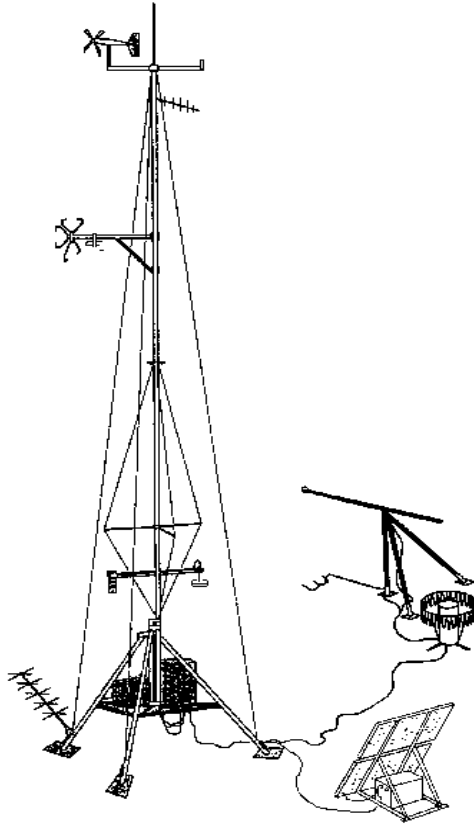


PAM-III: SHEBA

Base System Administration



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SHEBA PAM Base System Administration

1.0 Shebop

Sparc IPX, running Solaris 2.5.1.

SunOS shebop 5.5.1 Generic_103640-08 sun4c sparc SUNW,Sun_4_50

1.1 Memory

RAM: 32 Mbyte

SWAP:

32 Mbyte on /dev/dsk/c0t3d0s1

128 Mbyte on /scr/SWAP

1.2 Disks

1 Gbyte internal disk, SCSI target 3

<FALCON 1.0GB-ST11200N cyl 1874 alt 2 hd 15 sec 73>

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s0	159695	83382	60353	59%	/
/dev/dsk/c0t3d0s6	238163	178378	35975	84%	/usr
/dev/dsk/c0t3d0s7	535062	415174	66388	87%	/home

4 Gbyte external disk, SCSI target 0

<SEAGATE-ST34371N-0484 cyl 5147 alt 2 hd 10 sec 165>

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t0d0s3	962856	177202	737514	20%	/data
/dev/dsk/c0t0d0s4	3027532	308347	2628360	11%	/scr

1.3 SCSI addresses:

0 external hard disk

3 internal hard disk

4 exabyte 8505 XL

6 CD

1.4 Passwords

root (superuser): BearBait

sysadm: bearbait

pam: bearbait

1.5 Cabling

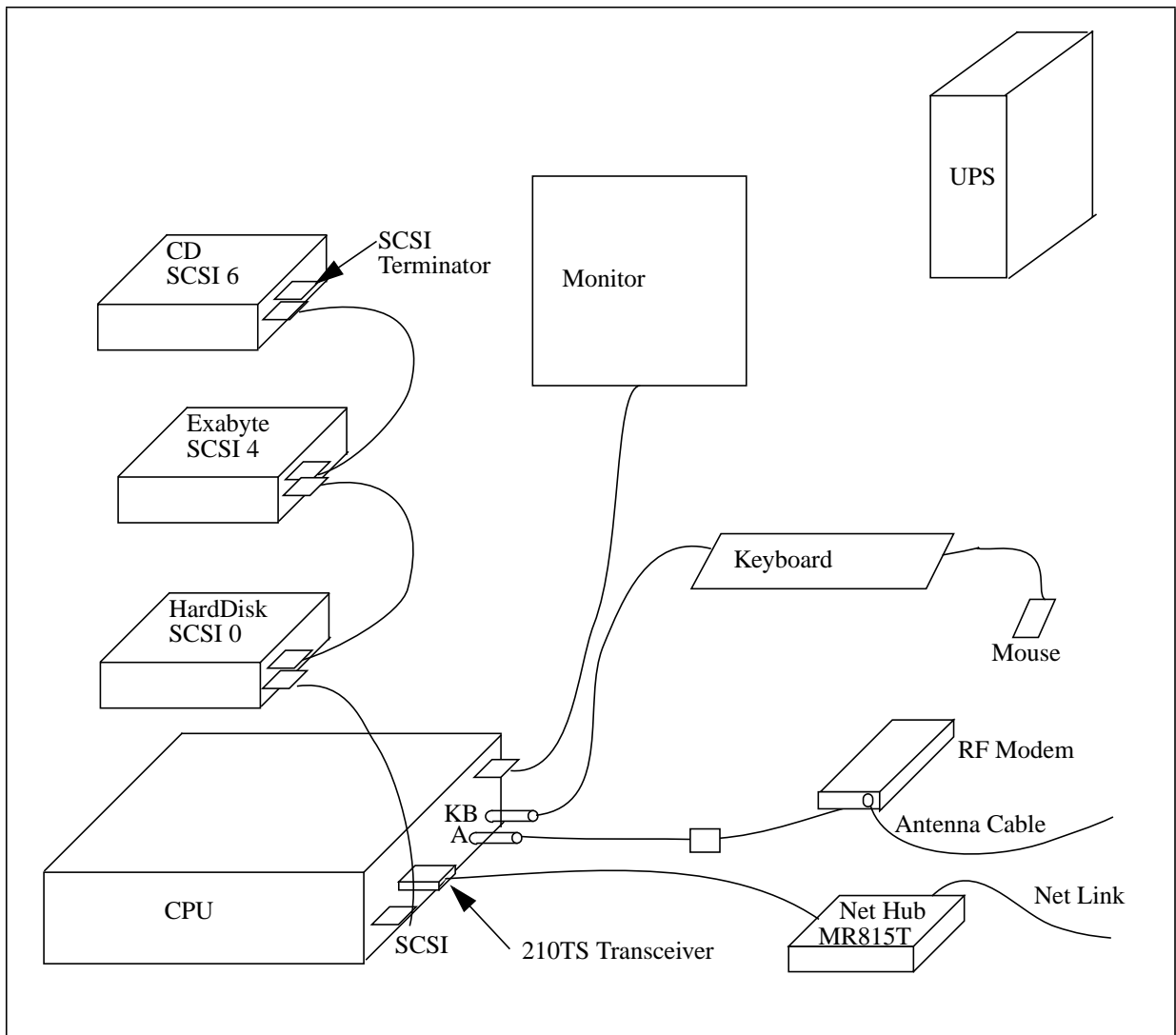


FIGURE 1. System Cabling

1.6 Rebooting

This system periodically will not reboot successfully after a power up. Give it a few minutes, if the keyboard lights do not blink and nothing appears on the screen, then power it down. Then just after power up, hold down the L1 (stop) key and press "A". Try another power cycle if needed.

On bootup, wait until the fancy desktop login window appears. Do not try to login to the simple console prompt that appears just prior to the desktop login window.

1.7 How to shutdown the system

If a window session is running, shut it down by clicking the EXIT box in the bottom task bar. When the login window appears, press on "Options", drag to "Command Line Login" and release. After the "Suspending Desktop Login" message appears, log into the root account, and enter:

```
init <state>
    <state>: 0=halt, S=go to single user mode, 6=reboot
```

Shut down to state 0 if you want to cut power, to state S if you want to do administration without anyone else logged on, and to state 6 if you just want to reboot.

If you log out without rebooting, a "Resuming Desktop Login" message is displayed and the login window reappears.

1.8 Rebooting a halted system

If the system is halted, with a ">" prompt, enter "new", and the prompt will change to "ok". Enter:

```
boot
```

If you want to boot to single user mode to do system work:

```
boot - -s
```

If you have changed the SCSI configuration:

```
boot - -r
```

2.0 Pampoll

SunOS 5.5 (Solaris) UNIX and Windoz 95 are installed on this system. By default, it boots UNIX, which is necessary to run the PAM software.

The system is an Ambra 100Mhz 486 DX2 notebook with passive display. It should always be on AC power, preferably on a UPS. Without AC power, the NiMh battery will probably only last a few minutes. The battery should be installed however, so that the system configuration is not lost if AC power is lost (the internal backup battery is about shot).

The bottom of the system gets quite hot, so leave it on a metal plate, to act as a heat sink.

2.1 Memory

RAM: 20 Mbyte

SWAP: ??

2.2 Disk

800 Mbyte internal IDE disk

2.3 LCD Display

The LCD display will show the following icons (from right to left). Those marked with a * should be on. Those marked with X should not. See the Ambra manual if you want more info.

1. * AC Power (looks like a plug)
2. * Battery Charge (an arrow), indicating the battery is being charged.
3. * Battery Status (a AA battery on its side, with vertical bars indicating battery level). The vertical bars will cycle through if the battery is being charged.
4. * Backup Battery Status (a watch battery, with a +).
5. X Suspend mode (a sleepy eye). See below, concerning power management.
6. PCMCIA card (black box)
7. Hard Disk
8. X Lock keys (caps lock, num lock, scroll lock, keypad lock). Turn these off with appropriate key. If the keypad is enabled, disable it with Fn+NumLock.

2.4 Power Management and System Configuration

2.4.1 Don't Suspend!

The Suspend feature of power management must be disabled on this system. If the system enters suspend mode, the PCMCIA network card is also powered down. When the system is wakened, the network card does not come up. The system must be rebooted to get the network card working again.

The system can be suspended in four ways:

1. by pressing and releasing (within 2 seconds) the little innocuous suspend button above the NumLock key
2. By closing and then re-opening the system within 2 seconds. Note that closing the system presses the suspend button. Now that is a stupid design! If the system is closed for more than 2 seconds, then only the display is turned off, which is OK.
3. if the Auto Suspend power management option is enabled, and the auto suspend idle timer expires
4. the battery is low, and the Battery Low power management option is set to Suspend.

When the system is suspended, the sleepy eye icon will appear in the LCD display above the keyboard. To un-suspend, press the suspend button again. Since the network card is probably frozen, you'll have to reboot.

It is wise to put a sign on pampoll, warning curious people not to open and reclose the system quickly.

Note that it is OK, and recommended, to leave the system closed when not in use.

Power management is configured with the System Configuration Utility (SCU). To bring up the SCU, shut down the system (see Figure 1.7, "How to shutdown the system"), and reboot. After the "SunOS - Intel Platform Edition Primary Boot Subsystem" screen appears, enter Ctrl-Alt-S (hold down Ctrl and Alt, type S, then release).

To navigate these screens, use the up,down,right and left arrow keys in the lower right corner of the keyboard and the Enter key to make a selection.

Highlight "PowerMgmt" and hit Enter. Configure things as follows:

2.4.2 Controls

Power Saving	Always
Battery Low	Warn Only
Alarm Resume	Disable

2.4.3 System Options

The only critical setting is to disable Auto Suspend. Warning: if one selects "Defaults" in the top menu, then Auto Suspend is re-enabled.

CPU Standby	4 Sec
Global Standby	6 Min
Auto Suspend	Disable
Disk Suspend	Enable
Video Monitoring	Enable

2.4.4 Devices

Video	6 Min
Disk	2 Min

When you're finished with the Power Management options, select Exit. If you've changed anything you'd like to save, hit Enter.

2.4.5 Other Setup Options

The only other critical options in the Setup menu are

Track Ball	Disable
Hard Disk -> Fixed Disk Types	= Auto
Memory -> Cache	Enable

Follow instructions about saving settings and exiting the SCU.

2.5 Pampoll System Clock

Every night at 00:02 local time, the script \$PAM/scripts/timehack.csh is run from superuser's crontab file on pampoll. This script shuts down polling, and then fetches the current time from station 4 (Florida). The EVE clocks are set from the GPS. So if Florida is up and on-the-air, and its GPS is working, then the system clock on pampoll should be correct.

The timehack.csh script does a sanity check, and will only correct the clock by less than 15 minutes. So, if the pampoll clock is more than 15 minutes off, it will not be corrected.

Everynight at 00:05, shebop sets its clock from pampoll.

3.0 Editing

The standard UNIX editors, vi and emacs, are provided on the system. If you are not familiar with either, a simple point-and-type editor is also available on the desktop window system, called dtpad. To run dtpad from the super user account, log into the destop as root. dtpad can then be run by clicking the editor icon on the task bar, or by typing "dtpad" in a terminal window. If you use the filemanager, you can also double click on a file to bring up the dtpad editor. See the Crontab section below about how to edit crontab files.

4.0 Network

When IP addresses have been assigned for SHEBA systems on the Des Gros you'll need to know these items:

- hostname of the pam base, if it is to be different than "shebop"
- IP address of pam base
- hostname and IP address of "Rocky" Win95 Notebook PC
- subnet mask
- domainname of Des Gros systems
- nameserver's IP address

Shut down the system to single user mode:

```
shutdown -g 10 -i S
```

If you change the name of shebop, edit these files:

- /etc/nodename
- /etc/hostname.le0

substituting the new system name.

Then edit these files:

- /etc/hosts

replacing IP address for shebop, and system name if necessary. Add an IP address for "rocky".

Edit

- /etc/resolv.conf

replacing domain name with name of sheba domain, and replace IP address of nameserver.

Setting the netmask is not as simple as it should be. The first byte in the IP address selects the network class. The default netmasks for each class are shown in Table 2, "Network Classes". If the

Class	First Byte	Address Format (N=network, h=host)	Default netmask
A	0-127	NNN.hhh.hhh.hhh	255.0.0.0
B	128-191	NNN.NNN.hhh.hhh	255.255.0.0
C	192-223	NNN.NNN.NNN.hhh	255.255.255.0

TABLE 2. Network Classes

netmask is other than the default, you need to edit `/etc/netmasks`. Add an entry, consisting of the network address for the class from column 3 (with 0's in the host address part) and the subnet mask. As an example, if the ship's network is a class B network (first byte in the range 128 to 191), add an entry like:

```
xxx.xxx.0.0      <netmask>
```

where `xxx.xxx` are the first two numbers of the IP address, and `<netmask>` is the subnet mask, something like `255.255.255.0`.

See "Samba" on page 9 about changing the Samba configuration.

Then reboot.

4.1 Samba

Samba allows UNIX and WIN95 systems to share files and printers. The config file for Samba is `/usr/local/samba/lib/smb.conf`. The current network address and subnet mask must be entered in this file. Look for the "allow hosts" entry:

```
allow hosts = 128.117.78.0/255.255.255.0
```

Substitute the network address and the subnet mask for the above values. Then either reboot, or restart samba:

```
cd /etc/rc2.d
./S99samba.server stop
./S99samba.server start
```

4.2 Net Config of "Rocky" Win95 Notebook PC

Boot up Rocky with the PCMCIA ethernet card plugged in and connected to the network. Use the twisted pair RJ45 cable to connect to the network hub.

1. If prompted for a network password, enter the Username as "pam", password "bearbait".
2. Double click on "My Computer", then "Control Panel" and "Network".
3. Under "Configuration" tab, highlight "TCP/IP -> 3Com Etherlink III PCMCIA" and select "Properties".
4. Select "IP Address" tab, and enter the IP address. Change the subnet mask if necessary.
5. Select "DNS Configuration". Enter the nameserver hostname and the domainname. Tab to the IP address field and enter the IP address of the nameserver. Click "Add".

6. Select "Gateway". I assume there will not be a need for gateways on the ship. If so remove any gateways that are configured.
7. Under the network "Identification" tab, enter "rocky" as the computer name, and "pam" as the workgroup.
8. Under "Access Control", select "Share-level access control".

Other things to check:

9. Highlight "3Com Etherlink III PCMCIA", select "Properties". "Bindings" should include TCP/IP. "Advanced". "Connector Type" should be twisted pair.
10. Select "File and Print Sharing..." and allow access to files.
11. Highlight "Client for Microsoft Networks", select "Properties", quick logon.
12. Click "OK". and then "OK" again to exit the Network window. Click "Yes" to restart.

4.2.1 Accessing Unix Disks from Windoz

In /usr/local/samba/lib/smb.conf, the "pam" user has been given write permission to the /home/pam and /data/pam directories. Therefore, if you wish to write to these directories you must use the "pam" account (password "bearbait") when logging into Windows.

To access the UNIX disks from Windows:

1. Double click "Network Neighborhood", and "Entire Network".
2. An entry "Pam" should be displayed. Double click it, and then "shebop" should appear. Click right button on "pam", click "Map Network Drive". Configure this drive as "E" and select "Reconnect at login".
3. Similarly map pam_data as drive "F".

4.2.2 Accessing Windoz disks from Unix

You can also allow a UNIX system to have access to the the PC disks. If you wish to provide access to the PC hard disk or the PCMCIA Flash disk, do the following:

1. insert the PCMCIA card. It should appear as drive "D" in the "My Computer" window.
2. Click the right button on the disk icon, and select "Sharing...".
3. Enter "C" or "D" for the shared name, select Full access type, and enter a simple carriage return as the Full Access Password (security is not a concern).
4. click OK.

If the Flash disk is inserted before you boot the PC, the last shared configuration will be in effect. If you insert the Flash disk after booting, you must re-do the shared configuration.

The disk should be visible from UNIX with the command:

```
smbclient -L rocky
```

One can copy files from "rocky" with the command (those are DOS-type backslashes):

```
smbclient "\\rocky\d" -c "get file"
```

Do "man smbclient" for more info. smbclient has an interface much like FTP.

The PAM script "pc_download" uses smbclient to transfer PAM packet files.

5.0 Backup Procedure

Complete (level 0) backups of all disks areas can be written to exabyte tape using the script `/usr/local/adm/backup/backup.lev0`. This script uses the UNIX `ufsdump` command to do exabyte tape backups of the `/`, `/usr`, `/home` and `/data` directories (but not `/scr`).

On pampoll the level 0 script is called `rbackup.lev0`. It creates a backup of the `/` and `/usr` directories on pampoll.

Every night, an incremental backup job is run from root's crontab on shebop. This creates a backup of every file on shebop's disks which has been modified since the last level 0 tape backup. These incremental files from the are stored on the `/scr/sysbackup` directory, not on tape. These files are deleted from the disk after they are a week old. This scheme is convenient, and provides a daily backup of changed files, but it has two drawbacks.

If it has been a long time since the last level 0 backup (or if many files have been modified) then the incremental files will become large and may take up a large amount of space on `/scr`.

Also if the external disk crashes, including the `/scr` partition, then you've lost everything since the last tape backup.

For these reasons I recommend doing a level 0 backup on shebop about every two weeks.

Level zero backups of pampoll do not need to be done as often, since pampoll's disk is not used for data storage. Backups of pampoll can be done as requested by the big PAM bosses in Boulder.

5.1 Shebop Level 0 Complete Backup to Tape

1. insert tape in drive
2. on an available terminal window, login as the superuser with the `su` command:
`su -`
3. change to admin directory:
`cd /usr/local/adm/backup`
4. run backup script:
`./backup.lev0`
5. If it succeeds, label the tape appropriately.

Status messages are printed to the screen and to a log file on that same directory.

5.2 Pampoll Level 0 Complete Backup to Tape

1. insert tape in exabyte drive on shebop
2. on pampoll, login as the superuser with the `su` command:
`su -`
3. change to admin directory:
`cd /usr/local/adm/backup`
4. run the `rbackup` (remote backup) script:
`./rbackup.lev0`
5. If it succeeds, label the tape appropriately.

Status messages are printed to the screen and to a log file on that same directory.

5.3 Exabyte errors and maintenance

If, when doing a tape backup, and the tape drive returns an error, you'll see the top LED on the drive flashing slowly, and ufsdump will print this error.

```
DUMP: NEEDS ATTENTION: Do you want to restart?: ("yes" or
      "no" )
```

Answer no, and hit ctrl-C enough times to stop the script. Re-insert the tape, then press the eject button to clear things and eject the tape. Try inserting a cleaning type and using a new exabyte tape.

If the top and bottom LEDs are flashing fast, then the drive needs to be cleaned using a cleaning cartridge.

5.4 Incremental Backups to Disk

Nightly incremental backups using ufsdump of the system, home and data directories are done onto the /scr disk. These incremental backup files are deleted when they are a week old.

Script /usr/local/adm/backup/backup.inc does the incremental backups and deletes week-old files. This is run automatically every night at 3 am from the super user's crontab.

5.5 Restoring a file from an Incremental Backup

To restore a file from one of the incremental backups, do the following:

1. Find out which backup contains your file. The *.list files on /scr/sysbackup contain a list of the files in the *.dump files. To list a *.list file (in this case the backup for /data on Oct 13, 97):

```
cd /scr/sysbackup
ufsrestore ta data.lev5.970913.list
```

If the file you want is present, then you can restore it. Note that the file is restored with the entire directory path as shown in the listing.

2. Change your working directory to wherever you want to restore the file, or /scr if you're in doubt.

```
cd /wherever
```

3. Use ufsrestore again to restore the file(s):

```
ufsrestore if /scr/sysbackup/data.lev5.970913.dump
```

Within ufsrestore, do "ls" to list files on the backup, "cd" to change directories in the backup, "add file" to add a file or directory to the list to be restored, "extract" to restore the files, and "quit".

5.6 Restoring a file from a Tape Backup

The procedure is similar to restoring from the incremental files on disk, except there is no *.list file, and you must position the tape using the "mt fsf" command. These directories are stored on these tape files:

tape file	directory
0	/
1	/usr
2	/home
3	/data

TABLE 3.

To restore files from a given directory (where N is the file number, shown above):

```
cd /wherever
setenv TAPE /dev/rmt/0mbn
mt rew
mt fsf N
ufsrestore if $TAPE
```

When prompted for the volume number, enter "1".

6.0 Disk Directories

- /home, 535 Mbyte
Users home directories, PAM tree and locally installed software. This directory is backed up with backup.lev0 and backup.inc scripts. Users should use /data or /scr for large data files.
- /data, 1 Gbyte
Contains PAM packet and NetCDF files. This directory is backed up with backup.lev0 and backup.inc scripts.
- /scr, 3 Gbyte.
Scratch data files, extra SWAP space, and incremental backups. This directory is NOT backed up, so users should not place irreplaceable files here.
- /usr/local
Freeware and other locally installed software. This is a link to /home/local.
- /usr/local/adm
system administration files
- /usr/local/src
Source for most share-ware software packages that have been installed on the system.
- /usr/local/bin, /usr/local/man, /usr/local/lib
local software binaries, libraries, man pages
- /usr/local/splus
S+ installation
- /usr/local/samba
Samba binaries and configuration for sharing files between UNIX and windoz systems. lib/smb.conf is the configuration file, lib/printcap lists the shared printers, log contains log files
- /home/pam
The PAM tree.
- /home/pam/log

- syslog files from PAM programs
- /data/pam
- PAM packet and NetCDF files.

7.0 Clock

7.1 Timezone (TZ)

The system timezone has been set to "US/Alaska". Alaska standard time is 9 hours earlier than GMT. I notice a timezone called AKWT, (winter time?) which seems to be the same as GMT. A user can set their own timezone, by putting a "setenv TZ" statement in their .local file. For example:

```
setenv TZ GMT
```

The default system timezone can be changed in /etc/TIMEZONE, and the system rebooted.

7.2 xntp

The xntp (network time protocol) software is installed but not configured on shebop. The xntp software is in /usr/local/src/xntp. If another UNIX system on the Des Gros will be the ship's clock, and is running xntp, then add an entry like this to the super user's crontab (where timeserver is the host name of clock system):

```
# Set system clock at midnight and noon from system called
timeserver.
# Substitute actual host name of the time server for "timeserver",
# or add an entry for timeserver in /etc/hosts.
0 0,12 * * * /usr/local/bin/ntpdate timeserver > /dev/null 2>&1
```

Adjusting the clock twice a day should be sufficient. The PAM polling process works best if the clock is within 5 seconds of the pam station clocks. If the clock system is UNIX, but not running xntp, then use rdate:

```
0 0,12 * * * rdate timeserver > /dev/null 2>&1
```

8.0 Crontab

A crontab file contains commands to be executed at periodic time intervals.

To list a crontab file

```
crontab -l
```

For help on crontab:

```
man crontab
```

To edit a crontab file, you first must decide on an editor. These examples will assume you want to use the vi editor. Emacs is also available.

To edit the crontab file from the default shell:

```
EDITOR=vi crontab -e
```

From the C shell:

```
csh
setenv EDITOR vi          # or emacs
crontab -e
```

If you are not familiar with vi or emacs, use the dtpad editor, which is a simple point and click editor. To use dtpad from the super user account, you must log into the window system from the root account (i.e. logging in with "su" from another user's window will not work). Then enter:

```
EDITOR=dtpad crontab -e
```

9.0 Answerbook Documentation

When the window system is up, select the up arrow above the "books?" icon. Click on Answerbook. The user, system administrator and desktop environment answerbooks are installed.

10.0 Adding a user:

From super user account:

```
useradd -u <uid> -g <group> -d /home/<user> -m -k /etc/skel \
-s /usr/local/bin/tcsh <user>
<uid>: numeric user id. Pick one that doesn't exist in
/etc/passwd. Currently 100 and 101 are used by the pam and
sysadm users.
<group>: group name. Pick one from /etc/group, probably "pam".
<user>: user's desired login name.
```

Set initial passwd:

```
passwd <user>
```

After logging in, the user may want to copy the login environment from the pam user:

```
cp -r ~pam/.login ~pam/.cshrc ~pam/.Xdefaults ~pam/.dt .
```

11.0 Printers:

If an HP printer is available on the network, which is running the HP JetDirect software, here is how to enable access to it:

1. become super user

```
su -
```
2. find out the printer's name and IP address. Add these to /etc/hosts.
3. Can you ping it?

```
ping printername
```
4. Start jetadmin program

- ```

 cd /opt/hpnp
 ./jetadmin

```
5. In jetadmin, select:
    - Configuration
    - Add printer
  6. enter printer's network name
  7. Select
    - change Lp destination
  8. enter a name for the printer queue
  9. Select
    - configure
  10. quit.
  11. try to print a page
 

```
lp -d printername filename
```

If a printer is available on another UNIX system, here is how to enable access to it. This can also be done with admintool, but this is pretty simple by hand:

1. Is the system running a System V version of UNIX (e.g. Solaris 2/SunOS 5) or a BSD version (SunOS 4, Linux)?
2. If system V, enter
 

```
lpsystem -t s5 <server>
```

`<server>` is the print servers host name.
3. if BSD
 

```
lpsystem -t bsd <server>
```
4. Enter:
 

```
lpadmin -p <lpname> -s <server> -I any -D "comment"
```

`<lpname>` is the name of the printer.

Command "lpstat -t" will list current printers.

If you want to give it a different name than it has on the server:

```
lpadmin -p <lpname> -s <server>!<othername> -I any -D "comment"
```

`<othername>` is the name of the printer on the server system.
5. Configure printer queue:
 

```
accept <lpname>
enable <lpname>
```
6. If this printer is to be the system default:
 

```
lpadmin -d <lpname>
```

To shutdown a printer queue:

```
reject <lpname>
disable <lpname>
```

To remove a printer:

```
lpadmin -x <lpname>
```

## 11.1 Samba Printers

If you wish to share a printer with Win95 systems, add a line to `/usr/local/samba/lib/printcap`. I believe you need to follow the printer name with a vertical bar '|'. Restart samba or reboot.

## 12.0 Known System bugs:

### 12.1 lpsched

Damn lpsched bug. Sometimes the print scheduler goes bonkers. If you see the CPU usage at 100% it may be due to lpsched. Enter "top". If lpsched is the big user, become the super user and:

```
cd /etc/rc2.d
./S80lp stop
./S80lp start
```

This could be put in root's crontab to run every night.

### 12.2 Unresponsive windows

Sometimes the window manager hangs. The input focus is frozen in one window and no amount of clicking will allow you to change to another window. The only solution I've found is to move the mouse to the background workspace, click and release the right button, and select "Restart Workspace Manager". Give it a few moments, it should work.

### 12.3 dtterm

When you start a dtterm process you'll see these errors on the console. Ignore them, they're harmless. Or if someone is really desperate for something to do, figure out how to get rid of them. They occur because the old keyboard on shebop does not have an insert key.

```
Warning:
 Name: Copy
 Class: XmPushButtonGadget
 2054-xxx Illegal mnemonic character. Could not convert X
 KEYSYM
 to a keycode.
```