To: Mark 5 Computer Users and Owners
From: Dan Smythe
Re: Disk-to-Disk Back-up of Mark 5 Systems

The memo summarizes the steps for doing a disk-to-disk back-up with a mark 5 system. This backup will make a clone of your system disk on another disk drive with equal or greater capacity. The backup disk drive can be in a removable CRU carrier like the one installed (but not necessarily connected) on the side of most of the first 22 mark 5 units. If your mark 5 unit does not have a removable carrier, you can install one; or you can temporarily attach the back-up disk to the secondary IDE connector on the mother board. You can make the back-up without removing the cover from your mark5 unit, but you will need to remove the cover and disconnect power to the primary disk in order to test the copy.

IMPORTANT: This procedure requires that your primary system disk be connected as the primary disk. If it is connected as the secondary disk, this procedure will over-write the data on your system disk. Some mark 5 units have the primary system disk connected to the secondary connector. You can check by running 'df' at a linux command prompt. If it says

/dev/hda etc.,

then your system disk is primary. If it says

/dev/hdc etc.,

then your system disk is secondary, and you need to move it to the primary IDE connector on the mother board, or follow the instructions in mk5buc.txt.

This procedure is based on l3bu.txt "Disk-to Disk Back-up with the Debian Linux 3 Rescue Floppy" by Himwich, Mujunen, and Gonzalez (1999 Jun 07).

The steps are:

1. With the power off, install the backup drive in the computer.
2. Turn the system on.
3. You should eventually see the red hat GRUB screen, with its 10-second countdown. Within the 10 seconds type 'e' to edit.
4. Select the line that starts with kernel and type 'e' to edit the line.
5. Go to the end of the line and type emergency as a separate word (press the [Spacebar] and then type emergency). Press [Enter] to exit edit mode.

6. Back at the GRUB screen, type 'b' to boot into single user mode.

7. To copy the primary (hda) disk to the back-up (hdc), at the shell prompt type:

```
# cd /dev
# dd if=hda of=hdc bs=16k
# sync;sync;halt
```

Notes:

(1) Be very careful with the dd command. If you exchange "hda" and "hdc", you may overwrite the disk you are trying to back up.
(2) The dd command may take 20-30 minutes to complete depending on the size and speed of your disks.
(3) "hda" is Primary Drive 0 (master) hard drive. "hdc" is Secondary Drive 0 (master) hard drive.

8. Remove the power after the "System halted" message appears.

9. (Optional) It is recommended that you verify that the back-up disk boots correctly. You will need to remove the cover and disconnect power to the primary disk in order to test the copy.

   (a) Remove power to the primary disk drive.
   (b) Restore power and boot with the back-up disk.
   (c) Login as oper and check that Mark5A runs OK.
   (d) It is also a good idea to verify that there is some new information on the back-up disk, perhaps a script or data file that would not have been present on the back-up disk before the most recent copy was made.
   (e) Shutdown the back-up disk in an orderly fashion, as root: "shutdown -h now".
   (f) Remove the power after the "System halted" message appears.
   (g) Re-connect power to the primary disk drive.

10. Remove the back-up disk and store it someplace safe.

11. Re-install the primary disk, restore the power, and reboot.