

August 1978

This document presents the detailed information necessary to generate a TRAX system.

TRAX System Generation Manual

Order No. AA-D335A-TC

OPERATING SYSTEM AND VERSION: TRAX Version 1.0

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CONTENTS

		Page
PREFACE		
CHAPTER 1	TRAX SYSTEM GENERATION PROCESS	1-1
1.1	OVERVIEW	1-1
1.2	DOCUMENTATION	1-5
1.3	TRAX DISTRIBUTION KIT	1-6
1.4	SYSTEM GENERATION DIALOGUE FUNCTION	1-7
1.5	FILE SPECIFICATION CONVENTIONS	1-8
1.5.1	Device Name	1-9
1.5.2	User File Directories (UFDs)	1-10
1.5.2.1	File Protection Considerations	1-11
1.5.3	Version Numbers	1-11
1.5.4	File Specification Defaults	1-12
1.5.5	File Specification Wildcards	1-12
CHAPTER 2	BUILDING THE TARGET SYSTEM DISK	2-1
2.1	PREPARING THE TARGET SYSTEM GENERATION DISK	2-1
2.1.1	Mounting the Target System Disk Pack	2-1
2.1.2	BAD Block Checking	2-1
2.1.3	Loading the Target Disk Image	2-3
2.2	BOOTSTRAPPING THE BASELINE SYSTEM	2-5
2.3	SUMMARY OF PROCEDURE	2-5
CHAPTER 3	PREPARING FOR SYSTEM GENERATION	3-1
3.1	COPYFILES PROCESS	3-1
3.1.1	Processing the Required Files Tape	3-4
3.1.2	Processing the Option Tapes	3-5
3.1.3	Processing the Current Change Tape	3-5
3.1.4	Processing Tape Read Errors	3-6
3.2	SUMMARY OF PROCEDURE	3-6

CONTENTS (CONT.)

	Page
CHAPTER 4	GENERATING THE TARGET SYSTEM 4-1
4.1	SYSTEM GENERATION – (SYSGEN) UTILITY 4-5
4.2	DIALOGUE PHASE 4-6
4.2.1	Dialogue Prologue Section 4-7
4.2.2	Kernel Section Dialogue 4-8
4.2.2.1	Hardware Configuration Determination Utility (AUTO) 4-9
4.2.2.2	Dialogue During Autosize 4-10
4.2.2.3	Verifying Hardware Configuration 4-13
4.2.2.4	Configuring the Hardware Manually 4-14
4.2.2.4.1	Mass Storage Devices 4-16
4.2.2.4.2	Mass Storage Devices on the 11-34 and 11-60 CPU Configurations 4-18
4.2.2.4.3	General Peripheral Device Specification 4-19
4.2.3	Communications Support Dialogue 4-21
4.2.3.1	TRAX/TL Communications Option 4-21
4.2.3.2	TRAX/3271 Communications Option 4-24
4.2.4	Applications Terminal Service Dialogue 4-25
4.2.4.1	Assignment of Terminals to DUP11 Interfaces 4-26
4.2.4.2	Assignments of Terminals to DZ11 Interfaces 4-27
4.2.4.3	Logical Terminal Naming 4-29
4.2.4.4	Modification of VT62 Terminal Error Messages 4-29
4.2.5	Dialogue Epilogue Section 4-30
4.3	DATA FILES GENERATION PHASE 4-31
4.4	BUILD PHASE 4-32
4.4.1	Stage 1: KERNEL Build Process 4-33
4.4.2	Stage 2: KERNEL Utilities Build Process 4-33
4.4.3	Stage 3: TRAX Executive Services and Utilities Build Process 4-33
4.4.4	Stage 4: Language Support Build Process 4-34
4.4.5	Stage 5: Communications Options Build Process 4-34
4.4.6	Stage 6: ATS Build Process 4-34
4.5	COMPLETION OF SYSGEN PROCESSING 4-34
4.6	RELOADING PREVIOUS CONFIGURA- TION DATA 4-36
4.7	PERFORMING SELECTED GENERATION STAGES 4-37
4.8	SUMMARY OF PROCEDURE 4-38

CONTENTS (CONT.)

		Page
CHAPTER 5	TAILORING THE TARGET SYSTEM	5-1
5.1	SPECIFYING THE SYSTEM IMAGE	5-2
5.1.1	Naming the Target System	5-2
5.1.2	Full Support Environment Selection	5-4
5.1.3	Choice of Language Object Time System	5-4
5.1.4	Partitioning Memory	5-4
5.1.5	Support Environment Terminal Characteristics	5-6
5.1.5.1	Adding Terminal Specifications	5-8
5.1.5.2	Additional Terminal Specification Commands	5-9
5.1.5.2.1	Duplicating Terminal Characteristics	5-9
5.1.5.2.2	Displaying Terminal Characteristics	5-10
5.1.5.2.3	Editing Terminal Characteristics	5-10
5.1.5.2.4	Deleting Terminal Specifications	5-11
5.1.6	Generating the System Image File	5-11
5.2	SPECIFYING SYSTEM MANAGER'S ACCOUNT	5-11
5.3	COMPLETING THE TARGET SYSTEM	5-13
5.3.1	Booting in the Unfinished Target System	5-13
5.3.2	Saving the Completed System Image	5-14
5.3.3	Deleting Files to Regain Disk Space	5-14
5.4	RE-STARTING THE SETUP SYSGEN SEQUENCE	5-15
5.5	PREPARING ALTERNATE VERSIONS OF THE TARGET SYSTEM	5-15
5.6	SUMMARY OF PROCEDURE	5-17
CHAPTER 6	CHECKING OUT THE TARGET SYSTEM	6-1
6.1	CHECKING OUT ATS TERMINALS (EXER62)	6-1
6.2	SETTING UP THE SAMPLE APPLICATION FOR CHECKOUT	6-1
6.2.1	Specifying the Test Application Terminals	6-2
6.3	VALIDATION PROCEDURE USING THE SAMPLE APPLICATION	6-4
6.3.1	Installation of the SAMPLE Transaction Processor	6-5
6.3.2	START the SAMPLE Transaction Processor	6-5

CONTENTS (CONT.)

		Page
6.3.3	Verify Transaction Selection Form Appearances	6-5
6.3.4	Display Initial Data File Information	6-6
6.3.5	Add Customer Record	6-6
6.3.6	Modify Customer Record	6-7
6.3.7	STOP the SAMPLE transaction Processor	6-7
6.3.8	REMOVE the SAMPLE Transaction Processor	6-8
6.3.9	End of Validation Procedure	6-8
6.3.10	Restoring the Original Validation Data Files	6-8
CHAPTER 7	UPDATING YOUR SYSTEM(S)	7-1
7.1	IN-PLACE UPDATING UTILITY (CHGMAKER)	7-1
7.1.1	Setting Up for CHGMAKER Processing	7-3
7.1.2	Bringing CHGMAKER Into Action	7-4
7.1.3	Phase I Processing the Change Tape	7-4
7.1.3.1	Phase I-A: Original Component Replacement	7-4
7.1.3.2	Phase I-B: Copying Additional Files; Checking for Others	7-6
7.1.4	Phase II: Retrieve Missing Components	7-7
7.1.5	Phase III: Rebuild Operations	7-8
7.1.6	Phase IV: Retailoring the System	7-8
7.2	PERFORMING THE UPDATE WITH SETUP	7-9
7.3	COMPLETING THE UPDATE PROCESS	7-9
7.4	RESTARTING SETUP FOR UPDATE PROCESSING	7-9
7.5	WHEN TO REBUILD TSTS	7-10
7.6	WHEN TO RELINK TSTS	7-10
7.7	SUMMARY OF PROCEDURE	7-11
CHAPTER 8	ON-LINE SYSTEM GENERATION	8-1
8.1	REQUIREMENTS FOR ON-LINE SYSTEM GENERATIONS	8-1
8.2	BUILDING THE TARGET SYSTEM GENERATION DISK ON-LINE	8-2

CONTENTS (CONT.)

		Page
8.2.1	Preparing the Target System Generation Disk On-Line	8-2
8.2.2	BAD Block Checking On-Line	8-2
8.2.3	Loading the Target System Generation Disk On-Line	8-3
8.3	COPY FILES PROCESS ON-LINE	8-4
8.4	COMPONENT GENERATION ON-LINE	8-5
8.5	TAILORING THE TARGET SYSTEM ON-LINE	8-7
8.5.1	Completing System Generation on the Current System	8-7
8.5.2	Completing the Target System on a Different System	8-7
8.5.3	Bringing Up the Target System Generation Disk	8-8
APPENDIX A	HARDWARE BOOTSTRAPS	A-1
A.1	PDP-11/34 AND PDP-11/60 BOOTSTRAP	A-1
A.2	PDP-11/70 BOOTSTRAP	A-1
APPENDIX B	MOUNTING AND DISMOUNTING MAGNETIC TAPES	B-1
B.1	TU45 TRANSPORT	B-1
B.1.1	Loading Tape on the TU45 Transport	B-1
B.1.2	Bringing Tape to Beginning-of-Tape (BOT)	B-1
B.1.3	Unloading Tape from the TU45 Transport	B-3
B.1.4	Manual Controls	B-3
B.1.4.1	ON/OFF	B-3
B.1.4.2	LOAD/RESET	B-3
B.1.4.3	REWIND	B-3
B.1.4.4	ON LINE	B-4
B.1.4.5	FILE PROT (FILE PROTECT)	B-4
B.1.4.6	1600 BPI	B-4
B.1.4.7	SELECT	B-4
B.2	TE16 TRANSPORT	B-4
B.2.1	Controls and Indicators	B-5
B.2.2	Address Selection Plug Receptacle	B-5
B.2.3	Operating Procedures	B-6
B.2.3.1	Application of Power	B-6
B.2.3.2	Loading and Threading Tape	B-7

CONTENTS (CONT.)

		Page
B.2.3.3	Unloading Tape	B-7
B.2.3.3.1	Tape Not at BOT	B-9
B.2.3.3.2	Tape at BOT	B-9
B.2.3.4	Restart after Power Failure	B-9
B.2.4	Operator Troubleshooting	B-9
APPENDIX C	SAVING AND RESTORING SYSGEN DISKS	C-1
C.1	SAVING THE SYSGEN DISK (STAND-ALONE SYSGEN)	C-1
C.2	SAVING THE SYSTEM GENERATION DISK (ON-LINE SYSGEN)	C-3
C.3	RESTORING THE SYSGEN DISK (STAND-ALONG SYSGEN)	C-5
C.4	RESTORING THE SYSTEM GENERATION DISK (ON-LINE SYSGEN)	C-6
C.5	SUMMARY OF PROCEDURES	C-7
C.5.1	Saving the System Generation Disk (Stand-Along SYSGEN)	C-7
C.5.2	Saving the System Generation Disk (On-Line SYSGEN)	C-8
C.5.3	Restoring the System Generation Disk (Stand-Alone SYSGEN)	C-9
C.5.4	Restoring the System Generation Disk (On-Line SYSGEN)	C-10
APPENDIX D	REDIRECTING LINE PRINTER OUTPUT DURING SYSGEN	D-1
APPENDIX E	HARDWARE INTERFACE ADDRESS AND VECTOR ASSIGNMENTS	E-1
E.1	FLOATING ADDRESSES	E-1
E.1.1	Floating Address Worksheet	E-2
E.2	FLOATING VECTORS	E-5
E.3	LINE PRINTER ADDRESSES AND VECTORS	E-5
E.4	ASSIGNMENT OF DUP11 INTERFACES	E-6
E.5	ASSIGNMENT OF DZ11 MULTIPLEXERS	E-6
APPENDIX F	MAXIMUM STORAGE SIZES OF TRAX SUPPORTED DISKS	F-1

CONTENTS (CONT.)

		Page
APPENDIX G	OTHER USES OF THE AUTO UTILITY	G-1
G.1	CHECKING THE HARDWARE INSTALLATION ADDRESSING	G-1
G.2	PRINTING HARDWARE CONFIGURATION REPORTS	G-2
G.3	CREATING (MODIFYING) AN AUTOSIZE DATA FILE	G-3
APPENDIX H	SAMPLE SYSTEM GENERATIONS	H-1
H.1	COMPLEMENTARY PAIR OF SMALL SYSTEMS (11-34)	H-1
H.2	SUPPORT ENVIRONMENT ONLY SYSTEM (11-70)	H-2
APPENDIX I	DEMONSTRATING THE TARGET SYSTEM	I-1
I.1	SETTING UP THE SAMPLE APPLICATION FOR DEMONSTRATION	I-1
I.1.1	Restoring the Original Demonstration Data Files	I-4
I.1.2	Setting up the Journaling Device	I-5
I.1.3	Specifying the Test Application Terminals	I-6
I.1.4	Define the Output-Only Station	I-8
I.1.5	Setup for Non-Existant Output-Only Terminal	I-9
I.2	DEMONSTRATION PROCEDURE USING THE SAMPLE APPLICATION	I-10
I.2.1	Installation of the SAMPLE Transaction Processor	I-11
I.2.2	***** Redirection of Data to Mailbox Station	I-12
I.2.3	START the SAMPLE Transaction Processor	I-12

CONTENTS (CONT.)

	Page	
I.2.4	Verify Transaction Selection Form Appearances	I-13
I.2.5	Display Initial Data File Information	I-13
I.2.5.1	Display Customer Number 12	I-13
I.2.5.2	Display Stock Item Number 05C955N4	I-14
I.2.5.3	Display Order Number 0000004000200	I-14
I.2.5.4	Display Invoice Number 000005000450	I-14
I.2.5.5	Display Backorder Information	I-14
I.2.5.6	Display Customer Number 12 by Name	I-14
I.2.5.7	Add Customer Record	I-15
I.2.6	Change Customer Record	I-15
I.2.7	Add Stock Item	I-16
I.2.8	Change Stock Item Record	I-16
I.2.9	***** Enter An Order	I-17
I.2.10	***** Display An Order	I-17
I.2.11	***** Ship An Order	I-17
I.2.12	Display of Final Data File Information	I-18
I.2.12.1	Display Customer Number 8	I-18
I.2.12.2	Display Customer Number 26	I-18
I.2.12.3	Display Stock Item Number 25C976W0	I-18
I.2.12.4	Display Stock Item Number 05C957N2	I-19
I.2.12.5	***** Display Order Number 000008000100	I-19
I.2.12.6	***** Display Invoice Number 000008000150	I-19
I.2.13	STOP the SAMPLE Transaction Processor	I-19
I.2.14	REMOVE the SAMPLE Transaction Processor	I-20
I.2.15	BRIEF INSTALL of SAMPLE Transac- tion Processor	I-20
I.2.16	RESTART the SAMPLE Transaction Processor	I-20
I.2.17	Reverify the Appearance of Transaction Selection Forms	I-20
I.2.18	STOP the SAMPLE Transaction Processor	I-20
I.2.19	REMOVE the SAMPLE Transaction Processor	I-20
I.2.20	End of Demonstration Procedure	I-21

APPENDIX J	SAMPLE TRANSACTION PROCESSOR EXECUTION RESULT SCREENS	J-1
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CONTENTS (CONT.)

			Page	
FIGURE	1-1	Block Diagram of the System Generation Process	1-2	
	2-1	Building the Target System Disk	2-2	
	3-1	Distribution Kit Tape Processing	3-2	
	4-1	Generating the Remaining System Components	4-2	
	4-2	Initial SYSGEN Printout	4-6	
	4-3	AUTO Utility Processing Flow	4-11	
	4-4	Maximum TRAX/TL Communication Arrangements	4-23	
	5-1	Completing the Target System	5-3	
	7-1	Updating an In-Place System	7-2	
	B-1	TU45 Drive, Tape Path	B-2	
	B-2	TE16 Drive, Tape Path	B-8	
	E-1	Floating Address Worksheet	E-4	
	TABLE	1-1	TRAX Distribution Tape Names and Part Numbers	1-6
		1-2	Commonly Used Filetypes	1-9
		1-3	Example Device Names	1-9
1-4		Commonly Used Device Names	1-10	
1-5		File Specification Defaults	1-12	
2-1		TRAX Utility Tapes	2-1	
2-2		Baseline System Image Names	2-4	
3-1		TRAX Options	3-5	
4-1		Mass Storage Devices	4-16	
4-2		General Peripheral Devices	4-20	
4-3		UT62 Terminal Error Messages	4-30	
6-1		SAMPLE Application Terminal Station Data	6-2	
6-2		Customer Information	6-7	
B-1		TE16 Switch Functions	B-5	
B-2		TE16 Indicators	B-6	
E-1		Line Printer Addresses and Vectors	E-6	
F-1		Disk Pack Storage Capacities	F-1	
I-1		Stock Item Number Coding Scheme	I-4	
I-2		Sample Applications Terminal Station Data	I-6	
I-3		(No Title)	I-15	
I-4	(No Title)	I-16		
I-5	(No Title)	I-17		

PREFACE

Major sections of this manual describe the complete process of generating an operating system for transaction processors that match the requirements and hardware configuration of any installation. All systems thus generated include systems programs, utility programs, language object time system, monitor, and transaction processors. Changing system characteristics, installing and removing system components, and correcting hardware and software problems are discussed in the manual. Included in the manual is a complete validation procedure to verify correct system generation. New system generation is discussed in the first part of the manual. Next, additions and changes to continually update the system are discussed. In the final part of the manual On-line system generation is covered. Summaries of procedures follow each chapter in the manual.

This manual is required reading for all persons with the responsibility of generating TRAX operating systems. This includes the system manager who may supervise the system generation actually performed by someone else as well as the person doing the actual system generation.

The manual is also of interest to those who are responsible for hardware and software policy and procedure, software support representatives, and field service engineers. Some of the information in the manual will be helpful to managers responsible for solving operational problems and maintaining published changes to system software.

Before attempting to generate a TRAX system, it is necessary to be familiar with TRAX utility programs, transaction processing, and the hardware on which TRAX will run. This information is available in the complete TRAX documentation package that accompanies this manual.

HOW TO USE THIS MANUAL

The manual is, informally, divided into five parts.

1. Preparing For System Generation
2. The SYSGEN Utility
3. Validating The System Generation
4. Updating the System
5. On-Line System Generation

Chapters 1 through 3 discuss all the steps required to prepare for running the SYSGEN and SETUP utilities which are then detailed in Chapters 4 and 5. In Chapter 6 the validation procedure is explained and then Chapter 7 discusses updating the system. Finally Chapter 8 is the On-Line generation procedure.

The appendices describe special procedures that can be of help in completing a smooth system generation; also in the appendices are demonstration runs, tables of pertinent data and photographs of the results of the validation procedure.

If this is the first system generation being done at an installation, the entire manual should be read before the system generation is begun. This provides an over-all view of the complete procedure. Once the manual is read the system generation is started by following the step-by-step instructions that begin in Chapter 2. Following each step exactly in Chapters 2 through 5, results in a complete TRAX operating system. This system is validated with the step-by-step instructions in Chapter 6 and by referring to the photographs in Appendix J.

At any time after the first system generation, it is possible to generate another system by reading only the summaries that follow each of the first six chapters. If, each time a system generation is done, notes are kept on the pages containing the summaries, each new generation is easier than the last one. Eventually it should be possible to remove these pages and bind them in a separate folder for ready reference during a system generation.

CHAPTER 1

TRAX SYSTEM GENERATION PROCESS

TRAX is generated from a magnetic tape distribution kit onto a hardware configuration chosen by your installation. The system generation procedures are described in this guide.

This guide is organized to permit both the novice and experienced system builders to quickly and efficiently generate and tailor the desired target system(s).

A brief overview of each chapter and appendix of the guide is presented, along with a list of documents with which you should be familiar. You should read these and all other documents of the TRAX Distribution Kit at least once before trying to generate your first TRAX system.

The rest of the chapter describes the actual tapes contained in the TRAX Distribution Kit, the dialogue function used in communicating with the utility programs, and the file specification convention used in the TRAX system.

1.1 OVERVIEW

The TRAX System Generation Guide is designed to lead you through the steps of the system generation process in a straight-forward manner. Alternative paths and techniques have been reserved for later chapters or appendixes so that the normal processing flow is uninterrupted. This system generation process is summarized in the block diagram shown in Figure 1-1. This diagram also points to the chapters and sections containing details on the related system generation process.

Chapter 2 leads you through the process of taking a blank disk pack, checking that pack for BAD blocks, then loading the pack with the TRAX Baseline System, a Support Environment only system configured precisely for system generation processing.

Chapter 3 takes the newly prepared target system disk and copies all required component files from the distribution kit to the disk. Any options available are added to the disk and the latest versions of all components are obtained from the most recently released version of the Change Tape.

TRAX System Generation Process

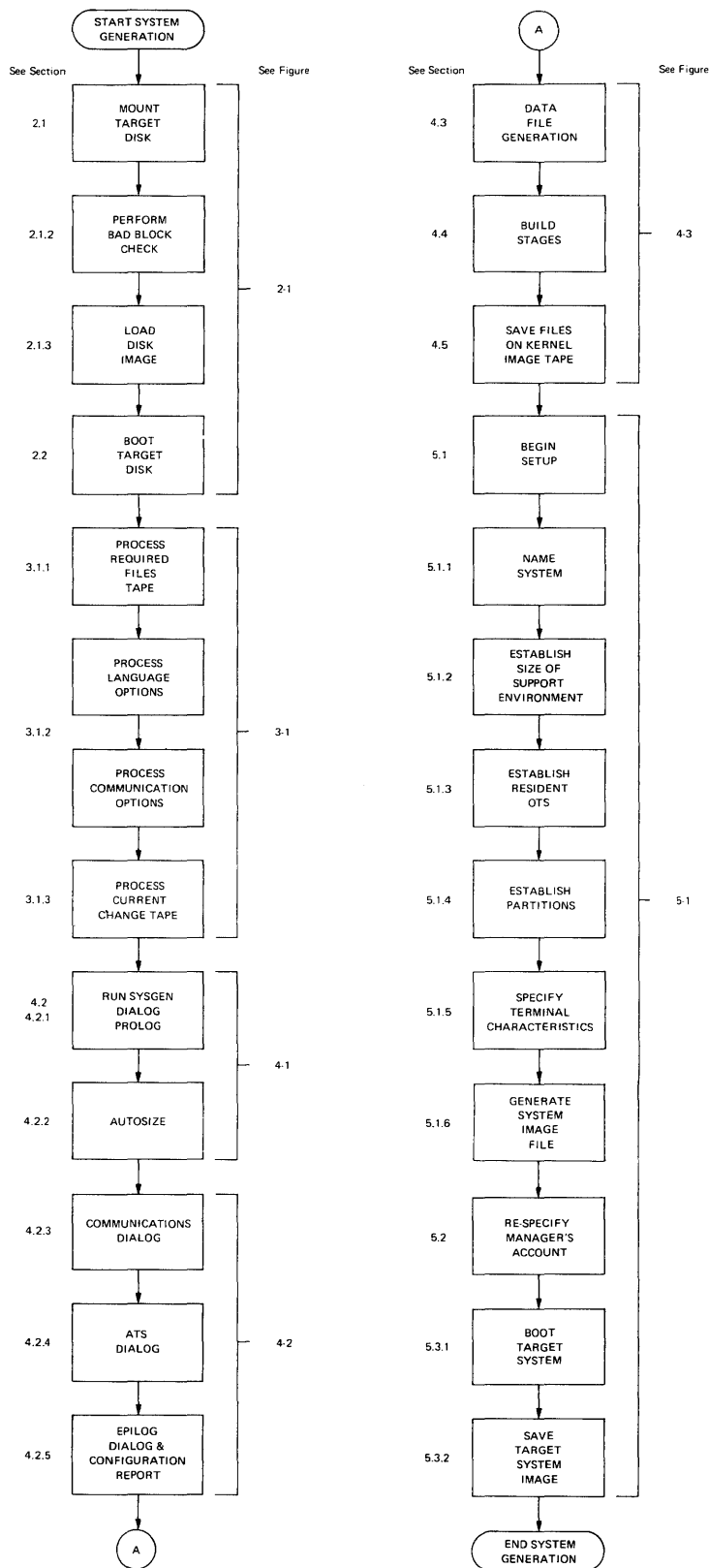


Figure 1-1 Block Diagram of the System Generation Process

Chapter 4 describes the major part of the system generation process. All configuration parameters and options are specified and then used to control the building of all remaining system components. The chapter presents several methods for specifying the hardware configuration data and allows the generation of both transaction processor environments with minimum-sized support environments, support environment only systems, and, if sufficient resources are available, systems that support both environments simultaneously.

Chapter 5 details the steps performed to tailor the basic capabilities and resources to fit the exact requirements of your installation. This guide expects you to perform only the minimum actions needed to implement the target system. Since these activities are the beginnings of the System Manager's responsibilities, further detailing of these tasks is left to the TRAX System Manager's Guide.

The chapter also touches on techniques for tailoring the same basic hardware and KERNEL configuration into a support environment only version that can be run at alternative times to support further application development and support.

Chapter 6 describes how to verify the operation of all applications terminals, through the use of the ATS diagnostic utility. Once a minimum set of applications terminals (four) has been verified to operate correctly, a specially prepared application, called the sample application, is set up and assigned applications terminals. A validation procedure is executed to show that the target system functions properly.

After a system is produced and in use, its maintenance is performed through the use of a special utility, CHGMAKER, and the periodically reissued change tapes. Chapter 7 explains the process and how to use it to keep your TRAX system(s) functioning smoothly and reliably.

Up to now, all discussions concerned stand-alone system generations where system generation is the only activity being processed. Chapter 8 delves into the alternative method of performing the system generation process on-line in the support environment of a different TRAX system. Nearly all stand-alone steps can be performed on-line. The chapter describes the necessary modifications and restrictions surrounding the process and details how to complete the final steps of the tailoring activity, either using the current system again in stand-alone mode, or how to move to another system to complete the target system generation.

TRAX System Generation Process

The appendixes contain a number of special process descriptions, tables of pertinent data, several illustrations of system generation, a demonstration procedure and photographs showing results of the validation procedure.

Appendix A details the use of the hardware bootstraps available on TRAX systems. The procedures describe how to bootstrap both magnetic tape drives and disk drives.

Appendix B describes how to mount and unmount magnetic tape reels from TRAX supported tape drives. The control functions of each drive are also discussed.

Appendix C gives a step-by-step description of how to (1) save the contents of a system generation disk after completing the COPYFILES process, and (2) restore a system generation disk to the same state. Both stand-alone and on-line versions of the procedures are discussed.

Appendix D details the procedure for transferring output directed to a malfunctioning or nonexistent line printer to another system device.

As an aid to the DIGITAL Field Service Engineer, Appendix E details the algorithms for vector and address assignments for all hardware devices to be installed in a TRAX configuration. A worksheet is included to aid in the calculation of addresses in the floating address space.

Also included in Appendix E are the allowed addresses and vector assignments for multiple line printers in a given configuration. The appendix also states the conventions for arranging the DUP11 and DZ11 devices relative to the sections of the TRAX system to which they are assigned.

Appendix F provides a small table comparing the maximum storage capacities between each disk type. The table gives storage values in both bytes and numbers of disk blocks (512 bytes per disk block).

Appendix G details the use of the AUTO utility running stand-alone under the baseline system to check the validity of the target system hardware configuration. The utility verifies that the configuration can be supported by a TRAX system. The appendix also details how the AUTO utility can be used to prepare hardware configuration files on-line.

Appendix H contains the system console listings for two representative system generations.

Appendix I describes the demonstration procedure. Many aspects of handling a transaction processor and its transactions are demonstrated via a “cookbook” presentation of procedural steps.

Appendix J shows photographs of screen presentations (and some hard-copy terminal reports) that appear during the execution of the validation procedure and the demonstration procedure.

1.2 DOCUMENTATION

The following is a list of documents you should be familiar with as a systems builder. This list is part of the complete documentation set supplied with the TRAX distribution kit and listed in the Introduction to TRAX.

1. INTRODUCTION TO TRAX
2. APPLICATION DESIGN GUIDE
3. SYSTEM MANAGER'S GUIDE
4. TRAX SYSTEM RELEASE NOTES (Current and Cumulative)

In addition to reading through these documents, it is recommended that you read all sections of this manual at least once before attempting your first system generation. Make notes in the manual as you go. This guide is a working plan for implementing your TRAX system.

Much of the terminology used in this guide is explained in Introduction to TRAX. In particular, a glossary is included in that manual, and you should study it before reading further.

It is very important that the Release Notes be thoroughly read each time a new set is received on a Change Tape. The Release Notes carry the latest up-to-date information about the TRAX system and how to perform system generations.

For the installation performing a system generation for the first time, the COPYFILES utility (Chapter 3) has a provision for printing out the Release Notes. Once a target system is generated and is running, the Release Notes can be printed out as desired.

TRAX System Generation Process

The Release Notes come in two sections: (1) Release Notes File, [200, 200] RELEASE, NTS, and (2) Update Notes File, [200,200] UPDATE, NTS. Either or both of these files can be printed by one of the following DCL commands:

```
COPY[200,200]★,NTS LP:
PRINT [200,200]★,NTS
```

The Release Notes File is an accumulation of all Release Note information issued via prior Change Tapes; the Update Notes File contains the Release Note information appearing on the latest Change Tape. As new Change Tapes are issued, successive Update Notes Files are merged with the Release Notes File.

1.3 TRAX DISTRIBUTION KIT

TRAX systems are distributed on 9-track, 2400 foot, reels of magnetic tape. The basic kit contains six tapes. Additionally, four more tapes contain optional components for inclusion in the target system.

Table 1-1 lists the TRAX distribution tapes part numbers, along with their logical names.

Table 1-1 TRAX Distribution Tape Names and Part Numbers

Logical Name	Magnetic Tape Part Number
(1) BADSYS Utility Tape	TRAX V1 BIN 1600 MT9 1/6 BB-D657A-BC
(2) DSCYS Utility Tape	TRAX V1 BIN 1600 MT9 2/6 BB-D658A-BC
(3) Baseline System Image Tape	TRAX V1 BIN 1600 MT9 3/6 BB-D659A-BC
(4) Required Files Tape	TRAX V1 BIN 1600 MT9 4/6 BB-D660A-BC
(5) Change Tape	TRAX V1 BIN 1600 MT9 5/6 BB-D661X-BC (Note 1)
(6) KERNEL Image Save Tape	TRAX V1 BIN 1600 MT9 6/6 BB-D662A-BC
(7) COBOL Language Option Tape	TRAX V1 BIN 1600 MT9 BB-D663A-BC
(8) BASIC-PLUS-2 Lang. Option	TRAX V1 BIN 1600 MT9 BB-D664A-BC
(9) TRAX/TL Comm. Opt. Tape	TRAX V1 BIN 1600 MT9 BB-D665A-BC
(10) TRAX/3271 Comm. Opt. Tape	TRAX V1 BIN 1600 MT9 BB-D666A-BC
	----- I I I I "tape number"

NOTE 1: Change Tapes are reissued periodically, and the "x" suffix letter indicates the revision level, beginning with "A," for the initial V1 release.

Every installation must obtain tapes 1 through 6 plus tape 7 or tape 8. Each installation may also acquire any or all remaining option tapes.

Throughout this manual, the various tapes of the distribution kit will be referenced by their logical names. Additionally, the reference will include the tape number portion of the magnetic tape's part number (Table 1-1), for example, the Required Files Tape (D660A).

1.4 SYSTEM GENERATION DIALOGUE FUNCTION

The dialogue queries issued by the system generation utilities conform to a standard developed for all TRAX utilities except the Kernel utilities. Conform to this standard. The major characteristics of this standard are as follows:

1. Each query consists of a prompt, an optional default value, and requests for one item of data.
2. Responding with a simple "?" causes text further describing the query to print out, followed by a reissuing of the query.
3. Responding with the ESC (SEL) key causes a back tracking in the dialogue to a previous query, except where otherwise noted in this chapter, or during the dialogue itself. This provides a means of changing previously specified data with minimum reentry of other data.
4. The CRTL/Z key may be used at any time to exit from the dialogue and, subsequently, from the utility itself.
5. You may select a long-form mode in the dialogue where "help" text is printed before each and every query.
6. When a choice from a list is given, the minimum unique number of characters is all that is required for a response. For example, the minimum required characters for each element in the following list of responses is underlined:

YES NO BASIC COBOL EXIT EDIT

To illustrate these dialogue characteristics, the following shows the initial herald text printout and the first query appearing from system generation as it begins execution:

TRAX System Generation Procedure

Copyright (c) 1977, 1978

Digital Equipment Corporation, Maynard MA 01754

System generation invoked on 21-Apr-78 at 09:35 AM

Dialogue prompts may be long or short in form. The long form gives additional explanatory text about the query and the data to be entered. The short form presents only the minimum prompt text required to identify the query.

During the short-form dialogue, use of the “?” response to a specific prompt will cause the associated long-form text to be printed out and the query reissued.

Do you want the “long” form of the dialogue <NO>?

The herald text is the title, “TRAX System Generation Procedure” followed by the copyright statement. Next is the “help” text for the query that appears at the end. This query establishes whether the long or short form of the dialogue will be used by system generation. Responding to this query with YES causes all further queries in system generation to be prefaced with help text.

Responding simply with a <RET> causes the default value, as shown between the “<” and “>” (NO in this case), to be taken as the actual response. Thereafter, each query appears immediately with no preceding help text unless requested via the “?” response on an individual basis.

1.5 FILE SPECIFICATION CONVENTIONS

There are many situations in which you must supply a file specification. Five different identifiers are required to completely specify a file:

- | | |
|----------------|--|
| dev: | The name of the device that holds the volume on which the file resides. |
| [group,member] | A User Identification Code (UIC) that identifies the directory containing the file. |
| filename | The name you assign to the file. This name must be an ASCII character string of 1 to 9 letters or numbers. |
| . filetype | The three characters type assigned to the file. Certain files have assumed filetypes, while others may be specified with a filetype of your own creation. The filetype must be an ASCII character string of 0 to 3 letters or numbers and prefixed with a “.” character. Table 1-2 lists the filetypes assumed for those files commonly encountered in TRAX. |
| ; n | A number that identifies the various versions of the same file. |

The format of a complete file specification is

dev: [group,member] filename . filetype ; n

Table 1-2 Commonly Used Filetypes

Filetype	Description of file
.CBL	COBOL source statement file
.B2S	BASIC-PLUS-2 source statement file
.MAC	MACRO-11 source statement file
.OBJ	Object module file
.LST	Line Printer listing file
.TSK	Task image file
.ODL	Overlay Description file
.CMD	Command file
.ATL	Application Terminal Language source file
.OLB	Object module library file

1.5.1 Device Name

The device name specifies the unit on which the file resides. The name consists of 2 alphabetic characters, and an optional 1- or 2-digit octal unit number, followed by a colon (:). When the name does not include a unit number, the system assumes that the unit number is 0. Example device names and corresponding units are listed in Table 1-3.

Table 1-3 Example Device Names

Name	Corresponding Unit
DM1:	RK07 disk, unit 1
MM0:	TU45 magnetic tape, unit 0
DB2:	RP05 disk drive, unit 2

The device name can specify either an actual physical unit, like the three in Table 1-3, or a pseudo device name, which corresponds to different physical units, depending on who enters the name. For example, the name TI: refers to the terminal at which you are interacting with the system. Another pseudo device name is SY:, which corresponds to your default system disk.

Table 1-4 lists the name of commonly used devices. The letter “n” stands for the octal unit number. There are different types of disks and magnetic tapes. Ask your system manager about the names you should be using. The TRAX System Manager’s Guide contains a complete list of device names.

Table 1-4 Commonly Used Device Names

Device	Name
Disk	DBn: DMn: DRn:
Line Printer	LPn:
Magnetic Tape	MMn:
Pseudo User Terminal	TI:
Terminal	TTn:
System Default Device	SY:

Since the names TI:, TTn:, and LP: represent input and/or output devices, other than storage media, they generally need not appear as part of a complete file specification. When you refer to one of these devices in file expression, the device name stands alone. For example, the following DCL command sends a copy of INSERT.CBL on your system disk to the line printer:

```
>COPY INSERT.CBL LP:
```

1.5.2 User File Directories (UFDs)

When you logged onto the system, you either directly or indirectly (through your last name) specified your UIC. This UIC identifies the default User File Directory (UFD) that exists for your use on SY: at the time the System Manager established your account on the system.

This UFD is itself a file that lists the names of all files in your area. The system cannot locate a file unless it first knows the UFD where that file is listed. If your UIC is [300,200], the name of your default UFD file is [0,0]300200.DIR;1. However, when referring to a UFD within a file specification, you must use the [group, member] format of the UIC, namely [300, 200].

Your default UFD is not the only directory you can access. On many occasions, you may need to access a file belonging to some other user. In this event, you can use the DCL SET DEFAULT command to change your default UFD. (This procedure is explained in the TRAX, Support, Environment, User's, Guide.) You may also gain access to files in other directories by specifying the UFD where they reside as part of the file specification.

Suppose you need to list the file [350, 227] INSERT.LST at your terminal:

```
>TYPE [350,227] INSERT.LST
```

This command assumes that you want the current version, and that INSERT.LST resides on your SY:.

1.5.2.1 File Protection Considerations – The system imposes some restrictions on access to UFDs and other files that belong to other users. Every file includes a protection mask that determines who can access the file and in what manner; when you attempt to access a file, the system checks your UIC against the file's protection mask. If you are attempting to perform an operation on that file, and the protection mask prohibits such an operation for your UIC, your attempted access fails, and the system will return an error message at your terminal.

For example, if you attempt to edit a file that prohibits access by your UIC, the editor displays the following message:

```
EDT -- Protection Violation
```

See the IRAX System Manager's Guide for a more detailed explanation of file protection.

1.5.3 Version Numbers

A version number is octal and lies in the range -1 to 77777. When a file is created, the system assigns it a version number of 1. Subsequently, the system increments the version number by 1 each time a new version of the same file is created. The "same file" is one that has the same name and type, listed in the same UFD on the same volume.

For example, whenever you edit a file, EDT creates an output file to contain the edited file. The file specification that refers to the output file is identical to the input file specification, except that the version number has increased by one.

The version number 0 is used to specify the current version of a file. The version number -1 causes the system to reference the oldest (lowest existing version number of a file) file specified by that device, UFD, filename and extension.

Recompilations of the same source file also produce files with the same specifications except for differing version numbers. For example, the following DCL command results in the creation of a file called INSERT.OBJ;1:

```
>COBOL/LIST/SWITCHES:(/TST) INSERT
```

If you repeat the command, the resulting file is called INSERT.OBJ;2 since the file INSERT.OBJ;1 already exists.

1.5.4 File Specification Defaults

Table 1-5 explains the defaults for each field of the file specification.

Table 1-5 File Specification Defaults

Field	Default
dev:	SY:
[group, member]	The UIC with which you logged on, or a UIC specified as part of the DCL SET DEFAULT command. (See TRAX Support Environment User's Guide)
filename	No default; filename must be specified.
filetype	Default depends on the program command or compiler that is processing the specified file.
version	For input files, the highest existing version. For output files, the highest existing version, plus 1. Some commands, such as DELETE, require an explicit version number.

1.5.5 File Specification Wildcards

The asterisk (*) may be used as a wildcard in file specification fields. Any field except the device may be specified by an asterisk. The asterisk indicates that all items in the indicated field are to be processed. For example, the following DCL command indicates that the current versions of all files in UFD [300,200] are to be copied to the magnetic tape mounted on unit 0

```
>COPY [300,200]*.* MM0:
```

Another example of wildcard usage is

```
>DIR/PRINT [*,*]*.LST;*
```

In this case, you are asking for a printed directory listing of all files in all UFD's that have the filetype .LST.

Some commands do not permit the use of wildcards as part of the file specification. See the IRAX Support Environment User's Guide for further examples of wildcard file specifiers.

CHAPTER 2

BUILDING THE TARGET SYSTEM DISK

Building the target system disk involves starting with the hardware configuration, a TRAX Distribution Kit, and a blank disk pack. You then perform the steps described in this chapter. The disk pack is checked for bad blocks, which are removed from service by assignment to a “bad blocks” file. The disk pack is then loaded with a complete disk image, containing a running TRAX system, known as the baseline system. The baseline system supports all necessary functions and utilities needed to perform a complete system generation and setup of a given TRAX system.

The following sections describe the build procedure part of the system generation diagrammed in the flow chart of Figure 2-1. Notes referring to hardware bootstraps (Appendix A) and the expected prompts are also shown on the flow chart.

2.1 PREPARING THE TARGET SYSTEM GENERATION DISK

A fresh disk pack is used as the target disk. It is mounted on a disk drive, checked for bad blocks, and then loaded with a complete disk image.

2.1.1 Mounting the Target System Disk Pack

Begin by mounting a fresh disk pack on the disk drive (unit y) on which the baseline system is to be installed and the target system generated. Make sure that the READY light is on and that the drive is not WRITE PROTECTED.

2.1.2 Bad Block Checking

Depending on the options chosen for your system, the TRAX Distribution Kit can include from seven to ten magnetic tapes. Three tapes are used to build the target system disk. These tapes and their identifying numbers (Section 1.3) are listed in Table 2-1.

Table 2-1 TRAX Utility Tapes

Title	Function	Tape Number
BADSYS	Checks for bad blocks on disk	(D657A)
DSCSYS	Copies BASLIN image to disk	(D658A)
BASLIN	Baseline System Images	(D659A)

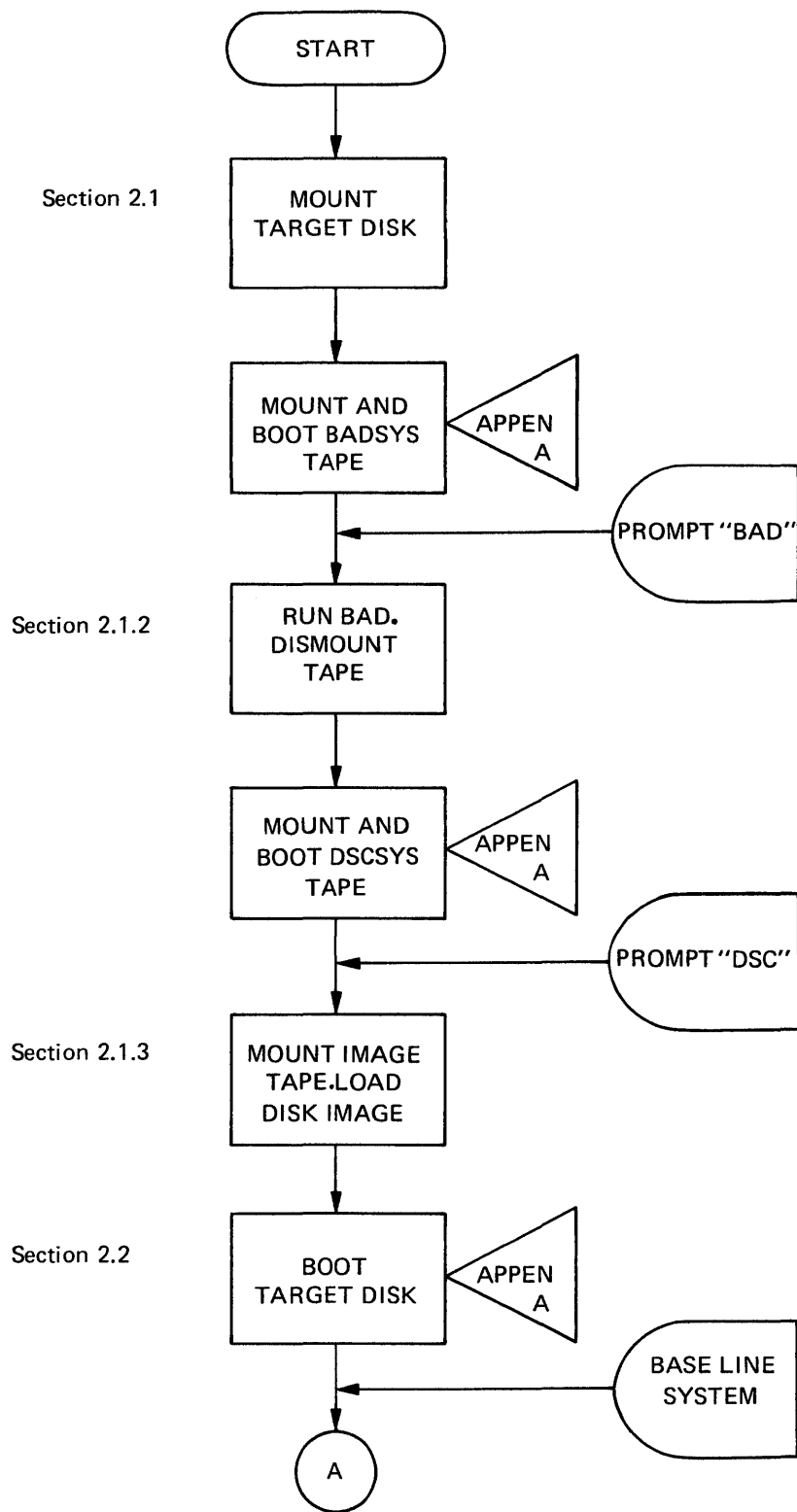


Figure 2-1 Building the Target System Disk

Mount the BADSYS utility tape (D657A) on tape drive unit 0 with the Write Protect ring removed. Make sure that the tape is at beginning-of-tape (BOT). The drive cannot be booted unless the tape is at BOT. Refer to Appendix A for instructions for bootstrapping the drive.

Once booted, the system is bootstrapped, the utility BADSYS prints the program herald and then prompts with

BL22 RSX11S BAD V20

BAD>

Respond to this prompt by typing on the System Console Terminal the name of the device on which the target disk is mounted. The proper responses are as follows:

DBy: for the RP04/05/06
DRy: for the RM02/03
DMy: for the RK07

The BADSYS utility program now checks every block on the disk.

When the check is finished, a status message appears stating the number of blocks found to be BAD.

When BAD block checking is completed, dismount the BADSYS tape and proceed to the next section. If, however, either the message HOME BLOCK ERROR or the message BAD BLOCK FILE OVERFLOW appears, you will have to use a new pack as the target system disk and repeat the BAD block checking. If the problem persists after trying several disk packs, you may have to contact your DIGITAL Field Service Engineer for maintenance of the disk drive.

2.1.3 Loading The Target Disk Image

After removing the BADSYS tape, mount the DSCSYS utility tape (D658A) at BOT with the write protect ring removed. Bootstrap the drive by referring to Appendix A. DSCSYS prints the program herald and then prompts with

RSX11S V2.1 BL22 DISK SAVE AND COMPRESS UTILITY

DSC>

Dismount the DSCSYS utility tape and mount the baseline system image tape (D659A). Make sure that the tape is at BOT and that the write protect ring is removed. Respond to the prompt with a command line in the following format:

Dxy:/VE=MMn:dddddd/RW

Dxy: is the drive name and unit number of the target system disk drive and must match your original response to the BAD> prompt in Section 2.1.2.

MMn: is the drive name and unit number of the tape drive on which you mounted the baseline system image tape.

Building the Target System Disk

dddddd is the label for the system image to be retrieved from the tape. The system images and their labels are listed in Table 2-2.

Table 2-2 Baseline System Image Names

Name	Configuration	
RK0734	RK07	for 11/34
RM0234	RM02	for 11/34
RM0370	RM03	for 11/70
RP0634	RP04/05/06	for 11/34
RP0670	RP04/05/06	for 11/70

For example, the command line

```
DB0:/VE=MM0:RP0634/RW
```

specifies that the target disk (DB0:) is mounted on an RP04/05/06 disk drive, unit 0, and will get from the tape mounted on a TE16 type drive (=MM0:) the system image identified as the baseline system for a PDP-11/34 with an RP04/05/06 system disk.

NOTE

The magnetic tape version of the DSC utility (DSCSYS) issues error messages based on error numbers. To decode the error number, see Appendix A of the System Manager's Guide.

The responses to the DSC> prompt loads the target disk with a complete disk image of the baseline system. This image will be used to generate your final TRAX system.

Complete this step by dismounting the baseline system image tape when the DSC> prompt reappears, and the tape has been rewound to BOT.

2.2 BOOTSTRAPPING THE BASELINE SYSTEM

The final step in the first part of the system generation is the bootstrapping of the target system disk drive. This brings the baseline system into memory from the target disk, at which point the baseline system begins execution. Refer to Appendix A for the proper bootstrap routine for your system.

The baseline system begins execution by starting up the INIT utility, which asks three queries for the target system name, the time and the date:

```
Target system name?  
Time?  
Date?
```


All TRAX systems are delivered with a standard name for the baseline system: **BASLIN**. Respond to the first query with this name. The format for the time is hh:mm, in 24-hour format, and the format for the date is dd-mmm-yy, where mmm represents the first three letters of the name of the month. For example, your responses at 6:34 PM on March 30, 1978, would be as follows:

Target system name? BASLIN
Time? 18:34
Date? 30-Mar-78

This completes the procedure for loading the target system disk, the first part of the system generation. The next part of the process involves copying files from tapes in the TRAX Distribution Kit onto the target disk. These steps are discussed in Chapter 3 of this guide.

For quick reference, a summary of the procedures in Chapter 2 follows.

2.3 SUMMARY OF PROCEDURE

1. Mount a fresh disk on disk drive y.
2. Mount the BADSYS utility tape (D657A) on tape drive n.
3. Bootstrap the tape drive (Appendix A).

BAD prompts for the drive name and the unit number of disk to be checked.

- a. Respond with the drive name and unit number in form: Dyz:.
 - b. When BAD prompts again, the disk bad block check is complete.
 1. If either the HOME BLOCK ERROR message or the BAD BLOCK FILE OVERFLOW message appears, discard the disk pack, get a new pack and return to Step 1. If problems persist with the same disk drive, you may have to contact your DIGITAL Field Service Engineer for maintenance of the drive.
 2. Otherwise, dismount the BADSYS tape.
4. Mount the DSCSYS utility tape (D658A) on tape drive n.
 5. Bootstrap the tape drive (Appendix A).

DSC prompts for a processing command.
 6. Dismount the DSCSYS tape.
 7. Mount the baseline system image tape (D659A) on tape drive n.
 8. Type a command line of the form.

Dxy:/VE=MMn:dddddd/RW

The target disk is loaded with a complete disk image containing the proper baseline system for your processor model and system disk type.

Building the Target System Disk

9. When DSC prompts again, dismount the baseline system Image tape.
10. Bootstrap the target system disk drive (Appendix A).
11. Respond with BASLIN, the time (hh:mm), and date (dd-mmm-yy) to the INIT queries.
12. The baseline system begins execution with the tape copy operations described in Chapter 3.

CHAPTER 3

PREPARING FOR SYSTEM GENERATION

This chapter describes the step-by-step procedures that you must perform before initiating the system generation process. These preparatory procedures include copying files from the TRAX Distribution Kit tapes, selecting options, and updating TRAX Distribution Kit components.

The flowchart in Figure 3-1 illustrates this part of the system generation process.

3-1 COPYFILES PROCESS

The first part in the system generation process is bootstrapping the TRAX baseline system into operation, as described in Chapter 2. The next part of the process is copying files from TRAX Distribution Kit tapes onto the target disk. The files to be copied include all files required as part of every TRAX system, files associated with selected system options, and new versions of files (contained on the latest change tape) that supersede existing versions.

This copying process is performed by the system generation utility COPYFILES, which begins execution automatically when the baseline system is bootstrapped, COPYFILES begins by displaying the following on the console terminal:

COPYFILES V01-00

Copy Files From Distribution Kit To system generation Disk

Occasionally, the distribution tapes may contain a file that should not be copied onto the target disk. The COPYFILES utility has a mechanism to skip such files.

The mechanism is controlled through the use of unique identification keys associated with every file contained on each tape. You will be instructed, by DIGITAL as to whether to activate the selective skip procedure and you will receive a list of the affected identification key(s) to submit to the COPYFILES utility.

COPYFILES always begins by asking you whether ANY file is to be skipped during the copy operations:

Are any files to be skipped <NO>?

This is a general query that covers the entire COPYFILES processing sequence. This question must always be answered NO unless you have received specific instructions from DIGITAL to respond YES.

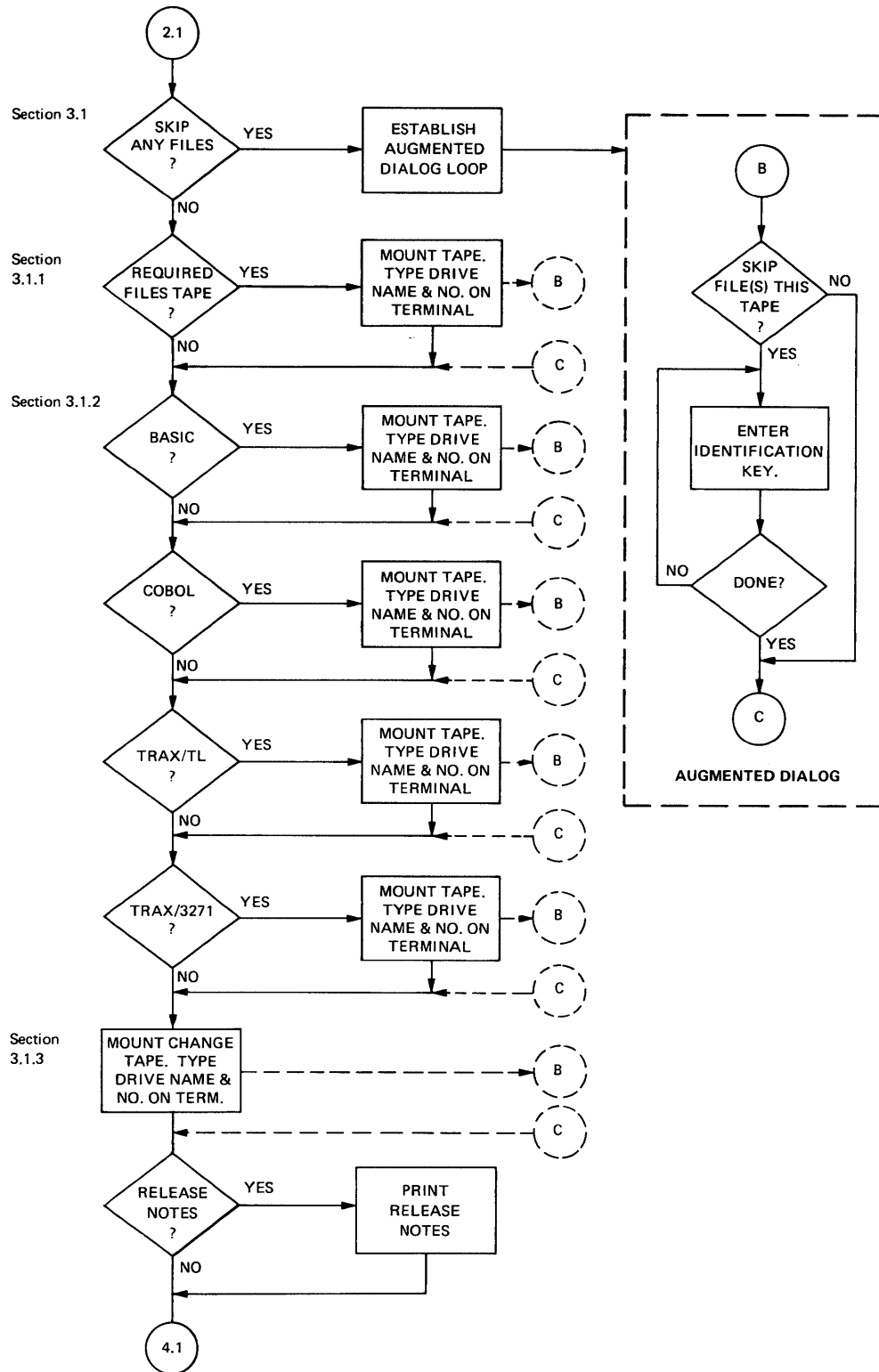


Figure 3-1 Distribution Kit Tape Processing

If DIGITAL has instructed you to respond with YES, the processing of each tape is augmented as follows.

DIGITAL tells you, on a tape-by-tape basis, to skip particular files on the tape. DIGITAL gives you a list of the identification keys of those files.

When COPYFILES asks you if any files are to be skipped on a given tape.

Are any files to be skipped on this tape <NO>?

Respond with YES.

COPYFILES then asks you for the identification keys of any file(s) to be skipped:

Delete?

Respond with an identification key.

NOTE

The identification key input is checked for accuracy (it carries a check digit with it), and if it is incorrect, an error message appears and the query repeats.

This question is repeated until you respond DONE. After this, the processing of the tape proceeds normally. The designated file(s) are not copied onto the target disk.

NOTE

The baseline system allows two magnetic tape drives to be used. If your hardware configuration contains at least two tape drives, you may alternate mounting the various tapes on these drives, mounting the next tape to be copied while COPYFILES is reading the current one.

Note also that the Write Protect ring should be removed from each tape mounted during the process.

The TRAX Distribution Kit contains some components that are specifically for use on only one of the CPU types supported by TRAX. In order for COPYFILES to "customize" the target system generation disk according to CPU type, the following query appears:

For what CPU type is this system generation destined <70>?

Valid responses are 34, 60, and 70 (the default).

NOTE

Attempting to perform a system generation or an update on a CPU using a disk designated for a different CPU type will cause the operation to issue an error message and terminate.

3.1.1 Processing The Required Files Tape

The first tape to be processed is the required files tape, numbered (D660A). COPYFILES asks you if you want the tape read in and copied to the target disk:

Do you want to read the Required Files Tape <YES>?

If you respond with NO, tape processing is skipped and COPYFILES continues with the processing of option tapes.

Respond with YES if the tape has not previously been processed for the system generation disk with which you are working. COPYFILES now displays the following:

Please mount the required files tape.

Respond with the drive name and unit number?

Respond with the tape drive unit name and number in the form: MMn;, where n is the octal unit number. COPYFILES logically mounts the tape (makes it available to the baseline system), and copies all files from the tape to the target system generation disk. The files are placed in their respective user file directories (creating the directories if necessary), with appropriate ownership and access characteristics.

When all the files are copied, COPYFILES rewinds the tape to the OIT, logically dismounts the tape from the system (places the unit in OFF-LINE mode), and releases the use of the tape drive. This process of copying a TRAX distribution kit tape is repeated for all option tapes and for the current change tape.

NOTE

Once the required files tape is copied to the target system generation disk, a new startup sequence occurs whenever the baseline system is bootstrapped.

The new sequence no longer automatically causes COPYFILES to begin execution. Instead, a status message appears from the INIT utility stating that the system is initialized, and you are left at DCL command level (the > prompt appears).

If you wish to run COPYFILES, do so via the following DCL command:

RUN \$COPYFILES

3.1.2 Processing The Option Tapes

After the required files tape is processed, COPYFILES queries you regarding each system option you wish to include. A response of YES to a given query causes COPYFILES to process the magnetic tape containing the associated files of the selected option.

You must select at least one language option for your final system; otherwise, COPYFILES will not continue past the point where you are queried about which language(s) you have chosen.

COPYFILES processes the options in the order shown in Table 3-1, which contains the names and part numbers of the tapes for currently released system options.

Table 3-1 TRAX Options

Option Tape Name	Tape Number
BASIC-PLUS-2 Language	D664A
COBOL-11 Language	D663A
TRAX/TL Communications	D666A
TRAX/3271 Communications	D665A

If your response to a selection query is NO, the process continues with the next option in the list. Otherwise, COPYFILES processes the option tape exactly as it did for the Required Files Tape, including any requested file skipping.

3.1.3 Processing The Current Change Tape

When the option selection is completed, COPYFILES processes the current Change Tape. The change tape is reissued periodically and is cumulative; each change tape includes all changes since the release date for your system. If your installation has accumulated two or more of these tapes, you must use only the tape with the latest release date on its label. The identifying number for the change tape is D661x, where x increases, letter-by-letter, for each new issue.

COPYFILES processes the change tape as it did the required files tape. When COPYFILES finds a file on the change tape that is already on the target disk, it replaces the old version of the file with the new version.

Each change tape contains the latest version of the TRAX Release Notes and the current set of Update Notes, both contained in UFD (200,200) as RELEASE, NTS and UPDATE, NTS, respectively.

Before proceeding with the start up of system generation, COPYFILES asks if you want a copy of these two files printed out on the first system line printer:

Preparing for System Generation

Do you want the Release Notes printed <NO>?

Respond with YES and both files are listed. See Appendix D if the line printer is not available or functioning.

When finished with the change tape, COPYFILES has completed all tape copy operations needed before system generation can begin. COPYFILES then terminates its execution by starting up the system generation utility, which continues the system generation, as discussed in Chapter 4.

For quick reference, a summary of the procedures discussed above appears in Section 3.2

3.1.4 Processing Tape Read Errors

Occasionally, COPYFILES could encounter difficulty reading a tape during the copy process. If this happens, COPYFILES prints out a status message identifying the file it was trying to read, and it then rewinds and unloads the tape before terminating further processing.

Possible corrections to the error include changing the tape to a different unit, trying a different version of the tape (your software specialist should have a copy), and/or having your DIGITAL Field Service Engineer check the tape drive(s).

When you are ready to try again, start COPYFILES again by typing the following DCL command:

```
RUN $COPYFILES
```

REMINDER

Any time you are at DCL command level, you have the angle bracket (>) prompt.

As COPYFILES asks about tapes already successfully processed, respond to the "Do you want to read. . ." query with NO. When you reach the tape you are trying to reprocess, respond with YES and normal processing continues from that point.

3.2 SUMMARY OF PROCEDURE

1. Bootstrap the baseline system into operation. Respond with BASLIN, time (hh:mm), and date (dd-mmm-yy).
 - a. If this is a re-boot of the baseline system, and the required files tape has previously been processed, re-start COPYFILES via the following DCL command:

```
RUN $COPYFILES
```

Otherwise, COPYFILES executes automatically as part of the startup sequence.

- b. In either case, the utility herald appears next.

2. Respond NO to query about any files to skip unless specifically instructed otherwise by DIGITAL.
 3. Respond with the type of CPU for which the target system generation disk is to be set up.
 4. If desired (you must process the tape at least once), respond YES to query about reading required files tape.
 - a. Mount required files tape (D660A). Respond with tape drive name and unit in the form MMn:.
 - b. If directed by DIGITAL, respond with YES to the query about skipping files. Type the specified identification keys supplied by DIGITAL of files to be skipped on this tape, and then type DONE to end the input sequence.
 5. Dismount required files tape when processing completed by COPYFILES.
- If desired, respond YES to query about reading the BASIC-PLUS-2 language option tape.
 1. Mount BASIC-PLUS-2 language option tape (D664A). Respond with tape drive name and unit in form: MMn:.
 2. If directed by DIGITAL to skip files on this tape, repeat Step 3-B.
 3. Dismount the BASIC-PLUS-2 language option tape when processing completed by COPYFILES.
 - If desired, respond YES to the query about reading the COBOL-11 language option tape.
 1. Mount the COBOL-11 language option tape (D663A). Respond with tape drive name and unit in form: MMn:.
 2. If directed by DIGITAL to skip files on this tape, repeat Step 3-B.
 3. Dismount COBOL-11 language option tape when processing completed by COPYFILES.
 - If desired, respond YES to the query about reading TRAX/TL communications option tape.
 1. Mount TRAX/TL communications option tape (D666A). Respond with tape drive name and unit in form: MMn:.
 2. If directed by DIGITAL to skip files on this tape, repeat Step 3-B.
 3. Dismount the TRAX/TL communications option tape when processing completed by COPYFILES.
 - If desired, respond YES to the query about reading TRAX/3271 communications option tape.
 1. Mount TRAX/3271 communications options tape (D665A). Respond with tape drive name and unit in form: MMn:.
 2. If directed by DIGITAL to skip files on this tape, repeat Step 3-B.
 3. Dismount TRAX/3271 communications option tape when processing completed by COPYFILES.

Preparing for System Generation

- Mount change tape (D661x) where x is the latest update level.

Respond with tape drive name and unit in the form MMn:.

1. If directed by DIGITAL to skip files on this tape, repeat Step 3-B.
2. Dismount change tape when processing completed by COPYFILES.

- COPYFILES terminates execution after starting up system generation, which continues the system generation as described in Chapter 4.

CHAPTER 4

GENERATING THE TARGET SYSTEM

With the baseline system resident in memory and preparation for system generation complete, COPYFILES sets up and causes execution of the system generation utility.

The SYSGEN utility is responsible for querying the system builder for his requirements and then combining those requirements with the data files loaded onto the system generation disk to build the remaining necessary components of the target TRAX system.

The SYSGEN utility functions in three distinct phases: (1) dialogue to elicit system builder requirements, (2) generation of data files, and (3) building of the remaining components of the target system. During the dialogue phase, your response to each query is stored internally for use during the second phase when various required data files are generated. These data files, which can be saved between SYSGEN sessions, are used during the actual build processes of the third phase as the system is completed.

When SYSGEN completes its work, all the necessary components of the target system reside on the system generation disk. Final “tailoring” of these components to obtain one or more target TRAX systems is performed by the SETUP utility. SYSGEN automatically starts up SETUP (just as COPYFILES started up SYSGEN) just before SYSGEN terminates its activity.

You should be aware that separate support environment only and transaction processor environment processing systems can be tailored from the same set of basic components. A system combining both environments can be set up if an appropriate hardware configuration is present. The function of the SETUP utility during system generation is described in Chapter 5.

This chapter describes the complete SYSGEN utility operation, beginning with an overview, continuing with the dialogue phase of SYSGEN, describing the data files that are generated, and concluding with an explanation of the build operations. Figure 4-1 shows the flowchart for this part of the system generation activity.

Generating the Target System

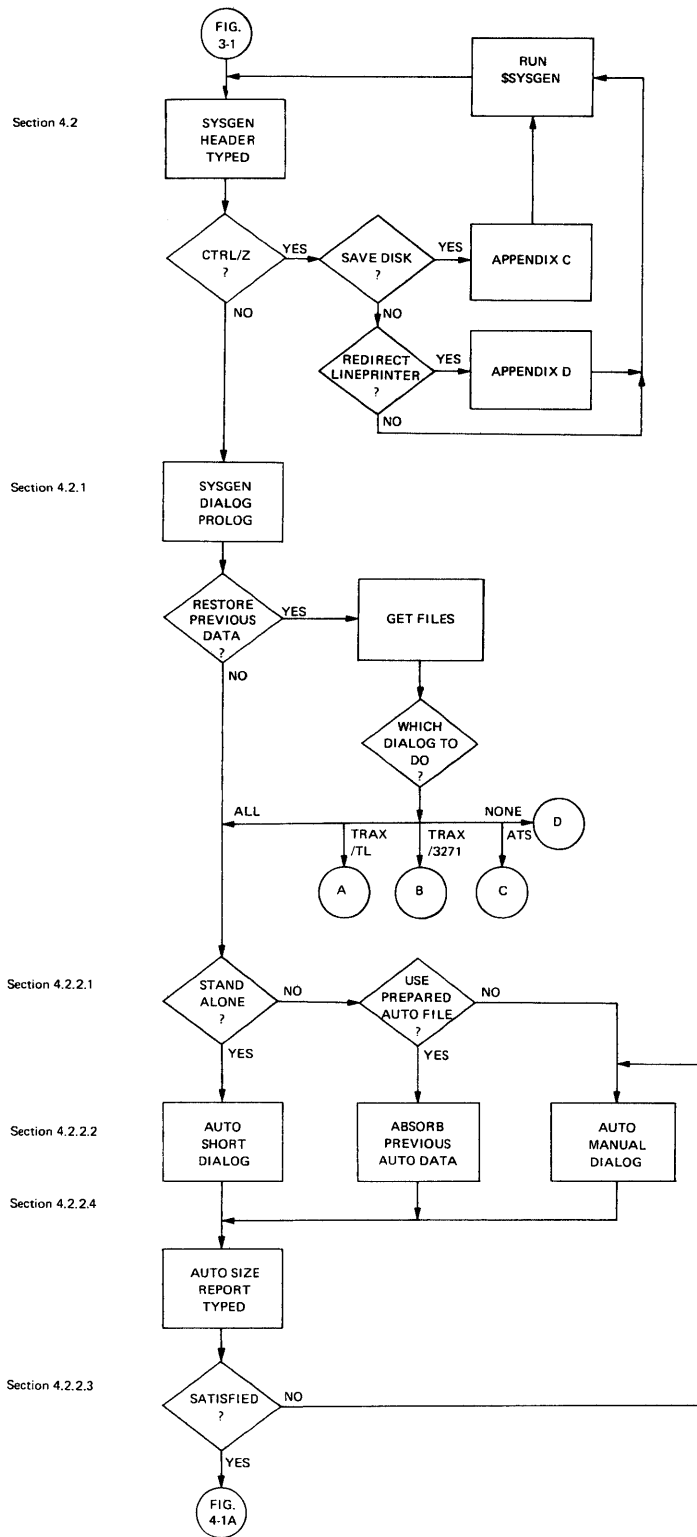


Figure 4-1 Generating the Remaining System Components

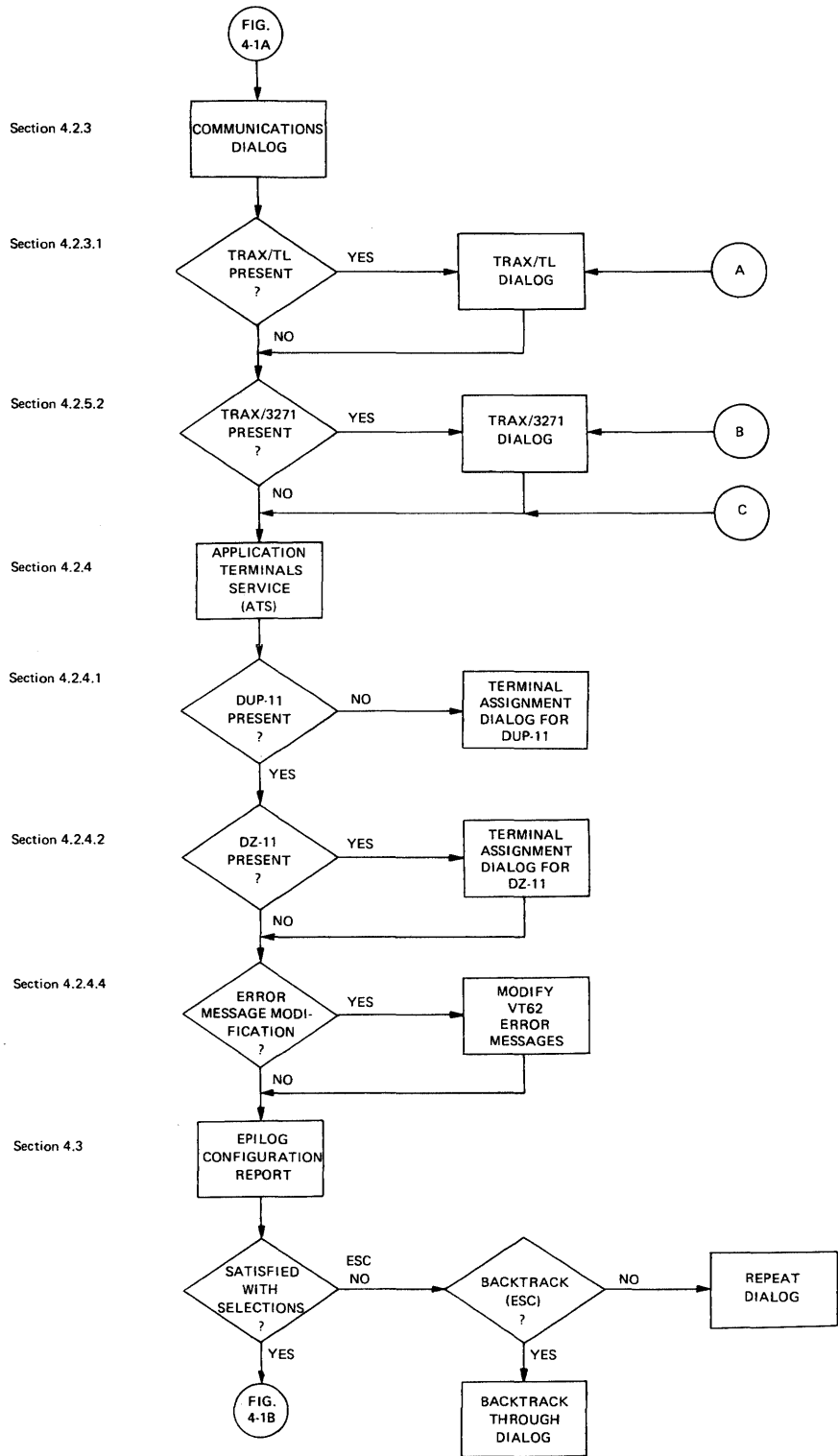


Figure 4-1A Generating the Remaining System Components (Cont.)

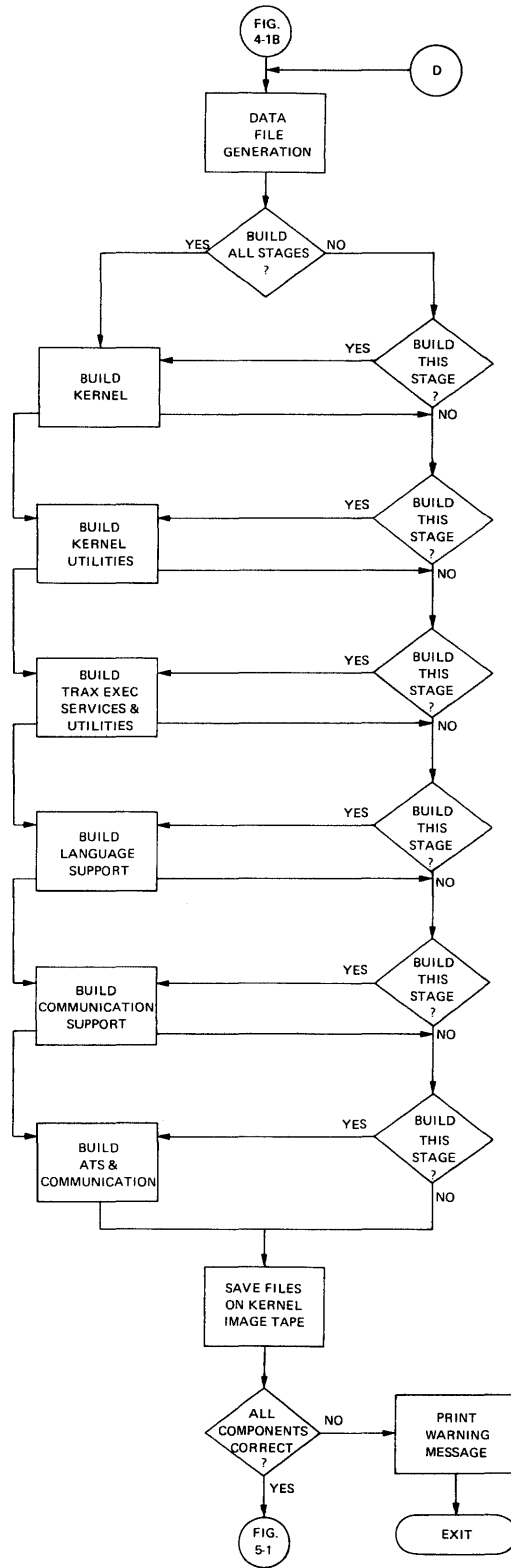


Figure 4-1B Generating the Remaining System Components (Cont.)

4.1 SYSTEM GENERATION – (SYSGEN) UTILITY

The SYSGEN program performs three functions:

1. Performs dialogue
2. Creates data files
3. Executes build processes

Together these functions form a major portion of the complete system generation process.

The dialogue phase is a hierarchical sequence of queries that is occasionally interrupted to give you a status report or, at your request, to explain a given query. Each query consists of a prompt, followed by expectation of the SYSGEN utility that you will type in a single piece of data. Each query is usually accompanied by a default value that may be denoted as the desired response with a simple <RET> response.

When all dialogue is complete, SYSGEN enters the second phase where some of data files needed for the subsequent build phase are generated.

Finally, the build phase is entered. In this phase, all remaining components of the target system are generated. The five sections of the phase are as follows:

1. Kernel image section
2. Kernel utilities section
3. TRAX executive services and utilities
4. Languages support section
5. Communications and application terminal services section

The central operating system on which TRAX is built is called the KERNEL. It contains all basic operating system functions as well as the device driver modules appropriate for the selected hardware configuration. The components of the KERNEL are built in the first section of the build phase.

The second section includes the building of all support utilities needed for the Digital Command Language, Batch, and Spooling facilities of TRAX. Also included in this section is the building of the user mode diagnostics.

The third section involves the building of all components needed for the support and execution of transaction processors on TRAX, along with development and control utilities.

In the fourth section, language support is constructed. What work is done here depends on which language options you have selected for the target system.

The final build section involves the building of all components of the application terminal service (ATS) part of TRAX. ATS is responsible for control and communication with all application terminals attached to the target system. If either or both of the communications options are present, the required build operations are also performed in this section.

When you build a TRAX system for the first time, you will enter and execute all sections of the dialogue and build phases. Later in this manual, we will describe ways in which you can perform the phases separately, saving their results for later use when you want to reexecute one or more of the build phase sections separately to modify part of the target system.

4.2 DIALOGUE PHASE

SYSGEN begins execution by displaying the information and query shown in Figure 4-2.

If you respond to this query with CTRL/Z, the SYSGEN utility will cease execution and return to the DCL command level, as indicated when the ">" prompt appears. As detailed in Appendix C, you may "save" the results of the copy files operation at this point by leaving SYSGEN and following the procedure shown in the appendix. SYSGEN may be re-started when you are ready by simply typing the following DCL command any time you are at DCL command level (you have the ">" prompt).

```
RUN $SYSGEN
```

TRAX System Generation Procedure

Copyright (c) 1977, 1978
Digital Equipment Corporation, Maynard MA 01754

SYSGEN invoked on 17-Jun-78 at 01:15 PM
Dialogue prompts may be "long" or "short" in form. The long form gives additional explanatory text about the query and the data to be entered. The short form presents only the minimum prompt text required to identify the query.

During the short form dialogue, use of the "?" response to a specific prompt will cause the associated long form text to be printed-out and the query re-issued.

Do you want the "long" form of the dialogue <NO>?

Figure 4-2 Initial SYSGEN Printout

As you proceed through the dialogue phase, you will see that some of the queries are indented various distances relative to preceding queries. This indentation indicates the hierarchy of the dialogue.

When responding with the ESC (SEL) key, back-tracking proceeds back along the same level as the last query asked until no other queries exist or a query at a higher level is found. If back-tracking continues, the level is that of the higher level query, causing any intervening lower level queries to be skipped.

Occasionally, you are told during the dialogue, and in this guide, that you may not back-track beyond a certain point. This is because the SYSGEN utility has taken some action that can not be reversed or modified without proceeding through the entire dialogue sequence from the beginning.

4.2.1 Dialogue Prologue Section

The first set of queries encountered in the Dialogue Phase of SYSGEN is called the Prologue Section. These queries set the format of the rest of the SYSGEN dialogue, establish whether this is a “stand-alone” syngen or whether data from a previous execution of SYSGEN is to be re-used, and determines whether the hardware configuration is to be “auto-sized” or specified via a dialogue sequence.

The first query in the prologue section occurs as part of the startup printout after SYSGEN begins execution, as described previously and shown in Figure 4.2. By your response, you set the format of all further queries to either the long form or the short form of the dialogue.

The next query asks you if you wish to restore data and specifications from a previous SYSGEN execution:

Do you want to restore data from a previous dialogue <NO>?

If you are generating a TRAX system for the first time, you must respond NO to this query. As will be described in Section 4.6, you respond YES to this query if you want to modify previous specifications and/or reexecute one or more sections of the dialogue and/or build phases. An example of this might be the respecification of the application terminal service hardware configuration, followed by rebuilding the supporting software.

If you respond YES to this query and no previously generated specification data file exists, SYSGEN will warn you with an appropriate error message and repeat the query.

Because TRAX permits the generation of other target systems while running under the support environment, some means is needed for telling these systems apart. The first mechanism is that of naming the target system image. (Naming is performed during execution of the SETUP

utility as described in Chapter 5). The second mechanism is through a text string that will (1) label all printouts produced by SYSGEN, AUTO, and SETUP, (2) appear in the identification part of all data files produced by SYSGEN and AUTO, and (3) be written into a special data file for use by your installation as you see fit for identification purposes.

A query to get the identification text string appears next in the dialogue:

Heading?

There is no default value unless you have restored data from a previous execution of SYSGEN. Any printing character is permitted in the string, up to 24 characters total.

As an aid to installation personnel in identifying which system their support environment programs are running under, the text response to the above query is written into a special file, [1,2] SYSHERALD, TXT. This is a simple sequential, variable type file containing a single record.

The prologue section ends with a query asking if the system you are generating will be a support environment (SE) only system:

Are you generating a Support Environment only system <NO>?

For such configurations, the ATS section and, if present, the communication option(s), are not generated, thus speeding up the system generation process as well as freeing up system resources for program development activities (principally, more memory is made available for the Kernel "pool", thus allowing more tasks to execute in less time, for instance). Additionally, up to 17 terminal interfaces may be included in the support environment.

Responding with YES to this query also causes SETUP to make adjustments in how final tailoring of the target system is performed.

REMINDER

In a support environment only system, TSTs can be developed and debugged, but no transaction processor(s) can be run.

4.2.2 Kernel Section Dialogue

The kernel section of the dialogue phase determines the hardware configuration on which the target system will be run. Note that this includes the hardware interfaces and controllers to be used in the transaction processor and communications environments, but does not determine what types and arrangements of applications terminals are attached to those interfaces.

NOTE

If you responded YES to the query about restoring previously generated dialogue data, then the hardware configuration will be extracted from that file and SYSGEN will ask how much dialogue you want to perform (Section 4.6).

4.2.2.1 Hardware Configuration Determination Utility (AUTO) – The determination of the kernel section specifications is performed by a support utility called AUTO. This utility is executed under the direction of the SYSGEN utility. (See Appendix F for a special use of AUTO to verify the actual hardware configuration after installation by DIGITAL.)

AUTO performs its function in either of two modes: automatic or manual. In the automatic mode, AUTO looks at the hardware of the system it is running on and creates specifications to match that actual configuration. In the manual mode, AUTO leads you through a dialogue sequence to specify the target hardware configuration.

Before AUTO selects the mode in which it operates, you are asked if you are performing the system generation in stand-alone mode on the actual hardware configuration on which the target system will be run:

Are you working stand-alone on the target machine <YES>?

Stand-alone means you are running under the baseline system supplied in the TRAX release kit. Running under any other version of TRAX is considered on-line. For stand-alone executions, AUTO performs an automatic determination of the hardware configuration.

WARNING

Execution of the autosize operation while running on-line may cause the system to crash since the AUTO utility must have access to the actual hardware when it is running.

If your response to the query is NO, then a second query appears asking if you wish to have AUTO reload a data file containing its determinations from a previous execution:

Is there an autosize file for the target machine <YES>?

If you respond to this query with NO, AUTO begins its processing in the manual mode. Otherwise, AUTO asks you for the name of the previously prepared data file:

Autosize file name <[200,201]AUTOSIZE.DAT>?

If the file is present, AUTO reloads all its information from that file and proceeds to the end of the kernel section where the verification report is printed (Section 4.2.2.3). A missing file causes AUTO to repeat the query.

NOTE

If you are going to proceed with the dialogue (manual) method of specification of the hardware configuration, skip now to Section 4.2.2.4.

Figure 4-3 shows the processing flow of the AUTO utility processing as directed by your responses.

4.2.2.2 Dialogue During Autosize – In either mode of operation, AUTO asks a number of queries to elicit data that can not be determined any other way. In the manual mode, these queries are interspersed throughout the dialogue that AUTO issues during processing. In the automatic mode, these queries appear in a straightforward sequence, after AUTO has made its search of the system hardware.

CAUTION

All disk drives with dual-port switches **MUST** have their dual-port switches set to the port (either A or B) corresponding to the CPU where autosizing is taking place.

The first of these queries asks you for the type of central processor unit (CPU) on which the target system will run:

What type of CPU do you have <11-70>?

Permitted responses are 11-34, 11-60, and 11-70.

Next, you are asked whether the power line frequency is 50 or 60 Hertz:

What is your power line frequency <60>?

Failure to respond properly to this query causes the target system clock to run incorrectly.

If your system includes one or more line printers (up to a maximum of 8), AUTO verifies the number present with a status message and then, for each printer, asks if the printer is an LA180P DECwriter type device or a standard line printer:

Is printer #x an LA180 <NO>?

Failure to respond properly to this query may result in incorrect operation of the affected printer.

If your hardware configuration includes one or more DZ11 terminal interface multiplexers (each DZ11 controls eight terminal interfaces), AUTO verifies the number in the system with a status message and then

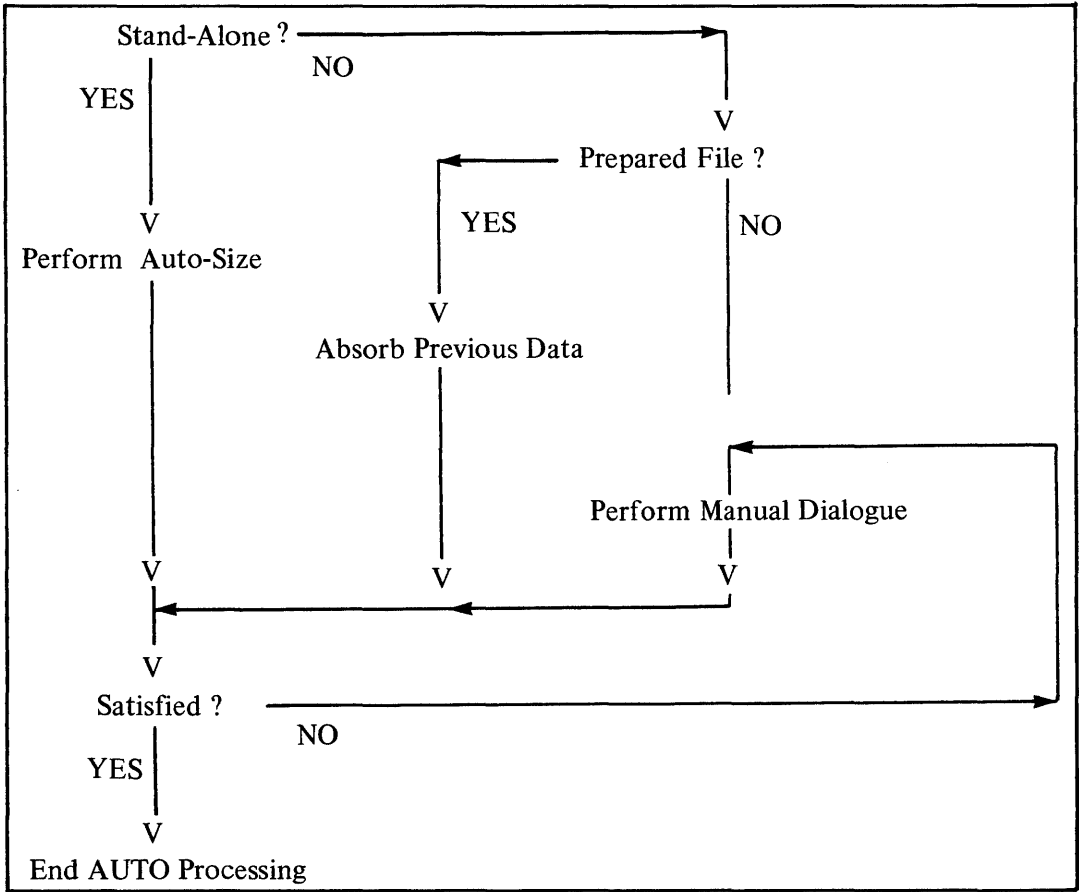


Figure 4-3 AUTO Utility Processing Flow

Generating the Target System

asks you to specify how many of these multiplexers to assign to each of the environments on the target system:

How many DZ11 units are in your S.E. <0>?
How many DZ11 units are in your A.E. <n>?

The default <n> will be the total number of DZ11 units found on the system.

Permissible answers are 0 or 1 (2 if generating a support environment only system).

TRAX supports a maximum of nine terminals (17 if generating a support environment only system) in the support environment (the console terminal is always in the support environment). If no DZ11 multiplexer is allocated to the support environment, then DL11 single-line terminal interfaces (up to eight) may be used to attach any terminals.

NOTE

Only EIA type DZ11 multiplexer interfaces may be attached to BELL 103 type dial-in communications modems for support environment terminals.

If you allocate one or more DZ11 multiplexers to the support environment, you are asked if any of the multiplexer's eight interfaces is to be attached to a dial-in modem requiring modem control support by TRAX to answer the phone when it rings:

Do your S.E. DZ11 interfaces need dial-in support <NO>?

If your respond YES, then an additional query appears asking for the baud rate at which the "phone" is to be answered:

Baud rate for dial-in S.E. DZ11 interfaces <300>?

Permitted values are 110, 150, or 300.

If you allocate one or more DZ11 multiplexers to the support environment, you may elect to deactivate one or more of the interfaces on each multiplexer by responding to the next query:

How many terminals are active on S.E. DZ11 #x <8>?

You may respond with a smaller number of lines than the maximum count, in order to allow one or more DL11 interfaces to be used in the support environment, so long as the total number of terminals in the support environment does not exceed nine (up to 17 terminals if support environment only).

Additionally, deactivating DZ11 interfaces frees more memory for the KERNEL pool.

As soon as AUTO determines that one or more DZ11 multiplexers are allocated to ATS, a check is made to see that a KMC11 device controller is present for use in controlling the ATS DZ11s. If not, an error message is placed in the configuration report and AUTO signals SYSGEN not to proceed out of the dialogue phase.

If your system contains one or more DUP11 type communications interfaces, AUTO verifies the number in the system with a status message and then asks you to specify how many of these interfaces to assign to either ATS or the TRAX/3271 communications facility:

How many DUP units are in your A.E. <n>?

The default <n> will be the total number of DUP units found on the system.

How many DUP units are in your TRAX/3271 option <0>?

You may allocate up to four of DUP interfaces to the 3271 facility.

Once AUTO determines that one or more DUP11 interfaces are allocated to ATS, a check is made to see that a KMC11 device controller is present for use in controlling the ATS DUP11s. If not, an error message is placed in the configuration report and AUTO signals SYSGEN not to proceed out of the dialogue phase.

If your system contains one or more DMC11 communications interfaces, AUTO verifies the number in the system with a status message and then asks you, for each separate DMC11 interface, which line protocol it will use:

What type DMC is unit #x <FULL>?

Valid responses are FULL DUPLEX, HALF DUPLEX PRIMARY, and HALF DUPLEX SECONDARY.

4.2.2.3 Verifying Hardware Configuration – At this point, you have reached the end of the AUTO utility operation whether it was operating in the automatic or manual mode. To verify the results of AUTO's processing, all determinations are printed out in report form on the first system line printer. (See Appendix D if you have no line printer). You should read the report and verify, by responding with YES to the next query, that the hardware configuration specifications are correct

Is the autosize report accurate <YES>?

If you are not satisfied with the results of the AUTO utility processing, respond with NO causing AUTO to restart its processing, this time in the manual mode, regardless of which mode was used originally. Note that all queries now have default values specified by previous responses, or data from a reloaded dialogue data file.

NOTE

In the report, when disk units are identified, all units in a given class (such as DB or DM) are identified as to model (RP05 or RP06, for example) only if the automatic mode of configuration checking was used. In the manual mode, all disks in a given class are identified as the highest model disk in the class. This difference causes no problem in system operation as the KERNEL determines the true model type of every disk attached to the system during the bootstrap and startup procedures.

To complete its processing, AUTO writes all its information into a data file (you might have started AUTO off with an old version) that may be reloaded in some future sysgen. The name of this file, located always in [200, 201], is AUTOSIZE, DAT. If you wish to keep it separate from other dialogue data files, you must rename the file via the DCL RENAME command. (See the TRAX support environment Programmer's Guide.)

NOTE

At this point in the process, the AUTO utility checks to see that the target system components are the correct files for the CPU type being processed. If they are not, AUTO issues a warning message and terminates the system generation process.

You must either rerun SYSGEN and specify the correct CPU type, or reexecute COPYFILES to get the correct disk contents.

Processing now proceeds to the communications support dialogue (Section 4.2.3).

4.2.2.4. Configuring the Hardware Manually – AUTO always enters the manual mode of specification if you are not running stand-alone on the target system or if you respond NO to the verification query just discussed.

Note that AUTO will be asking you for information concerning devices that are not supported by TRAX. AUTO needs this information in order that it may properly account for and position those hardware components that TRAX does support.

NOTE

If the long form of the dialogue is being used, all help text printouts precede their associated queries when processing the first of a repeating set of queries. For subsequent repeats, the short form dialogue is invoked until all remaining queries in the set are processed. The long form dialogue is then resumed.

The first query is concerned with the central processing unit (CPU):

What type of CPU do you have <11-70>?

Permissible responses are 11-34, 11-60, and 11-70.

One option exists for the CPU:

Does your CPU have the floating point option <NO>?

Respond YES if the floating point option is present. The floating point option is only supported for and is required for REAL data types in the TRAX/DATATRIEVE facility for the current release.

Next, AUTO asks for the size of the system memory:

How many kilo bytes of memory on the target machine?

Memory is measured in 1024 8-bit byte quantities, known as a kilo byte block of memory; for example, an 11-34 or 11-60 may have up to 248 kilo byte blocks of memory, while the 11-70 may have up to 4088 kilo byte blocks. Note that every PDP-11 system has 8 kilo byte blocks of memory allocated to its I/O page and is not included in its memory size value.

Next, you are asked whether the power line frequency is 50 or 60 Hertz:

What is your power line frequency <60>?

Failure to respond properly to this query causes the target system clock to run incorrectly.

4.2.2.4.1 Mass Storage Devices – The PDP-11 CPU, supports five types of mass storage devices. (Table 4-1). The RSO3/04 fixed head disk device is not supported by TRAX, but may be included in the configuration for use in other operating systems. The RK07 disk drive devices are attached only to the 11-34 and 11-60 CPUs through a special UNIBUS controller instead of through a mass storage device controller.

Table 4-1 Mass Storage Devices

Device	Device Name	CPU Support 3 6 7 4 0 0	Description
DB:	RP04/05/06	x x x	High-capacity, high-speed, removable pack disk drive
DM:	RK07	x x	Medium-capacity, high-speed removable pack disk drive
DR:	RMOx	2 2 3	High-capacity, high-speed removable pack disk drive (RM02 drive on 11-34, 11-60 RM03 drive on 11-70)
DS:	RS03/04		Small-capacity, high-speed fixed head disk drive
MM:	TU45/TE16/ TU16	x x x	Magnetic tape drive

For the 11-70 CPU configuration, up to four of these device types may be attached to the system through RH70 mass storage device controllers. No mixing of device types is allowed on a given RH70 controller, and no dual-porting of devices is supported. The location of an RH70 controller is established by knowing its bus address, or location on the computer data bus. There are four addresses where RH70 controllers may be attached:

176700 172440 176300 172040

AUTO cycles through the following sequence of queries, once for each address above, to obtain information on where the RH70 controllers are attached and what type of mass storage device each controls.

First, AUTO asks if an RH70 controller is attached at the current address:

Is there an RH70 controller at address XXXXXX <NO>?

where XXXXXX is one of the addresses listed above. If you are unsure about the positioning of the controllers, ask your DIGITAL Field Service Engineer to advise you of correct data.

If you respond NO to this query, AUTO skips the rest of the dialogue sequence and advances to the next controller position, When no more positions are left to check, AUTO advances to the next dialogue section on general peripherals (Section 4.2.2.4.3).

For each attached RH70 controller, AUTO needs to know what type of mass storage device(s) is attached:

What type of device is handled by this controller <DB:>?

Valid response are: DB:, DR:, and MM: .

If you respond with one of the disk drive types (DB: or DR:), AUTO asks for the number of drives attached to the controller:

How many disk drives are on this controller <1>?

Up to eight drives of a given type may be attached to each RH70 controller. Drive types may not be intermixed on the same RH70 controller. TRAX supports a maximum of two RH70 controllers in the same system controlling the same device type.

If you respond with the magnetic tape device type (MM:), AUTO asks for the number of tape formatters attached to the RH70 controller:

How many tape formatters are on this controller <1>?

A tape formatter is a type of subcontroller used specifically for handling magnetic tape drives attached to RH70 controllers. A maximum of two tape formatters is permitted on a given RH70 controller.

For each tape formatter attached to the RH70 controller, ATTO asks for the number of tape drive units controlled by the formatter:

How many tape drives are on formatter #X <1>?

Up to eight tape drives may be attached to a tape formatter, making 16 drives the maximum number permitted on a given RH70 controller. TRAX supports the maximum of 16 magnetic tape drives in a given system; the drives may be placed on a single RH70 controller or divided between two controllers.

After AUTO asks you about all four possible positions for RH70 controllers, it proceeds to the section on general peripheral devices (Section 4.2.2.4.3).

4.2.2.4.2 Mass Storage Devices on the 11-34 and 11-60 CPU Configurations

For the 11-34 and 11-60 CPU configurations, mass storage devices are connected through a different version of the controller, known as the RH11 mass storage device controller. These controllers are characterized by the devices connected to them and are addressed in the system at locations as assigned to the specific device types. As a result, a maximum of eight devices of each type may be attached to the target system.

Instead of cycling through four possible positionings of the controllers, as is done for the 11-70 CPU, AUTO asks about the presence of each specific type of mass storage device, beginning with the RP04/05/06 disk:

Is there an RP04/05/06 disk type RH11 controller present <NO>?

If so, you respond YES, and AUTO asks for the number of drives attached to the controller:

How many disk drives are on this controller <1>?

Your response may be up to eight drives.

AUTO next asks if mass storage tape drives are present in the system:

Is there a TU45/TE16/TU16 type RH11 controller present <NO>?

If so, you respond YES, and AUTO asks for the number of tape formatters attached to the controller:

How many tape formatters are on this controller <1>?

TRAX supports up to two tape formatters on a single RH11 controller in a given system. For each tape formatter, AUTO asks for the number of tape drives attached to the specific formatter:

How many tape drives are on formatter #X <1>?

A given formatter may control up to eight tape drives. TRAX supports a maximum of eight drives total for a given 11-34 or 11-60 configuration.

AUTO next asks if any RM02 type disk drives are attached to the system:

Is there an RM02/03 disk type RH11 controller present <NO>?

If so, you respond YES, and AUTO asks for the number of attached disk drives:

How many disk drives are on this controller <1>?

TRAX supports up to eight RM02 disk drives in a given 11-34 or 11-60 configuration.

Lastly, AUTO asks if any RS03/04 disk drives are present in the system:

Is there another RH11 controller present <NO>?

If so, you respond with YES, and AUTO asks for the number of attached disk drives:

How many disk drives are on this controller <1>?

A maximum of eight drives may be attached. Note: TRAX does not support use of the RS03/04 fixed head disk device. AUTO asks for this information in order to properly position and account for the other devices in the system that TRAX does support.

4.2.2.4.3 General Peripheral Device Specification – AUTO now proceeds to gather information about the rest of the various types of peripheral devices that may be attached to either type of system.

For each device researched, the following query appears, asking for the number of such devices:

How many <device name> devices do you have <0>?

The appropriate response is the exact number of such devices attached to the system, regardless of whether TRAX supports the use of the device, or whether you intend to include the device in your target hardware configuration (for instance, four DZ11 multiplexers, when you intend to only use two of them).

Table 4-2 shows the devices to be checked for, whether they are supported by TRAX (shown by an “*” in the second column), the range of the expected response, and for several of the devices, additional information that AUTO will ask for each device, along with the permitted responses.

Table 4-2 General Peripheral Devices

Device Type	TRAX	Range	Additional Queries	Responses
TS03/TU10 Tape Drive		0 - 8	None	None
Console DL11	★	1	None	None
DL11-D Interfaces	★	0 - 8	None	None
Line Printer	★	0 - 8	Is printer an LA180 type?	YES, NO
KMC11 Controller	★	1 - 3	None	None
DUP11 Interfaces	★	0 - 20	How many units in A.E.? How many units in TRAX/3271?	0 - 16 0 - 4
DZ11 Multiplexers	★	0 - 8	How many units in A.E.? How many units in S.E.? Dial-in support in S.E.? Answer baud rate? How many active interfaces?	0 - 6 0 - 1 (2, if S.E. only) YES, NO 110, 150, 300 baud 0 - 8 for each multiplexer
DV11 Interfaces		0 - 3	None	None
DMC11	★	0 - 4	What type of line protocol?	FULL DUPLEX Half-Duplex Primary, Half-Duplex Secondary
RK07 Disk Drivers	★	0 - 8	Not allowed on 11-70 CPU.	None
KW11-L Clock	★	0 - 1	None (You have one if the console DL11 interface is type "W")	None
KW11-P Interval Timer	★	0 - 1	None (You must have at least one of these, or one KW11-L)	None
KW11-C Calendar Clock	★	0 - 1	None	None
DJ11 Multiplexer		0 - 10	None	None

Table 4-2 (Cont.) General Peripheral Devices

Device Type	TRAX	Range	Additional Queries	Responses
DQ11 Interface		0 - 10	None	None
DU11		0 - 10	None	--
DR11A, C Interface		0 - 1	None	None
DL11-A, B Interface		0 - 8	None	None
DM11-BB Controller		0 - 1	None	None
LK11 Interface		0 - 1	None	None
DC11 Interface		0 - 16	None	None
PA611 Card Reader		0 - 1	None	None
PA611 Card Punch		0 - 1	None	None

Completion of the queries for all the devices in Table 4-2 signals the end of the manual mode processing for the AUTO utility. Go back to Section 4.2.2.3 for verification of the results of AUTO's investigations.

4.2.3 Communications Support Dialogue

This section of the dialogue does not appear unless one or both of the communications options were placed on the system generation disk during the copy files operation (Section 3.2.2).

Section 4.2.3.1 deals with the TRAX/TL Communications Option; Section 4.2.3.2 discusses the TRAX/3271 communications option.

4.2.3.1 TRAX/TL Communications Option – The TRAX/TL communications option provides communications between the target system and one or more remotely located TRAX systems. Each remote system, or node, is connected to the target system via one or two communications paths, called links

The target system may interface to a maximum of four links via the DMC11 type of communications interface. How these links are distributed for access to the nodes determines the maximum number of nodes that may be reached (varies between 2 and 4).

To reach a given node, the target system uses at least one link, called the primary link. You may also specify an additional link, called the secondary link, to be used in communicating with the same node. TRAX always attempts to communicate over its primary links first, but switches automatically to any available secondary links should the associated primary link become unreliable or fail completely.

In view of the maximum limit of four links interfacing to the target system, Figure 4-4 shows how the maximum number of nodes may be reached under different arrangements of primary and secondary link assignments.

NOTE

The links are numbered, beginning at 0, and correspond to the addressing sequence of the DMC11 controllers, the lowest addressed DMC11 being 0. Make sure that your DIGITAL Field Service Engineer makes the proper communications line connections by link number.

The number of links available to the target system is established in the kernel section dialogue. SYSGEN begins the process of assigning the links by asking for the number of nodes to be reached:

To how many nodes does your target system connect <#>?

Your response may range from one to the number of links available (the default). If you respond with a number of nodes larger than the available number of links, SYSGEN prints out an error message and repeats the query.

The next step in the process is establishment of the association between links and nodes. The dialogue sequence detailed below is repeated until all links have been assigned. The sequencing occurs on a node basis.

First, the node must be named:

What is the node name for node #x?

Respond with up to six alphanumeric characters to be used to identify the current node.

To the current node, a primary link is assigned:

What is the primary link # for node #x?

You must assign one of the available links, by link number, or SYSGEN prints an error message and repeats the query.

Next, you may specify a secondary link to be assigned to the current node:

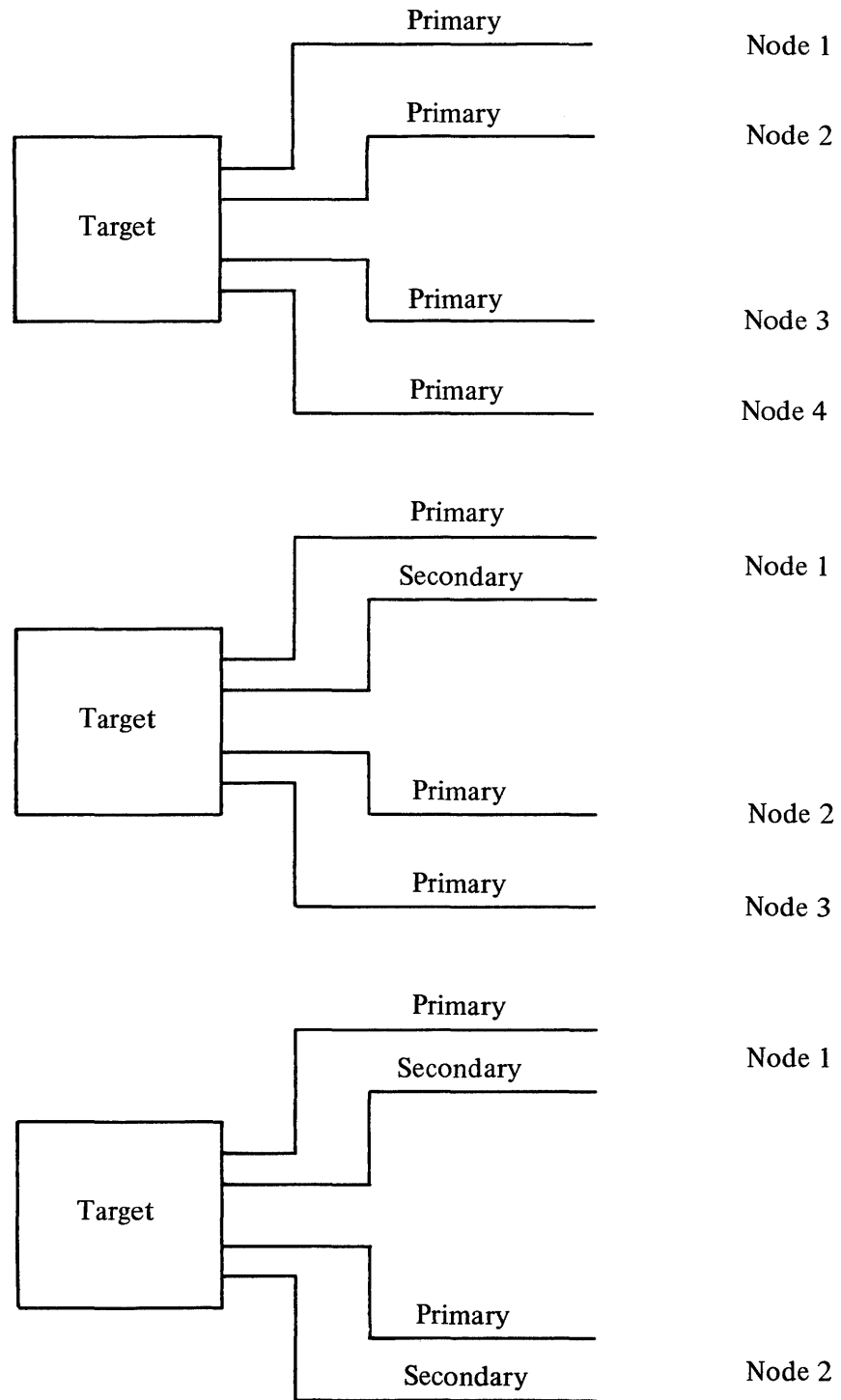


Figure 4-4 Maximum TRAX/TL Communication Arrangements

What is the secondary link # for node xxxxxx?

If you respond with a simple <RET>, no secondary link assignment is made. Otherwise, the response should be one of the available link numbers.

The sequence repeats for any remaining unprocessed nodes, so long as there is at least one (1) link available for assignment. If SYSGEN detects that a link has been assigned to two different nodes, an error message is printed and the entire assignment process restarted from the beginning.

4.2.3.2 TRAX/3271 Communications Option – The TRAX/3271 communications option provides up to four connections to remote IBM installations using emulation of control and terminal units for communicating with the remote site.

Between the TRAX and IBM systems, connection is made via a synchronous, high-speed polled communications line terminating in a DUP11 type interface at the TRAX system end. To the remote IBM system, the TRAX connection looks like a 3271 control unit and from one to 32 terminal units.

Although the TRAX system software emulates the actual control and terminal units, the dialogue specification discusses them as if they were physical devices.

The number of control units specified was given in the response to the query “How many DUP units are in your TRAX/3271 option” of Section 4.2.2.2. Each control unit is associated with a single DUP11 interface. Control units number from 0 to 3, while the DUP11 unit numbers begin at some value M, where there are M DUP11 interfaces allocated to the transaction processor environment (Section E.4).

The following dialogue appears for each control unit. First, the number of terminal units on the control unit is ascertained:

How many terminal units on control unit #x?

Respond with a number between 1 and 32.

Next, supply the control unit polling address used by the remote IBM system to communicate with this control unit:

What is the controller polling address for control unit #x?

Respond with STAm, where m ranges from 0 to 37 (octal values). This assignment is dictated by the desires of personnel at the remote IBM location and must follow their selections.

Each terminal unit on the control unit has a unique terminal polling address, independent of the control unit polling address. These polling addresses are also designated by personnel at the remote IBM system. The polling address assignments may be in sequential order, or in a scattered arrangement with some polling addresses left out.

The next query permits sequential assignment of all terminal unit polling addresses for the current control unit:

**Do you want sequential terminal polling addresses on control unit #x
<YES>?**

Respond with a simple <RET> and terminal polling addresses STA0 through STAm are assigned. Respond with NO and the following query appears, once for each terminal unit on the current control unit:

What is the polling address for terminal unit #m?

Respond with STAm, where m ranges from 0 to 37 (octal values). The assignments are dictated by selections made at the remote IBM system.

This completes the specification of a single control unit and its terminal units. The dialogue section repeats if there are other control units to be specified. When all control units have been specified, the TRAX/3271 dialogue is complete.

4.2.4 Applications Terminal Service Dialogue

The final dialogue section deals with the configuring of the controllers, multiplexers, interfaces, and terminals assigned to the application terminal service (ATS) part of the target system. You are also permitted to modify, if you wish, the text of the error messages used by the VT62 terminal.

Up to six DZ11 multiplexor interface controllers may be assigned to ATS, and up to 16 DUP11 interfaces may be present.

SYSGEN begins the dialogue by asking for the maximum expected number of transaction processors to ever be simultaneously active at one time:

**Maximum # of concurrently running transaction processor expected
<1>?**

TRAX supports up to two (2) concurrently running transaction processors.

Note that your response is a prediction of the maximum number of transaction processors you may run at any given time on the target system. If this maximum value must be increased at some future time, the ATS section of the dialogue will have to be reexecuted and the associated software re-built.

4.2.4.1 Assignment Of Terminals To DUP11 Interfaces – For each DUP11 interface allocated to ATS (the others may be in the TRAX/3271 communications facility), a sequence of queries appears determining the characteristics of the use of the DUP11 interface and how many terminals are connected to it

NOTE

If the long form of the dialogue is being used, all help text printouts will precede their associated queries when processing the first DUP11 interface. For subsequent processing, the short-form dialogue is invoked until all DUP11 interfaces are processed. The long-form dialogue is then resumed.

SYSGEN first asks what type of communications line protocol is being used for the current DUP11 interface:

Is DUP11 #x FULL or HALF duplex <FULL>?

FULL duplex operation permits simultaneous transmission and reception of data over the attached communications line. HALF duplex requires sharing of the communications line between the transmission and reception of data, a savings in line charges, but a reduction in effective data transmission rates over the line.

SYSGEN next asks if the communications line is a dial-in line:

Does DUP11 #x require dial-in support <NO>?

A response of YES structures ATS to permit dial-in operation of the attached communications line. Note that making and breaking the connection through the “dial-in” modem will be indicated to ATS as the line “going down” and “coming up.”

Only VT62 terminals may be connected to the DUP11 interface. The LA180 DECprinter must be attached to a VT62 which is attached to the DUP11 interface, in order for the LA180 printer to be accessed through the DUP11. Such an LA180 is considered a part of the VT62, in this configuration and, therefore, not known by ATS as a separate device. You instruct the transaction processing executive services section of TRAX about the existence of such LA180 DECprinters through the use of the STADEF utility after the target system is up and running.

Each DUP11 may interface up to 8 VT62 terminals. Communications with the terminals is through a polling protocol where the terminals are active on the communications line only when instructed by ATS.

Terminals on a polled DUP11 interface communications line must have their polling addresses assigned, in sequence, beginning at 1 (polling address 0 is illegal). Each VT62 terminal has an 8-bit polling address selector switch mounted on the underside of the terminal control printed circuit board. This switch is set to the binary equivalent of the polling address for each VT62, whether in a multiple terminal configuration on an interface or not.

The number of terminals on the DUP11 interface is acquired as follows:

How many terminals are connected to DUP11 #x <1>?

Presence and functioning of each terminal on the DUP11 interface communication line is determined dynamically by ATS whenever the target system is operating. Terminals may be turned on and off, as desired, with ATS continually monitoring the communications line, polling for their existence.

Repeat Count <number of lines unspecified>?

This question allows you to repeat the above specification for n consecutive DUP lines. If any DUP lines remain unspecified, the dialogue resumes by asking for the specification for the first unspecified line.

4.2.4.2 Assignments of Terminals to DZ11 Interfaces – SYSGEN processes terminal assignments and interface characteristics for DZ11 lines in a manner similar to the handling of DUP11 interfaces.

NOTE

The interfaces on the DZ11 are numbered in the print-outs as y-x where y is the DZ11 multiplexer number, beginning at 0, and x is the interface number, beginning at 0 and running to 7. When back-tracking in the dialogue, you must proceed through successive interfaces on the current DZ11 before receding to a previous DZ11.

How many DZ lines do you require in your configuration <maximum number>?

This question allows you to configure less lines than are present on the system.

The dialogue sequence for processing a DZ11 controlled interface(s) is detailed below.

The first characteristic of a DZ11 interface is the baud rate at which it operates:

At what speed does DZ11 interface #y-x operate <9600>?

The interface may operate at one of 14 available rates: 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, and 9600 baud. Every DZ11 interface functions in asynchronous, full-duplex mode.

Next, SYSGEN inquires if the interface is accessed through a dial-in connection:

Does DZ11 interface #y-x require dial-in support <NO>?

A YES response conditions ATS to answer the "phone" when it "rings" for the current interface.

Both VT62 terminals and LA180 DECprinter terminals may be connected to DZ11 controlled interfaces:

DZ11 interface #y-x connects to what type of terminal <VT62>?

Valid responses are VT62 and LA180.

Only one LA180 DECprinter terminal may be connected to a given DZ11 interface. One or more VT62 terminals may be connected to the interface in the same kind of polled arrangement used for the DUP11 type interfaces. Up to eight VT62 terminals can be connected to each DZ11 interface.

REMINDER

VT62 terminals connected to DZ11 interfaces operate in the asynchronous mode. Be sure that the asynchronous/synchronous switch setting on the terminal is positioned correctly. See your DIGITAL Field Service Engineer for details.

If you give VT62 as the terminal type, SYSGEN asks for the number of terminals connected to the interface:

How many terminals are connected to DZ11 interface #y-x <1>?

The VT62 polling addresses must number from 1 (0 is illegal) to the number of terminals connected to the interface.

Repeat Count <number of lines unspecified>?

This question allows you to repeat the above specification for n consecutive additional DZ lines. If any DZ lines remain unspecified, the dialogue resumes by asking for the specifications for the first unspecified line.

REMINDER

Long-format dialogue appears only for the first DZ11 interface processed. Short-format dialogue is used for successive sequences. When all DZ11 interfaces have been processed, the format is reset to long.

4.2.4.3 Logical Terminal Naming – Every terminal assigned to ATS (except DECprinters attached directly to VT62 terminals) is assigned a 6-character identifier, called its “logical terminal name.” SYSGEN assigns these names automatically as the interfaces are processed, using the following format:

<terminal sequence # > <terminal type>

As interfaces are processed (DUP11 interfaces followed by DZ11 interfaces), each terminal attached to the interface is assigned an internal <terminal sequence #>. These numbers begin at 1 and are assigned successively to each terminal, including those in multiple terminal arrangements on a single interface. The <terminal sequence #> appears in the logical terminal name as a 3-digit number, leading zero (0) digits included if necessary.

The <terminal type> is a 3-character identifier for the type of terminal being named:

V62	VT62 Applications Terminal
L18	LA180 DECprinter Terminal

These logical terminal names are used when you run the STADEF Station Definition Utility to allocate applications terminals to your transaction processor(s).

4.2.4.4 Modification of VT62 Terminal Error Messages – There are eight error conditions detected and processed directly by the VT62 terminal while it is being used. Each error is signaled by an error message that appears at the bottom of the terminal screen. Table 4-3 lists the default text string values of these messages as supplied in the TRAX release kit.

4.4 BUILD PHASE

The actual generating of the remaining components for the target system now begins. The process proceeds through six stages:

1. KERNEL build process
2. KERNEL utilities build process
3. TRAX executive services and Utilities build process
4. Language support build process
5. Communications options build process
6. Applications terminal service build process

SYSGEN permits you to execute all of the stages in sequence (as you normally will for a new system) or selectively (each stage is executed only if you so direct):

Do you want to perform all stages of generation <YES>?

Respond YES to proceed through all stages in sequence automatically. Suitable status messages appear at the beginning of each stage keeping you informed of the progress of the generation process.

NOTE

The complete staged generation process requires uninterrupted use of the system for several hours (depending on options and specification). If you are not prepared to perform the generation at this time, respond with CTRL/Z to the above query to terminate SYSGEN.

When you run SYSGEN at a later time, reload the dialogue data file and respond with NONE to the "What further dialogue. . ." query (Section 4.6). SYSGEN brings you immediately to the beginning of the build phase.

If you respond NO to this query, SYSGEN asks your permission before performing each stage of the generation process:

Do you want to perform the <process name> generation <NO>?

Respond YES or NO as required to execute selected stages. Each stage may be executed independent of the others.

NOTE

SYSGEN checks to see that all generation stages have been properly executed before proceeding to the tailoring process (Chapter 5). If any section has been skipped or needs to be reexecuted as a result of changes made during the reexecution of SYSGEN, then the utility prints a warning message and terminates (it does not start up the SETUP utility).

4.4.1 Stage 1: KERNEL Build Process

Stage 1 involves the assembly and linking of all components that make up the KERNEL section of the target system. This includes the basic executive program modules, data structures and device drivers. The status message for Stage 1 is as follows:

KERNEL generation started on 15-Jun-78 at 12:36 PM

NOTE

This phase must be completed before attempting to execute any other build phase.

4.4.2 Stage 2: KERNEL Utilities Build Process

Stage 2 includes the building of all KERNEL utilities. These utilities support the DCL command language as well as basic operation of the TRAX system. Also included are the User Mode Diagnostic utilities. The status message for Stage 2 is as follows:

KERNEL UTILITIES generation started on 15-Jun-78 at 01:19 PM

4.4.3 Stage 3: TRAX Executive Services and Utilities Build Process

Stage 3 includes the building of all modules that form the transaction processor executive services part of a TRAX system. Also constructed are all supporting utilities needed to develop, maintain, control, and monitor transaction processor operation. The status message for Stage 3 is as follows:

TRAX EXEC. SERVICES AND UTILITIES generation started on 15-Jun-78 at 02:07 PM

4.4.4 Stage 4: Language Support Build Process

Stage 4 is the building of language support for the TRAX system.

You must select at least one of the languages available for inclusion in the target system. It is in this stage that the proper library support for the chosen language(s) is generated. The status message for Stage 4 is as follows:

LANGUAGE SUPPORT generation started on 15-Jun-78 at 02:49 PM

NOTE

The TRAX/DATATRIEVE Dictionary file is installed in the system manager's account, [1, 1], during this stage.

4.4.5 Stage 5: TRAX/TL Build Process

This stage is skipped entirely for support environment only systems. The status message for stage 5 is as follows:

TRAX/TL generation started on 15-Jun-78 at 02:49 PM

4.4.6 Stage 6: ATS Build Process

Stage 6 includes the building of all required modules and command files for supporting the specified applications terminal service (ATS) configuration. This stage is skipped entirely for support environment only systems. The status message for Stage 6 is as follows:

ATS generation started on 15-Jun-78 at 03:21 PM

NOTE

If you have purchased the TRAX/3271 option, it is built during this phase.

This completes the generation phase of SYSGEN.

4.5 COMPLETION OF SYSGEN PROCESSING

When all generation stages are finished, SYSGEN prepares to save a number of generated files on magnetic tape:

Please mount the KERNEL Image Save Tape.
Respond with the device name and unit number?

The requested tape is the KERNEL image save tape, numbered D662A. Mount the tape with the Write Protect ring IN, and position the tape at BOT.

REMINDER

Each Distribution Kit contains one KERNEL image save tape (D662A). This tape is intended for use in generating the first version of the target system.

If additional TRAX systems are to be generated from a given distribution kit, then it is up to the installation to supply additional KERNEL image save tapes, marked appropriately to identify which target system they are associated with.

On this tape, SYSGEN saves a number of files produced during its execution and needed during future update operations (Chapter 7):

1. KERNEL image file.
2. KERNEL image symbol table file.
3. All KERNEL image assembly listings
4. All KERNEL component link maps.
5. Data files generated by SYSGEN.

When the tape processing is complete, it is automatically rewound and dismounted. Remove the tape and store it in a place of safekeeping.

SYSGEN has now reached the end of its range of processing steps performed during system generation. Before proceeding to the tailoring process (the SETUP utility), SYSGEN verifies that a complete set of system components is present and that the set has been properly generated.

If a valid system generation has not been produced at this point, SYSGEN prints a warning message and exits directly to DCL command level. You must reexecute SYSGEN and specify missing data, make required selections, and/or execute necessary generation stages.

When SYSGEN determines that all the proper components are present, it then starts up SETUP, the system management utility described in Chapter 5. SYSGEN then terminates its own execution.

The steps discussed in this chapter are summarized in Section 4.8.

4.6 RELOADING PREVIOUS CONFIGURATION DATA

When you respond to the “Do you want to restore. . .” query with YES (Section 4.2.1), SYSGEN asks you for the name of the configuration data file:

Configuration file <[200,201] CONFIGURE.DAT>?

Respond with either the default response or a name you have given to the desired configuration data file with the DCL command RENAME.

SYSGEN now accesses the data file and conditions its internal structures accordingly. Included in the configuration data file is a list of all files written to the associated KERNEL image save tape at the end of the past SYSGEN execution where the configuration file was created.

SYSGEN makes a check over the system generation disk for the presence of all files on the list. If any file is missing, SYSGEN asks you to mount the associated KERNEL image save tape on a tape drive:

Please mount the KERNEL image save tape.
Respond with drive name and unit number?

Mount the tape on the drive, with the write protect ring removed, and the tape positioned at BOT. Respond with the drive name and unit number in the form: MMn:.

SYSGEN now mounts the tape in the system, and then it scans the tape looking for and copying files to the sysgen disk that were missing.

When all files have been accounted for, the tape is rewound and dismounted from the system. Remove the tape reel from the drive and return it to a place of safekeeping.

When all files are present, SYSGEN asks you how much of the dialogue process to perform:

What further dialogue do you wish to perform <NONE>?

Respond with NONE, the default, to skip the entire dialogue phase and data files generation phase, and proceed directly to the build phase.

Respond with ALL and normal SYSGEN dialogue processing continues, with all query defaults taken from the configuration data file.

Three other responses permit accessing either of the communications options or the ATS dialogue section:

TL	TRAX/TL communication option dialogue
3271	TRAX/3271 communication option dialogue
ATS	Application terminal services dialogue

These responses are not applicable when the system to be generated is a support environment only system to be used strictly for program development.

Depending on your response, the selected dialogue section is executed. When the sequence completes, SYSGEN goes directly to the data files generation phase to regenerate the files that changed as a consequence of your dialogue responses.

4.7 PERFORMING SELECTED GENERATION STAGES

When you enter the build phase, you are asked if you want to perform all build stages:

Do you want to perform all stages of generation <YES>?

If you respond NO, then a succession of queries appears, one prior to each step in the generation process, asking you if you wish to perform the next stage.

The first generation stage is the KERNEL section build:

Do you want to perform the KERNEL section generation <YES>?

Respond NO to skip this stage. Respond YES and not only will the KERNEL Section be built, but all further stages are marked as needing to be executed before SYSGEN can continue to the tailoring process.

Next in line are the KERNEL Utilities:

Do you want to perform the KERNEL Utilities generation <YES>?

Respond NO to skip this stage.

Next comes the TRAX executive services and utilities stage:

Do you want to perform the TRAX Executive Services and Utilities generation <YES>?

A NO response skips the generation stage.

Language processing is next:

Do you want to perform the Language Support generation <YES>?

Respond with NO to skip this stage.

Generating the Target System

Do you want to generate the TRAX/TL communications facility <YES>?

Respond with NO to skip this phase.

The ATS generation is the last stage:

Do you want to generate the Application Terminal Service <YES>?

Respond NO to skip this stage and proceed immediately to the re-building of the KERNEL image save tape (Section 4.5).

4.8 SUMMARY OF PROCEDURE

1. Set format of dialogue to long or short form.
Leave SYSGEN to (1) redirect line printer output, if necessary, (Appendix D), and (2) save state of system generation disk, if desired (Appendix C).
 - A. Exit SYSGEN with CTRL/Z to first query.
 - B. Perform desired procedure(s).
 - C. Restart SYSGEN with DCL command:

RUN \$SYSGEN
2. Decide if previously generated configuration file to be used. If not, go to Step 3.
 - A. Give file specification for configuration file.
 1. If requested, mount KERNEL image save tape (D662A).
Respond with drive name and unit number in form: MMn:.
 2. Remove KERNEL image save tape when processing completed by SYSGEN.
 - B. Select what further dialogue is to be performed:

NONE Go to Step 21.
ALL Go to Step 3.
TL Go to Step 14.
3271 Go to Step 15.
ATS Go to Step 16.
3. Specify 24-character heading text string.
4. Specify whether you are building a support environment only system or not.
5. Specify stand-alone or on-line operation. If stand-alone, Step 6 is next, processing "*****" queries only.

- A. Decide if you will use an auto-size data file from a previous SYSGEN execution. If not, Step is 6 is next, processing all queries.
- B. Specify file specification of data file. Step 13 is next.

In the sequence to follow, both the automatic and manual modes of hardware configuring are combined. The steps appearing in the automatic mode are prefaced with “*****.”

- 6. ***** Specify type of CPU.
- 7. Specify presence of floating point option.
- 8. Give size of memory in kilo bytes.
- 9. ***** Specify power line frequency.
- 10. If CPU type is 11-70, specify up to four RH70 type mass storage device controllers and devices by repeating the next four steps for addresses:

176700 172440 176300 172040
 - A. Respond YES or NO if an RH70 controller exists at the current address.
 - B. Specify device type if controller there.
 - C. If disk drives on controller, specify number of drives.
 - D. If magnetic tape, specify number of tape formatters on controller. For each tape formatter, specify number of tape drives attached.
- 11. If CPU type 11-34 or 11-60, next set of steps determines RH11 controllers and attached devices.
 - A. Specify presence of RP04/05/06 type RH11 controller. Specify number of attached devices.
- 12. Specify presence of TU45/TE16 tape type RH11 controller.
 - A. Specify number of attached tape formatters.
 - B. For each tape formatter, specify number of attached tape drives.
- 13. Specify presence of RM02 type RH11 controller. Specify number of attached drives.
 - Specify presence of additional RH11 controllers. Specify number of attached drives.
 - Specify presence of general peripheral devices.
 - 1. Specify presence of TS03/TE10 tape drives.
 - 2. Specify presence of system console terminal DL11 interface.

3. Specify number of DL11-D type interfaces.
 4. Specify number of line printers in system for each line printer, specify whether it is LP11 or LA180 type.
- Specify number of KMC11 interface controllers. Specify number of DUP11 interfaces allocated to TRAX/3271 communications option.
 - Specify number of DZ11 multiplexer interface controllers
 1. ★★★★★ Specify number of DZ11 multiplexers assigned to applications environment.
 2. ★★★★★ Specify how many DZ11 multiplexers assigned to support environment.
 3. ★★★★★ Specify if any DZ11 requires dial-in servicing.
 4. ★★★★★ Specify dial-in answer baud rate, if necessary.
 5. ★★★★★ Specify number of active interface on each assigned DZ11.
 - 1. ★★★★★ For each DMC11, specify what type of line protocol: FULL DUPLEX, HALF DUPLEX PRIMARY, or HALF DUPLEX SECONDARY.
- Specify number of RK07 disk drives (11-34, 11-60 only).
 - Specify whether a KW11-L line clock is present.

If the System Console Terminal interface is a DL11-W type, it includes one KW11-L line clock in the interface.

- Specify whether a KW11-P interval timer is present. You must specify at least one of the KW11-L or KW11-P devices.
- Specify whether a KW11-C calendar clock is present.
- Specify number of DJ11 multiplexers.
- Specify number of DH11 multiplexers.
- Specify number of DQ11 interfaces.
- Specify number of DU11 interfaces.
- Specify number of DR11 interfaces.
- Specify number of DL11-A, B interfaces.
- Specify number of DM11-BB controllers present.
- Specify number of LK11 interfaces.
- Specify number of DC11 interfaces.
- Specify the presence of PA611 card punch.

Regular dialogue resumes from this point.

- Read the autosize report and verify its correctness. If not acceptable, change to manual mode of specification and go back to step 6, processing all queries.

The communications dialogue will appear only if either of the options is present, and the target system is not support environment only.

- The TRAX/TL communications option must be present to process the NODE and LINK assignments.
 1. Specify the number of target NODES.

For each NODE, perform next three steps.

 - A. Name the current NODE.
 - B. Specify primary LINK to current NODE.
 - C. Optionally, specify secondary LINK to current NODE.
- The TRAX/3271 communications option must be present to process the following steps.
 1. For each control unit, perform the following four steps.
 - A. Specify the number of terminal units on the current control unit.
 - B. Specify the IBM selected control unit polling address for the current control unit in the form: STAm.
 - C. If possible, assign all terminal unit polling addresses in sequence, beginning with STA0, and going through STA (m-1), where there are m terminal units on the current control unit.
 - D. Otherwise, specify each individual terminal units polling address, as selected by the remote IBM system, in the form: STAm (octal value for m).

The ATS dialogue is not executed if the target system is to be Support Environment only. If so, the Step 20 is next.

2. Specify maximum number of concurrently operating transaction processors to be expected.
3. Assign applications terminals to DUP11 interfaces allocated to ATS.
 - A. Specify whether DUP11 interfaces operates in FULL or HALF duplex mode.
 - B. Specify whether DUP11 interface requires dial-in servicing by ATS.
 - C. Specify number of VT62 terminals attached to DUP11 interface.
4. Specify the number of DZ lines to be used.
5. Assign application terminals to DZ11 multiplexer interfaces allocated to ATS.

Generating the Target System

- A. Specify baud rate of DZ11 interface.
- B. Specify if DZ11 interface requires dial-in servicing by ATS.
- C. Specify type of terminal attached to DZ11 interface.

1. If type is VT62, specify number of terminals attached to DZ11 interface.

6. Decide if you want to edit VT62 error message text. Specify new error message text for each of eight messages.

- Specify how to dispose of option/configuration report:

DISK	Leave on disk
PRINT	Print on line printer
TERM	List on-system console terminal

- Read report and decide if options and configuration data are acceptable. If not, return to Step 3.
- Select whether ALL or some of the generation stages will be performed.

1. Perform KERNEL section generation.
2. Perform KERNEL utilities generation.
3. Perform TRAX executive services and utilities generation.
4. Perform language Support generation.
5. Perform communications options generation. (Skipped if target system is support environment only).
6. Perform ATS generation. (Skipped if target system is support environment only).

- Mount KERNEL image save tape (D662A), with Write Protect ring IN, positioned at BOT.
- Remove KERNEL Image Save Tape when processing completed by SYSGEN. Store tape in a safe place with write protect ring removed.

SYSGEN verifies that a proper set of system components exists for processing by the SETUP utility. If so, SYSGEN starts up SETUP and then terminates.

Otherwise, SYSGEN prints status message about deficiencies and exits, reexecute SYSGEN and provide the needed data and/or executed the required generation stages.

CHAPTER 5

TAILORING THE TARGET SYSTEM

The last step in completing the system generation of the target system is tailoring its resources to your installation's requirements. This marks the beginning of the activity known as system management, a topic dealt with in greater detail in the TRAX System Manager's Guide.

In addition to the functionality provided by the DCL command language, the system manager has the use of the SETUP utility to perform his management responsibilities in keeping the generated system operating in the best interests of the installation.

Each installation's first exposure to SETUP and its capabilities is during the final tailoring activity when the installation generates its first TRAX system. During this activity, SETUP performs a number of tasks:

1. Updates the KERNEL image with the latest changes.
2. Determines what device driver modules to load into memory, along with the amount of memory each module will occupy.
3. Allocates memory in separately defined sections, called partitions, and installs various system components into these partitions based on specifications and data determined during the execution of SYSGEN.
4. Specifies the characteristics of support environment terminals.
5. Creates instructions for starting the target system when it is bootstrapped into operation.
6. Creates the systems manager's account and any others you may choose.
7. Boots the target system into operation for the first time.

When the target system is bootstrapped for the first time, SETUP allows you to save the system image on disk so that further bootstrap operations cause the system to automatically begin full operation through the use of SETUP and installation supplied startup commands.

This chapter describes the use of SETUP during the tailoring of the target TRAX system. Further discussion on the way SETUP may be used to prepare a support environment only version of a full transaction processing environment system is described in Section 5.5.

Modifying and enhancing in-place TRAX systems is further discussed in the TRAX System Manager's Guide. This system generation guide is intended only to aid installation personnel in completing the first version of each target system as quickly and efficiently as possible.

Figure 5-1 shows the flowchart for the final steps in completing the target system.

5.1 SPECIFYING THE SYSTEM IMAGE

When SYSGEN completes the building of all system components for the target system and verifies their integrity, it sets up and causes execution of the SETUP utility. SETUP issues the following message to inform you that it is functioning:

SYSGEN has ended. SETUP is now running.

SETUP's first order of business is to determine all necessary specifications for constructing the final system image file for the target system. Many of these specifications are determined by your responses to the dialogue sequences of the SYSGEN utility; others follow from the results of the component generations performed by SYSGEN. The data passed to SETUP appears in the file [200, 201] TRAX 11. SAV.

The remaining specifications are now determined through a dialogue with the SETUP utility. The rules concerning dialogue processing, as described for the SYSGEN utility (Section 1.5), apply also to SETUP queries.

During dialogue processing, SETUP records your responses, and along with its processing of the SYSGEN produced data, builds a specification data file that is permanently associated with the target system's image file. You can reexecute SETUP at any time you choose to respecify many of the specifications contained in this file; or if you so desire, you may create entirely new versions of the system image file based on the original KERNEL section and hardware configuration of the target system.

When started up from the SYSGEN utility, SETUP assumes a special, straightforward, sequencing of its commands in order to lead you through the minimum steps necessary to get the first version of the target system functioning. During this sequencing, some SETUP commands and dialogue sequences normally available to you are automatically skipped or replaced by assumptions and calculations performed by SETUP itself. The dialogue that remains is described in the following sections.

5.1.1 Naming The Target System

The first action of SETUP after the initial message is printed out is to ask you to name the version of the target system:

Target system name:

See Section

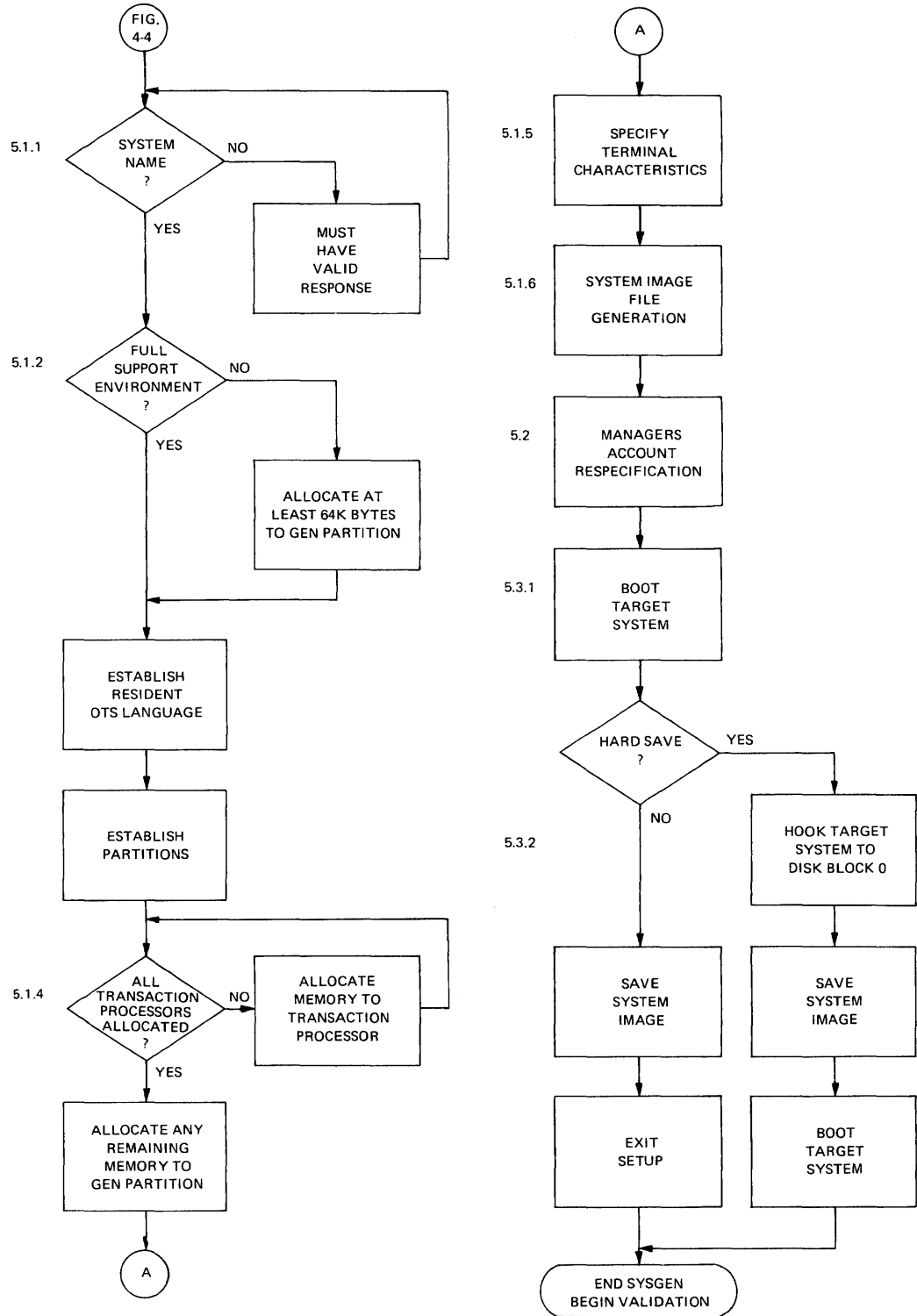


Figure 5-1 Completing the Target System

5.1.5 Support Environment Terminal Characteristics

There are seven characteristics of support environment terminals that you must specify before the target system is ready to run:

1. Terminal number (1 to 20, octal)
2. Terminal type: VT52 or LA36
3. Line width (in characters)
4. Lowercase capability
5. Baud rate
6. Remote access
7. Slave operation

Each terminal is identified by the device code TT, followed by its terminal number, as one or two octal numeric digits, and the device name terminator “:”. The system console terminal is always the first terminal in the support environment (TT0:).

TRAX supports two basic types of terminals:

1. VT52 Screen-oriented, with cursor positioning
2. LA36 Hardcopy, line-oriented

The VT52 terminal has a line width of 80 characters, and the line width of the LA36 terminal is 132 characters. You may specify more or less than these numbers if you wish, but terminal output may incorrectly match the terminal's characteristics if you do.

Both types of TRAX supported terminals handle the full 95 character printing ASCII character set. You may choose to specify a terminal as having no lowercase capability. In that case, all characters transmitted to and received from the terminal are converted to the 63 character subset of the ASCII character set (contains only the uppercase letters and several less special characters).

The speed at which the terminal operates is selectable only if the terminal is attached to a DZ11 type interface. For DL11 interfaced terminals, the speed is hard-wired into the interface by your DIGITAL Field Service Engineer when the system is installed.

DZ11 interfaces are capable of remote access via BELL 103A or equivalent modems. For these interfaces, you have previously specified the speed at which they operate in the SYSGEN dialogue process when you gave the baud rate at which remote support environment terminals are to be answered.

If no terminal is actually attached to a particular support environment interface the associated terminal specification should mark the terminal as

being in slave mode. This removes the terminal from the group of active terminals in the system and prevents noise on the unattached interface from interfering with the rest of the system.

SETUP now enters the terminal specifications part of the tailoring process. The specifications are entered via a dialogue, which begins with the following query:

Terminal command <EXIT>?

SETUP provides a small repertoire of commands to select the desired action:

ADD	Creates a new terminal specification
COPY	Duplicates a terminal specification
DISPLAY	Lists a terminal specification
EDIT	Edits a terminal specification
DELETE	Removes a terminal specification
EXIT	Leaves this phase of SETUP operation

One additional command, called STEAL, is available for use in on-line system generation, and it is described in the TRAX System Manager's Guide. This command is of no use when building a target system for the first time.

NOTE

Support environment terminals that exist, but have no terminal specification, default to the following characteristics:

Type:	LA36
Line width:	80 characters
Lowercase:	YES
Baud rate:	110
Remote access:	NO
Slave terminal:	NO

You may choose to create the terminal specifications later after the system is in operation.

The system console terminal, #0, is predefined by TRAX. You can not alter its specification, but you may use it in the COPY command to define other LA36 terminals attached to DL11 type interfaces.

If the system console terminal is the only terminal in the support environment of the target system, the terminal specification section should be skipped by specifying the EXIT command.

5.1.5.1 Adding Terminal Specifications – The ADD command first asks for the terminal number:

Terminal number?

Respond with the terminal number, in octal format, of the specification to be added. If you respond with a number for a terminal that does not exist, or is already specified, an error message appears and the query repeats.

If the specified terminal is interfaced through a DL11 type interface, the following message appears:

This terminal is a DL11 type terminal.

You may not set its baud rate, or set it to remote.

If the specified terminal is interfaced through a DZ11 type interface, the following message appears:

This terminal is a DZ11 type terminal.

The associated queries will be skipped during the specification sequence.

The next characteristic is the type of terminal:

VT52 terminal <YES>?

Respond NO if the terminal type is an LA36 DECwriter.

Next, specify the length of the terminal output line:

Width <80>?

VT52 terminal lines are 80 characters long, and LA36 terminal lines are 132 characters long.

Now, specify the “case” of the terminal:

Lowercase <YES>?

Both the VT52 and LA36 terminals are lowercase terminals.

The baud rate of the terminal is specified next (does not apply to DL11 type interfaces):

Baud rate <300>?

You may choose between 110, 150, and 300 baud for the LA36 terminal. The VT52 terminal may operate at one of the following speeds: 0, 110, 150, 300, 600, 1200, 2400, or 9600 baud.

Remember, if the terminal is a remote terminal, the selected speed must match the answer baud rate specified during the SYSGEN dialogue (Section 4.2.4).

The next query asks if remote access is applicable (does not apply to DL11 type interfaces):

Remote access <NO>?

Respond YES if the associated interface is attached to a communications modem reached through the dial-up telephone network. Respond NO if the terminal is attached directly to its interface (no modem involved), or if the attached modem is permanently connected.

The last query asks if the terminal is to be placed in slave mode:

Slave terminal <NO>?

You should respond YES if an actual terminal or modem is not attached to the associated interface. Note that this feature can be used to disable a terminal interface, that is suspected of being unreliable until it can be repaired.

This completes the specification of a single terminal's characteristics. The dialogue returns to the SETUP terminal command level for another command.

5.1.5.2 Additional Terminal Specification Commands – For convenience, all the other terminal specification commands (except STEAL) are briefly described in this section. See the TRAX System Manager's Guide for further details on all the commands.

5.1.5.2.1 Duplicating Terminal Characteristics – The COPY command permits you to use the characteristics of one terminal specification as the same characteristics for one or more other terminals attached to the same system. Only terminals attached to the same type (DL11 or DZ11) of interface may be processed by the COPY command.

The COPY command first asks for the originating terminal number:

From terminal # ?

Respond with a missing or nonexistent terminal number and an error message appears and the query repeats.

The command next asks for a target terminal number:

To terminal # ?

If you respond with the special response ALL, terminal specifications containing the characteristics of the original terminal are created for every other support environment terminal attached to the same type of interface as the original terminal (previously created specifications for any of the target terminals are replaced with the new specification).

NOTE

Use of the system console terminal, #0, is permitted as the originating terminal. This causes all terminals attached to DL11 type interfaces to be defined as LA36 terminals.

The System Console Terminal can not be used to define LA36 terminals connected to DZ11 multiplexor interfaces.

If you respond to the above query with a single terminal number, then a terminal specification containing the characteristics of the original terminal is created for the target terminal (replaces any current specification). If the target terminal is missing or nonexistent, an error message appears and the query repeats.

When the COPY command has completed its processing, it returns to the "From terminal. . ." query (unless the response was ALL). Respond with ESC (SEL) to the query to return to terminal specification command level.

If the response to the query was ALL, the command returns to terminal specification command level when all processing is complete.

5.1.5.2.2 Displaying Terminal Characteristics – The DISPLAY command is used to list the characteristics of a given terminal specification. The command asks for the terminal number:

Terminal number?

It then prints out the characteristics.

If a missing or nonexistent terminal number is given, an error message appears and the query repeats. Otherwise, the command completes, and then it returns to the "Terminal number. . ." query for another display.

Respond with ESC (SEL) to the query to return to terminal specification command level.

5.1.5.2.3 Editing Terminal Characteristics – The EDIT command is used to change one or more characteristics of a given terminal specification. The command first asks for a terminal number:

Terminal number?

and then proceeds to ask the same set of queries used by the CREATE command. This time, however, the default values of the queries are those of the specification being edited, not the initial values supplied by SETUP. You are not allowed to edit the characteristics of the system console terminal, #0.

If a missing or nonexistent terminal specification is given, an error message appears and the query repeats. Otherwise, the editing sequence begins. When the sequence completes, the command returns to the “Terminal number. . .” query to permit editing of another specification.

Respond with ESC (SEL) to the “Terminal number. . .” query to return to terminal specification command level.

5.1.5.2.4 Deleting Terminal Specifications – The DELETE command asks only for the terminal number of the specification to be deleted:

Terminal number?

If you respond with a missing or nonexistent terminal number, an error message appears and the query repeats. Otherwise, the designated specification is deleted (becomes “missing”) and the “Terminal number. . .” query repeats to permit further deletions. You may not delete the System Console Terminal specification.

Respond with ESC (SEL) to return to the terminal specification command level.

5.1.6 Generating the System Image File

At this point, SETUP has obtained sufficient data to construct a system image file for the indicated version of the target system. The file to be created is named <name>. SYS in UFD [1, 54] where <name> is your response to the “target system name. . .” query. This file is used by the SETUP command BOOT to bring the target system into operation. Note that an associated file <name>, STB, is also created at the same time. This file is known as the KERNEL symbol table file and is used whenever any of a number of system utilities needs to know the address of an entry point in the KERNEL image file.

SETUP signals its progression through the system image file generation via a series of status messages:

- Partition definition is complete.**
- Driver installation is complete.**
- Terminal definition is complete.**
- Unconditional task installation is complete.**
- Conditional task installation is complete.**

Final completion of the system image file is signaled when SETUP enters the account specification process.

5.2 SPECIFYING SYSTEM MANAGER’S ACCOUNT

Before the target system can function, at least one user account, [1, 1], called the System Manager’s Account, must be reestablished in order to replace the TRAX supplied password with one of your choosing. You

Tailoring the Target System

may also elect to specify other user accounts at this time; if so, refer to the TRAX System Manager's Guide.

For brevity's sake, only the process of respecifying the system manager's account is described now.

The account specification command level of SETUP is signified when the following query appears:

Account function <EXIT>?

Respond to the query with the command ADD.

SETUP next asks for the user identification code (UIC) of the account to be added:

Specify the account's UIC? [

Respond with [1, 1] as the system manager's account.

Next, SETUP requests the desired password for the account:

What is the password?

Respond with up to six characters, any ASCII letters or numbers permitted. DIGITAL emphasizes that proper precautions be taken to ensure that this password remains secure.

SETUP next asks for identification text strings for the account:

First name?

Last name?

Both responses may contain up to 12 ASCII letters or numbers. Additionally, the DCL LOGIN command allows substitution of the last name of an account for the UIC of the account when logging into the system. (See the TRAX System Manager's Guide).

Finally, SETUP asks for the default system device assignment for the account:

Default system device <SY>?

Your response to this query must be SY or the default response <RET> for the system manager's account. Otherwise, the target system will not begin execution properly when booted.

This completes the specification of the system manager's account, [1, 1]. At this point you will be prompted to add another account. To return to the account command level, press the escape (ESC) key:

Account function <EXIT>?

Unless you want to specify additional accounts at this time, respond with the default response to leave the account specification process.

5.3 COMPLETING THE TARGET SYSTEM

At this point, the target system image file can be booted into operation by the BOOT function of SETUP. However, when the system starts up, it does not perform a number of essential system commands establishing the proper global operating environment. This initialization is performed by the system utility INIT, and it includes a number of actions:

1. Establishes the proper system name, time, and date.
2. Executes system startup commands, and if present, the commands contained in an installation supplied command file.
3. Sets up the transaction processing environment, if necessary.
4. After system crashes, properly restarts the system automatically (fully automatically if the calendar clock option is present).

Fully completed TRAX systems begin operation by automatically invoking the INIT utility. Unfinished target systems begin operation immediately at the DCL command level. To finish the target system, the following "boot and save" procedure is performed.

5.3.1 Booting In the Unfinished Target System

Since the baseline system is currently connected to the hardware boot block of the system disk (block #0), you must use the BOOT function of SETUP to boot the unfinished system.

If you are performing the special system generation sequence, SETUP enters the BOOT command processing section directly and goes to the "What file should be booted. . ." query (below). Otherwise, SETUP must be executed via the following DCL command:

```
RUN $SETUP
```

SETUP then asks which function is to be processed:

Setup function <EXIT>?

Respond with BOOT.

SETUP asks for the name of the system image file to be booted:

What file should be booted in <KERNEL>?

Respond with the name you gave the target system in Section 5.1.1.

Several status message appear informing you that the baseline system is being shutdown and that the new system is being booted up.

When the target system begins execution, it prints the following herald, followed by entering monitor command mode and issuing the prompt:

TRAX V01

5.3.2 Saving the Completed System Image

All that remains to complete the system generation process is to save the executing target system image now in memory in the associated system image file so that future software boot operations will bring up a fully operational system.

To save the system type:

SAVE <CR>

at some later time, use the HARDSAVE command to link to link the system image you have just saved to the hardware bootstrap. Do not use the HARDSAVE option until you have thoroughly tested the system you have just saved.

5.3.3 Deleting Files To Regain Disk Space

After you have completed the target system (and its complementary support environment only version, if built), you may choose to delete from the system disk certain files or groups of files produced and used during the system generation process.

The current list of file or groups of files that fall into this category are listed in the Release Notes. Deleting these files from the system disk regains disk space for installation use at the expense of requiring the CHGMAKER utility to spend more time during the update process retrieving the deleted files from tape.

Based on the relative capacities of the TRAX-supported disks, DIGITAL recommends that the file deletes be performed only on single RK07 disk PDP-11/34 and PDP-11/60 systems unless absolutely necessary.

5.4 RE-STARTING THE SETUP SYSGEN SEQUENCE

When SYSGEN starts up SETUP in the special system generation sequence, SETUP processes data contained in a file, [200, 201] TRAX 11. SAV.

SETUP sometimes can not complete the special sequence processing without external help from the user (not enough room on the target system generation disk because a PURGE is needed, for instance).

After the condition preventing completion of the sequence is corrected, the special system generation sequence can be reexecuted from the beginning as follows. First, start up SETUP via the DCL command:

```
RUN $SETUP
```

SETUP queries for a command to process:

Setup function <EXIT>?

Respond with REPLY SYSGEN.

SETUP reinitializes its internal structures with data taken from the TRAX 11. SAV file. Processing then proceeds as described beginning in Section 5.1.1.

5.5 PREPARING ALTERNATE VERSIONS OF THE TARGET SYSTEM

The TRAX system generation process permits the generation of three basic forms of a TRAX system: (1) transaction processing environment with a minimum-sized support environment (16 kilo bytes of memory in the GEN partition), (2) full-sized systems supporting both environments simultaneously, and (3) support environment only system (no transaction processor execution).

SETUP provides the capability for developing a support environment only system using the same set of configuration and data files for some previously produced Transaction Processing system (type 1 above). This permits an installation to maintain both a Transaction Processing Environment system and a support environment only system on the same system disk and hardware configuration.

The process for tailoring a system generation into a complementary pair of systems begins first with the tailoring of the Transaction Processing version of the system as described in sections 5.1, 5.2, and 5.3.

Once tailoring for the transaction processor environment system is complete, reboot the baseline system back into operation.

WARNING

If you have already HARDSAVED the tailored system at this point, you must follow its requirements in getting to DCL command level as needed below.

When DCL command level is reached, execute SETUP via the following DCL command:

```
RUN $SETUP
```

SETUP queries for a command to process:

Setup function <EXIT>?

Respond with DEV.

SETUP initializes its internal structures once more with data from the TRAX 11. SAV file. Additionally, several changes are made internally to make the target system to look like a support environment only system (Section 4.2.1).

SETUP now proceeds as if the RETRY SYSGEN command has been entered. Processing continues at Section 5.1.1.

During processing, Section 5.1.2 is skipped since we know we are generating a support environment only system anyway. Section 5.1.4 is also skipped and all available memory is assigned to the GEN partition.

Once the system image file is completed (Section 5.1.6), the account specification section is entered. You should EXIT this section immediately since the same account information is used for both systems.

NOTE

In the future, any changes to account specifications appear in both systems simultaneously.

Completion of the target support environment system is performed in Section 5.3.

WARNING

When you are ready to HARDSAVE one of the complementary systems, you **MUST** save the transaction processing environment only system in order that proper handling of system crashes can take place.

5.6 SUMMARY OF PROCEDURE

The procedure outlined in this section describes only the normal SYSGEN driven sequencing of SETUP, sufficient for tailoring and setting up a newly generated TRAX system. All other procedures are variations on the theme as discussed in previous sections of this chapter.

1. SYSGEN passes control to start up the special SETUP tailoring sequence.
2. Respond with a name to label the system. The name may contain 1 to 6 ASCII letters and/or numbers. It is used to label the system image file, and it allows the BOOT function to bring that file into memory for execution.
3. If sufficient memory exists and if the system is not a support environment only system, respond to whether a complete support environment should be established in the target system.
4. If requested, select the desired language support object time system (OTS). This occurs only when both languages are present, but not enough memory exists for allowing both OTSs to be permanently installed.
5. Allocate all remaining available memory.
 - A. If this is a support environment only system, all available memory is allocated to the GEN partition (in addition to its 16 or 64 kilo bytes already allocated).
 - B. Otherwise, for each transaction processor to be executed, allocate a percentage of available memory to the transaction processor cache. Any remaining unallocated memory is allocated to the GEN partition.
6. For all support environment terminals (if any are present, not including the System Console Terminal), specify the following characteristics:
 - A. Type (VT52 or LA36).
 - B. Line width in characters.
 - C. Lowercase capability.
 - D. Baud rate (not requested for DL11 interfaced terminals).
 - E. Remote access (not requested for DL11 interfaced terminals).
 - F. Slave operation.

7. Respecify parameters for system manager's account.

- A. User Identification Code is [1,1].
- B. Specify desired account PASSWORD.
- C. Supply first and last names for account.
- D. Default system device is always SY:.

8. Boot in target system.

- A. Give the chosen system name selected in Step 2 to the "What file . . ." query.
- B. Once the system has been booted, and is at monitor command level, type:

SAVE <CR>

to save the new system image.

You may now continue the tailoring process as you like, culminating in the use of the HARDDAVE function of SETUP when desired.

CHAPTER 6

CHECKING OUT THE TARGET SYSTEM

Checking out the final operating system involves first ascertaining that the Applications Terminal Service network and attached terminals all function properly.

Once operating applications terminals are available, a Validation Procedure is performed to verify that the major components of the system work properly.

6.1 CHECKING OUT ATS TERMINALS (EXER62)

Before proceeding with the validation procedure described in Section 6.2, the correct operation of all terminals connected to the ATS network must be ascertained.

The Release Notes contain a writeup of the use of the ATS diagnostic utility EXER62. This utility permits on-line testing of up to 16 ATS assigned applications terminals, their communications lines, and interfaces. The utility must be used by the DIGITAL Field Service Engineer to test all aspects of the ATS network and attached terminals.

The logical terminal names assigned during the sysgen process are shown in the option/configuration listing produced by the SYSGEN utility (Section 4.2.5).

6.2 SETTING UP THE SAMPLE APPLICATION FOR CHECKOUT

DIGITAL supplies as part of the TRAX distribution kit a predefined application called the sample application.

To verify that the target system has been generated and tailored correctly, a special version of the sample application has been installed during system generation as the transaction processor SAMPLE.

Included with the transaction processor is a set of data files containing a standard set of data. These files are used during the execution of a sequence of preselected transactions and user responses to determine if the target system is functioning correctly.

The data files supplied with the SAMPLE transaction processor contain the following data:

- 25 Customers
- 50 Stock types of varying quantity
- 10 Currently unfilled orders

Checking Out the Target System

- 5 Invoices
- 3 Back-orders
- 1 Payments received or disbursed

6.2.1 Specifying the Test Application Terminals

The SAMPLE transaction processor is defined with four input-output terminal stations. Before the SAMPLE transaction processor can be used during the Validation Procedure, proper assignment of target system application terminals must be made through the use of the STADEF utility.

The names, terminal types, and input-output characteristics of the SAMPLE terminal stations are shown in Table 6-1.

Table 6-1 SAMPLE Application Terminal Station Data

Station Name	Terminal Type	Input/Output	Logical Terminal Assigned
TERM1T	VT62	BOTH	
TERM2T	VT62	BOTH	
TERM3T	VT62	BOTH	
TERM4T	VT62	BOTH	

NOTE

Some installations will generate complementary systems. In these installations, the running of STADEF must take place under the support environment only system, followed by booting in the transaction processor environment system to perform the validation procedure.

When you are ready, begin STADEF execution with the following DCL command:

RUN/PARTITION: TPIPAR \$STADEF

After printing its herald, STADEF asks you for the name of the transaction processor to work with:

Transaction processor name?

Respond with SAMPLE to access the specifications of the sample transaction processor to be used in system acceptance.

STADEF next asks for the command to be executed:

Command < EXIT > ?

Respond with EDIT, as you will be editing the SAMPLE transaction processor specifications for its four terminal stations in order to associate the stations with actual application terminals to be used.

STADEF first asks for the station name whose specifications are to be edited:

Station name?

Respond with one of the station names listed in Table 6-1.

STADEF now asks about the type of station selected.

Station type < TERMINAL > ?

The type is predefined, so you respond with a simple < RET > response.

The next query from STADEF concerns the ATS logical station name of the actual application terminal to be associated with the selected station:

Name of device?

From the option/configuration listing provided by the SYSGEN utility (Section 4.2.5), select one of the VT62 applications terminals to be assigned to the current station being edited. Respond with the terminal's logical terminal name, 001V62 for example.

NOTE

To prepare for the validation procedure, you must edit all four stations and assign them ATS terminals, Space has been left in Table 6-1 where you may record the chosen logical terminal names.

STADEF now asks for the input-output characteristics of the selected station:

Input or output device < BOTH > ?

Respond with a simple < RET >.

STADEF continues with more queries, all of which have predefined default responses:

Enable system messages <YES>?

Work class name <NONE>?

Will terminal run dedicated transaction <NO>?

Form name <SELMNU>?

Checking Out the Target System.

Respond to all four queries with the simple <RET> response.

STADEF prints a status message indicating that the editing is complete and returns to the “Station name . . .” query for another operation.

When all station definitions have been edited, respond to the “Station name . . .” query with ESC (SEL) to return to command level. Then respond with EXIT to the “Command . . .” query to terminate STADEF processing.

After completing the validation procedure, you are free to try the process again using other terminals in the ATS configuration. In this way, you can verify that all terminals at your installation are performing properly.

Appendix I also details a more extensive demonstration procedure designed to show off the various operations involved in transaction processor operation and VT62 terminal usage.

6.3 VALIDATION PROCEDURE USING THE SAMPLE APPLICATION

The following sequences of steps constitute a validation of the correct execution of the major components of the target TRAX system. Briefly stated, the following processes are executed:

1. **INSTALL SAMPLE** transaction processor.
2. **START SAMPLE** transaction processor.
3. Verify transaction selection form appearing on all terminals.
4. Display initial data file information.
5. Add a customer.
6. Modify a customer's data.
7. **STOP SAMPLE** transaction processor.
8. **REMOVE SAMPLE** transaction processor.

The validation procedure is presented in step-by-step form. Each step details the action to be taken and presents the results to be expected. (Appendix J contains photographs of the expected screen displays.)

The support environment sections of the procedure must be performed under the system manager's account, [1,1], using the system console terminal. If difficulty arises, it may be advantageous to return a copy of the terminal dialogue to your DIGITAL software specialist to ascertain what caused the difficulty.

6.3.1 Installation of the SAMPLE Transaction Processor

1. Run the TPCTRL utility via the following DCL command:

```
RUN $TPCTRL
```

The utility responds with its herald message.

2. The following dialogue occurs and you must respond with the answers shown.
 - a. Command < BRIEF > ? INSTALL < RET >
 - b. Transaction processor name? SAMPLE < RET >
 - c. Partition < TP1PAR > ? < RET >
 - d. Trace transaction processor < NO > ? < RET >
 - e. High performance RMS < YES > ? NO < RET >
 - f. Forms definition file version < LATEST > ? < RET >

There must have been no error messages before the next query.

3. TPCTRL queries once more:

```
Command < START > ?
```

Proceed immediately to the next section.

6.3.2 START the SAMPLE Transaction Processor

1. Respond to the previous query with a simple < RET >.
2. The following dialogue occurs; you must respond with the answers shown.
 - a. Transaction processor name? SAMPLE < RET >
 - b. Disable journalling < NO > ? < RET >
 - c. Disable logging < YES > ? NO < RET >

There must have been no error messages before the next query.

3. TPCTRL queries once more:

```
Command < EXIT > ?
```

Respond with a simple < RET >

6.3.3 Verify Transaction Selection Form Appearances

Shift your attention now to the four application terminals assigned to the SAMPLE transaction processor (Section 6.2.2). Each VT62 screen must now be displaying the data shown in Screen 1 (Appendix J).

Checking Out the Target System

Whenever the following steps in the validation procedure call for selection of a particular transaction, make sure that this form is displayed on the terminal, and then execute the following steps:

1. Step down to the desired transaction menu item by pressing the NEXT FIELD key.
2. When the cursor is positioned at the desired transaction name, select the menu item by pressing the SELECT key. The selected item will reverse its video presentation to denote the selection.
3. Press the ENTER key to request processing of the selected transaction.

6.3.4 Display Initial Data File Information

In this section, a data display transaction is executed to view one of the records of information found in the initial data files associated with the SAMPLE transaction processor.

Use the first VT62 terminal for this transaction.

1. Select the DPYCST transaction. Screen 2 will appear.
2. Type in customer number 12. Press the ENTER key for processing. Screen 3 will appear.
3. Press the AFFIRM key. Screen 1 will reappear.
4. Repeat Steps 1 through 3 on the second VT62 terminal.
5. Repeat Steps 1 through 3 on the third VT62 terminal.
6. Repeat Steps 1 through 3 on the fourth VT62 terminal.

6.3.5 Add Customer Record

1. Select the ADDCST transaction. Screen 12 will appear.
2. Press the FORWD FIELD key to skip to the customer name field.
3. Type in the customer name:

Joe Cool

- Press the ENTER key for processing. Screen 13 will appear.
4. For the items listed in Table 6-2, use the FORWD FIELD key to advance to the required field, type in the required information, and when all information has been entered, press the ENTER key for processing. Screen 14 will appear.

Table 6-2 Customer Information

Field Name	Field Contents
Address Line #1 (ADDRESS:)	123 West First Street
Address Line #2	West Bedford
Address Line #3	North Carolina
Zip Code (ZIP CODE:)	98765
Telephone (TELEPHONE #:)	(212) 555-1234

5. Press the AFFIRM key to accept the new customer record. Screen 1 will reappear.
6. Select the DPYCST transaction. Screen 2 will appear.
7. Type in customer number 26. Press the ENTER key for processing. Screen 15 will appear.
8. Press the ABORT key. Screen 1 will reappear.

6.3.6 Modify Customer Record

1. Select the CHGCST transaction. Screen 2 will appear.
2. Type in customer number 8. Screen 16 will appear.
3. Press the FORWD FIELD key, repeatedly, to reach the zip code field.
4. Type in a new zip code value of 12349. Press the ENTER key for processing. Screen 17 will appear.
5. Press the AFFIRM key to accept the changed record. Screen 1 will reappear.
6. Select the DPYCST transaction. Screen 2 will appear.
7. Type in customer number 8. Press the ENTER key for processing. Screen 18 will appear.
8. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

6.3.7 STOP the SAMPLE Transaction Processor

Leave the application terminal area and return to the system console terminal.

1. Execute the TPCTRL utility with the following DCL command:

```
RUN STPCTRL
```

The utility responds with its herald message.

2. The following dialogue occurs and you must respond with the answers shown.

Checking Out the Target System

- a. Command < BRIEF >? STOP < RET >
- b. Transaction processor name? SAMPLE < RET >
- c. Minutes until transaction initiation is disabled < 0 > ? < RET >
- d. Minutes till incomplete processing is aborted < 0 > ? 1 < RET >

After a one-minute wait, the transaction processor will be stopped. There must have been no error messages appearing before the next query.

3. TPCTRL queries once more:

Command < REMOVE >?

Proceed immediately to Section 6.3.9.

6.3.8 REMOVE the SAMPLE Transaction Processor

1. Respond with a simple < RET > to the last TPCTRL query.

There must have been no error messages before the next query.

2. TPCTRL queries once more:

Command < EXIT > ?

Respond with a simple < RET >.

6.3.9 End of Validation Procedure

By performing all the steps and obtaining the expected results, you have verified that all the principal components of the target system are functioning correctly.

6.3.10 Restoring the Original Validation Data Files

Once the validation procedure has been executed, the data file set is no longer usable for validation purposes (the files can still be used for demonstrations).

To restore the validation procedure data files to their original state, execute the following set of DCL commands from the system manager's account, [1,1]:

```
SET DEFAULT [1,300]
COPY *,VAL *,DAT
PURGE *,DAT
SET DEFAULT [1,1]
```

The files, *,VAL, are copies of the original data files. They should not be modified at any time or the validation procedure becomes worthless.

CHAPTER 7

UPDATING YOUR SYSTEM(S)

Periodically, DIGITAL issues updates on change tapes containing the latest versions of TRAX system components. When used during system generation, the change tape ensures the generation of the most up-to-date target system by replacing original components with their later versions.

For already generated systems, TRAX provides an automatic capability whereby in-place systems are updated using the components contained on the change tape without necessitating a completely new system generation process. This updating capability is provided through the CHGMAKER utility.

In this chapter, the use of the CHGMAKER utility is described. You are also shown how to use the SETUP utility to finish the update process on other “versions” of the target system, after the initial update process is complete.

Because the update process may involve changes to the language support library(s) or to the TST support library, all installation TSTs may need to be rebuilt from source files and/or relinked in order to be also updated properly. The chapter concludes with helpful hints on how to specify batch job files to perform these rebuild and/or relink operations.

Figure 7-1 shows the flowchart of the update process for an in-place TRAX system.

7.1 IN-PLACE UPDATING UTILITY (CHGMAKER)

CHGMAKER operates under the system manager’s account, [1,1], and it proceeds through a sequence of phases:

1. Component replacement from the change tape (same operation as performed by COPYFILES).
2. Copy supplementary files from change tape to system disk. These files will be used during the later rebuilding of selected components.
Also checks to see that files taken from the original TRAX distribution kit are still present on disk. An internal list is maintained for missing files.

Updating Your System(s)

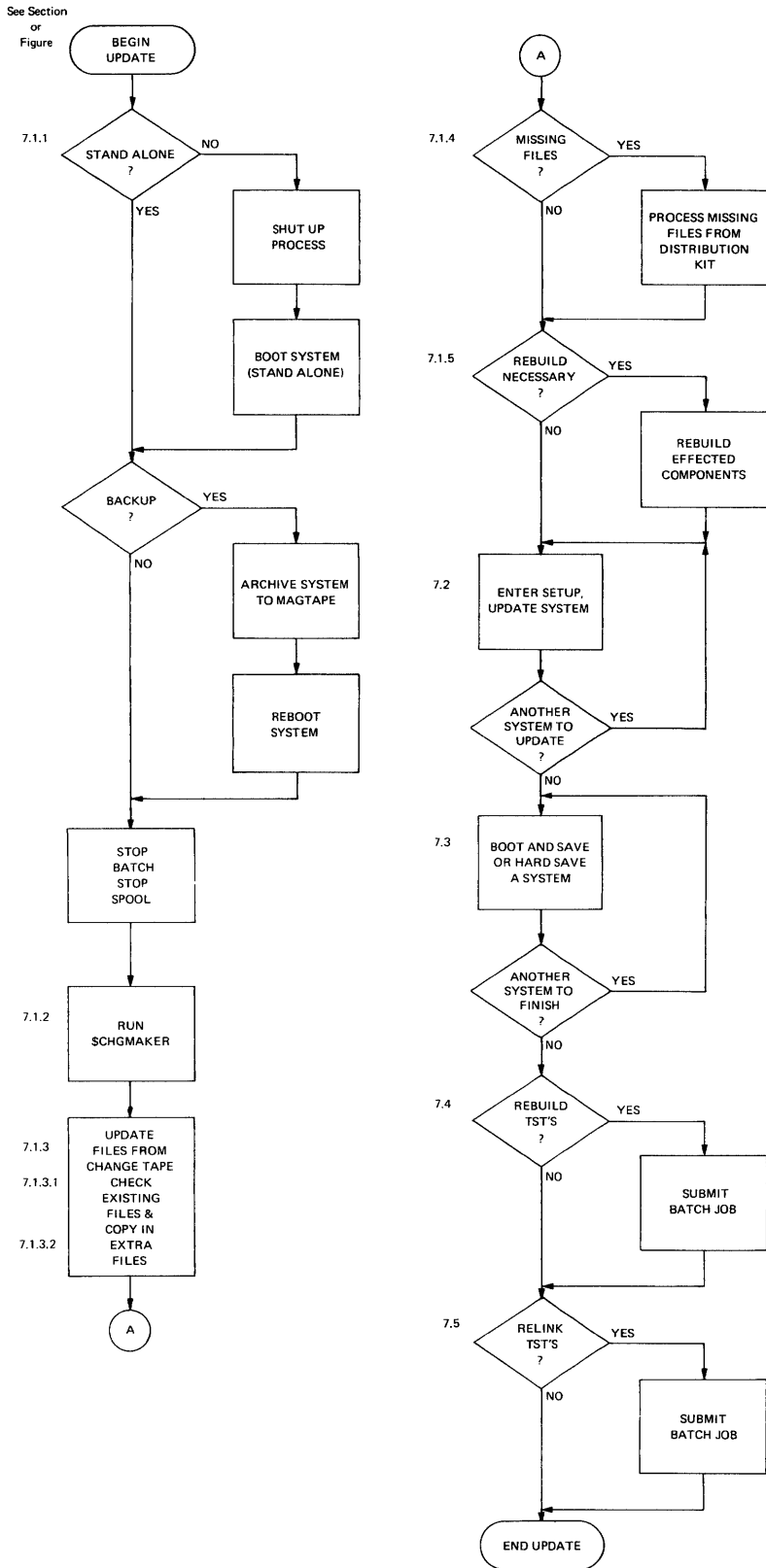


Figure 7-1 Updating an In-Place System

3. For files missing in the previous phase, CHGMAKER cycles through the necessary tapes from the distribution kit, copying the needed files to the system disk.
4. Rebuilds all updated components that are only built on-site. These are the same components built during the build base of the SYSGEN activity.
5. Starts up the SETUP utility, which constructs a new system image file based on the newly updated KERNEL section and tailored with the current set of specifications. SETUP is then used to boot and save the updated system so that it is again ready for installation activities.
Each system contained on the system disk can be updated during this phase.

Each phase builds on results of the previous phases. CHGMAKER maintains a control file ([1,1] UPDCHGPHA.SES) during its processing so that if it is prematurely terminated, at any point, the utility can restart the phase it was processing when interrupted.

CHGMAKER also checks the change tape, as it processes it during the first phase, to see if a new version of CHGMAKER has arrived. If so, the older version starts up the newer version, terminates its activities and closes all files, while the newer version picks up processing where the older version left off.

7.1.1 Setting Up For CHGMAKER Processing

The update process must take place in stand-alone mode where CHGMAKER is the only operating program. No transaction processing may be in progress.

Following the procedure described in the TRAX System Manager's Guide for shutting down the system, halt system operations in an orderly fashion, reboot the system into normal operation. If necessary, broadcast messages to system users informing them of the impending update process.

It is highly recommended at this point that the system disk containing the system to be updated be backed-up to magnetic tape using the DCL ARCHIVE command. The TRAX System Manager's Guide describes the correct procedure for the backup operation.

When the disk has been saved, reboot the system back into operation (Appendix A) and continue setting up for the update procedure.

Note that all batch and Spooling activities must be terminated. If they are still running, terminate their actions as described in the TRAX System Manager's Guide. The queues are left intact for processing after the system is restarted after the update.

Updating Your System(s)

You should continue to operate using the system console terminal under the system manager's account, [1,1]. If you attempt to start CHGMAKER executing in some other account, a warning message appears and CHGMAKER terminates processing.

7.1.2 Bringing CHGMAKER Into Action

Begin by executing CHGMAKER via the following DCL command:

```
RUN $CHGMAKER
```

Since this is the initial execution of CHGMAKER, it prints its herald:

CHGMAKER VO1-00

TRAX System Update Utility

CHGMAKER initializes its internal controls and files and prepares to enter the first phase.

If you are restarting CHGMAKER to continue update processing, the utility prints out the herald message and then determines what phase it was processing when terminated. The in-complete phase is restarted from the beginning.

7.1.3 Phase I Processing The Change Tape

Phase I involves all activities surrounding the processing of all the change tape contents. The phase is broken down into two subphases:

Phase I-A Original Component Replacement

Phase I-B Component Addition and Presence Checking

7.1.3.1 Phase I-A: Original Component Replacement - When CHGMAKER enters Phase I-A, the following status message appears:

10:42 AM Begin Phase I-A: Assimilate New Components From Change Tape

In order for CHGMAKER to complete the update process properly, it must know the CPU type of the system being updated. The following query appears asking for the CPU type:

For what CPU type is this update destined <70>?

Valid responses are 34, 60, or 70 (the default).

CHGMAKER asks you to mount the change tape (D661x) on some available magnetic tape drive (drive #n), with the write protect ring out and the tape positioned at BOT:

Please mount the change tape.

Respond with drive name and unit number?

Be sure you use the latest version of the change tape (highest value of the letter x), and respond with the drive name and unit number in the form MMn:.

CHGMAKER next asks if any files are to be skipped on the tape:

Are any files to be skipped on this tape <NO>?

DIGITAL will instruct you when to respond YES to this query and will supply you with a list of identification keys of files to be skipped.

If you respond YES, CHGMAKER asks for the identification keys:

Delete?

Respond with an identification key.

NOTE

The identification key input is checked for accuracy. If the input is incorrect, an error message appears and the query repeats.

The question is repeated until you respond DONE. After this, the processing of the tape proceeds normally. The designated file(s) are not copied to the system disk.

When all files have been read and copied to replace their older versions, Phase I-A comes to an end. The magnetic tape is not rewound or dismounted, however, as it contains information to be processed in Phase I-B.

If an error occurs during reading of the change tape, CHGMAKER prints out a status message identifying the file it was trying to read, and then rewinds and dismounts the tape before terminating further processing.

Possible corrections to the problem include changing the tape to a different tape drive, trying a different version of the change tape (your software support specialist should have a copy), and/or having your DIGITAL field service engineer check the tape drive.

When you are ready to try again, restart CHGMAKER by typing the following command:

RUN \$CHGMAKER

CHGMAKER restarts Phase I-A from the beginning and tries to process the change tape once more.

7.1.3.2 Phase I-B: Copying Additional Files; Checking for Others -

During this phase, additional files are read from the change tape, and checks are made to see if other necessary files (for later rebuild operations) are still present on the disk.

The phase begins with the printing of the following status message:

11:10 AM Begin Phase I-B: Account for Required Files Needed In Rebuilding

CHGMAKER asks if any file copies/checkups are to be skipped:

Are any files/checkups to be skipped <NO>?

You will have been instructed by DIGITAL if you are to respond YES to this query. You will also be given a list of identification keys of the files/checkups to be skipped.

If you respond YES, CHGMAKER asks for the identification keys:

Enter key <DONE>?

Respond with an identification key.

NOTE

The identification key input is checked for accuracy. If the input is incorrect, an error message appears and the query is repeated.

This question is repeated until you respond with DONE. After this, the processing of the change tape continues. The designated file(s) are not copied from the tape and any designated checkup(s) are skipped.

As the checking operation proceeds, one or more components may be found to be missing from the system disk. The names of these components and the distribution kit tape they were originally copied from (or written to in the case of the KERNEL image save tape) and recorded internally by CHGMAKER for use in Phase 2 when these components must be retrieved.

When all additional files have been copied from the change tape, the tape is rewound and dismounted from the system. You should remove the tape from the tape drive when the next phase begins.

If any errors occur during the copying of the additional files, a status message appears indicating which file was being read. The tape is rewound and dismounted before CHGMAKER terminates further processing.

Take appropriate action to correct the problem, as described in Section 7.1.3.1, and restart CHGMAKER to reprocess Phase I-A and Phase I-B.

7.1.4 Phase II: Retrieve Missing Components

Phase II begins with the following status message:

11:21 AM Begin Phase II: Retrieve Missing Components

If the checking operations of Phase I-B did not discover any missing components, CHGMAKER prints the following message:

All required components are present on disk.

CHGMAKER then proceeds immediately to Phase III.

Otherwise, CHGMAKER cycles through the tapes of the distribution kit as listed below:

1. Required files tape (D660A)
2. BASIC-PLUS-2 option tape (D664A)
3. COBOL option tape (D663A)
4. TRAX/TL communications option tape (D666A)
5. TRAX/3271 communications option tape (D665A)
6. KERNEL image save tape (D662A).

A tape is processed (1) if used during the original system generation of the system being updated and (2) if one or more missing components are present on that tape.

For each tape processed, CHGMAKER asks you to mount the tape, with the write protect ring removed, and the tape positioned at BOT:

Please mount the Required Files Tape.
Respond with drive name and unit number?

Respond with the name and unit number in the form MMn:

When all components are retrieved from the tape, the tape is rewound and dismounted. Remove the tape from the tape drive and store it in a safe place.

When all missing components have been retrieved and all tapes used have been rewound and dismounted, the following status message appears:

All required components are present on disk.
CHGMAKER proceeds directly into Phase III.

7.1.5 Phase III: Rebuild Operations

Phase III begins operation with the following status message:

11:40 AM Begin Phase III: Perform Rebuild Operations

Updating Your System(s)

If no rebuild operations need be done, CHGMAKER prints the following message:

No components need to be rebuilt.

CHGMAKER then proceeds immediately to Phase IV.

Otherwise, CHGMAKER asks if any rebuild operations are to be skipped:

Any rebuild operations to be skipped <NO>?

You will have been instructed by DIGITAL if you are to respond with YES. You will also have been given a list of identification keys of the rebuild operations to be skipped.

If you respond YES, CHGMAKER asks for the identification keys:

Enter Key <DONE>?

Respond with an identification key.

NOTE

The identification key input is checked for accuracy. If the input is incorrect, an error message appears and the query is repeated.

This query is repeated until you respond with DONE. After this, the rebuild processing begins. The designated rebuild operation(s) are not performed.

If by chance, some error occurs during a rebuild operation, contact your software specialist. Otherwise, CHGMAKER proceeds to the next phase.

7.1.6 Phase IV: Retailing the System

CHGMAKER enters Phase IV to set up for the running of the SETUP utility to complete the update operation. The phase begins with the printing of several status messages:

12:30 AM Begin Phase IV: SETUP Target System

Control is being transferred to the SETUP utility.

CHGMAKER has ended. SETUP is starting.

The SETUP utility is brought into execution in a special update mode. Once SETUP is running, CHGMAKER terminates its processing.

7.2 PERFORMING THE UPDATE WITH SETUP

SETUP's prime responsibility in the update process for a given TRAX system is to update the KERNEL section via a special patching process, and then using the already specified characteristics of the in-place system, create a brand new system image file already for saving and booting.

Action begins when SETUP asks for the name of the system to update:

What system do you wish to change?

Respond with the name of the system to be updated. An error message appears and the query repeats if no such system exists. SETUP now proceeds to construct a new system image file. First, the original KERNEL image file is copied to the new system image file. Current updates are applied through the special patching process to bring the KERNEL section up-to-date.

SETUP next proceeds through the remaining tailoring operations, as described in Section 5.1.6:

Partition definition is complete.

Driver Installation is complete.

Terminal definition is complete.

Unconditional task installation is complete.

Conditional task installation is complete.

SETUP signals the completion of the system image reconstruction by returning to the "What system do you..." query once more. If you have one or more other TRAX systems to update (the usual situation for complementary pair systems), continue by specifying another system name. Otherwise, respond with a simple <RET> and SETUP exits to DCL command level.

7.3 COMPLETING THE UPDATE PROCESS

Once you have completed the updating of all system components and created one or more new system image files, you must proceed through the BOOT and SAVE (HARDSAVE) procedures detailed in Section 5.3, once for each system updated. The system image files are then ready for further use.

Remember when you are ready to HARDSAVE one of the complimentary pair systems that it **MUST** be the transaction processor environment version in order for crash recovery to function properly.

7.4 RESTARTING SETUP FOR UPDATE PROCESSING

SETUP sometimes can not complete the special update sequence processing without external help from the user (not enough room on the system disk because a PURGE is needed, for example). In these instances, SETUP displays an appropriate status message and exits to DCL command level.

Updating Your System(s)

After the condition preventing completion of the update is corrected, the special update sequence can be reexecuted from the beginning as follows. First, restart SETUP with the following DCL command:

```
RUN $SETUP
```

When SETUP queries for a function to process:

Setup function <EXIT>?

Respond with **RETRY UPDATE**.

SETUP returns to the “What system do you...” query and the update process proceeds as detailed in Section 7.2.

7.5 WHEN TO REBUILD TSTS

After a system update, some elements of the language support, the compiler and/or support libraries, may have been updated to correct bugs that may affect performance of current installation TSTs. In this instance, remedial action requires that all TSTs be rebuilt from the original source files.

DIGITAL will inform you, through the Release Notes issued with each update, as to whether a rebuild of TSTs is necessary.

It is recommended that each installation build a single batch job file containing appropriate command and data for execution of the proper language compiler to build all TSTs from original source files. After submission of this batch job, the TSTs can be relinked with their OTS libraries via the batch job described in the next section.

NOTE

If an installation has TSTs written in more than one language, separate Batch job files should be created, one for each language.

7.6 WHEN TO RELINK TSTS

After a system update, the need for relinking current TSTs may arise from one of two sources. First, the TST support library, TSTLIB, may have been so modified that one or more of its global entry points has shifted. TSTs must be relinked to make proper connections.

In the second case, a language support object time system (OTS) may have been modified such that one or more of its global entry points has shifted, also necessitating a relink of all TSTs written in that language.

DIGITAL will inform you, through the Release Notes issued with each update, as to whether a relink of TSTs is required.

It is recommended that each installation construct and keep up-to-date a single batch job file containing appropriate commands and data for execution of the TSTBLD utility to relink every TST in use by the installation. If a general relink operation becomes necessary, submission of the batch job provides quick and efficient updating of the TSTs.

NOTE

If an installation has TSTs written in more than one language, separate batch job files should be created, one for each language.

7.7 SUMMARY OF PROCEDURE

1. Take appropriate action to reduce all system activity to only the update operation.
2. If desired, backup the system disk using the DCL ARCHIVE command. (See the TRAX System Manager's Guide.)
3. Make sure that all batch and spooling operations are suspended.
4. Log in under the system manager's account, [1,1], using the system console terminal.
5. Execute the CHGMAKER utility with the following DCL command:

RUN \$CHGMAKER

6. Respond with the CPU type of the system being updated.
7. Mount the change tape (D661x). Use the tape with the highest value of x. Respond with the drive name and unit number in the form MMy:.
8. If directed to by DIGITAL, respond YES to the query about skipping files. Type the specified identification keys of files to be skipped on this tape, and then type DONE to end the input sequence. CHGMAKER processes PHASE I-A.
9. If directed to by DIGITAL, respond YES to the query about skipping file copies/checkups. Type the specified identification keys of file copies or checkups to be skipped during Phase I-B, and then type DONE to end the input sequence. CHGMAKER processes Phase I-B.
10. CHGMAKER processes Phase II and retrieves missing components.
 - a. When requested, mount the specified distribution kit tape and respond with the drive name and unit number in the form MMx:.
 - b. Dismount the tape when processing completed by CHGMAKER.
11. If directed to by DIGITAL, respond YES to the query about skipping rebuild operations. Type the specified identification keys of rebuild operations to be skipped during Phase III, and then type DONE to end the input sequence. CHGMAKER processes Phase III.
12. CHGMAKER starts up the SETUP utility in the special update sequence mode. CHGMAKER terminates further processing.

Updating Your System(s)

13.SETUP asks for the name of the system to update:

What system to you wish to change?

Respond with the name of the system to be updated.

SETUP now builds a new system image file and sets it up using its previously defined characteristics.

SETUP returns to the above query to allow updating of another system. When done, respond with a simple <RET>.

14. Repeat Steps 8 and 9 in Section 5.6 for each system image file updated. Do not forget to HARDSAVE the transaction processor environment system of a complimentary pair.
15. If required, perform the rebuilding of all installation TSTs.
16. If required, perform the relinking of all installation TSTs.

CHAPTER 8

ON-LINE SYSTEM GENERATION

Performing the system generation process on-line, in the support environment, parallels the stand-alone process for system generation. In either case, a system generation disk is built and a target TRAX system constructed, with all but the last two steps of the tailoring process performed under an executing support environment.

No flowchart is given for this chapter since on-line system generations are variations of stand-alone system generations. No Summary of Procedure section is included for the same reason.

8.1 REQUIREMENTS FOR ON-LINE SYSTEM GENERATIONS

Two requirements must be met before an on-line system generation may take place under the support environment:

1. The general task execution partition, GEN, must contain a minimum of 64 kilo bytes of memory.
2. A second disk drive, any supported type permitted, must be present and generated into the system.

The size of the GEN partition is an absolute minimum; otherwise, several of the system generation tasks can not be executed. If GEN is larger than 64 kilo bytes, faster operation of the process may result, depending on what other requirements are being placed on the system by activities running concurrently with the system generation effort. A size of 256 kilo bytes or more is highly desirable.

TRAX does not support system generation of a new target system on the system disk of a running system, unless the running system is the baseline system. Therefore, your hardware configuration must contain at least one additional disk, any supported disk type permitted, of the type required for the target system generation procedure.

When running the utilities of the system generation procedure, you will be operating from the target system generation disk as if it were your current system disk. This is done by reassigning your system logical devices:

SY0: TRAX system disk
LBO: TRAX library disk
SP0: TRAX spooling disk

If the command completes successfully, you will see the normal DCL prompt (>). Otherwise, you should change disk drives and/or get a new disk pack, perform BAD block checking again, if necessary, and then retry the DSC copy operation.

Dismount the baseline system image tape from the tape drive and return it to a safe place.

8.3 COPY FILES PROCESS ON-LINE

If you are not currently logged into the system under the system manager's account, [1,1], do so now.

Instead of booting the baseline system in operation, you now set up the target system generation disk as your own system disk. First, reassign your system pseudo devices to the system generation disk:

```
ASSIGN Dyz: SY0:  
ASSIGN Dyz: LB0:  
ASSIGN Dyz: SP0:
```

Next, mount the target system generation disk and mark it public so that the line printer spooler utility can access it properly:

```
MOUNT Dyz: TRAXV01  
  
SET DEVICE:Dyz PUBLIC
```

You may want to use an autosize data file produced during a previous execution of the system generation process (or by using the AUTO utility as described in Appendix F). If so, it is required that a copy of the autosize data file be present on the target system generation disk. If it is located on some other disk, use the following DCL commands to copy over the file:

```
COPY Dab:[UIC]filename.ext SY0:AUTOSIZE.DAT
```

where Dab: is the device name and unit number of the disk where the original file is located. You may also wish to rename the copied file by changing the AUTOSIZE,DAT portion of the COPY command to the desired file name and extension.

Likewise, you may also desire to use a configuration data file produced during a previous execution of system generation. If so, it is required that a copy of the data file also be placed on the target system generation disk. This may be accomplished with the following set of DCL commands:

```
COPY Dap:[UIC]filename.ext SY0:CONFIGURE.DAT
```

where Dab: is the device name and unit number where the original configuration data file is located. You may also rename the copied file by changing CONFIGURE,DAT to the desired file name and extension.

Now, you are ready to execute the COPYFILES utility to load the target system generation disk with the system generation files.

```
RUN $COPYFILES
```

COPYFILES begins execution and processes the distribution kit contents as described in Chapter 3.

When COPYFILES completes its efforts, it passes control to the system generation utility for the next step in the system generation scenario.

8.4 COMPONENT GENERATION ON-LINE

Execution of the SYSGEN utility during on-line system generations is exactly the same as during stand-alone operations. Refer to Chapter 4 for a complete description of the SYSGEN process.

You are required to respond with NO to the query "Are you working..." This results in the execution of the dialogue form of hardware configuration specification. If you want to restore previous SYSGEN data, respond YES to the query "Do you want to restore...." SYSGEN then asks for the name of the data file:

```
Configuration file <[200,201] CONFIGURE,DAT>?
```

Respond either with the default response or the name you gave to the file when you copied it.

On-Line System Generation

SYSGEN accesses the data in the file and conditions its internal structures accordingly. Included in the configuration file is a list of all files that were written to the KERNEL image save tape when it was created during the previous SYSGEN process where the configuration file was generated.

SYSGEN checks over the target system generation disk for the presence of all files on the list. If any file is missing (they will all be missing if this execution follows the loading of a new target system generation disk), then SYSGEN asks you to mount the associated KERNAL image save tape (D662A) on an available magnetic tape drive:

Please mount the KERNEL Image Save Tape.
Respond with the drive name and unit number?

Mount the tape on the drive, with the Write Protect ring removed and the tape positioned at LD PT. Respond with the drive name and unit number in the form MMx:.

SYSGEN now mounts the tape in the system, and then scans the tape searching for and copying the missing files to the target system generation disk.

When all missing files are accounted for and copied, the tape is rewound and dismounted from the system. Remove the tape from the drive and return it to a safe place.

When all files are present, SYSGEN asks you how much of the dialogue is to be performed:

What further dialogue do you wish to perform < ALL > ?

Respond with NONE and the rest of the dialogue phase and data generation phase are skipped to get directly to the build phase.

Respond with ALL and the entire dialogue phase will be executed, with data retrieved from the configuration file becoming the default values for the dialogue queries.

Three other responses permit performing either of the Communications options, or the ATS specification dialogues. These choices do not apply if the target system is a support environment only system to be used strictly for program development.

The use of the other responses to process selected dialogue sections is thoroughly covered in Sections 4.6 and 4.7.

The time required to complete SYSGEN operations during an on-line system generation will vary, depending on the demands placed on the rest of the system by other activities. You can expect the on-line system generation process to take longer than the stand-alone equivalent, especially if the GEN partition is not several times larger than the minimum size of 64 kilo bytes.

When SYSGEN is finished, it starts up the SETUP utility in the same manner as during a stand-alone system generation. SETUP processing is explained in the next section.

8.5 TAILORING THE TARGET SYSTEM ON-LINE

When SETUP executes after system generation terminates, it performs the special processing sequence used during stand-alone system generations and described in Sections 5.1 and 5.1. In other words, all functions of SETUP except booting and saving can be used during on-line system generations. To boot and/or save requires a quiescent system where no other activity is going on and you can change the operating system as you desire.

8.5.1 Completing System Generation on the Current System

You may choose, at this time, to perform the remaining SETUP operations to boot and save the target system image file using the current hardware configuration you are running on. If so, prepare the other users and activities going on elsewhere in the current system for a shutdown of that system.

Execute the system shutdown procedure described in the TRAX system manager's Guide. When the system has halted, proceed to Section 8.5.3 to bring up the new system generation disk and complete the target system.

8.5.2 Completing the Target System on a Different System

Another method to be used in completing the target system is to remove the system generation pack from your current system, and carry it to the actual hardware configuration that it is going to run on. SETUP then can be used to perform the required boot and save operations.

Dismount the target system generation disk, deallocate the disk drive, and reset your system pseudo device assignments as shown in the following DCL commands:

```
DISMOUNT Dyz: TRAXV01
DEALLOCATE Dyz:
DEASIGN/ALL
```

where Dab: is the drive name and unit number of the actual system disk.

8.5.3 Bringing Up the Target System Generation Disk

Once you have mounted the target system generation disk on a drive in the new system (or plan to boot the system generation disk on your current system), boot the disk as directed by the procedure outlined in Appendix A. This brings the baseline system into action again with the usual INIT queries:

Target system name?

Time?

Date?

Respond with BASLIN, the time (hh:mm), and the date (dd-mmm-yy), and INIT completes bringing up of the system. You are back at DCL command level when the prompt `>` appears.

Processing the target system proceeds as described in Section 5.3 using the SETUP utility. Essentially, you are back in stand-alone mode and can proceed accordingly.

APPENDIX A

HARDWARE BOOTSTRAPS

DIGITAL supplies several preprogrammed bootstrap loaders for convenient loading of programs to handle various I/O and peripheral devices. These bootstrap units are programmed by DIGITAL on ROM (read only memory) to match an individual host processor. The bootstrap procedure that you use is determined by the processor in your hardware system.

The complete procedure for each TRAX-supported ROM and each TRAX supported device is described in the following sections. Additional details of the individual bootstrap loaders can be found in the PDP-11 Peripherals Handbook and in the PDP-11 Processor Handbook.

A.1 PDP-11/34 AND PDP-11/60 BOOTSTRAP

This bootstrap prompts you by typing a dollar sign (step 3) on the system terminal. The response to the prompt is the 2-letter device name for drive unit zero and the device name and octal unit number for drive units other than zero.

Perform the following steps to bootstrap either the PDP-11/34 or the PDP-11/60.

1. Press the CTRL and HALT switches simultaneously.
2. Press the CTRL and BOOT switches simultaneously.
3. In response to the \$ prompt on the console terminal, enter any pair of the following two letters when bootstrapping from device unit zero. When not bootstrapping from device unit zero, enter any pair of the following two letters and the octal device unit number.
 - a. DB RP04/05/06 disk
 - b. DM RK07 disk
 - c. DR RM02 disk
 - d. MM TU45/TE16 magnetic tape
4. Terminate your response with a carriage return.

A.2 PDP-11/70 BOOTSTRAP

Perform the following steps to use this bootstrap:

1. Press the HALT switch and then return it to ENABLE position.
2. Enter the startup address of 17765000 in the console switches.
3. Press the LOAD ADDR switch.
4. Set the console switches to the device code. The device codes are as follows:

Hardware Bootstraps

Device	Code
RM03 Disk Pack	0000001n
TE16/TU45 Magnetic Tape	0000006n
RP04/05/06 Disk Pack	0000007n

where n is the device unit number.

5. Press the START switch.

The bootstrap performs CPU tests, instruction and addressing tests, and memory and cache tests. If a hardware failure is detected, the bootstrap halts. If this occurs, call your local DIGITAL field service engineer.

It is possible to continue the bootstrap operation if a cache failure occurs. A cache failure is indicated by one of the following display light configurations:

17773644

17773736

17773764

Press CONT to continue bootstrapping the system.

APPENDIX B

MOUNTING AND DISMOUNTING

MAGNETIC TAPES

B.1 TU45 TRANSPORT

The TU45 magnetic tape drive is a MASSBUS-compatible, versatile tape drive subsystem available on all TRAX-supported configurations.

The subsystem consists of one TM02 tape formatter and one to eight tape drives. Two of these tape subsystems may be included in a given 11-70 CPU configuration.

The TU45 records and reads digital data in industry standard 1600-bytes/in. phase encoding (PE) or 800-bytes/in. in nonreturn to zero (NRZ) mode on 9-track magnetic tape at a speed of 75 in./se.

B.1.1 Loading Tape on the TU45 Transport

The supply reel (reel to be recorded or reproduced) is located at the top of the transport. The tape must unwind from the supply reel when the reel is turned in a clockwise direction. Note that a write protect ring is required on the supply reel to close the interlocks that allow writing.

To load a tape reel, position the reel on the quick release hub and press the hub actuator. Thread the tape along the path shown in Figure B-1. Wrap the tape leader onto the take-up reel so that the tape will be wound onto the reel when it is rotated clockwise. Wind at least three turns onto the take-up reel. Remove all slack in the tape path.

B.1.2 Bringing Tape to Beginning-of-Tape (BOT)

After tape has been loaded and checked for correct seating in the guides, use the following procedure to bring tape to BOT:

1. Turn power on by pressing the **POWER** control.
2. Press and release the **LOAD/RESET** control. A load sequence will be initiated. Recheck tape tracking in the guides and close the dust cover door.

CAUTION

The transport door should remain closed during normal operation to achieve maximum data reliability.

When the load cycle is complete, the tape will stop at the BOT. The transport is now ready to receive additional commands.

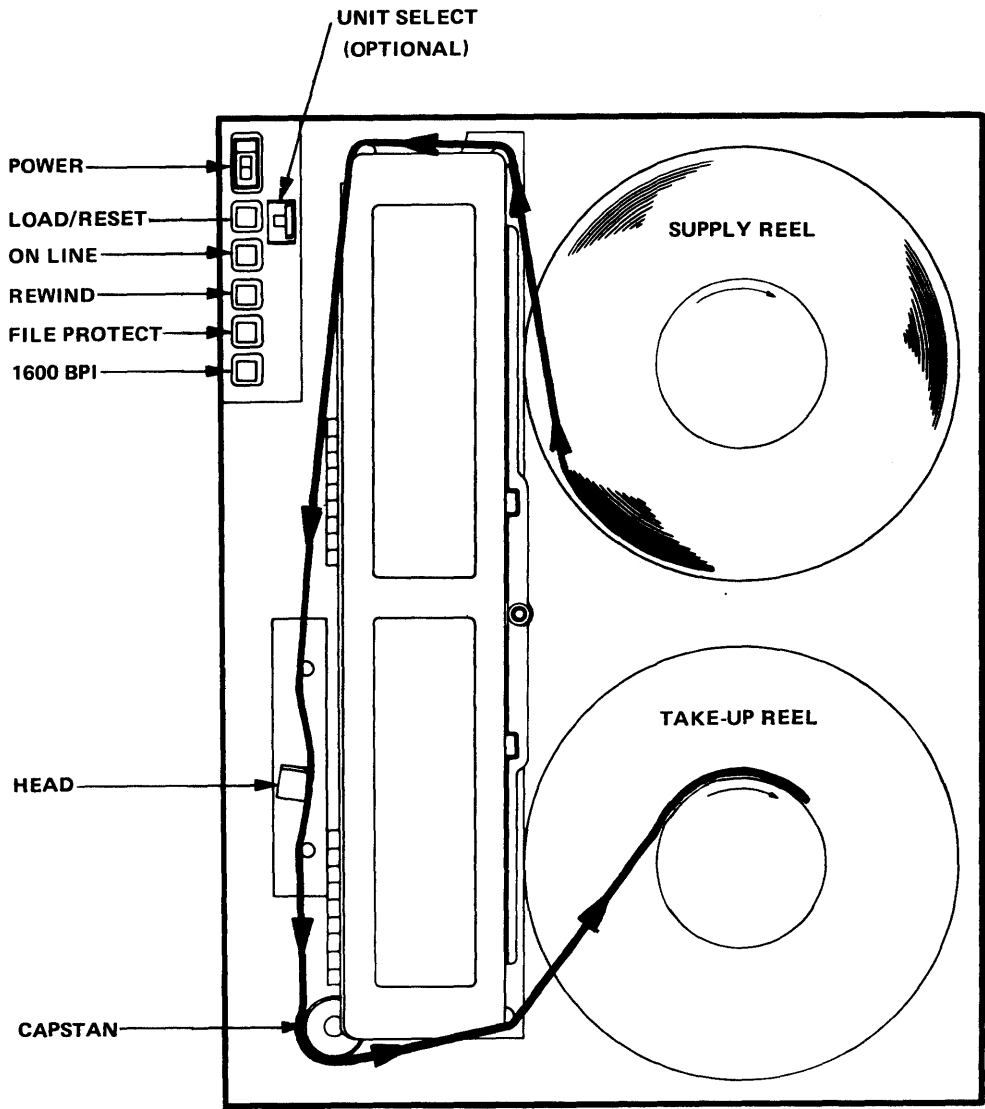


Figure B-1 TU45 Drive, Tape Path

B.1.3 Unloading Tape from the TU45 Transport

To unload a recorded tape, complete the following procedure. If power is on, start at Step 4.

1. Turn power on by pressing the power control switch.
2. Rotate the take-up reel to remove all slack tape.
3. Press and release the LOAD/RESET control; a load sequence will be initiated. If a BOT marker is not encountered, the transport will run for 7 seconds. Rewind to BOT and then stop.
4. Press and release the REWIND control; the tape will rewind to the BOT marker and then stop.
5. Press and release the REWIND control a second time; this initiates an unload sequence.

NOTE

It is not necessary to wait for the tape to rewind to BOT if an unload is desired; the REWIND switch may be pressed twice in succession.

6. Open the transport door and remove the reel. Close the transport door.

B.1.4 Manual Controls

The operational controls and indicators located on the control panel of the transport, are functionally described in the following paragraphs. The control panel is shown in Figure B-1.

B.1.4.1 On/Off – The ON/OFF control is an alternative action switch/indicator that connects line voltage to the power supply. When power is turned on, all power supplies are established and a reset signal is applied to the logic.

B.1.4.2 Load/Reset – The LOAD/RESET control is a momentary switch/indicator. Pressing and releasing the control energizes the servo system and initiates a load sequence. Vacuum is applied and tape enters the vacuum column (buffers). A forward command is initiated and it causes tape to move to and stop at the BOT. The transport is now ready to receive additional commands. While the BOT marker is located over the BOT sensor, the LOAD/RESET indicator is illuminated. Subsequent activation of the LOAD/RESET control terminates any automatic sequence (including LOAD).

B.1.4.3 Rewind – The REWIND control is a momentary switch/indicator that is enabled only in the OFF-LINE mode. Pressing and releasing the control causes the tape to rewind. On reaching the BOT marker, the marker will overshoot the BOT sensor, reverse direction, and then stop at the BOT.

Mounting and Dismounting Magnetic Tapes

If the REWIND control is pressed twice in succession or pressed when the tape is at BOT (LOAD/RESET indicator illuminated), an UNLOAD sequence will be initiated.

The REWIND indicator is illuminated throughout any rewind operation.

B.1.4.4 On Line – The ON LINE control is a momentary switch/indicator that is enabled after an initial LOAD or REWIND sequence has been completed. Pressing and releasing the switch changes the transport to ON-LINE mode and illuminates the indicator. In this condition, the transport can except external commands provided it is also READY and SELECTed.

The transport will revert to the OFF-LINE mode if any of the following occur:

1. ON LINE is pressed a second time.
2. An external REWIND and UNLOAD command is received.
3. Vacuum column interlock is broken.
4. AC power is lost.

B.1.4.5 – File Prot (File Protect) – This is an indicator that is illuminated whenever tape is in the vacuum column and the supply reel has its write protect ring removed.

B.1.4.6 1600 BPI – When the indicator is, illuminated, it indicates that the transport is functioning in the Phase-Encoded operational mode; i.e., recording or reading 1600-bytes/in. PE data.

B.1.4.7 Select – The SELECT switch is an 8-position thumb-wheel that provides selective addressing of up to eight transports. The address can be changed only when the transport is in the OFF-LINE mode.

B.2 TE16 TRANSPORT

The TE16 magnetic tape drive is a MASSBUS-compatible, versatile tape drive subsystem available on all TRAX-supported configurations.

The subsystem consists of one TM02 tape formatter and one to eight tape drives. Two of these subsystems may be included in a given 11-70 CPU configuration.

The TE16 records and reads digital data in industry standard 1600 bytes/in. phase encoding (PE) or 800 bytes/in. in non-return to zero (NRZ) mode on 9-track magnetic tape at a speed of 45 in. es/second.

B.2.1 Controls and Indicators

The operator control box is located at the lower left-hand corner. The functions of the control box switches and indicators are listed in Tables B-1 and B-2, respectively. All operator controls are momentary-contact switches. Indicators are yellow and red.

Table B-1 TE16 Switch Functions

Switch	Function
LOAD	<p>Pushing this switch, when tape is correctly threaded, causes tape to be pulled into the vacuum columns and the transport to seek the BOT marker and go ON-LINE when it is at rest at BOT.</p> <p>The indicator on this switch glows when tape is in the vacuum columns and proper vacuum has been established.</p>

NOTE

A seek-for BOT sequence consists of five seconds of forward motion, followed by a rewind to BOT.

ON LINE	<p>Pushing this switch causes the transport to make a transition between the ON-LINE and OFF-LINE states. For example, pushing the switch when the drive is OFF-LINE causes it to go ON-LINE. This switch is inoperative when the LOAD indicator is off and no LOAD sequence is happening.</p> <p>The indicator on this switch glows when the transport is ON-LINE.</p>
REWIND/UNLOAD	<p>This switch is inoperative when the transport is ON-LINE. Pushing this switch when the transport is OFF-LINE and not at BOT causes the drive to execute a high speed rewind to BOT. Pushing this switch when the transport is OFF-LINE and at BOT causes the transport to execute an UNLOAD sequence, gently winding all tape onto the lower reel.</p> <p>This is not an indicating switch.</p>

NOTE

Pushing this switch while the transport is executing a LOAD sequence (LOAD indicator on) and seeking forward for the BOT marker, aborts the LOAD sequence and causes a normal OFF-LINE REWIND procedure. Never push this switch before the BOT marker is sensed.

Table B-2 TE16 Indicators

Indicator	Functions
POWER	This indicator glows when AC power has been applied to the device. It is powered by the +5 V regulated supply.
BOT	This indicator glows when the BOT marker is positioned over its sensor.
WRL	This RED indicator glows when either no tape is mounted or a reel is mounted without Write Protect ring.
SELECT	This indicator glows when the transport is both ON-LINE and SELECTed.

B.2.2 Address Selection Plug Receptacle

This receptacle accepts plugs labeled 0 through 7, which define the logical address of the device. If no plug is in the receptacle, the transport cannot be selected. This is not an indicating plug.

B.2.3 Operating Procedures

TE16 operating procedures are described in the following paragraphs.

B.2.3.1 Application of Power

1. If the 861 power control REMOTE ON/OFF/LOCAL ON switch is in the REMOTE ON position, TE16 power is controlled by the processor POWER key switch. This method is used in normal operation.
2. If the processor POWER key switch is not activated, TE16 power may be turned on locally by setting the 861 Power Controller REMOTE ON/OFF/LOCAL ON switch to LOCAL ON. This method may be used during maintenance.

B.2.3.2 Loading and Threading Tape – Use the following procedure to mount and thread magnetic tape.

1. Apply power to the transport. Ensure that the transport is OFF-LINE (the ON LINE switch does not glow).
2. Place a Write Protect ring in the reel groove if data is to be written on the tape. Ensure that there is no ring in the groove if data on the tape is not to be erased or written over.
3. Mount the file reel onto the lower hub in the following manner:
 - a. Release the snap-lock lever on the lower hub by pulling it firmly outward on the rim end.
 - b. With the reel groove facing away from the operator, mount the file reel on to the lower hub.
 - c. When the reel is firmly seated against the hub flange (press the reel firmly, but not heavily), close the snap-lock lever on the hub.The file reel is now correctly mounted.
4. Manually unwind tape from the file reel and thread the tape by the tape guides and head assembly as shown in Figure B-2.
5. Wind about four turns of tape onto the take-up reel. Ensure that the tape is in the guides.

CAUTION

Wind tape flat onto the take-up reel. Do not bend tape back or place tape end outside of reel (out the window). While winding tape on take-up reel, simultaneously unwind the file reel to relieve tension on the tape. Rotate the reels gently. Do not jerk the tape, because it could stretch.

6. When the tape is mounted and threaded, press the **LOAD** button. After a 2-second delay, to allow vacuum to be established, tape will be pulled into the vacuum columns and the seek-for-BOT sequence will begin. This sequence consists of 5 seconds of forward tape motion followed by a rewind to BOT. When the BOT marker is sensed, tape motion stops and the transport goes ON-LINE (both the ON LINE switch and BOT indicators glow). The tape is now in position at BOT and the transport is ready for use.

B.2.3.3 Unloading Tape – Depending on whether or not tape is at the BOT marker, use one of the following unloading procedures.

Mounting and Dismounting Magnetic Tapes

1. Ensure that the vacuum door (Figure B-2) is closed and sealed properly.
2. If the tape does not stop at **BOT**, be certain the tape has a **BOT** marker.
3. Ensure that the Write Protect ring is inserted in the tape reel if a write operation is to be performed.
4. Check **POWER** indicator. If it not glowing, ensure that the 861 power control circuit breaker is on. Also ensure that the **REMOTE ON/OFF/LOCAL ON** 861 power control switch is in the **REMOTE ON** position.

APPENDIX C

SAVING AND RESTORING SYSGEN DISKS

In this appendix, procedures are detailed for saving the contents a system generation disk after it has been loaded by the COPYFILES utility. Both the stand-alone (Section C.1) and on-line (Section C.2) procedures are covered.

Following the save procedures are two restoration procedures (Section C.3 for stand-alone SYSGENs, Section C.4 for on-line) whereby a SYSGEN disk may be restored to its proper state for processing by SYSGEN.

C.1 SAVING THE SYSGEN DISK (STAND-ALONE SYSGEN)

The system generation disk is in the proper state for saving after the COPYFILES utility has terminated and started up the SYSGEN utility. You should not have proceeded with any of the SYSGEN processing; instead, respond with CTRL/Z to the query about which dialogue format to use. SYSGEN terminates immediately and returns you to DCL command level. The next step in the procedure is to get the DSC utility running in order to write the contents of the SYSGEN disk onto a magnetic tape. Begin by running the SETUP utility:

```
RUN $SETUP
```

SETUP begins operation asking which command to process:

Setup command <EXIT>?

Respond with BOOT. SETUP now asks for the name of a system image file to be software bootstrapped:

Name of system image to be booted?

Respond with [1,54] DSCSYS. This causes the stand-alone version of the DSC utility to be bootstrapped, as was done in Section 2.1.3 from magnetic tape.

DSC begins operation by printing its herald, followed by prompting for a command:

```
BL22 RSX11S DSC V21
```

```
DSC>
```

A suitable 2400-foot magnetic tape is now mounted on a magnetic tape drive, with the Write Protect ring left in the back of the tape reel and the tape positioned at BOT.

Saving and Restoring SYSGEN Disks

Issue the following command to DSC:

```
MMn:SAVE/RW/VE/DENS = 1600 =Dyz:
```

where

n is the magnetic tape drive number
y is the system generation disk drive type [B, R, or M(11-34, 11-60 only)]
z is the SYSGEN disk drive unit number

This command instructs DSC to copy the entire system generation disk contents to the magnetic tape, using 1600-bytes/in. density, and to reread the tape after copying to verify that the copy operation was correct.

While DSC proceeds, the disk is first copied to the magnetic tape. The tape is then rewound, and DSC prints the following status message:

STARTING VERIFY PASS

The tape is read and compared with the contents of the SYSGEN disk. Any discrepancies are noted with appropriate error messages.

When DSC completes operation, it reprompts for another command:

DSC>

If the disk save operation encountered no errors, reboot the SYSGEN disk as described in Appendix A. This restarts the baseline system so that you may continue system generation processing.

If errors do occur, however, take appropriate action to correct the problem (try another tape drive or another tape) and reissue the DSC command. If errors persist, you may have to rebuild the system generation disk from scratch, or you may have to contact your DIGITAL field service engineer for possible hardware maintenance.

Since you are now through with the magnetic tape drive, remove the save tape, marking it appropriately with a label, and remove the write protect ring to guard against accidental overwriting.

To the INIT queries of the baseline system respond with BASLIN, time (hh:mm), and date (dd-mmm-yy):

Target system name?

Time?

Date?

INIT brings up the baseline system, issues a status message that the system is operating, and leaves you at DCL command level.

To restart SYSGEN, type the following command:

```
RUN $SYSGEN
```

When the preface messages and first query appear, you are back at the point where you began this procedure. Proceed normally to complete the system generation.

A summary of this procedure appears in Section C.5.1.

C.2 SAVING THE SYSTEM GENERATION DISK (ON-LINE SYSGEN)

The system generation disk is in the proper state after the COPYFILES utility has terminated and started up the SYSGEN utility. You should not have proceeded with any of the SYSGEN processing; instead, respond with CTRL/Z to the query about which dialogue format to use. SYSGEN terminates immediately and returns you to DCL command level.

The next step requires you to dismount your system generation disk because the DSC utility can not access mounted disks. Issue the following DCL command:

```
DISMOUNT Dyz: TRAXV01
```

where

y is the system generation disk drive type [B, R, or M(11-34, 11-60 only)]

z is the system generation disk drive unit number.

The disk dismounts from the system (status message appears on the system console terminal) and the DCL prompt > appears.

Next, you must return your system pseudo device assignments to the current system disk, via the following DCL commands:

```
DEASIGN/ALL
```

where y and z are described above.

Select a magnetic tape drive that is not currently in use (unit *n*), and allocate the drive to your terminal via the DCL command:

```
ALLOCATE MMn:
```

A suitable 2400-foot magnetic tape is now hung on the selected tape drive, with the Write Protect ring left in the back of the tape reel and the tape positioned at BOT.

Issue the following command to DCL:

```
ARCHIVE/VOLUME/DENSITY:1600 Dyz: MMn:SAVE
```

where *n*, *y*, and *z* have been previously described.

This command instructs DCL to copy the entire system generation disk contents to the magnetic tape, using 1600 BPI density.

Since you are now through with the magnetic tape drive, remove the save tape, marking it appropriately with a label, and remove the Write Protect ring to guard against accidental overwriting. Deallocate the tape drive with the DCL command:

```
DEALLOCATE MMn:
```

Now, you are ready to remount your system generation disk in the system and reassign your system psuedo devices to the disk. The mount command is:

```
MOUNT Dyz: TRAXV01
```

The disk is made public via the following DCL command:

```
SET DEVICE: Dyz PUBLIC
```

Assignment of your system psuedo devices to the system generation disk is made through the following DCL commands:

```
ASSIGN Dyz: SY0:
```

```
ASSIGN Dyz: LB0:
```

```
ASSIGN Dyz: SP0:
```

You can now restart SYSGEN with the following DCL command:

```
RUN $SYSGEN
```

When the preface messages and first query appear, you are back where you began this procedure. You may now proceed with system generation in the normal manner.

A summary of this procedure appears in Section C.5.2.

C.3 RESTORING THE SYSGEN DISK (STAND-ALONE SYSGEN)

Restoring the system generation disk parallels the procedure used to load the original baseline system (described in Chapter 2). The difference is in the use of the magnetic tape containing the image of the disk as it was saved using the procedure described in Section C.1.

Begin by mounting a fresh disk pack on a suitable disk drive where you will execute the baseline system and build the target system. Make sure the READY light is on and the drive is not WRITE PROTECTED.

Next, perform the bad block checking procedure described in Section 2.1.2. Continue trying this procedure until you obtain a disk suitable for use as a system disk.

The DSC processing procedure described in Section 2.1.3 is executed next. The magnetic tape to be used is the system generation disk image tape, and the command to issue to DSC is shown below:

```
Dyz:/VE = MMn:SAVE/RW
```

where

n is the magnetic tape drive unit number
y is the SYSGEN disk drive type [B, R or M(11-34, 11-60 only)]
z is the SYSGEN disk drive unit number

When DSC is finished, and no errors have occurred, boot the SYSGEN disk using the procedure of Section 2.2. The INIT utility starts up the system and eventually leaves you at DCL command level.

To restart SYSGEN, type the following command:

```
RUN $SYSGEN
```

When the preface messages and first query appear, you are now ready to resume the system generation process.

A summary of this procedure appears in Section C.5.3.

C.4 RESTORING THE SYSTEM GENERATION DISK (ON-LINE SYSGEN)

Restoring the system generation disk parallels the procedure used to load

the original baseline system during on-line operation (Chapter 8). The difference is in the use of the magnetic tape containing the image of the system generation disk as it was saved by the procedure described in Section C.2.

Begin by mounting a fresh disk pack on an available disk drive where you will build the target system. Make sure the READY light is on and the drive is not WRITE PROTECTED.

Next, perform the bad block checking procedure described in Section 8.2.2. Continue trying this process until you obtain a disk suitable for use as a system disk. The magnetic tape to be used is the SYSGEN disk image tape, and the command to issue to DSL is shown below:

ARCHIVE/RESTORE/VOLUME MMn: SAVE Dyz:

where

n is the magnetic tape drive unit # .b
y is the SYSGEN disk drive type [B, R, or M(11-34, 11-60 only)]
z is the SYSGEN disk drive unit #

NOTE

No system image name (dddd) is given in this command since there is only one disk image on the tape.

After the ARCHIVE command has finished, follow the disk setup procedure described in Section 8.3. This procedure mounts the system generation disk, reassigns your system logical devices to the disk and starts SYSGEN executing once more.

When the preface messages and first query appear, respond with CTRL/Z and proceed with the rest of the on-line system generation process.

A summary of this procedure appears in Section C.5.4.

C.5 SUMMARY OF PROCEDURES

The procedures discussed in this appendix are summarized in the following sections.

C.5.1 Saving the System Generation Disk (Stand-Alone SYSGEN)

1. Terminate SYSGEN with CTRL/Z response to first query.
2. Run the SETUP utility with the following command:

RUN \$SETUP

- a. Issue BOOT command to SETUP.
 - b. Respond with [1,54] DSCSYS as system image to be booted. The next output on system console will be DSC utility coming to life.
3. Mount a fresh 2400-foot magnetic tape on any available unit (unit n), write protect ring left IN, tape positioned at LD PT.
 4. Issue following command to DSC:

MMn:SAVE/RW/VE/DENS = 1600 = DyZ:

where y is disk drive type [B, R, or M(11-34, 11-60 only)], and z is the drive unit number.

5. When DSC prompts again, it is finished. Reboot the system generation disk. (Appendix A)
6. Answer BASLIN, time (hh:mm), and date (dd-mmm-yy) to INIT queries. System will begin execution.
7. When back at DCL command level, start SYSGEN with following command:

RUN \$SYSGEN

Proceed with rest of system generation process.

C.5.2 Saving the System Generation Disk (On-Line SYSGEN)

1. Terminate SYSGEN execution by responding CTRL/Z to first query.
2. Dismount your system generation disk, NOT the system disk, with following command:

DISMOUNT DyZ: TRAXV01

Where y is disk drive type [B,R, or M(11-34, 11-60 only)], and z is the drive unit number.

3. Reassign your system pseudo devices to the current system disk with following command:

DEASSIGN/ALL

4. Allocate an available magnetic tape drive with command:

ALLOCATE MMn:

where n is tape drive unit number.

5. Mount fresh 2400-foot magnetic tape on selected drive, Write Protect ring left IN, tape positioned at BOT.

6. Issue the following command to DCL:

```
ARCHIVE/VOLUME/DENSITY:1600 Dyz: MMn:SAVE
```

7. Remove the magnetic tape from the tape drive and deallocate the drive with the following command:

```
DEALLOCATE MMn:
```

8. Remount your SYSGEN disk and make it public with the following commands:

```
MOUNT Dyz: TRAXV01  
SET DEVICE: Dyz PUBLIC
```

9. Reassign your system pseudo devices with the following commands

```
ASSIGN Dyz: SY0:  
ASSIGN Dyz: LB0:  
ASSIGN Dyz: SP0:
```

10. Reexecute SYSGEN with following command:

```
RUN $SYSGEN
```

Proceed with rest of system generation process.

C.5.3 Restoring the System Generation Disk (Stand-Alone SYSGEN)

1. Mount a fresh disk on disk drive z.
2. Mount the BADSYS utility tape (D657A) on tape drive n.
3. Bootstrap the tape drive (Appendix A).
BAD prompts for the drive name and unit number of the disk to be checked.
4. Respond with the drive name and unit number in the form MMn:.
5. When BAD prompts again, disk is checked.
 - a. If the HOME BLOCK ERROR message appears, discard the disk pack. Get a new disk pack and return to Step 1.
 - b. Otherwise, dismount the BADSYS tape.
6. Mount the DSCSYS utility tape (D658A) on tape drive n.

7. Bootstrap the tape drive. (Appendix A).
DSC prompts for a command.
8. Dismount the DSC tape from the tape drive.
9. Mount the system generation disk image save tape on tape drive n.
10. Type a command line of the following form:

Dyz:/VE = MMn:SAVE/RW

The system generation disk is reloaded with the complete disk contents of the disk as saved by the procedure described in Section C.1.

11. When DSC prompts again, remove the system generation disk save tape.
12. Bootstrap the system generation disk (Appendix A).
Respond with BASLIN, time (hh:mm), and date (dd-mmm-yy) to the INIT queries.
13. Restart SYSGEN with the following command:

RUN \$SYSGEN

Proceed with the rest of the system generation process.

C.5.4 Restoring the System Generation Disk (On-Line SYSGEN)

1. Mount a fresh disk on a selected disk drive, Dyz:.
2. Run the SETUP utility with the following command:

RUN \$SETUP

- a. Issue BAD command to SETUP.
- b. Respond with Dyz: as disk drive and pack to be checked for BAD blocks.
When done, terminate SETUP with EXIT response.
If HOME BLOCK ERROR message appears, discard disk pack.
Get a new disk pack and return to Step 2a.
3. Issue the following DCL command:

ARCHIVE/RESTORE/VOLUME MMn:SAVE Dyz:

4. Mount the system generation disk and make it public via the following DCL commands:

MOUNT Dyz: TRAXV01
SET DEVICE:Dyz PUBLIC

5. Log into the system under the system manager's account, [1,1].

Saving and Restoring SYSGEN Disks

6. Reassign your system logical devices from the system disk to your SYSGEN disk via the following commands:

```
ASSIGN Dyz: SY0  
ASSIGN Dyz: LB0:  
ASSIGN Dyz: SP0:
```

7. Restart SYSGEN via the following command:

```
RUN $SYSGEN
```

Continue with the rest of the system generation process.

APPENDIX D

REDIRECTING LINE PRINTER OUTPUT

DURING SYSGEN

The SYSGEN utility produces two reports during its execution for listing on the first system line printer. However some system generations may take place on hardware configurations without line printers or the first line printer may be disabled and you will need to go to a backup unit.

NOTE

If you discover that the line printer is bad only after you have begun SYSGEN processing, you may have to abort SYSGEN processing by typing CTRL/C followed by <RET> and then typing ABORT/TASK to the DCL> prompt. This terminates SYSGEN processing and returns you to DCL command level.

Proceed directly to Step 2 of the following procedure.

In either case, use the following procedure to redirect SYSGEN's output to an alternative device.

1. After SYSGEN begins execution, respond with CTRL/Z to the initial query about dialogue format. SYSGEN will terminate execution immediately.
2. When you have returned to DCL command level (you have the > prompt), issue the following DCL commands:

```
STOP/QUEUE/MANAGER
ASSIGN/REDIRECT CLO: <device code>
DEASSIGN/GLOBAL CLO:
```

The <device code> chosen is the device name and unit number where line printer output is to appear. Normally, you redirect to the console terminal (TT0:).

3. Reexecute SYSGEN via the following command:

```
RUN $SYSGEN
```

Proceed with the rest of SYSGEN in the normal manner.

To complete the substitution for the missing or disabled line printer, be sure to include an appropriate redirection command in the target system's startup batch command file. (See the TRAX System Manager's Guide.)

Redirecting Line Printer Output During SYSGEN

WARNING

Do not use the NL: device to redirect output from the pseudo device CL:.

APPENDIX E

HARDWARE INTERFACE ADDRESS AND VECTOR ASSIGNMENTS

The TRAX system initialization code performs a hardware configuration check each time the system disk (or distribution medium) is bootstrapped. In the absence of any information to the contrary, the initialization code assumes that all devices attached to the UNIBUS have been assigned addresses according to the manufacturing standards. Although it is possible to assign nonstandard address and vector values, TRAX requires that the standard configuration rules be followed.

Several devices have so-called floating addresses. This means that the presence or absence of any floating address device will affect the assignment of addresses to other floating address devices. Similarly, many devices have floating vectors. According to the standards, interrupt vectors must be assigned in a specific sequence and the presence of one type of device will affect the correct assignment of interrupt vectors for other devices. Finally, there are many options that have fixed addresses and vectors. This appendix presents the algorithms for assignment of floating addresses and vectors.

E.1 FLOATING ADDRESSES

Currently, the floating address devices include the DJ11 and DH11 multiplexers; the DQ11, DU11, and DUP11 synchronous line interfaces; the LK11; the DMC11 interprocessor link; the DZ11 multiplexer; and the KMC11 microprocessor. The following ground rules apply to these devices and future floating address devices;

NOTE

All addresses shown in this section are relative to the 11-34 and 11-60 18-bit addressing space. To correct for the 11-70 22-bit addressing space, replace the leading 7-digit with 177 (octal) in all cases.

Vector addresses are the same for each PDP-11 CPU.

1. Future devices may float both their addresses and interrupt vectors.
2. The floating address space starts at 760010(8) and proceeds upwards to 764000(8).
3. A gap in the address space implies that a device does not exist.

4. The first address of a new type device will always be on a 2^N word boundary, where N is the integer value of (log base 2 of (M+9999999)), and M is the number of device registers.

Number of Registers	Possible Boundaries
in Device	
1	Anyword
2	XXXXX0,XXXXX4
3,4	XXXXX0
5,6,7,8	XXXXX00,XXXXX20,XXXXX40,XXXXX60
9 through 16	XXXXX00,XXXXX40

5. A gap of at least one word will be left after each type of device, starting on the same boundary the device would start on. Note that the gap must be at least one word in length but may be longer than one word. Gap length is determined by the boundary on which the next device must begin.
6. Multiple devices of the same type must be addressed contiguously.

Address 760010 is reserved for the first DJ11. Since the DJ11 has four registers, additional DJ11s are assigned addresses modulo 10(8) immediately following the first DJ11 (for example, 760010 and 760020, etc.). The modulo 10 (8) address following the last DJ11 is left empty and is known as DJ11 gap. If there are no DJ11s, the gap is at 760010. If there is one DJ11, the gap will be at 760020. All gaps must be at least one word in length.

After all DJ11 addresses and the DJ11 gap are defined, the address for the first DH11 can be assigned. DH11s have eight registers which implies a modulo 20 (8) boundary. The address of the first DH11 is the first modulo 20 address following the DJ11 gap. If there are no JD11s (DJ11 gap at 760010), the first DH11 is assigned address 760020. Similarly, if there is one DJ11, the DJ11 gap will begin at 760020 and the next available mod 20 boundary is 760040. All additional DH11s are assigned addresses modulo 20 immediately after the first DH11. The DH11 gap begins on the modulo 20 boundary following the last DH11.

After all DH11 addresses and DH11 gap are defined, DQ11, DU11, DUP11, LK11, DMC11, DZ11, and KMC11 addresses and required gaps can be assigned in sequence. Addresses for any future floating address devices will be assigned in a similar manner.

E.1.1 Floating Address Worksheet

The algorithm for assignment of floating addresses can be confusing for a large configuration with multiple units of several types of floating address devices. The floating address worksheet that follows is a graphic aid that should eliminate some confusion and relieve configuration

problems. The worksheet allows you to assign device addresses quickly without referring to the formal rules. Instructions for use of the worksheet are presented below. A blank worksheet is provided for general use in Figure E-1.

The worksheet is divided into four sections covering the address range 760010 through 762000. Although the floating address area continues up to 764000, the worksheet should cover most configurations. If necessary, you can create a second worksheet by adding 2000 to all addresses listed.

The following are instructions for the use of the worksheet:

1. Record the quantity of each type of floating address device in the space provided on the worksheet.
2. Beginning at the upper left of the worksheet at address 760010 and proceeding down the DJ11 column, record the unit numbers for all DJ11s in the configuration. Begin with unit 0 and end with unit n-1. (There are n DJ11s in the configuration.)
3. Immediately below the last DJ11 unit, mark an X for the required DJ11 gap. Also mark an X in the box immediately to the right (DH11 column).

In general, when numbering device units down the appropriate column, use only the unshaded boxes. The shaded boxes represent illegal addresses for the particular device type. Since the gap address must also be a legal device address, use only an unshaded box for the gap X when numbering down the column.

In marking an X in the column to the right of a device address gap, use the shaded boxes since the X in the next column merely provides a starting point for numbering units of the next device type. If there are no units of a particular device type, enter only the gap X's on the worksheet.

If you use all available space in one section of the worksheet, simply copy the entries on the last line of the full section to the top line of the next section. Then continue numbering in the new section.

4. Continuing just below the X in the DH11 column, number all DH11 units, once again, start with unit 0 and continue to unit n-1. Skip the shaded boxes in numbering down the column. In the first unshaded box below the last DH11 unit, mark an X for the DH11 gap. Also mark an X in the box to the right, whether it is shaded or unshaded.
5. Continue with the remaining floating address devices. In each case, number units from 0 to n-1 down the column beginning in the first unshaded box below the X. Mark an X in the next unshaded box below the last unit and in the box immediately to the right of the last unit (whether that box is shaded or unshaded).

FLOATING ADDRESS WORKSHEET

ADDRESS	DEVICE							DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11								
760000															
760010															
760020															
760030															
760040															
760050															
760060															
760070															
760100															
760110															
760120															
760130															
760140															
760150															
760160															
760170															
760200															
760210															
760220															
760230															
760240															
760250															
760260															
760270															
760300															
760310															
760320															
760330															
760340															
760350															
760360															
760370															
760400															
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11							

QTY (n)	QTY (n)
DJ11 _____	DMC11 _____
DH11 _____	DZ11 _____
DQ11 _____	KMC11 _____
DUP11 _____	
LK11 _____	

ADDRESS	DEVICE							DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11								
760400															
760410															
760420															
760430															
760440															
760450															
760460															
760470															
760500															
760510															
760520															
760530															
760540															
760550															
760560															
760570															
760600															
760610															
760620															
760630															
760640															
760650															
760660															
760670															
760700															
760710															
760720															
760730															
760740															
760750															
760760															
760770															
761000															
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11							

DEV	UNIT	ADDRESS
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ADDRESS	DEVICE							DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11								
761000															
761010															
761020															
761030															
761040															
761050															
761060															
761070															
761100															
761110															
761120															
761130															
761140															
761150															
761160															
761170															
761200															
761210															
761220															
761230															
761240															
761250															
761260															
761270															
761300															
761310															
761320															
761330															
761340															
761350															
761360															
761370															
761400															
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11							

DEV	UNIT	ADDRESS
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ADDRESS	DEVICE							DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11								
761400															
761410															
761420															
761430															
761440															
761450															
761460															
761470															
761500															
761510															
761520															
761530															
761540															
761550															
761560															
761570															
761600															
761610															
761620															
761630															
761640															
761650															
761660															
761670															
761700															
761710															
761720															
761730															
761740															
761750															
761760															
761770															
762000															
	DJ11	DH11	DQ11	DUP11	LK11	DMC11	DZ11	KMC11							

DEV	UNIT	ADDRESS
_____	_____	_____
_____	_____	_____

6. After you have recorded all floating address devices, you can read the UNIBUS address for each device unit directly from the worksheet.

E.2 FLOATING VECTORS

Many devices have floating vectors. The vector assignment sequence is normally the same sequence as that which the devices enter production. A vector for a new hardware option is not inserted before the vector for a device that is already in production. Gaps in the vector assignments are not required. The floating vectors begin at address 300 and proceed continuously upwards. The vector assignment sequence for current devices is defined below.

Device	First Address	Next Address	Vector Size	Max No. of Units	BR Level
DC11	174000	+10	10	32	BR5
KL11,DL11A,B	176500	+10	10	16	BR4
DP11	174770	- 10	10	32	BR5
DM11A	175000	+10	10	16	BR5
DN11	175200	+10	4	16	BR4
DM11BB	170500	+10	4	16	BR4
DR11A,C	167770	- 10	10*	32	BR5
PA611 READER	172600	+ 4	4*	16	BR4
PA611 PUNCH	172700	+ 4	4*	16	BR4
DT11 (DT03-FP)	174200	+ 2	10*	8	BR7
DX11	176200	+40	10*	4	BR4
DL11C,D,E	175610	+10	10*	31	BR4
DJ11	FLOAT	+10	10*	16	BR5
DH11	FLOAT	+20	10*	16	BR5
GT40	172000		20*		BR4
LPS11	170400	+40	30*	14	BR5
DQ11	FLOAT	+10	10*	16	BR5
KW11W	172400	NA	10*	1	BR6
DU11	FLOAT	+10	10*	16	BR5
DUP11	FLOAT	+10	10*	16	BR5
DV11	175000	+40	20*	4	BR5
LK11	FLOAT	+10	10*	1	BR4
DMC11	FLOAT	+10	10*	16	BR5
DZ11	FLOAT	+10	10*	8	BR5
KMC11	FLOAT	+10	10*	3	BR5

*The first vector for the first device of this type must always be on a 10 (8) boundary.

E.3 LINE PRINTER ADDRESSES AND VECTORS

Table E-1 shows the correct addresses and vectors to be assigned for printers attached to TRAX hardware configurations.

Table E-1 Line Printer Addresses and Vectors

Line Printer Number	Base Address	Vector Address
0	177514	200
1	164004	170
2	164014	174
3	164024	270
4	164034	274
5	164044	774
6	164054	770
7	164064	764

E.4 ASSIGNMENT OF DUP11 INTERFACES

DUP11 interfaces are used both in the applications terminal services part of a TRAX system as well as in the TRAX/3271 communications option.

The addressing of the DUP11 interfaces begins at address XXXXXX, depending on where the first DUP11 interface falls within the floating address space. This first interface is known as DUP11 0. All other interfaces number upward.

Assuming that there are N DUP11 interfaces in the system, and M of them are allocated to the TRAX/3271 communications option, then the DUP11 interfaces are arranged as follows:

1. DUP11 0 through N-M-1 are assigned to the transaction processor environment.
2. DUP11 N-M through N-1 are assigned to TRAX/3271.

E.5 ASSIGNMENT OF DZ11 MULTIPLEXERS

DZ11 multiplexer controllers are used both in the support environment as well as under the applications terminal service.

The addressing of the first DZ11 multiplexer begins at position YYYYYY, depending on where the first DZ11 multiplexer falls in the floating address space. This multiplexer is known as DZ11 0. All other DZ11 multiplexers number upward.

Assuming that there are X DZ11 multiplexers (DZ11E, F units count as two DZ11 multiplexers), and Y DZ11 multiplexers have been assigned to the support environment, then the DZ11 multiplexers are arranged as follows:

1. DZ11 0 through Y-1 are allocated to the support environment.
2. DZ11 Y through X-1 are allocated to the transaction processing environment.

APPENDIX F

**MAXIMUM STORAGE SIZES OF TRAX
SUPPORTED DISKS**

Table F-1 lists the maximum amount of storage available on each type of disk drive supported by TRAX. The storage amounts are given in total bytes/pack and total number of blocks/pack (512 bytes/block).

Table F-1 Disk Pack Storage Capacities

Disk Type	Size in Bytes	Size in Blocks
RK07	27,529,216	53,768
RM02	67,420,160	131,680
RM03	67,420,160	131,680
RP04	87,960,576	171,798
RP05	87,960,576	171,798
RP06	174,423,040	340,670

APPENDIX G

OTHER USES OF THE AUTO UTILITY

In addition to its use by the SYSGEN utility for determining the current system's hardware configuration (Chapter 4), the AUTO utility can be used by the DIGITAL Field Service Engineer to check the validity of the addressing of the hardware he has just installed to see if it can be supported by a TRAX system.

The system manager may also use the AUTO utility to perform several functions:

1. Print a hardware configuration report for a specified TRAX system.
2. Create/modify an autosize data file using the manual mode of dialogue specification.

The latter function is useful in preparing for system generations where the desired hardware configuration is different from the configuration on which the system generation will take place (automatic mode would give the wrong results).

In Section G.1, the running of AUTO in stand alone mode under the baseline system after the hardware installation is complete is detailed. Section G.2 discusses the use of the utility to generate hardware configuration reports. Section G.3 details how to use the utility to create and/or modify a hardware configuration data file using the dialogue process.

CAUTION

Do not use the AUTO utility on the system console terminal (TT0:) on ANY TRAX system except the baseline system. The AUTO utility attempts the automatic hardware auto-size operation when running from TT0:; and if executing under some other system other than the baseline system, will interfere with the execution of the KERNEL executive of the system leading to system crashes or faulty operation.

G.1 CHECKING THE HARDWARE INSTALLATION ADDRESSING

Once the procedures of Chapter 2 has been completed, the following steps can be executed to invoke the AUTO utility and check the installed hardware configuration.

Other Uses of the Auto Utility

Assuming that the target system generation disk has been loaded with the baseline system image, boot the disk using the procedure detailed in Appendix A. (This may have already been accomplished as indicated at the end of Chapter 2.)

If the required files tape from the TRAX distribution kit has not been processed yet, the baseline system begins execution and starts up the COPYFILES utility. In this case, respond to the first query with CTRL/Z to terminate COPYFILES operation and return to DCL command level.

If the required files tape has been processed previously, the INIT utility leaves you at DCL command level when it completes the startup process.

CAUTION

All disk drives with dual-port switches **MUST** have their dual-port switches set to the port (either A or B) corresponding to the CPU on the system where autosizing is taking place.

For the following checkout procedure, you must be operating from the System Console Terminal. Start up the AUTO utility with the following DCL command:

```
RUN $AUTO
```

AUTO begins execution by displaying its program herald and then asks which type of CPU it is running on:

What type of CPU do you have <11-70>?

Valid responses are 11-34, 11-60, and 11-70 (the default).

AUTO now performs the hardware search. None of the normal dialogue queries usually asked during autosizing appears during this execution of the AUTO utility.

When it is done, the hardware configuration report discussed in Section 4.2.2.3 is printed on the first system line printer. (See Appendix D if you do not have a working line printer). An example of such a report is shown in Section H.3 of Appendix H.

Instead of asking the query "Is the autosize report. . .," AUTO simply issues a statement that says that the hardware configuration can or can not be used for running a TRAX system. AUTO then terminates execution and returns you to DCL command level.

G.2 PRINTING HARDWARE CONFIGURATION REPORTS

Any time you are running under the support environment, from a terminal other than the system console terminal (TT0:), you may execute AUTO

to read an autosize data file and print the resulting hardware configuration report (the report files are never stored on disk).

Begin by invoking AUTO via the DCL command:

```
RUN $AUTO
```

AUTO recognizes that it is not running from the system console terminal and proceeds to enter its dialogue and report processing.

AUTO first queries you if there is a data file to be processed:

Is there an autosize file for the target machine <YES,>?

Respond with YES and AUTO asks for the file specification:

```
Autosize file name <[200,201] AUTOSIZE.DAT>?
```

Respond with either a simple <RET> for the default (current system data file), or supply the file specification of the data file to be used. A missing file causes AUTO to repeat the query.

AUTO now prints the hardware configuration report as detailed in Section 4.2.2.3. An example of such a report is shown in Section H.3 of Appendix H. See Appendix D if you do not have an available line printer on the system.

AUTO next queries for your acceptance of the report:

```
Is the autosize report accurate <YES>?
```

Since you are only interested in the report itself, respond with YES. AUTO terminates further processing and leaves you at DCL command level.

G.3 CREATING(MODIFYING) AN AUTOSIZE DATA FILE

Any time you are running under the support environment, from a terminal other than the system console terminal (TT0:), you may execute AUTO to create (or modify) an autosize data file using the manual mode dialogue.

You must be logged-in under the system manager's account, [1,1], to perform the file creation/modification operation. Also remember that the file produced by AUTO is [200,201]AUTOSIZE.DAT. If such a file already exists and you wish to save, use the RENAME or COPY commands to change the file name and/or move it to a different device and/or UFD.

Other Uses of the Auto Utility

Begin by invoking AUTO via the following DCL command:

```
RUN $AUTO
```

AUTO recognizes that it is not running on the system console terminal and proceeds to enter its dialogue and report processing.

AUTO first queries you for the presence of a file to be modified:

Is there an autosize file for the target machine <YES>?

If you wish to modify an existing file, respond with YES and AUTO asks for the file specification.

Autosize file name <[200,201]AUTOSIZE.DAT>?

Respond with either a simple <RET> for the default (current system data file), or supply a file specification for the file to be modified. A missing file causes AUTO to repeat the query.

If you respond to the Is there an autosize file... query with a simple a <RET>, AUTO begins the manual mode dialogue sequence detailed in Sections 4.2.2.4.1 through 4.2.2.4.3. Answer the queries of the sequence as you would during a normal system generation.

After completing the dialogue, or immediately after specifying a file to be modified, AUTO prepares and prints the hardware configuration report described in Section 4.2.2.3. An example of such a report is shown in Section H.3 of Appendix H.

AUTO queries for you acceptance of the data as shown:

Is the autosize report accurate <YES>?

Respond with NO, and the manual mode of dialogue specification is restarted from the beginning, allowing respecification of data. If you are creating a new data file, the defaults of the queries are those from your previous responses. If you are modifying an old data file, the query defaults are taken from the data file. Of course, if this is a subsequent time through the dialogue sequence, the defaults are your previous responses.

When the file is correct to your satisfaction, respond with YES to the above query and AUTO creates/recreates the autosize data file [200,201] AUTOSIZE.DAT to preserve your selections and data. AUTO then terminates and returns you to DCL command level.

APPENDIX H

SAMPLE SYSTEM GENERATIONS

In this appendix, two examples of TRAX system generations are presented. Both the 11-34 CPU (Section H.1) and the 11-70 CPU (Section H.2) are highlighted.

The examples cover two basic system forms:

1. Complementary pair of systems.
2. Large systems supporting both environments simultaneously.

Both methods of hardware configuring are illustrated:

1. Manual (Section H.1)
2. Automatic (Section H.2)

Scattered throughout the examples are many of the devices supported by TRAX. Examples of the reports produced by the SYSGEN, AUTO, and SETUP utilities appear only in the second example (Section H.2).

H.1 COMPLEMENTARY PAIR OF SMALL SYSTEMS

The system generation example presented in this section shows the generation of a transaction processing environment with minimum support environment system, followed by tailoring of a complementary support environment only version of the original system. This is done as an on-line system generation on an 11-34.

The example illustrates the following characteristics:

1. CPU is 11-34.
2. Memory size is 248 kilo bytes.
3. The final result is a pair of complementary systems.
4. Hardware configuring is performed by the automatic method.
5. One transaction processor is supported.
6. There are no communications options.
7. COBOL language is present.
8. One DZ11 multiplexer exists in the support environment, with a single VT52 terminal attached to interface 0, and the other seven interfaces deactivated.

Sample System Generations

The example includes making a copy of the baseline system after COPYFILES has completed. This procedure is detailed in Appendix C. SETUP is run twice to generate the Application Only system "DZ34" and the Support Only system "DEV34".


```
>SHOW DEFAULT
  DB0:[1,1]
```

```
>
>ALLOCATE DB2:
>RUN $SETUP
```

SETUP V1.0

The system management utility

Setup command <EXIT>? BAD

Device to be checked for bad blocks? DB2:

BAD -- TOTAL NO. OF BAD BLOCKS = 1.

Setup command <EXIT>?

```
>
>ARCHIVE/VOLUME/RESTORE MM0:RP0634 DB2:
>ASSIGN DB2: SY0:
>ASSIGN DB2: LB0:
>ASSIGN DB2: SP0:
>
>MOUNT DB2: TRAXV01
>
>SET DEVICE:DB2 PUBLIC
>
>COPY DB0:[111,3]AUTO34.DAT [200,201]AUTOSIZE.DAT
>
>RUN $COPYFILES
```

COPYFILES V01-00
Copy Files From Distribution Kit To SYSGEN Disk

Are any files to be skipped <NO>?

For what CPU type is this system destined <70>? 34

Do you want to read the Required Files tape <YES>?

Please mount the Required Files Tape.

Respond with the device name and unit number? MM0:

```
13:29 BEGIN Tape Copy Operation
14:13 END Tape Copy Operation
```

Do you want to read the BASIC-PLUS 2 Language Options Tape <NO>?

Do you want to read the COBOL-11 Language Options Tape <NO>? Y

Please mount the COBOL-11 Language Option Tape

Respond with the device name and unit number? MM0:

```
14:17 BEGIN Tape Copy Operation
14:40 END Tape Copy Operation
```

Do you want to read the TRAX/TL Communications Option Tape <NO>?

Do you want to read the TRAX/3271 Communications Option Tape <NO>?

Please mount the Change Tape.

Respond with the device name and unit number? MM0:

```
14:44 BEGIN Tape Copy Operation
14:58 END Tape Copy Operation
```

Do you want the Release Notes printed <NO>?

Sample System Generations

Terminal definition is complete.

Task installation is complete.

Account function <EXIT>?

Losins are temporarily disabled!
Losins are now enabled!

% All local assignments on this terminal have been deleted.

>

What file should be BOOTed in <TRAX>? DEV34

>RUN \$SYSGEN

TRAX System Generation Procedure

COPYRIGHT (c) 1977, 1978
Digital Equipment Corporation, Maynard MA 01754

SYSGEN invoked on 03-Aug-78 at 04:40 PM

Dialogue prompts may be "long" or "short" in form. The long form gives additional explanatory text about the query and the data to be entered. The short form presents only the minimum prompt text required to identify the query.

During the short form dialogue, use of the "?" response to a specific prompt will cause the associated long form text to be printed out and the query re-issued.

Do you want the "long" form of the dialogue <NO>?

Do you want to restore data from a previous dialogue <NO>?

Headings? TRAX

Are you generating a Support Environment only system <NO>?

Are you working stand-alone on the target machine <YES>? N

Is there an autosize file for the target machine <YES>?

Autosize file name <[200,201]AUTOSIZE.DAT>?

Is the autosize report accurate <YES>? N

Now you must specify the system configuration manually.

Some of the devices asked about below are not supported by TRAX, but may be on your machine anyway. We must know about all these devices so that we can figure out where the TRAX supported devices are located.

What type of CPU do you have <11-70>? 11-34

Does your CPU have the floating point option <YES>?

How many kilobytes of memory on the target machine <248>?

What is your power line frequency <60>?

Is there an RP05/06 disk type RH11 controller present <YES>?

How many disk drives are on this controller <3>? 4

Is there an TU16/TU45/TE16 type RH11 controller present <YES>?

How many tape formatters are on this controller <1>?

How many tape drives are on formatter #0 <2>?

Is there an RM02/03 disk type RH11 controller present <NO>?

Is there an another type RH11 controller present <NO>?

How many TS03/TU10 TAPE devices do you have <0>?

How many Console DL devices do you have <1>?

How many DL11-D devices do you have <0>?

How many LP11 devices do you have <1>?

Is printer #0 an LA180 <NO>?

How many KMC11 devices do you have <2>?

How many DUP11 devices do you have <8>?

How many DUP11 units are in your A.E. <8>? 0

How many DUP units are in your TRAX/3271 option <0>?

How many DZ11 devices do you have <3>? 4

How many DZ11 units are in your A.E. <4>? 2

How many DZ11 units are in your S.E. <0>? 1

Do your S.E. DZ11 units need dial-in support <NO>?

How many terminals are active on the first S.E. DZ11 <8>? 1

How many DV11 devices do you have <0>?

How many DMC11 devices do you have <3>?

What type DMC is unit #0 <Full-duplex>?

What type DMC is unit #1 <Full-duplex>?

What type DMC is unit #2 <Full-duplex>?

How many RK07 devices do you have <3>? 0

How many KW11-L devices do you have <1>?

How many KW11-P devices do you have <1>?

How many DJ11 devices do you have <0>?

Sample System Generations

How many DH11 devices do you have <0>?

How many DQ11 devices do you have <0>?

How many DU11 devices do you have <0>?

How many DR11 devices do you have <0>?

How many DL11A,B devices do you have <0>?

How many DM11-BB Modem devices do you have <0>?

How many LK11 devices do you have <0>?

How many DC11 devices do you have <0>?

How many PA611 Card Read devices do you have <0>?

How many PA611 Card Punch devices do you have <0>?

Is the autosize report accurate <YES>?

Application Terminal Support Dialogue

Maximum # of concurrently active transaction processors <1>?

How many DZ lines do you desire in your configuration <16>?

At what speed does DZ-11 channel #1-0 operate <9600>?

Does DZ-11 channel #1-0 require dial-in support <NO>?

DZ-11 channel #1-0 connects to what type of terminal <VT62>?

How many terminals are connected to DZ-11 channel #1-0 <1>?

Repeat count <15>?

Do you want to modify the VT62 error messages <NO>?

Disposition of your option/configuration listings <PRINT>?

Are you satisfied with your option/configuration selections <YES>?

The dialogue phase of SYSGEN is now complete. The next phase is the staged system generation of the target TRAX system.

The "back-tracking" feature of the SYSGEN query function can not be used to re-enter the dialogue section at this point. In order to do that, you must abort the SYSGEN operation by responding with CTRL/Z to any subsequent queries. You may then re-start the SYSGEN process from the beginning.

Do you want to perform all stages of generation <YES>?

KERNEL generation started on 03-Aug-78 at 04:45 PM

KERNEL UTILITIES generation started on 03-Aug-78 at 05:12 PM

TRAX EXECUTIVE and UTILITIES generation started on 03-Aug-78 at 05:57 PM

LANGUAGE SUPPORT generation started on 03-Aug-78 at 06:21 PM

APPLICATIONS TERMINAL SERVICE generation started on 03-Aug-78 at 06:28 PM

Sample System Generations

Please mount the KERNEL Image Save Tape.

Respond with the device name and unit number? MM0:

SYSGEN has ended. SETUP is now running.

>
>

>

TRAX System Generation Procedure

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SYSGEN invoked on 03-Aug-78 at 14:59

Dialogue prompts may be "long" or "short" in form. The long form gives additional explanatory text about the query and the data to be entered. The short form presents only the minimum prompt text required to identify the query.

During the short form dialogue, use of the "?" response to a specific prompt will cause the associated long form text to be printed out and the query re-issued.

Do you want the "long" form of the dialogue <NO>? ^Z

>

>DIS DB2: TRAXV01

>DEASSIGN/ALL

>

>ALLOCATE MM0:

>

>ARCHIVE/VOLUME/DENSITY:1600 DB2: MM0:SAVE

>

>DEALLOCATE MM0:

>

>MOUNT DB2: TRAXV01

>

>SET DEVICE:DB2 PUBLIC

>

>ASSIGN DB2: SY0:

>ASSIGN DB2: LBO:

>ASSIGN DB2: SPO:

>

Target system name? DZ34

You have 92 Kbyte blocks of memory left. Allocate this memory among your transaction processors. Any amount un-allocated will be added to GEN.

What % of the remaining space is for TP # 1? 100

You have specified a size of 92 Kbytes for this transaction processor partition.

% This TP partition will not support the resident RMS feature.

Sample System Generations

Terminal command <EXIT>? ADD

Terminal number? 1

Speed <2400>? 9600

VT52 terminal <YES>?

Width <80>?

Lower case <YES>?

Remote terminal <NO>?

Slave terminal <NO>?

Terminal command <EXIT>?

Partition definition is complete.

Driver installation is complete.

Terminal definition is complete.

Task installation is complete.

We are creating a new account file!

Account function <EXIT>? ADD

What is the account's UIC? 1,1

What is the password? TRAX

Last name? TRAX

First name? TRAX

Default system device <SY>?

UFD -- DIRECTORY ALREADY EXISTS

What is the account's UIC?

Account function <EXIT>?

Logins are temporarily disabled!

Logins are now enabled!

% All local assignments on this terminal have been deleted.

What file should be BOOTed in <TRAX>? ^Z

>ASSIGN DB2: SY0:

>ASSIGN DB2: LB0:

>ASSIGN DB2: SP0:

>

>RUN \$SETUP

SETUP V1.0 - The system management utility

Setup command <EXIT>? DEV

Target system name? DEV34

Terminal command <EXIT>? ADD

Terminal number? 1

Speed <2400>? 9600

VT52 terminal <YES>?

Width <80>?

Lower case <YES>?

Remote terminal <NO>?

Slave terminal <NO>?

Terminal command <EXIT>?

Partition definition is complete.

Driver installation is complete.

H.2 LARGE ALL-PURPOSE SYSTEM

The final example shows a very large system capable of supporting two transaction processor environments as well as a support environment for application development and support. The system generation is done stand-alone on an 11-70. The system has the following general characteristics:

1. CPU is 11-70.
2. Memory size is 1240 kilo bytes.
3. Hardware configuring is performed by the automatic method.
4. One transaction processor is supported.
5. The transaction processor portion receives 639 kilo bytes of memory. The rest is allocated to the support environment.
6. The language chosen is COBOL.
7. One DZ11 is allocated to the support environment, supporting eight VT52 terminals.

This example starts with the booting of the DSC tape and assures that the disk has already been checked for bad blocks.

RSX11S V2.1 BL22 DISK SAVE AND COMPRESS UTILITY

DSC>DB0:/VE=MMO:RP0670/RW
DSC -- 45 START VFY PASS

DSC>

TRAX TRANSACTION PROCESSING SYSTEM VERSION 1.0

>
>>
>>>
>>>>
>>>>>

>RUN \$INIT
Target system name? BASLIN

Time? 17:55

Date? 05-AUG-78

INIT has successfully finished.

>

>RUN \$COPYFILES

COPYFILES V01-00
Copy Files From Distribution Kit To SYSGEN Disk

Are any files to be skipped <NO>?

For what CPU type is this system destined <70>?

Do you want to read the Required Files tape <YES>?

Please mount the Required Files Tape.

Respond with the device name and unit number? MMO:
17:57 BEGIN Tape Copy Operation
18:21 END Tape Copy Operation

MTAACP -- MMO: ** DISMOUNT COMPLETE **

Do you want to read the BASIC-PLUS 2 Language Options Tape <NO>?

Do you want to read the COBOL-11 Language Options Tape <NO>? YES

Please mount the COBOL-11 Language Option Tape

Respond with the device name and unit number? MMO:
18:27 BEGIN Tape Copy Operation
18:44 END Tape Copy Operation

MTAACP -- MMO: ** DISMOUNT COMPLETE **

Do you want to read the TRAX/TL Communications Option Tape <NO>?

Do you want to read the TRAX/3271 Communications Option Tape <NO>?

Please mount the Change Tape.

Respond with the device name and unit number? MMO:
18:46 BEGIN Tape Copy Operation
18:54 END Tape Copy Operation

Sample System Generations

MTACCP -- MMO: ** DISMOUNT COMPLETE **

Do you want the Release Notes printed <NO>?

>
>@ <EOF>
>

TRAX System Generation Procedure

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SYSGEN invoked on 05-Aug-78 at 06:54 PM

Dialogue prompts may be "long" or "short" in form. The long form gives additional explanatory text about the query and the data to be entered. The short form presents only the minimum prompt text required to identify the query.

During the short form dialogue, use of the "?" response to a specific prompt will cause the associated long form text to be printed out and the query re-issued.

Do you want the "long" form of the dialogue <NO>?

Do you want to restore data from a previous dialogue <NO>?

Headings? TRAX70 EXAMPLE

Are you generating a Support Environment only system <NO>?

Are you working stand-alone on the target machine <YES>?

What type of CPU do you have <11-70>?

What is your power line frequency <60>?

You have 1 LP11 devices.

Is printer #0 an LA180 <NO>?

You have 8 DZ11 devices.

How many DZ11 units are in your A.E. <8>? 0

How many DZ11 units are in your S.E. <0>? 1

Do your S.E. DZ11 units need dial-in support <NO>?

How many terminals are active on the first S.E. DZ11 <8>?

You have 16 DUP11 devices.

How many DUP11 units are in your A.E. <16>? 8

How many DUP units are in your TRAX/3271 option <0>?

You have 2 DMC11 devices.

What type DMC is unit #0 <Full-duplex>?

What type DMC is unit #1 <Full-duplex>?

Is the autosize report accurate <YES>?

Application Terminal Support Dialogue

Maximum # of concurrently active transaction processors <1>?

Is DUP-11 #0 FULL or HALF duplex <FULL>?

Does DUP-11 #0 require dial-in support <NO>?

How many terminals are connected to DUP-11 #0 <1>? 8

Repeat count <7>?

Do you want to modify the VT62 error messages <NO>?

Disposition of your option/configuration listings <PRINT>?

Are you satisfied with your option/configuration selections <YES>?

The dialogue phase of SYSGEN is now complete. The next phase is the staged system generation of the target TRAX system.

The "back-tracking" feature of the SYSGEN query function can not be used to re-enter the dialogue section at this point. In order to do that, you must abort the SYSGEN operation by responding with CTRL/Z to any subsequent queries. You may then re-start the SYSGEN process from the beginning.

Do you want to perform all stages of generation <YES>?

KERNEL generation started on 05-Aug-78 at 07:20 PM

KERNEL UTILITIES generation started on 05-Aug-78 at 07:43 PM

TRAX EXECUTIVE and UTILITIES generation started on 05-Aug-78 at 08:10 PM

LANGUAGE SUPPORT generation started on 05-Aug-78 at 08:31 PM

APPLICATIONS TERMINAL SERVICE generation started on 05-Aug-78 at 08:37 PM

Please mount the KERNEL Image Save Tape.

Respond with the device name and unit number? MM0:

MTAACP -- MM0: ** DISMOUNT COMPLETE **

SYSGEN has ended. SETUP is now running.

>
>

Target system name? TRAX70

Full support environment <NO>? YES

You have 912 Kbyte blocks of memory left. Allocate this memory among your transaction processors. Any amount un-allocated will be added to GEN.

What % of the remaining space is for TP # 1? 70

You have specified a size of 639 Kbytes for this transaction processor partition.

The un-allocated memory, 274 K bytes, will be added to GEN.

Sample System Generations

Terminal command <EXIT>? ADD

Terminal number? 1

Speed <2400>?

VT52 terminal <YES>?

Width <80>?

Lower case <YES>?

Remote terminal <NO>?

Slave terminal <NO>?

Terminal command <EXIT>? COPY

From terminal? 1

To terminal? ALL

Terminal command <EXIT>?

Partition definition is complete.

Driver installation is complete.

Terminal definition is complete.

Task installation is complete.

We are creating a new account file!

Account function <EXIT>? ADD

What is the account's UIC? 1,1

What is the password? TRAX

Last name? TRAX

First name? TRAX

Default system device <SY>?

UFD -- DIRECTORY ALREADY EXISTS

What is the account's UIC?

Account function <EXIT>?

Logins are temporarily disabled!

Logins are now enabled!

% All local assignments on this terminal have been deleted.

What file should be ROOTed in <TRAX>? ^Z

APPENDIX I

DEMONSTRATING THE TARGET SYSTEM

In this appendix, the validation procedure detailed in Chapter 6 is expanded into a demonstration procedure suitable for showing how to control a transaction processor and many sample interactions using the VT62 applications terminal (and an LA180 DECprinter terminal, if available).

The appendix first describes the sample application, on which the demonstration procedure is executed. After discussing how to reset the application data file set back to its original values, you are also shown how to set up a magnetic tape for journaling, how to associate actual application terminals with the terminals stations of the sample application, how to define an output-only report station for use with the LA180 DECprinter, and how to handle the case of running the demonstration without an output-only terminal (the demonstration produces several printed reports).

Once the application definitions are completely setup, the demonstration procedure is presented.

I.1 SETTING UP THE SAMPLE APPLICATION FOR DEMONSTRATION

The sample application is a representative order-entry application for a rare coin distributorship.

DISCLAIMER

DIGITAL takes no responsibility for the suitability or accuracy of the implementation of the SAMPLE transaction processor. No claim is made that this implementation is the only implementation or the best implementation. The sample application is intended only for demonstration of the various aspects of TRAX transaction processor handling.

The coin distributorship maintains several data files. Each customer is recorded in the customer file. The current inventory is cataloged in the inventory file and receipts and disbursements are recorded in the payments file.

Demonstrating the Target System

For purposes of demonstration, the design of the sample application concentrates on order entry, both over the counter as well as by telephone or mail. Each order and its associated invoice(s) is kept in a general order data file. This file contains the data of the order, its line items, associated invoices, and the status of its disposition.

Finally, backorder requests are maintained in a separate file so that quick resolution of the backordered items is possible when new stock is received.

Fifteen transactions are implemented in the sample application (an additional four transactions that are variations of some of the original ones are also included and are used to provide examples in the TRAX documentation set). A brief listing of the transactions and their capabilities are listed below.

ADDCST - Add Customer

Allows a new customer to be added to the customer file.

ADDSTK - Add Stock Item

Allows a new stock item to be added to the inventory file.

CHNCST - Change Customer Data

Allows editing of a customer's data record from the customer file.

CHNSTK - Change Stock Item Data

Allows editing of a stock item record from the inventory file.

APPPAY - Apply Payments

Permits acceptance of payments against invoices and records them in the payments file.

DPYCST - Display Customer Data

Displays the data in a customer file record.

DPYBCK - Display Backorder Information

Displays data from the backorder file.

DPYINV - Display Invoice Data

Displays data from an order invoice.

DPYORD - Display Order Data

Displays data about an order.

DPYSTK - Display Stock Item Data

Displays data from a stock item record.

ENTORD - Enter An Order

This is the primary order-entry transaction. Up to 16 items can be ordered at any one time. The items requested are verified as present or backordered if the customer so desires. When the order is complete, a confirmation report is printed for mailing to the customer, a picking list slip is sent to the stock room. The order data is added to the order file.

CSHSAL - Cash Sale

Like the enter-an-order transaction, except that the stock is delivered immediately, an invoice is printed for the entire order, and payment is received on the spot.

SHPORD - Ship An Order

Used by the stock room to ship all or part of any order. For any part shipped, an invoice is created and added to the order file.

RCVSTK - Receive Stock

Allows new stock to be received by the distributorship. Stock is entered into inventory, with reservation of items for purposes of filling backorders before filling regular orders.

PROBCK - Process Backorders

Moves items on backorder status to ready to ship status in the order file when stock is available to satisfy the requirements. The items can then be shipped in the normal fashion.

Included with the transaction processor are a set of data files containing a standard set of data. These files are used during the execution of a sequence of preselected transactions and user responses to demonstrate the target system.

The data files supplied with the SAMPLE transaction processor contain the following data:

25	Customers
50	Stock types, of varying quantity
10	Currently unfilled orders
3	Invoices
5	Backorders
1	Payments received or disbursed

Demonstrating the Target System

A brief explanation is in order for the stock item number coding scheme chosen for the sample application. The number consists of five parts:

1. Value of coin
2. Type of coin
3. Year of minting
4. Location of mint
5. Condition of coin

Table I-1 lists the the possible values for each of the parts. The year of minting is coded simply as the last three digits of the year.

Table I-1 Stock Item Number Coding Scheme

vvttyyymc

Value	Type	Year of Mint	Mint Code	Location City	Condition
01	C Cent	791-	A	Atlanta	0 Poor to 9 Mint
05	D Dollar	999	B	Boston	
10			C	Chicago	
25			D	Denver	
50			K	Kansas City	
			L	Los Angeles	
			N	New York	
			P	Philadelphia	
			S	San Francisco	
			W	Washington, D.C.	

I.1.1 Restoring The Original Demonstration Data Files

Once the validation procedure has been executed (Chapter 6), the data file set is no longer usable for validation purposes (the files can still be used for demonstrations).

To restore the demonstration data files to their original state, execute the following set of DCL commands from the system manager's account, [1, 1]:

```
SET DEFAULT [1,300]
COPY *.VAL *.DAT
PURGE *.DAT
SET DEFAULT [1,1]
```

The files, *.VAL, are copies of the original data files. They should not be modified at anytime or the validation procedure becomes worthless.

I.1.2 Setting Up the Journaling Device

NOTE

Some installations will generate complementary systems. In these cases, the running of SYSMOD and STADEF must take place under the support environment only system, followed by booting in the transaction processor environment system to perform the demonstration procedure.

As part of the demonstration of the SAMPLE transaction processor on the target system, a single magnetic tape is established as the journaling device.

Selection of journaling is made through the TPDEF utility, and it comes preselected as part of the definition of the SAMPLE transaction processor.

To prepare for journaling, select an available tape drive and hang a 2400-foot magnetic tape, with the write protect ring left in the reel and the tape positioned to LD PT.

If you have previously used the SYSMOD utility to specify the journal device, then skip to the next section on terminal specification. Otherwise, the following sequence of operations is performed. (See the TRAX System Manager's Guide for a discussion of the SYSMOD utility).

From the system manager's account, [1, 1], using the system console terminal, invoke the SYSMOD utility via the following DCL command:

```
RUN $SYSMOD
```

The utility responds by printing its herald message followed by a request for some command to process:

Command <EXIT>?

Since no journaling device has previously been specified for the target system, you respond to the query with CHANGE.

SYSMOD next asks for the name of the old journal device:

Old device?

Respond with NONE. SYSMOD then asks for the name of the new journal device:

Demonstrating the Target System

New device?

Respond with the tape drive name and unit number of the chosen magnetic tape drive in the form MMn.

SYSMOD completes the reassignment and queries for another command to process:

Command <EXIT>?

Respond with a simple <RET> and SYSMOD terminates operation.

The target system immediately recognizes the presence of the new journal tape and initializes it for use.

I.1.3 Specifying The Test Application Terminals

The SAMPLE transaction processor is defined with four input-output terminal stations and one output-only terminal station. Before the SAMPLE transaction processor can be used during the demonstration procedure, proper assignment of target system application terminals is made through the use of the STADEF utility.

The names, terminal types, and input-output characteristics of the SAMPLE terminal stations is shown in Table I-2.

Table I-2 Sample Application Terminal Station Data

Station Name	Terminal Type	Input/Output	Logical Terminal Assigned
TERM1T	VT62	Both	
TERM2T	VT62	Both	
TERM3T	VT62	Both	
TERM4T	VT62	Both	
OUTSTA	LA180	Output	

If your installation does not have at least one output-only application terminal (LA180), ignore the part of the assignment procedure for Station OUTSTA. After processing the VT62 terminal stations, perform the steps in Section I.2.3 for creating a mailbox station that will be used as a substitute for the missing output-only terminal.

If you have not done so, read Chapter 5 of the TRAX Application Programmer's Guide on the operation of the Station Definition Utility, STADEF.

When you are ready, begin STADEF execution with the following DCL command:

```
RUN $STADEF
```

After printing its herald, STADEF asks you for the name of the transaction processor with the following question:

Transaction processor name?

Respond with SAMPLE to access the specifications of the Sample transaction processor to be used in the demonstration.

STADEF next asks for the command to be executed:

Command <EXIT>?

Respond with EDIT, as you will be editing the SAMPLE transaction processor specifications for its five terminal stations in order to associate the stations with actual application terminals to be used.

To illustrate, three types of terminals might be redefined:

1. VT62 terminal (001V62).
2. LA180 DECprinter attached to a VT62 terminal (VT62 terminal name is 003V62).
3. LA180 DECprinter attached directly to a DZ11 multiplexer terminal interface (005L18).

The six character names in parentheses are the ATS logical terminal names assigned to the terminals during system generation.

From the Option/Configuration listing produced by the SYSGEN utility (Section 4.2.5), select four of the VT62 application terminals and write their logical terminal names into the column provided in Table I-2. If an output-only terminal is available, write its logical terminal name into Table I-2 also. Remember that you use the VT62 logical terminal name if the LA180 is attached through the VT62 terminal.

While executing the EDIT command, STADEF first asks for the station name whose specifications are to be edited:

Station name?

Respond with one of the station names listed in Table I.1.

STADEF now asks about the type of station selected:

Station type <TERMINAL>?

The type is predefined, so you respond with a simple <RET> response.

The next query from STADEF concerns the ATS logical station name of the actual application terminal to be associated with the selected station:

Demonstrating the Target System

Name of device?

Respond with the logical terminal name as written in Table I-2.

STADEF now asks for the input-output characteristics of the selected station:

Input or output device < default >?

The default value will depend on which terminal station you selected; in any case, respond with a simple <RET> to maintain the predefined value.

If the selected terminal was the output-only terminal, STADEF is now finished with the terminal station processing for the selected station. A status message is printed, and STADEF returns to the "Station name . . ." query for more editing.

For VT62 type terminal stations, STADEF continues with more queries, all of which have predefined default responses:

Enable system messages <YES>?

Work class name <NONE>?

Will terminal run dedicated transaction <NO>?

Form name <SELMNU>?

Respond to all four queries with the simple <RET> response.

STADEF prints a status message indicating that the editing is complete and returns to the Station name . . . query for another operation.

When all station definitions have been edited, respond to the Station name . . . query with ESC (SEL) to return to command level.

After completing the demonstration procedure, you are free to try the process again using other terminals in the ATS configuration. In this way, you can verify that all terminals at your installation are performing properly.

I.1.4 Define the Output-Only Station

Because of requirements of the validation procedure (Chapter 6), the definition of the output-only station, OUTSTA, must now be made through the STADEF utility. If the definition has previously been entered, skip to the next section.

At this point, STADEF is querying for a new command to process:

Command <EXIT>?

Respond with ADD.

1. The following dialogue occurs; you must respond with the answers shown.
 - a. Station name? OUTSTA <RET>
 - b. Station type? TERMINAL <RET>
 - c. Name of device?

Respond with the logical device name of the LA180 terminal to be used. If the LA180 is attached through a DZ11 interface, respond with the actual logical terminal name (005L18, for example). If the LA180 is attached through a VT62 terminal, respond with the VT62 terminal logical terminal name (003V62, for example). If no terminal is available, respond with 000L18 as a placeholder.

2. STADEF queries once more:

Input or Output device <BOTH>?

Respond with OUTPUT. STADEF completes the station definition and issues a status message before returning to the Station name . . . query.

All terminal stations needed by the sample application have been defined. Respond to the query with ESC (SEL) to return to command level; respond with EXIT to cause STADEF to terminate execution.

I.1.5 Setup For NonExistent Output-Only Terminal

If you assigned an existing output-only terminal to station OUTSTA, proceed immediately to Section I.2 for the demonstration procedure.

For those systems without an output-only terminal, data flow to station OUTSTA must be redirected to a suitable destination that will allow the SAMPLE transaction processor to function properly.

For all systems containing at least 248 kilo bytes of memory, the redirection is made to a mailbox station, labelled ALTOUT. Systems with less than 248 kilo bytes of memory can not support mailbox stations, and thus, no redirection from OUTSTA is possible. For these systems, only a subset of the demonstration procedure will be used.

Since the mailbox station, ALTOUT, is not predefined in the SAMPLE transaction processor, you must execute STADEF once more to add the required definition.

Demonstrating the Target System

Begin the execution of STADEF with the following DCL command:

```
RUN $STADEF
```

STADEF asks for the name of the transaction processor:

Transaction processor name?

Respond with SAMPLE, STADEF next asks for the command to execute:

Command <EXIT>?

Respond with ADD, to enter a new station definition.

STADEF now asks a series of queries for data used to define the mailbox station; you must respond with the answers shown:

Station name? ALTOUT <RET>

Station type? MAILBOX <RET>

Number of stations in group <1>? <RET>

Minimum message size <64>? 2600 <RET>

STADEF responds with a status message stating that the mailbox station definition has been added to the SAMPLE transaction processor and returns to the query:

Station name?

Respond with CTRL/Z to cause STADEF to terminate further action and close its files.

The procedure for redirection of data directed to OUTSTA to the mailbox ALTOUT will take place after the SAMPLE transaction processor is installed.

I.2 DEMONSTRATION PROCEDURE USING THE SAMPLE APPLICATION

The following sequences of steps constitute a demonstration of the correct execution of the major components of the target TRAX system.

Briefly stated, the following processes are executed:

1. INSTALL SAMPLE transaction processor.
2. Redirect output-only Station, if necessary.
3. START SAMPLE transaction processor again.
4. Verify transaction selection form appearing on all terminals.
5. Display initial data file information.
6. Add a customer.
7. Change a customer's data.
8. Add a stock item.
9. Change a stock item's data.
10. Enter an order.
11. Display the entered order.
12. Ship the order.

13. Display final data file information.
14. STOP SAMPLE transaction processor.
15. REMOVE SAMPLE transaction processor.
16. INSTALL SAMPLE transaction processor, using BRIEF mode.
17. RESTART SAMPLE transaction processor.
18. Reverify transaction selection form appearing on all terminals.
19. STOP SAMPLE transaction processor.
20. REMOVE SAMPLE transaction processor.

The demonstration procedure is presented in step-by-step form. Each step details the action to be taken, and presents the results to be expected. (Terminal screen photographs are reproduced in Appendix J.)

The support environment sections of the procedure must be performed under the system manager's account, [1, 1], using the system console terminal. If difficulty arises, it may be advantageous to return a copy of the terminal dialogue to your DIGITAL Software Specialist to ascertain what caused the difficulty.

WARNING

For the minimum-sized system (less than 248 kilo bytes of memory) with no output-only terminal, the steps of the procedure prefixed with ***** must be skipped.

I.2.1 Installation of the SAMPLE Transaction Processor

1. Run the TPCTRL utility via the following DCL command:

```
RUN $TPCTRL
```

The utility responds with its herald message.

2. The following dialogue occurs; you must respond with the answers shown.
 - (a) Command <BRIEF>? INSTALL <RET>
 - (b) Transaction processor name? SAMPLE <RET>
 - (c) Partition <TP1PARK>? <RET>
 - (d) Trace transaction processor <NO>? <RET>
 - (e) Forms definition file version <LATEST>? <RET>

There must have been no error messages before the next query.

3. TPCTRL queries once more:

Command <START>?

If you will be redirecting the output-only station to a mailbox, respond with EXIT and proceed to the next section.

Otherwise, respond with a simple <RET> and proceed directly to Section I.2.3, Step 2-b.

I.2.2 *** Redirection Of Data To Mailbox Station**

Skip to the next section of the procedure if an output-only station is present and assigned to the SAMPLE transaction processor.

1. Execute the TPMOD utility via the following DCL command:

```
RUN $TPMOD
```

The utility responds with its herald message.

2. The following dialogue occurs; you must respond with the answers shown.
 - a. Transaction processor name? SAMPLE <RET>
 - b. Log file <TPMOD.LOG>? <RET>
 - c. Permanent changes <NO>? YES <RET>The redefinition now applies also to the brief installation performed in Section I.2.16.
 - d. Command <EXIT>? REDIRECT <RET>
 - e. From station? OUTSTA <RET>
 - f. To station? ALTOUT <RET>The redirection takes place and a status message appears indicating completion of the action.
3. TPMOD queries once more:

```
Command <EXIT>?  
Respond with a simple <RET>.
```

I.2.3 Start The Sample Transaction Processor

1. Run the TPCTRL utility via the following DCL command:

```
RUN $TPCTRL
```

The utility responds with its herald message.

2. The following dialogue occurs; you must respond with the answers shown.
 - a. Command <BRIEF>? START <RET>
 - b. Transaction processor name? SAMPLE <RET>
 - c. Enable journaling <YES>? No <RET>
 - d. Enable logging <NO>? <RET>

There must have been no error messages before the next query.

3. TPCTRL queries once more:

Command <EXIT>?

Respond with a simple <RET>.

I.2.4 Verify Transaction Selection Form Appearances

Shift your attention now to the four application terminals assigned to the SAMPLE transaction processor (Section I.1.2). Each VT62 screen should now be displaying the data shown in Screen 1.

Whenever the following steps in the demonstration procedure call for selection of a particular transaction, make sure that this form (Screen 1) is displayed on the terminal, and then execute the following steps:

1. Step down to the desired transaction menu item by pressing the NEXT FIELD key.
2. When the cursor is positioned at the desired transaction name, select the menu item by pressing the SELECT key. The selected item will reverse its video presentation to denote the selection.
3. Press the ENTER key to request processing of the selected transaction.

I.2.5 Display Initial Data File Information

In this sequence of actions, several of the data display transaction will be executed to view some of the records of information found in the initial data files associated with the SAMPLE transaction processor:

1. Display customer number 12.
2. Display stock item number 05C955N4.
3. Display order number 000004000200.
4. Display invoice number 000005000450.
5. Display backordered items.
6. Display customer number 12 by name.

Although, each of the display processes could be executed on a single VT62 terminal, it is recommended, if at all possible, that the first four display transactions be performed on separate applications terminals. The rest of the transactions may then be processed using a single VT62 terminal.

I.2.5.1 Display Customer Number 12 – Use the first VT62 terminal for this transaction.

1. Select the DPYCST transaction. Screen 2 will appear.
2. Type in customer number 12. Press the ENTER key for processing. Screen 3 will appear.
3. Press the AFFIRM key. Screen 1 will reappear.

I.2.5.2 Display Stock Item Number 05C955N4 – Use the second VT62 terminal for this step.

1. Select the DPYSTK transaction. Screen 4 will appear.
2. Type in stock item number 05C955N4. Press the ENTER key for processing. Screen 5 will appear.
3. Press the AFFIRM key. Screen 1 will reappear.

I.2.5.3 Display Order Number 000004000200 – Use the third VT62 terminal.

1. Select the DPYORD transaction. -Screen 6 will appear.
2. Type in order number 000004000200. Press the ENTER key for processing. Screen 7 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.5.4 Display Invoice Number 000005000450 – Use the fourth VT62 terminal.

1. Select the DPYINV transaction. Screen 8 will appear.
2. Type in invoice number 000005000450. Press the ENTER key for processing. Screen 9 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.5.5 Display Backorder Information

1. Select the DPYBCK transaction. Screen 4 will appear.
2. Type in stock item number 05D938W5. Press the ENTER key for processing. Screen 10 will appear.
3. Press the ENTER key to accept the display. Screen 11 will appear.
4. Press the STOP REPEAT key to end the transaction. Screen 1 will reappear.

I.2.5.6 Display Customer Number 12 By Name

1. Select the DPYCST transaction. Screen 2 will appear.
2. Type in customer name:

COY COINS INC

- Press the ENTER key for processing. Screen 3 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.5.7 Add Customer Record

1. Select the ADDCST transaction. Screen 12 will appear.
2. Press the FORWD FIELD key to skip to the Customer Name field.
3. Type in the Customer Name:

Joe Cool

Press the ENTER key for processing. Screen 13 will appear.

4. For the items listed in Table I-3, use the FORWD FIELD key to advance to the required field, type in the required information, and when all information has been entered, press the ENTER key for processing. Screen 14 will appear.

Table I-3

Field Name	Field Contents
Address Line #1 (ADDRESS:)	123 West First Street
Address Line #2	West Bedford
Address Line #3	North Carolina
Zip Code (ZIP CODE:)	98765
Telephone (TELEPHONE:)	(212) 555-1234

5. Press the AFFIRM key to accept the new customer record. Screen 1 will reappear.
6. Select the DPYCST transaction. Screen 2 will appear.
7. Type in customer number 26. Press the ENTER key for processing. Screen 15 will appear.
8. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.6 Change Customer Record

1. Select the CHGCST transaction. Screen 2 appears.
2. Type in customer number 8. Screen 16 will appear.
3. Press the FORWD FIELD key, repeatedly, to reach the zip code field.
4. Type in a new zip code value of 12349. Press the ENTER key for processing. Screen 17 will appear.
5. Press the AFFIRM key to accept the changed record. Screen 1 will reappear.

Demonstrating the Target System

6. Select the DPYCST transaction. Screen 2 will appear.
7. Type in customer number 8. Press the ENTER key for processing. Screen 18 will appear.
8. Press the ABORT key to end the transaction. Screen 1 will reappear.

I.2.7 Add Stock Item

1. Select the ADDSTK transaction. Screen 4 will appear.
2. Type in the stock item number 50C942K3. Press the ENTER key for processing. Screen 19 will appear.
3. For the items listed in Table I-4, use the FORWD FIELD key to advance to the required field, type in the required information, and when all information has been entered, press the ENTER key for processing. Screen 20 will appear.

Table I-4

Field Name	Field Contents
CURRENT PRICE:	10000
RESTOCK LEVEL:	2
CURRENT ON HAND:	4
SHIPPING WEIGHT:	100
STOCK LOCATION:	036:182

4. Press the AFFIRM key to accept the new stock item record. Screen 1 will reappear.
5. Select the DPYSTK transaction. Screen 4 will appear.
6. Type in the stock item number 50C942K3. Press the ENTER key for processing. Screen 21 will appear.
7. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.8 Change Stock Item Record

1. Select the CHSTK transaction. Screen 4 will appear.
2. Type in stock item number 05D974K2. Screen 22 will appear.
3. Press the FORWD FIELD key repeatedly until positioned at the Restock level field.
4. Type in the new value of 2. Press the ENTER key for processing. Screen 23 will appear.
5. Press the AFFIRM key to accept the changed record. Screen 1 will reappear.
6. Select the DPYSTK transaction. Screen 4 will appear.
7. Type in stock item number 05D974K2. Press the ENTER key for processing. Screen 24 will appear.
8. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.9 ★★★★★ Enter An Order

1. Select the ENTORD transaction. Screen 2 will appear.
2. Type in customer number 8 in the customer number field. Press the ENTER key for processing. Screen 25 will appear.
3. For the items listed in Table I-5, use the FORWD FIELD key to advance to the required field, type in the required information, and when all information has been entered, press the ENTER key for processing. Screen 26 will appear.

Table I-5

Field Name	Field Contents
Customer Purchase Order #:	321-78-A
Order taker:	WJB
Shipping instructions:	UPS

4. Position the cursor on line (1) at the stock column field. Type in stock number 25C976W0. Press the NEXT FIELD key.
5. Type 3 into the quan column field.
6. Position the cursor on line (2) at the stock column field. Type in stock number 05C957N2. Press the NEXT FIELD key.
7. Type 1 into the quan column field. Press the ENTER key for processing. Screen 27 will appear.
8. Press the ENTER key to accept the order. Screen 28 will appear.
9. Press the AFFIRM key to complete the transaction. Screen 1 will reappear.

If an output-only terminal is present and assigned, two reports: (1) picking list going to the stockroom and (2) confirmation listing of order will appear on the output-only device. Otherwise, the reports will be sent to the mailbox station, ALTOUT. The expected reports are shown in screens 29 and 30.

I.2.10 ★★★★★ Display An Order

1. Select the DPYORD transaction. Screen 6 will appear.
2. Type in Order number 000008000100. Press the ENTER key for processing. Screen 31 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.11 ★★★★★ Ship An Order

1. Select the SHPORD transaction. Screen 6 will appear.
2. Type in order number 000008000100 into the Order ID: field. Press the ENTER key for processing. Screen 32 will appear.

Demonstrating the Target System

3. Type in a single letter P, twice. (Note that the cursor automatically advances to the next field in the Pick? column). The cursor will be left pointing to the Pick? column on line 3. Press the ENTER key for processing. Screen 33 will appear.
4. Press the AFFIRM key to accept the shipment. Screen 1 will reappear.

If an output-only terminal is present and assigned, a packing slip will appear on the device. Otherwise, the report will be sent to the mailbox station, ALTOUT. The expected report is shown in screen 34.

I.2.12 Display of Final Data File Information

In this final sequence, several of the data display transactions will be executed once more to redisplay several new or modified records processed during the previous steps:

1. Display customer number 8.
2. Display customer number 26.
3. Display stock item number 25D976W0.
4. Display stock item number 05C957N2.
5. Display order number 000008000100.
6. Display invoice number 000008000150.

I.2.12.1 Display Customer Number 8.

1. Select the DPYCST transaction. Screen 2 will appear.
2. Type in customer number 8. Press the ENTER key for processing. Screen 35 will appear.
3. Press the AFFIRM key to terminate the transaction. Screen 1 will reappear.

I.2.12.2 Display Customer Number 26.

1. Select the DPYCST transaction. Screen 2 will appear.
2. Type in customer number 26. Press the ENTER key for processing. Screen 36 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.12.3 Display Stock Item Number 25C976W0.

1. Select the DPYSTK transaction. Screen 4 will appear.
2. Type in stock item number 25C976W0. Press the ENTER key for processing. Screen 37 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.12.4 Display Stock Item Number 05C957N2.

1. Select the DPYSTK transaction. Screen 5 will appear.
2. Type in stock item number 05C957N2. Press the ENTER key for processing. Screen 38 will appear.
3. Press the ABORT key to end the transaction. Screen 1 will reappear.

I.2.12.5 ★★★★★ Display Order Number 000008000100.

1. Select the DPYORD transaction. Screen 6 will appear.
2. Type in order number 000008000100. Press the ENTER key for processing. Screen 39 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.12.6 ★★★★★ Display Invoice Number 000008000150.

1. Select the DPYINV transaction. Screen 8 will appear.
2. Type in invoice number 000008000150. Press the ENTER key for processing. Screen 40 will appear.
3. Press the AFFIRM key to end the transaction. Screen 1 will reappear.

I.2.13 STOP the SAMPLE Transaction Processor

Leave the application terminal area and return to the system console terminal.

1. Execute the TPCTRL utility with the following DCL command:

RUN \$TPCTRL

The utility responds with its herald message.

2. The following dialogue occurs; you must respond with the answers shown.
 - a. Command <BRIEF>? STOP <RET>
 - b. Transaction processor name? SAMPLE <RET>
 - c. Minutes until transaction initiation is disabled <0>? <RET>
 - d. Minutes till incomplete processing is aborted <0>? 1 <RET>

After a one-minute wait, the transaction processor will be stopped. There must have been no error messages appearing before the next query.

3. TPCTRL queries once more:

Command <REMOVE>?

Proceed immediate to the next section (Section I.2.15).

I.2.14 REMOVE the SAMPLE Transaction Processor

1. Respond with a simple <RET> to the last TPCTRL query.
2. TPCTRL queries for the name of the transaction processor to be removed:

Transaction processor name?

Respond with SAMPLE.

There must have been no error messages before the next query.

3. TPCTRL queries once more:

Command <EXIT>?

Respond with a simple <RET>.

I.2.15 BRIEF INSTALL of SAMPLE Transaction Processor

1. Execute the TPCTRL utility with the following DCL command:

```
RUN $TPCTRL
```

The utility responds with its herald message.

2. The following dialogue occurs; you must respond with the answers shown.
 - a. Command <BRIEF>? <RET>
 - b. Transaction processor name? SAMPLE <RET>

There must have been no error messages appearing before the next query.

3. TPCTRL queries once more:

Command <START>?

Respond with a simple <RET> and proceed to Step 2-b under Section I.2.16 (a repeat of the steps outlined in Section I.2.3).

I.2.16 ReSTART the SAMPLE Transaction Processor.

Perform the steps detailed in Section I.2.3.

I.2.17 reverify The Appearance of Transaction Selection Forms

Perform the steps detailed in Section I.2.4.

I.2.18 STOP The SAMPLE Transaction Processor

Perform the steps detailed in Section I.2.13.

I.2.19 REMOVE The SAMPLE Transaction Processor

Perform the steps detailed in Section I.2.14.

I.2.20 End of demonstration Procedure

By performing all the steps and obtaining the expected results, you have demonstrated that all the principle components of the target system are functioning correctly.

APPENDIX J

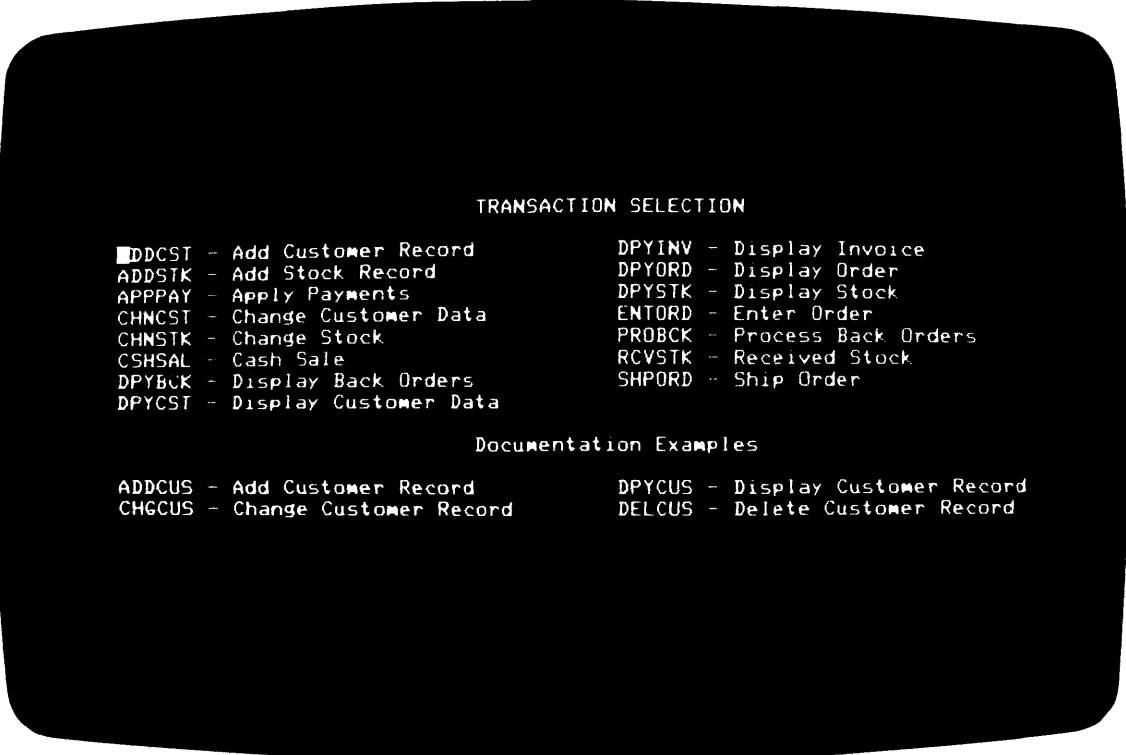
SAMPLE TRANSACTION PROCESSOR

EXECUTION RESULT SCREENS

During the execution of the validation procedure detailed in Chapter 6 and the demonstration procedure detailed in Appendix I, operations performed on the VT62 applications terminal produce screen displays indicating the results of the operation.

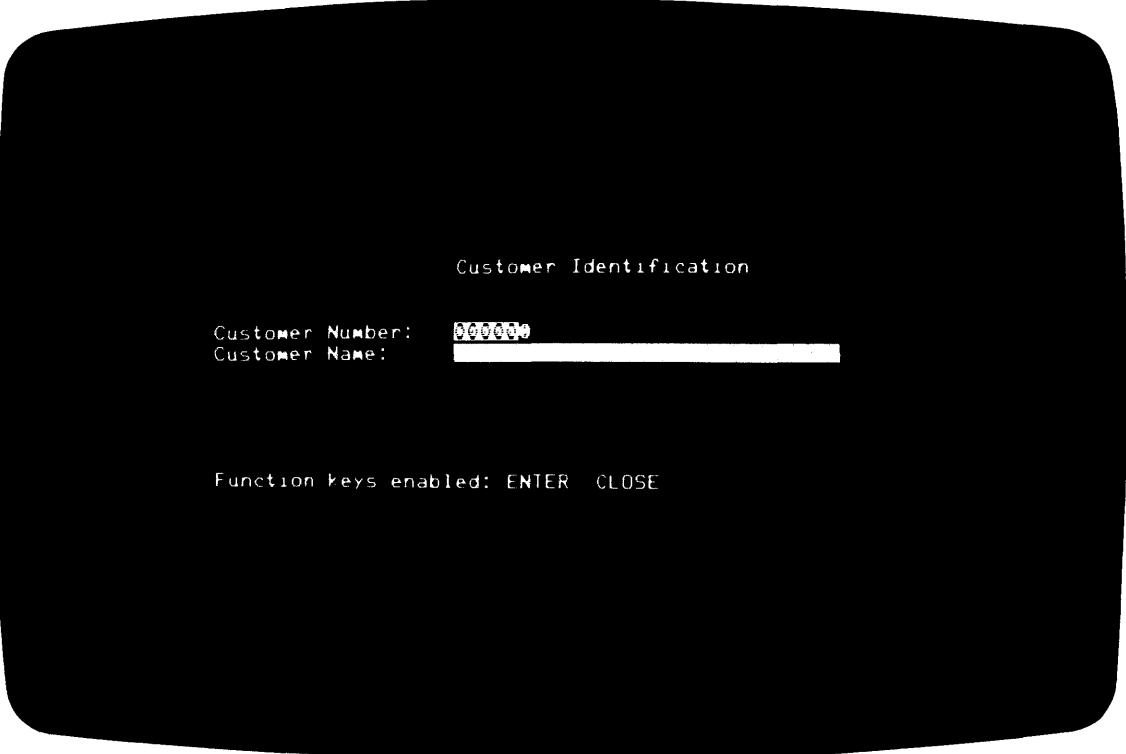
For both procedures, the expected displays are reproduced in this appendix and referred to in the guide as Screen X, where X ranges from 1 to 40.

SCREEN 1



SELMNU – Transaction Selection Form

SCREEN 2



CUSTID – Customer Selection Form

Sample Transaction Processor Execution Result Screens

SCREEN 3

TRANSACTION COMPLETE
Press Key AFFIRM to SELECT a new Transaction

CUSTOMER File Display

Customer Number: 000012
Customer Name: Coy Coins Inc
Address: Dept UL2
13 F Street
Coy, AS
Zip Code: 72067
Telephone: 501-622-5501
Attention: A J Shaganian
Credit Limit: 000000050000
Current Balance: 000000000000 Purchases To Date: 000000000000
Next Order Number: 0001 Next Payment Number: 0001
Function keys enabled: AFFIRM

CUSTDO – Customer Number 12 Data (AFFIRM Reply)

SCREEN 4

Identify item of stock

Stock Number: []-[]-[]-[]

Format of stock number: 99A-999-A-9 where 99A = denomination
999 = last three digits of year
A = mint
9 = condition

Denominations	Mints		Years	Conditions
01C	01D	D = Denver	N = New York	All between 0 - 9
05C	02D	S = San Francisco	A = Atlanta	0 = Worst
10C	05D	P = Philadelphia	B = Boston	9 = Best
25C	10D	C = Chicago	K = Kansas City	
50C	25D	W = Washington	L = Los Angeles	

Function keys enabled: ENTER CLOSE

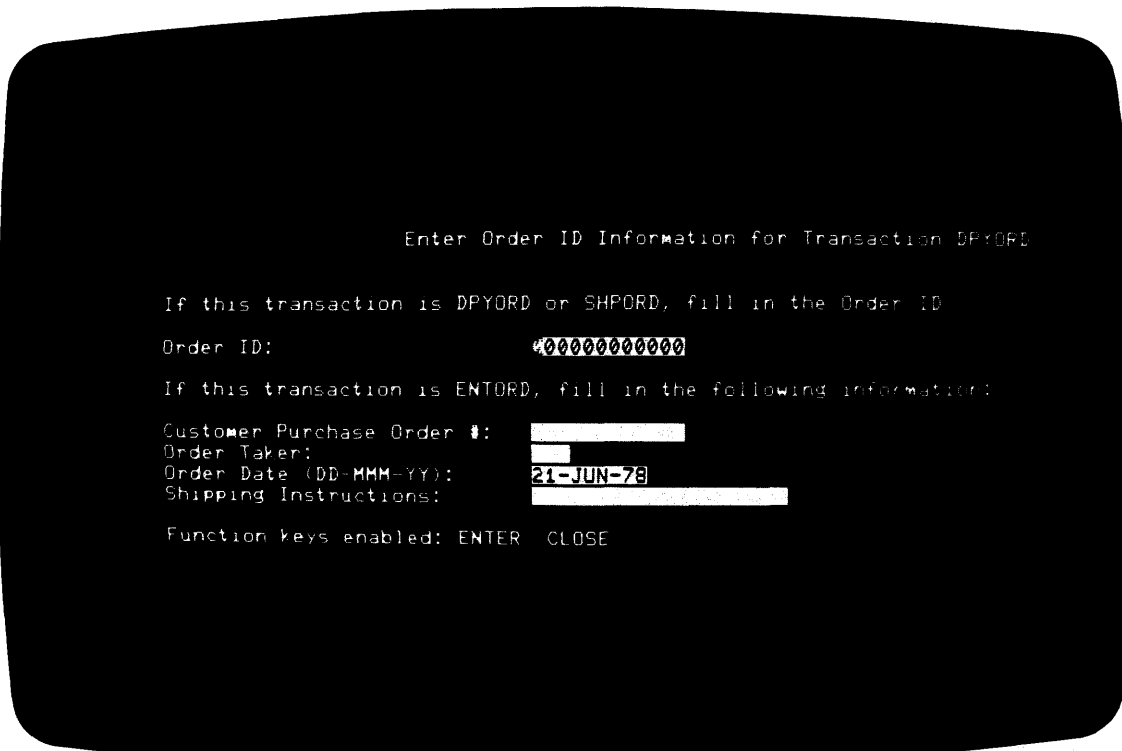
STCKID – Stock Item Selection Form

SCREEN 5



STCKDO – Stock Item Number 05C955N4 Data (AFFIRM Reply)

SCREEN 6



ORDRID – Order Entry Selection Form

SCREEN 7

TRANSACTION COMPLETE. Press Key AFFIRM to SELECT a new Transaction.
 Order #: 000004000200 Next Inv: 50 Type: R PO: 10SNE1 Taker: ERA
 Gross: 000000000000 Disc: 0300 Ordered: 12-Oct-77 Completed: 12-Oct-77
 Shipping Inst: UPS CLOSED? 0

	STOCK #	QUAN.	DESCRIPTION	STATUS	PRICE	EXT. PRICE
(1)	25C954B5	0001	1954 Boston FINE	N	0000025	0000000025
(2)	25C938D5	0001	1938 Denver FINE	N	0000027	0000000027
(3)	01D955L4	0001	1955 Los Angeles AFIN	N	0000104	00000000104
(4)	25D971D6	0001	1971 Denver VFIN	N	0002509	00000002509
(5)	05D942W1	0001	1942 Washington A GD	N	0000515	00000000515
(6)	50C977W9	0001	1977 Washington BUNC	N	0000049	00000000049
(7)	25C938D5	0001	1938 Denver FINE	N	0000027	0000000027
(8)	05C975P1	0001	1975 Philadelphia A GD	N	0000005	00000000005
(9)	25D971D6	0001	1971 Denver VFIN	N	0002509	00000002509
(10)	05D938W5	0001	1938 Washington FINE	N	0000591	00000000591
(11)	25C938D5	0001	1938 Denver FINE	N	0000027	0000000027
(12)	25C972W4	0001	1972 Washington AFIN	N	0000025	00000000025
(13)	50C977W9	0001	1977 Washington BUNC	N	0000049	00000000049
(14)	05D972K4	0001	1972 Kansas City AFIN	N	0000506	00000000506
(15)	50C977W9	0001	1977 Washington BUNC	N	0000049	00000000049
(16)						

Function keys enabled: AFFIRM

ORDRDP – Order Number 000004000200 Data (AFFIRM Reply)

SCREEN 8

Invoice Code: ██████████ Balance Due: \$ Billing Date:
 Gross Total: \$ Invoice Amt: \$ Payment Date:
 Disc: \$ Ship: \$ Insr: \$ Payment #:
 STOCK # DESCRIPTION QUAN PRICE \$ EXT. PRICE

- (1)
- (2)
- (3)
- (4)
- (5)
- (6)
- (7)
- (8)
- (9)
- (10)
- (11)
- (12)
- (13)
- (14)
- (15)
- (16)

Function keys enabled: ENTER CLOSE

INVCDP – Invoice Selection Form

Sample Transaction Processor Execution Result Screens

SCREEN 9

```
TRANSACTION COMPLETE. Press Key AFFIRM to SELECT a new Transaction.
Invoice Code: 000005000450 Balance Due: $000000000011 Billing Date: 11 Aug
Order Total: $000000000059 Invoice Amt: $000000000011 Payment Date:
Disc: $000000000000 Ship: $000000000050 Insn: $00000000100 Payment #: 000000000000
STOCK # DESCRIPTION QUAN PRIC EXT AMT
05D938W5 1937 Kansas City FINE 0001 00000000 0000000000
05D938W5 1938 Denver FINE 0001 00000000 0000000000
05D938W5 1938 Denver FINE 0001 00000000 0000000000
04
05
06
07
08
09
10
11
12
13
14
15
16
Function keys enabled: AFFIRM
```

INVCDP – Invoice Number 000005000450 Data (AFFIRM Reply)

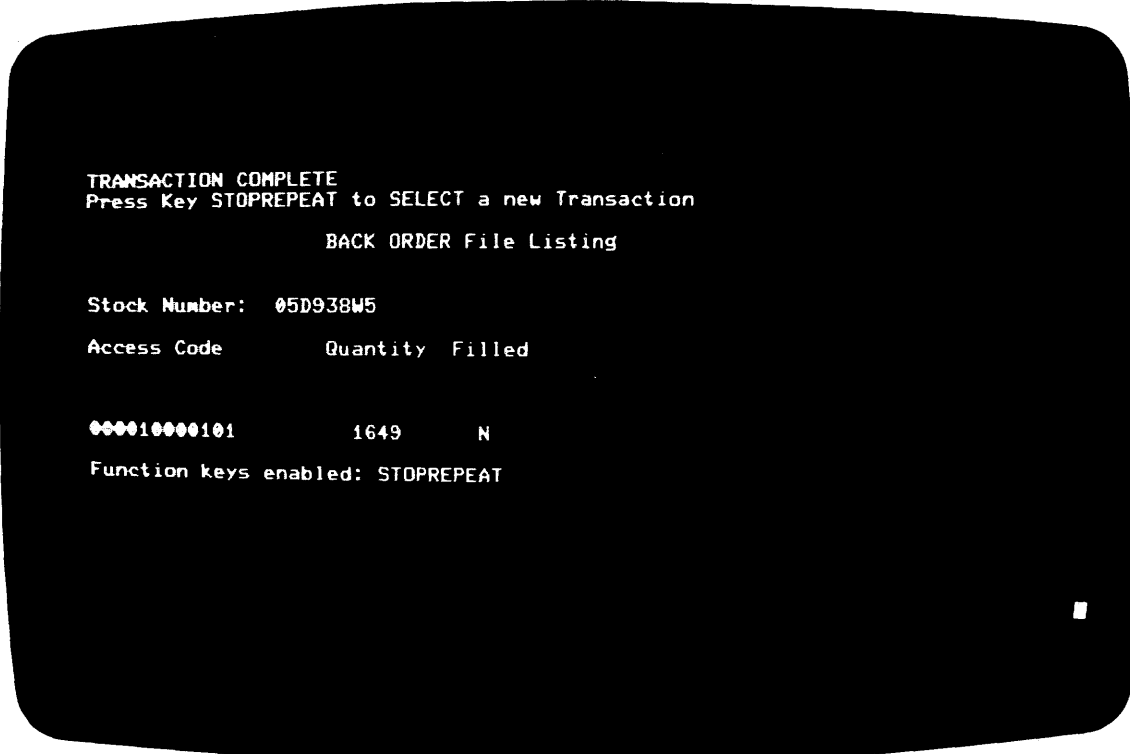
SCREEN 10

```
BACK ORDER File Listing

Stock Number: 05D938W5
Access Code      Quantity  Filled
000010000101    1649      N
Function keys enabled: ENTER CLOSE
```

BACKDP – Back Ordered Stock Item 05D938W5 Data

SCREEN 11



BACKDP – Back Ordered Stock Item 05D938W5 Data (STOP REPEAT REPLY)

SCREEN 12



CUSTID – New Customer Selection Form

SCREEN 13

```
CUSTOMER File Display

Customer Number: 000026
Customer Name:  Joe Cool
Address:
                _____
                _____
                _____
                _____
Zip Code:       00000
Telephone:     000-000-0000
Attention:     _____

Credit Limit:  000000050000

Current Balance: 000000000000  Purchases To Date: 000000000000
Next Order Number: 0000      Next Payment Number: 0000

Function keys enabled: ENTER
```

CUSTDP – Customer Number 26 Initial Data

SCREEN 14

```
TRANSACTION COMPLETE
Press key AFFIRM to SELECT a new Transaction

CUSTOMER File Display

Customer Number: 000026
Customer Name:  Joe Cool
Address:       123 West First Street
                West Bedford
                North Carolina
Zip Code:     08765
Telephone:   212-555-1234
Attention:   _____

Credit Limit:  000000050000

Current Balance: 000000000000  Purchases To Date: 000000000000
Next Order Number: 0000      Next Payment Number: 0000

Function keys enabled: AFFIRM
```

CUSTDP – Customer Number 26 Data (AFFIRM Reply)

SCREEN 15

```
TRANSACTION COMPLETE
Press Key AFFIRM to SELECT a new Transaction

                CUSTOMER File Display

Customer Number: 000026
Customer Name:  Joe Cool
Address:        123 West First Street
                West Bedford
                North Carolina
Zip Code:       98765
Telephone:      212-555-1234
Attention:      _____

Credit Limit:   000000050000

Current Balance: 000000000000   Purchases To Date: _____
Next Order Number: 00001       Next Payment Number:  _____

Function keys enabled: AFFIRM
```

CUSTDO – Customer Number 26 Data (AFFIRM Reply)

SCREEN 16

```
                CUSTOMER File Display

Customer Number: 000008
Customer Name:  Balch Coins Gallery
Address:        Dept PC1
                4 W Avenue
                Balch, AS
Zip Code:       72009
Telephone:      501-822-4031
Attention:      E G Shekavian

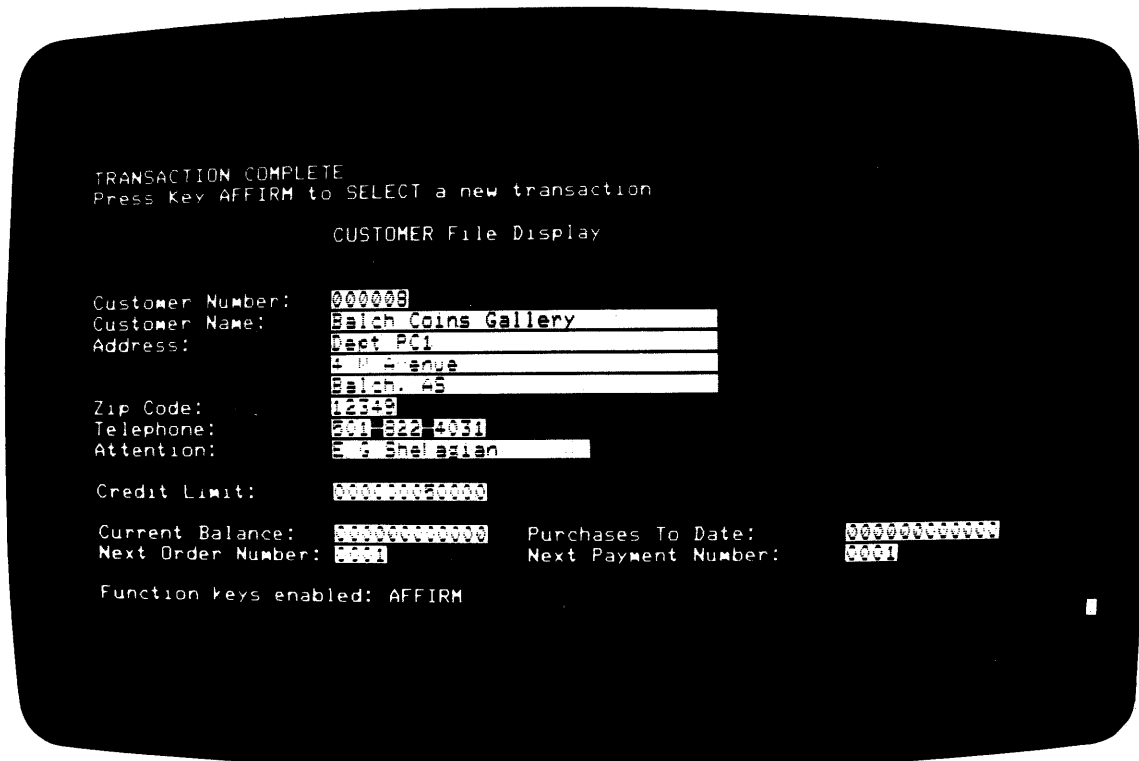
Credit Limit:   000000050000

Current Balance: 000000000000   Purchases To Date: 000000000000
Next Order Number: 00001       Next Payment Number: 00001

Function keys enabled: ENTER
```

CUSTDP – Customer Number 8 Data

SCREEN 17



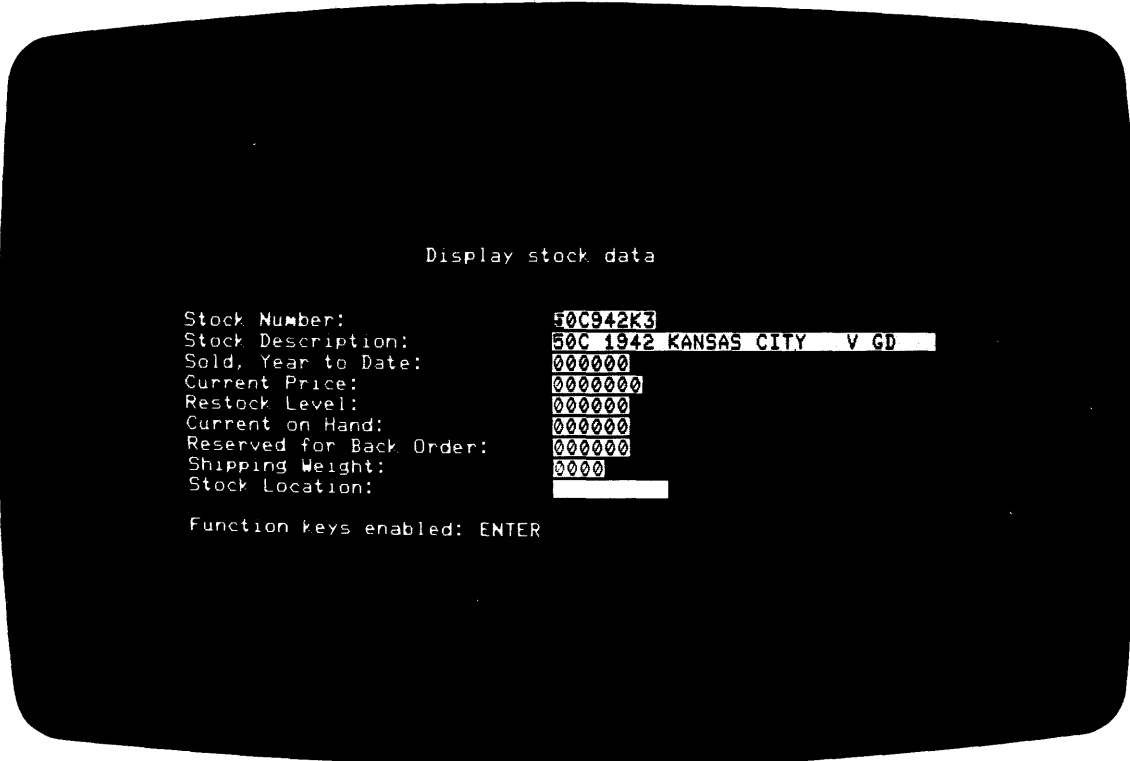
CUSTDP – Customer Number 8, New ZIP CODE (AFFIRM Reply)

SCREEN 18



CUSTDO – Customer Number 8 Data (AFFIRM Reply)

SCREEN 19



STCKDP – Initial Data For Stock Item Number 50C942K3

SCREEN 20



STCKDP – Stock Item Number 50C942K3, New Data (AFFIRM Reply)

SCREEN 21



STCKDO – Stock Item Number 50C942K3 Data (AFFIRM Reply)

SCREEN 22



STCKDP – Stock Item Number 05D974K2 Data

SCREEN 23



STCKDP – Stock Item Number 05D974K2 Data, Modified (AFFIRM Reply)

SCREEN 24



STCKDO – Stock Item Number 05D974K2 Data (AFFIRM Reply)

Sample Transaction Processor Execution Result Screens

SCREEN 31

```

TRANSACTION COMPLETE. Press Key AFFIRM to SELECT a new Transaction.
Order #: 000008000100 Next Inv: 50 Type: R AC: 321-78-A Taken: WJB
Gross: 000000000080 Disc: 0000 Ordered: 21-JUN-78 Completed:
Shipping Inst: UPS CLOSED? 0
  STOCK # QUAN. DESCRIPTION STATUS PRICE EXT. PRICE
(1) 25C976W0 0003 1976 Washington WORN N 00000000 000000000000
(2) 05C957N2 0001 1957 New York GOOD N 00000000 000000000000
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
Function keys enabled: AFFIRM
    
```

ORDRDP – Order Number 000008000100 Data (AFFIRM Reply)

SCREEN 32

```

Line Pick? Status Stock # Quan Description of Item
(1)      N      25C976W0 0003 1976 Washington WORN
(2)      N      05C957N2 0001 1957 New York GOOD
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)

Shipping Charge
0000000000

Insurance Charge
0000000000

Enter "P" to pick an item. Only pick items with status "N" (not yet shipped).
Function keys enabled: ENTER CLOSE
    
```

ORDRSH – Order Number 000008000100 Shipping Worksheet

Sample Transaction Processor Execution Result Screens

SCREEN 33



ORDRSH – Order Number 000008000100 Marked For Shipping (AFFIRM Reply)

SCREEN 34

Packing Slip

ORDER NO
000008-0001

DATE
21-JUN-78

SOLD TO:
Balch Coins Gallery
Dept PCI
4 W Avenue
Balch, AS

SHIP TO:
Balch Coins Gallery
Dept PCI
4 W Avenue
Balch, AS

CUST NO	SHIPPING	INSTRUCTIONS	ORDER NO	TYPE	CUST PO	TAKER	TERMS
000008	UPS		0001	R	321-78-A	WJR	NET 30

LINE	STOCK NO	DESCRIPTION	LOCATION	UNIT PRICE	QUANTITY ORDERED	QUANTITY THIS SHIPMENT	BALANCE ON ORDER
1	25C976W0	1976 Washington	WORN	\$ 0.25	0003	0003	0000
2	05C957N2	1957 New York	GOOD	\$ 0.05	0001	0001	0000
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

ORDRSH – Order Number 000008000100 Packing Slip

SCREEN 35

```
TRANSACTION COMPLETE
Press Key AFFIRM to SELECT a new Transaction

          CUSTOMER File Display

Customer Number: 000008
Customer Name:  Balch Coins Gallery
Address:         Dept PC1
                4 W Avenue
                Balch, AS
Zip Code:       12349
Telephone:      501-822-4031
Attention:      E C Shekagian

Credit Limit:   000000050000

Current Balance: 000000000080   Purchases To Date: 000000000050
Next Order Number: 0002         Next Payment Number: 0001

Function keys enabled: AFFIRM
```

CUSTDO – Customer Number 8 Data (AFFIRM Reply)

SCREEN 36

```
TRANSACTION COMPLETE
Press Key AFFIRM to SELECT a new Transaction

          CUSTOMER File Display

Customer Number: 000026
Customer Name:  Joe Cool
Address:         123 West First Street
                West Bedford
                North Carolina
Zip Code:       98765
Telephone:      212-333-1234
Attention:      _____

Credit Limit:   000000050000

Current Balance: 000000000000   Purchases To Date: _____
Next Order Number: 0002         Next Payment Number: _____

Function keys enabled: AFFIRM
```

CUSTDO – Customer Number 26 Data (AFFIRM Reply)

Sample Transaction Processor Execution Result Screens

SCREEN 37



STCKDO – Stock Item Number 25C976W0 Data (AFFIRM Reply)

SCREEN 38



STCKDO – Stock Item Number 05C957N2 Data (AFFIRM Reply)

SCREEN 39

```
TRANSACTION COMPLETE. Press Key AFFIRM to SELECT a new Transaction.
Order #: 000008000100 Next Inv: 51 Type: R PO: 321-78-A Taker: WJB
Gross: 000000000080 Disc: 0000 Ordered: 21-JUN-78 Completed: 21-JUL-78
Shipping Inst: UPS CLOSED? C
STOCK # QUAN. DESCRIPTION STATUS PRICE EXT. PRICE
(1) 25C976W0 0003 1976 Washington WORN S 0000025 00000000075
(2) 05C957N2 0001 1957 New York GOOD S 0000005 00000000005
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
Function keys enabled: AFFIRM
```

ORDRDP – Order Number 000008000100 Data (AFFIRM Reply)

SCREEN 40

```
TRANSACTION COMPLETE. Press Key AFFIRM to SELECT a new Transaction.
Invoice Code: 000008000150 Balance Due: $000000000080 Billing Date: 21-JUL-78
Gross Total: $000000000080 Invoice Amt: $000000000080 Payment Date:
Disc: $000000000000 Ship: $000000000000 Insr: $000000000000 Payment #: 000000000000
STOCK # DESCRIPTION QUAN PRICE S EXT. PRICE
(1) 25C976W0 1976 Washington WORN 0003 0000025 S 00000000075
(2) 05C957N2 1957 New York GOOD 0001 0000005 S 00000000005
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
Function keys enabled: AFFIRM
```

INVCDP – Invoice Number 000008000150 Data (AFFIRM Reply)

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