

XVM/RSX PART XII
V1B SYSTEM INSTALLATION GUIDE



CHAPTER 1

INTRODUCTION

This part of the manual describes how to build an XVM/RSX system in general terms. Familiarity with XVM/DOS is assumed. Users who are unfamiliar with XVM/DOS are advised to read the following manuals before attempting to build a system:

1. XVM/DOS System Installation Guide
2. XVM/DOS Users Manual

Building an XVM/RSX system is a seven-stage process. The first stage is building an XVM/DOS system tailored to the user's hardware system. (The disk on which this system is built will hereafter be called the system disk.) Next, a program supplied with XVM/RSX must be run under DOS to generate a batch job file. This program asks various questions regarding the user's hardware system and desired software configuration. From the information supplied, a batch job file is generated capable of building an RSX system in its initial form. The third stage in the process is to run the batch job, mounting those XVM/RSX distribution tapes requested. This completes the XVM/RSX V1A build procedures. A similar sequence of operations has to be performed to update the system to XVM/RSX V1B. This must be done before going on to the next stage.

At this point in the build procedure, the user has a "preconfigured" XVM/RSX system on disk (i.e., a system that has RSX built into DOS), but one in which RSX has not yet been activated. This system should then be saved on tape via the DOSSAV program supplied with XVM/DOS. Next, the user must tailor XVM/RSX to the specific needs of the installation. Finally, any additional tasks such as user programs, I/O handlers or system programs should be installed into the XVM/RSX system.

Under certain circumstances, it is desirable to configure a system in which a complete DOS system is used for bootstrapping an RSX system from a different disk (referred to as a cross-disk system). If this software configuration is required, read Appendix B for more information.

The user is strongly urged to read this entire part of the manual before attempting to build an XVM/RSX system. Chapters 2 through 5 describe the steps necessary to build a system and explain the reasons for doing each one. These chapters are not system build instruction, but contain essential information for following the actual build procedures found in Chapter 6.

CHAPTER 2
BUILDING AN XVM/DOS SYSTEM

XVM/RSX uses XVM/DOS as a base. RSX must be built into a DOS system before it can be used. The DOS system should be built following the directions given in the XVM/DOS System Installation Guide. This system must contain:

1. The A version of the system disk handler and the A version of the cross-disk handler, if any.
2. The A version of either the magtape or DECTape handler, (whichever one can read the RSX system distribution tapes).
3. The SGEN, PIP, PATCH, MACRO, DOSTKB, UPDATE and EXECUTE system programs. (The file EXECUT BIN must exist in both the BNK and PAG UFDs of the system disk.)

If the user's installation has UNICHANNEL hardware, PIREX must contain drivers for all DOS and RSX UNICHANNEL peripheral device handlers to be used by either system. The spooling facilities can be installed in the system, if desired.

If RSX is to reside on the RF fixed-head disk, the DOS system built on that disk should be as small as possible. Only those DOS system programs and binary files specifically required to build RSX should be installed in DOS. This is recommended, because the RF disk may be too small to store a large DOS system, a complete RSX system and user files. It is mandatory that the XVM/DOS RF disk system have the maximum number of free disk blocks if the RSX Executive must be assembled.

In this text, it is assumed throughout the RSX build procedures that the DOS MICLOG password is SYS. The program called BUILD, which generates a batch job file for building XVM/RSX into XVM/DOS, must be run on the system disk. Under no circumstances should the DOSSAV system distributed with XVM/DOS be used as a base for building XVM/RSX. The required XVM/DOS system must be generated using the XVM/DOS build procedures.

CHAPTER 3

GENERATING A DOS BATCH JOB FILE

After the XVM/DOS system has been built, the program called BUILD can be run to generate a DOS batch job.

3.1 PREPARING TO RUN BUILD

On the RSX distribution tape DEC-XV-IXRAA-A-UC3 for DECTape media, DEC-XV-IXR2A-A-MC7 for 7-track Magtape media, or DEC-XV-IXR2A-A-MC9 for 9-track Magtape media are the files CODE SRC, RSXPAT XCU, RSXPAT XCT, BUILD XCU, and BUILD XCT. Prior to running BUILD, all five of these files should be transferred to the system disk. This step reduces the time required to load and execute BUILD.

After making the appropriate .DAT slot assignments, PIP may be requested. Then each of these five files can be transferred from tape to disk.

3.2 RUNNING BUILD

Once RSXPAT XCU, RSXPAT XCT, BUILD XCT, BUILD XCU, and CODE SRC are on disk, BUILD can be run using the EXECUTE XVM/DOS system program.

In order for BUILD to create a batch file capable of building XVM/RSX into DOS, the user must supply that program with various information. The following subsections explain what questions are asked and how to answer them. The titles of these subsections specify most of the questions.

1. Is your distribution media DECTape?

This question determines the device to be used when PIPing files from tape to disk during the batch job run. If the user received the XVM/RSX system on DECTape, the answer should be 'YES'. Otherwise, the answer should be 'NO'.

2. Do you want TKB to be a DOS system program?

There is a version of the RSX Task Builder, TKB, which can be made to run under DOS. Its inclusion into DOS is optional. If it is desirable to build RSX tasks under DOS, answer 'YES'. Otherwise answer 'NO'.

3. Do you have floating point hardware?

The user should respond according to the installation's hardware configuration. The answer to this question determines if the floating point version of the RSX system library, .LIBFX BIN, should be transferred to disk. In all cases the non-floating point library, .LIBRX BIN, will be transferred. This question also relates to the transfer of the floating point version of the FORTRAN IV compiler. More information on this latter point will be supplied subsequently.

4. Is this disk the RSX system disk?

Unless the user plans to use a complete DOS system on one disk and an RSX system on another (i.e., a cross disk system), the answer should be 'YES'. Only if a cross disk system is being built and the user is building a system on his DOS system disk should the answer be 'NO'. If this question is answered 'NO', then BUILD will ask:

SPECIFY RSX SYSTEM DISK(1=RK,2=RP,3=RF):

The user should respond by typing the numeric code identified with the type of disk to be the RSX system disk. This question ends the dialogue between BUILD and the user in this case.

5. What is your memory size in K words?

In the case where an RSX system disk is being built, BUILD will ask for the installation's memory size. The user should respond with the decimal number of K word increments of memory on his system, i.e., increments of 1024 memory locations. The number specified should be an integral multiple of 4. This number must also be between 32 and 128.

6. Do you want the standard RSX executive?

BUILD must determine if the user desires a special version of the XVM/RSX executive. If the user has XVM hardware, requires no more than 64 LUNs (comparable to .DAT slots in DOS), and has no more than six terminals, the answer should be 'YES'. If the standard version of the executive is not desired, the following questions will be asked:

Do you have XVM hardware?

How many LUNs do you want?

How many terminals do you have?

The first of these questions should only be answered 'YES' if the user has an XVM computer or an XM-15 option on a PDP-15 computer. If the answer is 'NO', the NOXM assembly parameter will be defined when assembling the executive. This parameter's definition will cause the removal of the Share directive and the Task Timing routine associated with XVM hardware.

The other two questions are self explanatory and require only a decimal integer to be supplied. The number of LUNs must be between 21 and 512. The number of terminals must be between 1 and 17.

NOTE

The last few questions asked by BUILD determine which TSK files will be transferred from tape to disk. TSK files are linked binary files from which a core image of the task is written on disk when the task is installed by RSX.

7. Do you want all the standard MCR functions?

Regardless of the user's response, all mandatory MCR functions will be installed in the system. If the RSX system disk is the RF, only those MCR functions which the user specifically requires should be installed. Hence, for RF users the answer should usually be 'NO'. If not all of the standard MCR functions are needed, each optional MCR function will be listed so the user can indicate which ones are desired. Optional MCR functions can also be installed on-line once the disk storage requirements of the system are more clearly defined.

8. Do you want all the standard TDV functions?

This section of the dialogue is analogous to that relating to MCR functions. If this question is answered 'NO', BUILD will interrogate the user to determine what TDV functions are needed.

9. Indicate which of these I/O handlers you want.

BUILD must determine if the user wants a DEctape handler, standard line printer handler (LP15), or a UNICHANNEL line printer handler (LP11). The answer to this set of questions is obvious from the user's hardware.

10. Do you want the RSX checkout package?

The checkout package is optional. It is recommended, however, that it be run at installations that have not used RSX before.

11. Do you want the RSX batch subsystem?

The XVM/RSX batch subsystem is optional. It can be installed on-line. Unless the user is certain that RSX Batch will be used, the response should be "NO".

12. Do you have UNICHANNEL hardware?

This question is asked only if the system disk is not an RK disk or if the UNICHANNEL line printer handler was not selected. If the question is answered "YES", the RSX POLLER task is transferred to disk. This task is responsible for interrogating PIREX to determine the status of UNICHANNEL I/O devices. It should not be transferred to disk for systems without UNICHANNEL hardware.

When BUILD has completed its dialogue, a batch job file is written on the device assigned to .DAT slot 2. This batch job can then be run to build an XVM/RSX V1A preconfigured system.

If BUILD detects an erroneous answer, the user's response is rerequested. If the user wishes to stop BUILD prematurely, he can do so by typing CTRL/C.

3.3 RUNNING THE BATCH JOB

The batch job file written by BUILD can be invoked via the DOS Monitor batching mechanism. Whenever the batch job asks for a tape to be mounted and pauses, the user should mount the tape on the indicated drive and type CTRL/R to resume the batch job. Following these procedures results in the creation of a preconfigured XVM/RSX V1A system on the system disk.

3.4 BUILDING XVM/RSX V1B

An XVM/RSX V1B system can be preconfigured after the foregoing V1A system build procedures have been completed.

NOTE

If you do not intend to include MULTIACCESS in RSX, but you do wish to have batch processing, use the batch system available with version V1A. The new MULTIACCESS Batch Processor is incompatible with the V1A TDV facility.

There are three files on the distribution medium that must be transferred to the system disk in order to build XVM/RSX V1B. These

files are BUILD XCT, BUILD XCU and CODE SRC. (These should not be confused with files of the same name from the XVM/R SX V1A build procedures.) The necessary PIP commands to transfer the files are shown below. Both DECTape¹ and magtape versions are shown. The portion of each command that varies is enclosed in brackets.

```
$PIP
>T SY <SCR>,{MT } BUILD XCT,BUILD XCU (B)
      {DT0}

>T SY <SCR>,{MT } CODE SRC
      {DT0}
```

Proceed with the RSX build procedures by bootstrapping the DOS system at memory location 77637 (octal). Enter the following set of DOS commands:

```
$A SY 1,2/TT 12,13
$XVM OFF
$BANK ON
$E BUILD
```

BUILD then asks a series of questions concerning parameters for constructing the system. The parameters are:

<u>Parameter</u>	<u>Meaning</u>
NLU	Number of LUNs in the RSX system.
MA.NLU	Number of virtual LUNs per MULTIACCESS user.
TTYS	Number of terminals on the system.
MCRTMO	Number of seconds before MCR timeout occurs.
NOMAC	The system is non-MULTIACCESS if this parameter is defined (given a value).
PARITY	Parity processing is included on terminal I/O if this parameter is defined.
NOXM	This parameter is defined if the XM-15 memory management option does not exist.
LIGHTS	This parameter is defined if a rotating light pattern is desired in the AC, XR, LR and MQ.

The questions asked by BUILD are explained in the following paragraphs.

1. Is the DOS and RSX system disk the same disk?
If the DOS and RSX systems reside on the same disk, answer "YES" to this question and the next question will be skipped.
2. Enter the RSX system disk type (1=RK, 2=DP, 3=DK).
Enter a decimal number corresponding to the disk type that will contain the RSX Executive and tasks. This disk must be patchable and have a DOS file structure.

¹ For DECTape, be sure to use drive 0.

3. Do you have a DECTape update kit?
If the answer is "NO", a magtape kit is assumed.
4. Do you have TKB as a DOS system program?
DOSTKB is a required component for the XVM/RSX V1B build procedures. If space has already been allocated on the DOS system disk for TKB, answer "YES" to this question.
5. Do you have magtape?
If your system configuration includes a magtape, answer "YES" to this question.
6. Do you have UNICHANNEL hardware?
If your system configuration includes the UNICHANNEL front end, answer "YES" to this question.
7. Do you have an LP-11?
If a line printer is connected to the UNICHANNEL, answer "YES" to this question.
8. Do you have XVM hardware?
If you have the XM-15 memory management option, answer "YES" to this question.
9. Do you have floating-point hardware?
If you have the FP-15 floating-point option, answer "YES" to this question. If you answer "NO", the next question is skipped.
10. Do you want the non-floating-point compiler and libraries?
To include FOR as a TDV function task, answer "YES" to this question.
11. Do you want to run MULTIACCESS?
If you want to run the new multiuser version of TDV, answer "YES" to this question.
12. Do you want the RSX batch subsystem?
If you answer "YES" to this question, the components of the batch-processing subsystem are assembled and the resulting binary files are stored under the RSX UIC. At this point, however, certain pieces of the batch-processing software will not be constructed. These pieces are FORTRAN code and must be compiled with the RSX FORTRAN Compiler.

It is the user's responsibility to insert the batch subsystem into RSX.
13. Do you want ODT?
If you answer "YES" to this question, the binary of ODT is placed under the RSX UIC.

It is the user's responsibility to insert ODT into RSX.

14. Do you want to run the default system?

If you answer "YES" to this question, no further questions will be asked and the following default values will be assumed for the parameters listed:

<u>Parameter</u>	<u>Default Value (Decimal)</u>	
	<u>MULTIACCESS</u>	<u>Non-MULTIACCESS</u>
NLU	200	64
MA.NLU	25	---
TTYS	5	3
MCRTMO	60	60
NOMAC	---	0
PARITY	---	---
NOXM	---	---
LIGHTS	---	---

15. How many LUNs do you want? [64 or 200]

The numbers in brackets are the default values for a non-MULTIACCESS system and a MULTIACCESS system, respectively.

16. How many LUNs/user do you want? [25]

If you have not specified a MULTIACCESS system, this question is not asked.

To plan the number of LUNs/user, use the formula:

$$\frac{(\text{total number of LUNs}-64)}{\text{number of users}} = \text{LUNs/user}$$

(must be at least 24)

17. How many terminals do you have? [3 or 5]

The numbers in brackets are the default values for a non-MULTIACCESS and a MULTIACCESS system, respectively.

18. Enter the number of seconds for the MCR timeout interval. [0=no MCR timeout]

The number entered can be 0, or 15 or more. Any number between 1 and 14 causes the RSX Executive not to assemble.

19. Do you want parity processing on terminal I/O?

If some of the terminals attached to your system require correct parity to operate properly, answer "YES" to this question. Odd parity is generated.

3.5 RUNNING THE BATCH JOB

The batch job file written by BUILD can be invoked via the DOS Monitor batching mechanism. Whenever the batch job asks for a tape to be mounted and pauses, the user should mount the tape on the indicated drive and type CTRL/R to resume the batch job. Following these procedures results in the creation of a preconfigured XVM/RSX VLB system on the system disk.

3.6 SAVING THE PRECONFIGURED SYSTEM

Once a preconfigured RSX system has been generated, it must be saved on tape with the DOSSAV program. The use of DOSSAV is described in the XVM/DOS Users Manual. Saving the system at this point is very important, because it is needed whenever the RSX Executive is modified and whenever updates of XVM/RSX are distributed.

CHAPTER 4

RSX CONFIGURATION PROCEDURES

This section describes basic RSX configuration procedures which are used to define devices, partitions, and other system characteristics to RSX.

4.1 RSX: BOOTSTRAPPING THE RSX SYSTEM

The RSX system can be automatically bootstrapped from the DOS system disk by requesting a program installed in the DOS system. Simply type the following:

\$RSX

If this is the first time RSX has been invoked in this way, the system will respond by requesting configuration.

4.2 RSX SYSTEM CONFIGURATION

The system configurator asks a short set of questions to determine various characteristics of the XVM/RSX system. The following subsections explain how the user should respond. The titles of these subsections specify the questions. All numeric responses are in decimal notation except where otherwise noted. Typing a carriage return in response to a question gives the bracketed value specified in the question.

1. Specify number of clock ticks per second [60]:

The user should respond with the frequency of the installation's KW-15 real time clock. In the United States this number will usually be 60; 50 in Europe.

2. Specify core size [32K]>

Here the user should supply his installation's core memory size in K words, e.g., 64K, 96K, etc. The number must be an integral multiple of 4 and must be between 32 and 128.

CAUTION: This number may be smaller than or equal to the answer specified to BUILD's question asking for memory size. It cannot be larger. If a larger number is specified, file structure degradation may occur!

3. MCR partition size octal [3000]>

Under normal circumstances the user should accept the default value. If a smaller value is chosen several mandatory MCR functions (...INS,...RCF, etc.) may not be installed in that partition. The system configurator will reject a value greater than 3000 octal.

4. System disk; [RF], RP, RK>

The user must supply the name of the RSX system disk type. The response governs the disk type from which the system configurator's version of INSTALL will obtain TSK files and where the SAVE MCR function will write core images of the system.

5. How many RF platters? [0]>

The number of RS09 disks on the system should be the answer.

6. How many RP disks? [0]>

The number of RP02 disks on the system should be the answer.

7. How many RK disks? [0]>

The number of RK05 disks on the system should be the answer.

8. How many large nodes? [10]>

This answer governs the number of partitions which can be specified in the system. Additional large nodes can be added using the RCF MCR function. Usually the default value should be accepted.

9. How many small nodes? [150]>

This parameter may be highly variable. The user is advised to consult the System Management section (Part III) for an explanation of small node usage. Usually, the default value should be accepted. More small nodes can be added to the system later with RCF.

4.3 SYSTEM CONFIGURATION ERROR MESSAGES

There are several error messages which may be encountered during system configuration. The following list shows all error messages which may be output during the user's dialogue with the system configurator.

```
***IF YOU HAVE KT15 (MEMORY RELOCATE) THE  
***PROTECT/RELOCATE SWITCH IS SET WRONG
```

```
ILLEGAL NUMBER OF TTY'S PATCHED IN
```

```
^^^SYNTAX ERR AT "X" -- RETYPE
```

```
^^^INVALID SIZE -- RETYPE
```

```
^^^NAME ALREADY USED -- RETYPE
```

```
***RE-ENTRANT ECO PACKAGE NEEDED
```

```
INSUFFICIENT CORE OR NODES, TRY AGAIN
```

```
'RSX' UFD NOT ON SYSTEM DISK
```

```
NODES WOULD OVERFLOW DISK PARTITION
```

In addition to these error messages, the System Configurator's version of INSTALL may issue various others while attempting to install the initial set of tasks. Refer to the documentation on the INSTALL MCR function for more details.

4.4 SETTING UP AN RSX ENVIRONMENT

After the System Configurator has run to completion, the XVM/RSX system is established. Before a true multiprogramming environment can be established, however, a series of procedures must be followed to describe and enable terminals, and back up the newly configured system. Specifically, the user must define the characteristics of every terminal in his system using the DTC MCR function. Then, the system disk files handler should be assigned to various LUNs. Finally, an image of core should be written to the RSX system disk via the SAVE MCR function. Then, if the user wishes to run the RSX checkout package, the following steps should be done.

MCR><u>RCF	Invoke On-Line System Configurator
TYPE UNITS "NAME(BASE,SIZE) "	
PARTITION	
><u>COP1(70000,2000)	Assign partitions for
><u>COP2(72000,3000)	Tasks in the checkout
><u>COP3(75000,2000)	package
>	End of partition specifications
SYS COM	No COMMON block
>	specifications
SMALL NODE	No additional small node
>	specification at this time
LARGE NODE	No additional large node
>	specifications at this time
TYPE N TO EXIT	
>	Indicate satisfactory input
RCF OK!	Successful reconfig- uration
MCR><u>INS SATCHK	Install certain tasks
MCR><u>INS RX	necessary to run the
MCR><u>INS COPHM	checkout package
MCR><u>INS DTRUN	
MCR><u>SAVE	Back up the current RSX system
MCR><u>COP	Invoke the RSX checkout package
.	
.	
.	
MCR><u>KCH	Stop (kill) checkout package output
COP-CANCELLED BUT ACTIVE TASKS RUN THROUGH COMPLETION	
CAUTION -- DON'T ABORT EXEC MODE COP TASKS!	

CHAPTER 5

ADDING TASKS TO THE SYSTEM

After establishing an initial RSX environment it may be desirable to add other I/O handlers, system programs, and user tasks to the system. For each new task to be added, use the following steps.

1. Determine the memory requirements of the task. For system programs and standard I/O handlers the core requirements are given in Appendix A of the System Management Part. Then define the task's partition if the partition is not already in the system.
2. Assemble or compile the task's sources. For system programs and standard I/O handlers, the assembly parameters required are noted in Appendix B of the System Management Part.
3. Task build the task. Instructions for building tasks supplied with the system are located in Appendix B of the System Management Part.
4. If the task is an I/O handler, use the ADV MCR function to add PDVL nodes for this handler.
5. Use the RCF MCR function to enter the task's partition into the system if the partition is not already specified.
6. Install the task by using the INSTALL MCR function.
7. Use the SAVE MCR function to record the existence of this task.

CHAPTER 6

XVM/RSX SYSTEM BUILD PROCEDURES

The following figure (6-1) indicates the actual steps involved in building XVM/RSX into an XVM/DOS system.

CAUTION

DO NOT ATTEMPT TO USE THESE PROCEDURES UNLESS
YOU HAVE READ THE PRECEDING CHAPTERS.

NOTES

1. User responses and commands are underlined; system outputs are not.
2. All command lines end with a carriage return (↵) unless otherwise noted.
3. Where several items are bracketed, { }, the user must include only one item in the command line.

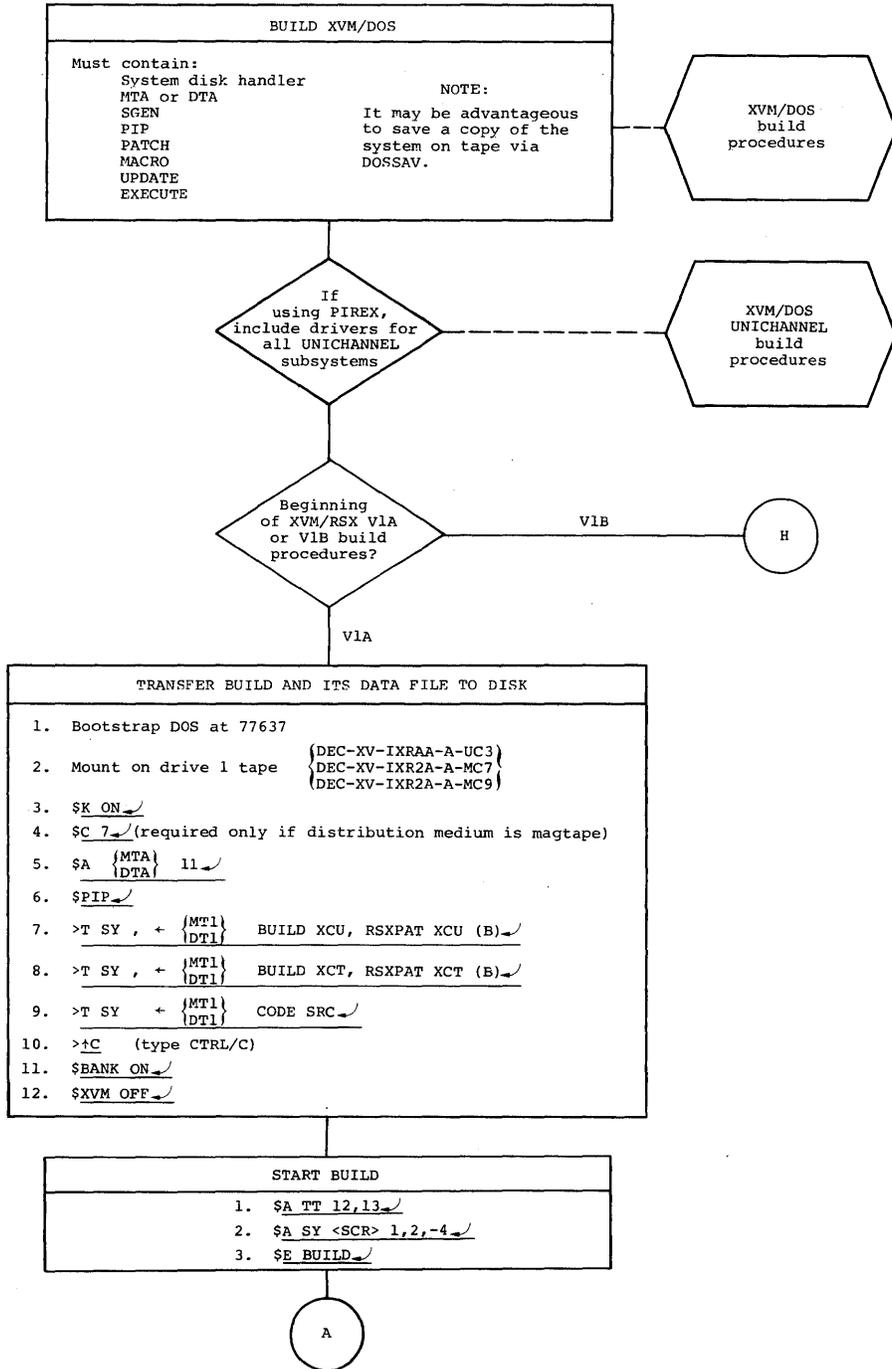


Figure 6-1. Guide to Building XVM/RSX.

NOTE

To answer BUILD questions, type Y_ for YES and N_ for NO. In response to questions asking for a numerical answer, type the appropriate integer.

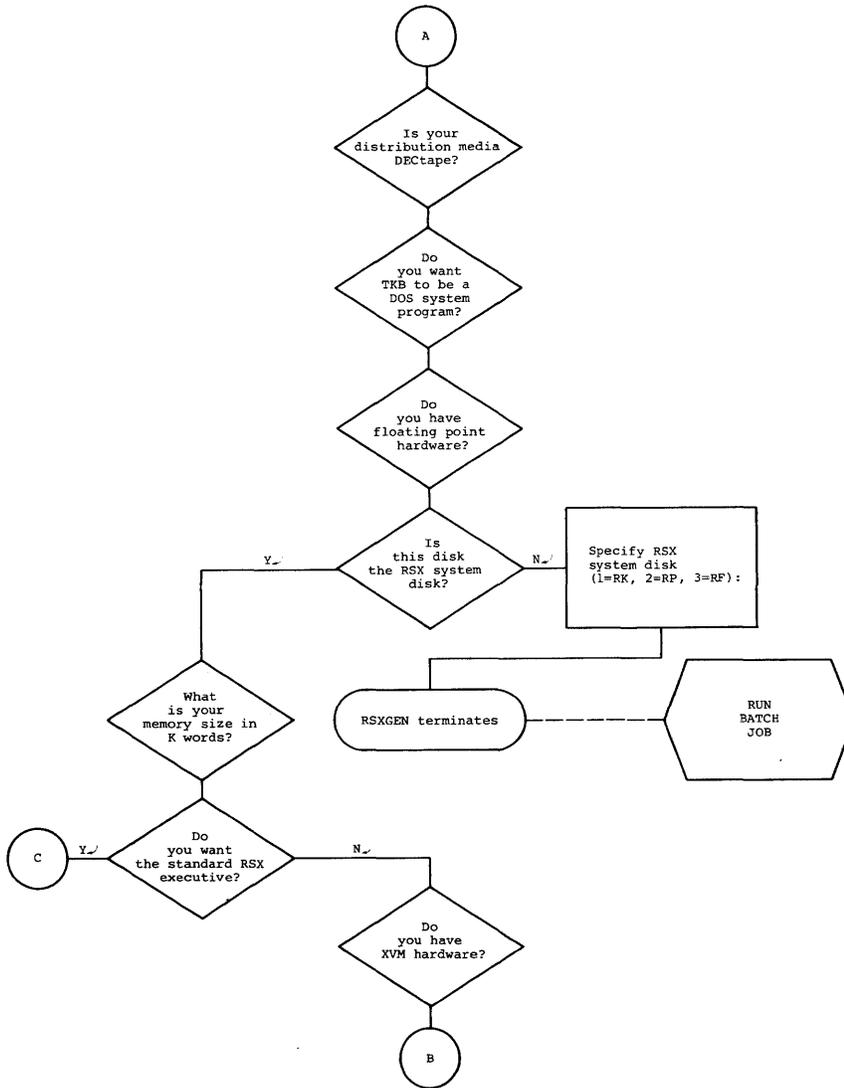


Figure 6-1 (Cont.) Guide to Building XVM/RSX.

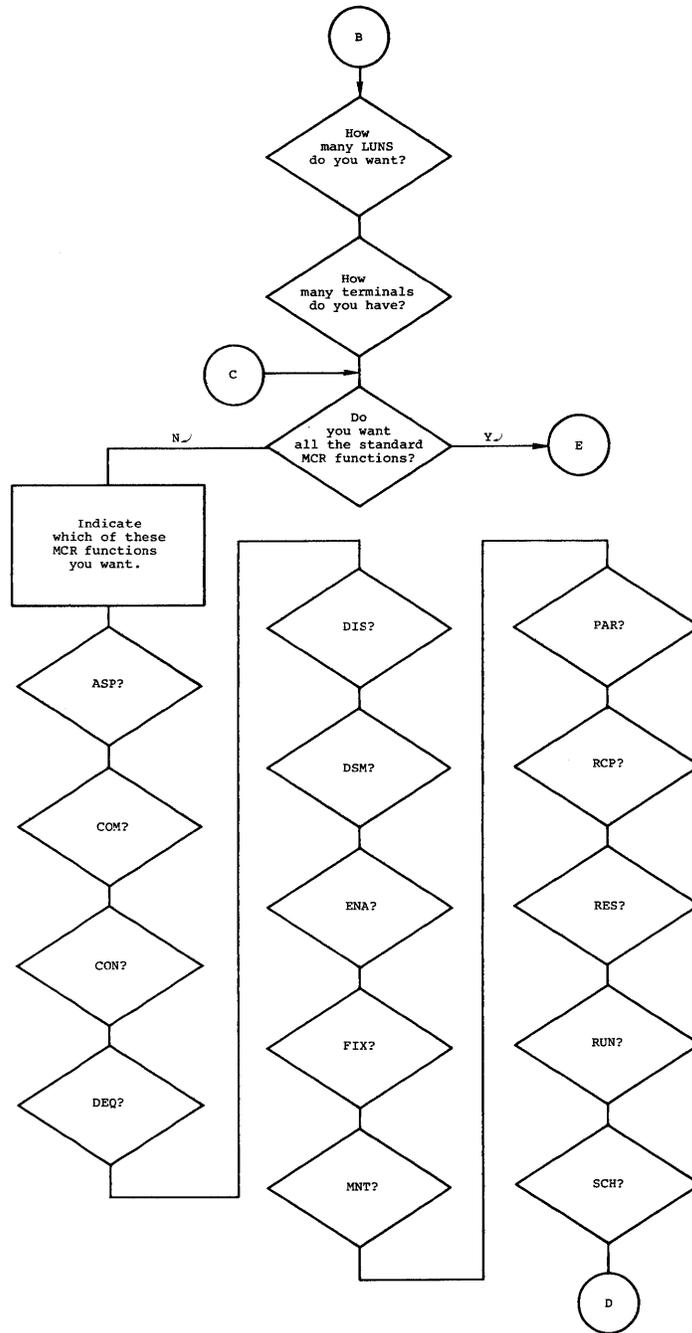


Figure 6-1 (Cont.) Guide to Building XVM/RSX.

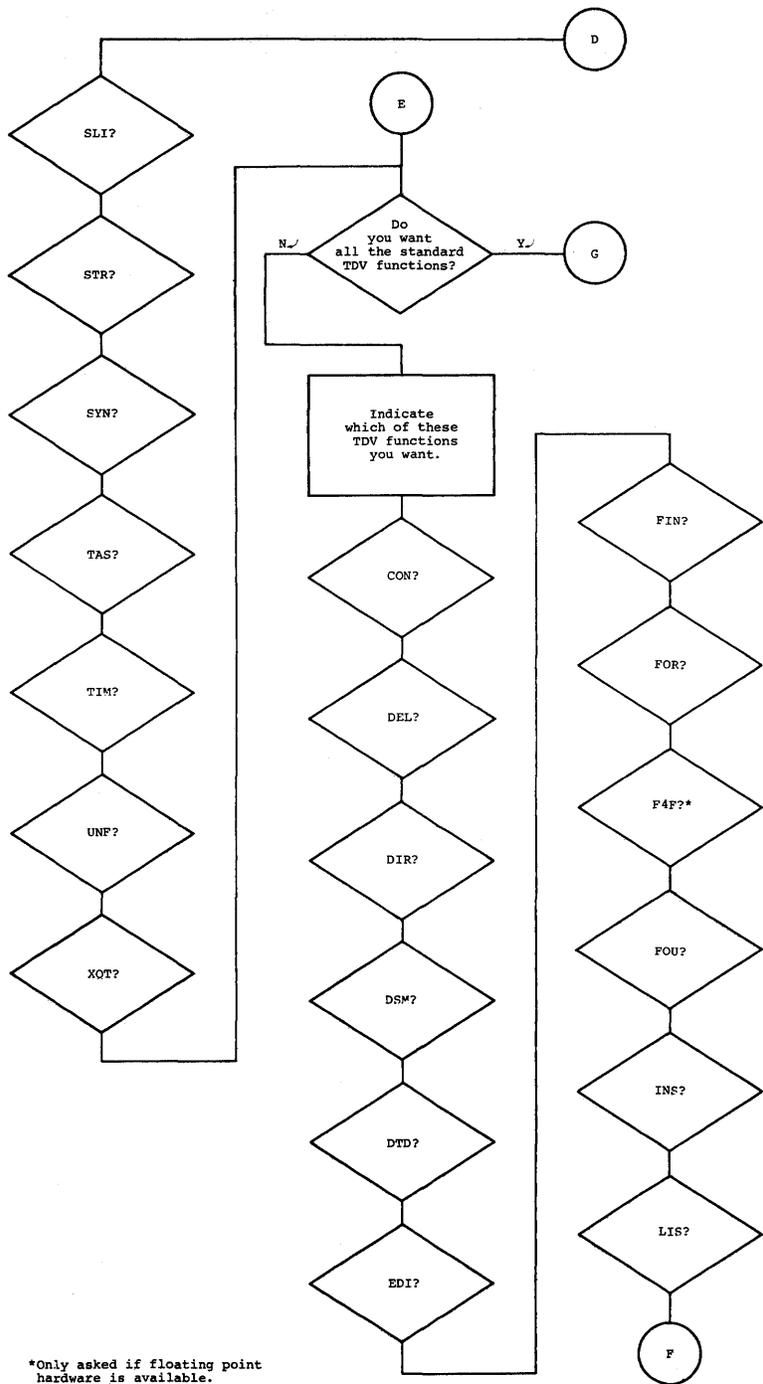
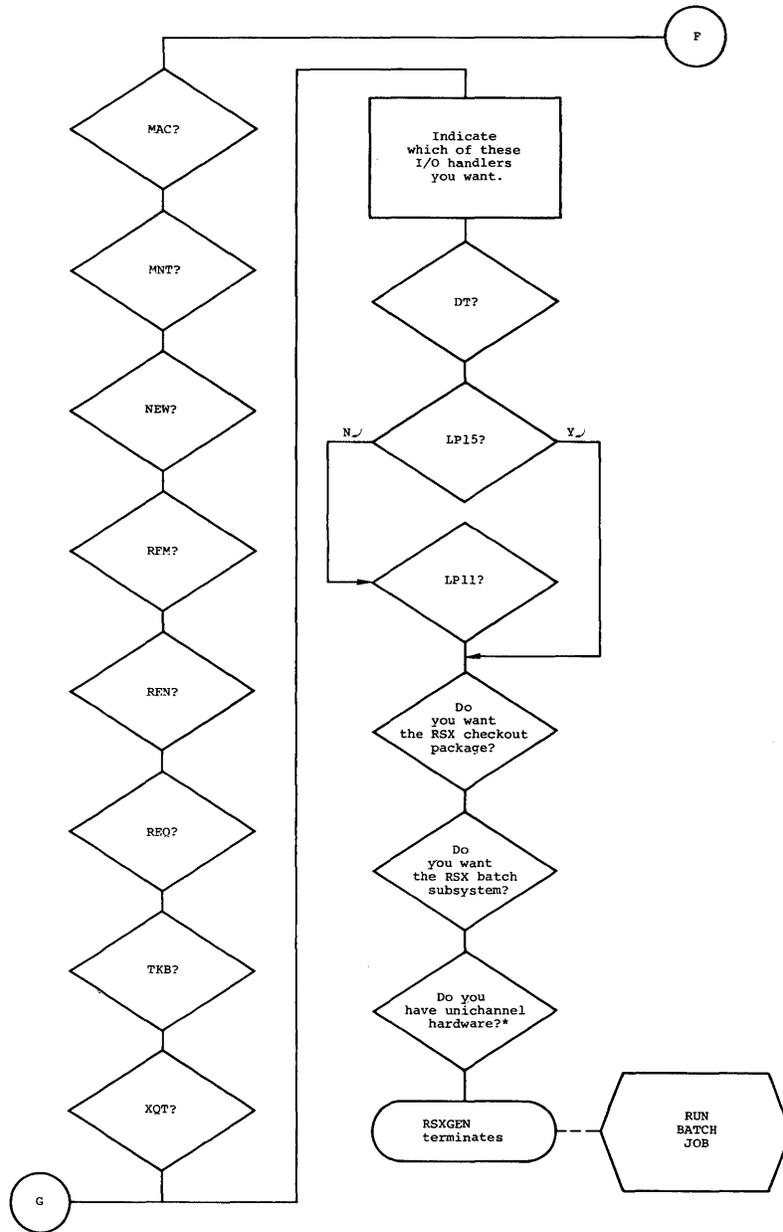


Figure 6-1 (Cont.) Guide to Building XVM/RSX.



*Asked only if the system disk is not RK and the LP11 line printer handler was not selected.

Figure 6-1 (Cont.) Guide to Building XVM/RSX.

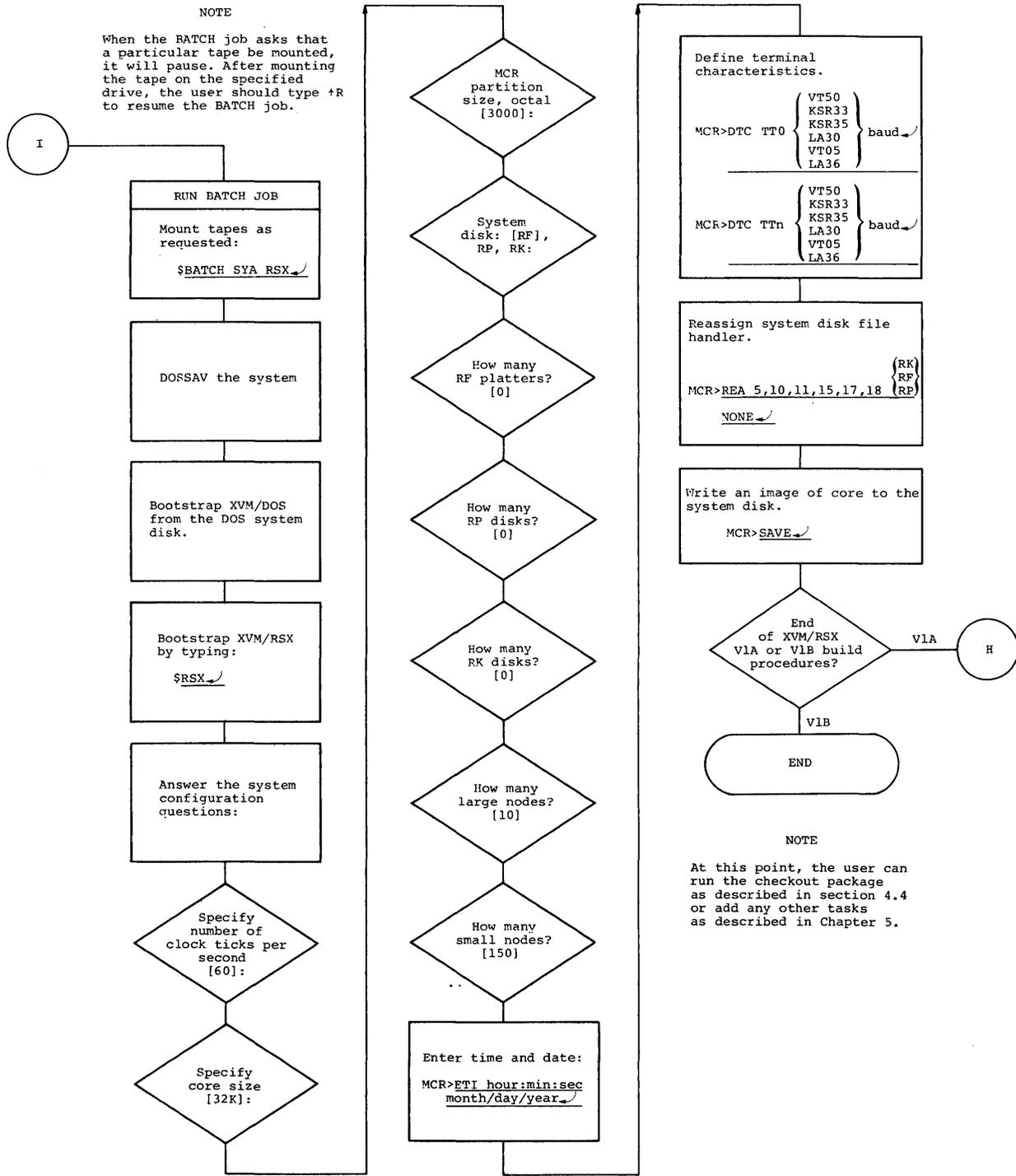


Figure 6-1 (Cont). Guide to Building XVM/RSX.

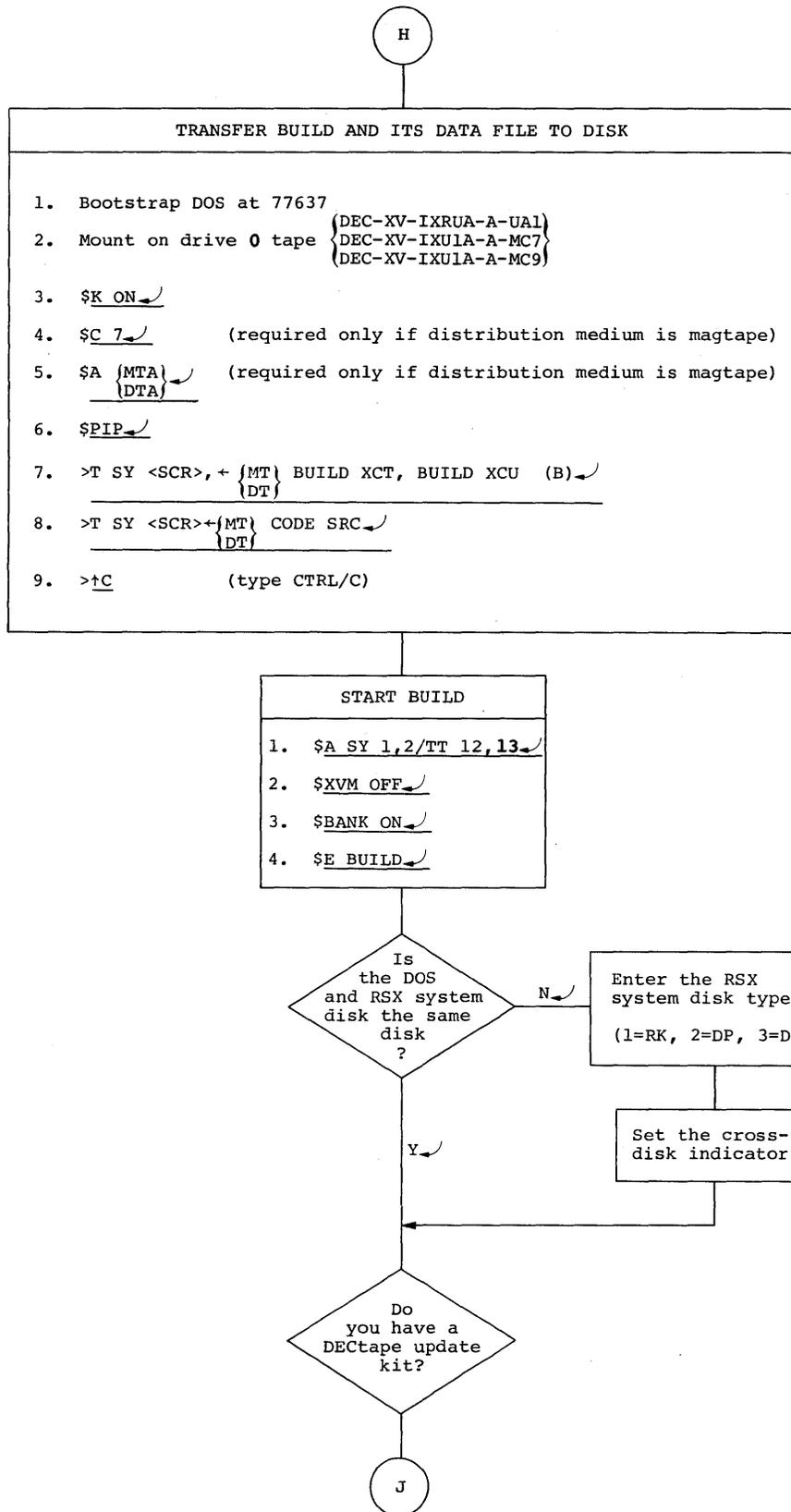


Figure 6-1 (Cont). Guide to Building XVM/RSX.

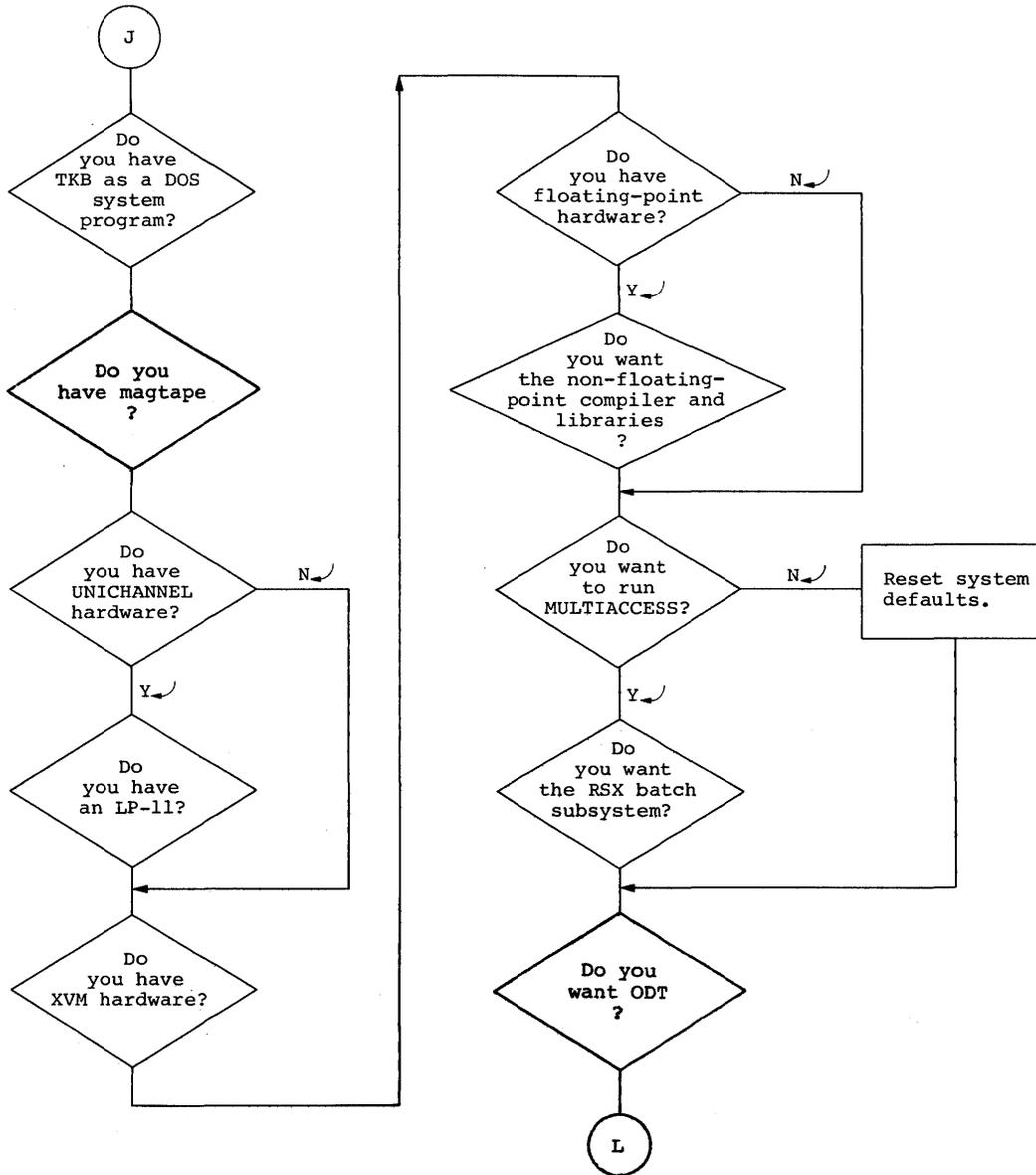


Figure 6-1 (Cont). Guide to Building XVM/RSX.

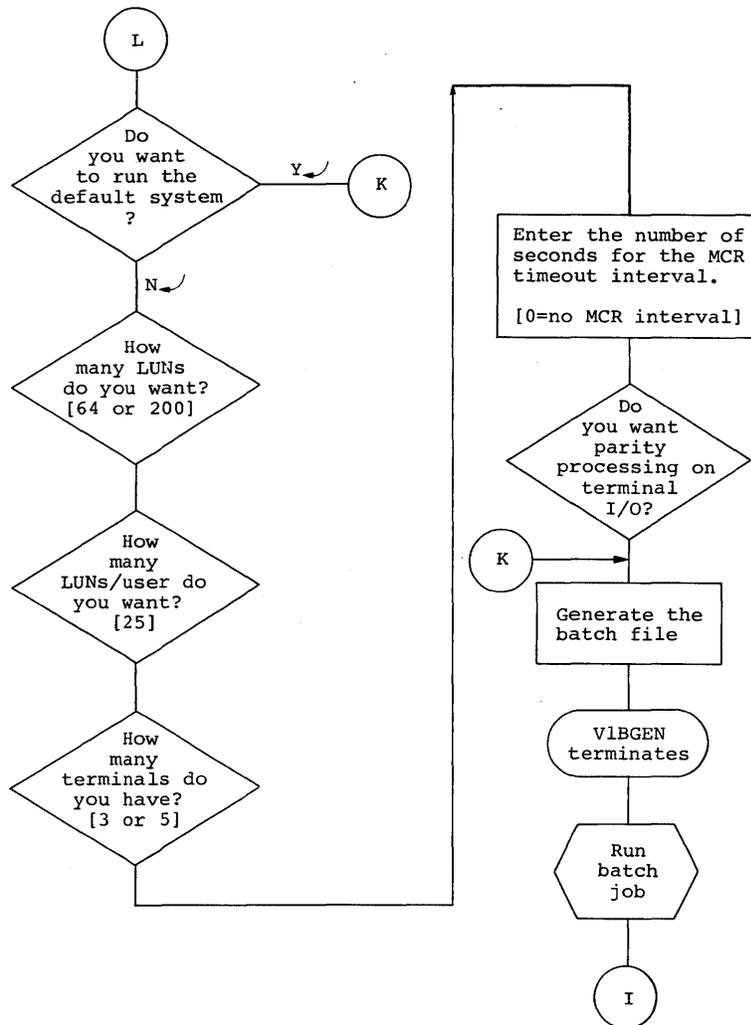


Figure 6-1 (Cont). Guide to Building XVM/RSX.

APPENDIX A

REPLACING THE RSX EXECUTIVE

From time to time it may be necessary to replace the RSX executive. This will be the case if the user wishes to reassemble the executive with a different set of assembly parameters, correct an error, modify the functions of the executive, or include an updated version.

To do this, restore the preconfigured RSX system to the RSX system disk with DOSSAV. Transfer the correct source files of the executive into the SCR UFD on that disk. Then assemble the executive under DOS with the desired assembly parameters as indicated in Appendix B of System Management Part. Next MICLOG under DOS so the RSX executive can be PATCHed into the system. Assign .DAT slot -10 to the A version of the DOS system disk handler and associate it with the SCR UFD e.g., \$ASSIGN RKA <SCR> -10. Then invoke the DOS system program PATCH and enter the new version of the RSX executive as follows:

```
$PATCH
PATCH XVM Vnxnnn
>RSXIMG
>READ RSX.P2
>EXIT

$
```

The sources and binary files of the RSX executive can now be deleted from disk. The updated preconfigured RSX system should be saved on tape. It will then be necessary to invoke the RSX system configurator, define terminal characteristics, REASSIGN devices, etc.

APPENDIX B

BUILDING A CROSS DISK SYSTEM

If the user's installation has two or more disk types, a cross disk system may be desirable. This is especially true if the user plans to use XVM/DOS extensively and one of his disks has limited storage capacity (e.g., RF-RP combinations). To create a cross disk software system, the user will have to build a standard RSX system on the disk on which he wants to store installed tasks. This disk will hereafter be called the RSX system disk. It must also contain a minimal DOS system. Furthermore, the user will have to build a typically larger DOS system on the DOS system disk, i.e., on the disk from which RSX will be bootstrapped. The DOS system disk must contain an RSX bootstrap as a DOS system program. It is this disk which the user should use when operating under DOS.

This process can be accomplished by following the RSX build procedures through the final DOSSAV operation for both disks to be used. There is only one exception. Once the batch run for the RSX system disk is complete, perform the following extra steps:

1. Mount on drive 1 DEC-XV-IXRAA-A-UB2, DEC-XV-IXR1A-A-MC7 or DEC-XV-IXR1A-A-MC9.
2. \$MICLOG SYS
3. \$A SY 10 / $\left\{ \begin{array}{l} \text{DTA} \\ \text{MTA} \end{array} \right\}$ 11
4. \$C 7 (Required only if the distribution media is Magtape)
5. \$PIP
6. >R SY <RSX> ...DSY TSK _ SY <RSX> ...DOS TSK
7. >T SY <RSX> ...DOS TSK $\left. \begin{array}{l} \left\{ \begin{array}{l} \text{DT1} \\ \text{MT1} \end{array} \right\} - \left\{ \begin{array}{l} \text{DOS.RK} \\ \text{DOS.RP} \\ \text{DOS.RF} \end{array} \right\} \end{array} \right\}$ TSK (B)
8. >^C (Type Control C)

The choice of the files DOS.RK TSK, DOS.RP TSK, or DOS.RF TSK should correspond to the DOS system disk type, i.e., RK, RP, or RF respectively.

When building the system on the RSX system disk, avoid adding DOS modules which are not specifically required to build RSX. When building the system on the disk to be used when running DOS (i.e., the DOS system disk) be sure to specify that this disk will not be the RSX system disk.

Once built in its entirety, the RSX system can be bootstrapped as follows:

1. Bootstrap DOS off the DOS system disk.
2. In response to the DOS monitor's "\$" type RSX. RSX will then be bootstrapped off the RSX system disk.

When RSX is bootstrapped the first time, the user should establish the proper environment by configuring RSX in the standard fashion. It will also be possible to enter RSX from the RSX system disk by:

1. Bootstrapping DOS off the RSX system disk.
2. Typing RSX in response to the monitor's "\$".

When running RSX and it is desired to bootstrap DOS off the DOS system disk, simply request the MCR function DOS via the standard MCR interface.

It will also be possible to bootstrap the DOS system on the RSX system disk from RSX by requesting the MCR function DSY via the standard MCR interface. The DSY MCR function is simply the standard DOS MCR function (bootstrap DOS off the RSX system disk) under a new name.

CHAPTER 3

RSX CHECKOUT PACKAGE

A checkout package is supplied with the RSX PLUS III system to be used in ensuring that an installation's hardware and system software are thoroughly tested.

The package consists of the following Tasks:

Task	Function
RX	Low priority Task that sets R1, R2, R3, R4, R5, R6, X10, X11, X12, X13, X14, X15, X16, X17, XR, LR, MQ, SC, L20, and optionally FP15 registers, continually checks that contents of registers are not altered, and logs in and out on LUN-3.
DTRUN	Writes file on DECTape unit 2, reads it back to verify contents (DECTape with a cleared directory should be used), and logs in and out on LUN-3.
COPHM	Logs in and out on LUN-3 to note passage of one hour of checkout package execution.
TTYIO	Prints message on LUN-3 asking for number of terminals in system, requests that message be typed by operator on each of these terminals, and repeats this message on the appropriate terminal ten times.
SATCHK	Checks that disk driver and allocator are functioning properly for each disk in system, verifies that bit maps on each disk are intact, and does not alter any data on the disks.
...COP	MCR function which synchronizes execution of RX, DTRUN, COPHM, TTYIO, and SATCHK.
...KCH	MCR function which cancels future requests for Tasks in checkout package.

There are several procedures which must be followed to install these checkout Tasks and reassign LUNs to be used for checkout purposes. During the initial RSX configuration process described in Chapter 1 of this manual, the user should be sure to do the following:

1. Install all Tasks listed above.
2. If the installation has DECTape, install the DECTape Handler and mount a DECTape on unit 2, write enabled. The DECTape directory must be cleared. If the installation does not have DECTape, remove both the DECTape Handler (named DT....) and the DTRUN Task from the system with the REM MCR function.
3. Deassign LUNs 30 through 37 by reassigning them to NONE with the MCR REASSIGN Function. This is necessary because ...COP alters these LUN assignments.
4. Enter the time and date with the MCR ETIME function.

The checkout package synchronizes the Tasks described above to verify that all devices are working properly and that multiprogramming has been established in the RSX PLUS III system. To begin running checkout, the user types the following at the MCR terminal:

```
MCR>COP
```

The command should be terminated with an ALTMODE (not a carriage return) in order to free the MCR terminal for other output. This MCR command invokes the Task named ...COP, which synchronizes execution of the other checkout Tasks, as follows:

```
SYNC RX M 0M 5M
SYNC SATCHK M 1M 5M
SYNC DTRUN M 2M 5M
SYNC TTYIO M 130S
SYNC COPHM M 3601S 1H
```

The effect of this synchronization is that different Tasks will be simultaneously accessing different devices. RX and SATCHK will begin examining registers and bit maps. Then DTRUN will initiate verification of DECTape file and hardware integrity. Each terminal in the system will then be accessed by TTYIO, which requests a message of the operator for each terminal and repeats it ten times, as shown in the printout below. Tests will continue in this manner until terminated explicitly by the operator with the KCH MCR function, as follows:

```
MCR>KCH
```

If checkout continues for more than one hour, COPHM will note the passage of this and subsequent hours by logging on LUN-3. Any error messages will be printed on the MCR terminal and followed by a string of back arrows (←) extending to the right margin.

The following printout appears on the MCR terminal.

```
MCR>COP
```

```

* RSX CHECKOUT PACKAGE -- LUNS 30-37 *
* HAVE BEEN ALTERED PER PHYSICAL UNIT *
* EXISTENCE. A WRITE-ENABLED DECTAPE *
* WITH A NEW DIRECTORY IS NEEDED ON *
* UNIT TWO (IF DECTAPES IN SYSTEM). *

```

```

00:14:00 -- BEGIN REGISTER TEST
00:15:00 -- BEGIN BIT MAP VERIFICATION
ALLOCATE ERROR ON RPl <----->
GET ERROR ON RPl <----->
ALLOCATE ERROR ON RPl <----->
GET ERROR ON RPl <----->
ALLOCATE ERROR ON RPl <----->
GET ERROR ON RPl <----->
ALLOCATE ERROR ON RPl <----->
00:16:00 -- BEGIN DT I/O TEST
GET ERROR ON RPl <----->
HOW MANY TTY'S DO YOU HAVE?3

```

```

RX begins
SATCHK begins

```

```

RP errors (unit
1 was off line)

```

```

DTRUN begins

```

```

System requests
number of
terminals
SATCHK ends
System types
User types
System types
remainder

```

```

00:16:13 -- END BIT MAP VERIFICATION
PLEASE TYPE A LINE TERMINATED WITH A CAR RTN. ON EACH TTY
GGGKLOYTRREGHBNMO97654EDY80
00:17:16 -- END REGISTER TEST
GGGKLOYTRREGHBNMO97654EDY80
GGGKLOYTRREGHBNMO97654EDY80
GGGKLOYTRREGHBNMO97654EDY80
00:17:41 -- END DT I/O TEST
MCR>KCH
COP CANCELLED BUT ACTIVE TASKS RUN THROUGH COMPLETION
CAUTION -- DON'T ABORT EXEC MODE COP TASKS!
MCR>

```

```

RX ends

```

```

DTRUN ends
End checkout run

```

```

Return to MCR

```

Additional terminals will be addressed as shown below:

```

PLEASE TYPE A LINE TERMINATED WITH A CAR RTN, ON EACH TTY
DFGHJKLOIYREWWGGG6890

```

```

System types
User types
System types
remainder

```

Multiprogramming is demonstrated in this package by the fact that at times, all of the following functions are being performed:

- . Examination of core registers (RX)
- . Examination of drivers and bit maps for each disk (SATCHK)
- . DECTape copy (DTRUN)
- . Terminal interaction (TTYIO)

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