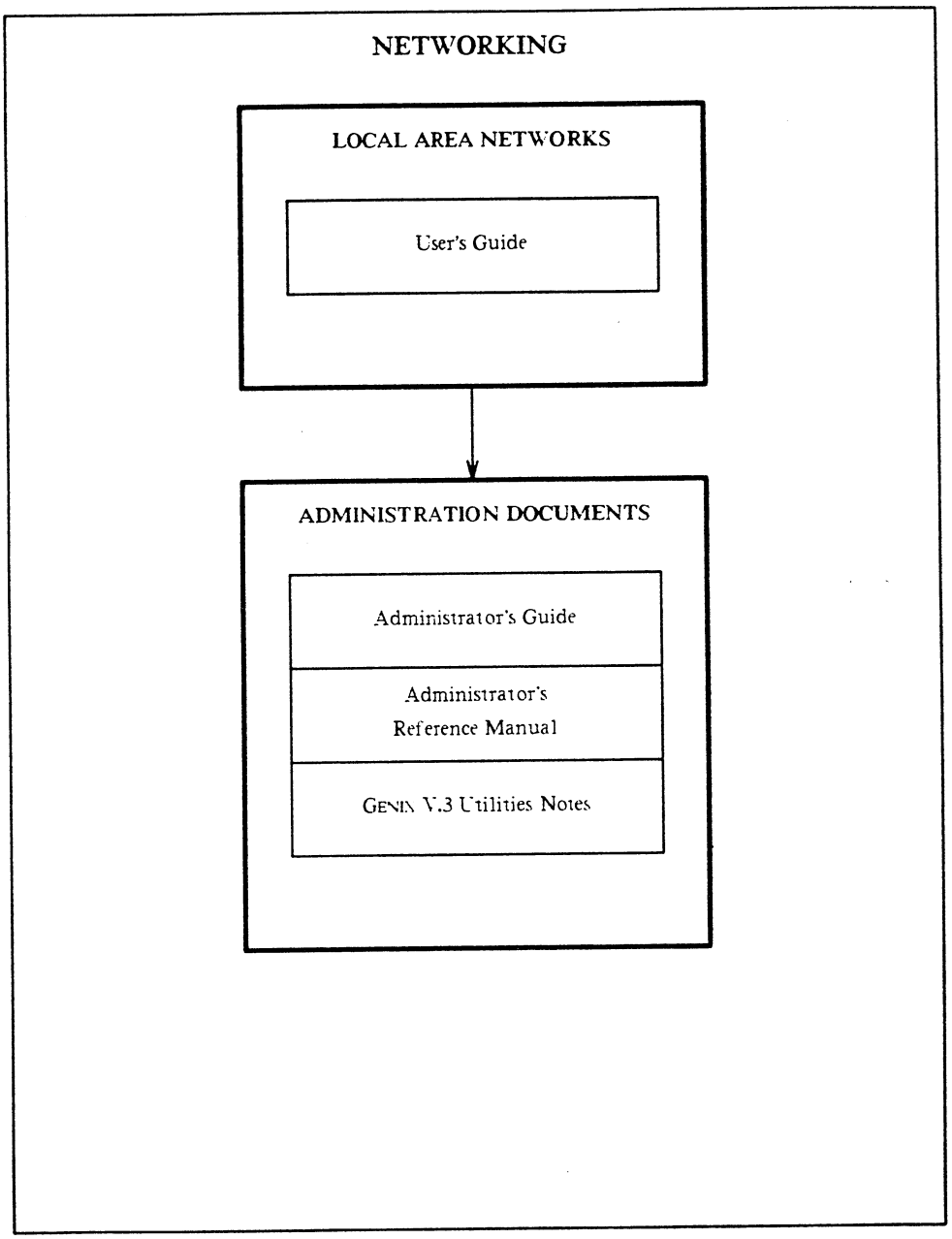

Figure 2-7. Networking

TABLE 2-1. ALPHABETICAL TASK INDEX

KEY WORD	TASK	DOCUMENT TITLE	SECTION
administer	administer networking activities	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
administration	find a list of system administration tasks	Administrator's Guide	3.11
applications	write and install applications software	STREAMS Programmer's Guide	3.10
		Networking Guide	3.3
	write transport interface applications software	Networking Guide	3.3
architecture	learn about the software architecture	Product Overview	3.5
automate	automate routine procedures	User's Guide	3.13
build	build and maintain a file system	Administrator's Guide	3.11
calculations	do spreadsheet calculations	User's Guide	3.13
calculator	desk calculator functions	User's Guide	3.13
changed	learn what has changed	Utilities Notes	3.16
command	learn command usage	User's Guide	3.13
		User's Reference Manual	3.14
	learn syntax of commands	User's Reference Manual	3.14
compile	write, compile, and debug a program	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7
connect	connect to another computer	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
control	track and control versions of a file	Programmer's Guide	3.6
crashes	actions to take if the system crashes	Administrator's Guide	3.11
data	learn about STREAMS data structures	STREAMS Programmer's Guide	3.10
debug	design and debug a device driver	STREAMS Programmer's Guide	3.10

KEY WORD	TASK	DOCUMENT TITLE	SECTION
	write, compile, and debug a program	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7
design	design and debug a device driver	STREAMS Programmer's Guide	3.10
device	design and debug a device driver	STREAMS Programmer's Guide	3.10
diagnostics	monitor hardware using diagnostics programs	Administrator's Guide	3.11
documentation	learn about documentation	Documentation Roadmap	3.2
documents	learn how to order documents	Documentation Roadmap	3.2
driver	design and debug a device driver	STREAMS Programmer's Guide	3.10
dump	take and analyze a system memory dump	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
edit	edit a file	User's Guide	3.13
	use advanced editor features	User's Guide	3.13
	use screen editor (vi)	User's Guide	3.13
	use line editor (ed)	User's Guide	3.13
enter	enter information into a file	User's Guide	3.13
error	correct typing errors	User's Guide	3.13
	interpret error messages	Administrator's Guide	3.11
execute	execute a job on another computer	User's Guide	3.13
features	learn about the features	Product Overview	3.5
		Utilities Notes	3.16
	use advanced editor features	User's Guide	3.13
file	build and maintain a file system	Administrator's Guide	3.11
	edit a file	User's Guide	3.13
	enter information into a file	User's Guide	3.13
	learn format of system files	Programmer's Reference Manual	3.7

KEY WORD	TASK	DOCUMENT TITLE	SECTION
	mount and unmount a file system	Administrator's Guide	3.11
	track and control versions of a file	Programmer's Guide	3.6
format	learn format of system files	Programmer's Reference Manual	3.7
functions	desk calculator functions	User's Guide	3.18
	learn syntax of library functions	Programmer's Reference Manual	3.7
install	install a new release of the system	Utilities Notes	3.16
		Administrator's Guide	3.11
	install GENIX V.3 source code	Source Code Release Notes	3.15
	write and install applications software	STREAMS Programmer's Guide	3.10
		Networking Guide	3.3
interface	learn about transport interface routines in the Network Services Library	Networking Guide	3.3
	write a terminal interface program	Programmer's Guide	3.6
	write interface to the transport provider protocol	Networking Guide	3.3
	write transport interface applications software	Networking Guide	3.3
job	execute a job on another computer	User's Guide	3.13
	use cron to schedule jobs in advance	User's Reference Manual	3.14
kernel	write kernel modules using STREAMS	STREAMS Programmer's Guide	3.10
learn	learn about documentation	Documentation Roadmap	3.2
	learn about STREAMS data structures	STREAMS Programmer's Guide	3.10
	learn about the features	Product Overview	3.5
		Utilities Notes	3.16
	learn about the software architecture	Product Overview	3.5
	learn about the STREAMS mechanism	STREAMS Primer	3.14
	learn about the GENIX V.3 system	User's Guide	3.13

KEY WORD	TASK	DOCUMENT TITLE	SECTION
	learn about transport interface routines in the Network Services Library	Networking Guide	3.3
	learn about ways of using the STARLAN NETWORK	Networking Guide	3.3
	learn command usage	User's Guide	3.13
		User's Reference Manual	3.14
	learn format of system files	Programmer's Reference Manual	3.7
	learn how to order documents	Documentation Roadmap	3.2
	learn syntax of commands	User's Reference Manual	3.14
	learn syntax of library functions	Programmer's Reference Manual	3.7
	learn syntax of system calls	Programmer's Reference Manual	3.7
	learn what has changed	Utilities Notes	3.16
	learn what is standard and optional	Product Overview	3.5
	learn what you can do	Product Overview	3.5
library	learn syntax of library functions	Programmer's Reference Manual	3.7
login	log in to the GENIX V.3 system	User's Guide	3.13
mail	send mail to others	User's Guide	3.13
maintain	build and maintain a file system	Administrator's Guide	3.11
mechanism	learn about the STREAMS mechanism	STREAMS Primer	3.9
memo	take and analyze a system memory dump	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
memory	take and analyze a system memory dump	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
messages	interpret error messages	Administrator's Guide	3.11
	send messages to others	User's Guide	3.13
	write messages to others	User's Guide	3.13
modules	write kernel modules using STREAMS	STREAMS Programmer's Guide	3.10
monitor	monitor hardware using diagnostics programs	Administrator's Guide	3.11
	monitor system usage	Administrator's Guide	3.11

KEY WORD	TASK	DOCUMENT TITLE	SECTION
mount	mount and unmount a file system	Administrator's Guide	3.11
network	administer networking activities	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
	learn about transport interface routines in the Network Services Library	Networking Guide	3.3
networking	administer networking activities	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
optimize	optimize the system	see "tuning"	
optional	learn what is standard and optional	Product Overview	3.5
options	order the right options	Product Overview	3.5
order	learn how to order documents	Documentation Roadmap	3.2
	order the right options	Product Overview	3.5
paper	print information on paper	User's Guide	3.13
print	print information on paper	User's Guide	3.13
program	monitor hardware using diagnostics programs	Administrator's Guide	3.11
	track versions of a program	Programmer's Guide	3.6
	troubleshoot programming problems	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7
	write a terminal interface program	Programmer's Guide	3.6
	writ, compile, and debug a program	Programmer's Guide	3.6
		Programmers' Reference Manual	3.12
programming	troubleshoot programming problems	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7

KEY WORD	TASK	DOCUMENT TITLE	SECTION
protocol	write interface to the transport provider protocol	Networking Guide	3.3
provider	write interface to the transport provider protocol	Networking Guide	3.3
restore	back-up and restore files	Administrator's Guide	3.11
retrieve	save and retrieve information	User's Guide	3.13
routine	automate routine procedures	User's Guide	3.13
	learn about transport interface routines in the Network Services Library	Networking Guide	3.3
save	save and retrieve information	User's Guide	3.13
schedule	schedule tasks in advance	User's Guide	3.18
	use cron to schedule jobs in advance	User's Guide	3.18
scripts	write shell scripts	User's Guide	3.13
send	send information to another computer	User's Guide	3.13
	send information to others	User's Guide	3.13
	send mail to others	User's Guide	3.13
	send messages to others	User's Guide	3.13
shell	using the shell	User's Guide	3.13
	write shell scripts	User's Guide	3.13
software	install a software package	Administrator's Guide	3.11
		Utilities Notes	3.16
	learn about the software architecture	Product Overview	3.5
	write and install applications software	STREAMS Programmer's Guide	3.10
		Networking Guide	3.3
	write transport interface applications software	Networking Guide	3.3
sort	sort information	User's Guide	3.13
spelling	find spelling mistakes	User's Guide	3.13
spreadsheet	do spreadsheet calculations	User's Guide	3.18
standard	learn what is standard and optional	Product Overview	3.5

KEY WORD	TASK	DOCUMENT TITLE	SECTION
start	start using the GENIX V.3 system	User's Guide	3.13
structures	learn about STREAMS data structures	STREAMS Programmer's Guide	3.10
syntax	learn syntax of commands	User's Reference Manual	3.14
	learn syntax of library functions	Programmer's Reference Manual	3.7
	learn syntax of system calls	Programmer's Reference Manual	3.7
take	actions to take if the system crashes	Administrator's Guide	3.11
	take and analyze a system memory dump	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
terminal	write a terminal interface program	Programmer's Guide	3.6
track	track and control versions of a file	Programmer's Guide	3.6
	track versions of a program	Programmer's Guide	3.6
transport	learn about transport interface routines in the Network Services Library	Networking Guide	3.3
	write interface to the transport provider protocol	Networking Guide	3.3
	write transport interface applications software	Networking Guide	3.3
troubleshoot	troubleshoot programming problems	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7
	troubleshoot system problems	Administrator's Guide	3.11
tuning	tuning the system	Administrator's Guide	3.11
		Administrator's Reference Manual	3.12
typing	correct typing errors	User's Guide	3.13
unmount	mount and unmount a file system	Administrator's Guide	3.11
usage	learn command usage	User's Guide	3.13
		User's Reference Manual	3.14
	monitor system usage	Administrator's Guide	3.11
user	add a new user	Administrator's Guide	3.11

KEY WORD	TASK	DOCUMENT TITLE	SECTION
versions	track and control versions of a file	Programmer's Guide	3.6
	track versions of a program	Programmer's Guide	3.6
write	write a terminal interface program	Programmer's Guide	3.6
	write and install applications software	STREAMS Programmer's Guide	3.10
		Networking Guide	3.3
	write, compile, and debug a program	Programmer's Guide	3.6
		Programmer's Reference Manual	3.7
	write interface to the transport provider protocol	Networking Guide	3.3
	write kernel modules using STREAMS	STREAMS Programmer's Guide	3.10
	write messages to others	User's Guide	3.13
	write shell scripts	User's Guide	3.13
	write transport interface applications software	Networking Guide	3.3

Chapter 3

DOCUMENT DESCRIPTIONS

3.1 INTRODUCTION

This chapter contains descriptions of documents that will help user's take full advantage of their *Series 32000* Computer. The descriptions are presented in alphabetical order by document title.

Each document description contains the following information:

- document title
- name of the product described
- any necessary prerequisite documents or knowledge
- intended audience for the document
- NSC Customer Order Number
- summary of the document's contents

As mentioned in Section 1.4, references to documents about products whose name includes NSC, *Series 32000* or GENIX V.3 system, omit that qualifier from the title. For example, the *GENIX V.3 Programmer's Guide* is found under the *Programmer's Guide*.

3.2 DOCUMENTATION ROADMAP

Document Title: *Documentation Roadmap*
Product Described: GENIX V.3 System
Prerequisites: None
Audience: All users
Publication No: 424510771-310
Summary of Contents:

The *Roadmap* will help you get acquainted with the documents you can use with your NSC *Series 32000* Computer. Most people will use the *Roadmap* to understand general relationships among the documents or to identify the documents they need to do a particular task to learn about additional documents that might be of interest.

To this end, the *Roadmap* is divided into two major chapters:

- Chapter 2 illustrates how documents are related to each other and, for each of many common tasks associated with using the *Series 32000* Computer, refers you to the document that describes how to do that task.
- Chapter 3 contains descriptions of each document: document title, ordering number (called a *select code*), the product described, necessary prerequisite knowledge, and a summary of its contents.

3.3 NETWORKING GUIDE

Document Title: *Networking Guide*
Product Described: GENIX V.3 System
Prerequisites: *Programmer's Guide* and a background in data communications and networking, including the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference model
Audience: Systems programmers
Publication No: 424510771-140
Summary of Contents:

The *Networking Guide* provides an introduction and overview of the NSC Transport Interface, its capabilities, and its applications. Topics covered include the following:

- goals of the transport interface, with discussions of OSI, transport protocols, and STREAMS
- explanation of the transport interface routines in the Network Services Library that provide services for applications programs
- several illustrated examples describing key areas of developing applications that interface to transport protocols

3.4 NETWORKING SUPPORT UTILITIES NOTES

Document Title: *Networking Support Utilities Notes*
Product Described: Networking Support Utilities
Prerequisites: *Owner/Operator Manual (NSC Series 32000 Computer)*
Audience: System administrators
Publication No: 424510771-430
Summary of Contents:

This document describes how to install the Networking Support Utilities.

The Networking Support Utilities product supplements the Essential Utilities by extending system capabilities to support networking applications. The product includes standard STREAMS protocol modules (for use by applications), a network utility that monitors network service requests (the Listener), and the host version of the sharable Network Services Library (for use by applications developers).

This product is required to take advantage of the following features that are new, beginning with the GENIX V.3 system release: Remote File Sharing, STREAMS mechanisms and tools, the NSC Transport Interface, Media-Independent **uucp**, and the Listener.

For more details about the contents of a *Utilities Notes* document, see the description of *Utilities Notes* for add-on products.

3.5 PRODUCT OVERVIEW

Document Title: *Product Overview*
Product Described: GENIX V.3 System
Prerequisites: None
Audience: Current and potential users
Publication No: 424510771-320
Summary of Contents:

The *Product Overview* describes the software and documentation available for the GENIX V.3 System release as packaged for the NSC *Series 32000* Computer. In particular, this document is directed toward users who are interested in buying a *Series 32000* Computer or upgrading their existing one to the GENIX V.3 release.

Topics covered include the following:

- overview of the GENIX V.3 System
- structure and components of the GENIX V.3 operating system: kernel, shell, and file system
- benefits of the GENIX V.3 operating system: power, portability, compatibility, flexibility, and standardization
- contents of GENIX V.3 System release
- descriptions of the new features for the GENIX V.3 release

- descriptions of each the GENIX V.3 System Utilities package
- descriptions of some selected additional software products for use with the GENIX V.3 System
- summary of available documentation
- descriptions of features in Releases 2.0 and 2.1

3.6 PROGRAMMER'S GUIDE

Document Title: *Programmer's Guide*
Product Described: GENIX V.3 System
Prerequisites: *User's Guide*
Audience: All programmers
Publication No: 424510771-120
Summary of Contents:

This is a two-part document that describes the GENIX V.3 system programming environment, and provides detailed descriptions or tutorials on 14 programming tools.

Part 1 discusses the GENIX V.3 system programming environment as it appears to occasional programmers and to applications programmers. It describes the utilities used by programmers (compilers, loaders, debuggers, etc.) and presents a generic view of how the GENIX V.3 system interfaces with a language (system calls, standard libraries, shared libraries, archives, etc.). Detailed instruction in the use of languages is not part of this Guide; that is the responsibility of the individual language manuals.

Part 2 contains detailed definitions of such GENIX V.3 system tools as the C language, the Common Object File Format, and the Link Editor command language. It also includes tutorials on the following topics:

- generating Shared Libraries
- developing screen-handling programs using **curses/terminfo**
- using File and Record Locking facilities
- using Inter-Process Communication facilities
- **awk:** pattern scanning and processing language and command
- **lex:** generates programs to be used in simple lexical anlysis of text
- **make:** maintain, update, and regenerate groups of programs
- **SCCS:** Source Code Control System, maintain versions of files automatically
- **sdb:** symbolic program debugger
- **yacc:** yet another compiler-compiler, converts a set of rules into tables for use in parsing a language

Illustrations in the Guide typically assume the tools will be used with C language programs.

3.7 PROGRAMMER'S REFERENCE MANUAL

Document Title: *Programmer's Reference Manual*
Product Described: GENIX V.3 System
Prerequisites: *Programmer's Guide*
Audience: All programmers
Publication No: 424510771-220
Summary of Contents:

This manual describes the programming features of the GENIX V.3 System. It contains descriptions of commands, system calls, subroutines, libraries, file formats, macro packages, and character set tables. Each set of descriptions is preceded by an introduction. In particular, the Introduction to the System Calls section lists and describes the error values returned by system calls. Syntax and examples are provided within each description as appropriate.

The descriptions (called manual pages or manpages) are preceded by an Introduction to the whole manual, a Table of Contents, and a Permuted Index, prepared from the one-line description that occurs at the beginning of each manpage.

3.8 REMOTE FILE SHARING UTILITIES NOTES

Document Title: *Remote File Sharing Utilities Notes*
Product Described: Remote File Sharing Utilities
Prerequisites: *Owner/Operator Manual (NSC Series 32000 Computer)*
Audience: System administrators
Publication No: 424510771-430
Summary of Contents:

This document describes how to install the Remote File Sharing Utilities.

The Remote File Sharing Utilities product provides the facilities needed to share remote files transparently among computers. It requires the Networking Support Utilities product and a Transport Provider (such as the STARLAN Network).

For more details about the contents of a *Utilities Notes* document, see the description of *Utilities Notes* for add-on products.

3.9 STREAMS PRIMER

Document Title: *STREAMS Primer*
Product Described: GENIX V.3 System
Prerequisites: *Programmer's Guide* and a background in data communications and networking
Audience: Knowledgeable applications programmers and systems programmers
Publication No: 4245108771-150
Summary of Contents:

STREAMS is a major building block in the comprehensive support for networking services provided by the GENIX V.3 system. The *STREAMS Primer* provides a high-level technical overview of STREAMS. Topics covered include the following:

- a summary of the STREAMS mechanism
- a description of the applications and benefits of STREAMS
- illustrations and definitions of STREAMS terminology
- a simple example, discussed from both the applications programmer's and systems programmer's points of view
- a discussion of each of the facilities provided by STREAMS: buffer management, flow control, scheduling, multiplexing, asynchronous operation of STREAMS and user processes, and error and trace loggers
- a comparison of certain design features of character input/output device drivers with STREAMS modules and drivers

3.10 STREAMS PROGRAMMER'S GUIDE

Document Title: *STREAMS Programmer's Guide*
Product Described: GENIX V.3 System
Prerequisites: *STREAMS Primer*
Audience: Knowledgeable applications programmers and systems programmers
Publication No: 424510771-151
Summary of Contents:

The *STREAMS Programmer's Guide* is divided into three main parts. The first part describes how applications programmers should use user-level STREAMS facilities. It provides design and programming information and guidelines for developing STREAMS applications. It includes the following information:

- STREAMS viewed from the applications programmer's point of view
- details on user-level data structures, system calls, and multiplexing

- several illustrated examples describing key areas of developing applications

The second part describes how systems programmers should use STREAMS facilities to write GENIX V.3 system kernel modules and device drivers. It assumes the reader has GENIX V.3 system kernel programming experience. It provides detailed information, with various examples, on the development methods and design philosophy of all aspects of STREAMS. It covers the following topics:

- how to construct and dismantle a Stream
- STREAMS data structures and how to create a kernel module
- service and system calls, message blocks, buffer pools, message queuing, and flow control
- writing a STREAMS driver
- multiplexing
- additional topics

The third part contains a summary of kernel-level data structures, STREAMS message types, and specifications of kernel utility routines.

3.11 ADMINISTRATOR'S GUIDE

Document Title: *Administrator's Guide*
Product Described: GENIX V.3 System
Prerequisites: *User's Guide*
Audience: System administrators
Publication No: 424510771-110
Summary of Contents:

The objectives of this guide are:

- to provide clear instructions on how to do administrative tasks
- to give some background about when and why you should do these tasks
- to suggest shell scripts that can help automate some tasks
- to serve as a quick reference for administrative procedures

Information is organized by tasks associated with major subject areas, such as:

- the processor: how to get a *Series 32000* into operation and keep it going
- the file system: how to build and maintain a file system
- user services: things you need to do for other users
- peripheral devices: disk, tape, printer, and tty management
- the outside world: networking, inter-machine communication
- security: routine procedures for GENIX V.3 system administration

- performance management: finding and fixing performance problems
- appendices: device names and disk partitioning; directories and files used by the administrator; error messages that appear on the console terminal and the action the system administrator should take
- a glossary and an index

3.12 ADMINISTRATOR'S REFERENCE MANUAL

Document Title: *Administrator's Reference Manual*
Product Described: GENIX V.3 System
Prerequisites: *Administrator's Guide*
Audience: System administrators
Publication No: 424510771-210
Summary of Contents:

This manual describes the GENIX V.3 system commands used by system administrators. After the Introduction and the Table of Contents, there is a Permuted Index to the commands' names, prepared from the one-line description of each command that occurs at the beginning of each command's description. Then come the descriptions of the commands (called manual pages or manpages).

3.13 USER'S GUIDE

Document Title: *User's Guide*
Product Described: GENIX V.3 System
Prerequisites: None
Audience: All users
Publication No: 424510771-130
Summary of Contents:

This guide introduces a user to the GENIX V.3 System, the operating system of the *Series 32000* Computer. The guide begins with a general description of the GENIX V.3 system, followed by instructions for using a terminal, and instructions for using the file system. Next, it presents tutorials on the three most commonly used tools of the GENIX V.3 system: the line editor (**ed**), the screen editor (**vi**), and shell programming (**sh**). Finally, the guide teaches how to communicate with other users of a GENIX V.3 system. The reader learns how to exchange messages and files by executing commands such as **mail, mailx, uuto, uupick,** and **uucp.** The guide also includes a glossary and an index.

3.14 USER'S REFERENCE MANUAL

Document Title: *User's Reference Manual*
Product Described: GENIX V.3 System
Prerequisites: *User's Guide*
Audience: All users
Publication No: 424510771-230
Summary of Contents:

This manual describes all the GENIX V.3 system user commands that are delivered with the *Series 32000* Computer. It contains descriptions of the purpose and use of the GENIX V.3 system commands. When appropriate, it also contains diagnostic indications, warnings of potential pitfalls, examples of how to use the commands, and where to find related information.

An Introduction describes how to use the manual. It also provides the basic information needed to get started on the GENIX V.3 system — information such as how to log in and log out, how to use a terminal to communicate with the GENIX V.3 system, and how to run a program. (For more complete information on these topics, see the *User's Guide* and the *Programmer's Guide*.) After the Introduction and the Table of Contents, there is a Permuted Index to the command names, prepared from the one-line description of each command that occurs at the beginning of each command's description. Then come the descriptions of the commands (called manual pages or manpages), in alphabetical order. Lastly, there is an Index to Utilities, listing which commands are in each Utilities package.

3.15 SOURCE CODE RELEASE NOTES

Document Title: *Source Code Provision Release Notes*
Product Described: GENIX V.3 System Source Code
Prerequisites: None
Audience: Programmers who port the GENIX V.3 system to other computer hardware
Publication No: 419510771-002
Summary of Contents:

This document describes the Source Code Provision product, which consists of all *Series 32000* Computer source code corresponding to GENIX V.3 System release. It is available to customers who have a source license. (When a customer pays the binary license fee, they do not receive the source code for GENIX V.3.) This product is available on cartridge tape and magnetic tape. The source code product includes the following:

- kernel, standard device drivers, field upgrade utilities, and all the Utilities packages listed in Appendix A of the *Product Overview* (including the Remote File Sharing Utilities and Networking Support Utilities products, but excluding the Cartridge Tape Utilities package)
- Advanced Programming Utilities (Issue 1.0)
- C Programming Language Utilities (Issue 4.0)

- FORTRAN Programming Language Utilities (Release 1.1)
- process accounting software and manual pages

For more details about the contents of a *Utilities Notes* document, see the description of *Utilities Notes* for add-on products.

The Release 2.1 source code product (see Select Code 305-480) does not contain the Remote File Sharing Utilities product, the Networking Support Utilities product, nor the Advanced Programming Utilities product. It contains Issue 3.1 of the C Programming Language Utilities product, instead of Issue 4.0.

NOTE: This document can be purchased only by customers who have a source license or who have signed a non-disclosure agreement with NSC.

3.16 UTILITIES NOTES

Document Title: *Utilities Notes*
Product Described: GENIX V.3 System
Prerequisites: None
Audience: System administrators
Publication No: 419510771-410
Summary of Contents:

The *Utilities Notes* document contains the following information:

- a summary of the new features of this release, including how these features affect current users
- special instructions for installing some utilities packages
- a list of new and changed documentation and how to get it
- for an update release, page or section replacements for documentation changes

GLOSSARY

This Glossary defines some of the words and phrases used in this document. The emphasis is on words that have a special meaning with respect to the GENIX V.3 system.

add-on product

products that NSC markets for use with the GENIX V.3 operating system.

NSC/XM

the acronym for the NSC eXpansion Module, a cabinet that can be attached to a *Series 32000* Computer to house a power supply and additional devices, such as cartridge tape drives, floppy disk drives, and hard disk drives.

boot

to start the operating system, so called because the kernel must bootstrap itself from secondary storage into memory.

command

1. an instruction to the shell, usually to run a program as a child process (commands are usually found in **/bin** or **/usr/bin**). 2. by extension, any executable file, especially a utility program (commands may be found anywhere; they are searched for according to the value of the shell environment variable **PATH**).

device

1. a file that is not a plain file or a directory. For example, a tape drive is a device and so is the null device. 2. an input-output unit, either physical or virtual, that appears in the file system as a special file.

diagnostic

A diagnostic is a message printed at your terminal that identifies and isolates program errors.

directory

a file that comprises a catalog of file and directory names; the organizing principle of the file system, a directory consists of entries that specify further files (including directories), and constitutes a node of the directory tree.

execute

informally, to run a program.

file

1. in general, a potential source of input or destination for output. 2. a directory entry; several directories may have files with the same name.

file system

1. a collection of files that is accessible via some path from the root directory of the file system. 2. the collection of all files on a computer. 3. the part of the kernel that deals with file systems.

filter

a program that reads data from standard input, transforms it in some way, and writes the results to standard output.

GENIX V.3 system

the name of a family of operating systems (for example, GENIX V.3 System V), not an acronym for anything; a trademark of NSC, the word GENIX V.3 should be used as an adjective, for example, "GENIX V.3 system," "GENIX V.3 software."

kernel

the GENIX V.3 system proper; code resident in memory that implements the system calls.

library

an archive of object files from which the link editor may select functions and data as needed.

MAU

acronym for the Math Acceleration Unit, a single integrated circuit designed to speed up floating-point operations on some *Series 32000* Computers.

operating system

the program for managing the resources of the computer. It takes care of such things as input/output procedures, process scheduling, and the file system, removing this burden from user programs.

program

1. an executable file. 2. a process.

redirection

feature that allows you to reassign standard input and standard output to files or other devices.

shell

1. the program (called **sh**) that acts as the interface between the user and the GENIX V.3 operating system; it causes other programs to be executed on command; the shell is usually started on a user's behalf when the user logs in. 2. by analogy, any program started upon logging in.

spool

to collect and serialize output from multiple processes competing for a single output service, such as a printer or automatic calling unit.

spooler

a program that spools.

spool area

a directory in which a spooler collects work.

standard input

the place from which a program expects to receive its input, usually a terminal; however, see "redirection."

standard output

the place to which a program writes its results, usually a terminal; however, see "redirection."

system calls

1. the set of system primitive functions through which all system operations are allocated, initiated, monitored, manipulated, and terminated. 2. the system primitives invoked by user processes for system-dependent functions, such as I/O, process creation, etc.

Utilities package

a group of programs that performs related functions; examples of packages are Directory and File Management, Performance Measurement, and Line Printer Spooling.

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