



Printrak, A Motorola Company

MANUFACTURING INSTALLATION PROCEDURE FOR UNIVERSAL CLONE DISK V4.4.7

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1.0 SOFTWARE CONFIGURATION.

- 1.1 Halt the computer by entering the command **shutdown -h now**
- 1.2 Once the computer is sitting at the >>> boot prompt, enter the command **set auto_action halt**
- 1.3 Power down the computer.
- 1.4 Connect the Universal UCD (UCD) to SCSI bus 0 by attaching the free end of the 2-meter SCSI cable to this bus. *This may be difficult on AlphaServer computers, since most of these do not have an available external SCSI port for bus 0. Refer to the Troubleshooting Section for ways to get around this problem.*
- 1.5 Power up the UCD.
- 1.6 Power up the computer.
- 1.7 When the >>> prompt appears, enter the command "sh dev" to verify that the UCD appears at DKA500.
- 1.8 Enter the command **b dka500** (or dkb500, etc) to boot the UCD. *Hereagain, if this is an AlphaServer, the UCD may appear as DKB500 or DKC500. If so, note the location of the UCD and boot this device. The Troubleshooting Section contains information on this special case.*
- 1.9 The system should boot up normally and the login screen should appear. *See the Troubleshooting Section if any bootup errors occur.*
- 1.10 Login as **root** with a password of **Superuser**
- 1.11 Enter the command **cd /usr/local/bin**
- 1.12 Enter the command **./Uniclone**
- 1.13 Enter the nodename when prompted **Enter nodename for this computer:** observing the convention of XXYYNN, where XX is the two-letter abbreviation of this site (such as NW for Norway), YY is the two-letter abbreviation for the type of workstation (WS for IS2000's, LV for Livescans, etc), and where NN is the number of this workstation. As an example, Norway Livescan #1 would be *nwlv01*. See the chart at the end of this procedure for dedicated abbreviations.
- 1.14 If this is a Livescan, enter the IP address of the printer at the prompt **Enter the IPAddress for the Lexmark printer:**
- 1.15 Enter the IP address of the computer when prompted **Enter the IPAddress for this computer:**

- 1.16 When the prompt ***The Subnet Mask is 255.255.255.0. Is this correct (y/n)[n]?*** confirm this by entering **y** and proceeding to step 1.18. If this is not the desired value, hit the **ENTER** key.
- 1.17 Enter the desired subnet mask when prompted ***Please enter the correct Subnet Mask:***
- 1.18 Confirm your choice when the prompt ***The Subnet Mask is 255.255.255.0. Is this correct (y/n)[n]?*** appears.
- 1.19 Select either **a** to install the full ngw software suite with the operating system, or **o** to install just the operating system when prompted:
- Install which of the following:*
- (a)pplication software (ngw, TP2000, etc) and the operating system*
(o)perating system only
- (a/o)?*
- 1.20 There will be a momentary pause while the UCD interrogates the system hardware, after which information similar to the following will be displayed:
- The following disks are available:*
- rz0 is a 2 Gbyte device*
- rz1 is a 2 Gbyte device*
- Which disk do you wish to use for the system disk?*
- 1.21 Enter the disk you want to use for the system disk using the format **rzxx** where the "xx" is the number of the device. In this example, rz0 will be selected. *Note from the list that the disk capacity is given. If the disk selected for system disk is smaller than 2 Gbytes, you will only be able to load the operating system software - no ngw (the program will alert you to this fact).*
- 1.22 When the device is selected, a message similar to ***You wish to use rz0 for the system disk, is that correct (y/n)[n]?*** will be displayed. Confirm your choice by entering **y** or reject it by hitting the **ENTER** key.
- 1.23 If you did not confirm your choice (you desire to use another disk for the system disk), repeat steps 1.21 through 1.23.
- 1.24 If only the operating system is being loaded (the answer to step 1.19 was "o"), skip to step 1.29.
- 1.25 A screen similar to the following will be displayed:

The following disks are available:

rz1 is a 2 Gbyte device

Which disk do you wish to use for the WIP disk?

- 1.26 Enter the disk you want to use for the WIP disk using the format **rzxx** where the "xx" is the number of the device. In this example, rz1 will be selected.
- 1.27 When the device is selected, a message similar to ***You wish to use rz1 for the WIP disk, is that correct (y/n)[n]?*** will be displayed. Confirm your choice by entering **y** or reject it by hitting the **ENTER** key.
- 1.28 If you did not confirm your choice (you desire to use another disk for the WIP disk), repeat steps 1.26 through 1.28.
- 1.29 The program will prompt ***Do you want a second swap space (this takes up about 96 Mbytes)(y/n)[y]?*** Determine whether a second swap space is needed (the default is "yes", so hitting the **Enter** key will select a second swap space.
- 1.30 Once all choices have been made, a summary of these choices will be displayed:

System Name is: maws01
System IP Address is: 1.100.156.166
System Subnet Mask is: 255.255.255.0
System Disk is at SCSI ID: rz0
WIP Disk is at SCSI ID: rz1
System Disk size is: 2 Gbytes
WIP Disk size is: 2 Gbytes
System Disk type is: rz28z
WIP Disk type is: rz28ss
WIP Disk has second swap space
Load operating system with application software

Is this information correct (y/n)[n]?

Note that the disk types for the system and WIP disks are displayed. The system disk type is rz28z, which is the standard Printrak 2-Gbyte system disk configuration. The WIP disk type is rz28ss, which is the standard 2-Gbyte WIP configuration with a second swap space. If your disks are different sizes or types, the designation may be different.

- 1.31 At the prompt *The disks will now be formatted. Do you want to proceed (y/n)[n]?* determine whether you want to wipe out the data on the system and/or WIP disks. If you enter **y** to proceed, go to step 1.33. Otherwise, hit the **Enter** key if you want to abort formatting the disk(s) and proceed to step 1.32.

- 1.32 The program will terminate if you hit the **Enter** key at the prompt *Do you want to exit this program (y/n)[y]*? Otherwise, the parameters will be cleared and you will return to step 1.13 to repeat the parameter entry.
- 1.33 The disks will be erased and checked one last time to make sure they were not labeled incorrectly (sometimes disks are configured with a label which makes them appear as if they are smaller than they actually are: 2-Gbyte disks are labeled as 1-Gbyte, 4-Gbyte disks are labeled as 2-Gbyte, etc). If the disks were correctly labeled, the program will proceed to step 1.35.
- 1.34 A prompt will appear which tells the user which disk has been labeled incorrectly. If the user wishes to rearrange the disk configuration based on this new information, simply hit the **Enter** key to reenter parameters. Otherwise, the program will begin file transfer. **NOTE: It is strongly recommended that the parameters be reentered, as the disk which was labeled incorrectly may remain incorrectly labeled unless parameters are changed.**
- 1.35 After about 30 minutes, the screen will clear and a set of instructions will appear on the screen indicating what final steps need to be taken.
- 1.36 Enter the command **halt** to shutdown the system.
- 1.37 At the the >>> boot prompt enter the command **set auto_action boot** if you want the computer to bootup automatically at powerup.
- 1.38 Power down the computer and the UCD.
- 1.39 Remove the UCD SCSI cable from the computer's SCSI port.
- 1.40 Power the computer back up.
- 1.41 If auto_action is set to *halt*, enter **b** at the >>> boot prompt.
- 1.42 The computer will now automatically execute the remaining configuration instructions. If only the operating system is being loaded, the computer will configure a few files, then rebuild the kernel. This takes about 10-15 minutes. If application software (ngw, ngwconfig, etc) was selected, the installation will take longer (approximately 25 minutes).

2.0 LIVESCAN CONFIGURATION.

If the system being loaded is a Livescan, the setup procedure listed below is recommended in order to complete configuration of this system for use.

- 2.1 When the login screen appears, enter the login of **root** with the password of **Superuser**
- 2.2 Enter the command **cd /usr/xtouch**
- 2.3 To begin touchscreen setup, enter the command **./setup**
- 2.4 When the setup screen appears, click on the **Hardware Calibrate** button to begin hardware setup (NOTE: If the message *Controller not responding* appears, click on the **OK** button, then on the **Exit** button and repeat steps 2.3 and 2.4 again. If the controller still fails to respond, press on the face of the touchscreen while the front door is open and verify that the green light on the controller changes in intensity when the screen is touched. If not, begin troubleshooting the touchscreen.
- 2.5 Center yourself in front of the Livescan at the same position you will be working from, then press the bullseye that appears in the lower left corner with your left finger. Repeat this in the top right corner with your right finger.
- 2.6 Click on the **Software Calibrate** button and follow the instructions.
- 2.7 When all of the calibration setup has been completed, click on the **Save** button.
- 2.8 Click on the **Exit** button to leave the calibration environment.
- 2.9 Move the pointer to the top left corner and click on the **Session** button.
- 2.10 Select **End Session** and confirm your choice.
- 2.11 Login as **ngw** with a password of **superuser** (notice the lower case “s”).
- 2.12 Wait approximately 60 seconds before touching the screen in order for the touchscreen to activate properly (If the touchscreen does not respond, try logging out and logging back in again).
- 2.13 Open an xterm window by touching the screen and selecting **xterm** from the drop-down menu.
- 2.14 Enter the command **setup_fas** to begin calibrating the FAS.
- 2.15 When the glass prism is cleaned properly, hit the **Enter** button to commence calibration.
- 2.16 Once the FAS is calibrated, enter the command **cd /usr/fp2000/bin**

- 2.17 Enter the command ***./fp2000setup*** to initialize the FP2000S.
- 2.18 If this Livescan has a mugshot camera, enter the command ***mse*** to activate the mugshot capture screen.
- 2.19 Press the ***Scan*** button to activate the camera.
- 2.20 Press the black pan and tilt buttons on the four sides of the picture to move the camera around and verify function.
- 2.21 Press the ***Control*** button in the top left corner of the screen and select ***Quit*** when testing is complete.
- 2.22 At this point, either follow the instructions for a Livescan Booking or begin running endurance tests on the system (*fp_accept_test*, *fasnfp*, *fascalibrate*, *tenprint* for the Lexmark, etc). The Manufacturing Diagnostics procedure lists how to run these.

3.0 AFIS INSTALLATION PROCEDURE.

If the system being loaded is an AFIS workstation, the setup procedure listed below is recommended in order to complete configuration of this system for use.

- 3.1 Login as **ngw** with a password of **superuser**
- 3.2 Open an Xterm window by clicking on the center of the screen with the left mouse button and selecting **xterm** from the drop-down menu.
- 3.3 If this is a VS2000 (Verification Workstation), the installation is complete.
- 3.4 If this is an LS2000 (Latent Workstation) or IS2000 (Input Workstation), enter the command **lcc** and confirm that the Latent Scanner Calibration Screen appears.
- 3.5 Follow the Latent Scanner Calibration Procedure to calibrate the scanner.
- 3.6 If this is a LS2000 (Latent Workstation), the installation is complete.
- 3.7 If this is an IS2000 (Input Workstation), calibrate the Flatbed Scanner per the procedure (Prima Graphics only).
- 3.8 Move the pointer to the icons at the top of the screen and click the left mouse button on the Tenprint Entry icon (the name of an icon is displayed in the top right corner of the screen).
- 3.9 Place a fingerprint card or other document on the flatbed scanner face down.
- 3.10 Click on **Control** at the top left-hand side of the screen and select **Card Formats** from the menu.
- 3.11 Click on the **Scan Entire Flatbed Surface** button and confirm that the image is distinct and bright enough to be readable.
- 3.12 Click on the **OK** button at the bottom of the screen to exit this window.
- 3.13 Exit the tenprint entry screen.
- 3.14 The IS2000 workstation installation is now complete.

4.0 ALPHASERVER CONFIGURATION.

If the system being reloaded is an AlphaServer 1000 or 1000A which contains MM2000 hardware matchers, the setup procedure listed below is recommended in order to complete configuration of this system for use.

- 4.1 Login as **root** with a password of **Superuser**
- 4.2 Enter the command **halt** to bring the server down.
- 4.3 At the >>> boot prompt, insert an ECU (Eisa Configuration Utility) floppy in the floppy drive.
- 4.4 Enter the command **runecu**
- 4.5 Press the **RETURN** key when prompted.
- 4.6 Select item number **5** from the menu (Save and Exit).
- 4.7 Press the **RETURN** key when the next menu comes up to save the configuration.
- 4.8 Remove the disk from the floppy drive.
- 4.9 Cycle power on the system.
- 4.10 If *auto_action* is set to *halt*, enter the command **b** at the >>> boot prompt to boot the system up.
- 4.11 AlphaServer configuration is complete. Sybase and DSR files may now be setup.

5.0 SAVING SYSTEM UNIQUES.

To configure a computer which has crashed so that it has the same descriptor screens, printer functionality, and network connectivity when a new system disk is installed, it is recommended that the following steps be implemented. If either the system or WIP disk on the crashed system is not accessible, the steps can still be followed in order to retrieve whatever is available. For the purpose of this example, the system disk is assigned the SCSI ID of "0" and the WIP disk is assigned the SCSI ID of "1". Leave the UCD attached to the system after the baseline software has been installed so that restoration of the uniques can take place once the baseline installation is complete.

- 5.1 After booting up the UCD (but before reloading the crashed system), login as **root** with a password of **Superuser**.
- 5.2 Enter the command **fsck -oy /dev/rz0a** to clean up the crashed system disk's *root* partition. If the system hangs because the disk is non-functional, open another window and enter the command **ps -ef** and locate the *fsck* process, then kill it by entering the command **kill -9 nnnn** where *nnnn* is the process number shown in the lefthand column.
- 5.3 Enter the command **mount /dev/rz0a /newroot** to mount the crashed system disk's root partition as */newroot*.
- 5.4 Cleanup the crashed system disk's */usr* partition by entering the command:
fsck -oy /dev/rz0g
- 5.5 Enter the command **mount /dev/rz0g /newusr** to mount the crashed system disk's *usr* partition as */newusr*.
- 5.6 Cleanup the crashed system's */usr2* partition by entering the command:
fsck -oy /dev/rz0g
- 5.7 Enter the command **mount /dev/rz1c /newusr2** to mount the crashed system's */usr2* partition as */newusr2*.
- 5.8 Enter the command **cd /usr2** to move to a partition with some room in it.
- 5.9 Create a directory for holding these 'uniques' by entering the command
mkdir uniques
- 5.10 Move to this directory by entering **cd uniques**
- 5.11 Enter the command **tar cvfb uniques.tar 20 /newroot/etc /newusr2/ngw/data** to create a tar file which contains all of the system uniques. (Note: If there are a large number of saved bookings in the */newusr2/ngw/data* directory, the file may be too large to fit in this partition. If that is the case, some of these saved bookings may

have to be deleted. Another option would be to backup the contents of /newusr2 onto tape, to be reloaded after the system is restored to functionality).

- 5.12 Once these files have been retrieved, unmount the /*newroot* directory by entering the command **umount /newroot**
- 5.13 Unmount the /*newusr* directory by entering the command **umount /newusr**
- 5.14 Unmount the /*newusr2* directory by entering the command **umount /newusr2**
- 5.15 The system uniques are now saved. Proceed with the baseline installation as specified in Sections 1 through 4. Refer to Section 6 to reinstall the uniques.

6.0 REINSTALLING SAVED UNIQUES.

To reinstall the uniques saved in Section 5, follow the steps outlined in this section. For the purposes of this example, it will be assumed that the UCD is at SCSI ID "5". This section presupposes that the UCD is still attached to the system to allow for transfer of the uniques to the system and that the system has been booted from its system disk.

- 6.1 Login to the computer as **root** with a password of **Superuser**
- 6.2 Enter the command **cd /usr2** to move to the /usr2 directory.
- 6.3 Enter the command **fsck -oy /dev/rz5h** to clean up the /usr2 partition on the UCD.
- 6.4 Enter the command **mount /dev/rz5h /mnt** to mount the UCD's /usr2 partition.
- 6.5 Enter the command **mv /mnt/uniques/uniques.tar .** to retrieve the uniques file from the UCD.
- 6.6 Enter the command **umount /mnt** to unmount the UCD.
- 6.7 Enter the command **tar xvf uniques.tar** to install the files.
- 6.8 Enter the command **reboot** to reboot the system and allow the files to take effect.
- 6.9 File restoration is now complete.

7.0 CUSTOMIZATION OF THE UNIVERSAL CLONE.

Provision on the 4-GByte UCD has been provided for a complete workstation backup. Partitions d, e, and f can be used to store root, usr, and usr2 in their entirety. This can be used for two purposes: To provide a place to store the various files and directories for a workstation (such as /usr/ngw/data files); and to allow the user to transfer the contents of a computer intact to another computer. The UCD can be customized to load specific tar files for different sites. The custom tar files must be prepared for installation as follows (for these examples, the UCD is assumed to be at rz5, the workstation's system disk is at rz0, and its WIP is setup with /usr2 on rz1a):

7.1 Enter the command **cd /usr2**

7.2 To permanently remove the generic tar files, enter the command **rm TarFiles.tar**

7.3 Load the custom tar files into the current directory (/usr2) by using ftp or by loading them off of a tape drive.

7.4 Once the tar files are loaded, they must be tar'd into a large tar file called TarFiles.tar. This can be done using the following command:

```
tar cvfb TarFiles.tar 20 /usr2/*.tar.Z
```

7.5 The new tar file must remain in the /usr2 directory so that the UCD can access this file during loads. The software knows how to install **NGW**, **NGWCONFIG**, **TP**, **TPSVC**, **MRP**, and **FP2000** at this time. Files other than these types will have to be installed manually.

7.6 It is recommended that the *profiles* directory be removed from */usr/local/etc* if new tar files are being used. This directory customizes the Kentucky ngw suite which is used as the generic tar file collection.

7.7 The salient shell scripts which run Unicloner are located in the */usr/local/bin* and */usr/local/etc* directories. If it is decided to alter these, it is recommended that backups be made prior to editing the files.

7.8 The current version of the UCD uses the ngwconfig site pick of *generic*. If the user wishes to install this system as a different site, it is recommended that they login as **root** with a password of **Superuser** after the installation has completed, then run the ngwconfig script by entering the command **/usr/ngwconfig/bin/configure**. The correct sitename can be selected from the displayed list. As soon as the operation is completed, the user logs out of root and logs in as **ngw** with a password of **superuser**.

7.9 To prepare to save a workstation's contents in the d, e, and f partitions, the user must first clean these partitions up by entering the command **fsck -oy /dev/rz5d** (and repeat this command for rz5e and rz5f).

- 7.10 Enter the command **mount /dev/rz5d /ngwroot** to mount the UCD's /ngwroot partition.
- 7.11 Enter the command **mount /dev/rz5e /ngwusr** to mount the UCD's /ngwusr partition.
- 7.12 Enter the command **mount /dev/rz5f /ngwusr2** to mount the UCD's /ngwusr2 partition.
- 7.13 Enter the command **mount /dev/rz0a /newroot** to mount the workstation's root partition.
- 7.14 Enter the command **mount /dev/rz0g /newusr** to mount the workstation's /usr partition.
- 7.15 Enter the command **mount /dev/rz1a /newusr2** to mount the workstation's /usr2 partition.
- 7.16 Enter the command **vdump -0vf - -D /newroot | (cd /ngwroot; vrestore -xvf -)** to transfer the contents of the workstation's root partition onto the UCD. The files being transferred will scroll past on the screen. This usually takes less than five minutes.
- 7.17 Enter the command **df** and compare the size of /newusr2 with the available space in /ngwusr2. If /newusr2 is larger than the available space in /ngwusr2, some files will need to be deleted from /newusr2 prior to the data transfer to make room. Until such time as the contents of /newusr2 are smaller than /ngwusr2, a transfer is not advised. A sample is shown below:

Filesystem	512-blocks	Used	Avail	Capacity	Mounted on
/dev/rz5a	193694	85544	88780	49%	/
/proc	0	0	0	100%	/proc
/dev/rz5g	3014012	1118412	1594198	41%	/usr
/dev/rz5h	968606	260770	610974	8%	/usr2
/dev/rz5d	193694	2	193692	0%	/ngwroot
/dev/rz5e	3014012	2	3014010	0%	/ngwusr
/dev/rz5f	3014012	2	3014010	0%	/ngwusr2
/dev/rz0a	193694	89254	85070	51%	/newroot
/dev/rz0g	3014012	1508774	1203836	56%	/newusr
/dev/rz1a	2100000	1000000	1100000	47%	/newusr2

- 7.18 Enter **vdump -0vf - -D /newusr2 | (cd /ngwusr2; vrestore -xvf -)** to transfer the contents of the workstation's /usr partition onto the UCD. The files being transferred will scroll past on the screen. This can take some time depending on how many saved bookings and other data is stored on the WIP.

7.19 Enter **vdump -0vf - -D /newusr | (cd /ngwusr; vrestore -xvf -)** to transfer the contents of the workstation's /usr partition onto the UCD. The files being transferred will scroll past on the screen. This will take at least 20 minutes to complete.

7.20 Enter the command **df** and confirm that a screen similar to the following appears:

Filesystem	512-blocks	Used	Avail	Capacity	Mounted on
/dev/rz5a	193694	85544	88780	49%	/
/proc	0	0	0	100%	/proc
/dev/rz5g	3014012	1118412	1594198	41%	/usr
/dev/rz5h	968606	260770	610974	8%	/usr2
/dev/rz5d	193694	89254	85070	51%	/ngwroot
/dev/rz5e	3014012	1508774	1203836	56%	/ngwusr
/dev/rz5f	3014012	1000000	2014012	56%	/ngwusr2
/dev/rz0a	193694	89254	85070	51%	/newroot
/dev/rz0g	3014012	1508774	1203836	56%	/newusr
/dev/rz1a	2100000	1000000	1100000	47%	/newusr2

7.21 The UCD now contains the files and directories necessary for doing file repair, as outlined in the File Repair Section which follows.

8.0 FILE REPAIR.

In some cases, a complete reload of a system is not necessary. If only a few files are missing, it may be possible to reconstruct the system disk and still retain the system uniques (nodename, hosts file, etc). The base operating system software in the root and /usr directories is similar to that on the UCD, so many of the files and directories can be transferred. If a system disk is deemed too badly damaged to repair, the UCD can also act as a repository of saved bookings and other files. These files could be transferred to the new system disk once basic ngw installation is complete. The steps below outline how to mount the directories in order to facilitate this process.

8.1 Execute steps 1.1 through 1.10 in Section 1.0.

8.2 To clean the system disk's root partition, enter the command:

fsck -oy /dev/rzxxa

where the "xx" is the SCSI ID of the damaged system disk.

8.3 Mount the damaged system disk's root partition by entering:

mount -u /dev/rzxxa /newroot

where the "xx" is the SCSI ID of the damaged system disk.

8.4 To clean the system disk's /usr partition, enter the command:

fsck -oy /dev/rzxxg

where the "xx" is the SCSI ID of the damaged system disk.

8.5 Mount the damaged system disk's root partition by entering:

mount /dev/rzxxg /newusr

where the "xx" is the SCSI ID of the damaged system disk.

8.6 Confirm that the files are mounted by entering the command **df** and verifying that the system displays a message similar to the following:

Filesystem	512-blocks	Used	Avail	Capacity	Mounted on
/dev/rz5a	193694	85544	88780	49%	/
/proc	0	0	0	100%	/proc
/dev/rz5g	3014012	1118412	1594198	41%	/usr
/dev/rz5h	968606	260770	610974	8%	/usr2
/dev/rz2a	193694	89254	85070	51%	/newroot
/dev/rz2g	3014012	1508774	1203836	56%	/newusr

- 8.7 A useful first step in determining which files are missing from the damaged system disk is using the **diff** command to list the differences between these directories. As an example, if files had been inadvertently deleted from the /usr/bin directory, a comparison could be made by entering the command **diff /usr/bin /newusr/bin** and noting any files listed with < symbol in front of the name. Any files listed this way are present in the /usr directory on the UCD, but not on the /usr directory on the damaged system disk (/newusr). Any files with a > symbol in front are present on the damaged system disk (/newusr) and not the UCD. These files may have been installed with the application software (ngw, Tp2000, etc) and will not be present on the UCD. If application software files have been deleted (such as /usr/ngw/data/config), it can not be retrieved from the UCD.
- 8.8 Once the list of missing files has been completed, the pertinent files can be transferred by using the **cp** command. For instance, if the /etc/fstab file has been deleted from the damaged system disk, enter the command:

```
cp /etc/fstab /newroot/etc
```

This will transfer the fstab file from the UCD to the damaged system disk. This process can be repeated for any number of files. If an entire directory was deleted, the **cp -r** command can be used. As an example, if the /etc directory was accidentally deleted, the command below would copy this over to the damaged disk:

```
cp -r /etc /newroot
```

NOTE: When something as system-specific as the /etc directory or the files /etc/hosts, /etc/routes, or /etc/rc.config are copied from the UCD to a system disk, the repaired system will probably have to have **netsetup** run when it is boot up after the repairs are complete. The /etc/routes file will also have to be changed to reflect the workstation's nodename and router connections. The hosts file can probably be retrieved from another similar workstation and the /etc/routes file can be copied from a similar workstation, then modified.

9.0 TROUBLESHOOTING.

NOTE: To determine the correct SCSI ID for the UCD, use the following formula:

$$rz\ number = SCSI\ Bus \times 8 + SCSI\ ID\ of\ device$$

*The SCSI bus can be determined from using the **sho dev** command at the >>> boot prompt.*

The SCSI bus translation is as follows:

DKA is SCSI bus 0

DKB is SCSI bus 1

DKC is SCSI bus 2

DKD is SCSI bus 3

The SCSI ID of the device is taken from the first number in the three-number designation.

A disk with the designation "DKA500" has a SCSI ID of "5".

A disk with the designation "DKC400" has a SCSI ID of "4".

A disk with the designation of "DKB100" has a SCSI ID of "1".

For a disk with the designation DKC500, the rz number would be:

$$rz\ number = bus\ 2 \times 8 + 5 = 16 + 5 = rz21$$

For a disk with the designation DKD500, the rz number would be:

$$rz\ number = bus\ 3 \times 8 + 5 = 24 + 5 = rz29$$

Example #1

Symptom: Universal Clone boots up to single-user mode with the error messages:

Can't open /dev/rrz5a: No such device or address

Can't open /dev/rrz5g: No such device or address

Can't open /dev/rrz5h: No such device or address

Cause: Universal Clone is on SCSI bus 1, making it rz13 instead of rz5. It appears as dkb500 when a **sho dev** is entered at the >>> boot prompt.

Solution: Enter the following series of commands:

a) **fsck -oy /dev/rz13a**

b) **mount -u /dev/rz13a /**

c) **df**

Filesystem	512-blocks	Used	Avail	Capacity	Mounted on
/dev/rz13a	193694	88752	85872	51%	/

d) **cd /etc**

- e) **cp fstab.bus1 fstab**
- f) **init 3**

NOTE: There are fstab files for bus0, bus1, and bus2. Depending on which bus the UCD is on, substitute the correct file: fstab.bus0 for SCSI bus0 (dka500), fstab.bus1 for SCSI bus1 (dkb500), and fstab.bus2 for SCSI bus2 (dkc500).

Example #2

Symptom: Universal Clone boots up to single-user mode with the error messages:
Can't open /dev/rz5a: No such device or address
Can't open /dev/rz5g: No such device or address
Can't open /dev/rz5h: No such device or address

Cause: UCD is on SCSI bus 2, making it rz21 instead of rz5. It appears as dkc500 when a **sho dev** is entered at the >>> boot prompt.

Solution: Enter the following series of commands:

- a) **fsck -oy /dev/rz21a**
- b) **mount -u /dev/rz21a /**
- c) **fsck -oy /dev/rz21g**
- d) **mount /dev/rz21g /usr**
- e) **df**

Filesystem	512-blocks	Used	Avail	Capacity	Mounted on
/dev/rz21a	193694	88752	85872	51%	/
/dev/rz21g	3014012	1570698	1141912	58%	/usr

- f) **cd /etc**
- g) **cp fstab.bus2 fstab**
- h) **init 3**

NOTE: There are fstab files for bus0, bus1, and bus2. Depending on which bus the UCD is on, substitute the correct file: fstab.bus0 for SCSI bus0 (dka500), fstab.bus1 for SCSI bus1 (dkb500), and fstab.bus2 for SCSI bus2 (dkc500).

Example #3

Symptom: Error message ***Latent Scanner not responding*** appears when command **lcc** entered or latent entry screen activated.

Cause: The /usr/ngw/data/config file is configured improperly.

Solution: Enter the following series of commands:

- a) **cd /usr/ngw/data**
- b) **vi config**
- c) **/FrameGrabberDev**
- d) Replace the entry **/dev/rrz9c** with **DecMme**
- e) **ZZ**

Example #4

Symptom: Error message ***Tenprint Scanner not responding*** appears after entering command **ccd** or tenprint entry is attempted.

Cause: The /usr/ngw/data/config file is configured improperly.

Solution: Enter the following series of commands:

- a) **cd /usr/ngw/data**
- b) **vi config**
- c) **/ScannerBus**
- d) Verify that the tenprint scanner is on the same SCSI bus as identified here. Make any corrections as required.
- e) **/ScannerID**
- f) Verify that the tenprint scanner is at the same SCSI ID as identified here. Make any corrections as required.
- g) **ZZ**

Example #5

Symptom: Sony mugshot camera pan-and-tilt does not work on Livescan touchscreen or Mugshot Capture Station.

Cause: The /usr/ngw/data/config file is configured improperly.

Solution: Enter the following series of commands:

- a) **cd /usr/ngw/data**
- b) **vi config**
- c) **/mseCameraType**
- d) Confirm that this entry exists. If so, verify that it is followed by **EVI/D30** (the entire line would appear as shown below).

mseCameraType *EVI/D30*

- e) Once the entry is correct, save and exit with the command **ZZ**

Example #6

Symptom: When the size of each disk is displayed, one or more appears to be smaller than it actually is (a device identified at the >>> boot prompt as a 2.1 Gbyte disk is identified by the UCD as a 1 Gbyte disk).

Cause: Disk was diskabeled improperly for a smaller capacity.

Solution: Delete (zero) the disklabel as follows:

- a) If logged in as ngw, enter the command **su** with a password of **Superuser** to become superuser.
- b) Enter the command **disklabel -z rzxx** where the "xx" is the SCSI ID of the device (NOTE: Make absolutely certain this is the correct disk! This command can wipe out any disk which is not currently mounted).
- c) The disklabel has now been removed and the disk can be configured.

Example #7

Symptom: Unable to determine what the UCD's SCSI ID is.

Cause: One or more disks already in the system have a SCSI ID of "5".

Solution: Execute the following steps:

- a) Bring the computer down to the >>> boot prompt by entering the command **halt**
- b) Enter the command **set auto_action halt** at the >>> boot prompt.
- c) Power down the computer.
- d) Disconnect the UCD's SCSI cable from the computer.
- e) Power up the computer and associated peripherals.
- f) Enter the command **sho dev** and record the devices with a "5" in the designation (such as DKA500, DKB500, etc).

- g) Power down the computer.
- h) Connect the UCD's SCSI cable to the computer.
- i) Power up the UCD.
- j) Power up the computer and associated peripherals.
- k) Enter the command **sho dev** and identify the UCD.
- l) Boot up the UCD per step 1.8, substituting the correct value of the UCD for *DKA500*.

AVAILABLE DIAGNOSTICS.

To aid in troubleshooting a system with questionable hardware, the following diagnostics have been provided. Tests included will verify the functionality of the entire system (Section 10.0 VET), an internal framegrabber (Section 11.0 alphavcr), and the CPU's processor and system disk (Section 12.0 Endurance Test). All of them can be run without any additional hardware or software, requiring only that the system be booted up from the UCD and that the user is logged in as "root".

10.0 VERIFIER EXERCISER TOOL (VET).

"VET" is the "Verifier and Exerciser Tool" provided by DEC with their Digital Unix Version 3.2G operating system software. It tests everything in (and attached to) the computer and retains a permanent error log for reference.

10.1 Enter the command **vetsetup** and observe the screen shown below:

```
*****
*
*          Verifier and Exerciser Tools - Installation Support          *
*
*****
```

10.2 Enter **y** at the prompt *Would you like to install the DEC VET database? Enter "y" or "n" [n]:* The following screen will appear:

```
*****
*
*          Verifier and Exerciser Tools - Distributed Support          *
*
*****
```

10.3 Hit the **Enter** key at the prompt *Would you like the set up for distributed DEC VET support performed? Enter "y" or "n" [n]:*

10.4 Enter the command **vet** and observe a dialog box appearing which says *Running system sizer on node.....please wait*. Note: If vet does not initiate it may not be installed. Follow the installation instructions at the end of this procedure to enable vet.

10.5 Click on the **OK** button when the dialog box *Sizer was unable to get information for all devices* appears.

10.6 Click on the icon which has the nodename next to it. This is located at the top of the *Device Work Area* box located directly below the title **NODE/DEVICE**.

- 10.7 Click on the **Select Devices** button at the bottom of the *Device Work Area* box. All of the devices shown in the *Device Work Area* box should now appear in the *Process Work Area* box in the lower half of the window.
- 10.8 Click on the word **Printer** in the *Process Work Area* box so that it is highlighted (you may have to use the arrows on the right-hand side of the window to scroll down the list).
- 10.9 Move the cursor to the top of the window and click on the word **Set Up** to activate this drop-down menu.
- 10.10 Click on the word **Deselect** to delete the printer from the list. The highlighted entry should disappear.
- 10.11 Click on the **Start All** button at the bottom of the screen to begin the diagnostics.
- 10.12 Click on the **OK** button when the *DEC Vet: Error Log Filename* dialog box appears.
- 10.13 Vet will begin executing by creating two windows: *Vet_run* which displays Vet's progress; and *DEC Vet* which displays multi-colored test patterns. The xterm window will also fill up with alphanumeric characters simulating the output to a VT monitor.
- 10.14 When the *DEC Vet* test patterns begin appearing, a dialog box at the bottom of the screen displays which test is running, along with two buttons for controlling this screen: The **Suspend** button will cause the test to loop continually at this location (it will break out of the loop when the **Continue** button is clicked) and the **Fail** button will cause the computer to fail this part of the video test. The video display can be expanded to full screen by clicking on the top right corner of the *DEC Vet* window.
- 10.15 When the video tests are done, the *Vet_run* window will reappear and will display each test as it is run.
- 10.16 When all of the tests are complete a summary of failures will be available. In earlier versions of OSF/1 Version 10.2, a list of errors remains on the screen after the tests have completed (in later versions, this list disappears after the tests complete). The list can be scrolled through while the tests are still running by using the mouse. If this screen disappears before examination is complete, the errors can be viewed again by examining the *//vet_error.log* in the *//* directory. A sample list appears on the next page:

- a) This is a typical disk partition error. It is generated because Printrak disk partitions do not conform to standard DEC disk partition maps. The error simply says that the computer does not recognize this partition map. This error does not fail the unit.

```
*** SETUP ERROR 1 from process 1, group exer for device /dev/rz0g***  
File vet_exer_disk, test 0, subtest 0 - Fri Aug 2 11:07:07 1996  
Disk size is unknown  
***End of error report from process 1***
```

- b) This error shows up once or twice during a diagnostic session. It simply means that the disk was busy when the diagnostic tried to query it. This error does not fail the unit.

```
*** SETUP ERROR 1 from process 1, group exer for device /dev/rz0g***  
File vet_exer_disk, test 0, subtest 0 - Fri Aug 2 11:07:07 1996  
Failure status returned from OPEN  
Status returned: error code=16 (device busy)  
***End of error report from process 1***
```

- c) The error shown below is a fatal error if the computer is connected to the network. If there is no network connection, this error can be ignored.

```
*** SETUP ERROR 1 from process 1, group exer for device /dev/rz0g***  
File vet_exer_disk, test 0, subtest 0 - Fri Aug 2 11:07:07 1996  
Node: aklv09 - Error connecting to target.  
Status returned: error code =60 (connection timed out).  
***End of error report from process 1***
```

- d) This error will appear after the operator has failed a video test by clicking on the **Fail** button during the video display test. This particular failure was from the Gray level test. Any error which says *HARD ERROR* is considered fatal.

```
*** HARD ERROR 14 from process 5, group exer for device video***  
File vet_exer_video, test 10, subtest 1 - Fri Aug 2 11:07:07 1996  
User declared: Video Gray Level Test failed  
***End of error report from process 14***
```

10.17 Once the problem reports have been examined, click on the top left corner of the Vet window to close it or click on the **File** menu pick and select **Exit** to shut the window. Additional information can be found in a file created by vet called *vet_err.log*. This file is present in the current directory and can be read like any other ASCII text file (with the commands *more*, *cat*, *vi*, *emacs*, or *xedit*).

10.18 It is recommended that the *vet_err.log* file be removed after troubleshooting has concluded. This can be done by entering the command **rm vet_err.log**

11.0 ENDURANCE TEST.

The Endurance Test hammers the processor chip inside the CPU repeatedly. A very large file is created and copied from one file to another, then read and verified. This diagnostic will stress the CPU and the system disk, can be run continuously (no time limit) and will note whenever an error occurs.

- 11.1 Login as **root** and **Superuser**
- 11.2 Enter the command **cd /usr/tools/test**
- 11.3 Enter the command **./burn.prep.su**
- 11.4 Enter the command **./burn.root**
- 11.5 To halt the test at any time enter the command **CTRL-C**
- 11.6 If the Error_count ever exceeds '0', one (or more) errors has occurred with this system. The Error_count log itself can be examined to view these errors by entering the command **more Errors_logged** *DO NOT RUN THE ENDURANCE TEST AGAIN UNTIL THE ERROR LOGS HAVE BEEN EXAMINED - DOING THIS WILL ERASE THE ERROR LOGS FROM THE PREVIOUS RUN.*
- 11.7 Enter the command **./burn.prep.su** to clear out the buffers when testing done.

12.0 FRAME-GRABBER DIAGNOSTICS.

The purpose of this diagnostic is to test the mugshot camera and its attendant peripherals (the pan, tilt, and zoom controls cannot be tested with this diagnostic - a Mugshot window would have to be opened to test these features).

- 12.1 If no camera is currently connected to the Frame-Grabber, connect one to Port #1 on the Frame-Grabber board.
- 12.2 Login as **root** and **Superuser**
- 12.3 Enter the command **/usr/bin/mme/alphavcr**
- 12.4 When the new windows come up click on **Options** (if the colors are distorted, click on the black *alphavcr* window to return them to normal).
- 12.5 Select **Display**
- 12.6 Select **Triple Size** or **Full Screen** depending on how large a display is desired.
- 12.7 Click on **File**
- 12.8 Select **Live Video**
- 12.9 Verify that the video is relatively clear and that the colors are correct. If a white screen with a herring-bone pattern appears, verify that the camera is powered up and connected to the correct port (the default for alphavcr is Port 1, but this can be changed from the Options window).
- 12.10 When the test is complete, click on **File** and select **Exit**

13.0 UNIVERSAL CLONE DISK RESTORATION.

If the UCD crashes, a new 4-Gbyte disk can be configured to replace it. A 4-mm tape with the contents of the UCD has been shipped with each UCD. This can be used to reload a new 4-Gbyte disk. The disklabel table below is provided for a reference when preparing the new disk. For the example here, rz5 will be used for the UCD and rz6 will be used for the tape drive. The "rz" value on your system may vary based on which bus the UCD and tape drive are attached to.

- 13.1 Install the new disk in the UCD tabletop enclosure.
- 13.2 Locate an available DEC computer and halt it.
- 13.3 At the >>> boot prompt, enter the command **set auto_action halt** to prevent the computer from automatically booting up.
- 13.4 Enter the command **sh dev** and note which SCSI IDs are not in use on the bus to which the tape drive will be attached.
- 13.5 Power down the computer.
- 13.6 Connect the UCD to the computer with the SCSI cable.
- 13.7 If the computer does not have a 4-mm tape drive associated with it, a portable unit must be attached to the same computer as the UCD. Make sure the tape drive is set to a unique SCSI ID so that it does not conflict with any other devices on the same bus (the ID which was noted in step 13.4).
- 13.8 Power up the UCD, then the tape drive (if connected outside the computer), then power up the computer last.
- 13.9 At the >>> boot prompt, enter the command **sh dev** and verify that the UCD and the tape drive show up. The tape drive will be an *MK...* device, where the letter after the "MK" represents the bus which the tape drive is one. As an example, a tape drive on SCSI bus "0" with an ID of "5" would show up as *MKA500*. One at SCSI bus "1" with an ID of "6" would be *MKB600* (see the Troubleshooting Section for additional information on reading SCSI IDs). The typical tape drives will be designated as tlz06 or tlz09 4-mm tape drives when the *sh dev* command is used.
- 13.10 Boot the computer up by entering the **b** command at the >>> boot prompt.
- 13.11 Login as **root** with a password of **Superuser**
- 13.12 Enter the command **disklabel -rw rz5 rzxx** to label the new UCD disk with a generic label.

- 13.13 Enter the command **disklabel -e rz5** to begin editing the disklabel. Note the value of the "c" partition and compare this to the two example disklabels listed below. These two disklabels are the most common types seen to date. If your disklabel is larger than either of these, simply use the largest disklabel partition map.

	size	offset	directory
a:	200000	0	/
b:	800000	200000	swap
c:	8496960	0	
d:	200000	4110480	/ngwroot
e:	2093240	4310480	/ngwusr
f:	2093240	6403720	/ngwusr2
g:	2110480	1000000	/usr
h:	1000000	3110480	/usr2

	size	offset	directory
a:	200000	0	/
b:	800000	200000	swap
c:	8888924	0	
d:	200000	4110480	/ngwroot
e:	2289222	4310480	/ngwusr
f:	2289222	6599702	/ngwusr2
g:	2110480	1000000	/usr
h:	1000000	3110480	/usr2

- 13.14 Once the label is correct, enter the command **ZZ** (capital "zz") to save and exit.

- 13.15 Hit the **Enter** key when the message *Do you want to write the new label [y]?* appears.

- 13.16 Enter the command **newfs /dev/rz5a** to format the root partition.

- 13.17 Enter the command **newfs /dev/rz5d** to format the /ngwroot partition.

- 13.18 Enter the command **newfs /dev/rz5e** to format the /ngwusr partition.

- 13.19 Enter the command **newfs /dev/rz5f** to format the /ngwusr2 partition.

- 13.20 Enter the command **newfs /dev/rz5g** to format the /usr partition.

- 13.21 Enter the command **newfs /dev/rz5h** to format the /usr2 partition.

- 13.22 Enter the command **cd /dev** to switch to the /dev directory.

- 13.23 Enter the command **disklabel -r rz5** and verify that a table similar to the one on the next page appears:

#	size	offset	fstype	[fsize	bsize	cpg]	
a:	200000	0	4.2 BSD	1024	8192	16	# (Cyl. 0 -164*)
b:	800000	200000	unused	1024	8192		# (Cyl. 164* -492*)
c:	8888924	0	unused	1024	8192		# (Cyl. 0 -2569)
d:	200000	4110480	4.2 BSD	1024	8192		# (Cyl. 492* -1185*)
e:	2289222	4310480	4.2 BSD	1024	8192		# (Cyl. 1185* -1877*)
f:	2289222	6599702	4.2 BSD	1024	8192		# (Cyl. 1877* -2569*)
g:	2110480	1000000	4.2 BSD	1024	8192		# (Cyl. 492* -1519*)
h:	1000000	3110480	4.2 BSD	1024	8192		# (Cyl. 1519* -2569*)

13.24 Enter the command **rm *rmt0*** to remove the old tape drivers.

13.25 Enter the command **./MAKEDEV tz6** to create new tape drivers.

13.26 Enter the command **mount /dev/rz5a /mnt** to mount the root partition.

13.27 Insert the backup tape in the tape drive and confirm that the activity LED on the tape drive flashes methodically on and off. Once it stops flashing, proceed to the next step.

13.28 Enter the command **vrestore -xvf /dev/nrmt0h -D /mnt** to restore the root partition. The activity LED should flash intermittently as the data is downloaded. The list of files being loaded should also scroll past on the screen. Wait until the prompt reappears on the screen before proceeding.

13.29 Enter the command **umount /mnt** to unmount the root partition.

13.30 Enter the command **mount /dev/rz5g /mnt** to mount the /usr partition.

13.31 Enter the command **vrestore -xvf /dev/nrmt0h -D /mnt** to restore the /usr partition. The activity LED should flash intermittently as the data is downloaded. The list of files being loaded should also scroll past on the screen. Wait until the prompt reappears on the screen before proceeding.

13.32 Enter the command **umount /mnt** to unmount the root partition.

13.33 Enter the command **mount /dev/rz5h /mnt** to mount the /usr2 partition.

13.34 Enter the command **vrestore -xvf /dev/nrmt0h -D /mnt** to restore the /usr2 partition. The activity LED should flash intermittently as the data is downloaded. The list of files being loaded should also scroll past on the screen. Wait until the prompt reappears on the screen before proceeding.

13.35 The reload should now be complete. If this workstation has ngw loaded on it which could be used in the d, e, and f partitions of the UCD, they can be loaded

14.0 LIST OF APPROVED WORKSTATION ABBREVIATIONS.

ad	Active Document Server
am	Adaptive Matcher
cs	Certification Station
cv	Civil Verification Station
dg	DSR/MSS
dm	DSR/MMC
ds	DSR2000 Data Storage and Retrieval Workstation
em	Expert Matcher
es	Enrollment Station
id	IDS2000 Identity Station
ls	LS2000 Latent Workstation
lv	LSS2000 Livescan Workstation
mc	MMC2000 Minutiae Matcher Controller
md	MDS2000 Mugshot Display Station
mg	MCS2000 Mugshot Capture Station
mp	MMP2000 Minutiae Matcher Processor
ms	MSS2000 Mugshot Server
na	NIST Archive
ns	NIST Server
qs	Queue Server
rg	SRG Report Generator
sr	Storage Retrieval Server (CHS)
tp	Transaction Processor
vs	VS2000 Verification Workstation
wf	Workflow File Server (CHS)
ws	IS2000 Input Workstation

15.0 LIST OF ASSIGNED SITE ABBREVIATIONS.

gu	Guam
nc	North Carolina
sc	Shelby County
kx	Knoxville
bu	Bullhead
ne	Nebraska
nm	New Mexico
al	Albuquerque
ss	Secret Service
pr	Puerto Rico
fc	File Conversion
sw	Switzerland
pc	Pinellas County
la	Louisiana Test Suite
gr	Greece
ca	Cambridge
na	Namibia
ir	Garda (Ireland)
fl	FDLE
nv	Novaris
ks	Kansas
wm	West Midlands
cz	Czech Republic
ma	Macau
nl	Netherlands
ok	Oklahoma
tb	Tennessee Bureau of Investigation (TBI)
br	Louisiana (Baton Rouge)
je	Louisiana (Jefferson County)
in	Immigration Naturalization Service (INS)