

# SGEN XVM UTILITY MANUAL

DEC-XV-USUTA-A-D



XVM  
Systems  
digital

**SGEN XVM UTILITY  
MANUAL**

**DEC-XV-USUTA-A-D**

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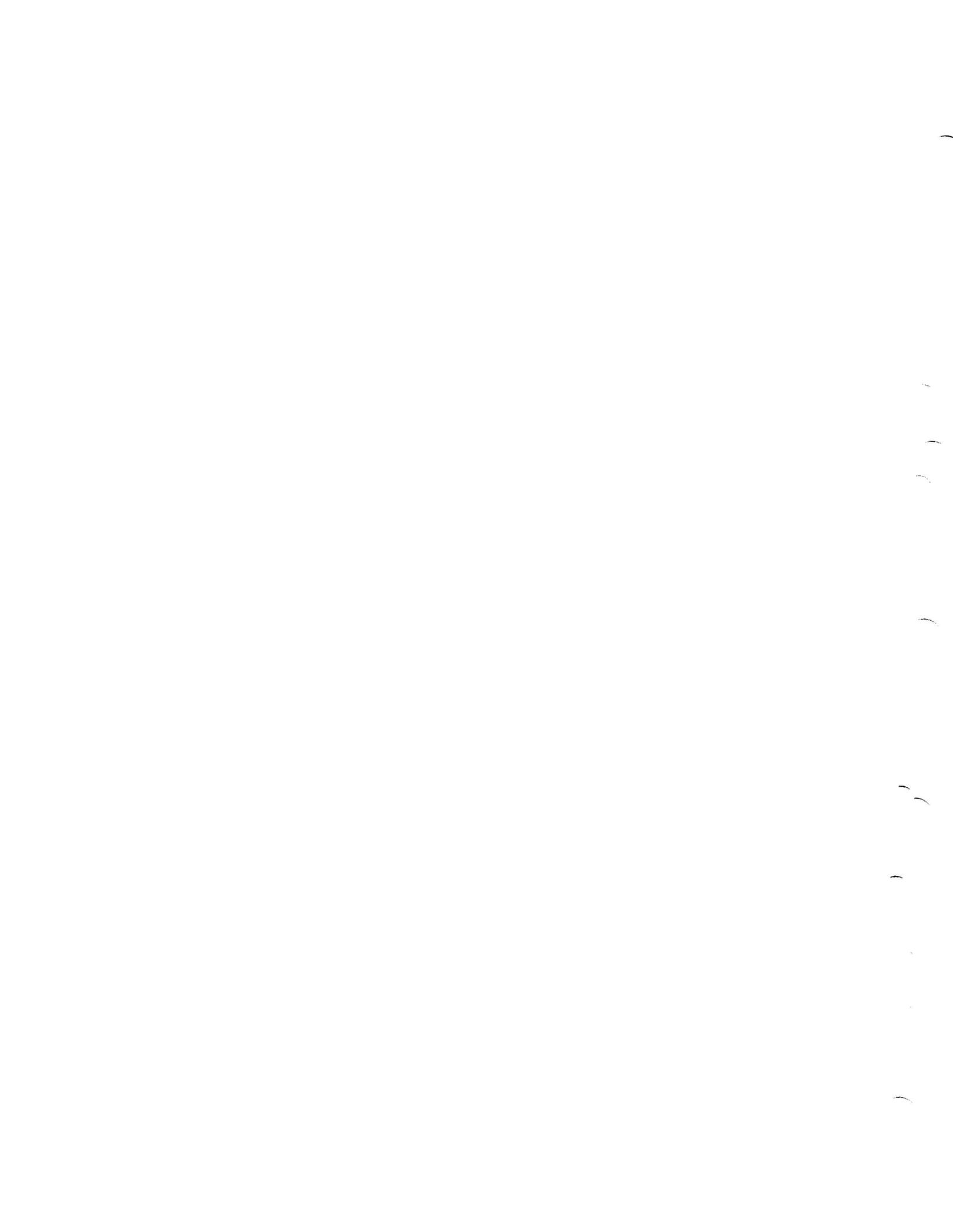
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## LIST OF ALL XVM MANUALS

The following is a list of all XVM manuals and their DEC numbers, including the latest version available. Within this manual, other XVM manuals are referenced by title only. Refer to this list for the DEC numbers of these referenced manuals.

BOSS XVM USER'S MANUAL	DEC-XV-OBUAA-A-D
CHAIN XVM/EXECUTE XVM UTILITY MANUAL	DEC-XV-UCHNA-A-D
DDT XVM UTILITY MANUAL	DEC-XV-UDDTA-A-D
EDIT/EDITVP/EDITVT XVM UTILITY MANUAL	DEC-XV-UETUA-A-D
8TRAN XVM UTILITY MANUAL	DEC-XV-UTRNA-A-D
FOCAL XVM LANGUAGE MANUAL	DEC-XV-LFLGA-A-D
FORTTRAN IV XVM LANGUAGE MANUAL	DEC-XV-LF4MA-A-D
FORTTRAN IV XVM OPERATING ENVIRONMENT MANUAL	DEC-XV-LF4EA-A-D
LINKING LOADER XVM UTILITY MANUAL	DEC-XV-ULLUA-A-D
MAC11 XVM ASSEMBLER LANGUAGE MANUAL	DEC-XV-LMLAA-A-D
MACRO XVM ASSEMBLER LANGUAGE MANUAL	DEC-XV-LMALA-A-D
MTDUMP XVM UTILITY MANUAL	DEC-XV-UMTUA-A-D
PATCH XVM UTILITY MANUAL	DEC-XV-UPUMA-A-D
PIP XVM UTILITY MANUAL	DEC-XV-UPPUA-A-D
SGEN XVM UTILITY MANUAL	DEC-XV-USUTA-A-D
SRCCOM XVM UTILITY MANUAL	DEC-XV-USRCA-A-D
UPDATE XVM UTILITY MANUAL	DEC-XV-UUPDA-A-D
VP15A XVM GRAPHICS SOFTWARE MANUAL	DEC-XV-GVPAA-A-D
VT15 XVM GRAPHICS SOFTWARE MANUAL	DEC-XV-GVTAA-A-D
XVM/DOS KEYBOARD COMMAND GUIDE	DEC-XV-ODKBA-A-D
XVM/DOS READER'S GUIDE AND MASTER INDEX	DEC-XV-ODGIA-A-D
XVM/DOS SYSTEM MANUAL	DEC-XV-ODSAA-A-D
XVM/DOS USERS MANUAL	DEC-XV-ODMAA-A-D
XVM/DOS VIA SYSTEM INSTALLATION GUIDE	DEC-XV-ODSIA-A-D
XVM/RSX SYSTEM MANUAL	DEC-XV-IRSMA-A-D
XVM UNICHANNEL SOFTWARE MANUAL	DEC-XV-XUSMA-A-D



## PREFACE

This manual describes the XVM/DOS System Generator Utility Program, SGEN XVM, and gives other information needed by the System Manager for installation and maintenance of the XVM/DOS system.

In the preparation of this manual, it was assumed that the reader is familiar with the XVM Disk Operating System (XVM/DOS), including its Monitor, and the several Utility Programs -- especially PIP, PATCH, and UPDATE XVM. The XVM/DOS USERS MANUAL describes the general operating procedures for XVM/DOS.

Chapters 1 and 2 of this manual describe SGEN XVM and its use. Chapter 3 describes the general sequence of operations to be followed when using SGEN XVM. It is recommended that the user read the entire manual before installing XVM/DOS.



CHAPTER 1  
USING SGEN

1.1 CONTEXT

The XVM/DOS System Generator, SGEN XVM, allows the system manager to modify an existing XVM/DOS system to suit the needs of a particular installation. SGEN XVM does not create a system, but modifies an existing one. The XVM/DOS disk-restore DECTapes or magtape that Digital Equipment Corporation distributes will produce a working XVM Disk Operating System when restored to the disk via the DOSSAV XVM program<sup>1</sup>. The system manager can initiate a system generation operation in order to tailor this basic system to his own needs by issuing the following series of commands to the XVM/DOS Monitor:

```
$MICLOG SYS Required System Manager Password for the basic system
$ { A RK -14 } (for system generation on RK Disk Cartridge) { Required }
  { A DK -14 } (for system generation on RF DECdisk) { ASSIGN }
  { A DP -14 } (for system generation on RP Disk Pack) { statement }
$SGEN Load command for SGEN XVM
```

When SGEN XVM is loaded, it automatically starts an interactive system generation procedure. Once system generation is complete, the system manager should save the changed system via the DOSSAV XVM program. He should always retain at least two copies of the system: the original tape(s) from DEC, and a copy of the new system.

When the system manager wishes to do a subsequent system generation, he should type the same command series given above, substituting the Monitor Identification Code which he supplied during the last system generation.

1.2 ORGANIZATION

SGEN XVM is a core-image system program with no overlays. When loaded into core SGEN XVM tests to ensure that the system is currently logged in and that the "A" handler of the RF15 DECdisk (DKA) or RK15 Disk

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<sup>1</sup>Appendix A describes the DOSSAV XVM program.

## Using SGEN

cartridge/or RP15 Disk Pack (DPA) is assigned to .DAT -14. SGEN XVM exits if these requirements are not met. SGEN XVM then types out its name, version number, and the device and unit number on which the new system will reside.

SGEN XVM then proceeds with eight sequentially presented sets of questions that can modify three basic areas of the system: (1) system parameters, (2) I/O, and (3) system programs. The eight sets of questions are identified by the letters A through H. Each set is started by a key question that describes the category of the questions in that particular set. Key questions start at the left margin, questions within a set are tabbed one stop (8 spaces) to the right.

The user can save time by refusing to consider questions in a particular set involving an area not to be modified. He can do this by responding to the key question of any set with a Carriage RETURN, which effects the acceptance of a set of default answers. This means that the parameters covered by the rejected set remain as in the previous system.

SGEN XVM provides restart points which coincide with the beginning of each set of questions. In general, a CTRL P from the keyboard at any point before the end of the current set of questions causes a return to the start of the current set of questions, and the deletion of all answers previously supplied for the current set. Before the user terminates a particular set, he should then check all answers for that set. If he later finds a mistake after a set is completed, he must abort the operation and go through another complete system generation to correct the error. A CTRL C, at any time before the end of Section H terminates the system generation, leaving the old system unchanged.

### 1.3 ANSWERS TO SGEN XVM QUESTIONS

#### 1.3.1 Teleprinter Command Mode

To save time, SGEN XVM supplies a default answer in either parentheses or square brackets with each question. The default answer always shows how the previous system looked or in some way indicates no change is required. A Carriage RETURN response indicates the user accepts the default answer. In the illustration of each question where the default may be more than one, this manual indicates the possibility with brackets ( $\{ \}$ ). Thus:

API?  $\left\{ \begin{array}{l} (Y) \\ (N) \end{array} \right\}$

## Using SGEN

Y and N are 1-character answers for many of the Yes/No, On/Off class of questions. They are self-explanatory. In the case of some questions, however, a third 1-character choice is required. In such questions, the third choice implies "Yes, but ask me questions about the details of the subject". For example, Section B, which concerns devices and device handlers, first asks about each device, deferring questions about its handlers until necessary. Thus, the question:

PR? (\$)

asks whether the user wants the Paper Tape Reader. "N" says "NO, delete the Paper Tape Reader and all of its handlers and skips from the system". Response "\$" or Carriage RETURN says, "YES, keep the Paper Tape Reader and all its handlers and skips as they are". Response "Y" says, "YES, keep the Paper Tape Reader, but ask me questions about its handlers and skips". ALT MODE alone is echoed "\$", and substitutes for "\$". For the Y/N/\$ type of question, which accepts a 1-character answer, a left arrow (or underline) implies the default and gives a visible answer on the printout. (Carriage RETURN is not a printing character.)

Some questions cannot be answered by a simple yes/no multiple choice type of question; for example, the specification of the monitor identification code (MIC) (section 2.1.4). For such questions the present value (or default) is supplied in square brackets rather than parentheses. The user may type a single Carriage RETURN to continue with the present value, or a new value followed by a Carriage RETURN. The exact form a new value must take is given in the sections on the appropriate questions.

Some questions allow multiple answers; for example, "SKIP MNEMONICS IN ORDER" (section 2.4.2). In such instances, the user may type several answers on one line, separating each answer from the next by a comma.

Other answers are explained in the relevant parts of Chapter 2.

### 1.3.2 SGEN XVM Batching Command Mode

Like other XVM/DOS Monitor system programs, SGEN XVM may be used in the XVM/DOS Batching Command Mode. In fact, some features have been added which make the batching process easier. These features are required for the following reason: For those answers whose defaults are specified in parentheses, SGEN XVM reads teleprinter input in Image Alphanumeric

## Using SGEN

Mode. Hence, it does not require a Carriage RETURN to complete a .READ. System considerations, however, require that Batching Mode tapes or decks be in IOPS ASCII. This means that each line of input must be terminated by a Carriage RETURN. Since lines containing one Carriage RETURN only cannot be generated by the Editor, the default answer must always be specified by a left arrow (+) or an underline (\_). One-character answers in teleprinter mode have their Batching Mode equivalents as follows:

Teleprinter	Batching
Y	Y)
N	N)
\$	\$)
Carriage RETURN	+)
or	
Left arrow (+)	
or	
Underline (_)	

All of the above types of answers go with questions where the default is specified in parentheses. The user should have XX.X) in the batching command string in all cases where the default is not specified in parentheses (i.e., no default, or one in brackets).

### 1.4 ERROR MESSAGES

SGEN XVM checks all answers for syntax and acceptability to the XVM/DOS software. It also does some limited checking for acceptability within the current hardware configuration. Whenever SGEN XVM finds a wrong answer, it types an error message two tabs to the right of the left hand margin (16 spaces in). SGEN XVM does not check for multiple errors; any answers that follow an erroneous answer on the same line are not processed, and must be retyped.

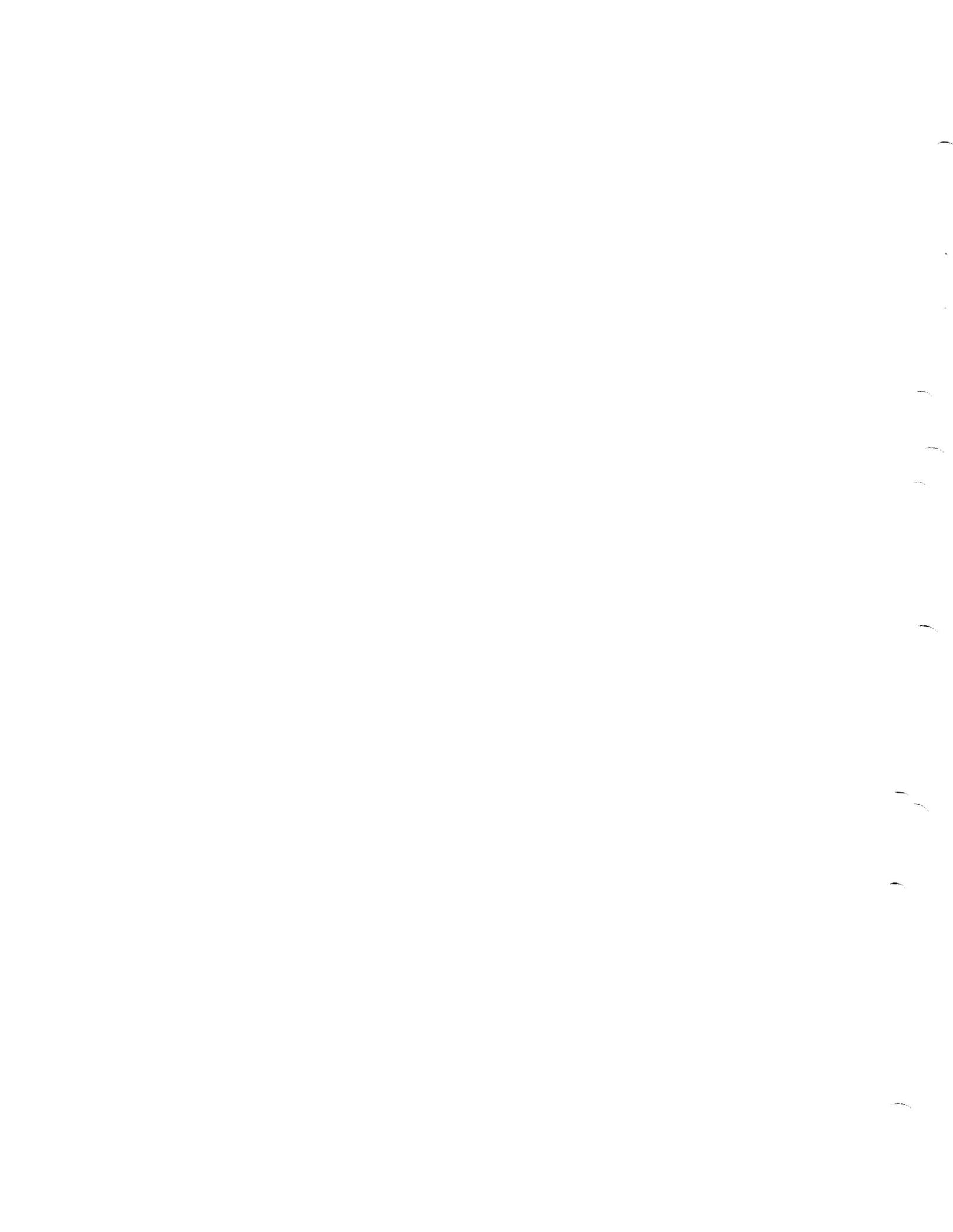
### 1.5 OPERATION

When SGEN XVM starts operation, it saves an image of the three parameter blocks from the system device plus the Storage Allocation Table. These blocks contain the old image of the three system information blocks: SGNBLK, SYSBLK and COMBLK. SGNBLK contains information about the default settings of key .SCOM registers, the .DAT and .UFDT, an

## Using SGEN

ordered skip chain, the names of all the handlers, and certain information about the devices that the system recognizes. Together, SYSBLK and COMBLK occupy two contiguous blocks on the system device. They describe the system programs. These information blocks are illustrated in the XVM/DOS System Manual.

Most of SGEN XVM's operations consist of building new images of SGNBLK, COMBLK and SYSBLK and the Storage Allocation Table. On completion of the last set of questions (the "H" set), SGEN XVM disallows commands from the teleprinter, writes out the new system block images, and deletes any discarded handlers from the IOS User File Directory. (Up to that point, the current system has remained unchanged.) It is up to the user to insert added handlers and system programs. Handlers can be added via PIP XVM. PATCH XVM can be used to add core-image system programs for which SGEN XVM has allocated space.



CHAPTER 2  
DETAILED DESCRIPTION OF OPERATION

This section describes the options available to the SGEN XVM user, and explains some of the planning necessary for determining an optimum configuration for a particular installation. Each first order (2-digit) paragraph denotes a new set of questions. Each second order (3-digit) paragraph presents an individual question and a description of its meaning and use.

2.1 A. ALTER SYSTEM PARAMETERS? (N)

The "A" section defines those system parameters that do not fall under I/O or system program categories. Some are default parameters which can be modified by commands to the Nonresident Monitor. Others can only be modified by SGEN XVM. Figure 2-1, Section A Questions, illustrates this section.

2.1.1 API?  $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

This asks whether the user wishes the default to be API (Automatic Priority Interrupt System) on or off. A "Y" response makes "API ON" the default condition. An "N" answer makes "API OFF" the default. The Nonresident Monitor's API ON/OFF command can change the state of API temporarily.

2.1.2 TAB SIMULATION?  $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

This asks whether or not the Resident Monitor teleprinter handler should simulate the TAB function by outputting spaces. This question should be answered with a "Y" response if the console terminal is a LA36 or a KSR-33. It should be answered "N" if the console is a KSR-35. The Nonresident Monitor's TAB command can temporarily override this setting.

Detailed Description of Operation

SGEN XVM V1A000

SYSTEM UPDATE ON DPO

A. ALTER SYSTEM PARAMETERS? (N) Y

API? (N) Y

TAB SIMULATION? (Y) Y

FILL CHARACTERS? (Y) Y

MICISYSJ

DEFAULT # BUFFERSE3J 4

# WORDS/BUFFERE500J

UC15 CONFIG? (N) Y

POLLER? (N) Y

DEFAULT FILES PROTECTION CODEE2J

RESIDENT PATCH AREA SIZEE0J

PAGE MODE SYSTEM? (N) Y

XVM MODE SYSTEM? (N) Y

SYSTEM MEMORY SIZE E 24KJ 96K

60 CPS? (Y)

SGEN XVM V1A000

SYSTEM UPDATE ON DPO

A. ALTER SYSTEM PARAMETERS? (N) Y

API? (N) Y

TAB SIMULATION? (Y)

FILL CHARACTERS? (Y)

MICISYSJ

DEFAULT # BUFFERSE3E 2

# WORDS/BUFFERE500J

UC15 CONFIG? (N)

DEFAULT FILES PROTECTION CODEE2J 1

RESIDENT PATCH AREA SIZEE0J

PAGE MODE SYSTEM? (N)

XVM MODE SYSTEM? (N)

SYSTEM MEMORY SIZE E 24KJ 32K

60 CPS? (Y)

Figure 2-1

Section A Questions: System Parameters

## Detailed Description of Operation

### 2.1.3 FILL CHARACTERS? $\left\{ \begin{array}{l} (Y) \\ (N) \end{array} \right\}$

This question asks whether or not the Resident Monitor teleprinter handler should insert fill characters in the output to the console teleprinter. A "Y" response causes several Null Characters to be output following each Carriage RETURN. This question should be answered with the "Y" response if the console terminal is a 30 cps. LA3Ø. It should be answered "N" if the console terminal is a KSR-33, a KSR-35, or a slower LA3Ø. The Nonresident Monitor FILL command can temporarily override this question.

### 2.1.4 MIC [mic]

This question prints the current Monitor Identification Code (MIC) in square brackets. A Carriage RETURN entry retains the old MIC. If the user wishes to change the current MIC, he should type exactly three printing characters, followed by a Carriage RETURN. If possible, the user should avoid MIC codes that equal User Identification Codes (UICs) current to the system. In particular, he must avoid the following UIC's: ???, PAG, BNK, IOS, CTP and SCR. SGEN XVM does not accept non-printing characters as part of an MIC.

### 2.1.5 DEFAULT # BUFFERS[n]

This command requests a default number of buffers to be allocated for user programs and non-core image system programs. The number in square brackets is the old number. If the user wishes to retain the old default number, he should type a Carriage RETURN. SGEN XVM accepts any set of six or fewer octal digits followed by a Carriage RETURN as the octal number. The Master Tapes which Digital Equipment Corporation distributes indicate three (3) as a default number. The user must consider the trade-off of the available core in his installation (systems with little memory might need a smaller number of buffers) versus the convenience of a large number of buffers.

This parameter does not affect core-image system programs, which always get as many buffers as they need. Users whose programs need a different number of buffers may use the BUFFS Nonresident Monitor command to allocate the exact number of buffers needed.

## Detailed Description of Operation

### 2.1.6 # WORDS/BUFFER [nnn]

This requests the number of words per buffer, and prints the old number (in octal) in square brackets. A decision regarding an efficient size for the buffers requires some knowledge of the disk handlers which use them. The handlers break buffers from the pool into three parts: (1) File Information (about  $40_8$  words), (2) the Block List -- addresses of pre-allocated blocks (between 4 and  $374_8$  addresses, inclusive), and (3) the data buffer ( $400_8$  words). Thus, buffers must be at least  $444_8$  words long.

The disk handlers do not use extra words in buffers longer than  $1034_8$ . This, therefore, may be an upper limit on buffer size, unless other programs need more space in their buffers. The larger the Block List -- that is, the larger the buffer -- the faster is the output. Smaller Block Lists may give more efficient allocation of disk space, and certainly save core.

Any number typed is interpreted as an octal number.

### 2.1.7 UC15 CONFIG? $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

The XVM-200 is a dual processor system made up of an XVM processor and a PDP-11 processor. Normally, the two processors run together as an integrated single system. It is possible to use the system as independent systems running independently on each processor. In order to enable this operation, it is necessary to control the interaction between the two processors. This control is provided by this question and the one which follows.

This question asks whether the UC15 option hardware should be enabled for use. If the "Y" response is given, the interprocessor communication link will be allowed to interrupt the XVM processor. If the "N" response is given, these interrupts will be disabled. The "Y" response is required for correct operation of all DEC supplied UNICHANNEL software. The "N" response is appropriate for XVM/DOS systems without UNICHANNEL hardware or for independent operation of the two processors. The Nonresident Monitor UC15 command can temporarily override the response to this question.

SGEN XVM uses the response to this question to determine whether the following question should be asked. If the answer is "Y", the following

## Detailed Description of Operation

question (Section 2.1.8) is asked. If the answer is "N", the following question is not asked and SGEN XVM skips to the question in Section 2.1.9.

2.1.8 POLLER?  $\left\{ \begin{array}{l} (Y) \\ (N) \end{array} \right\}$

The XVM/DOS monitor discovers errors detected by the PDP-11 UNICHANNEL processor via an automatic polling mechanism. The monitor periodically polls the UNICHANNEL software system (XVM/PIREX) for information about any errors which may have occurred. If an error has occurred, an appropriate message will be passed on to the user. If the user is not using the DEC supplied UNICHANNEL Software system, he may wish to disable the error poller. This question provides the user with that capability.

If the "Y" response is given to this question, the poller will be enabled; the XVM/DOS monitor will periodically poll the UNICHANNEL processor and report any errors so discovered back to the user. If the "N" response is given, the poller will be disabled and this process will not occur. It should be noted that this all depends upon the UC15 option hardware being enabled. If the UC15 is disabled, the poller does not run, regardless of the state of the poller enable/disable switch. Because of this, SGEN XVM will only ask, "POLLER?" if the previous question, "UC15 CONFIG?", has been answered affirmatively.

"POLLER?" should be answered "Y" for all normal UNICHANNEL systems. The "N" response should be given only if the following three conditions are met:

1. The UNICHANNEL (PDP-11) is running some non-standard, user supplied software (replacing XVM/PIREX).
2. This non-standard UNICHANNEL software will not respond correctly to error status requests. For more information on error status requests, see the XVM UNICHANNEL Software Manual.
3. The UNICHANNEL and XVM processors will be interacting with each other via the interprocessor communication (interrupt) link. If this were not the case, a "N" response would be given to the question, "UC15 CONFIG?", and the current question, "POLLER?", would not be asked.

## Detailed Description of Operation

The user should be cautious about disabling the poller. Doing so disables virtually all error messages regarding devices connected to the UNICHANNEL. If a device should go off-line, the XVM/DOS monitor will be unable to detect or report it. This condition will only be remedied by the user visually checking the device and discovering the problem. The Nonresident Monitor POLLER command can temporarily override the response to the question. "POLLER?".

### 2.1.9 DEFAULT FILES PROTECTION CODE [n]

This requests the default file protection code, and prints the old code in square brackets. The possible codes and their meanings are:

- Code = 1 Unprotected, with the exception that the file may not be deleted and the number of blocks may not change, if the directory is protected.
- Code = 2 Write protected, if directory protected.
- Code = 3 Read/Write protected, if directory protected.

SGEN XVM checks the validity of the number entered.

The default protection code for User File Directories is always 1, protected, and may not be changed by SGEN XVM.

A user may temporarily change the default protection by means of the Nonresident Monitor Command PROTECT.

### 2.1.10 RESIDENT PATCH AREA SIZE [nnn]

This requests the Resident Monitor's Patch area size and prints the old number in square brackets. The Resident Monitor's Patch Area is a number of reserved registers (no bigger than 1000<sub>8</sub>) located just above the Resident Monitor. The System Loader does not refresh it, except on Bootstrap loads, restarts, and any of the QFILE GET commands. The area may be used for patching the system or for communication among several programs in different core loads.

SGEN XVM interprets any number typed in response to this question as an octal number. Therefore, the digits 8 and 9 are not accepted.

### 2.1.11 PAGE MODE SYSTEM? $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

This requests the default addressing mode. A "Y" response makes page addressing the default mode. An "N" response makes bank mode the

## Detailed Description of Operation

default. Users may temporarily change the mode via the PAGE ON/OFF or BANK ON/OFF Nonresident Monitor commands.

2.1.12 XVM MODE?  $\left\{ \begin{array}{l} (Y) \\ (N) \end{array} \right\}$

This requests the default operating mode for the execution of user programs under XVM/DOS. A "Y" response makes XVM ON (17-bit indirect addressing) the default mode. A "N" response makes XVM OFF (15-bit indirect addressing) the default mode. The Nonresident Monitor XVM command can temporarily override the response to this question. The System must have the XM15 option in order to take advantage of 17-bit indirect addressing.

2.1.13 SYSTEM MEMORY SIZE? [nnnK]

This requests the default system memory size (MEMSIZ) for the system. The memory size should be expressed as a two to three digit, decimal number followed by the letter "K". The "K" is an abbreviation for 1024. Thus a memory size of 65,536 words is expressed as "64K", not "65K". Legitimate memory sizes are in the range 24K through 128K inclusive in increments of 8K. The Nonresident Monitor MEMSIZ command can temporarily override the response to the question, "SYSTEM MEMORY SIZE?".

An attempt to enter an illegitimate memory size will result in the error message:

"ILLEGAL MEMORY SIZE"

The "system memory size" question will then be repeated.

2.1.14 60 CPS?  $\left\{ \begin{array}{l} (Y) \\ (N) \end{array} \right\}$

This requests the line frequency at the installation. Installations with 60hz line frequency require a "Y" answer; those with 50hz require an "N" response.

2.2 B. ALTER I/O DEVICES OR HANDLERS? (N)

This set of questions allows the user to delete or retain devices and all their handlers, and allows a third option of retaining the reference to the device, and then retaining, deleting or adding handlers

## Detailed Description of Operation

and skips for a particular device. The printout given in Figure 2-2 illustrates the use of this section.

Section B refers to all devices currently in the system by a 2-character device code. The device codes for those device handlers included in the original supplied by the Digital Equipment Corporation are:

CD	Card Reader (CR03B or CR15 or CR11)
DK	RF15 Disk Control
DP	RP15 Disk Pack Control
DT	DEctape (TC15 DEctape Control)
LK	LK35 Keyboard
LP	Line Printer (either LP15C or LP15F or LP11/LS11)
MT	Magtape
PP	Paper Tape Punch (PC15)
PR	Paper Tape Reader (PC15)
RK	RK05 Disk Cartridge Control
VP	VP Point Plotting Display
VT	VT15 Graphic Display Console
VW	Writing Tablet
XY	XY11 Plotter

(TT, which means console terminal, is not included in this set of questions, because DOS uses the console terminal as its command device.)

The device handler names used in Section B are printed as 3-character names. In reality, handler names are four characters long, but this section truncates the last character, a period (.). The first two characters must be the 2-character device code for the handler's device. The third character must be alphabetic.

SGEN XVM starts this set of questions by asking whether the user wishes to delete discarded handlers from IOS. Deletion saves space on the system device.

SGEN XVM then begins asking key questions for each device currently on the system:

```
XX? ($)      (where XX stands for any device code)
or
HANDLERLESS DEVICE ($)
```

If the user answers with a Carriage RETURN or "\$", SGEN XVM retains the device and all its skips and handlers as they were in the previous system. If the user answers "N", SGEN XVM deletes all information about that device and its handlers, and all its skips from the Skip

Detailed Description of Operation

B. ALTER I/O DEVICES OR HANDLERS? (N) Y

DELETE DISCARDED HANDLERS? (Y) Y

TO BE KEPT:

FR? (\$) \$

FP? (\$) \$

DT? (\$) \$

DK? (\$) Y

DKA? (Y) Y

DKB? (Y)

DKC? (Y) N

NEW HANDLERS:

>DKD

>

DSSF=707001? (Y)

NEW SKIPS:

>

DP? (\$) \$

MT? (\$) N

LP? (\$) \$

CD? (\$) \$

VP? (\$) \$

VT? (\$) N

VW? (\$) N

LK? (\$) N

RK? (\$) \$

XY? (\$) \$

HANDLERLESS DEVICE? (\$) \$

Figure 2-2

Section B Questions: I/O Devices and Handlers

## Detailed Description of Operation

Chain. (Deletion of handlers from the handler UFD, IOS, does not occur until the termination of Section H.)

If the user answers "Y", SGEN XVM asks specific questions about the handlers and skips for the device in question.

### NOTE

A "HANDLERLESS DEVICE" is a set of one or more skips not associated with any handler. An example of a handlerless device is the set of LT19 skips used to prevent illegal interrupts from LT19 Terminals. Handlerless device questions should be treated in the same manner as normal device questions except that no handler questions are asked.

#### 2.2.1 XXX? (Y)

(where XXX stands for any handler name)

SGEN XVM asks this question for each handler the device has in IOS. A "Y" response retains the handler; an "N" response deletes it.

### NOTE

SGEN XVM does not allow the user to delete the "A" handler for the system device (DKA., RKA. or DPA.).

#### 2.2.2 NEW HANDLERS:

When SGEN XVM has asked a question for each of the device handlers currently in IOS, it asks whether the user wishes to add any new handlers. It makes no sense to "add" a handler name which has just been deleted. If the user wishes to change a handler, he may use PIP XVM to transfer a new one to IOS. PIP XVM automatically deletes the old one if the user transfers a new one with the same name. New handler names should follow the rules outlined in Section 2.2. When the user has no more handlers to add, he should simply type a Carriage RETURN.

Adding handler names only makes them "logically" present. The user must call PIP XVM to transfer the handlers to the IOS UFD, in order to make handlers physically present. SGEN XVM warns the user about missing handlers at the end of Section C. File names for handlers in IOS must have the same name as the handler global and the entry point label and a "BIN" extension (e.g., .GLOBL DKA. ,DKA. DAC CALP, or DKA. BIN).

## Detailed Description of Operation

### 2.2.3 OLD SKIPS

Presumably, the user changes old skips only in the case where they were incorrectly inserted. In any case, after the user has indicated he has no more handlers to add for the current device, SGEN XVM prints the skips for this device that are in SGNBLK (whether or not these skips are in the skip chain). SGEN XVM prints skips in the following format:

```
devskp = nnnnnn? (Y)
```

A Carriage RETURN or "Y" accepts the old skip; an "N" deletes the skip.

### 2.2.4 NEW SKIPS:

When SGEN XVM has exhausted the skips for the current device as they were in the old system, it requests any new skips. New skips should be typed in the following format:

```
devskp = nnnnnn
```

where devskp has no more than six characters, and nnnnnn is a legitimate device skip. SGEN XVM performs (in octal) the following tests to determine if a skip is a legitimate IOT:

1. Must be an IOT. (i.e., must be of the form 7Ønnnn).
2. Bit 14 must be zero -- the skip may not clear the accumulator.

Either of these two tests will cause the error message ILLEGAL IOT to be displayed and the IOT. In addition, the low order octal digit must be a 1 -- it must be a skip IOT and not some other kind. This check may be overridden by the user by typing "Y" to the question:

```
"NOT A STANDARD SKIP IOT"
```

```
"DO YOU WISH IT ACCEPTED? (N)"
```

Any other answer causes the skip to be ignored.

If a skip is rejected for any of the above reasons, SGEN XVM re-prompts with the ">" symbol which requests another skip.

Users should not insert skips which can in any way modify the contents of the accumulator. Such skips will cause unpredictable timing dependent action in XVM/DOS. For a similar reason users are also cautioned

## Detailed Description of Operation

against using skip IOTs which in any way modify device status information.

When the user types a Carriage RETURN after the ">", SGEN XVM proceeds to the next device. Negative skips (that is, those which skip on "OFF", not "ON") should be preceded by a minus sign (-), to indicate that they are negative:

```
devskip = -nnnnnn
```

### 2.3 C. ADD NEW DEVICE? (N)

When SGEN XVM has finished with Section B, it asks whether the user wishes to add a new device. Section C differs from other sections in that restarts (CTRL P) only delete information added for the current device.

That is, if the user adds devices AA, BB, and CC, but types CTRL P during the CC operation, SGEN XVM returns to a point just after the completion of the BB device insertion.

When the user has no more devices to add -- that is, when he answers the key question with an "N" or Carriage RETURN, SGEN XVM reminds him of all the handlers he has added to the system, but which are not yet present in IOS. He can add them later, via PIP XVM. The printout shown in Figure 2-3 illustrates the use of this Section.

#### 2.3.1 DEVICE CODE [ ]

Here, the user may type any two alphameric characters that SGEN XVM cannot interpret as an octal number. It is recommended, however, that the user give only alphabetic characters, as any numerals might be confused with a unit number. SGEN XVM does not accept any input other than two alphameric characters. There is no default for this question; SGEN XVM assumes that if the user answered the Section C question with a "Y", he has a device code to add. SGEN XVM makes no assumption about which device it is.

#### 2.3.2 NEW HANDLERS:

Here, the user should add all the handlers he will use for the new device. The names should follow the rules for handler names outlined in paragraph 2.2.

Detailed Description of Operation

```
C. ADD NEW DEVICE? (N) Y
    DEVICE CODE[ ] AD
    NEW HANDLERS:
    >ADA
    >
    NEW SKIPS:
    >701301
      ("701301" ISN'T SYMBOL)
    >ADSF=701301
    >
```

```
C. ADD NEW DEVICE? (N)
    MISSING HANDLERS:
    DKD.
    ADA.
```

Figure 2-3  
Section C Questions: Adding New Devices

## Detailed Description of Operation

A carriage RETURN typed after the prompt symbol causes SGEN to proceed to the next question.

### 2.3.3 NEW SKIPS:

The new skips for the device should follow the format outlined in Paragraph 2.2.4. SGEN XVM adds all new skips to the end of the Skip Chain. The user may change the order of the Skip Chain in Section D.

When the user has no more skips to add, he types a Carriage RETURN after the prompt symbol. SGEN XVM repeats the key question for Section C.

C. ADD NEW DEVICE? (N)

If the user has another new device, he may add it now.

#### NOTE

A "HANDLERLESS DEVICE" is created by: (1) entering any two unused (alphabetic) characters for the device code (this device code is not retained); (2) answering the new handlers as a question followed by a Carriage RETURN; (3) entering the skips in the format outlined in paragraph 2.2.4.

### 2.4 D. CHANGE SKIP CHAIN? (N)

When the user has responded to the key question for Section C with an "N" or a Carriage RETURN, SGEN XVM proceeds to Section D, which allows the user to change the Skip Chain order and delete skips. The user may not add any skips in this section. The printout of Figure 2-4 illustrates the uses of this Section.

#### 2.4.1 DISPLAY SKIP CHAIN? (Y)

In most instances, the user wishes to see all skip mnemonics and acronyms in the old system, plus those he has just added. If he answers "Y" or Carriage RETURN. SGEN XVM types: DEFAULT SKIP CHAIN ORDER, followed by the old Skip Chain with any new skips at the end.

#### 2.4.2 SKIP MNEMONICS IN ORDER:

Users have two basic options for this part: accept the whole chain as is, or retype the entire chain, in a new order. The user may type a

Detailed Description of Operation

D. CHANGE SKIP CHAIN? (N) Y

DISPLAY SKIP CHAIN? (Y)

DEFAULT SKIP CHAIN ORDER:	<u>SKIP MNEMONICS IN ORDER:</u> (cont)
SPFAL	>\$WTSK
DTDF	
DSSF	>\$SDDF
RKSF	
DPSJ	>\$CRSI
MTSF	
SPDI	>\$CRSD
WTSK	
SDDF	>\$LPSF
CRSI	
CRSD	>\$CLSF
LPSF	
CLSF	>\$RSF
RSF	
PSF	>\$PSF
KSF	
KSF1	>\$KSF
TSF	
DTEF	>\$KSF1
DPSE	
MPSNE	>\$TSF
MPSK	
SPE	>\$DTEF
CRSF	
LSSF	>\$DPSE
XYSF	
KSF2	>\$MPSNE
KSF3	
KSF4	>\$MPSK
KSF5	
	>\$SPE
SKIP MNEMONICS IN ORDER:	
>\$SPFAL	>\$CRSF
	>\$LSSF
>\$DTDF	>\$XYSF
>\$DSSF	>\$KSF2
>\$RKSF	>\$KSF3
>\$DPSJ	>\$KSF4
>\$MTSF	>\$KSF5
>\$SPDI	>\$

Figure 2-4

Section D Questions: Altering Skip Chain

## Detailed Description of Operation

single Carriage RETURN in response to the "SKIP MNEMONICS IN ORDER:" question, and obtain the old chain order, with any new skips at the end of the chain. If he types any mnemonic, however, he must account for all of the skips. When the user responds to the SGEN XVM request for the next skip (>) with an ALT MODE, SGEN XVM types "\$" and the first skip in the old chain that has not already been selected. When the user responds to the ">" with a Carriage RETURN, SGEN XVM deletes all unlisted skips, freezes the new order, and continues on to Section E.

Two warnings are in order: (1) Negative skips should be at the end of the chain. Illegal interrupts may otherwise occur when the peripheral device is down. (No standard XVM/DOS devices have negative skips.) (2) Beware of changing the relative order of the chain, as supplied by DEC. For instance, the clock interrupt must come before the printer.

2.5 E. ALTER DEVICE PARAMETERS? (N)

2.5.1 7-CHANNEL MAGTAPE  $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

The user should choose the proper default. "N" gives 9-channel. The printout for this section is shown in Figure 2-5.

2.5.2 LINE PRINTER SIZE (80, 120, OR 132) [nnn]

Acceptable responses to this question are 80, 120, or 132, or a Carriage RETURN. A Carriage RETURN retains the old line size, printed in square brackets.

2.5.3 VT ON:  $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

This requests the default setting for the CTRL X option. A "Y" makes VT ON the default. An "N" makes VT OFF the default. SGEN XVM does not ask this question or the next one if the VTA handler is not in the system.

2.5.4 HALF ON?  $\left\{ \begin{array}{c} (Y) \\ (N) \end{array} \right\}$

This requests the default setting for the half-screen setting for the CTRL X option. An "N" response makes HALF OFF the default. A "Y" response makes HALF ON the default.

## Detailed Description of Operation

```
E. ALTER DEVICE PARAMETERS? (N) Y
    7 CHANNEL MAGTAPE? (Y)
    LINE PRINTER LINE SIZE(80,120, OR 132)[80] 132
    VT ON? (N) Y
    HALF ON? (N)
```

Figure 2-5

### Section E Questions: Altering Device Parameters

```
F. ALTER .DAT SLOTS? (N) Y
    # OF POSITIVE .DAT SLOTS[20]
    DISPLAY .DAT SLOTS? (Y) Y
    .DAT   DEVICE  UIC
    -15    SYA     UIC
    -14    SYA     UIC
    -13    SYA     UIC
    -12    CMA     UIC
    -11    SYA     UIC
    -10    CMA     UIC
    -7     DPL     SYS
    -6     SYA     UIC
    -5     NONE    UIC
    -4     SYA     BLD
    -3     TTA     UIC
    -2     TTA     UIC
    -1     SYA     SYS
    1      SYA     UIC
    2      SYA     UIC
    3      SYA     UIC
    4      SYA     UIC
    5      SYA     UIC
    6      SYA     UIC
    7      SYA     UIC
    10     SYA     UIC
    11     SYA     UIC
    12     TTA     UIC
    13     TTA     UIC
    14     NONE    UIC
    15     NONE    UIC
    16     PPA     UIC
    17     MTA     UIC
    20     MTA     UIC
```

```
NEW ASSIGNMENTS:
>A LP -12,6/CD 5
    ("CD" ISN'T IN SYSTEM)
    EX:
    >A DK<UIC> 7,10/TTA 4
>A LP -12,6/CDB 5
>A SY <UIC> -4
>
```

Figure 2-6

### Section F Questions: .DAT Slot Assignments

## Detailed Description of Operation

### 2.6 F. ALTER .DAT SLOTS? (N)

This section allows the user to alter the number of positive, or user .DAT slots, which is a permanent change to the system (until the next System Generation), and to make the default assignments to both the .DAT slots and the .UFDT slots. The operator may temporarily change the assignments via the ASSIGN (A) command to the Nonresident Monitor. (See Figure 2-6.)

#### 2.6.1 # OF POSITIVE .DAT SLOTS [nn]

This asks the number of positive .DAT slots for the new system, and indicates the old number in square brackets. The number of negative .DAT slots is fixed at 15. SGEN XVM accepts any octal number from 1 to 77, inclusive. Each .DAT slot adds two registers to the size of the Resident Monitor and two parameters to SGNBLK -- one for the .DAT slot entry, and one for the .UFDT entry. Users with a great deal of core should still be careful about too many .DAT slots. That might cause SGNBLK overflow and an abort from the system generation. Further, FORTRAN OTS users must reassemble FIOPS STOP and .FLTB in order to use more than 20<sub>8</sub> .DAT slots. (See FORTRAN IV XVM OPERATING ENVIRONMENT MANUAL for instructions.)

#### 2.6.2 DISPLAY .DAT SLOTS (Y)

If the user wishes to change any assignments, he may request their current assignments by answering "Y" or Carriage RETURN. This has the effect of a REQUEST command to the Nonresident Monitor.

#### 2.6.3 NEW ASSIGNMENTS:

The user may make new default assignments to the .DAT and/or .UFDT by using the same format of ASSIGN (A) commands he would use to the Nonresident Monitor. When the user has no more new assignments, he should type Carriage RETURN when SGEN XVM types a new angle bracket (>). Typing 'UIC' in a .UFDT slot means the UIC currently logged in is given to that .UFDT slot. Typing 'SYS' in a .UFDT slot means either BNK or PAG will be assigned to that slot by the loaders (depending on the addressing mode of the load). Any other three letters are retained unless changed via an ASSIGN command.

## Detailed Description of Operation

### 2.7 G. CHANGE SYS FILES? (N)

With the exception of the first question, which refers to the size of the ↑Q area, this refers to the core-image system programs currently listed in SYSBLK and COMBLK. This section allows no additions. The printout given in Figure 2-7 illustrates the use of this section.

#### 2.7.1 ↑Q AREA SIZE? (NONE, NNNK) [nnnk]

This question allows the user to set the ↑Q area size. The Resident Monitor will ↑Q dump (to the ↑Q area) the minimum of the current system memory size and the ↑Q area size. The ↑Q area size should normally be set to the expected system memory size. However, some users, especially those with large amounts of memory (more than 32K), may wish to select an ↑Q area size smaller than their memory size. This saves disk space while sacrificing the upper portion of all memory dumps.

While the system will allow ↑Q dumps to any size ↑Q area, GET/PUT operations will be performed only if the Q area is at least as large as the system bootstrap (24K or 32K).

Detailed Description of Operation

G. CHANGE SYS FILE? (N) Y

^Q AREA SIZE(NONE,NNNK) [NONE] 32K

TO BE KEPT:

DOS15? (\$) \$

SGENT? (\$) \$

UPDATE? (\$) N

PIPT? (\$) \$

EDIT? (\$) \$

MACRO? (\$) \$

PATCH? (\$) \$

QFILE? (\$) \$

Figure 2-7

Section G Questions: Changing System Programs

## Detailed Description of Operation

### 2.7.2 TO BE KEPT:

syspro? (\$)

After the ↑Q area size has been defined, SGEN XVM asks questions about each core-image system program currently on the system, in the order that it finds them in COMBLK. A response of "\$" or Carriage RETURN instructs SGEN XVM to retain all information about the last-named system program. A response of "Y" instructs SGEN XVM to retain the program's name in SYSBLK and COMBLK, but implies that the user wishes to change some of the information about the program, as listed in SYSBLK and COMBLK. An "N" deletes the program from the system. SGEN XVM does not allow the Nonresident Monitor (DOS15) to be deleted.

2.7.2.1 overlay (Y) (where "overlay" is the name of any currently listed overlay)

If the user responds to a system program name with a "Y", SGEN XVM first lists each of the program's overlays, if any. These are Yes/No answers.

A "Y" Carriage RETURN response retains that overlay, and an "N" response deletes it.

2.7.2.2 OVERLAY NAME [ ]

If the user wishes to add any overlays to the current system program, he should type the names at this point. SGEN XVM rejects names which are more than six characters long, or are the same as any Nonresident Monitor or PATCH XVM command. If the named overlay is already listed in SYSBLK, SGEN XVM requests the next overlay. If not, SGEN XVM requests:

2.7.2.3 # OF BLOCKS [ ]

The user should type the number of blocks required for the new system program. If the number is legal, SGEN XVM tests whether there are as many contiguous free blocks on the system device as are necessary to hold the new overlay. SGEN XVM starts testing at block 0 of the system device, and stops as soon as it finds enough blocks. SGEN XVM then updates its image of the Storage Allocation Table (SAT) to indicate that those blocks are occupied.

## Detailed Description of Operation

Note that when disk space is limited, and the user wishes to add several system programs and overlays or a large ↑Q area, SGEN XVM may not allocate disk space efficiently. In an extreme case, the user may need to first transfer the files of several UFDs (or even all of IOS, except the system device's "A" handler) off the disk via PIP XVM, and then do one pass through SGEN XVM to delete all unwanted system programs. Then the user must do enough succeeding passes to ensure that system programs are added in order of size, with the largest first. Finally, the user should transfer the UFDs back, via PIP XVM. This allows the UFD files, which need not be in contiguous blocks, to use the noncontiguous blocks.

### 2.7.2.4 BUFFS [nn]

This question indicates the number of buffers previously allocated for this system program, and asks whether the user wishes to change the number. SGEN XVM has no way of checking whether the number of buffers allocated is compatible with the program. That is the user's responsibility.

### 2.7.2.5 .DAT SLOT nn? (Y)

After the user has indicated the number of buffers for this program, SGEN XVM asks him to check the .DAT slots required. It first lists the old ones. If the user types "Y" or Carriage RETURN, SGEN XVM retains the listed .DAT slot. An "N" deletes the listed .DAT slot.

### 2.7.2.6 .DAT SLOTS

After checking the old .DAT slots, the user should add any new ones the program needs. The .DAT slots added must be legal, as determined in Section F. All positive .DAT slots may be obtained by typing "ALL". If the user has added an overlay, he should add any .DAT slots needed by the overlay but not listed by SGEN XVM for the system program.

## Detailed Description of Operation

### 2.8 H. ADD SYS PROG? (N)

This section allows users to add the names of new core-image system programs and their overlays to SYSBLK and COMBLK. Restarts in this section delete only the current system program, just as they do for new devices, Section C.

The printout given in Figure 2-8 illustrates the use of this section.

#### 2.8.1 PROG NAME [ ]

Names must conform to the rules for system program names outlined in paragraph 2.7.2.2. There is no default for this question.

#### 2.8.2 # OF BLOCKS [ ]

This question works just like that for overlays, described in paragraph 2.7.2.3. There is no default for this question.

#### 2.8.3 OVERLAY NAME [ ]

Any overlay names must conform to the rules for system program names outlined in Paragraph 2.7.2.2. If the overlay name is not already listed in SYSBLK, SGEN XVM requests:

# OF BLOCKS [ ]

#### 2.8.4 BUFFS [0]

The user should enter the octal number of buffers needed for the new system program.

#### 2.8.5 .DAT SLOTS:

The user should list the octal numbers of all .DAT slots needed by the new system program, or any of its overlays. The response "ALL)" obtains all positive .DAT slots.

After the user has entered all necessary .DAT slots, he should type a Carriage RETURN in response to the ">" symbol typed by SGEN XVM. This returns him to the start of Section H.

Detailed Description of Operation

If the user types Carriage RETURN or "N" to the key question for Section H, SGEN XVM disallows CTRL P or CTRL C, modifies the system and re-bootstraps the monitor.

```
H. ADD SYS PROG? (N) Y
      PROG NAME[] ADMON
      # OF BLOCKS[] 7
      OVERLAY NAME[] ADMON1
      # OF BLOCKS[] 3
      OVERLAY NAME[]
      BUFFS[] 4
      .DAT SLOTS:
      >11,12,13,14
      >
```

```
H. ADD SYS PROG? (N)
```

```
MODIFYING SYSTEM(^P,^C IGNORED)
```

Figure 2-8  
Section H Questions: Adding System Programs

APPENDIX A  
DOSSAV XVM OPERATING INSTRUCTIONS

DOSSAV XVM (DOSSAV) is the save/restore system for XVM/DOS.

DOSSAV saves and restores to/from DECdisk, Disk Cartridges, Disk Packs, DECTape and magtape. A DECdisk system can be saved on and restored from DECTape, magtape, Disk Cartridge and Disk Pack. A Disk Pack or Disk Cartridge system can use DECTape and magtape.

Once loaded, DOSSAV asks for all necessary information such as input and output device, unit numbers, and, in the case of magtape, track and density.

GENERAL INSTRUCTION:

The user must type a Carriage RETURN after all entries, including the character typed to restart after errors. For XVM UNICHANNEL systems, start up XVM/PIREX as indicated below.

To load XVM/PIREX, place the ABS11 paper tape in the XVM's paper tape reader. Place the ENABLE/HALT switch on the PDP-11 in the HALT position. Press the STOP and RESET switches on the XVM simultaneously. Set the ADDRESS switches on the XVM to 17700. Press the READIN switch on the XVM. When readin operation is completed and the XVM has halted, set the PDP-11 switch register to:

100000 for 8K local memory on the PDP-11  
120000 for 12K local memory on the PDP-11

and depress the PDP-11 LOAD ADDR switch, then set the ENABLE/HALT switch on the PDP-11 to ENABLE, and finally depress the PDP-11 START switch.

Remove ABS11 from the paper tape reader, and reload it with the XVM/PIREX paper tape. Press CONTINUE on the XVM. This will cause the ABS11 program (which has two segments: a PDP-11 segment, and an XVM

## DOSSAV XVM Operating Instructions

segment) to read in XVM/PIREX (which is a PDP-11 absolute binary tape) via the XVM segment and load it into PDP-11 lower memory via the PDP-11 segment.

When the XVM/PIREX paper tape has been read in, the XVM will halt, and the PDP-11 will be running XVM/PIREX. Remove the XVM/PIREX paper tape from the reader. At this point the UNICHANNEL Peripheral Processor has been loaded and is waiting for an I/O request from XVM/DOS.

### A.1 RESTORING SYSTEMS

The following examples illustrate how to put the systems distributed by DIGITAL on DECTape or magtape onto a DECdisk, Disk Pack or Disk Cartridge. The user responses are underlined. The RK05 based systems start up XVM/PIREX as described in GENERAL INSTRUCTION, above, before starting up DOSSAV. DOSSAV resides on a paper tape, which must be (HRM) loaded at 57720 (restart 54000).<sup>1</sup>

1. To restore a DECdisk system from DECTape (1 of 2 on Unit 1 and 2 of 2 on Unit 2)

```
DOSSAV XVM Vnxnnn
INPUT DEVICE? DT
UNIT NO? 1
OUTPUT DEVICE? DK
DATE CREATED: 06 Jun 73    /Note that if DK is typed no
                           unit number is requested.
TAPE DONE. MOUNT ANOTHER /At this point,
2                       /type 2 on the key-
                           /board followed by Carriage
                           RETURN.
```

2. To restore a DECdisk system from magtape (on Unit 0):

```
DOSSAV XVM Vnxnnn
INPUT DEVICE? MT
UNIT NO? 0
OUTPUT DEVICE: DK
DATE CREATED: 06-JUN-73
```

#### NOTE

All XVM/DOS System Restore magtapes distributed by DIGITAL are 800 BPI. DOSSAV always assumes odd parity. For 9 track units, DOSSAV assumes 800 BPI.

---

<sup>1</sup>DOSSAV may be loaded at any of the following locations. 17720<sub>8</sub>, 37720<sub>3</sub>, 57720<sub>3</sub> or 77720<sub>8</sub>. A binary loader precedes DOSSAV on the paper tape and this loader moves DOSSAV to bank 2 where DOSSAV actually runs. The restart must be 54000<sub>8</sub>.



## DOSSAV XVM Operating Instructions

It is possible to restore to the DECdisk a software system which was created for a machine smaller (different number of DECdisk platters) than the one being restored to. DOSSAV does all the necessary adjustments of the SATs<sup>1</sup>. Therefore, the restore tapes issued by DIGITAL for a 1-platter system can be restored to any system. Note that this should only be done with the master tape(s) which have block 1775<sub>8</sub> free. That block is needed during the restore for five or more DECdisk platters. It is not possible to restore a software system which is larger than the hardware. (For example, one cannot restore a 3-platter system onto a 1-platter configuration.)

The system can then be bootstrapped from the appropriate disk. See the XVM/DOS Keyboard Command Guide.

### A.2 SAVING SYSTEMS

Once the user has tailored the system to his specific configuration, he will want to save that system for future restorations. To do that, simply reverse the procedure above. To illustrate, consider Example 1 above and the changes necessary to it to create a restore tape.

To save a DECdisk system to DECTape (on Units 1 and 2):

```
DOSSAV XVM Vnxnnn
INPUT DEVICE? DK
OUTPUT DEVICE? DT
UNIT NO? 1
TAPE DONE. MOUNT ANOTHER At this point, type 2 on the key-
                          board followed by a Carriage RE-
                          TURN.
2
```

Note that DOSSAV XVM allows for as many DECTapes and magtapes as are necessary to hold the system.

### A.3 ERROR CONDITIONS AND MESSAGES

Recoverable errors during command string decoding: If a question is answered incorrectly, DOSSAV outputs an appropriate error message and then repeats the question. These error messages are:

ILLEGAL DEVICE	An illegal device mnemonic was typed (something other than DP, DK, RK, DT, or MT) or an illegal combination of devices was typed (i.e., input = DT and output = MT).
BAD TRACK	Something other than 7 or 9 was typed.

---

<sup>1</sup>SATs: Storage Allocation Tables - i.e., bit maps.

DOSSAV XVM Operating Instructions

BAD DENSITY            Something other than 2 (200), 5 (556), or  
8 (800) was typed.

Recoverable errors during operations: If it is possible to recover from an error, DOSSAV attempts to do it. The error message is output to the console. After the problem has been corrected, any character on the keyboard followed by a Carriage RETURN resumes operation.

TAPE NOT READY	The DECTape or magtape unit is off line or not write enabled.
DISK NOT READY	DECdisk is write locked.
DISK PACK NOT READY	The Disk Pack or Disk Cartridge unit is not ready.

Unrecoverable errors: Primarily hardware errors, from which DOSSAV cannot recover. After the error message has been output, DOSSAV restarts. DOSSAV retries five times on parity error, before issuing an unrecoverable error message.

DECTAPE ERROR  
MAGTAPE ERROR  
DISK ERROR  
DISK PACK ERROR

ATTEMPT TO RESTORE SYSTEM TO WRONG DISK

To protect users who have access to more than one type of disk and who may have several sets of restore tapes, all restore tapes are created with the mnemonic of the disk type in the first SAT. DOSSAV checks this code against the output device code. If they differ, this message is output.

BLK 1775 OCCUPIED. NO 2ND SAT CREATED

A DECdisk system created for 4 or fewer platters is restored to a machine with 5 or more platters and block 1775 is already used. Therefore, no second SAT is created. A master tape was not used to make the restore.

XX ERR IGN

where XX = DK or DP or RK.

This error is typed on the console, and the XVM halts. This reports that "Read/Write check" errors occurred more than 12<sub>8</sub> times during a save or restore process. The bad block number is present in the XVM AC. Users can continue the save or restore process by pressing the continue switch on the console of the machine.

#### A.4 TAPE STRUCTURE

The restore tapes are structured as follows: the first SAT of the system is the first block put on the tape. This SAT, which is never restored to the disk, has two words modified: word 2 contains the creation date (MMDDYY,YY is years since 1970) and word 376 contains the device mnemonic (.SIXBT, right justified). All the occupied blocks referenced by this SAT are then put sequentially on the tape. The second SAT, if there is one, is then put on, and so on. This structure enables use of magtape, which is a sequential only device.

#### A.5 DOSSAV XVM RESTRICTIONS

1. It is not possible to save or restore magtapes with even parity.
2. DOSSAV fails when two DECTapes are on line with the same unit number. It is necessary to restart under such circumstances.

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READER'S COMMENTS

NOTE: This form is for document comments only. Problems with software should be reported on a Software Problem Report (SPR) form.

Did you find errors in this manual? If so, specify by page.

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Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

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Is there sufficient documentation on associated system programs required for use of the software described in this manual? If not, what material is missing and where should it be placed?

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Please indicate the type of user/reader that you most nearly represent.

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Non-programmer interested in computer concepts and capabilities

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