



*Mobile Communications*

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EDACS™  
SYSTEM MANAGER SOFTWARE

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**Maintenance Manual**

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## 1.0 INTRODUCTION

This manual describes the installation of software and/or Operating systems on the EDACS PDP-11 System Manager. Other sections of the manual will discuss saving and recovering system images, recommended backup/archive techniques and schedules, system manager configuration, re-configuration or changes and additions.

**This manual should be thoroughly read before attempting to install the system. There are areas during the process which will permit all data files to be destroyed on existing systems.** This is not the case with new systems, since there are no data files. Extreme care should be taken to follow the procedures outlined explicitly. Deviation from the procedures may result in loss of data or restarting the installation.

The installation of the software, and/or operating system, and saving data, require the use of the TK50 Tape drive. Information concerning loading and unloading of tape cartridges is included in Section 5.0 - Hardware Verification. Further information concerning the use of the TK50 tape drive can be located in the TK50 Users Guide.

In addition to this manual, references may also be made to the System Manager's Operator's Manual and the System Manager Hardware Installation manual supplied with the equipment.

## 2.0 HARDWARE/SOFTWARE REQUIREMENTS

The hardware requirements listed below are the minimum requirements needed to install software and/or Operating System on the EDACS PDP-11 System Manager:

- PDP-11 Computer - 11/53, 11/53+, 11/73, 11/83
- 4 or more Terminal Ports
- TK50 Tape Drive
- Printer
- VT220 or higher CRT Terminal
- 3 Blank TK50 Tape Cartridges

The software requirements depend on the state of the system. The software distribution will be provided on TK50 tape cartridges. The contents of the distribution are listed below:

New System Manager

- a. Boot Tape
- b. Distribution Tape - Micro Rxx V4.3 and System Manager V??.??

Existing System Manager

- a. Distribution Tape - Micro Rxx V4.3 and System Manager V??.??

The boot tape will contain a special bootable image of the BRU (Backup and Restore Utility) task and will be labeled BRUSYS. The boot tape will be needed for installation on a new system manager or as is discussed later, the recovery of the saved system image.

The distribution tape will contain the most current version of the Micro RSX Operating System and the most current version of the EDACS System Manager software. The distribution tape will also contain all of the necessary facilities to create a boot tape. The distribution tape will not contain any data files.

Prior to installing System Manager software on the PDP-11, a terminal must be connected to the console port on the PDP-11. If a spare terminal is not available, utilize one of the system manager terminals by moving the cable from a port ( Note which port was selected ) to the console port or A0 port. The console port is labeled A0 and will be either an RS232 - 25 pin connector or a DEC-423 J6 connector. A discussion on setting the console port and terminal configuration is included in section 5.0 - Hardware Verification.

## **3.0 INSTALLATION**

This section will discuss the procedure for installation of the software on a new system manager or upgrading an existing system manager. The installation of the software will consist of 4 phases:

1. Saving Data Files (**UPGRADE ONLY**)
2. Loading the Distribution
3. Installing the Distribution
4. Creating a System Image

If the system manager currently has a fully functional system, Phase 1 - Saving Data Files, must be performed. After Phase 1, the upgrade will proceed to Phase 2 - Loading the Distribution, which is also the starting point for new system managers. Phase 2 is performed via the boot tape or utilizing an extracted copy of the boot tape image. After Phase 2 has been completed, Phase 3 - Installing the Distribution will be performed. Phase 3 will be executed upon the first power up or restart of the system manager. At the completion of Phase 3, Phase 4 - Creating a System Image will be executed. Phase 4 is optional, however, it is highly recommended that Phase 4 be executed.

### **3.1 Phase 1 - Saving Data Files (UPGRADE ONLY)**

Saving data files prior to loading the distribution on an existing system manager is the first step to effecting an orderly and clean upgrade. The data files are saved to TK50 tape to permit re-entry of the data into the system manager during Phase 3 of the installation.

Phase 1 will require interfacing with the RSX Operating System. During this phase, certain files will be extracted from the distribution tape. These files will be executed by entering the required commands discussed below. These files will create a copy of the [SMDAT] directory, certain startup files, and copies of non-standard user accounts. The length of time required to create the saved data tape depends on the size of the [SMDAT] and the number of non-standard user accounts on the system.

#### **NOTE**

Follow the forthcoming instructions explicitly to achieve a clean and error free upgrade. Failure to perform these instructions may result in the loss of data or having to perform the upgrade a second time.

The RSX prompt is the "\$" symbol. When this symbol is present at the beginning of a line, commands may be entered. All commands are terminated with the RETURN key. Commands and entries will be designated by bold face characters.

If a terminal has not been connected to the console port, connect it at this time. Reference Section 5.0 - Hardware Verification for more information on configuring the console port and terminal setup. Press RETURN to obtain the "\$" prompt.

On the console terminal, at the "\$" prompt, login to the RSX operating system by entering "hello" and terminating with the RETURN key. When prompted, enter the username and the password and terminate each with the RETURN key for entry into the system. The username and password may not be the same as demonstrated below which is the Micro RSX default username and password. If the Micro RSX system level username and password have changed, they must be used at this time.

**NOTE**

Do not login as SYSMGR/SYSMGR, as this is the default login for executing the EDACS System Manager software. The EDACS System Manager software is not executable from the console terminal.

The login to RSX would normally be as follows:

```
$ Hello
$ Account or Name: MICRO
$ Password: RSX
```

The system will display a brief login message and will return the "\$" prompt.

At this time it will be necessary to load the TK50 distribution tape into the tape drive and enable the drive. The TK50 distribution will be labeled "SYSMGR V?.??. Insert the tape cartridge into the tape drive and enable the tape drive.

At the "\$" prompt, enter the following commands to logically mount the tape and to execute the transfer. Terminate with the RETURN key:

```
$ MOU/FOR MU0:
$ BRU/NOINI/REW/NEW/UFD MU0:[SMUTIL]*.* DU0:
```

At this time the system will display the status of the tape as the copy is being performed. Since the distribution tape is not a directory structured tape, the system must read to the end of tape. This will take additional time.

```
BRU - Starting Tape 1 on MU0:
```

```
BRU - End of Tape 1 on MU0:
```

```
BRU - Completed
```

After the transfer has been completed, enter the following command to logically dismount the tape. Terminate with the RETURN key:

```
$ DMO MU0:
```

At this time, the upgrade command files will have been extracted from the distribution tape. Upon execution, the upgrade command file will create a backup of certain data files, request removal of the saved data tape, request the loading of the distribution tape, and will execute the boot image to start Phase 2.

At the "\$" prompt, enter the following command to execute the upgrade command file and terminate with the RETURN key:

```
$ @[smutil]upgrade
```

The following information and requests will be displayed during the execution of the save data procedure. Perform each function only when requested.

Now entering the System Manager Installation Backup Phase

The System Manager installation will backup the current data files from the [SMDAT] directory. The System Manager installation will also backup certain System Manager, RSX configuration files and non-standard user accounts.

Remove the Distribution tape cartridge from the tape drive.

Press RETURN when the Tape has been removed [S]:

**<RETURN>**

Insert and enable a BLANK TK50 tape cartridge in the tape unit.

Insure that the tape IS NOT WRITE PROTECTED.

This can be accomplished by sliding the WRITE PROTECT tab on the front of the tape cartridge to the right -->. The tape will be write protected if "ORANGE" is present in the write protect tab.

Press RETURN when TK50 tape is ready:

**<RETURN>**

Extracting non-standard user accounts.

Creating the upgrade save command file

Executing the Phase 1 - Save data

Please remove the TK50 backup tape from the tape unit. Label the tape as follows INSTALL DATA SAVE and append the date.

Press RETURN when the TK50 tape has been removed [S]:

**<RETURN>**

Insert and enable the TK50 tape cartridge labeled "SYSMGR V?.??" in the tape unit.

Press RETURN when "SYSMGR V?.??" TK50 tape is ready [S]:

**<RETURN>**

Phase 2 - Loading the Distribution will now commence.

### **3.2 Phase 2 - Loading The Distribution**

Phase 2 will copy all files from the distribution tape to the system disk. Loading of the distribution requires that no tasks be executing at the time of the load. The medium for performing the loading of distribution will be the Standalone BRU System (BRUSYS). BRUSYS is a memory resident system, replacing the Micro RSX Operating System.

If Phase 1 was executed, the upgrade command file will automatically boot the Standalone BRU System. **If Phase 1 was executed, proceed to section 3.2.2.**

If the installation is for a new system manager, follow section 3.2.1 to properly load the Standalone BRU system.

#### **3.2.1 Standalone Bru System Boot**

The steps to boot the Standalone BRU System on a new system are as follows:

1. Ensure that power is off on the PDP-11.
2. Insert and enable the TK50 Tape labeled "BRUSYS" in the tape drive.

3. Boot the system by pressing Power on/off switch. The console terminal will display the boot up memory diagnostic messages at this time.

Testing in progress - Please Wait

9 8 7 6 5 4 3 2 1

Trying MU0

Starting system from MU0

4. At this time the system manager will boot using the Standalone Bru system software. Proceed to Section 3.2.2 for the remaining discussion on loading the distribution.

### 3.2.2 Executing Standalone Bru System

The remaining discussion will center on performing the BRUSYS operation. As before, keyboard entries will be boldface characters and will be terminated with the RETURN key. Items displayed by the BRUSYS task will be indented and continuing discussion of the BRUSYS process will be interspersed.

**\*\* IT IS IMPERATIVE THAT THE DOCUMENTATION BE FOLLOWED TO INSURE A CLEAN INSTALLATION.\*\***

#### NOTE

UPON THE ACTUAL TRANSFER OF THE DISTRIBUTION DATA TO THE SYSTEM DISK, BRUSYS WILL INITIALIZE THE SYSTEM DISK AND ALL DATA WILL BE LOST. UP TO THE TIME OF THE TRANSFER THE BRUSYS TASK MAY BE ABORTED BY ENTERING CTRL-Z.

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

Valid Switches are:

/CSR=nnnnnn to change the default device CSR

/VEC=nnn to change the default device vector

/FOR=n to change the default magtape formatter number

/DEV to list all default device CSR and Vectors

Enter first device:

Enter the **"/DEV"** option to obtain a list of the current default devices present on the system and terminate with the RETURN key.

Enter first device:**/DEV**

The BRUSYS system will display the current default devices and return to the previous prompt.

<u>Device</u>	<u>CSR</u>	<u>Vector</u>	<u>CSR Status</u>
DB	176700	254	Not Present
DK	177404	220	Not Present
DL	174400	160	Not Present
DM	177440	210	Not Present
DP	176714	300	Not Present
DR	176300	150	Not Present
DU	172150	154	Present (System Drive)
MM	172440	330	Not Present
MS	172522	224	Not Present
MT	160000	320	Not Present
MU	174500	260	Present (TK50 Tape Drive)

"Enter first device:" will be the "SYSTEM DISK DRIVE" which is device "DU:". Enter the following and terminate with the RETURN key:

Enter First Device:DU: (**DON'T FORGET THE ':'**)

The BRUSYS system will now prompt for the second device to be used during the upgrade operation: Enter second device will be the TK50 tape drive which is device "MU:". Enter the following and terminate with the RETURN key:

Enter Second Device:MU: (**DON'T FORGET THE ':'**)

The BRUSYS system will now request the time by displaying the following:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'  
<RETURN>

Press the RETURN key and the MICRO RSX MCR '>' prompt will appear. Enter the above requested TIM command and the current time and the current date in the requested format e.g.

> **TIM 12:00 01/12/92**

The BRUSYS system will return the '>' prompt. **At this point, ensure that the distribution tape "SYSMGR V??.?" is enabled in the tape drive.** If Phase 1 was executed, the distribution tape should be in the tape drive. If this is a new system manager, remove the TK50 tape labeled "BRUSYS" from the tape drive and enable the distribution tape "SYSMGR V??.?" in the tape drive.

Enter the following command at the ">" prompt and terminate with the RETURN key:

>**RUN BRU**

The system will display the "BRU" prompt.

BRU>

To copy the distribution from the TK50 tape, enter "MU:" and terminate with the RETURN key.

BRU> **MU:**

The system will now prompt for the device to save the system image 'TO'. Enter "DU:" for the system disk drive and terminate with the RETURN key.

To: **DU:**

At this time the BRUSYS system will display the current status of the copy operation as it is copying from the TK50 tape and creating the new system image on the system disk drive.

BRU - Starting Tape 1 on MU0:

BRU - End of Tape 1 on MU0:

BRU - Completed

After the copy has completed the system will return the BRU prompt. Enter "CTRL Z" to terminate the BRU program. This is accomplished by pressing the "CTRL" key and the "Z" key simultaneously. Enter <RETURN> to obtain the ">" prompt.

Remove the TK50 distribution tape from the tape drive. Return the TK50 distribution tape to its storage location. At this time Phase 2 has been completed. Phase 3 will be executed upon the first startup of the system manager.

A sample loading of distribution would appear as follows:

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

Valid Switches are:

/CSR=nnnnnn to change the default device CSR

/VEC=nnn to change the default device vector

/FOR=n to change the default magtape formatter number

/DEV to list all default device CSR and Vectors

Enter first device:/DEV

<u>Device</u>	<u>CSR</u>	<u>Vector</u>	<u>CSR Status</u>
DB	176700	254	Not Present
DK	177404	220	Not Present
DL	174400	160	Not Present
DM	177440	210	Not Present
DP	176714	300	Not Present
DR	176300	150	Not Present
DU	172150	154	Present (System Drive)
MM	172440	330	Not Present
MS	172522	224	Not Present
MT	160000	320	Not Present
MU	174500	260	Present (TK50 Tape Drive)

Enter First Device:DU:

Enter Second Device:MU:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'

> TIM 12:00 01/12/92

> RUN BRU

BRU>

BRU> MU:

To: **DU**:

BRU - Starting Tape 1 on MU0:

BRU - End of Tape 1 on MU0:

BRU - Completed

BRU>^Z

<RETURN>

>

### 3.3 Phase 3 - Installing The Distribution

The third phase of the installation will be completed upon the first startup of the system. If the system manager has 2 disk drives and the installation is performed on a new system manager, the second drive or activity drive will be initialized during the third phase.

Press the "RESTART" button on the front panel of the PDP-11 or power cycle the PDP-11 to perform the startup. The PDP-11 will display the memory diagnostics and will prompt for setting of the time. If this is a new system, the time must be entered. If this was an upgrade of an existing system manager, the current time will still be accurate and should not be changed unless needed.

The system will perform it's normal startup procedure. The startup procedure will test for the presence of the SMCONFIG.SYS file. If the file is present, the system will assume a normal startup procedure. If the file is not present, the system will execute the installation of the distribution. The system will prompt for the needed items and inputs. Throughout the installation, items being executed will be displayed as will any errors encountered. Listed below is the procedure for the installation of the distribution. Items related to the installation will be indented. Comments and directions will accompany.

This is the **FIRST** startup of the current system manager since the installation/upgrade.

Was an **INSTALL DATA SAVE** executed prior to the installation <Y/N>?

If Phase 1 was executed, an **INSTALL DATA SAVE** tape was created. At this time the saved data will be restored to the system manager. Answer with a "Y" and terminate with **RETURN**. If this is a new system or no data save was executed in Phase 1, answer with a "N" and terminate with **RETURN**.

If the answer is "Y", follow the instructions below for restoring the **INSTALL DATA SAVE**. If the answer was "N", the installation will skip to the system manager configuration.

Insert and enable in the tape unit the TK50 tape cartridge labeled **INSTALL DATA SAVE**.

Insure that the tape **IS WRITE PROTECTED**.

Press <**RETURN**> when TK50 tape is ready.

Now Restoring System Manager Data Files

mou mu0:/for

bru/rew/noini/new/ufd/bac:savall mu0: du0:

Now Restoring Any user accounts

@[smutil]upgrstr

dmo mu0:

Please remove the TK50 Tape labeled INSTALL DATA SAVE from the tape unit.

Press <RETURN> when the TK50 tape has been removed.

The installation will now execute the system manager configuration software. The purpose of the software is to prompt for the configuration of the system manager storage capacity, port definitions, etc. If this installation is for an upgrade and the configuration has not changed, the configuration section will be skipped. If the installation is for a new system, all questions must be answered.

Now entering the System Manager Configuration

#### **REFERENCE SECTION 4.0 - SYSTEM MANAGER CONFIGURATION FOR INFORMATION CONCERNING CONFIGURATION OR RE-CONFIGURATION**

After the system manager configuration has been completed, the installation procedure will perform the necessary activities to create a new system or upgrade an existing system.

Update data files as required for new installation.

Purge all of the directories.

The System Manager installation procedure is complete. All startup files have been modified. At this time it is highly recommended that a full system save phase of the installation be implemented.

At this point the installation of the system manager distribution has been completed. The installation procedure will execute Phase 4 of the installation, Creating a System Save. Phase 4 is optional, however it is highly recommended that Phase 4 be implemented.

### **3.4 Phase 4 - Create A System Save**

The purpose of Phase 4 is to create a bootable system tape and to create a tape which contains a complete image of the current installed system. This permits easy recovery of a system in the event this is needed. Phase 4 will require 2 TK50 tape cartridges.

The following is a list of the Phase 4 commands:

Do you wish to create SYSTEM SAVE SET - BOOT TAPE <Y/N> ?

If the answer is "N", the installation will skip Phase 4. Command files have been provided to implement Phase 4 manually. If the answer is "Y", Phase 4 will begin the creation of a system save set.

Insert and enable a TK50 tape cartridge in the tape unit. Insure that the tape IS NOT WRITE PROTECTED

Press <RETURN> when TK50 tape is ready

@[smutil]bldbrusys

Please remove the TK50 backup tape from the tape unit. Label the tape as follows BRUSYS - BOOT and append the date.

Press <RETURN> when the TK50 tape has been removed

Insert and enable a TK50 tape cartridge in the tape unit. Insure that the tape IS NOT WRITE PROTECTED

Press <RETURN> when TK50 tape is ready

@[smutil]savesys

Please remove the TK50 backup tape from the tape unit. Label the tape as follows SYSTEM SAVE SET - DATA and append the date.

Press <RETURN> when the TK50 tape has been removed

At this time, Phase 4 has been completed or skipped. The installation is complete. The system will continue with the startup of the system manager and normal operations.

## **4.0 SYSTEM MANAGER CONFIGURATION/RE-CONFIGURATION**

The configuration of the system manager must be defined and related to the application software to permit the system to function properly. The system manager configuration informs the system as to the version of software currently installed, the type of processor, number of disk drives, port configuration and assignments, and other various system elements. The system manager configuration is stored in [1,2]SMCONFIG.SYS and the startup command file [1,2]SMSTART.CMD.

The installation process will automatically request initial configuration if no configuration has been defined. If a configuration exists, the installation will request a re-configuration.

The re-configuration of the system manager may be executed manually during normal operations. At the RSX prompt "\$" enter the following command line and terminate with RETURN.

**\$ run sm0:[sminstall]smstart**

The manual re-configuration may be used when sites are added, devices are added, etc. **The system manager must be restarted for the changes to take effect.**

Section 4.1 will discuss the initial configuration of the system manager. Section 4.2 will discuss the re-configuration of the system manager.

### **4.1 Configuration**

Initial configuration of the system is determined when the [1,2]smconfig.sys file does not exist and will normally occur upon power up of the system. A series of question will be displayed which will permit the system manager configuration to be defined. At the completion of the questions, the startup command file [1,2]smstart.cmd will be created and the configuration will be stored in [1,2]smconfig.sys. The following questions will be presented during the configuration of the system manager.

What version system manager are you going to install?(ex:2.20) **3.00**

Answer: The version number will be on the label of the TK50 tape. Example : SYSMGR V3.00

What PDP-11 processor are you running ? (53, 73, 83) **83**

Answer: This depends on the hardware configuration

How many hard drives does this machine have? **2**

Answer: Again depends on the hardware configuration

The next question is displayed only for an 11/83 configuration.

If there are 2 disk drives, is one of them an RA82? **Y**

Answer: only the largest systems have system managers with the RA82 drive. Most disks are 5 1/4 inch Winchester, of 72 or 159 megabytes capacity.

The next statement defines the archive or backup device. The RX33 floppy disk drive is no longer supported as the archive device. The only device supported is the TK50 Tape Drive.

The archive device will be a TK50 tape drive (MU0:)

The next question requests the number of ports on the system manager in addition to the console port. The number of ports can be determined by visually counting the number of connectors on the back of the system manager cabinet. Also note which port is connected to a device. A device is a site, terminal, printer, external device (MSC2). If the port is connected to a site, note whether it is a dialup modem, dedicated line, or hardwire connection. This information will be requested when defining each port.

Excluding the console port and the extra serial port on PDP-11/53's, how many additional serial ports does this machine have? **16**

Answer: again a hardware dependant question.

For each port, input the following info:

For the device type -->

- P for printer
- T for local terminal
- R for remote terminal
- S for hardwired or dedicated site
- D for dialup site
- X for console switches or RSM
- N for unused port

For the baud rate -->

- 1200
- 2400
- 9600
- 19200 - for DHQ multiplexers only

For each serial port on this PDP-11:

a) What is the device attached to this serial port?

choices are:

- P --> printer
- T --> local terminal
- R --> remote terminal
- S --> hardwired or dedicated site
- D --> dialup site
- X --> External Device
- N --> unused port

ANSWER: Generally, printers are put on port 1 and sites and MSCs are put after it, followed by terminals and dialup terminal lines. But it depends on the placement and need for modem control terminal lines.

b) What is the baud rate for the device? (1200, 2400, 9600, 19200)

ANSWER : Sites are usually 9600 baud, printers 9600 baud, terminals that are directly connected are usually 19200 baud; dialup lines are usually 9600 baud or 2400 baud, depending on the speed of the modem attached to the port; this holds true for both dialup sites and terminal lines.

c) If the device is a local terminal, should the System Manager login screen be started when the computer is booted up?

ANSWER : This is usually Y (yes) for those terminals directly connected to the PDP, since it enhances the security of the computer.

d) If the device is a site, what is the site number associated with this port?

ANSWER : Enter the site number associated with this port. If the port is connected to an MSC1, the site number will be "0".

e) If the device is an external device, what is the external device number associated with this port?

ANSWER: Enter a device number starting with 1. A MSC2 device will have a device number of "1".

What is the maximum regroup plan number allowed on this system (0-15) ? **0**

ANSWER : This should always be 0.

How often should the system manager time be sent to the sites? **12h** (units = m (min) or h (hours) ex: 12h)

ANSWER : This should be 12 hours; to enter it, type in: 12H

What is the free block activity warning limit (1000 - 65000)? **3000**

ANSWER : Is hardware dependent. This depends on the maximum capacity of the activity disk drive.

What is the disk limit at which to refuse activity downloads (1000 - 65000)? **1000**

ANSWER : Again Hardware Dependent and depends on disk capacity

## **4.2 Re-Configuration**

Re-configuration of the system manager is usually needed if the software is updated, a new site is added, the disk capacity is increased, external devices are added, or terminal assignments are changing. If the [1,2]smconfig.sys file exists, the task will prompt with the current configuration, ask if it is to change, and if changing, what changes are to be made. The re-configuration is used to update the software version. Since updating software does not normally require a change in the hardware, the hardware configuration may be bypassed. Listed below are the re-configuration questions:

Current version system manager is V2.50

Are you upgrading/re-installing a system manager? (Y/N)

Answer 'Y' if software is being upgraded or re-installed on the system manager. Answer 'N' if the re-configuration involves changes to the hardware configuration only. The next question will be skipped if the answer is 'N'.

What version system manager are you going to install? (ex: 2.20) **3.00**

If a changes are to be made to the existing system manager configuration, answer "Y" to the next question. A "N" will skip the configuration section of this installation.

---

Re-configure system manager <Y/N default is N> ?

If the answer is 'Y', the following items will be displayed:

This System Manager is currently running on a PDP-11/73 - Change it? **n**

This System Manager has 2 hard drives - Change it? **n**

This System Manager has 16 terminal ports - Change it? **n**

For each port, input the following info:

For the device type -->

P for printer

T for local terminal

R for remote terminal

S for hardwired or dedicated site

D for dialup site

X for console switches or RSM

N for unused port

For the baud rate -->

1200

2400

9600

19200 - for DHQ multiplexers only

For Port 1 (tt1:)

The device type is p

The baud rate is 9600

Do you wish to change this information? (Y/N) **n**

For Port 2 (tt2:)

The device type is s

The baud rate is 9600

The site number associated with this port is 2

Do you wish to change this information? (Y/N) **n**

For Port 3 (tt3:)

The device type is d

The baud rate is 9600

The site number associated with this port is 1

Do you wish to change this information? (Y/N) **n**

For Port 4 (tt4:)

The device type is d

The baud rate is 9600

The site number associated with this port is 3

Do you wish to change this information? (Y/N) **n**

For Port 5 (tt5:)

The device type is t

The baud rate is 19200

The SM user menu is automatically started at this terminal.

Do you wish to change this information? (Y/N) **n**

For Port 6 (tt6:)

The device type is n

Do you wish to change this information? (Y/N) **n**

For Port 7 (tt7:)

The device type is r

The baud rate is 2400

Do you wish to change this information? (Y/N) **n**

For Port 8 (tt10:)

The device type is r

The baud rate is 2400

Do you wish to change this information? (Y/N) **n**

For Port 9 (tt11:)

The device type is s

The baud rate is 9600

The site number associated with this port is 7

Do you wish to change this information? (Y/N) **n**

For Port 10 (tt12:)

The device type is t

The baud rate is 19200

The SM user menu is automatically started at this terminal.

Do you wish to change this information? (Y/N) **n**

For Port 11 (tt13:)

The device type is t

The baud rate is 9600

The SM user menu is automatically started at this terminal.

Do you wish to change this information? (Y/N) **n**

For Port 12 (tt14:)

The device type is t

The baud rate is 19200

The SM user menu is automatically started at this terminal.

Do you wish to change this information? (Y/N) **n**

For Port 13 (tt15:)

The device type is X

The baud rate is 19200

Do you wish to change this information? (Y/N) **n**

For Port 14 (tt16:)

The device type is n

Do you wish to change this information? (Y/N) **n**

For Port 15 (tt17:)

The device type is s

The baud rate is 19200

The site number associated with this port is 0

Do you wish to change this information? (Y/N) **n**

For Port 16 (tt20:)

The device type is n

Do you wish to change this information? (Y/N) **n**

The maximum regroup plan number for this system is 0 - Change it? **n**

The System Manager sends the time to all sites every 1h - Change it? **n**

The free block activity warning limit is 5000 - Change it? **n**

The disk limit at which to refuse activity downloads is 1000 - Change it? **n**

## **5.0 HARDWARE VERIFICATION**

Before loading the system manager software, check the hardware to ensure that the system is properly configured. Proper hardware configuration is described in the following paragraphs. Additional information is supplied in the computer manufactures hardware manual and in the System Manager Hardware Installation manual (LBI - 38249A).

### 5.1 Baud Rate Selection

The baud rate must be physically set for the console communication port and for the printer port on the PDP-11/53 & PDP-11/53+ systems shown in figures 1 and 2. Set the console terminal port (A0) for 9600 baud. Set the printer port (A1) (11/53 only) to the selected baud rate for the printer device. Some baud rates may need to be changed depending on the device requirements and port speeds set during software installation. Figures 1 and 2 show the location of the ports and baud rate selector on the various models of the system manager. Some models permit values higher than 7 for the baud rate selector. These higher values are used for diagnostic purposes only. The system manager will not automatically bypass the setting of the time if the setting is higher than 7. Use a screwdriver to change the setting on the baud rate selector.

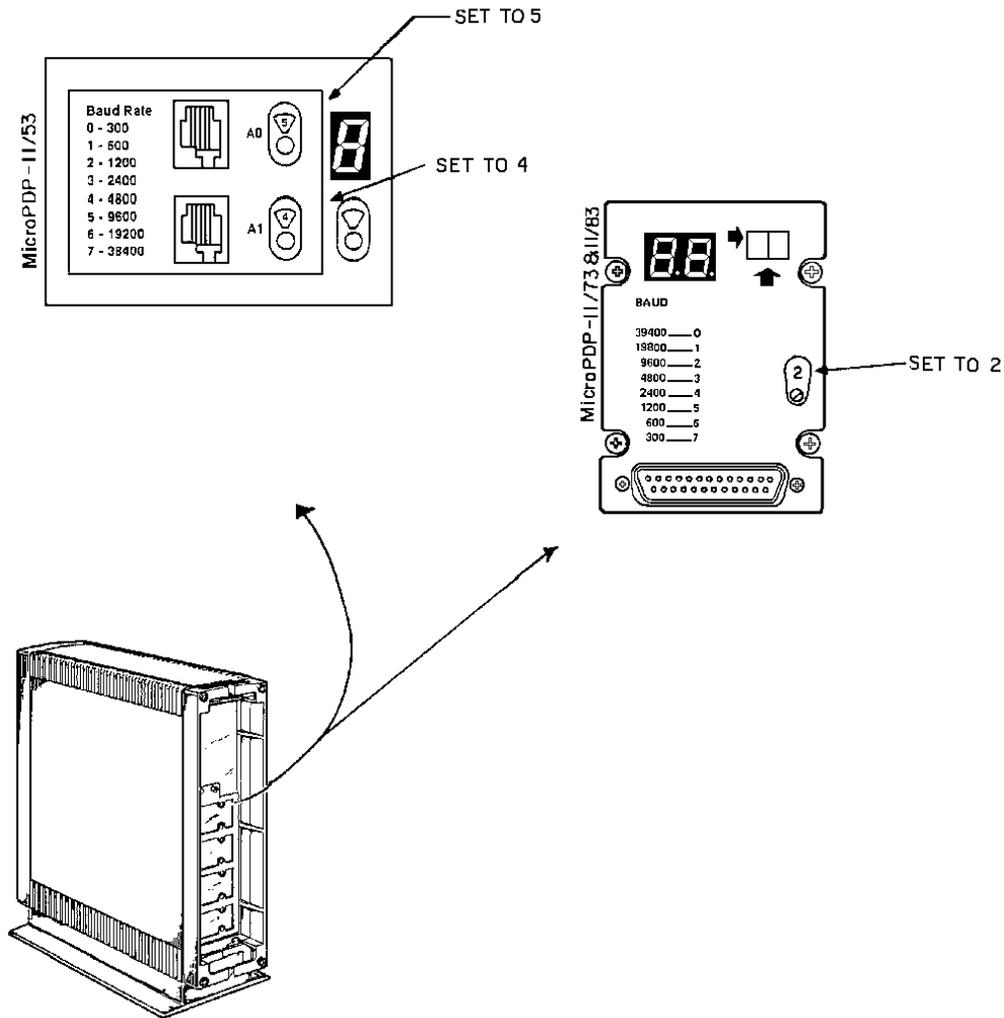


Figure 1 - Baud Rate Selection For Computers In BA23 Cabinets

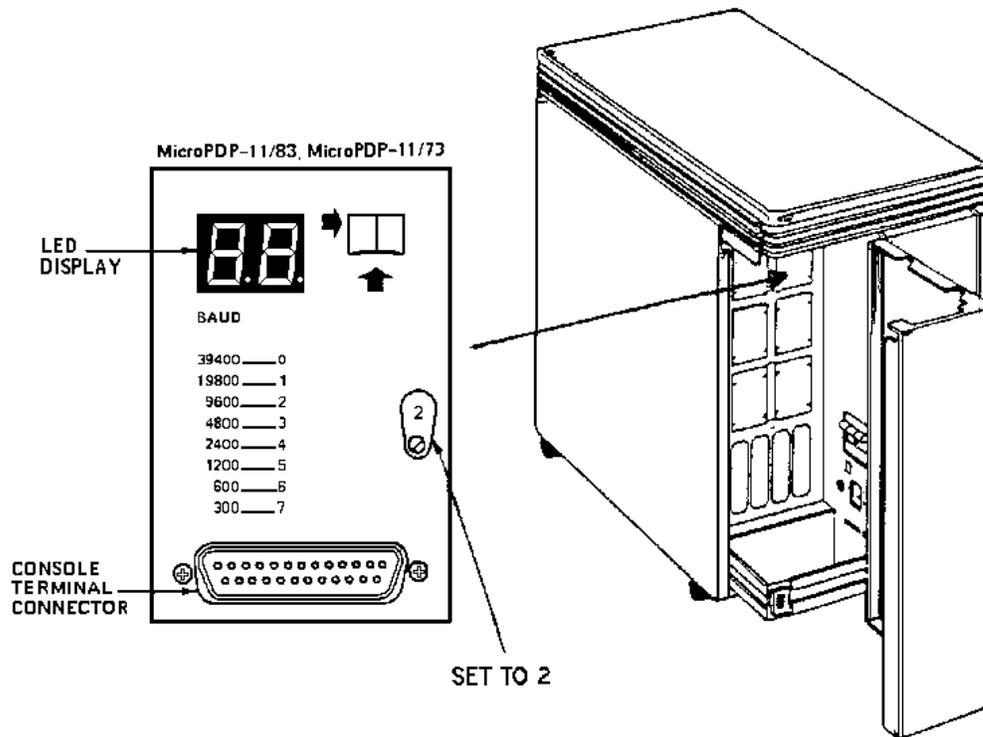


Figure 2 - Baud Rate Selection For Computers In BA123 Cabinets

## 5.2 Cable Connections

The proper cable connections for the system manager are shown in Figures 3 thru 5. The console terminal and the printer (if used) are connected as shown in the illustration. Operating position terminals and modems are connected to the remaining ports. The physical location of the communications ports on the system may differ from the illustration.

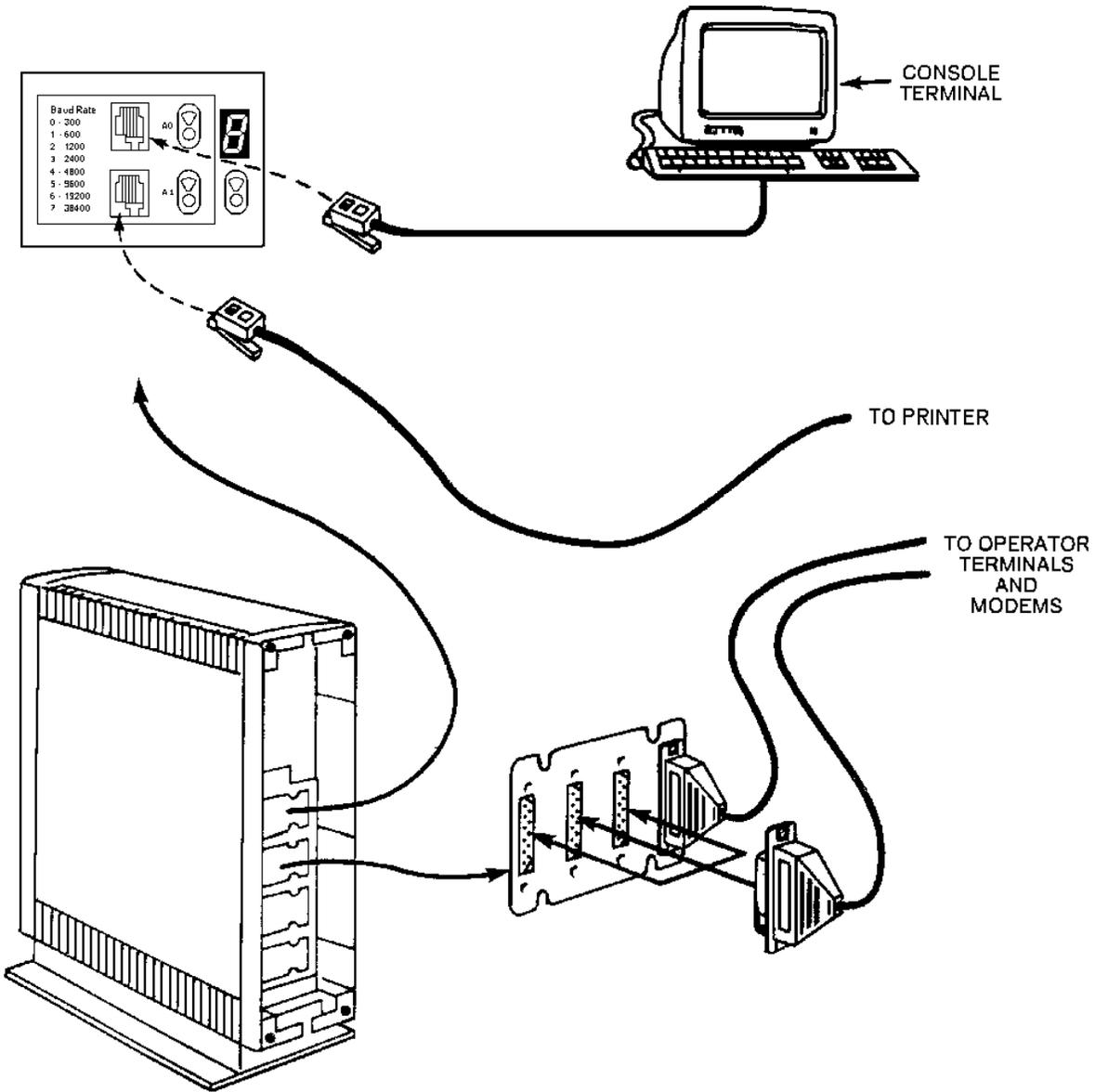


Figure 3 - Cable Connections For 11/53 In BA23 Enclosure

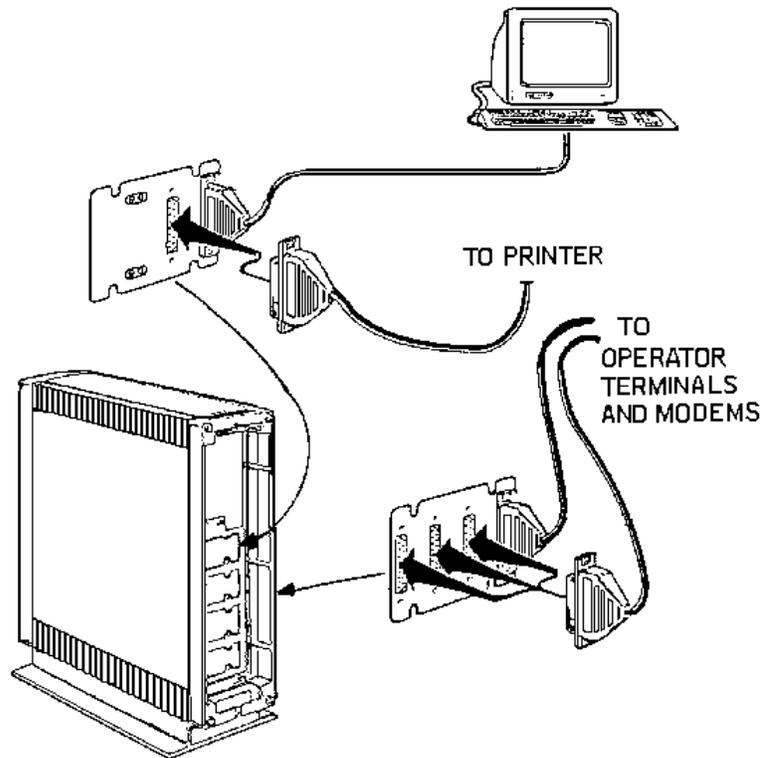


Figure 4 - Cable Connections For 11/73 In BA23 Enclosure

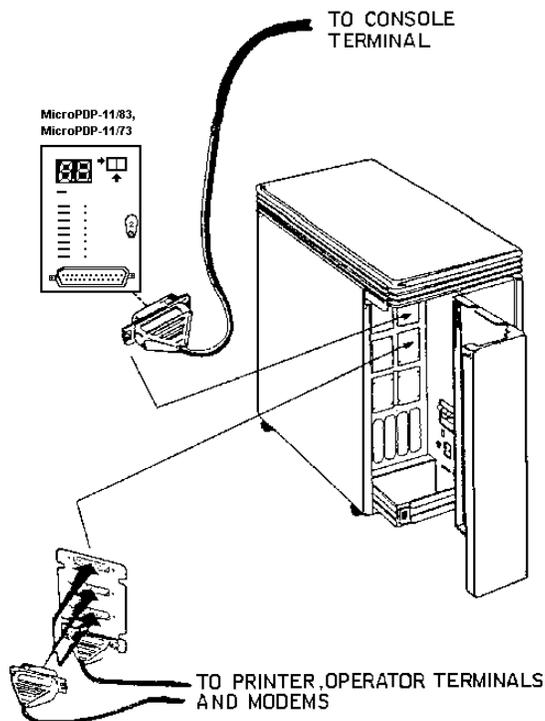


Figure 5 - Cable Connections For 11/73 or 11/83 In BA123 Enclosure

### 5.3 Terminal Set\_up

The video display terminal used with the System Manager stores many of its operating characteristics in memory. These characteristics may be changed via the Set\_up mode. The Set\_up mode may be entered by pressing the function key F3. Pressing F3 a second time will return the terminal to normal operation. The Set\_up mode may be entered at any time without loss of information displayed on the display screen.

The arrow (cursor) keys are used to select fields within the Setup screens. The ENTER key is used to toggle through the various field values and/or accept an action field. More information on Set\_up can be obtained in the hardware documentation supplied with the terminal.

Figures 6 thru 12 show the various Set\_up screens and the proper settings for the VT320 terminal. If using a different terminal, the Set\_up screen may appear different, however the corresponding Set\_up values should be used. Different baud rates for terminals and printers may be used depending on the characteristics of these devices. Some port baud rates are selectable during software installation. Be sure to check the setting of the transmit baud rate on the communications Set\_up screen and the printer speed (baud rate) on the Printer Set\_up screen.

**NOTE**

When all changes have been made to the Set\_up Screens, return to the Set\_up Directory screen. Use the SAVE function to save the changed values.

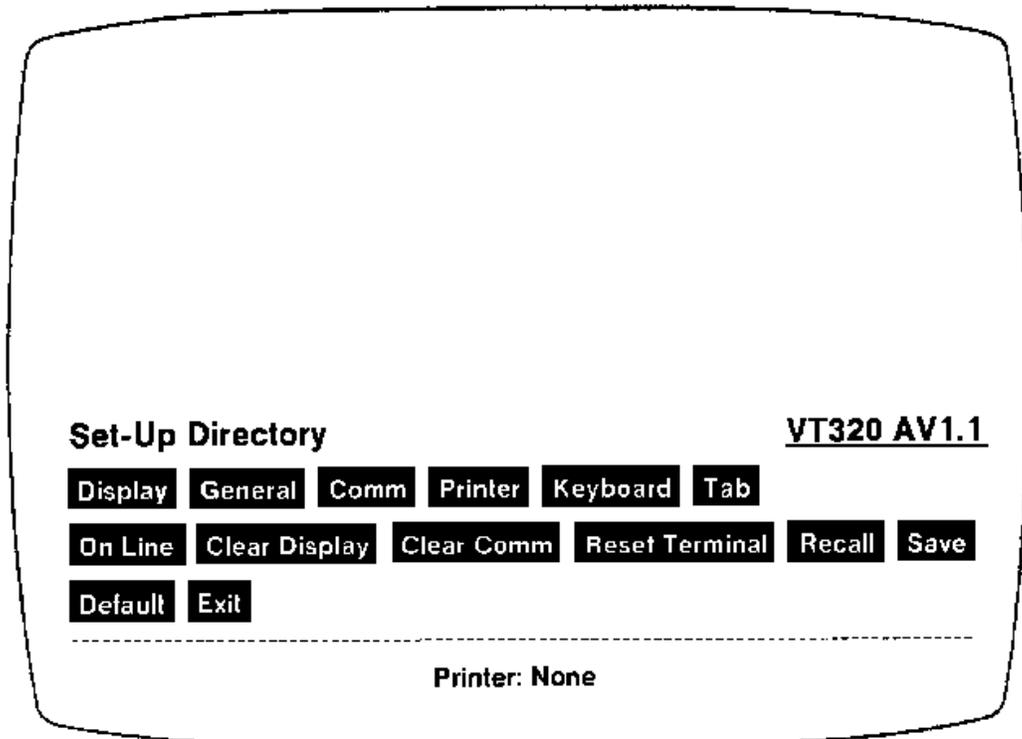


Figure 6 - Set-Up Directory Screen

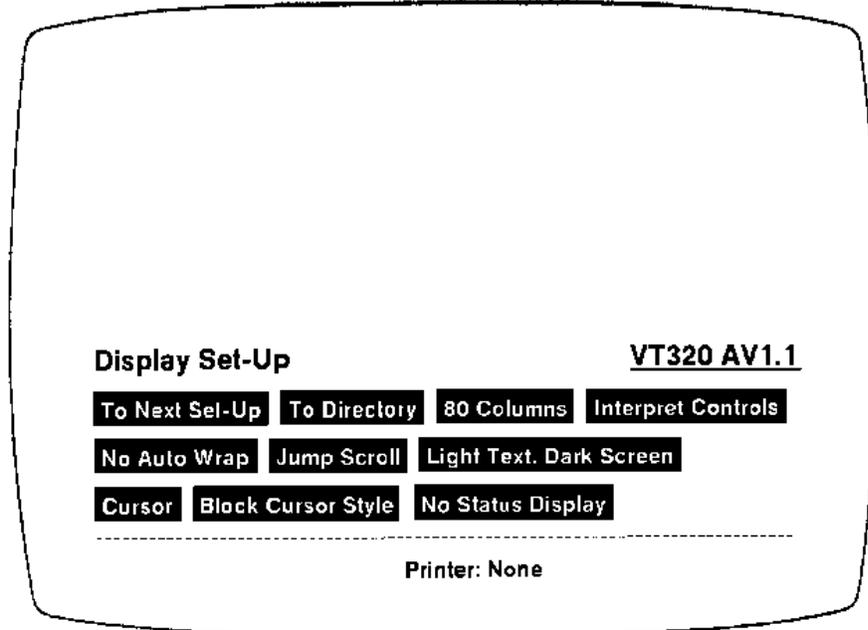


Figure 7 - Display Set-Up Screen

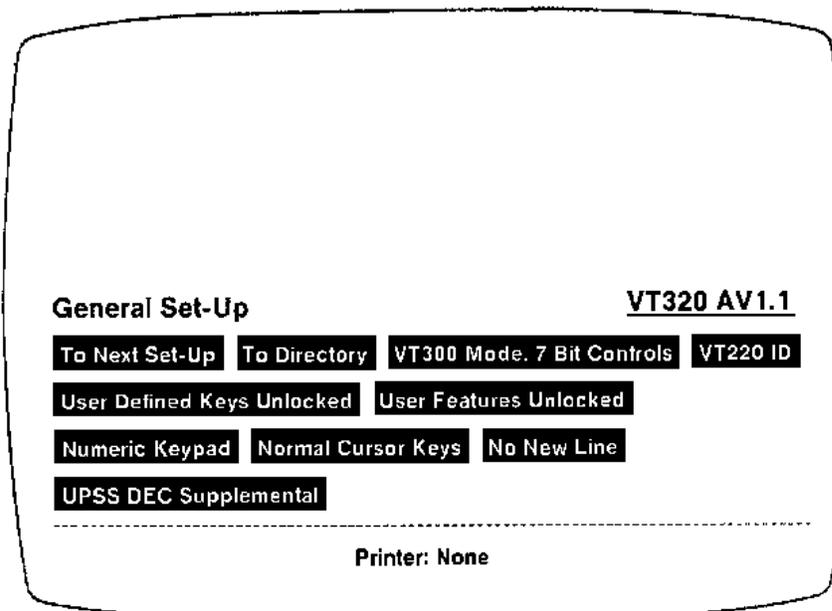


Figure 8 - General Set-Up Screen

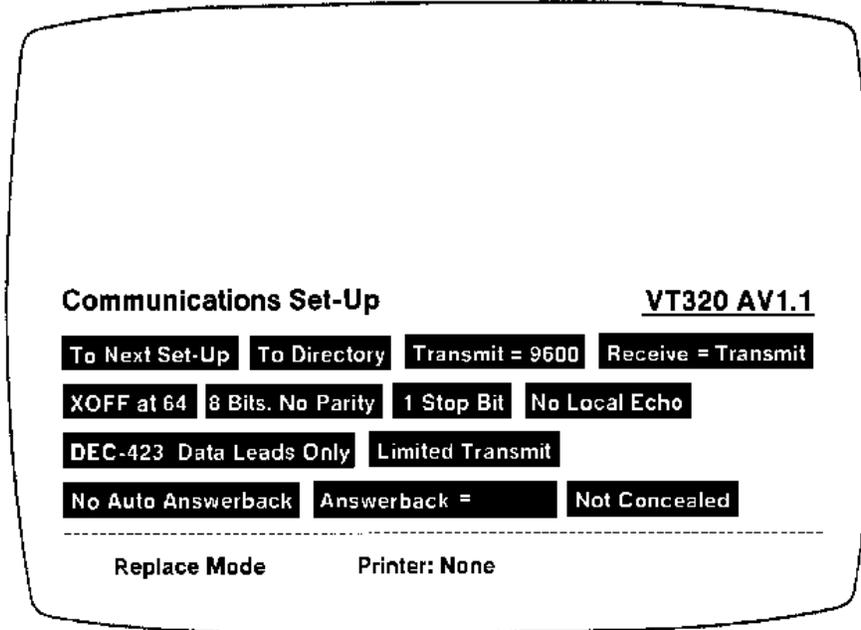


Figure 9 - Communications Set-Up Screen

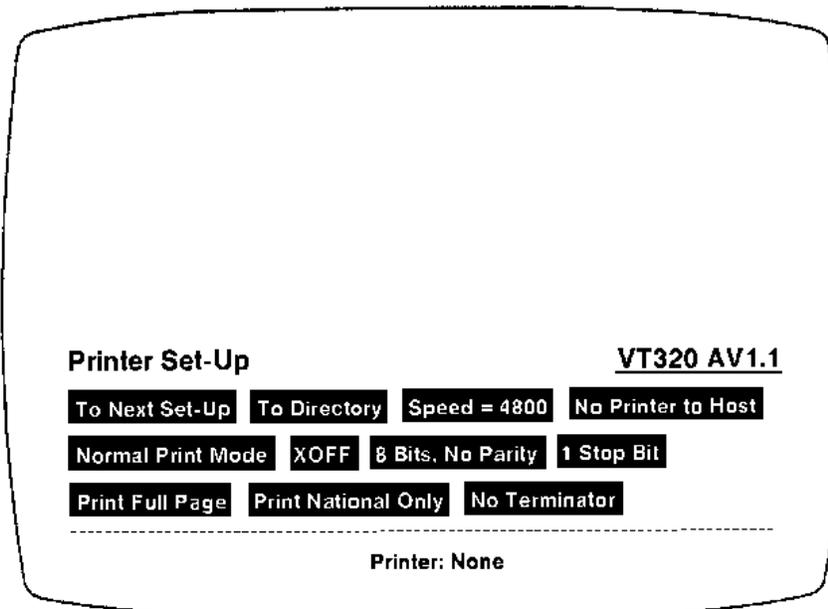


Figure 10 - Printer Set-Up Screen

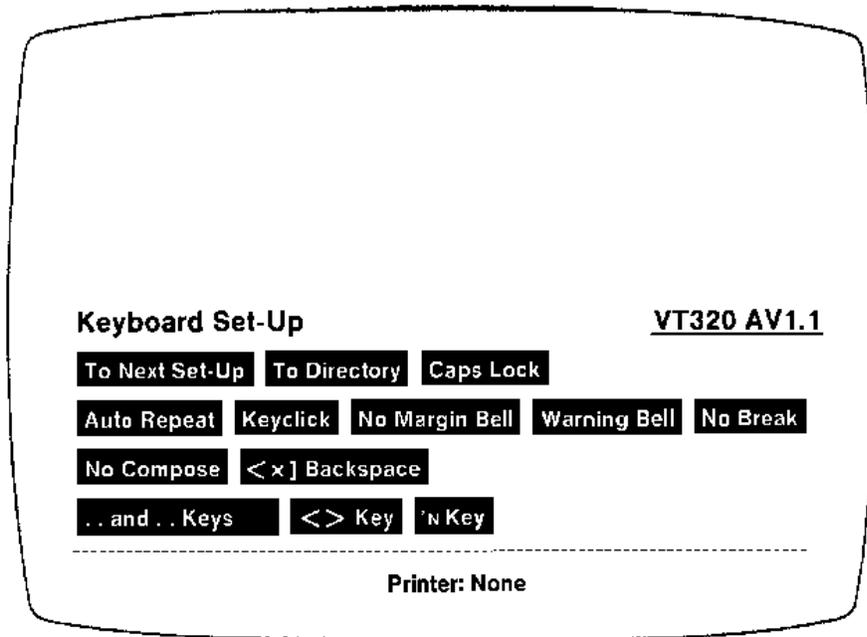


Figure 11 - Keyboard Set-Up Screen

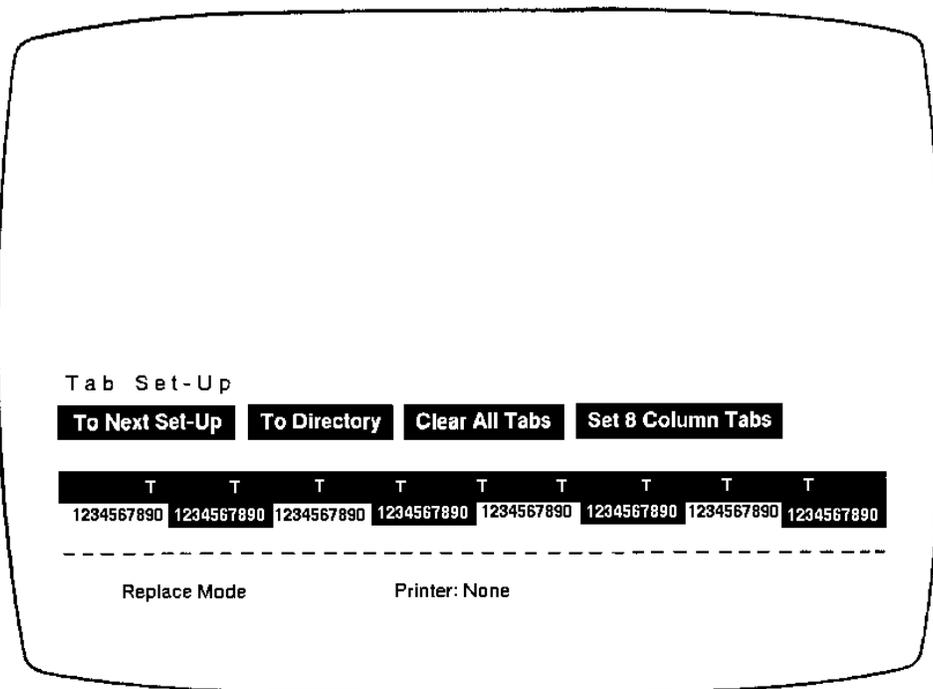


Figure 12 - Tab Set-Up Screen

## **5.4 Computer Power\_Up/Restart**

Utilize the following procedures when bring the system manager computer on-line from a cold start or a restart. Additional information may be obtained by referencing the computer manufacture's documentation.

The computer control panel for the 11/53 and 11/73 is shown in Figure 13. On some models this control pannel may be oriented vertically. The location of the control panel for the 11/83 is shown in Figure 14.

1. Insure that all black indicator buttons are set to the out position.
2. Insure that a video display terminal is connected to the console port of the computer (see Figures 3 thru 5). This will permit the operator to monitor the startup sequence for any possible errors. Turn the power on to the console terminal.
3. To turn on power to the computer, use the power on/off (1/0) switch on the control panel. If power is currently present to the computer, press the restart button on the control panel. At this time the computer will execute the power up sequence. After a successful power up or restart, the computer will ask for the time.
4. If a clock/calendar module is not installed, the time and date prompt will appear. Enter the time and date in the proper format:

**TIME AND DATE: HH:MM DD-MMM-YY**

ex:           TIME AND DATE: 13:10 11-AUG-92

The time is entered in a 24-hour format with HH being the current hour and MM being the current minute. The date is entered in the day-month-year format, where DD is the current day, MMM is the alpha abbreviation for the current month, and YY is the current year.

If a clock/calendar card is installed, the computer will display the time and date currently stored on the card, and will ask if the time and date need to be changed. Answer "Y" if the time and date are to be changed. Answer "N" or press RETURN to leave the time and date unchanged.

At this time the computer will display status messages relative to the start up of the computer. At the end of the start up sequence the console terminal will be logged out of RSX. At this time the system will be fully operational and the console terminal may be removed and used as a system manager terminal.

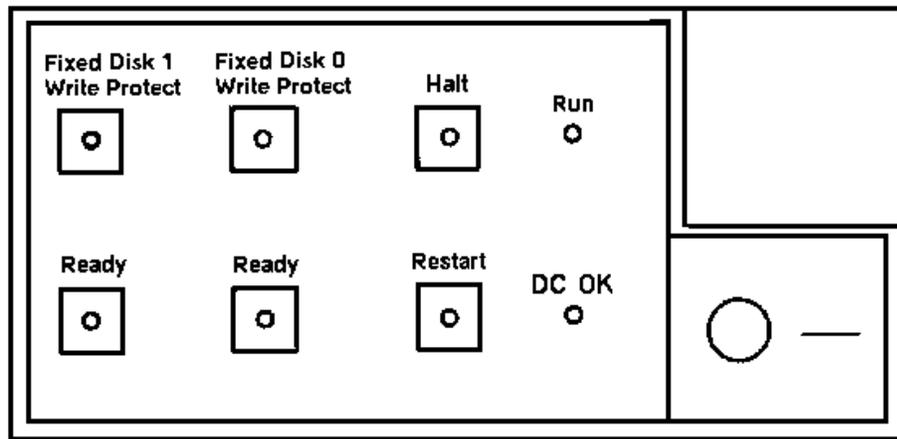


Figure 13 - Control Panel (11/53 and 11/73)

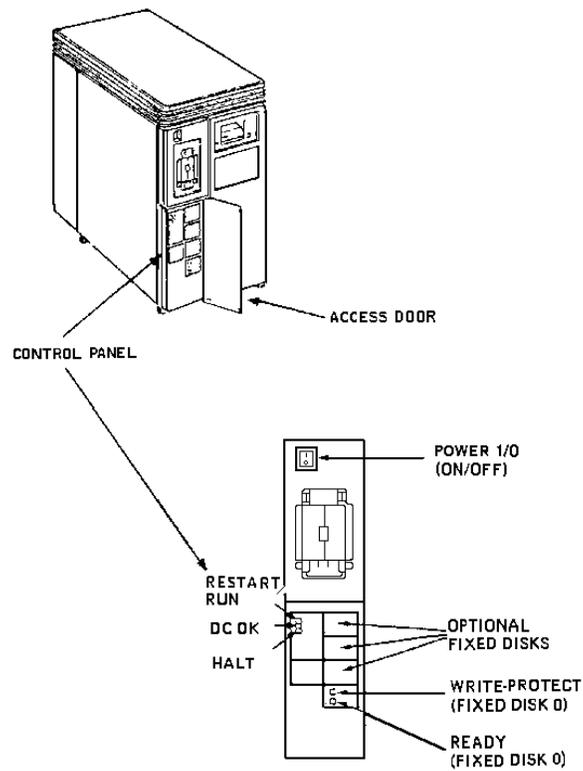


Figure 14 - Control Panel (11/83)

## 5.5 Changing The Time And Date

The time and date may be changed after the system is booted by utilizing the following procedure:

1. Exit to or Login to the RSX Operating System.
2. At the RSX prompt "\$", enter the following command and terminate with the RETURN key.

```
$ @chgtime
```

This command file will prompt for the time and date, and will update the clock/calendar module and all sites.

## 5.6 Tape Cartridge Installation/Removal

To install the TK50 tape cartridge, insert the cartridge into the tape drive as shown in Figure 15. Lower the locking flap on the front of the tape drive. Press the large button on the lower right side of the tape drive. The large button will display red and the tape indicator on the lower left side will toggle on and off as the tape cartridge is being loaded. The tape indicator will remain solid when the tape cartridge is fully loaded and enabled.

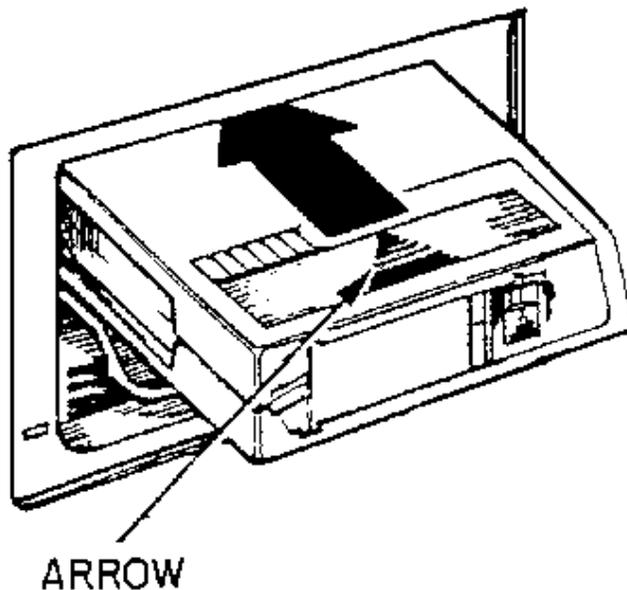


Figure 15 - Tape Cartridge Loading

To remove the Tk50 tape cartridge, press the large red button on the lower right side of the tape drive. The button will remain red and the tape indicator will toggle as the tape is rewound. When the tape cartridge has been fully rewound and unloaded, the red button will be turned off and the tape indicator will remain solid. Lift the locking flap and remove the tape cartridge.

For more information and diagrams on the use and care of the TK50 Tape cartridge, reference the TK50 Users Guide furnished with the TK50 tape drive.

## 6.0 SYSTEM SAVE AND RECOVERY

This section of the System Manager Installation Guide is being provided to aid the users of the System Manager to more fully utilize some of the features of the RSX Operating system to insure a more reliable performance of the system and to permit flexibility in saving critical system data and recovery of system data in the event of a system failure.

The section will discuss the procedures to be performed to create a bootable TK50 tape cartridge to be used when saving system data and recovering system data if needed. This section will also discuss the procedures for executing a clean save of the system disk and a clean recovery of the system disk data.

The installation procedure discussed in Section 2.0 permits the creation of a boot tape and a complete system save. It is however necessary to perform these functions manually. If the installation was performed on a new system manager with no data, it is recommended that a system data save be performed when the databases have been fully loaded. It is also recommended that 2 copies of the TK50 boot tape and system data save be created. One copy should be stored at an off site location. The system data save is not a replacement for Option 74 (Archive Database) on the system manager menu.

### 6.1 Create Bootable TK50 Tape (BRUSYS)

The creation of a bootable BRUSYS tape is performed by executing a command file residing in the [SMUTIL] directory. To create a bootable BRUSYS tape, execute the following procedures:

At the RSX prompt "\$", enter the following command:

```
$ @[smutil]bldbrusys
```

The "bldbrusys" command file will request the loading of a blank tape, perform the creation, and request the removal of the tape. Brusysbld will prompt as follows:

Please insert and enable a blank TK50 tape cartridge into the tape unit.

Press RETURN when the TK50 has been mounted <RETURN>

The following lines will be displayed as the tape is created:

```
$ Set Def [6,54]
$ Assign sy: lb:
$ Mou/FOR MU0:
$ @VMR
$ RUN VMRM42
  Filename: BRUSYS
  VMR> save/boot=du: MU0:BRUSYS
$ <EOF>
$ deassign lb:
$ Set Def [SMUTIL]
```

At this point the VMR command file will create and transfer a bootable image of BRUSYS to the TK50 tape. It will also copy boot block information for the disk drive. When this step has completed, the operator will be requested to remove the tape.

Please remove the TK50 boot tape from the tape unit.

Press Return when the TK50 tape has been removed <RETURN>

After removing the tape, WRITE PROTECT the tape. This is accomplished by sliding the write protect cover on the front of the tape cartridge to the left. An orange label will appear when this is completed. Label the tape "BRUSYS" and append the date of creation. Return the tape cartridge to the clear plastic cover it was originally in.

If only one copy of the BRUSYS boot tape has been created, another copy can be created by performing the procedures outlined in this section a second time.

## **6.2 System Save/Recovery (BRUSYS)**

The current system manager permits the archiving of data files to tape and the restoration of these files when required. In conjunction with this feature, procedures have been developed to permit a full system save and recovery.

These procedures involve the use of a bootable TK50 tape with a standalone copy of BRU (Backup and Restore Utility), the saving of the operating system and data to tape using the standalone media, and the recovery of data from tape using the standalone media.

The save procedure should be used when there has been an upgrade of the RSX Operating System and/or an upgrade of the System Manager application software. The save procedure would be used when increasing the capacity of the system disk. There is no need to perform the save function during normal day to day operations, however when large amounts of data have been added or changed, it may be feasible to perform a save of the system.

The recovery procedure should be used when there is a problem with the integrity of the disk or the system installed on the disk. The recovery option can be used to restore a system when the capacity of the disk has been increased. The recovery procedures will utilize facilities which will permit the formatting of the hard disk, location of bad blocks, and recovery of the system disk information to include the current RSX operating system and current application software. After the recovery operation has completed and the most current copy of the archived database has been restored, the save operation can be performed to make a complete copy of the system disk.

As stated previously, the increasing of the capacity of the system disk, which primarily occurs in single disk system managers, will use both the save and the recovery procedures. Before the disk drive is physically changed, the system image would be saved to a TK50 tape. After the save, the disk drive can be physically replaced and the recovery procedure can be executed to restore the original system image to the larger disk drive. After recovery, the system can be restarted for normal operation with no further interface.

A terminal must also be connected to the console port for interaction into the operating system. Reference Section 5.0 - Hardware Verification for more information on the configuration of the console terminal.

### **6.2.1 System Preparation**

The preparation of the system must be executed prior to performing the save or the recovery operation. The system manager must be in a state of no tasks performing to insure a good save or recovery. This state is called the shutdown stage. This can be accomplished by exiting to RSX. Once the terminal has been put into RSX, the system program "SHUTUP" must be executed to properly shutdown the system. At the RSX prompt "\$", enter the following command and terminate with the RETURN key:

```
$ RUN $SHUTUP
```

Reference RSX manual titled "Users Guide 2", section 2.1 for more information relative to the "SHUTUP" program.

The "SHUTUP" program will prompt for number of minutes before shutdown and the reason for the shutdown. Enter '0' for the number of minutes and terminate with the RETURN key. Enter the reason for shutdown and terminate with the RETURN key.

The shutdown procedure will also request if the operator wishes to Backup or Restore files or Continue shutdown. Enter "CONTINUE" to skip this option. Shutdown will permit a save or recovery operation to be executed without any other tasks executing on the system.

**After the system has been shutdown, insert the TK50 tape labeled "BRUSYS" into the tape drive. Reference the "TK50 Users Guide" for information relative to use of the TK50 tape drive and TK50 tape.**

Restart the system by pressing the Restart Button or Power on/off switch. The console terminal will display the boot up memory diagnostic messages at this time.

Testing in progress - Please Wait

9 8 7 6 5 4 3 2 1

Before the display has complete, enter a "CTRL C". This is accomplished by pressing the "CTRL" key and the "C" key simultaneously. This will permit the system to enter into the dialog mode of operation.

The system will display the following:

Message 04 Entering Dialog Mode

Commands are Help, Boot, Setup, Map, and Test.  
Type a command then press the RETURN key:

To begin the process of save/recovery enter "BOOT MU:" and terminate with the RETURN key.

Commands are Help, Boot, Setup, Map, and Test.  
Type a command then press the RETURN key:**Boot MU:**

This will select the TK50 tape drive as the boot device. At this time the system will boot the device selected. The following items will be displayed:

Trying MU0

Starting system from MU0

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

RSX-11M/RSX-11M-PLUS Standalone Configuration and Disk Sizing Prog

Valid Switches are:  
/CSR=nnnnnn to change the default device CSR  
/VEC=nnn to change the default device vector  
/FOR=n to change the default magtape formatter number  
/DEV to list all default device CSR and Vectors

Enter first device:

Enter the "/DEV" option to obtain a list of the current default devices present on the system and terminate with the RETURN key.

Enter first device: /DEV

The BRUSYS system will display the current default devices and return to the previous prompt.

<u>Device</u>	<u>CSR</u>	<u>Vector</u>	<u>CSR Status</u>
DB	176700	254	Not Present
DK	177404	220	Not Present
DL	174400	160	Not Present
DM	177440	210	Not Present
DP	176714	300	Not Present
DR	176300	150	Not Present
DU	172150	154	Present (System Drive)
MM	172440	330	Not Present
MS	172522	224	Not Present
MT	160000	320	Not Present
MU	174500	260	Present (TK50 Tape Drive)

"Enter first device:" will be the "SYSTEM DISK DRIVE" which is device "DU:". Enter the following and terminate with the RETURN key:

Enter First Device: **DU: \*\* DON'T FORGET THE ":" \*\***

The BRUSYS system will now prompt for the second device to be used during the save/recovery operation. Enter second device will be the TK50 tape drive which is device "MU:". Enter the following and terminate with the RETURN key:

Enter Second Device: **MU: \*\* DON'T FORGET THE ":" \*\***

The BRUSYS system will now request the time by displaying the following:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'  
<RETURN>

Press the RETURN key and the MICRO RSX MCR '>' prompt will appear. Enter the above requested TIM command and the current time in hours/minutes and the current date in the requested format e.g.

> **TIM 12:00 01/12/92**

The BRUSYS will return the '>' prompt. At this point system preparation has been completed.

Remove the TK50 tape labeled "BRUSYS" from the tape drive. Reference Section 6.2.2 for information on the SAVE operation and Section 6.2.3 for information on the RECOVERY operation.

## 6.2.2 Save Operation

After preparing the system for the save operation based on Section 6.2.1, and removing the "BRUSYS" tape, the Save of the system will begin at the '>' prompt. Insure that the save tape, a blank tape or reusable tape, has been properly installed into the device.

Enter the following command at the ">" prompt and terminate with the RETURN key:

> **RUN BRU**

The system will display the "BRU" prompt.

BRU>

To save the system disk image from the system disk, enter "DU:" and

terminate with the RETURN key.

BRU> **DU:**

The system will now prompt for the device to save the system image 'to'. Enter "**MU:**" for the TK50 tape drive and terminate with the RETURN key.

To: **MU:**

At this time the BRUSYS system will display the current status of the SAVE operation as it is creating the save tape.

BRU - Starting Tape 1 on Mu0:

BRU - End of Tape 1 on MU0:

BRU - Completed

After the save has completed the system will return the BRU prompt.

Enter "CTRL Z" to terminate the BRU program and RETURN to restore the ">" prompt.

```
BRU> ^Z
<RETURN>
>
```

Remove the TK50 Tape from the tape drive and reference the TK50 Users Guide, Page 2-2, for information about labeling TK50 tapes. The TK50 tape should be labeled as follows:

```
BRUSYS SAVE SET
mm/dd/yy
```

Storage of the TK50 tape at an offsite location is highly recommended as well as performing the above process another time to insure 2 exact copies of a save.

Before storing the TK50 save tapes, insure that the tapes have been WRITE PROTECTED.

After creating the save tape/tapes, restart the system by pressing the "RESTART" button on the front pannel of the PDP-11 cabinet. After the system has fully booted, the terminal will display the system manager login form.

A sample save session would appear as follows:

Testing in progress - Please Wait

9 8 7 6^C 5 4 3 2 1

Message 04 Entering Dialog Mode

Commands are Help, Boot, Setup, Map, and Test.

Type a command then press the RETURN key: **Boot MU:**

Trying MU0

Starting system from MU0

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

**RSX-11M/RSX-11M-PLUS Standalone Configuration and Disk Sizing Prog**

Valid Switches are:

/CSR=nnnnnn to change the default device CSR  
/VEC=nnn to change the default device vector  
/FOR=n to change the default magtape formatter number  
/DEV to list all default device CSR and Vectors

Enter first device: **/DEV**

<u>Device</u>	<u>CSR</u>	<u>Vector</u>	<u>CSR Status</u>
DB	176700	254	Not Present
DK	177404	220	Not Present
DL	174400	160	Not Present
DM	177440	210	Not Present
DP	176714	300	Not Present
DR	176300	150	Not Present
DU	172150	154	Present (System Drive)
MM	172440	330	Not Present
MS	172522	224	Not Present
MT	160000	320	Not Present
MU	174500	260	Present (TK50 Tape Drive)

Enter First Device: **DU:**Enter Second Device: **MU:**

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'

&lt;RETURN&gt;

> **TIM 12:00 01/12/92**> **RUN BRU**

BRU&gt;

BRU> **DU:**To: **MU:**

BRU - Starting Tape 1 on MU0:

BRU - End of Tape 1 on MU0:

BRU - Completed

BRU> **^Z**

&lt;RETURN&gt;

&gt;

**6.2.3 Recovery Operation**

The recovery option should be used when there is a problem with the integrity of the disk or the system installed on the disk. The recovery option can be used to restore a system when the capacity of the disk has been increased. The recovery

procedures will utilize facilities which will permit the location of bad blocks, and recovery of the system disk information to include the current RSX operating system and current application software.

After preparing the system for the save operation based on Section 6.2.1, and removing the "BRUSYS" tape, the recovery operation will begin at the '>' prompt. Insure that the recovery TK50 tape labeled "BRUSYS SAVE SET", has been properly installed into the TK50 tape drive.

Reference the "TK50 Users Guide" for information relative to use of the TK50 tape drive.

The first step in the recovery operation is to prepare the System disk for receipt of the SAVE data by verifying that there are no bad blocks on the disk. This can be accomplished by running the "BAD" program which is part of the BRUSYS system.

**NOTE**

The "BAD" program will destroy all data currently residing on the System Disk. The system disk will no longer be a bootable device.

At the '>' prompt, enter the following command and terminate with the RETURN key.

```
> RUN BAD
```

The system will return the BAD prompt.

```
BAD>
```

Enter the system disk device name "**DU0:**" and terminate with the RETURN key.

```
BAD> DU0:
```

At this time the system will locate any bad blocks currently present on the system disk and will save them to the BAD-SYS.SYS file. The BAD program will display the current status and the number of BAD blocks located. The BAD program may consume from 30+ minutes of time depending on the size of the disk.

When the BAD program has completed, the system will return the BAD prompt. Enter "**CTRL Z**" to terminate the BAD program. The system will return to the '>' prompt.

```
BAD> ^Z  
>
```

Enter the following command at the ">" prompt and terminate with the RETURN key:

```
> RUN BRU
```

The system will display the "BRU" prompt.

```
BRU>
```

To recover the system disk image from the TK50 tape, enter "**MU:**" and terminate with the RETURN key.

```
BRU> MU:
```

The system will now prompt for the device to save the system image 'to'. Enter "**DU:**" for the system disk drive and terminate with the RETURN key.

To: **DU:**

At this time the BRUSYS system will display the current status of the RECOVER operation as it is recovering the system image from the TK50 tape and creating the new system image on the system disk drive.

BRU - Starting Tape 1 on Mu0:

BRU - End of Tape 1 on MU0:

BRU - Completed

After the save has completed the system will return the BRU prompt. Enter "**CTRL Z**" to terminate the BRU program and **RETURN** to display the ">" prompt.

```
BRU> ^Z
<RETURN>
>
```

Remove the TK50 tape from the tape drive. Return the TK50 tape to its storage location.

After recovery of the system, restart the system by pressing the "RESTART" button on the front pannel of the PDP-11 cabinet. After the system has fully booted, the terminal will display the system manager login form.

To return the system disk to it's most current state, log in to the system manager and select option "75" (Retrieve System Database). Use the latest backup tape to restore the database files to their most current state.

A sample recovery session would appear as follows:

Testing in progress - Please Wait

9 8 7 6^C 5 4 3 2 1

Message 04 Entering Dialog Mode

Commands are Help, Boot, Setup, Map, and Test.  
Type a command then press the RETURN key: **Boot MU:**

Trying MU0

Starting system from MU0

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

RSX-11M/RSX-11M-PLUS Standalone Configuration and Disk Sizing Prog

Valid Switches are:

/CSR=nnnnnn to change the default device CSR  
/VEC=nnn to change the default device vector  
/FOR=n to change the default magtape formatter number  
/DEV to list all default device CSR and Vectors

Enter first device: **/DEV**

<u>Device</u>	<u>CSR</u>	<u>Vector</u>	<u>CSR Status</u>
DB	176700	254	Not Present
DK	177404	220	Not Present
DL	174400	160	Not Present
DM	177440	210	Not Present
DP	176714	300	Not Present
DR	176300	150	Not Present
DU	172150	154	Present (System Drive)
MM	172440	330	Not Present
MS	172522	224	Not Present
MT	160000	320	Not Present
MU	174500	260	Present (TK50 Tape Drive)

Enter First Device: **DU:**

Enter Second Device: **MU:**

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'  
<RETURN>

> **TIM 12:00 01/12/92**

> **RUN BAD**

BAD>

BAD> **DU:**

BAD> **^Z**

> **RUN BRU**

BRU>

BRU> **MU:**

To: **DU:**

BRU - Starting Tape 1 on Mu0:

BRU - End of Tape 1 on MU0:

BRU - Completed

BRU> **^Z**

<RETURN>

>

## **7.0 SCHEDULING SYSTEM SAVES AND ARCHIVE DATA/ACTIVITY**

With the additional ability to perform complete system saves, it becomes even more critical that periodic archives of databases and activity be performed. The more recent an archive, the less chance of losing critical data in the event of recovery or restoration. Understand fully that without a recent copy of the database, in the event of a loss of data, there may be quite a high level of manual data entry to recover and restore missing data. Some means of hardcopy records should be available to compliment the existing database on the system manager. The hardcopy records may ultimately become the only means to restore a database, should there be no recent copy of the database to tape.

The purpose of this section is to discuss the timeliness of these features. The frequency of saving system data or archiving depends largely on the volume of database changes or the volume of activity acquisition. The system manager has 2 areas of storage, the database & system area and the activity area. On some systems there is a disk drive for each area, while on other systems, the 2 areas are split on a single drive. Systems with single disk drives are more likely to reach capacity much sooner as are systems with 2 disk drives and large volumes of activity.

Archive the database each week on the same day and use 2 different tapes. The archived database may be appended to an existing archive tape therefore permitting multiple database archives on a single tape. Each database archive tape should be the same, i.e. perform the database archive twice, once to each tape. Store one tape at an offsite location for security purposes.

Archive the activity each week on the same day in conjunction with archive of the database. This will permit the system to free space on the activity disk for future activity acquisition. This is especially essential for single disk drive systems. At the end of the month, retire the activity tape or tapes. Keep an activity tape for each month, and re-use the tape the following year. Activity may be retrieved for the purpose of reports and analysis of the system, therefore keeping old activity files around for extended periods of times only increases the potential of reaching capacity sooner.

Perform a system save each month or when large amounts of data have changed and use 2 different tapes. Perform the system save twice and store one tape at an offsite location.

The above recommendations may not be suitable for all systems. However, it should be pointed out that the time spent archiving data and performing system saves will far outweigh the amount of time required to re-enter all data from the keyboard.

## **8.0 RAW ACTIVITY UTILITIES**

Each time a site downloads activity to the system manager, the activity is stored in 2 files: the processed activity file and the raw activity file. The processed activity files remain on the system until they are removed by the archive facility. The raw activity file/files remain on the system for apprx. 2 days until the nightly clean up task removes them. The processed activity files contain merged raw activity data, e.g. a channel assignment and a channel drop will be reflected as a single transaction in the processed activity file. However, the raw activity file will contain both activities in the exact order of occurrence.

Two utilities have been provided to permit analysis of the raw activity before it is removed from the system: the raw activity reporter (rawprt) and the raw activity reporter batch (rawbatch).

### **8.1 RAWPRT Command File**

Execution of the RAWPRT utility will be accomplished by using a command file in the [smutil] directory. The command file will prompt for the date of the raw activity, site number (there is a raw activity file for each site), copy the file from the [smact] directory to a save directory, execute the RAWPRT task, and permit deletion of the files upon exiting the command file.

---

To execute the RAWPRT command file, login to RSX or exit to RSX from the system manager menu. At the "\$" prompt, enter the following command and terminate with RETURN:

**\$ @[smutil]rawprt**

The command file will request the date of the desired raw activity file.

Enter the date of raw activity file <mm/dd>

Enter the month and day of the raw activity file in the requested input format and terminate with RETURN. e.g.

Enter the date of raw activity file <mm/dd> **10/09**

The command file will request the site number of the raw activity file.

Enter the site number [S R:01-31]:

Enter a site number from 1 to 31 and terminate with RETURN. e.g.

Enter the site number [S R:01-31]: **01**

The command file will transfer the raw activity file from the [smact] directory to the save directory. Using the above example, the file transferred would appear as: sm1:[smact]R1009.01. After transferring the file, the RAWPRT task will be executed.

Reference section 8.2 for information on executing the RAWPRT utility and the required inputs.

After the RAWPRT utility has completed the command file will request if the created files in the save directory should be deleted. The default is yes.

Delete Files <Y/N>

There are no provisions for automatically deleting these files. It is recommended that a "Y" be entered. These files may and will consume possible needed disk space.

## 8.2 RAWPRT

The rawprt task will prompt for the month of the file. Enter the month previously entered when requested by the command file and terminate with RETURN:

Please enter the month (1-12) of the file you wish to review: **10**

The rawprt task will prompt for the day of the file. Enter the day previously entered when requested by the command file and terminate with RETURN:

Please enter the day (1-31) of the file you wish to view: **09**

The rawprt task will prompt for the site number of the file. Enter the site number previously entered when requested by the command file and terminate with RETURN:

Please enter the site number: **01**

The rawprt task will next request the device (disk) and directory name where the file resides. These are the same as the current directory, enter the RETURN key to assume the default.

Please enter the device (if needed) and directory name: <RETURN>

The rawprt task will now request a time range for this report.

Do you want to specify a time range for this report <Y/N>

**The answer to the above question, requires only the pressing of the Y or the N key. There is no termination with the RETURN key required.**

If rawprt is to be executed on all data in the file, press the N key. Do not terminate with RETURN.

If rawprt is to be executed on a selected range of data determined by the date and time, press the Y key. Do not terminate with RETURN. The rawprt task will now request the start time of the report. Enter the date and time in the requested format and terminate with the RETURN key.

Enter report start time (MM-DD-YY HH:MM): **10-09-91 13:20**

The rawprt task will now request the ending time of the report. Enter the date and time in the requested format and terminate with the RETURN key.

Enter report ending time (MM-DD-YY HH:MM): **10-09-91 15:20**

If the rawprt task was previously executed on the selected raw activity file, the task will request if the old data is to be used for this report. If the report was previously generated and the existing report files, R????LST and R????PAG, are to be used, enter a "Y" and terminate with a RETURN. If the files do not exist, the task will display "File does not exist" and the rawprt task will terminate. If a new report is to be generated, enter a "N" and terminate with RETURN. If no report files exist, the rawprt task will not display the next request.

Are you re-entering an already processed file <Y/N>? **N**

If a version has already been run, a new version of the .PAG and .LST files will be created, and the old will remain in the directory. If the file is being processed, the rawprt task will display the status of the processing with the following message: Working on time: hh:00.

Once the report has processed, the first page will automatically be displayed. The top line shows the site, date, and page number of the current report. There are 18 lines displayed, but only 17 lines per page. This means that the last line of the current page will also be the first line of the next page. At the bottom of the screen are some of the commands available for further access to the report data. Press 'Z' to view the second page of commands. Commands will work regardless of which set of prompts is displayed.

### ***J (Jump to page)***

Press this key to jump to a specific page number. Rawprt will prompt for the page number to jump to. If a page number greater than the last page (shown in the upper right corner) is specified, the report will jump to the last page.

### ***N (Next page), B (Back page)***

These commands page the report one page forward, or one page back. The rawprt task will not go beyond the beginning or ending page boundaries.

### ***Q (Quit)***

Pressing Q quits the current report, but not the program. After pressing Q, the task will prompt again to press Q to quit completely, or any other key to begin a new report. Pressing any other key starts the program again from the beginning.

***D (set search Date)***

This command is used to set the date for the time search functions. When 'D' is pressed, the task will prompt for the month, then day to search within. Once this is done, all hour and minute searches will use this date. The date may change at any time using this command. In addition, if either minute searching or hour searching is selected before the date is set, then the program will prompt for the date from them. The 'D' command only needs to be used to change the date. If the date entered does not exist, then the report stays on the same page.

***H (find Hour)***

This command permits the task to find the page containing the first record with the hour specified. If a date has not been previously specified, the task will prompt for the date, otherwise the date will default to the last one entered. If the same hour occurs twice within a report (i.e. site controller reset), then the first one will be found. Specify the same hour again to find the second occurrence.

***M (find Minute)***

This command permits the task to find the page containing the first record with the minute within the hour specified. If an hour was previously specified, then all minute searches use that hour. If an hour or date have not yet specified, the task will be prompt for them.

***S (Swap printers)***

Three printer types are supported by this program; the system printer, a local printer, or a file. The system printer is the main printer for the System Manager. A local printer is one connected directly to a terminal, and file means an RSX disk file named Rmmddss.DAT where mm=month, dd=day, and ss=site. The printer type defaults to System, and all printouts will be routed there unless this parameter is specifically changed. All devices print three screen pages per printer page, and the system printer and local printer pages look exactly like the screen. File printed pages, however, are only 17 lines long, so the last line of each page is not repeated as the first line of the next page. All .DAT files will be saved in the same directory as the one specified at the program start.

***C (Close print spool)***

To print a page, the 'P' or 'R' keys are used. These commands do not actually cause the printer to start, however. All printouts are spooled to a printer buffer, and are not printed until the 'C' key is pressed. This closes the print spool and flushes it to the selected device. The print spool will also close if the program is terminated, or if another print device is selected. If a device is closed and re-opened, an extra form feed is generated so that a distinction between print sessions may be made.

***P (Print to spool)***

This command causes the current page (shown on the screen) to be printed to the current printer device. If the device is not open, this command opens it, otherwise the page is appended to the existing print spool. This command does not actually cause the printer to start, however. Use the 'C' command to close the print spool and flush it to the printer or file.

***R (print Range)***

This command allows the printing of a range of pages to the current print device. The task will prompt for the first and last page to print. The pages are sent to the print spool, but are not actually printed until the 'C' command is used to close the print spool and flush it to the printer. If the starting page is larger than the ending page, then no pages will print and the program will return to the command mode.

***F (Find activity)***

This command pulls up a new set of menus which permits the task to search for and display specific activity types found within the current report. All of the currently defined activity types are listed, each with a unique number to represent it. At the prompt, type the number of the activity type you wish to search for. This brings up a second menu listing the currently defined secondary search criteria for that particular activity type. If 'G' is pressed at this point, without any secondary criteria, then all records of that activity type will be found, without any other restrictions. If, however, one or more secondary criteria are specified, then only records matching **all** of the criteria will be found. For example: to find all group calls to group XX on channel YY, specify group calls: callee ID XX, channel YY. To find all group calls to group XX, and all group calls on channel YY, the group type must be specified twice, once with channel number and again with group ID. Up to 16 activity types may be searched at one time. The task will also search for as many secondary criteria as are defined, but each secondary criteria may be used only once. If the same secondary criteria are specified more than once, the last one given is the one used.

Pressing the 'G' key from the main search menu starts the search process. If any records are found, a new file is created. This file is named Rmmdss.Rnn with mm=month, dd=day, ss=site, and nn=number of the searched file (starting from zero). All records matching those specified are copied into this file. All searching is done from the current raw file. When all records have been found, the report generates a new set of listing and page files, named Rmmdss.Lnn and Rmmdss.Pnn, and displays the first page of the report as though it were an ordinary report. All functions of the reporter still behave the same as for an ordinary report as well. If no matches were found, the reporter returns to the original report and prints a message that no matches were located.

***O (Other files)***

If the task has previously created search files and the files remain on the disk, re-enter them at any time using this command. Pressing 'O' brings up a screen with the searched criteria used for the first file. Use the 'N' and 'B' keys to step between files. When the file to re-enter has been located, press 'V'. This file now becomes the current file. To return to the original, unsorted file, press 'O' again. To quit and return to the file, press 'Q'.

***% (statistics)***

This key pulls up a screen containing some channel statistics. The top half of the screen shows the amount of time that one, two, etc. channels were up at the same time. Then, the total time that no channels were up is shown. Que depths, busy, and denied call numbers are also given. These statistics are for the original, unsorted rawfile and are not recalculated for sorted files. To do this, see the section on the RAWSTAT program. Press 'P' to print this page to the current printer device.

**8.3 RAWBATCH**

Raw reports often take a long time to generate. While they are running, they tie up the terminal and no other processes may be performed. Running the reports in batch mode and re-entering them later with RAW permits the terminal to be free, and also to run multiple reports. RAWBATCH requires three files; RAWBATCH.TSK, RAWBATCH.DAT, and RBATSUB.CMD. The .TSK file is the actual task. The .DAT file contains the filenames of the files to process, and the .CMD file is the job submission command file. In addition, a copy of BTQ.CMD will help.

To run RAWBATCH, edit or create a RAWBATCH.DAT file with the following format. The first line must be the raw file to use. The second line must be the processed file to write to, and the third line must be the page file to use. There is no limit on the number of files to process. List as many files to process as is required, and they will be processed until the end of the file is reached. An example follows:

```

R0101.01          { raw file }
R010101.LST      { processed file }
R010101.PAG/SEEK { page file }
R0102.01          { raw file }
R010201.LST      { processed file }
R010201.PAG/SEEK { page file }

```

There are several things to be aware of when creating the RAWBATCH.DAT file. One, be sure to pad the lines to at least 31 spaces, and be sure that the comments start beyond the thirty first column. Thirty one characters are read by the program, leaving room for directory and device names if necessary. Secondly, be sure to include the /SEEK on the page file, as it is a random access file and will not work without it. Third, do not leave any blank lines at the beginning or end of the .DAT file, as it will cause an error to occur. Finally, be sure that the directories are either specified, or that all files are in the same directory. If any files are missing, the batch process will terminate with an error. If an error occurs, check the RBATSUB.LOG file generated by the process to find the error. RAWBATCH is generally found in the [SMEXE] directory.

When all of the files are ready, submit the batch job using @BTQ RBATSUB. This submits the job and frees the terminal. When the job finishes, a message will be sent to the terminal if still logged on. Be aware that these reports take a long time to generate, and the default run time may need to be lengthened if several reports are to be run. This process may also be executed from the \_\$ prompt by typing RUN [SMEXE]RAWBATCH. The filenames will still be taken from the RAWBATCH.DAT file.

## 9.0 CHANNEL WALKER UTILITIES

The channel walker task will inform a site to move the control channel from the current location to another location. This task may be scheduled to execute at specific intervals and for the specific site. Command files residing in the [smutil] directory will perform the necessary functions to implement the channel walker process.

To execute the channel walker process, login to RSX or exit to RSX if using a system manager terminal.

The command file [smutil]inschnwlc is used to install a copy of the channel walker task for each selected site. The inschnwlc command file requires the site number to be passed as a parameter. To install a copy of channel walker for a site, .e.g. site 2, enter the following command at the "\$" prompt and terminate with RETURN:

```
$ @[smutil]inschnwlc 2
```

The above command line will install the channel walker task for site 2.

The command file [smutil]runchnwlc is used to execute the channel walker process and define the interval of execution. The command file requires the site number, start interval, and interval of execution be passed as parameters. At the "\$" prompt enter the following command and terminate with RETURN:

```
$ @[smutil]runchnwlc 2 1T 2H
```

This command informs the channel walker task to run immediately for site 2 and repeat every 2 hours. The channel to become the next control channel will be de-allocated, followed by a selected time interval, before setting it to the control channel. The channel is allocated and set to control channel with the same site message.

The site number must be a value from 1 to 31, and should correspond with the site number entered using the inschnwk command file discussed above. The start interval is the amount of time before the channel walker task begins execution. This value is normally defined in terms of ticks (1000th of a second) and a value of 1T will execute the channel walker task immediately upon execution of the command file. The interval of execution should be defined in terms of minutes 'm' or hours 'h'. It is recommended that the interval of execution be defined so as not to degrade the performance of the site, i.e. an interval of '2m' will move the control channel every 2 minutes which may be too frequent. A value of 24h would permit the control channel to move once each day.

To halt execution of the channel walker task for a site use the [smutil]stpchnwk command file. The stpchnwk command file requires the site number to be passed as a parameter. At the "\$" prompt enter the following command and terminate with a RETURN:

```
$ @[smutil]stpchnwk 2
```

The stpchnwk command file will abort the channel walker task assigned to site 2, and remove the task.

---

**GLOSSARY**

<b><i>Boot</i></b>	A computer program designed to bring itself into a desired state by means of its own actions.
<b><i>Boot-up</i></b>	The process of bringing the operating system into operation at power-up.
<b><i>Boot tape</i></b>	A tape which is used to boot-up programs residing on the tape and bring the computer into full operation. The boot tape bypasses the disk drive which is normally the boot device.
<b><i>Cold Start</i></b>	Applying power to the computer for the first time after it was turned off.
<b><i>Console Terminal</i></b>	A terminal dedicated to the computer system console operator. Also referred to as SYS_CON (system console).
<b><i>Disk</i></b>	A storage medium consisting of a magnetic surface on which data is stored, similar to sounds recorded on tape.
<b><i>Disk Drive</i></b>	A hardware component that stores and retrieves information on a disk.
<b><i>Operating System</i></b>	The software that controls the overall operation of the computer.
<b><i>Prompt</i></b>	An on-screen indicator that informs the viewer that a program is waiting on input.
<b><i>Software</i></b>	Programs that run on computer hardware. Software consists of coded instructions for the computer to follow.
<b><i>System Prompt</i></b>	A command prompt from the operating system indicating the computer is waiting for a command. The normal command prompt is the dollar sign (\$).
<b><i>EDACS System Manager</i></b>	A software application used to interact and manage the site controller and other associated devices of an EDACS Trunking System.
<b><i>System Save</i></b>	The saving of a system image or image copy to another medium, either disk or tape.
<b><i>System Recovery</i></b>	The recovery of a system image from another medium used during system save.
<b><i>Standalone System</i></b>	A special software application which will execute without interactoin with the operating system. Replaces the operating system in memory. Normally for specific functions e.g. System save, System Recovery.
<b><i>TK50 Tape Cartridge</i></b>	A special tape cartridge used by the TK50 tape drive.



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